

	DAQ+IF TEST PLAN	 SAp-SPIRE- FP-0067-02 Issue : 0.-1 Date : 26/02/03
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Draft

HERSCHEL/SPIRE

DAQ+IF TEST PLAN

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DAQ+IF
TEST PLAN



SAp-SPIRE-FP-0067-02
Issue: 0.-1
26/02/03

DOCUMENT STATUS and CHANGE RECORD

Date	Issue	Affected pages
9/3/2001	0.-	Creation

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1 INTRODUCTION

1.1 PURPOSE

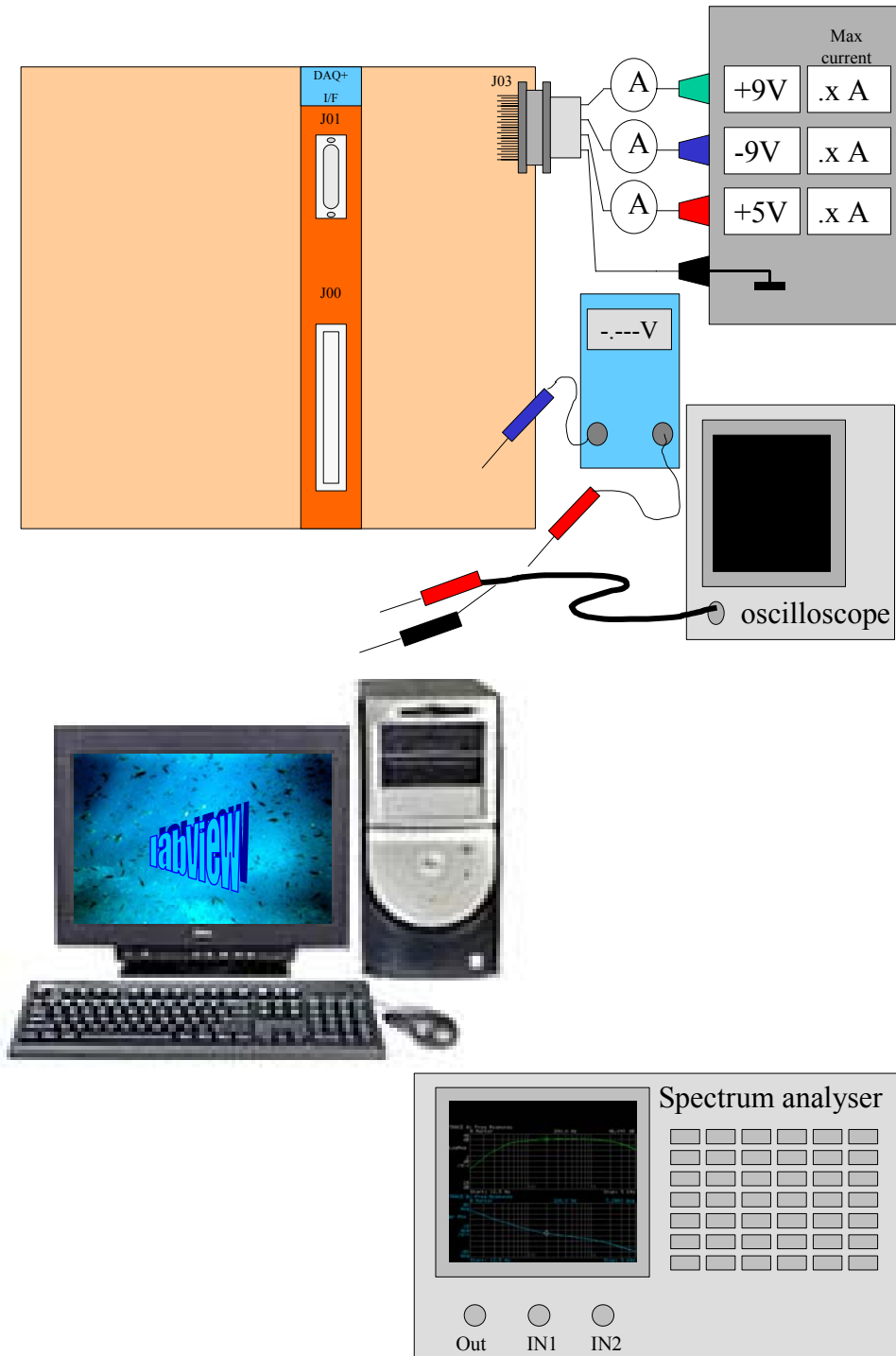
1.2 SCOPE

1.3 APPLICABLE DOCUMENTS

1.4 REFERENCE DOCUMENTS

2 GENERAL DESCRIPTION

2.1 OVERVIEW



Picture 2-1: DCU overview

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3 TEST EQUIPEMENTS

4 DCU QM1 ELECTRICAL TESTS

4.1 DAQ+IF test

4.1.1 Visual test

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 1	Check that no components missing and all the component are in the good way.	19/4/02			OK
DAQ+IF 2	Check that there isn't any visible short circuit	19/4/02			OK

4.1.2 Test with power supplies

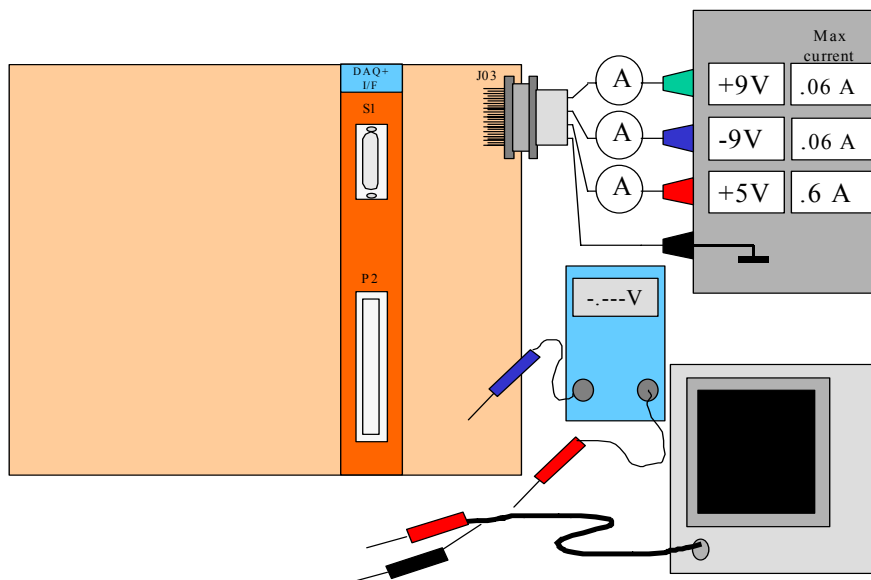
4.1.2.1 Test configuration

Before to start any electrical test on the DAQ+I/F board **ALL TEST** on the **BACK-PLANE** would be done with **SUCCESS**.

For following tests, we will keep the same configuration we had use for the back-plane electrical test.

We will increase the maximum current allow to 60mA for the +9V and -9V and to 600mA for the +5V.

We will switch off the lab power and then plug the DAQ+I/F board.



Picture 0-1 Bias electrical test configuration

4.1.2.2 Test

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 3	Switch on the lab power Check there is any short circuit.	22/4/02			OK
DAQ+IF 4	Measure the current on +9V				
DAQ+IF 5	Measure the current on -9V				
DAQ+IF 6	Measure the current on +5V				

4.1.2.2.1 CMD DPU Interfaces

TBD

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4.1.2.2.2 CMD Optional Interfaces

This interface use the DAQ+IF BOARD 50 pins connector P2.

This interface is a parallel interface directly connected to the PC data acquisition board PCI-DIO32HS

One 16 bits bus is used to send commands and the other is used to receive data.

4.1.2.2.3 Photometer BIAS amplitude

Command: SetPhotoBiasAmpl

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 7	Sent to photometer bias channel P250 the parameter 55 and check the transmission with a oscilloscope	21/5/02			OK
DAQ+IF 7	Sent to photometer bias channel P350 the parameter AA and check the transmission with a oscilloscope	21/5/02			OK
DAQ+IF 7	Sent to photometer bias channel P500 the parameter 55 and check the transmission with a oscilloscope	21/5/02			OK
DAQ+IF 7	Sent to photometer bias channel T/C the parameter AA and check the transmission with a oscilloscope	21/5/02			OK

Command: GetPhotoBiasAmpl

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 7	Get photometer bias channel P250 check that the parameter is 55				
DAQ+IF 7	Get photometer bias channel P350 check that the parameter is AA				
DAQ+IF 7	Get photometer bias channel P500 check that the parameter is 55				
DAQ+IF 7	Get photometer bias channel T/C check that the parameter is AA				

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4.1.2.2.4 Photometer HEATER amplitude

Command: SetPhotoHeaterVolt

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 8	Sent to photometer heater the parameter 55 and check the transmission with a oscilloscope	21/5/02			OK

Command: GetPhotoHeaterVolt

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 8	Get photometer heater check that the parameter is 55				

4.1.2.2.5 PSW JFET VSS amplitude

Command: SetPhSWJfetVSS

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 9	Sent to PSW VSS1 the parameter 55 and check the transmission with a oscilloscope	21/5/02			OK
DAQ+IF 9	Sent to PSW VSS2 the parameter AA and check the transmission with a oscilloscope	21/5/02			OK
DAQ+IF 9	Sent to PSW VSS3 the parameter 55 and check the transmission with a oscilloscope	21/5/02			OK
DAQ+IF 9	Sent to PSW VSS4 the parameter AA and check the transmission with a oscilloscope	21/5/02			OK
DAQ+IF 9	Sent to PSW VSS5 the parameter 55 and check the transmission with a oscilloscope	21/5/02			OK
DAQ+IF 9	Sent to PSW VSS6 the parameter AA and check the transmission with a oscilloscope	21/5/02			OK

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Command: GetPhSWJfetVSS

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 9	Get PSW VSS1 check that the parameter is 55				
DAQ+IF 9	Get PSW VSS2 check that the parameter is AA				
DAQ+IF 9	Get PSW VSS3 check that the parameter is 55				
DAQ+IF 9	Get PSW VSS4 check that the parameter is AA				
DAQ+IF 9	Get PSW VSS5 check that the parameter is 55				
DAQ+IF 9	Get PSW VSS6 check that the parameter is AA				

4.1.2.2.6 PMW JFET VSS amplitude

Command: SetPhMWJfetVSS

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 10	Sent to PMW VSS1 the parameter 55 and check the transmission with a oscilloscope	21/5/02			OK
DAQ+IF 10	Sent to PMW VSS2 the parameter AA and check the transmission with a oscilloscope	21/5/02			OK
DAQ+IF 10	Sent to PMW VSS3 the parameter 55 and check the transmission with a oscilloscope	21/5/02			OK
DAQ+IF 10	Sent to PMW VSS4 the parameter AA and check the transmission with a oscilloscope	21/5/02			OK

Command: GetPhMWJfetVSS

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 10	Get PMW VSS1 check that the parameter is 55				
DAQ+IF 10	Get PMW VSS2 check that the parameter is AA				
DAQ+IF 10	Get PMW VSS3 check that the parameter is 55				
DAQ+IF 10	Get PMW VSS4 check that the parameter is AA				

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4.1.2.2.7 PLW JFET VSS amplitude

Command: SetPhLWJfetVSS

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 11	Sent to PLW VSS1 the parameter 55 and check the transmission with a oscilloscope	21/5/02			OK
DAQ+IF 11	Sent to PLW VSS2 the parameter AA and check the transmission with a oscilloscope	21/5/02			OK

Command: GetPhLWJfetVSS

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 11	Get PLW VSS1 check that the parameter is 55				
DAQ+IF 11	Get PLW VSS2 check that the parameter is AA				

4.1.2.2.8 T/C JFET VSS amplitude

Command: SetPhTCJfetVSS

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 12	Sent to T/C VSS1 the parameter 55 and check the transmission with a oscilloscope	21/5/02			OK

Command: GetPhTCJfetVSS

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 12	Get PLW VSS1 check that the parameter is 55				

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4.1.2.2.9 PSW JFET ON/OFF

Command: SetPhSWJfetBias

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 13	Sent the parameter 55 and check the transmission with a oscilloscope	21/5/02			OK

Command: GetPhSWJfetBias

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 13	Get parameter check that the parameter is 55				

4.1.2.2.10 PMW PLW and T/C JFET ON/OFF

Command: SetPhMLWJfetBias

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 14	Sent the parameter 55 and check the transmission with a oscilloscope	21/5/02			OK

Command: GetPhMLWJfetBias

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 14	Get parameter check that the parameter is 55				

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4.1.2.2.11 Photometer BIAS sine

Command: SetPhotoBiasMode

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 15	Sent the parameter 55 and check the transmission with a oscilloscope	21/5/02			OK

Command: GetPhotoBiasMode

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 15	Get parameter check that the parameter is 55				

Sent Command SetPhotoBiasFreq with 511 as parameter

Command: SetPhotoBiasMode

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 15	Sent the parameter FF and check the transmission with a oscilloscope And the frequency of the sine DATA	22/5/02			OK

Sent Command SetPhotoBiasFreq with 64 as parameter

Command: SetPhotoBiasMode

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 15	Sent the parameter FF and check the transmission with a oscilloscope And the frequency of the sine DATA	22/5/02			OK

Command: GetPhotoBiasFreq

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 15	Get parameter check that the parameter is 64				

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4.1.2.2.12 Photometer demodulation

Command: SetDemodPh

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 16	Sent to P250 the parameter 00 and check the phase and the Frequency with a oscilloscope	23/4/02			OK
DAQ+IF 16	Sent to P350 the parameter 3F and check the phase and the Frequency with a oscilloscope	23/4/02			OK
DAQ+IF 16	Sent to P500 the parameter 7F and check the phase and the Frequency with a oscilloscope	23/4/02			OK
DAQ+IF 16	Sent to T/C the parameter BD and check the phase and the Frequency with a oscilloscope	23/4/02			OK

Command: GetDemodPh

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 16	Get P250 check that the parameter is 00				
DAQ+IF 16	Get P350 check that the parameter is 3F				
DAQ+IF 16	Get P500 check that the parameter is 7F				
DAQ+IF 16	Get T/C check that the parameter is BD				

4.1.2.2.13 Photometer acquisition

Connect 6 different DC generators on the 6 analogic DAQ+IF board inputs

Set all photometer channel offsets:

Sent Command SetDataMode with photometer automatic offset mode

Sent Command Startframe with run.

Then after 1s

Get photometer offsets

Mode photometer continue:

Sent Command SetPhotoSampFreq with 3 as parameter

Sent Command SetFrameNber with 0 as parameter

Sent Command SetDataMode with 0 as parameter

Sent Command Startframe with 1 as parameter

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 17	-The offsets	24/5/02			OK
	-Frame frequency.	24/5/02			OK
	-ADC timing	24/5/02			OK
	-Mux timing	24/5/02			OK
	-The Data noise	6/6/02	10 LSBrms		NOK
	-The data values	6/6/02	Test mode		OK

Mode photometer discrete:

Sent Command Startframe with 0 as parameter

Sent Command SetFrameNber with 5 as parameter

Sent Command Startframe with 1 as parameter

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 18	Check frame there is 5 frames.	24/5/02			OK

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4.1.2.2.14 Spectrometer BIAS amplitude

Command: SetSpectroBiasAmpl

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 19	Sent to spectrometer bias channel SSW the parameter 55 and check the transmission with a oscilloscope	23/5/02			OK
DAQ+IF 19	Sent to spectrometer bias channel SLW the parameter AA and check the transmission with a oscilloscope	23/5/02			OK

Command: GetSpectroBiasAmpl

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 19	Get spectrometer bias channel SSW check that the parameter is 55				
DAQ+IF 19	Get spectrometer bias channel SLW check that the parameter is AA				

4.1.2.2.15 Spectrometer HEATER amplitude

Command: SetSpectroHeaterVolt

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 20	Sent to spectrometer heater the parameter 55 and check the transmission with a oscilloscope	23/5/02			OK

Command: GetSpectroHeaterVolt

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 20	Get spectrometer heater check that the parameter is 55	23/5/02			OK

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4.1.2.2.16 SSW JFET VSS amplitude

Command: SetSpSWJfetVSS

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 21	Sent to SSW VSS1 the parameter 55 and check the transmission with a oscilloscope	23/5/02			OK
DAQ+IF 21	Sent to SSW VSS2 the parameter AA and check the transmission with a oscilloscope	23/5/02			OK

Command: GetSpSWJfetVSS

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 21	Get SSW VSS1 check that the parameter is 55				
DAQ+IF 21	Get SSW VSS2 check that the parameter is AA				

4.1.2.2.17 SLW JFET VSS amplitude

Command: SetSpLWJfetVSS

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 22	Sent to SLW VSS1 the parameter 55 and check the transmission with a oscilloscope	23/5/02			OK

Command: GetSpLWJfetVSS

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 22	Get SLW VSS1 check that the parameter is 55				

4.1.2.2.18 Spectrometer JFET ON/OFF

Command: SetSpSLWJfetBias

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 23	Sent the parameter 5 and check the transmission with a oscilloscope	23/5/02			OK

Command: GetSpSLWJfetBias

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 23	Get parameter check that the parameter is 5				

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4.1.2.2.19 Spectrometer BIAS sine

Command: SetSpectroBiasMode

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 24	Sent the parameter AA and check the transmission with a oscilloscope	23/5/02			OK

Command: GetSpectroBiasMode

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 24	Get parameter check that the parameter is AA				

Sent Command SetSpectroBiasFreq with 511 as parameter

Command: SetSpectroBiasMode

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 24	Sent the parameter FF and check the transmission with a oscilloscope And the frequency of the sine DATA	23/5/02			OK

Sent Command SetSpectroBiasFreq with 64 as parameter

Command: SetSpectroBiasMode

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 24	Sent the parameter FF and check the transmission with a oscilloscope And the frequency of the sine DATA	23/5/02			OK

Command: GetPhotoBiasFreq

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 24	Get parameter check that the parameter is 64				

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4.1.2.2.20 Spectrometer demodulation

Command: SetSpectroDemodPh

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 25	Sent to SSW the parameter 3F and check the phase and the Frequency with a oscilloscope	23/5/02			OK
DAQ+IF 25	Sent to SLW the parameter 7F and check the phase and the Frequency with a oscilloscope	23/5/02			OK

Command: GetSpectroDemodPh

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 25	Get SSW check that the parameter is 3F				
DAQ+IF 25	Get SLW check that the parameter is 7F				

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4.1.2.2.21 Spectrometer acquisition

Connect 6 different DC generators on the 6 analogic DAQ+IF board inputs

Set all spectrometer channel offsets:

Sent Command SetDataMode with Spectrometer automatic offset mode

Sent Command Startframe with run.

Then after 1s

Get spectrometer offsets

Then start acquisition

Mode spectrometer:

Sent Command SetSpectroSampFreq with 3 as parameter

Sent Command SetDataMode with 4 as parameter

Sent Command Startframe with 1 as parameter

Test number	Test	Test check Date	Check Result	Corrections	Test Status OK/NOK
DAQ+IF 26	-The offsets	25/5/02			OK
	-ADC timing	25/5/02			OK
	-Mux timing	25/5/02			OK
	-Frame frequency.	25/5/02			OK
	-The Data noise	6/6/02	10 LSBrms		NOK
	-The data values	6/6/02	Test mode		OK

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5 TRACEABILITY MATRIX

Requirement ID	Description	Test
BDA-DRCU-05	The DRCU is to provide 5 BDA bias signals, adjustable from 0 to 200 mV _{rms} , and 1 bias signal for temperature readout, adjustable from 0 to 500 mV _{rms} . The temperature readout biases are to be divided from a common oscillator. Each bias shall be adjustable with 8-bit precision. The frequency of each bias shall be adjustable between 50 and 300 Hz, with a precision of 5 Hz.	DAQ+IF 7 DAQ+IF 15 DAQ+IF 19 DAQ+IF 24
BDA-DRCU-06	The DRCU will provide 15 commandable JFET source voltages with 256 levels. The range of V _{ss} is from 0 V to -5 V.	DAQ+IF 9 DAQ+IF 10 DAQ+IF 11 DAQ+IF 12 DAQ+IF 21 DAQ+IF 22
BDA-DRCU-09	Each of the 15 V _{dd} and V _{ss} supplies must be commandable ON/OFF for spectrometer and photometer independently, without overshoot. Each V _{dd} and V _{ss} pair are turned on and off together.	DAQ+IF 13 DAQ+IF 14 DAQ+IF 23
BDA-DRCU-10	The DRCU will provide 2 double-wired JFET heater lines with adjustable amplitude and duration. The supplies must be able to provide 5 V and 25 mA (photometer), 3 V and 10 mA (spectrometer). Each heater line is commandable ON/OFF, with a minimum duration of 10 s.	DAQ+IF 8 DAQ+IF 20
BDA-DRCU-15	The sampling of the photometer channels shall be synchronised with the bias, at a rate selectable between $v_{bias}/2$ to $v_{bias}/256$.	DAQ+IF 17
BDA-DRCU-16	The sampling of the spectrometer channels shall be synchronised with the bias, at a rate selectable between $v_{bias}/2$ to $v_{bias}/256$.	DAQ+IF 26