
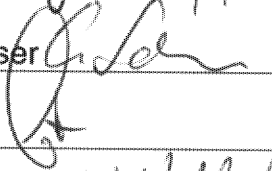





SPIRE-AST-REP-002489

Title: **Test Report for Electrical Integration  
of EQM-SPIRE Warm Units**

CI-No: 153 200

Prepared by:	J. Schäffler 	Date:	Date: 14.06.05
Checked by:	C. Schlosser 		6.7.05
Product Assurance:	R. Stritter 		11.07.05
Configuration Control:	W. Wietbrock 		12.02.05
Project Management:	Dr. W. Fricke 		12/07/05

Distribution: See Distribution List (last page)

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Issue	Date	Sheet	Description of Change	Release
1	14.06.05	all	Initial Issue	

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## 1 SUMMARY

This document summarizes the results of the electrical tests performed during integration of the EQM-SPIRE Warm Units according to the test procedure No. HP-2-ASED-TP-0057, issue 1.

The filled in test procedure is given in Attachment 8.I.

The measurement steps of the MIL-Bus verification have been created in IDAS-Format, so the test has been run automatically according to this IDAS-Procedure.

The test results of the MIL-Bus verification have been stored on the computer Hard-Disc by the IDAS program.

The IDAS created test report of the MIL-Bus verification is given in Attachment 8.II.

## 2 Test Report Digest

---

**Operations:** Electrical Integration of EQM SPIRE Warm Units

---

**Start Date:** 11.05.05      **End Date:** 11.05.05      **Location:** Astrium OTN

---

**Test Procedures (Ref. Number – Issue / Rev. – Date)**

- **Master:** HP-2-ASED-PR-0051 1 / - 01.03.05  
- **Specific:** HP-2-ASED-PR-0057 1 / - 09.05.05

---

**Test Readiness Review:** 11.05.05 (see HP-2-ASED-MN-0970)

**Post Test Review:** -

**Test Changes:** No test change has been raised.

**Non Conformances:** HP-150000-ASED-NC-1083 (see attachment 8.III)

---

**Test Conclusion:**

The electrical integration of the EQM-SPIRE Warm Units has been performed successfully.

The release for the start of the functional test of EQM-SPIRE Warm Units was given after mating of the harness.

### 3 TEST RESULTS

The detailed test results are given within the filled-in test procedure (see attachment 8.I/II).

A short summary of the obtained results is given below.

#### 3.1 Bonding Measurement

Warm Unit	Required Value	Actual Value
HSDPU	$\leq 2.5 \text{ m}\Omega$	0.84 m $\Omega$
HSFCU	$\leq 2.5 \text{ m}\Omega$	1.18 m $\Omega$
HSDCU	$\leq 2.5 \text{ m}\Omega$	1.45 m $\Omega$

#### 3.2 Grounding Verification

Test Item	Required Value	Actual Value
SVM star ground	$\leq 100 \text{ m}\Omega$	41 m $\Omega$
PLM SCOE	$\leq 100 \text{ m}\Omega$	90 m $\Omega$
CDMU DFE	$\leq 100 \text{ m}\Omega$	97 m $\Omega$

#### 3.3 Insulation Resistance Test

The actual resistance between primary power return of HSDPU (J01, pin4) and SVM panel GND was  $\geq 20 \text{ M}\Omega$  (required value  $\geq 1 \text{ M}\Omega$ ).

### 3.4 Power Verification of HSDPU

Due to external power excitation of HSFCU and HSDCU the power verification has been performed at HSDPU only.

The results of HSDPU power verification are summarized below. The recording of the inrush current is shown in Fig. 3.4-1.

Test Item	Required Value	Actual Value
Supply Voltage	(28±1) VDC	28 VDC
Polarity	Pin2:pwr/pin4:ret	ok
Inrush current	≤ 2.25 A	1.156 A
Steady state current	≤ 1 A	0.49 A

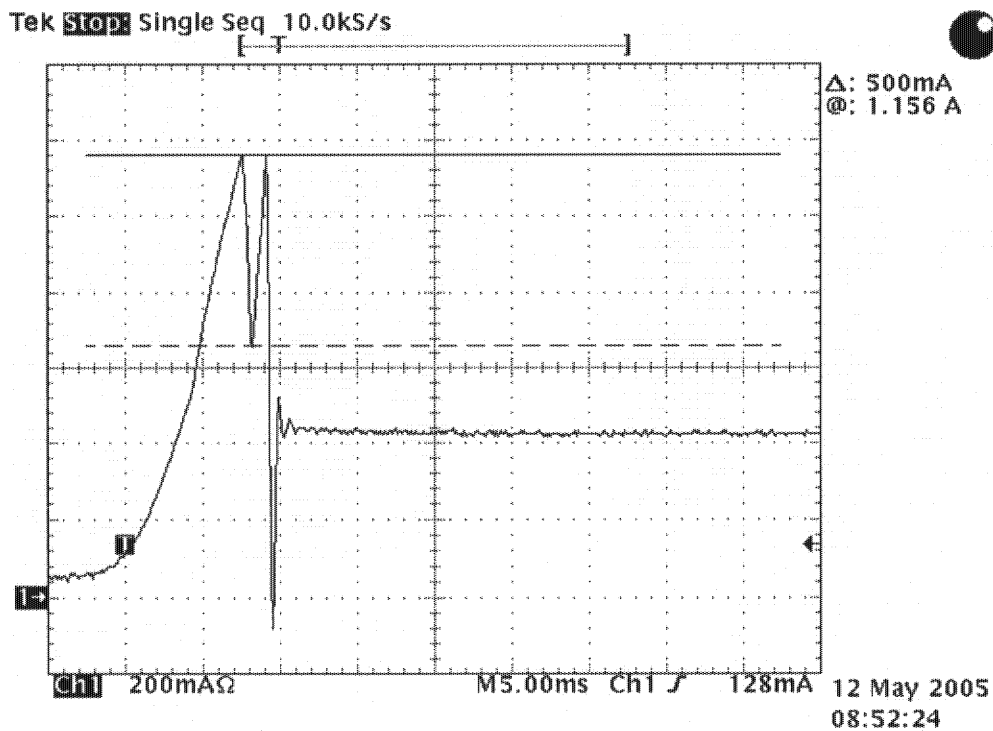


Fig. 3.4-1: Inrush Current Measurement of HSDPU

### 3.5 MIL-BUS 1553 Verification

The test results of the MIL-Bus verification are described in the test report HP-2-ASED-TR-0042 (see attachment 8.II)

During the MIL-Bus verification, IDAS reported some NOKs in following measurement report steps:

6.4.2.8, 6.4.3.4 and 6.4.3.5

In these steps the P-P Voltage, B-Fall-time and A/B ratio were out of the specified

"IDAS-measurement-type limits" (see NCR-No: HP-150000-ASED-NC-1083)

#### **NCR disposition:**

**The non-conformances have to be analysed to assign the problem either as**

- Electrical measurement problem or
- MIL Bus-standard misinterpretation.



## 4 CONFIGURATION STATUS

The actual configuration of the SPIRE QM-Warm Units is defined within the Acceptance Data Package SPIRE-RAL-PRJ-001898, issue 3.0.

The mechanical integration of the SPIRE Warm Units onto the SVM simulator is described within document No. HP-2-ASED-PR-0031.

The actual EGSE configuration is defined in the EGSE Setup Procedure, No. HP-2-ASED-PR-0034.

**5 NCR SUMMARY**

In the scope of integration performance the following NCR's have been raised:

NCR	Step No.	Date	Description	Status	Remark
- NCR -No.: HP-150000- ASED-NC-1083	6.5	18.05.05	MIL-Bus functional behaviour out of requirement	Open	Non-conformance to be analysed and investigated.

### 6 TEST CHANGE SUMMARY

This paragraph summarizes all changes of the integration procedure which have a relevant impact on the performed tests (e.g. change of the test setup, additional test steps or sequences, modification or deletion of test steps or sequences, change of expected values or pass/fail criteria).

All other minor deviations to or adaptations of the integration procedure are hand marked at the respective test step.

During the performance of the integration the following Test Changes (TC) have been considered:

Test Change	Step No.	Date	Description	Status	Remark
N/A			N/A		

## 7 AS-RUN PROCEDURE

**Test Facility:** EADS Astrium GmbH Ottobrunn, building 5.0, clean room class 100.00

**Test Equipment:**

- Herschel PLM-SCOE
- Herschel CDMU-DFE
- IDAS-5 incl. Test Head 1/2 and T-adapter
- Bonding Measurement Bridge (Metra Hit, 27I)
- Oscilloscope (Tektronix, TDS 754A)
- Current Probe (Tektronix, TCP 202)
- Multimeter (HP, 34401A)

**Test Date:** 11 May 05

**Test Procedure:** HP-2-ASED-TP-0057, issue 1.0

**Test Conductor:** C. Schlosser

**Quality Assurance:** E. Lamprecht

**Test Engineer:** A. Grasl  
J. Schäffler

**EGSE Operator:** M. Kölle  
S. Ilsen

## 8 ATTACHMENTS

- I. Filled in Test Procedure HP-2-ASED-TP-0057
- II. IDAS generated Test Report HP-2-ASED-TR-0042
- III. NCR No. HP-150000-ASED-NC-1083

**I. Filled in Test Procedure HP-2-ASED-TP-0057**

46 pages

Working Copy!

Title: EQM-SPIRE Warm Units Integration with IDAS

CI-No: 153 200

Prepared by:	<u>J. Schäffler</u> <i>J. Schäffler</i>	Date:	<u>11.5.05</u>
Checked by:	<u>Ch. Schlosser</u> <i>Ch. Schlosser</i>		<u>11.5.05</u>
Product Assurance:	<u>for R. Stritter</u> <i>B. Breuge</i>		<u>12.05.05</u>
Configuration Control:	<u>W. Wietbrock</u> <i>W. Wietbrock</i>		<u>12.05.05</u>
Project Management:	<u>for W. Rühle</u> <i>W. Rühle</i>		<u>12.05.05</u>

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Issue	Date	Sheet	Description of Change	Release
1	9.5.05			



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## 1 Scope

This procedure details the general rules and necessary steps to be followed during the electrical integration and test of the Herschel SPIRE Warm Units.

An overview of the SPIRE Warm Units on the SVM Panel is given below.

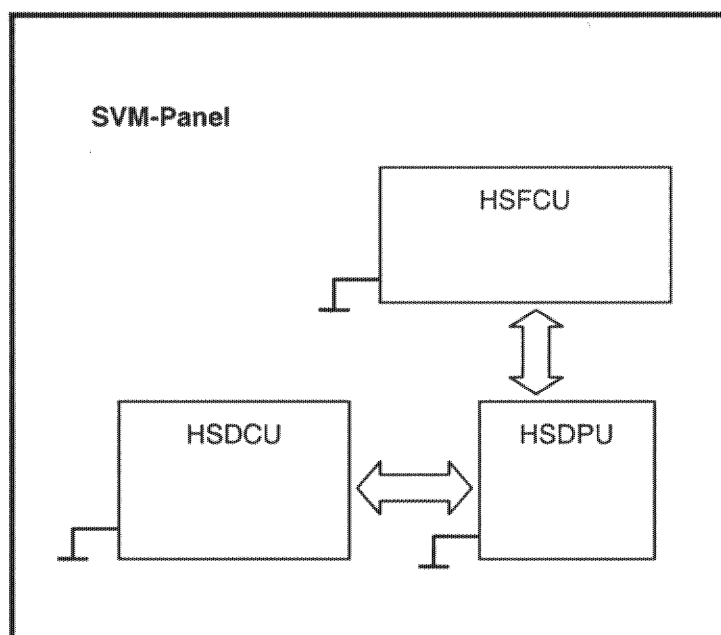


Figure 1.0-1: SPIRE Warm Units on SVM Panel

## 2 Objective

### 2.1 General Overview

The purpose of this integration steps is to install and test the relevant electrical interfaces of the SPIRE Warm Units and to mate the harness connectors to the units. A block diagram of the SPIRE QM Warm Units is given in Fig. 2.1-1 below.

The mechanical integration of the SPIRE Warm Units and the interconnection harness onto the EQM SVM simulator is described within the procedure for Herschel EQM SVM Simulator Integration, doc. No. HP-2-ASED-PR-0031 (RD1).

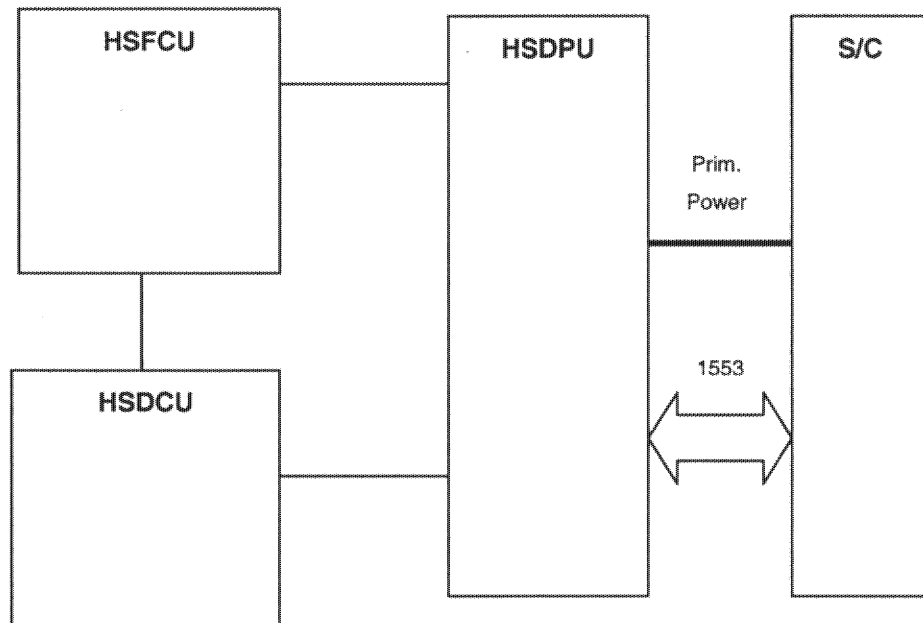
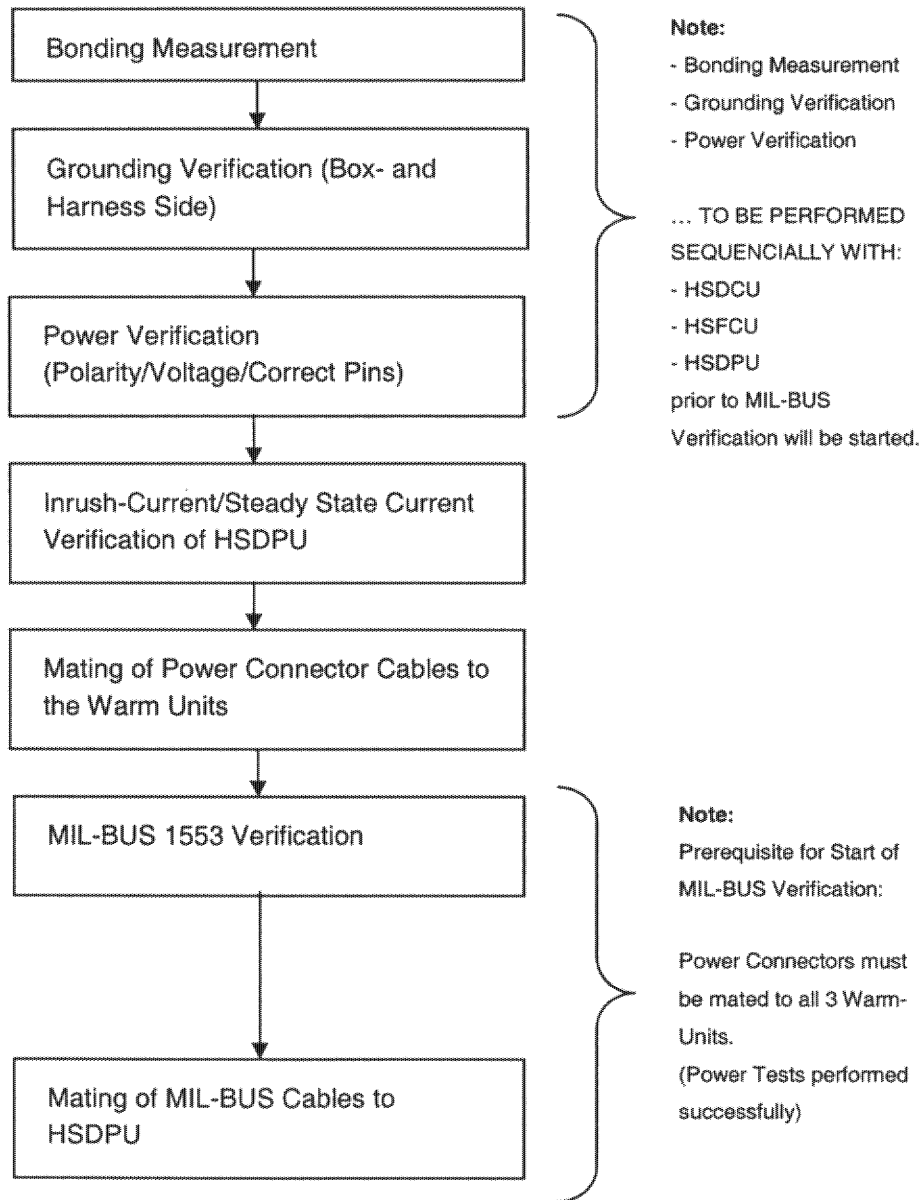


Figure 2.1-1: Blockdiagram of the Herschel SPIRE QM Warm Units (TBC)

**2.2 Main Test Flow for Integration and Test of SPIRE Warm Units  
(Measurements to be performed with IDAS)**



## 2.3 Integration and Test Flow Description

Following electrical tests will be performed for each SPIRE Warm Unit:

### 2.3.1 Bonding Test between Box Housing and SVM Panel

Purpose:

To verify the bonding resistance between the housing of the mounted box structure and SVM-panel GND.

Required bonding resistance:

$R < 2.5 \text{ mOhm}$

Prerequisite: A grounding diagram should be available to verify the correct bonding between used electronics units and grounding point. (see para. 4.2.1.6)

Note: For verification of the Grounding Diagram, it is proposed to measure the resistance of:

- DCU-, FCU- and DPU-housing to SVM panel GND
- SVM panel GND to measurement GND
- PLM SCOE int. GND rail to facility GND
- CDMU-DFE rack int. GND rail to facility GND
- IDAS rack int. GND rail to measurement GND

Used equipment:

Bonding Measurement Bridge (Milliohm meter).

Measurement to be performed:

Manually.

### 2.3.2 Bonding Resistance Tests between Box Ground Pins and Ground at Warm-Unit-Side

Purpose:

To verify the bonding resistance between grounded connector pins and ground when grounding of this pins is required. (e.g. power return pins at Warm Unit or at harness conn.)

Used equipment:

IDAS.

Measurement to be performed:

Automatically by using IDAS and proper test-steps.

IDAS will perform this test by connecting an ohmmeter with 1 to 10 mA measurement current between the required connector pins and ground. Measurement will be activated by proper measurement program steps.

### 2.3.3 *Insulation Resistance Tests between (Box-Connector) Power return Pins and Ground - at PLM SCOE-Side*

Purpose:

To verify the insulation resistance between insulated connector pins and ground when insulation of this pins is required. (e.g. power return pins at Warm Unit or at harness conn.)

Required Insulation Resistance:

$R \geq 1 \text{ MOhm}$

Used Equipment:

Ohm-Meter

Measurement to be performed:

Manually

### 2.3.4 *Power Voltage Test*

Purpose:

To verify the correct voltage and the correct polarity at the required connector pins prior to mating of the harness connectors to the Warm-Units. (see para. 4.2.1.1/2)

Used Equipment:

Multimeter

Measurement to be performed:

Manually

### 2.3.5 *Inrush Current Test*

Purpose:

To measure the inrush current of the HSDPU, when the power is switched on and the power connector is mated to the HSDPU via IDAS T-Adaptor or break out box.

To measure the voltage and the steady state current of the HSDPU.

(see para. 4.2.1.1)

Used Equipment:

IDAS and current probe or DVM and scope with current probe

Measurement to be performed:

Automatically by using IDAS and programmed test steps or by using a scope with current probe.

A current vs. time diagram will be provided.

**Note:**

**After successful performance of the bonding-, voltage- and inrush current-verification, the power connectors will be connected to the relevant Warm Unit acc. to para. 4.2.1.7. The power verification has to be performed , before the MIL-BUS verification will be started.**

### **2.3.6 MIL-BUS 1553 Verification**

Purpose:

To measure the electrical characteristics of the MIL-Bus 1553 like voltage, rise time, fall time, measurement of ratio between A-voltage and B-voltage. (see para. 4.2.1.3/4)

Used Equipment:

IDAS and integrated scope

**Note:**

**After successful performance verification of the MIL-Bus 1553, the MIL-Bus connectors will be mated to the Warm Unit acc. to para 4.2.1.7.**



### 3 Documents/Drawings

#### 3.1 Applicable Documents

No.	Document Name	Document Number	Issue/Revision
AD1	PA-Plan	HP-2-ASED-PL-0007	2-1
AD2	SPIRE-ICD	SCI-PT-IIDB/SPIRE- 02124	3-3
AD3			
AD4			
AD5			
AD6			
AD7			
AD8			

#### 3.2 Reference Documents

No.	Document Name	Document Number	Issue/Revision
RD1	EQM SVM Simulator Integration	HP-2-ASED-PR-0031	1
RD2	EGSE Configuration Procedure	HP-2-ASED-PR-0035	1
RD3	SPIRE Harness Definition	SPIRE-RAL-PRJ-000608	1.2
RD4	SPIRE ESD Requirements	SPIRE-RAL-NOT-002028	-
RD5			

**3.3 Other Documents**

NA



## 4 Configuration and Requirements

### 4.1 PLM Configuration

The Warm -Units are mounted at the EQM-SVM Panel acc. to RD1, the S/C Harness is prepared but not connected.

The grounding has to be performed acc. to para. 4.2.1.6

### 4.2 Test Setup

#### EGSE configuration during tests:

The used EGSE is composed of two main parts:

- PLM-SCOE (for power excitation)
- CDMU-DFE (for data handling)

#### IDAS-5 Configuration during tests:

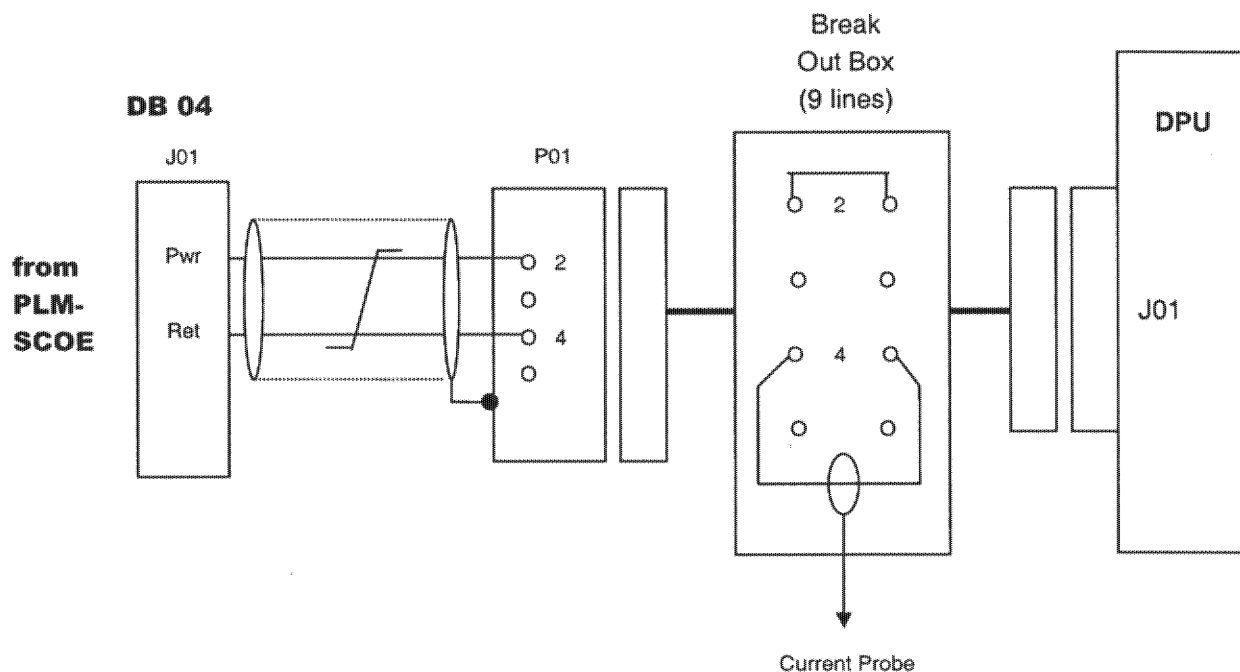
IDAS-5 Test Heads are connected via proper Testadapters to the relevant

"Unit under Test" - Connectors. For current measurements (Inrush and Steady-State) a current probe will be used.

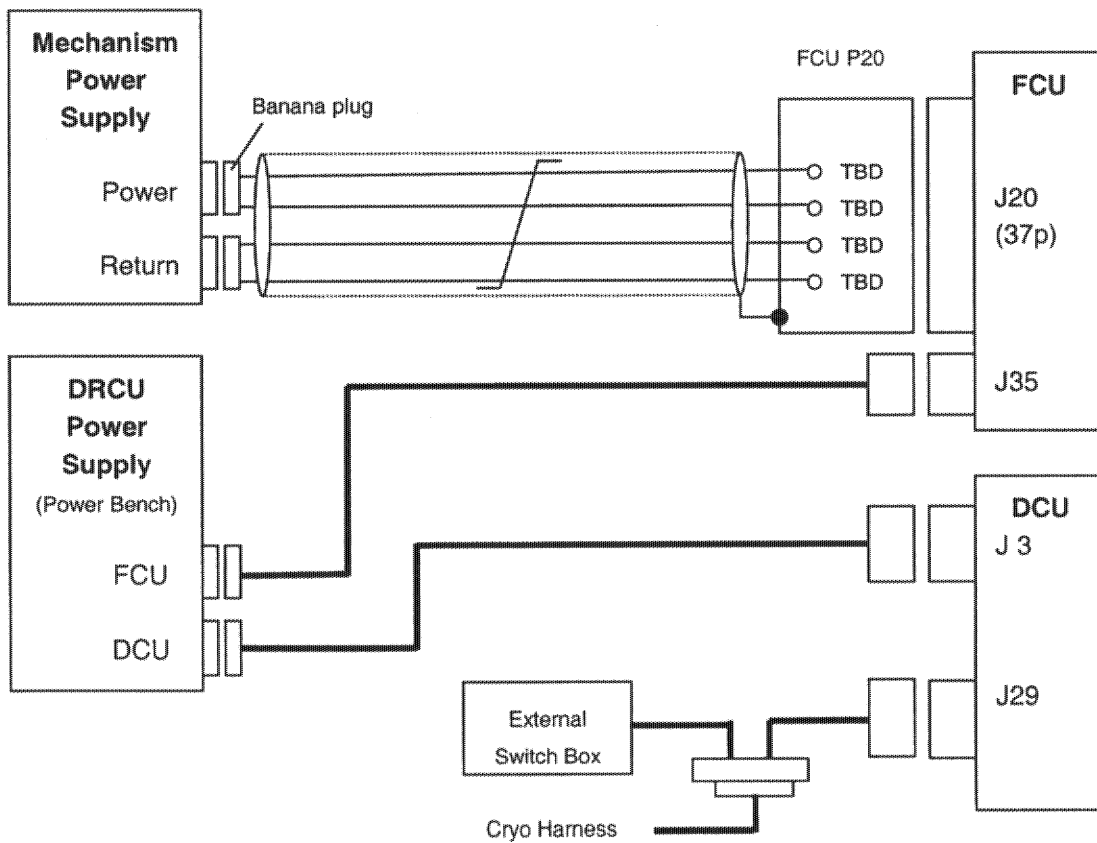
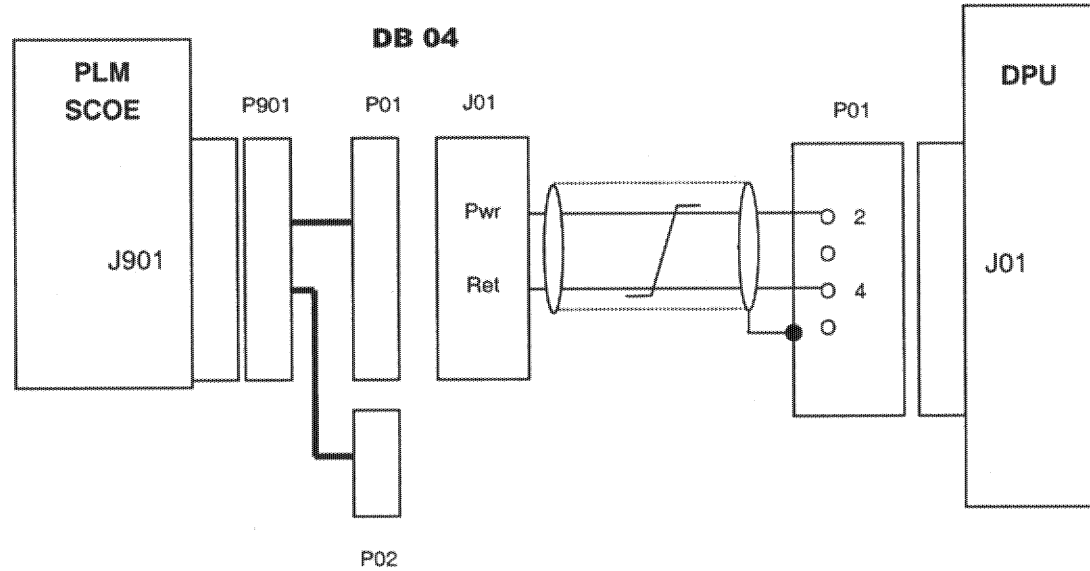
The IDAS-Rack must be grounded acc. to para. 4.2.1.6.

4.2.1 Block Diagram of the Test Setup

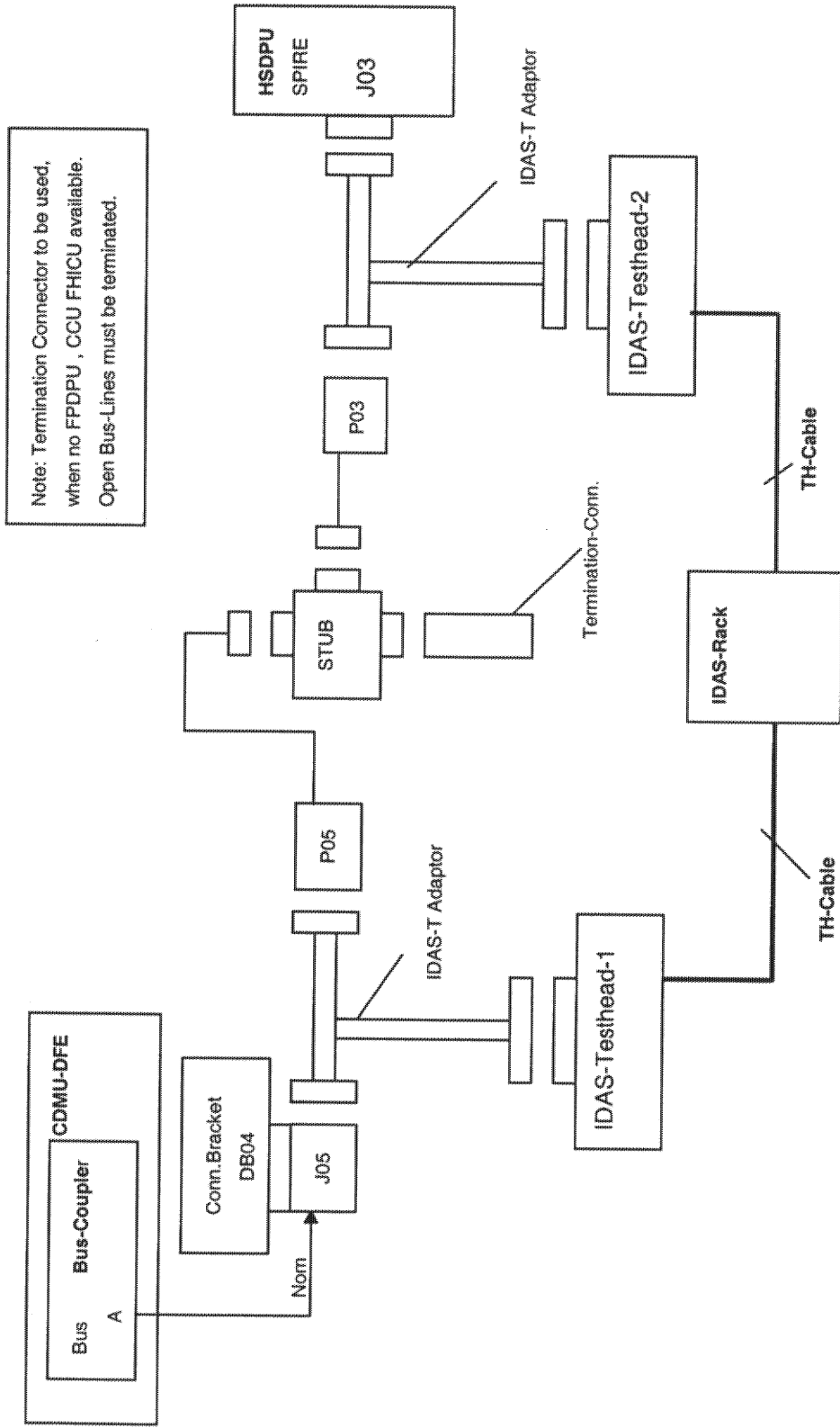
4.2.1.1 Electrical Test Setup for Power Verification



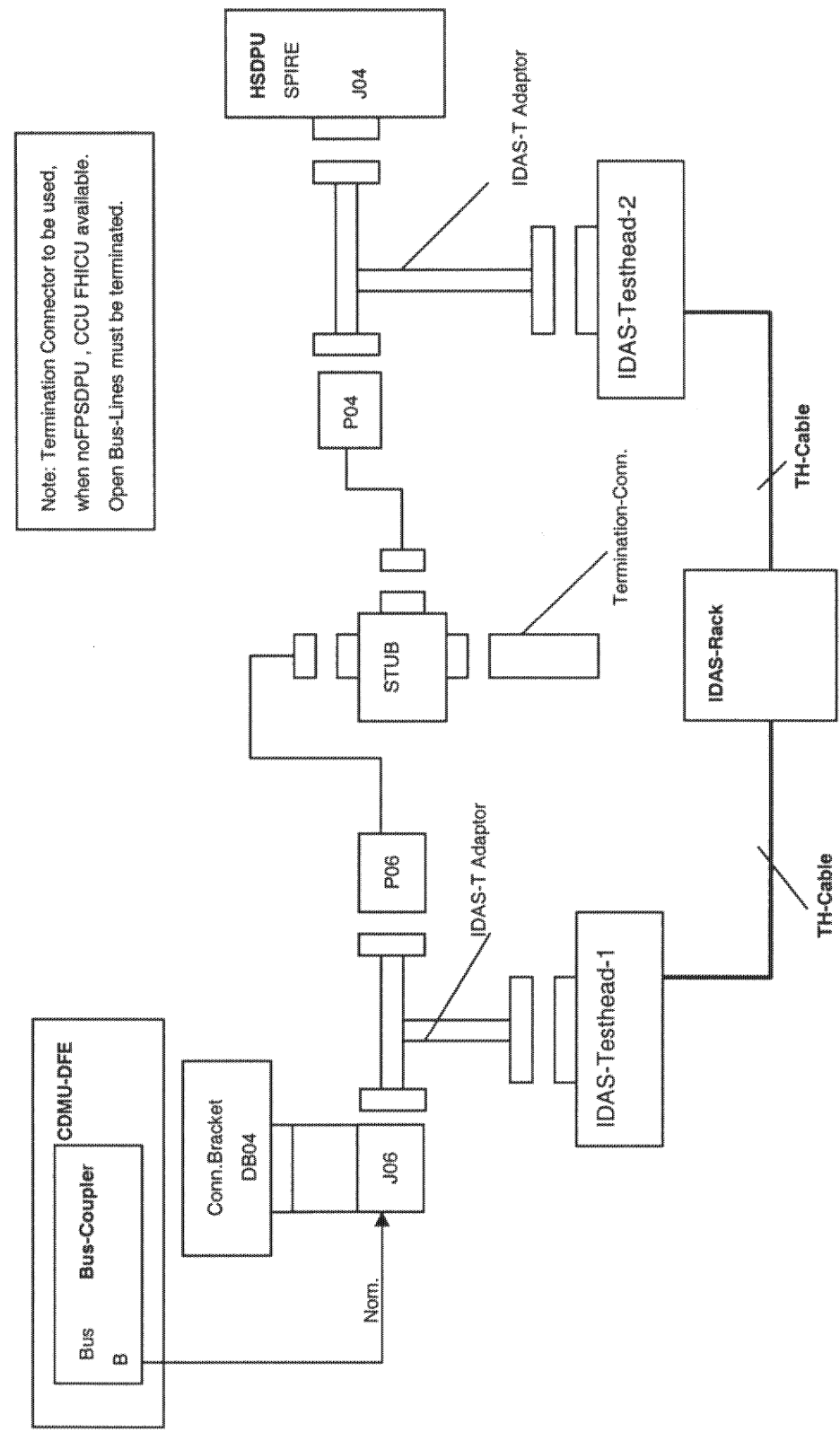
4.2.1.2 Power Excitation of SPIRE Warm Units after Verification of I/F's



4.2.1.3 Electrical Test-set up for SPIRE MIL-Bus A Verification (Prime)



4.2.1.4 Electrical Test-set up for SPIRE MIL-Bus B Verification (Prime)

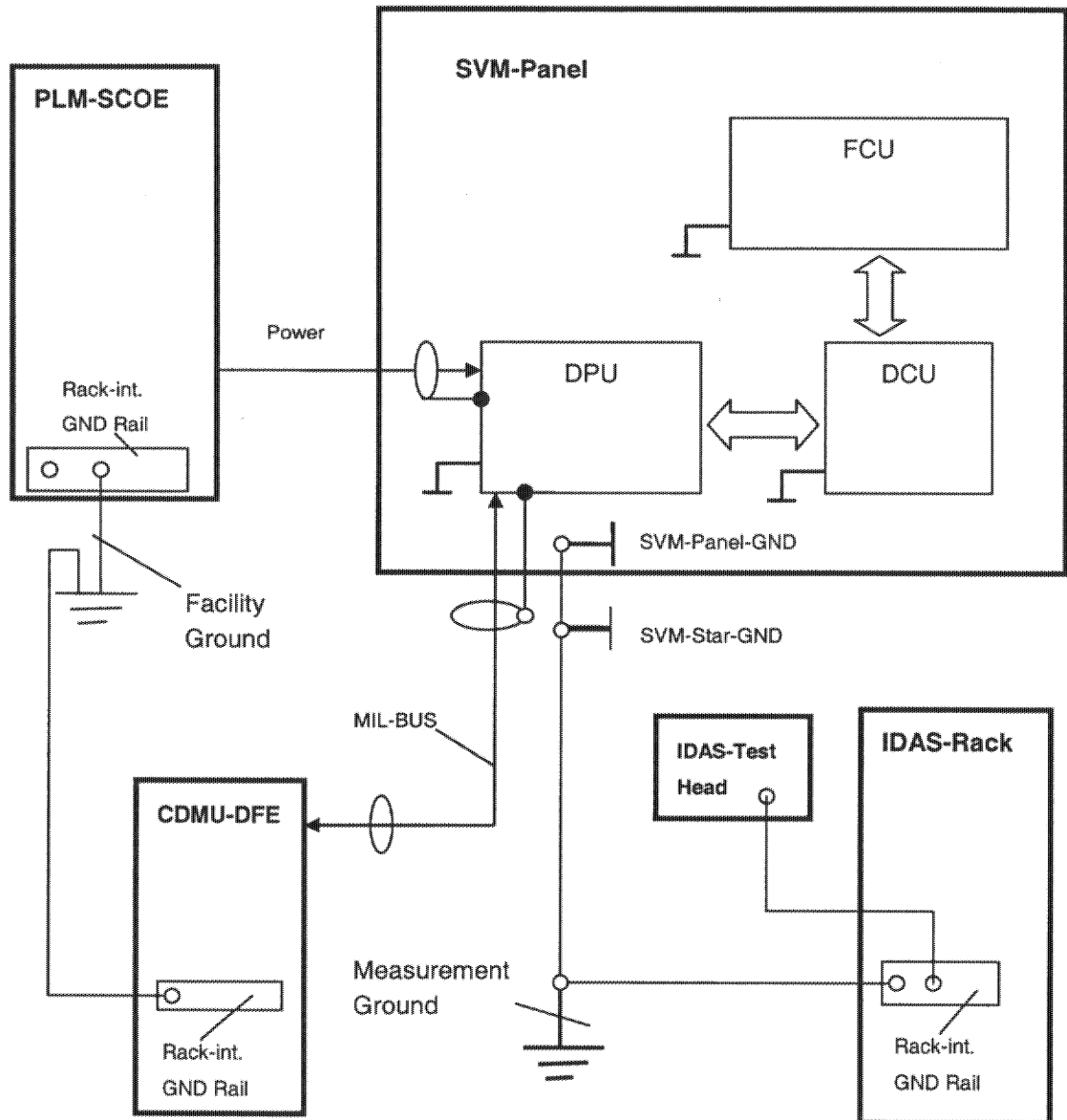


Note: Termination Connector to be used, when noFPSPDU, CCU FHICU available. Open Bus-Lines must be terminated.

4.2.1.5 Electrical Test set-up for Synch Signal Verification

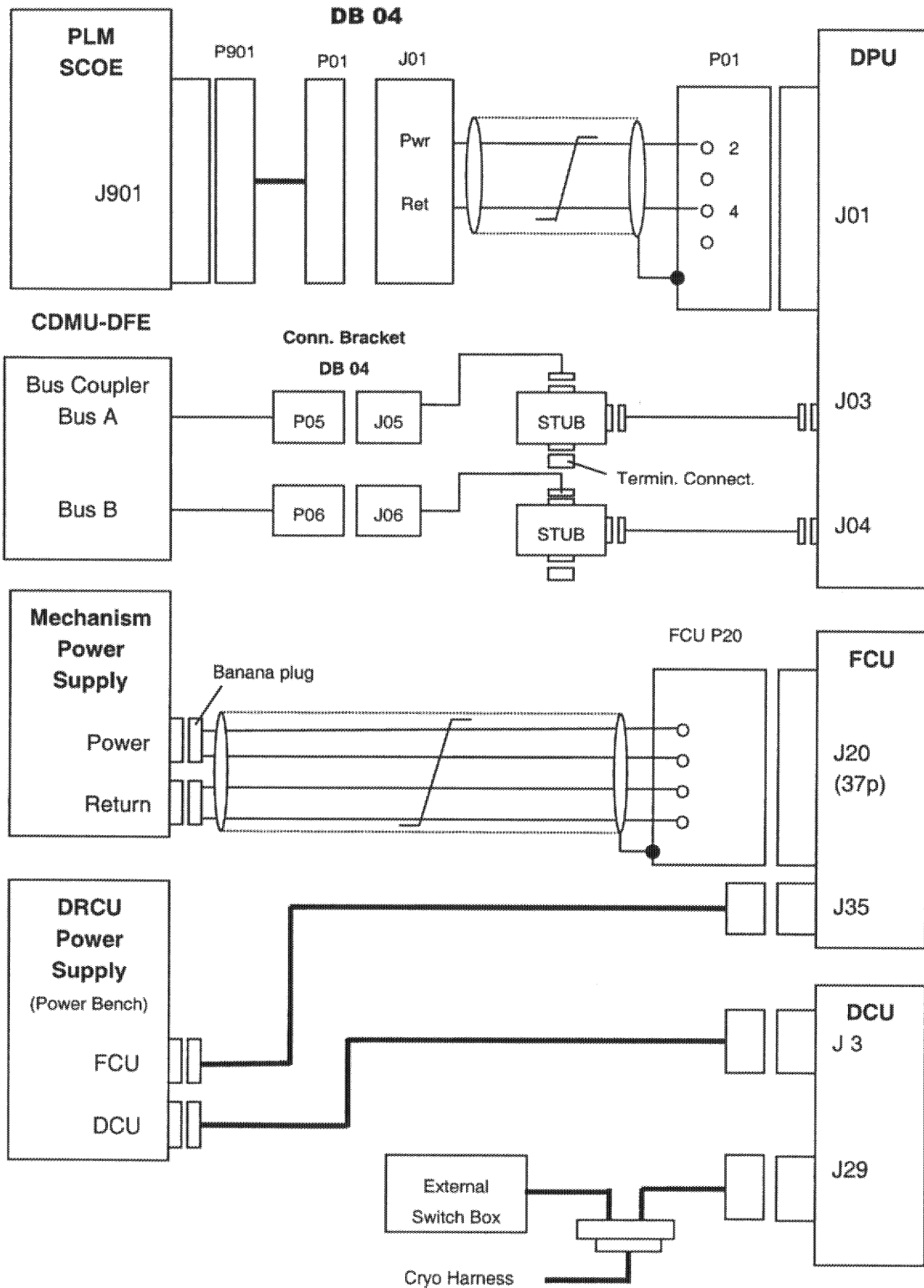
NA

4.2.1.6 Grounding scheme for SPIRE-Warm Units Test-set up





4.2.1.7 Block Diagram of the Electrical Setup after Test Completion (SPIRE Configuration only)



#### **4.2.2 Environment of the test set-up**

The tests shall be performed in Cl.100 000 Clean Room

#### **4.2.3 ESD constraints**

During handling and connection at the Warm Units, ESD precautions acc. to RD4 have to be applied, e.g. personnel must be grounded.

The SVM must be grounded acc. to para 4.2.1.6.

#### **4.2.4 QA Requirements**

In general the PA Plan shall be followed (see AD1).

Quality Assurance will be a major part of AIT activities in order to ensure that all activities are performed in a controlled manner and documented in accordance with the corresponding requirements.

The main AIT-QA tasks are as follows:

- assurance that activities are performed in accordance with released procedures
- release of hardware for integration/testing
- witnessing of all AIT activities and environmental conditions
- performance of visual inspections
- application of non-conformance reporting system and relevant logbooks
- preparation and performance of KIP's/MIP's/TRP's and PTR's
- to assure that materials/parts/units etc. are traceable
- hazard identification and tracking.

#### **4.2.5 Documentation Requirements**

All data, results and possible special events received during this test have to be entered into the integration report

##### **- Sequence Diary**

The obtained records shall be marked with

- date of the test
- title of the procedure
- identification number of procedure
- test article identification number

Each activity and operation has to be entered in the logsheet.

##### **- Summary of Deviation**

In the event that the specimen exhibits any major failure or deviations from the requirement

set forth in this procedure, testing shall be discontinued and a NCR shall be raised. Testing shall be continued only upon authorisation of Product Assurance and Project engineering acc. to the NCR decision.

- **Post Test Documentation**

After performance of the activities the summary sheets must be filled-in.

A copy of the filled-in summary sheets (see para 7.0) has to be incorporated to the summary report for the integration. After end of integration a test report shall be written.

## 5 Conditions

### 5.1 Personnel

Responsibility	Name / Organization
Test Manager	C. Silbmer
Test Engineer	A. Zand / J. Schöffle
EGSE Operator	M. Wille / S. Ilser
Support Engineer	
PA Responsible	E. Compiant
Customer Representative	C. Saywe

### 5.2 Environmental

Environmental	Nominal	Actual	P	N
Clean Room Class	100 000	ok.	✓	/
Temperature	(22±3) °C	20,9 °C	✓	/
Rel. Humidity	40....60 %	50,2 %	✓	/
Pressure	ambient	ok.	✓	/

Note: Clean room class acc. to Federal Standard 209 E

5.3 GSE Equipment and Tools

5.3.1 EGSE

Test Equipment List					
Item	Manuf.	Model No.	SN No.	Invent No.	Next Calib.
PLM-SCOE	Sat. Services	-	CI3A 2210-SE840/30	NA	NA
CDMU-DFE	Sat. Services	-	CI3A 2200-SE841/01	NA	NA
Bonding Meas. Bridge	<i>Metra Wit</i>	<i>27 I</i>		<i>11026526</i>	<i>09/07</i>
Scope	Tektronix	TDS 754A	<i>770 223 43</i> →		
Current Probe	Tektronix	TCP 202	<i>43 742</i> →		
Multimeter	<i>HP</i>	<i>34407A</i>		<i>47242</i>	<i>05/05</i>

EGSE Command Sequence	Description	Single Actions
Switch ON PLM-SCOE	Switch ON Power	TBD
Switch ON CDMU-DFEE	Control Data Handling	TBD

### 5.3.2 IDAS

The IDAS-5 with two test heads and Scope and Current Probe shall be available for performance of this test.

Test Equipment List					
Item	Manuf.	Model No.	SN No.	Invent No.	Next Calib.
IDAS-Rack	ASTRIUM	OTV	04	<del>11024657</del> IDAS-21-004	03/06
Scope	Le Croy	LC584AM	CI-No: IDAS-LI-004	11024657	
Current-Probe	—	—	—	—	—
Probe-Amplifier	—	—	—	—	—
Test-Head 1	ASTRIUM	TH1	—	11024997	"
Test-Head 2	ASTRIUM	TH2	—	11024998	"

### 5.3.3 Special Equipment for IDAS:

Test Adaptors for following connector-types shall be available:

- Connector : DEMA 9s/9p

### 5.3.4 IDAS Software Status

The actual IDAS Software Status is: IDAS5.V4.6.0.exe

## 6 Verification Requirements and Step by Step Procedure

### 6.1 Verification Requirements/Tolerances

#### 6.1.1 *Bonding Verification*

Bonding Resistance:  $R < 2.5 \text{ mOhm}$  between mounted box housing and SVM-Panel-GND.

#### 6.1.2 *Grounding Verification:*

Grounding Resistance:  $R \leq 100 \text{ mOHM}$  between setup and facility/measurement ground.

(Grounding Diagram of SPIRE-Warm Units Test Setup: see para 4.2.1.6)

### 6.1.3 Voltage/Current Verification:

- DPU: LCL class I acc. to SCI-PT-IIDA-04624, issue 3.3, Tables 5.9.5-3/5

Bus-Voltage: 26.....29 V

Inrush Current:  $\leq 2.25$  A

Steady State Current:  $\leq 1$  A

Pin Allocation: Conn.J01 -Prim.Power: Pin 2 ; Return: Pin 4  
(see para 4.2.1.1)

### 6.1.4 MIL-BUS 1553 Verification

- A- Voltage P-P: 4-6V

- B-Voltage P-P: 19-25V

- Polarity measurmts: to verify polarity before stub and at DPU-Connector is correct

- MIL BUS Verification with:

...Rise-Time: 80-300 nsec

...Fall-Time: 80-300 nsec

...Ratio-Measurement between A-Bus Voltage and B- Bus Voltage

- Pin Allocation: HSDPU - J03: BUS A (+) Prime: Pin 2 ; BUS A (-) Prime: Pin 6

HSDPU - J04: BUS B (+) Prime: Pin 2 ; BUS B (-) Prime: Pin 6

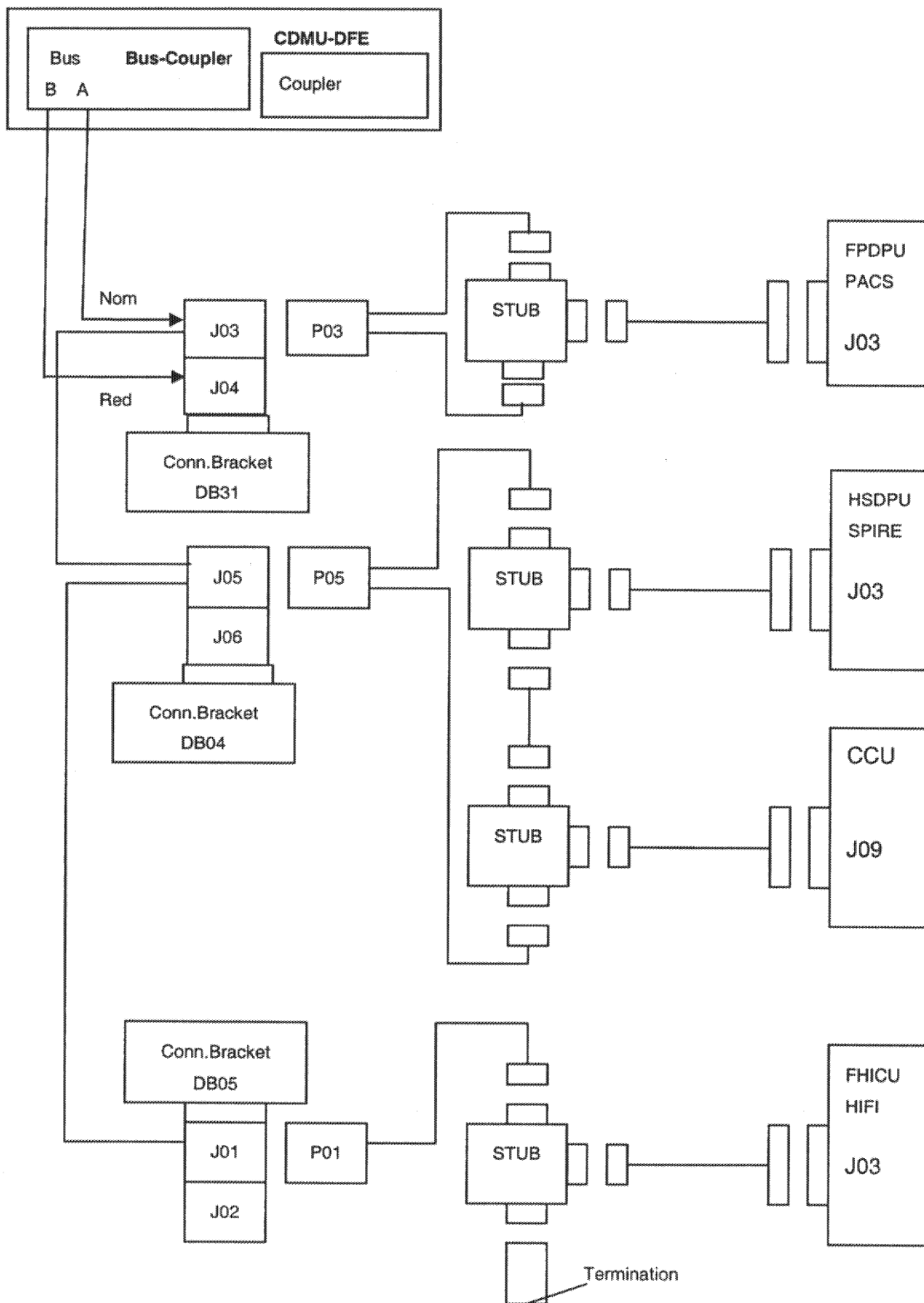
(see annex 1, para 8.1.1/2)

**Note:** The Herschel EQM-SVM system configuration of the MIL-Bus 1553 is given in chapter 6.1.5

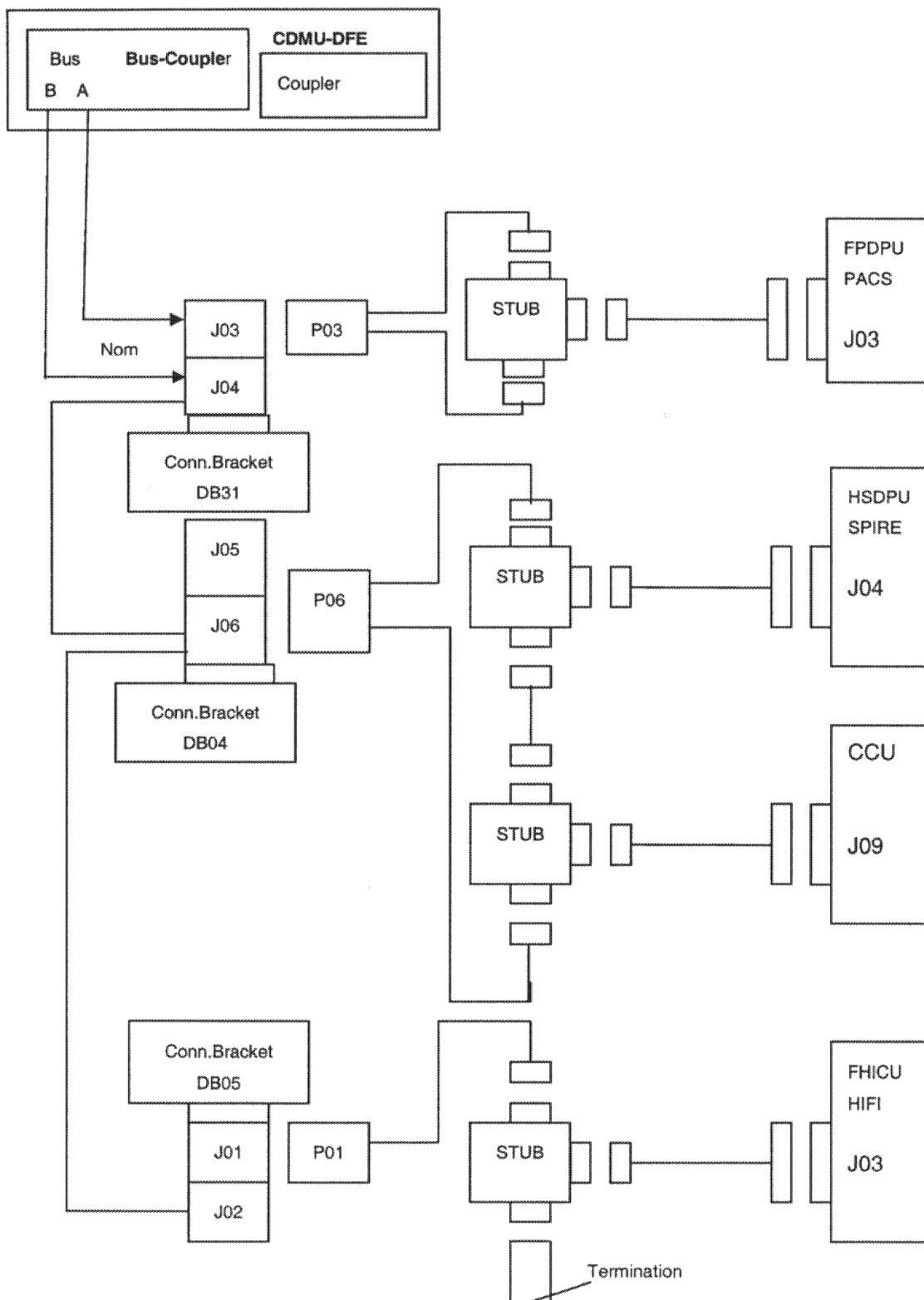
If the MIL-Bus system set-up is not completely available according to 6.1.5, the correct termination of the MIL-Bus with termination connectors must be provided acc. to para. 4.2.1.3 and 4.2.1.4.



6.1.5 MIL-BUS 1553A Structure (Nominal) at EQM-SVM Warm Units



6.1.6 MIL-BUS 1553B Structure (Nominal) at EQM-SVM Warm Units



6.2 Step by Step Procedure

Step	ACTIVITY	Required value	Actual value	Date	AIT Sign	QA Sign	Remarks / NCR No
6.1.0	<b>Bonding Measurement</b>						
6.1.1	Measure acc. to a four-point measurement the resistance between: - HSDPU and SVM panel GND - HSFCU and SVM panel GND - HSDCU and SVM panel GND	$\leq 2.5 \text{ mOHM}$ $\leq 2.5 \text{ mOHM}$ $\leq 2.5 \text{ mOHM}$	$0,84 \text{ m}\Omega$ $1,18 \text{ m}\Omega$ $1,45 \text{ m}\Omega$	 11.5.05			
6.2.0	<b>Grounding Verification</b>						
6.2.1	Check the grounding of SVM star GND	$\leq 100 \text{ mOHM}$	$41 \text{ m}\Omega$				
6.2.2	Check the grounding of PLM-SCOE	$\leq 100 \text{ mOHM}$	$90 \text{ m}\Omega$				
6.2.3	Check the grounding of CDMU-DFE	$\leq 100 \text{ mOHM}$	$97 \text{ m}\Omega$				
6.3.0	<b>Insulation Resistance Test</b>						
6.3.1	Measure the resistance between HSDPU/J01, pin4 and SVM panel GND	$\geq 1 \text{ MOHM}$	$> 20 \text{ M}\Omega$				

Step	ACTIVITY	Required value	Actual value	Date	AIT Sign	QA Sign	Remarks / NCR No
6.4.0	Power Verification						
6.4.1	Prepare the test setup acc. to para 4.2.1.1 <i>Command DPU pwr on</i>		<i>✓</i>	} <i>11.5.05 - Schel</i>			
6.4.2	Check the voltage of DPU: - between pin 2 (pwr) and pin 4 (ref) <i>Command DPU pwr off</i>	(28±1) VDC	<i>28V 0V n/a</i>				
6.4.3	Check the supply voltage of FCU (ext. power supply)	(28±1) VDC					
6.4.4	Measure the inrush/steady state current: - mate connector DPU-P01 - switch ON power at PLM-SCOE and record the current - evaluate the inrush current - evaluate the steady state current		<i>1,156 A 0,49 A 0.4.</i>				
6.4.5	Complete the primary power cabling acc. to para 4.2.1.2: - verify that PLM-SCOE and ext. power supply OFF - remove the break out boxes - mate DPU-P01 to DPU-J01 - mate FCU-P20 to FCU-J20	≤ 2.25 A ≤ 1 A	<i>0.4-</i>				

Step	ACTIVITY	Required value	Actual value	Date	AIT Sign	QA Sign	Remarks / NCR No
6.5.0	<b>MIL-BUS 1553 A/B Verification</b> This step by step procedure will be created by using IDAS. (see following pages 31-38)	✓	✓				
6.6.0	<b>Complete Set-up for Functional Test</b> Establish final connection and verify set-up as given in chapter 4.2.1.7	✓	✓	11.5.05	Sk.l.	Sign	NC-150000- ASED-NC-1083

**HERSCHEL****6.4 Mil-Bus Polarity Measurements preparation**

Sheet: 31

St-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min. Value	Max. Value	actual Value	P/N
0.1	MIL-BUS 1553 Verification								
0.2	MIL BUS Verification between EQM SPIRE-DPU (Warm Unit) NO and Connector Bracket DB04 - Conn.J05/J06 for Nominal BUS A&B								
0.3	Verify the MIL-BUS set up for SPIRE Warm Unit Integration acc. to Sketch 6.1.5.								
0.5	Prepare test set-up acc. to Sketch 4.2.1.3.								
0.6	Prerequisite for MIL-BUS Verification: Power Verification passed.								
0.7	All Mil-Bus connectors of the complete S/C Mil-Bus harness must be open.								
0.8	Prepare EGSE for transmit Command Word								
0.9	Connect IDAS-5 Testhead-1 via the T-Adapter 9d to Connector Bracket DB04- between J05 and P05								
0.10	Connect Testhead-1-GND to box structure (bonding stud of unit)								

**HERSCHEL**

**6.4 MIL-Bus Polarity Measurements preparation**

Sheet: 32

St-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min. Value	Max. Value	actual Value	P/N
0.11	Connect IDAS-5 Testhead-2 via adapter No.9d to Harness Spire Connector J03								
0.12	Connect Testhead-2-GND to box structure (bonding stud of unit)								
0.13	Verify Mil-Bus Polarity by Sending a Command word/ Transmit		PM						
	CMD via Nominal Bus			A-Voltage-pos	_Volt			1	30
	Testhead-1: DB04-J05			B-Voltage-pos	_Volt			1	30
	02			TRIGGERLEVEL	_Volt			0	2
	06			TRIGGERSLOPE	_Pos			1	1
	Testhead-2: SPIRE-J03								
	02								
	06								
0.14	Stop the Mil-Bus CMD								
0.15	Disconnect IDAS Testheads with T-Adaptors from DB04 and NO from SPIRE-DPU-J03 and connect DB04-J05 to P05								

**HERSCHEL**

**6.4 Mil-Bus Polarity Measurements preparation**

Sheet: 33

St-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min.Value	Max. Value	actual Value	P/N
1.0	Measurement of Bus B				NO				
1.1	Configure the EGSE to Bus B				NO				
1.2	Connect IDAS-5 Testhead-1 via the T-Adapter 9d to Connector Bracket DB04- between J06 and P06 -connect Testhead to Gnd				NO				
1.3	Connect IDAS-5 Testhead-2 via adapter No.9d to Unit- Harness Spire J04 Connector - connect Testhead to Gnd. Box not connected.				NO				
1.4	Verify Mil-Bus Polarity by Sending a Command word/ Transmit				PM				
	CMD via redundant Bus					053.100	A-Voltage-pos	_ Volt	1 30
	Testhead-1: DB04-J06					053.100	B-Voltage-pos	_ Volt	1 30
	02					053.100	TRIGGERLEVEL	_ Volt	0 2
	06					053.100	TRIGGERSLOPE	_ Pos	1 1
	Testhead-2: SPIRE-J04								
	02								
	06								



## HERSCHEL

## 6.4 Mil-Bus Polarity Measurements preparation

Sheet: 34

St-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min.Value	Max. Value	actual Value	P/N
1.5	Stop the Mil-Bus CMD				NO				
1.6	Disconnect Testhead 2 and T-Adaptor from Connector SPIRE J04				NO				
1.7	Disconnect Testhead 1 and T-Adaptor from Connector DB04- J06/P06				NO				
2.0	Test-Conditions/Declarations: In this test the Mil-Bus signals Bus A/B will be measured.				NO				
2.1	Measurement of Nominal BUS A				NO				
2.2	Verify Box Power is ON				NO				
2.3	Connect IDAS-5 Testhead-1 via the T-Adapter 9d to Connector Bracket DB04-J05 - between connector J05 and P05				NO				
2.4	Connect Testhead-1-GND to box structure (bonding stud of unit)				NO				
2.5	Connect IDAS-5 Testhead-2 via adapter No.9d between SPIRE J03 and P03				NO				

## HERSCHEL

## 6.4 Mil-Bus Verification

Sheet: 35

St-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min. Value	Max. Value	Actual Value	P/N
2.6	Connect Testhead-2-GND to box structure (bonding stud of unit)				NO				
2.7	Verify Mil-Bus by Sending a Status Word Check from receiver NO via Nominal Bus								
2.8	Verify Mil-Bus Signal BC to RT			PM	055.100	A-VOLT P-P	_ Volt	19	25
	Testhead-1: DB04-J05				055.100	A-RISE TIME	nsec	80	300
	02				055.100	A-FALL TIME	nsec	80	300
	06				055.100	B-VOLT P-P	_ Volt	4	6
	Testhead-2: SPIRE-J03				055.100	B-RISE TIME	nsec	80	300
	02				055.100	B-FALL TIME	nsec	80	300
	06				055.100	VOLT-A / VOLT-B	%	4	6
					055.100	TRIGGERLEVEL	_ Volt	1	5
					055.100	TRIGGERSLOPE	_ Pos	1	1
2.9	Verify Mil-Bus Signal RT to BC			PM	055.200	A-VOLT P-P	_ Volt	4	6
	Testhead-1: DB04-J05				055.200	A-RISE TIME	nsec	80	300
	02				055.200	A-FALL TIME	nsec	80	300
	06				055.200	B-VOLT P-P	_ Volt	19	25
	Testhead-2: SPIRE-J03				055.200	B-RISE TIME	nsec	80	300
	02				055.200	B-FALL TIME	nsec	80	300
	06				055.200	VOLT-A / VOLT-B	%	4	6
					055.200	TRIGGERLEVEL	_ Volt	1	5
					055.200	TRIGGERSLOPE	_ Pos	0	0

HERSCHEL

6.4 Mil-Bus Verification

Actual Value P/N

Max. Value

Min. Value

Phys. Unit

Parameter

Meas. Type

C-St.

Test-Step Description

St-No

- 2.10 Stop the Mil-Bus CMD NO
- 2.11 Disconnect Testhead 1 from DB04-J05/P05 NO
- 2.12 Disconnect Testhead 2 from Spire-J03/P03 NO
- 2.13 Connect Connector DB04-J05 to P05 NO

3.0 Measurement of Nominal BUS B NO

3.1 Connect IDAS-5 Testhead-1 via the T-Adapter 9d to Connector NO  
Bracket DB04-J06- between J06 and P06 - connect Testhead to  
Gnd

3.2 Connect IDAS-5 Testhead-2 via adapter No.9d between Unit- NO  
Harness Spire J04 - and Box -Connector SPIRE-J04 - connect  
Testhead to Gnd. Box is connected to MIL-Bus.

3.3 Verify Mil-Bus by Sending a Status Word check to receiver via NO  
redundant Bus

## HERSCHEL

## 6.4 MI-Bus Verification

Sheet: 37

St-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min. Value	Max. Value	Actual Value	P/N
3.4	Verify Mil-Bus Signal BC to RT			PM	055.100	A-VOLT P-P	_ Volt	19	25
	Testhead-1: DB04-J06				055.100	A-RISE TIME	nsec	80	300
02					055.100	A-FALL TIME	nsec	80	300
06					055.100	B-VOLT P-P	_ Volt	4	6
	Testhead-2: SPIRE-J04				055.100	B-RISE TIME	nsec	80	300
02					055.100	B-FALL TIME	nsec	80	300
06					055.100	VOLT-A / VOLT-B	%	4	6
					055.100	TRIGGERLEVEL	_ Volt	1	5
					055.100	TRIGGERSLOPE	_ Pos	1	1
3.5	Verify Mil-Bus Signal RT to BC			PM	055.200	A-VOLT P-P	_ Volt	4	6
	Testhead-1: DB04-J06				055.200	A-RISE TIME	nsec	80	300
02					055.200	A-FALL TIME	nsec	80	300
06					055.200	B-VOLT P-P	_ Volt	19	25
	Testhead-2: SPIRE-J04				055.200	B-RISE TIME	nsec	80	300
02					055.200	B-FALL TIME	nsec	80	300
06					055.200	VOLT-A / VOLT-B	%	4	6
					055.200	TRIGGERLEVEL	_ Volt	1	5
					055.200	TRIGGERSLOPE	_ Pos	0	0

**HERSCHEL****6.4 Mil-Bus Verification**

Sheet: 38

St-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min. Value	Max. Value	Actual Value P/N
3.6	End of MIL BUS Measurements					NO		
3.7	Disconnect Testhead 1 and T-Adaptor from Conn-Bracket DB04NO							
3.8	Connect DB04 Connector J06 to P06					NO		
3.9	Disconnect Testhead 2 and T-Adaptor from Connector SPIRE-J04					NO		
3.10	Connect SPIRE Connector J04 to P04 and J03 to P03					NO		
3.11	End of SPIRE MIL BUS Verification					NO		

## 7 Summary Sheets

### 7.1 Procedure Variation Summary

	Test Change	Curr. No.:	
		Date	
		Page	of
Test designation	Test Procedure	Issue	Rev.
Test step changed	Reason for Change		
Prepared by:	Resp. Test Leader	Project Engineer	
PA/QA	Prime	Customer	

7.2 Non Conformance Report (NCR) Summary

NCR - No.	NCR - Title	Date	Open Closed	PA sig.
HP-150000 - ASED-NC-1083	MIL - Bus functional behaviour out of requirement	18.5.05		

7.3 Sign-off Sheet

	Date	Signature
Test Manager	17.5.05	<i>A. Jahn</i>
Operator	17.5.05	<i>J. Schäffler</i>
PA Responsible	17.5.05	<i>C. Schupps</i>
ESA Representative		

7.4 Sequence Diary - performed steps



Date: /Time	Procedure Steps performed	Remarks/ NCRs	Name/Sign
17.5.05	6.1/6.2/6.3/6.4	HP-150000-AJED-NC	Schäffler / Jcl.
	6.5/6.6	- 1083	



8 Annex

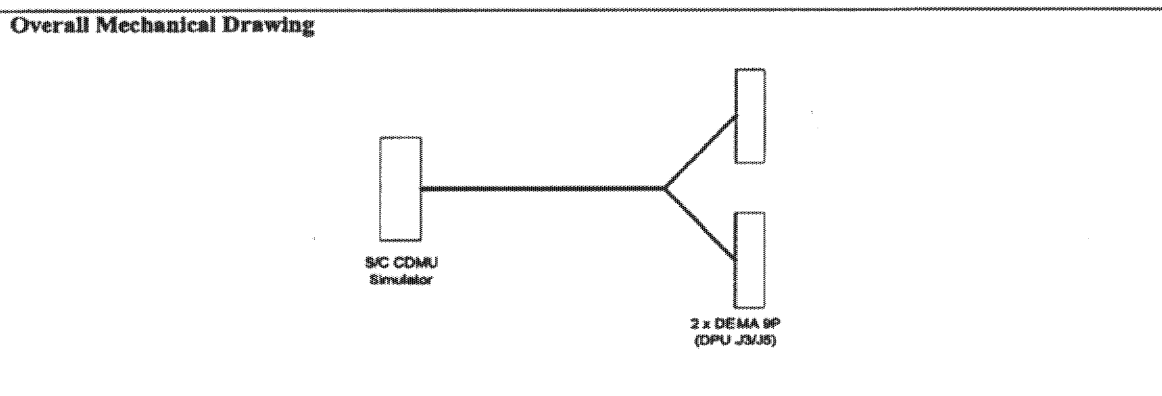
8.1 Annex 1 - Pinlists of Warm Units

8.1.1 Pin Allocation of MIL-Bus A

		<p><b>SPIRE HARNESS DEFINITION DOCUMENT</b></p>	<p>Doc: SPIRE-RAL-PRJ-000608                  Issuc: 1.1                  Date: 05/03/03                  Page 205 of 228</p>
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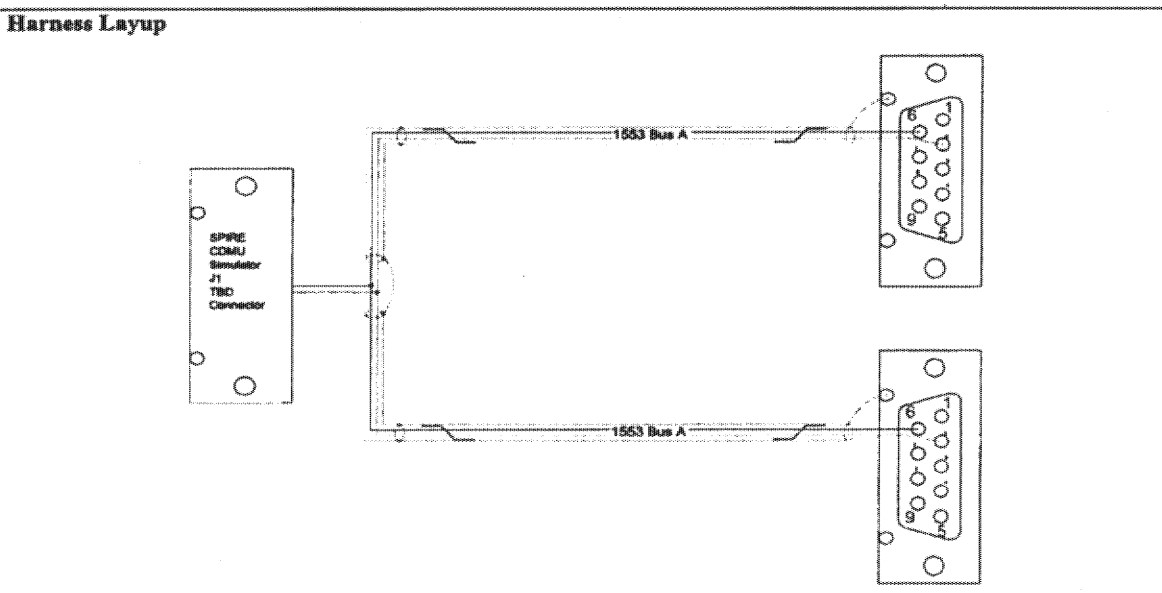
4.7 Test Harnesses

4.7.1 T1 1553 Bus A



**Connector/Backshell Details**

DEMA 9 P + Glenair 550 - T - 039 - M - 1 - TBD - H - 0 - TBD	to DPUJ3
DEMA 9 P + Glenair 550 - T - 039 - M - 1 - TBD - H - 0 - TBD	to DPUJ5



**II. IDAS generated Test Report HP-2-ASED-TR-0042**

16 pages



SPIRE-WU  
EQM


# Report

Doc. No.: HP-2-ASED-TR-0042  
Issue: 1 Date 18.05.2005  
Sheet: 1

## Herschel

### 6.4 MIL-Bus Polarity Measurements preparation

St.No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min.Value	Max. Value	Actual Value	P/N
0.2	MIL BUS Verification between EQM SPIRE-DPU (Warm Unit) and Connector Bracket DB04 - Conn.J05/J06 for Nominal BUS A&B	NO							
0.3	Verify the MIL-BUS set up for SPIRE Warm Unit Integration acc. to Sketch 6.1.5.	NO							
0.5	Prepare test set-up acc. to Sketch 4.2.1.3.	NO							
0.6	Prerequisite for MIL-BUS Verification: Power Verification passed.	NO							
0.7	All Mil-Bus connectors of the complete S/C Mil-Bus harness must be open.	NO							
0.8	Prepare EGSE for transmit Command Word	NO							
0.9	Connect IDAS-5 Testhead-1 via the T-Adapter 9d to Connector Bracket DB04- between J05 and P05	NO							
0.10	Connect Testhead-1-GND to box structure (bonding stud of unit)	NO							
0.10 - 1	Connect Testhead-1-GND to box structure (bonding stud of unit)	NO							
0.10 - 2	Connect Testhead-1-GND to box structure (bonding stud of unit)	NO							
0.11	Connect IDAS-5 Testhead-2 via adapter No.9d to Harness Spire Connector J03	NO							
Location: OTN				IDAS_Operator:	GRASLA	Test Conductor: Ch.Schlosser			
PA: E.Lamprecht				OCOE_Operator:	Stijn Ilsen	Date: 11.05.2005			

		<b>Report</b>					Doc. No.: HP-2-ASED-TR-0042 Issue: 1      Date 18.05.2005 Sheet: 2		
SPIRE-WU EQM		6.4 Mil-Bus Polarity Measurements at CDMU P51							
Sl.No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min.Value	Max. Value	Actual Value	P/N
0.11 - 1	Connect IDAS-5 Testhead-2 via adapter No.9d toHarness Spire Connector J03	NO							
0.11 - 2	Connect IDAS-5 Testhead-2 via adapter No.9d toHarness Spire Connector J03	NO							
0.12	Connect Testhead-2-GND to box structure (bonding stud of unit)	NO							
0.12 - 1	Connect Testhead-2-GND to box structure (bonding stud of unit)	NO							
0.12 - 2	Connect Testhead-2-GND to box structure (bonding stud of unit)	NO							

Location: OTN	IDAS_Operator: GRASLA	Test Conductor: Ch.Schlosser
PA: E.Lamprecht	OCCOE_Operator: Stijn Ilseu	Date: 11.05.2005



SPIRE-WU  
EQM

# Report

Doc. No.: HP-2-ASED-TR-0042

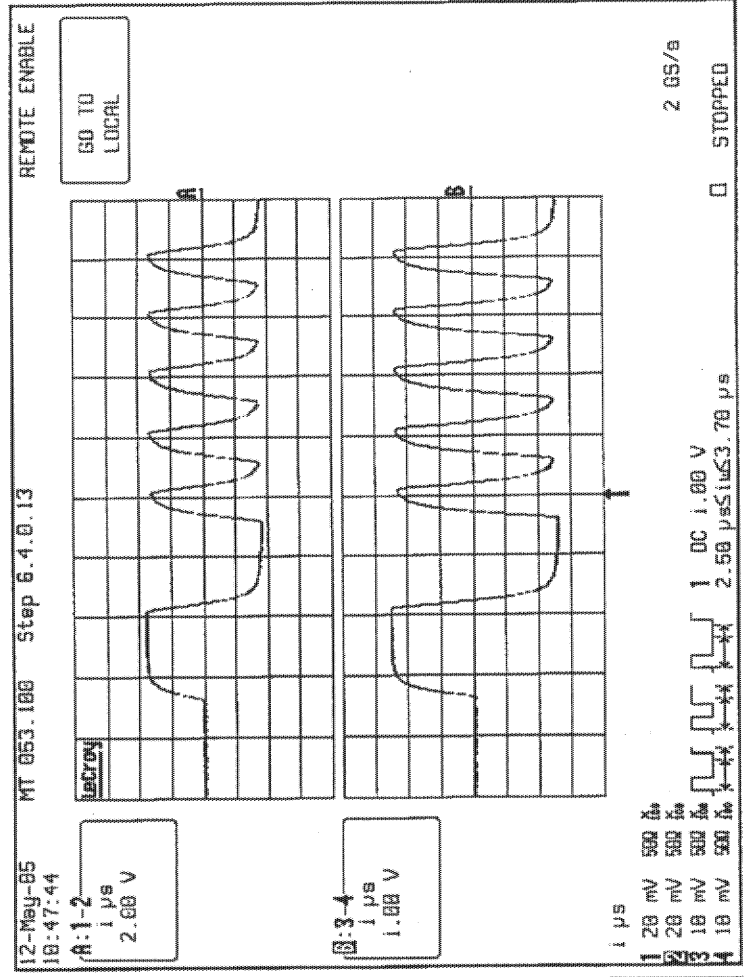
Issue: 1 Date 18.05.2005

Sheet: 3

## 6.4 Mil-Bus Polarity Measurements at SPIRE J03-Conn

St-No	Test-Step Description	C-St	Meas. Type	Parameter	Phys. Unit	Min. Value	Max. Value	Actual Value	P/N
0.13	Verify Mil-Bus Polarity by Sending a Command word/ Transmit CMD via Nominal Bus	PM	053.100	A-Voltage-pos	_ Volt	1	30	3,47	OK
	Testhead-1: DB04-J05		053.100	B-Voltage-pos	_ Volt	1	30	2,49	OK
	01 Connector/Pin unknown in ICD		053.100	TRIGGERLEVEL	_ Volt	1	1	1,00	OK
	06 Connector/Pin unknown in ICD		053.100	TRIGGERSLOPE	_ Pos	1	1	1,00	OK

Testhead-2: SPIRE-J03  
02 Connector/Pin unknown in ICD  
06 Connector/Pin unknown in ICD



Location: OTN	IDAS_Operator: GRASLA	Test Conductor: Ch.Schlosser
PA: E.Lamprecht	OCOE_Operator: Stijn Ilsen	Date: 12.05.2005



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# Report

Doc. No.: HP-2-ASED-TR-0042

Issue: 1 Date 18.05.2005

Sheet: 4

6.4 Mil-Bus Polarity Measurements at CDMU P51

St.No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min. Value	Max. Value	Actual Value	P/N
0.14	Stop the Mil-Bus CMD	NO							
0.15	Disconnect IDAS Testheads with T-Adaptors from DB04 and from SPIRE-DPU-J03 and connect DB04-J05 to P05	NO							
1.0	Measurement of Bus B	NO							
1.1	Configure the EGSE to Bus B	NO							
1.2	Connect IDAS-5 Testhead-1 via the T-Adapter 9d to Connector Bracket DB04- between J06 and P06 -connect Testhead to Gnd	NO							
1.3	Connect IDAS-5 Testhead-2 via adapter No.9d to Unit-Harness Spire J04 Connector - connect Testhead to Gnd. Box not connected.	NO							

Location: OTN

PA: E.Lamprecht

IDAS\_Operator: GRASLA

OCODE\_Operator: Stijn Ilsen

Test Conductor: Ch.Schlosser

Date: 12.05.2005



SPIRE-WU  
EQM

# Report

Doc. No.: HP-2-ASED-TR-0042

Issue: 1 Date 18.05.2005

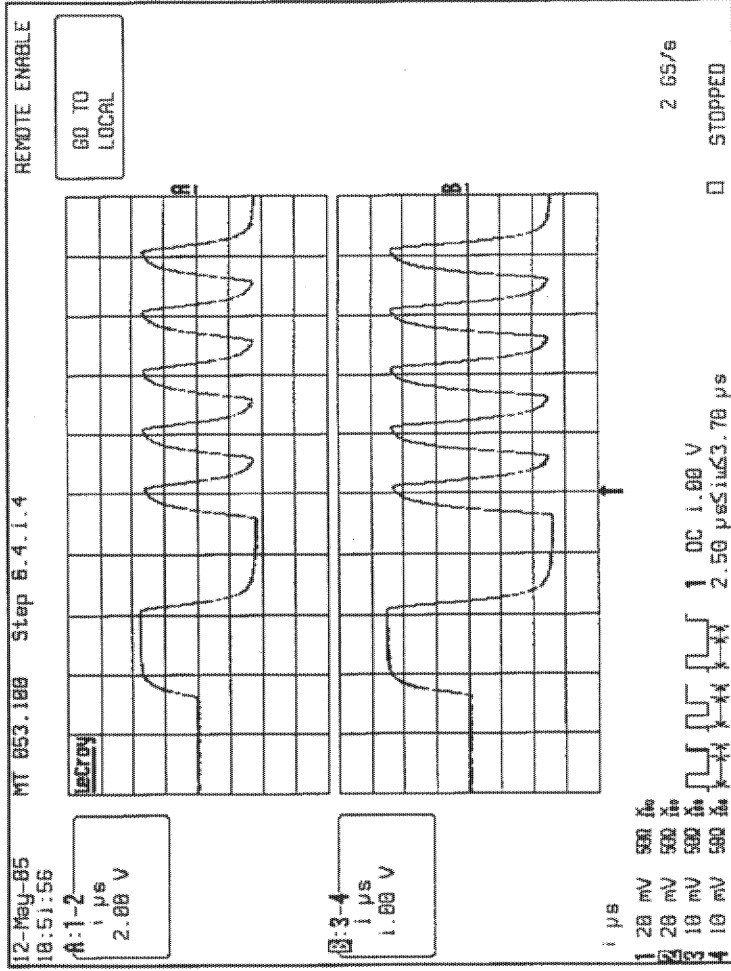
Sheet: 5

## Herschel

### 6.4 Mil-Bus Polarity Measurements at CDMU P51

SI-No	Test-Step Description	C-St	Meas. Type	Parameter	Phys. Unit	Min. Value	Max. Value	Actual Value	PIN
1.4	Verify Mil-Bus Polarity by Sending a Command word/ Transmit CMD via redundant Bus	PM	053.100	A-Voltage-pos	_ Volt	1	30	3,47	OK
	Testhead-1: DB04-J06		053.100	B-Voltage-pos	_ Volt	1	30	2,49	OK
01	Connector/Pin unknown in ICD		053.100	TRIGGERLEVEL	_ Volt	1	1	1,00	OK
06	Connector/Pin unknown in ICD		053.100	TRIGGERSLOPE	_ Pos	1	1	1,00	OK

- Testhead-2: SPIRE-J04
- 02 Connector/Pin unknown in ICD
- 06 Connector/Pin unknown in ICD



Location: OTN  
PA: E.Lamprecht

IDAS\_Operator: GRASLA  
OCOE\_Operator: Stijn Ilsen

Test Conductor: Ch.Schlusser  
Date: 12.05.2005



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EQM

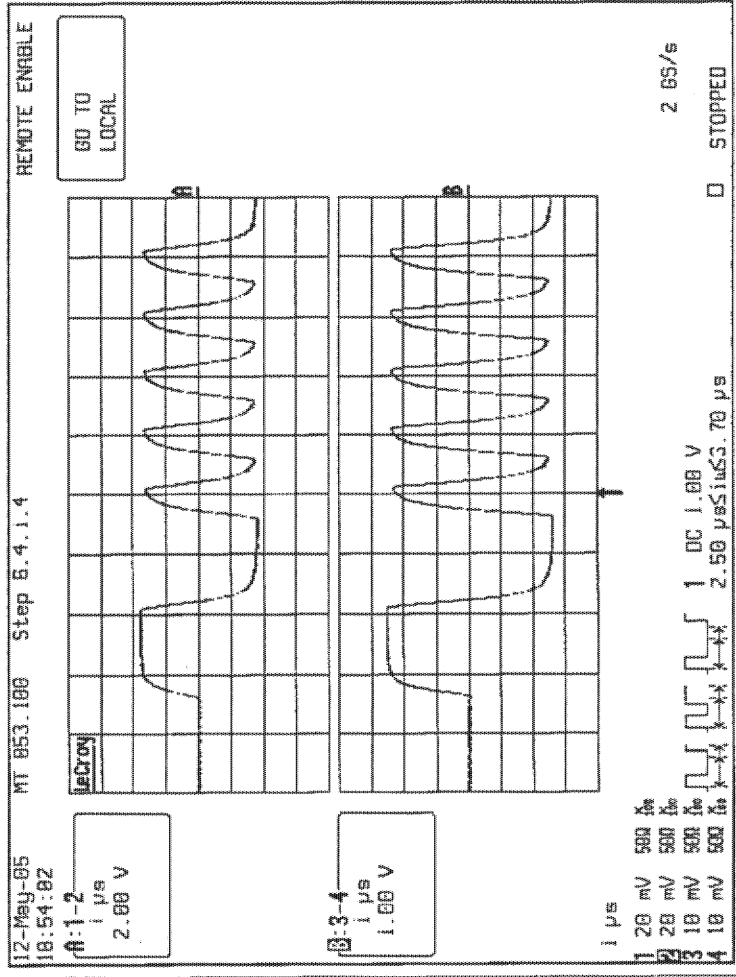
# Report

Doc. No.: HP-2-ASED-TR-0042  
Issue: 1 Date 18.05.2005  
Sheet: 6

## 6.4 Mil-Bus Polarity Measurements at CDMU P51

St-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min. Value	Max. Value	Actual Value	P/N
1.4-1	Verify Mil-Bus Polarity by Sending a Command word/ Transmit CMD via redundant Bus	PM	053.100	A-Voltage-pos	Volt	1	30	3,47	OK
	Testhead-1: DB04-J06		053.100	B-Voltage-pos	Volt	1	30	2,49	OK
01	Connector/Pin unknown in ICD		053.100	TRIGGERLEVEL	Volt	1	1	1,00	OK
06	Connector/Pin unknown in ICD		053.100	TRIGGERSLOPE	_Pos	1	1	1,00	OK

- Testhead-2: SPIRE-104
- 02 Connector/Pin unknown in ICD
- 06 Connector/Pin unknown in ICD







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# Report

Doc. No.: HP-2-ASED-TR-0042

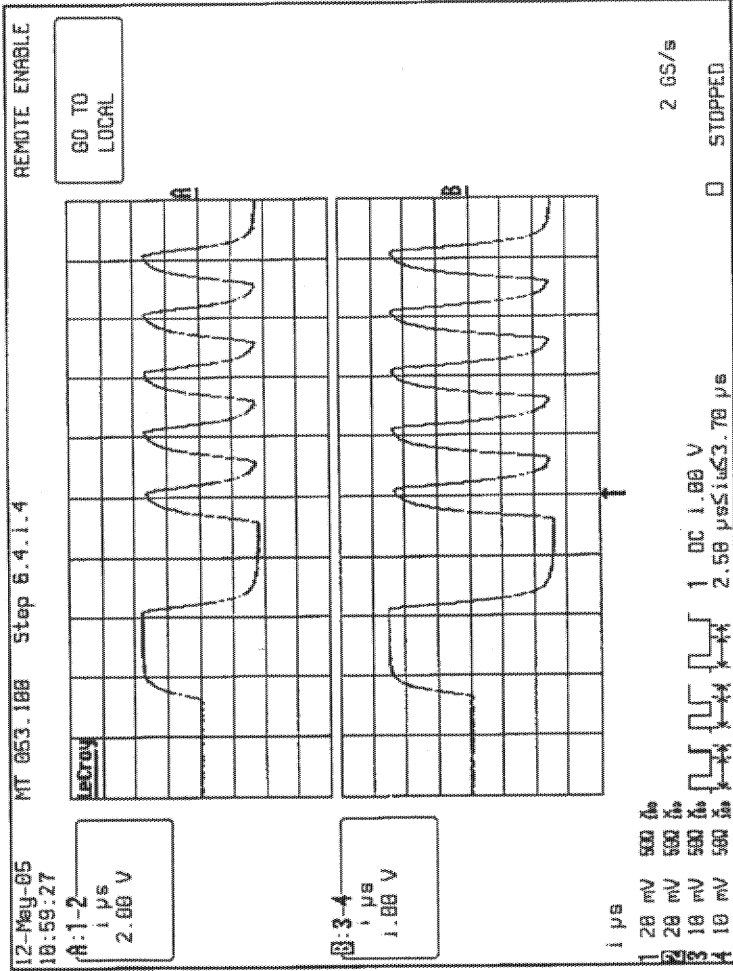
Issue: 1 Date 18.05.2005

Sheet: 7

## Herschel 6.4 Mil-Bus Polarity Measurements at CDMU P51

St-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min. Value	Max. Value	Actual Value	P/N
1.4-2	Verify Mil-Bus Polarity by Sending a Command word/ Transmit CMD via redundant Bus	PM	053.100	A-Voltage-pos	Volt	1	30	3.47	OK
	Testhead-1: DB04-J06		053.100	B-Voltage-pos	Volt	1	30	2.49	OK
01	Connector/Pin unknown in ICD		053.100	TRIGGERLEVEL	Volt	1	1	1.00	OK
06	Connector/Pin unknown in ICD		053.100	TRIGGERSLOPE	Pos	1	1	1.00	OK

Testhead-2: SPIRE-J04  
02 Connector/Pin unknown in ICD  
06 Connector/Pin unknown in ICD



Location: OTN  
PA: E.Lamprecht

IDAS\_Operator: GRASLA  
OCOE\_Operator: Stijn Ilsen

Test Conductor: Ch.Schlosser  
Date: 12.05.2005



SPIRE-WU  
EQM

# Report

Doc. No.: HP-2-ASED-TR-0042

Issue: 1 Date 18.05.2005

Sheet: 8

## 6.4 Mil-Bus Polarity Measurements at CDMU P51

St-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min. Value	Max. Value	Actual Value	P/N
1.5	Stop the Mil-Bus CMD								
1.5 - 1	Stop the Mil-Bus CMD	NO							
1.6	Disconnect Testhead 2 and T-Adaptor from Connector SPIRE J04	NO							
1.7	Disconnect Testhead 1 and T-Adaptor from Connector DB04-J06/P06	NO							
2.0	Test-Conditions/Declarations: In this test the Mil-Bus signals Bus A/B will be measured.	NO							
2.1	Measurement of Nominal BUS A	NO							
2.2	Verify Box Power is ON	NO							
2.3	Connect IDAS-5 Testhead-1 via the T-Adapter 9d to Connector Bracket DB04-J05 - between connector J05 and P05	NO							
2.4	Connect Testhead-1-GND to box structure (bonding stud of unit)	NO							
2.5	Connect IDAS-5 Testhead-2 via adapter No.9d between SPIRE J03 and P03	NO							
2.6	Connect Testhead-2-GND to box structure (bonding stud of unit)	NO							
2.7	Verify Mil-Bus by Sending a Status Word Check from receiver via Nominal Bus	NO							

Location: OTN	IDAS_Operator: GRASLA	Test Conductor: Ch.Schlusser
PA: E.Lamprecht	OCOE_Operator: Stijn Ilse	Date: 12.05.2005



SPIRE-WU  
EQM

# Report

Doc. No.: HP-2-ASED-TR-0042  
Issue: 1 Date 18.05.2005  
Sheet: 9

6.4 Mil-Bus Verification of the CDMU nom. path

St-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min. Value	Max. Value	Actual Value	P/N
2.8	Verify Mil-Bus Signal BC to RT	PM	055.100	A-VOLT P-P	_ Volt	19	25	6,89	NOK
			055.100	A-RISE TIME	_ nsec	80	300	117,69	OK
			055.100	A-FALL TIME	_ nsec	80	300	223,80	OK
	Testhead-1: DB04-J05		055.100	B-VOLT P-P	_ Volt	4	6	4,97	OK
01	Connector/Pin unknown in ICD		055.100	B-RISE TIME	_ nsec	80	300	109,43	OK
06	Connector/Pin unknown in ICD		055.100	B-FALL TIME	_ nsec	80	300	229,85	OK
	Testhead-2: SPIRE-J03		055.100	VOLT-A / VOLT-B	%	4	6	1,39	NOK
02	Connector/Pin unknown in ICD		055.100	TRIGGERLEVEL	_ Volt	1	1	1,00	OK
06	Connector/Pin unknown in ICD		055.100	TRIGGERSLOPE	_ Pos	1	1	1,00	OK

Location: OTN  
PA: E.Lamprecht

IDAS\_Operator: GRASLA  
OCOE\_Operator: Stijn Ilsen

Test Conductor: Ch.Schlosser  
Date: 12.05.2005



**Herschel**

SPIRE-WU  
EQM

# Report

Doc. No.: HP-2-ASED-TR-0042  
Issue: 1 Date 18.05.2005  
Sheet: 10

6.4 Mil-Bus Verification of the CDMU nom. path

St-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min. Value	Max. Value	Actual Value	P/N																																								
12-May-05 11:12:41	MT 855.100 Step 6.4.2.8	REMOTE ENABLE																																															
<table border="0"> <tr> <td>r@level(A)µV</td> <td>117.69 ns</td> </tr> <tr> <td>F@level(A)µV</td> <td>223.80 ns</td> </tr> <tr> <td>r@level(B)µV</td> <td>189.43 ns</td> </tr> <tr> <td>F@level(B)µV</td> <td>229.85 ns</td> </tr> </table>										r@level(A)µV	117.69 ns	F@level(A)µV	223.80 ns	r@level(B)µV	189.43 ns	F@level(B)µV	229.85 ns																																
r@level(A)µV	117.69 ns																																																
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r@level(B)µV	189.43 ns																																																
F@level(B)µV	229.85 ns																																																
<table border="0"> <tr> <td>1 20 mV 500 ns</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2 20 mV 500 ns</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3 5 mV 500 ns</td> <td></td> <td></td> <td></td> <td>1.00 V</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4 5 mV 500 ns</td> <td></td> <td></td> <td></td> <td>2.50 µs</td> <td>3.70 µs</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>										1 20 mV 500 ns										2 20 mV 500 ns										3 5 mV 500 ns				1.00 V						4 5 mV 500 ns				2.50 µs	3.70 µs				
1 20 mV 500 ns																																																	
2 20 mV 500 ns																																																	
3 5 mV 500 ns				1.00 V																																													
4 5 mV 500 ns				2.50 µs	3.70 µs																																												
2.10	Stop the Mil-Bus CMD								NO																																								
2.11	Disconnect Testhead 1 from DB04-J05/P05								NO																																								
2.12	Disconnect Testhead 2 from Spire-J03/P03								NO																																								
2.13	Connect Connector DB04-J05 to P05								NO																																								

Location: OTN	IDAS_Operator: GRASLA	Test Conductor: Ch.Schlosser
PA: E.Lamprecht	OCOE_Operator: Stijn Ilsen	Date: 12.05.2005



SPIRE-WU  
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# Report

Doc. No.: HP-2-ASED-TR-0042

Issue: 1 Date 18.05.2005

Sheet: 11

6.4 Mil-Bus Verification of the CDMU nom. path

Herschel

St-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min. Value	Max. Value	Actual Value	P/N
-------	-----------------------	-------	------------	-----------	------------	------------	------------	--------------	-----

3.0 Measurement of Nominal BUS B NO

3.1 Connect IDAS-5 Testhead-1 via the T-Adapter 9d to Connector Bracket DB04-J06- between J06 and P06 - connect Testhead to Gnd NO

3.2 Connect IDAS-5 Testhead-2 via adapter No.9d between Unit-Harness Spire J04 - and Box -Connector SPIRE-J04 - connect Testhead to Gnd. Box is connected to MIL-Bus. NO

3.3 Verify Mil-Bus by Sending a Status Word check to receiver via redundant Bus NO

Location: OTN	IDAS_Operator: GRASLA	Test Conductor: Ch.Schlosser
PA: E.Lampricht	OCOE_Operator: Stijn Ilsen	Date: 12.05.2005



SPIRE-WU  
EQM

# Report

Doc. No.: HP-2-ASED-TR-0042

Issue: 1 Date 18.05.2005

Herschel

6.4 Mil-Bus Verification of the CDMU nom. path

Sheet: 12

St-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min. Value	Max. Value	Actual Value	P/N
3.4	Verify Mil-Bus Signal BC to RT	PM	055.100	A-VOLT P-P	Volt	19	25	6,89	NOK
			055.100	A-RISE TIME	nsec	80	300	117,69	OK
			055.100	A-FALL TIME	nsec	80	300	223,80	OK
	Testhead-1: DB04-J06		055.100	B-VOLT P-P	Volt	4	6	4,97	OK
01	Connector/Pin unknown in ICD		055.100	B-RISE TIME	nsec	80	300	109,43	OK
06	Connector/Pin unknown in ICD		055.100	B-FALL TIME	nsec	80	300	229,85	OK
	Testhead-2: SPIRE-104		055.100	VOLT-A / VOLT-B	%	4	6	1,39	NOK
02	Connector/Pin unknown in ICD		055.100	TRIGGERLEVEL	Volt	1	1	1,00	OK
06	Connector/Pin unknown in ICD		055.100	TRIGGERSLOPE	_Pos	1	1	1,00	OK

Location: OTN  
PA: E.Lamprecht

IDAS\_Operator: GRASLA  
OCOE\_Operator: Stijn Ilsen

Test Conductor: Ch.Schlosser  
Date: 12.05.2005



SPIRE-WU  
EQM

# Report

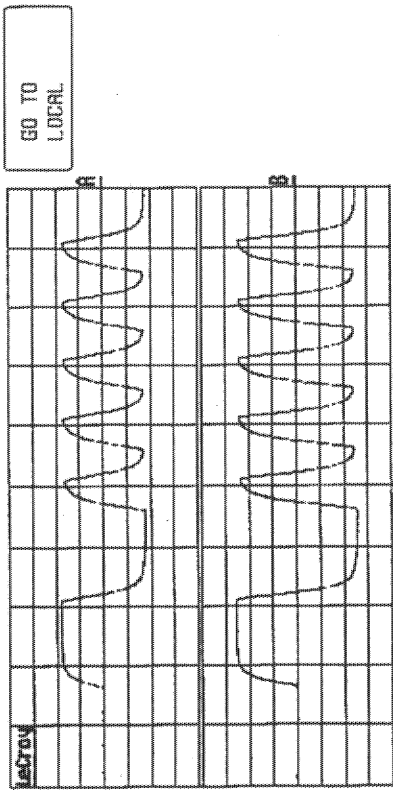
Doc. No.: HP-2-ASED-TR-0042  
Issue: 1 Date 18.05.2005  
Sheet: 13

St-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min. Value	Max. Value	Actual Value	P/N
12-May-85 11:43:39	MT 855.188 Step 6.4.3.4								
A:1-2									
B:3-4									

## Herschel

6.4 Mil-Bus Verification of the CDMU non. path

REMOTE ENABLE



GO TO LOCAL

r@level(A)M 117.69 ns  
 F@level(A)M 223.88 ns  
 r@level(B)M 189.43 ns  
 F@level(B)M 229.85 ns



2 65/s

STOPPED

Location: OTN	IDAS_Operator: GRASLA	Test Conductor: Ch. Schlosser
PA: E. Lamprecht	OCOE_Operator: Stijn Ilse	Date: 12.05.2005



SPIRE-WU  
EQM

# Report

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Sheet: 14

## 6.4 Mil-Bus Verification of the CDMU nom. path

### Herschel

St-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min.Value	Max. Value	Actual Value	P/N
3.5	Verify Mil-Bus Signal RT to BC	PM	055.200	A-VOLT P-P	_ Volt	4	6	6,89	NOK
			055.200	A-RISE TIME	insec	80	300	117,69	OK
			055.200	A-FALL TIME	insec	80	300	223,80	OK
	Testhead-1: DB04-J06		055.200	B-VOLT P-P	_ Volt	19	25	4,97	NOK
01	Connector/Pin unknown in ICD		055.200	B-RISE TIME	insec	80	300	109,43	OK
06	Connector/Pin unknown in ICD		055.200	B-FALL TIME	insec	80	300	229,85	OK
	Testhead-2: SPIRE-J04		055.200	VOLT-A / VOLT-B	%	4	6	0,72	NOK
02	Connector/Pin unknown in ICD		055.200	TRIGGERLEVEL	_ Volt	2,52	2,52	2,52	OK
06	Connector/Pin unknown in ICD		055.200	TRIGGERSLOPE	_ Pos	0	0	0,00	OK

Location: OTN  
PA: E.L.amprecht

IDAS\_Operator: GRASLA  
OCCO\_Operator: Stijn Ilsen

Test Conductor: Ch.Schlosser  
Date: 12.05.2005





SPIRE-WU  
EQM

# Report

Doc. No.: HP-2-ASED-TR-0042  
Issue: 1 Date 18.05.2005  
Sheet: 15

## Herschel

### 6.4 Mil-Bus Verification of the CDMU nom. path

SI-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min. Value	Max. Value	Actual Value	P/N								
12-May-05 11:44:14	MT 055.288 Step 6.4.3.5		REMOTE ENABLE														
1	1-2 1 $\mu$ s 2.00 V																
2	3-4 1 $\mu$ s 1.00 V																
	<table border="0"> <tr> <td>r@level(A) (mV)</td> <td>117.69 ns</td> </tr> <tr> <td>F@level(A) (mV)</td> <td>223.88 ns</td> </tr> <tr> <td>r@level(B) (mV)</td> <td>189.43 ns</td> </tr> <tr> <td>F@level(B) (mV)</td> <td>229.85 ns</td> </tr> </table>	r@level(A) (mV)	117.69 ns	F@level(A) (mV)	223.88 ns	r@level(B) (mV)	189.43 ns	F@level(B) (mV)	229.85 ns								
r@level(A) (mV)	117.69 ns																
F@level(A) (mV)	223.88 ns																
r@level(B) (mV)	189.43 ns																
F@level(B) (mV)	229.85 ns																
3.6	End of MIL BUS Measurements																
3.7	Disconnect Testhead 1 and T-Adaptor from Conn-Bracket DB04																
3.8	Connect DB04 Connector J06 to P06																
3.9	Disconnect Testhead 2 and T-Adaptor from Connector SPIRE-J04																

Location: OTN	IDAS_Operator: GRASLA	Test Conductor: Ch.Schlösser
PA: E.Lamprecht	OCOE_Operator: Stijn Ilscn	Date: 12.05.2005



SPIRE-WU  
EQM

# Report

Doc. No.: HP-2-ASED-TR-0042

Issue: 1 Date 18.05.2005

Sheet: 16

6.4 MIL-Bus Polarity Measurements preparation

Herschel

St-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min.Value	Max. Value	Actual Value	P/N
3.10	Connect SPIRE Connector J04 to P04 and J03 to P03	NO							
3.11	End of SPIRE MIL BUS Verification	NO							
Location: OTN		IDAS_Operator:	GRASLA	Test Conductor:		Ch.Schlusser			
PA: E.Lamprecht		OCOE_Operator:	Stijn Ilscn	Date:		12.05.2005			

**III. NCR HP-150000-ASED-NC-1083**

6 pages

<b>Company</b> ESTEC		<b>Project Name</b> HERSCHEL-PANCK		NCR-No: HP-112200-ASED-NC-1083	
				Related internal NCR-No:	
				Critical Item: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
				Revision 0	
				Page 1 of 3	
<b>Nonconformance Report</b>					
NCR Title SPIRE: MIL bus functional behaviour out of requirement detect. w. IDAS					
NC Item Identification SPIRE warm units					
Next Higher Assembly SPIRE					
Drawing No			Sr No.		
Procedure No					
Supplier RAL			Purchase Order		
Subsystem			Model		EQM
<b>NC Observation</b> Date: 18-MAY-05 Location: ASEDOtn				NC Detected During Test	
Description of Nonconformance				Requirements Violated	
During EQM SPIRE Warm units integration tests with IDAS according to HP-2-ASED-PR-0057 "1" some values" out of spec" are identified by the IDAS measurements as mentioned in the attached measurement records in annex 1 on page 9, 12, 14,					
Initiator: Date, Name and Signature 18-MAY-05 Lamprecht					
Internal NRB Dispositions to be investigated by ASEDO				Classification: Major <input checked="" type="checkbox"/> Minor <input type="checkbox"/>	
Ref. to MoMs				Customer Notification	
Cause of NC Ref to Failure Report			Corrective/Preventative Actions		Verification
Date:	PA 19-MAY-05 Lamprecht	Engineering 19-MAY-05 Grasl	19-MAY-05 Schlosser		
Name:					
Signature:					

<b>Company</b> ESTEC		<b>Project Name</b> HERSCHEL-PLANCK		NCR-No: HP-112200-ASED-NC-1083	
				Related internal NCR-No:	
				Critical Item: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
				Revision 0	
				Page 2 of 3	
<b>Nonconformance Report - Continuation Sheet -</b>					
<b>NCR Treatment Sequence / Findings / Statements / Actions</b>					
<b>Int. Ref</b>	<b>Actionee</b>	<b>Due Date</b>	<b>Action</b>	<b>Conclusion / Remark</b>	<b>Closed</b>
I0-1	Schlosser	28-MAY-05	to be investigated by ASED		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

<b>Company</b> ESTEC	<b>Project Name</b> HERSCHEL-PLANCK	NCR-No: HP-112200-ASED-NC-1083 Related internal NCR-No: Critical Item: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <span style="float: right;">Revision 0</span> Page 3 of 3						
<b>Nonconformance Report - Continuation Sheet -</b>								
<b>NCR/NRB Attachments</b>								
1	<table border="0"> <tr> <td style="text-align: right;">Description</td> <td style="text-align: left;">Filename</td> </tr> <tr> <td>SPIRE MIL bus verification</td> <td>SPIRE MIL bus.pdf</td> </tr> </table>	Description	Filename	SPIRE MIL bus verification	SPIRE MIL bus.pdf	<table border="0"> <tr> <td style="text-align: right;">Last Updated</td> </tr> <tr> <td>19-MAY-05 16:29:07</td> </tr> </table>	Last Updated	19-MAY-05 16:29:07
Description	Filename							
SPIRE MIL bus verification	SPIRE MIL bus.pdf							
Last Updated								
19-MAY-05 16:29:07								



SPIRE-WU  
EQM

# Report

Doc. No.: HP-2-ASED-TR-0042

Issue: 1 Date 18.05.2005

Herschel

6.4 MIL-Bus Verification of the CDMU nom. path

Sheet: 9

St-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min.Value	Max. Value	Actual Value	P/N
2.8	Verify Mil-Bus Signal BC to RT	PM	055.100	A-VOLT P-P	_ Volt	19	25	6,89	NOK
			055.100	A-RISE TIME	nsec	80	300	117,69	OK
			055.100	A-FALL TIME	nsec	80	300	223,80	OK
			055.100	B-VOLT P-P	_ Volt	4	6	4,97	OK
			055.100	B-RISE TIME	nsec	80	300	109,43	OK
			055.100	B-FALL TIME	nsec	80	300	229,85	OK
			055.100	VOLT-A / VOLT-B	%	4	6	1,39	NOK
			055.100	TRIGGERLEVEL	_ Volt	1	1	1,00	OK
			055.100	TRIGGERSLOPE	_ Pos	1	1	1,00	OK

Testhead-1: DB04-J05

01 Connector/Pin unknown in ICD

06 Connector/Pin unknown in ICD

Testhead-2: SPIRE-J03

02 Connector/Pin unknown in ICD

06 Connector/Pin unknown in ICD

Location: OTN

PA: E.Lamprrecht

IDAS\_Operator: GRASLA

OCOE\_Operator: Stijn Ilse

Test Conductor: Ch. Schlosser

Date: 12.05.2005



SPIRE-WU  
EQM

# Report

Doc. No.: HP-2-ASED-TR-0042

Issue: 1 Date 18.05.2005

Herschel

6.4 Mil-Bus Verification of the CDMU nom. path

Sheet: 12

St-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min. Value	Max. Value	Actual Value	P/N
3.4	Verify Mil-Bus Signal BC to RT	PM	055.100	A-VOLT P-P	Volt	19	25	6,89	NOK
			055.100	A-RISE TIME	nsec	80	300	117,69	OK
			055.100	A-FALL TIME	nsec	80	300	223,80	OK
			055.100	B-VOLT P-P	Volt	4	6	4,97	OK
			055.100	B-RISE TIME	nsec	80	300	109,43	OK
			055.100	B-FALL TIME	nsec	80	300	229,85	OK
			055.100	VOLT-A / VOLT-B	%	4	6	1,39	NOK
			055.100	TRIGGERLEVEL	Volt	1	1	1,00	OK
			055.100	TRIGGERSLOPE	Pos	1	1	1,00	OK

Testhead-1: DB04-J06

01 Connector/Pin unknown in ICD

06 Connector/Pin unknown in ICD

Testhead-2: SPIRE-J04

02 Connector/Pin unknown in ICD

06 Connector/Pin unknown in ICD

Location: OTN

PA: E.Lamprecht

IDAS\_Operator: GRASLA

OCOE\_Operator: Stijn Ilsen

Test Conductor: Ch.Schlösser

Date: 12.05.2005





SPIRE-WU  
EQM

# Report

Doc. No.: HP-2-ASED-TR-0042

Issue: 1 Date 18.05.2005

Sheet: 14

## 6.4 Mil-Bus Verification of the CDMU nom. path

### Herschel

St-No	Test-Step Description	C-St.	Meas. Type	Parameter	Phys. Unit	Min.Value	Max. Value	Actual Value	P/N
3.5	Verify Mil-Bus Signal RT to BC	PM	055.200	A-VOLT P-P	_ Volt	4	6	6,89	NOK
			055.200	A-RISE TIME	nsec	80	300	117,69	OK
			055.200	A-FALL TIME	nsec	80	300	223,80	OK
			055.200	B-VOLT P-P	_ Volt	19	25	4,97	NOK
			055.200	B-RISE TIME	nsec	80	300	109,43	OK
			055.200	B-FALL TIME	nsec	80	300	229,85	OK
			055.200	VOLT-A / VOLT-B	%	4	6	0,72	NOK
			055.200	TRIGGERLEVEL	_ Volt	2,52	2,52	2,52	OK
			055.200	TRIGGERSLOPE	_ Pos	0	0	0,00	OK

Testhead-1: DR04-J06

01 Connector/Pin unknown in ICD

06 Connector/Pin unknown in ICD

Testhead-2: SPIRE-J04

02 Connector/Pin unknown in ICD

06 Connector/Pin unknown in ICD

Location: OTN  
PA: E.Lamprecht

IDAS\_Operator: GRASLA  
OCOE\_Operator: Stijn Ilsen

Test Conductor: Ch.Schlosser  
Date: 12.05.2005

END OF DOCUMENT

	Name	Dep./Comp.		Name	Dep./Comp.
	Alberti von Mathias Dr.	AOE22	X	Stritter Rene	AED11
	Barlage Bernhard	AED11		Tenhaeff Dieter	AOE22
	Bayer Thomas	AET52		Thörmer Klaus-Horst Dr.	OTN/AED65
	Faas Horst	AEA65		Wagner Klaus	AOE23
	Fehringer Alexander	AOE13	X	Wietbrock, Walter	AET12
	Frey Albrecht	AED422		Wöhler Hans	AOE22
	Gerner Willi	AED11			
X	Grasl Andreas	OTN/AOA54	X	Alcatel	ASP
	Grasshoff Brigitte	AET12	X	ESA/ESTEC	ESA
	Hauser Armin	AOE23			
	Hinger Jürgen	AOE23		<b>Instruments:</b>	
X	Hohn Rüdiger	AET52		MPE (PACS)	MPE
	Huber Johann	AOA4	X	RAL (SPIRE)	RAL
	Hund Walter	ASE4A		SRON (HIFI)	SRON
X	Idler Siegmund	AED432			
	Ivány von András	FAE22		<b>Subcontractors:</b>	
	Jahn Gerd Dr.	AOE23		Air Liquide, Space Department	AIR
	Kalde Clemens	APE3		Air Liquide, Space Department	AIRS
X	Kameter Rudolf	OTN/AOA54		Air Liquide, Orbital System	AIRT
	Kettner Bernhard	AOE22		Alcatel Bell Space	ABSP
	Knoblauch August	AET32		Astrium Sub-Subsyst. & Equipment	ASSE
X	Koelle Markus	AET22		Austrian Aerospace	AAE
	Kroeker Jürgen	AED65		Austrian Aerospace	AAEM
	Kunz Oliver Dr.	AOE23		APCO Technologies S. A.	APCO
X	Lamprecht Ernst	OTN/ASI21		Bieri Engineering B. V.	BIER
	Lang Jürgen	ASE4A		BOC Edwards	BOCE
	Langfermann Michael	AET52		Dutch Space Solar Arrays	DSSA
	Mack Paul	OTN/AOA54		EADS CASA Espacio	CASA
	Muhl Eckhard	OTN/AOA54		EADS CASA Espacio	ECAS
X	Pastorino Michel	ASPI Resid.		EADS Space Transportation	ASIP
	Peitzker Helmut	AED65		Eurocopter	ECD
	Peltz Heinz-Willi	AET42		HTS AG Zürich	HTSZ
	Pietroboni Karin	AED65		Linde	LIND
	Platzer Wilhelm	AED22		Patria New Technologies Oy	PANT
	Rebholz Reinhold	AET52		Phoenix, Volkmarsen	PHOE
	Reuß Friedhelm	AED62		Prototech AS	PROT
	Rühe Wolfgang	AED65		QMC Instruments Ltd.	QMC
	Runge Axel	OTN/AOA54		Rembe, Brilon	REMB
	Sachsse Bernt	AED21		Rosemount Aerospace GmbH	ROSE
	Schink Dietmar	AED422		RYMSA, Radiación y Microondas S.A.	RYM
X	Schlosser Christian	OTN/AOA54		SENER Ingenieria SA	SEN
	Schmidt Rudolf	FAE22		Stöhr, Königsbrunn	STOE
	Schweickert Gunn	AOE22		Terma A/S, Birkerød	TER
	Stauss Oliver	AOE13			
	Steininger Eric	AED422			