

ESO

European Organisation for Astronomical Research in the Southern Hemisphere



ODT

Test-bench

LabView Modules User Manual

Doc. No.: GEN-MAN-ESO-21110-0028

Issue: 1D2

Date: 05.03.2008

 Author(s):
 E. Müller, S. Deiries.....

 Name
 Date
 Signature

 Approved by:
 D. Baade....
 Date
 Signature

 Name
 Date
 Signature

 Name
 Date
 Signature



GEN-MAN-ESO-21110-0028 1D2 05.03.08 2 of 135

CHANGE RECORD

Doc:

Issue:

Date:

Page:

ISSUE	DATE	SECTION/PARA. AFFECTED	REASON/INITIATION DOCUMENTS/REMARKS
1D0	28.02.2008	All	New document
1D1	29.02.2008	All	Layout changes
1D2	05.03.2008	All	Changes from E. Müller



Doc:

Issue:

Date:

Page:

TABLE OF CONTENTS

1	Scop	De	5
2	Intro	duction	5
3	Appl	licable and Reference Documents	5
	3.1	Applicable Documents (see also in the individual modules)	5
	3.2	Reference Documents	5
4	Lab\	View Modules	6
	4.1	Acquisition Setup	6
	4.2	Device Driver Setup	20
	4.3	Interface for the Keithley 6514 Electrometer	
	4.4	Interface for the Keithley 486 Picoammeter	
	4.5	Interface for the Keithley 2100 USB Digital Multimeter	40
	4.6	Interface for the Motorized filter wheel (Newport Model 74041)	
	4.7	Interface for the Monochromator MSH301	
	4.8	Interface for the Newport Power Supply (Model 69931)	
	4.9	Interface for the Newport ESP 300 Motion Controller	66
	4.10	Interface for the Newport ITL 09 Motion Controller	72
	4.11	Interface for the Newport MM 4000 Motion Controller	78
	4.12	Interface for FIERA	
	4.13	Interface for PULPO (rev 1.0)	97
	4.14	Interface for the BOC Edwards TIC	
	4.15	Interface for the USB Interface Board	113
	4.16	Interface for automated data acquisition	117



GEN-MAN-ESO-21110-0028 1D2 05.03.08 4 of 135

Doc:

Issue:

Date:

Page:

INTENTIONALLY LEFT BLANK



GEN-MAN-ESO-21110-0028 1D2 05.03.08 5 of 135

Doc:

Issue:

Date:

Page:

Scope 1

This document describes the LabView modules of the new AO test-bench in Laboratory 051. Its functionality and architecture are given.

2 Introduction

This document explains the new LabView drivers and functions of the ODT test-bench programmed by Eric Müller.

It also should serve as a user manual.

Applicable and Reference Documents 3

3.1 Applicable Documents (see also in the individual modules)

User Manuals of test-bench devices (paper and CD-documentation):

- ORIEL ¹/₄ M MONOCHROMATOR Model MSH301 (Manual)
- ORIEL Monochromator Utility Software Version 3.3
- ORIEL 10 100W Lamp Housing LSH101 (Manual)
- ORIEL 100 W Arc Lamp Power Supply LSN110 (Manual)
- Keithley Model 6514 System Electrometer
- Keithley Safety Standards Conformance Information
- Keithley Software Utility ELNX-852 Version C02 -
- Keithley Low-Current/High Resistance Product Information LCHR-950-01 REV.D
- Newport ESP Motion Controller Configuration Procedure Version 3.01
- Newport High-Performance Mid-Range Travel Linear Stage User's Manual
- Edwards EXPT Pumping Station & TIC Manual and Software
- NGC User's manual and Software documentation: http://www.eso.org/projects/ngc
- FIERA User's Manual and Software documentation: ftp://ftp.eso.org/pub/vlt/vlt/pub/releases/JAN2006/vol-4/VLT-MAN-ESO-13640-

1388.pdf

- PULPO User's Manual: http://www.eso.org/projects/odt/pulpo/pulpo.html
- Jumo Imago 500 User's Manual
- ODT test-bench documentation: http://www.eso.org/projects/odt/CCDtestbench/index.html

3.2 Reference Documents

Doc. No.: VLT-MAN-ESO-xxxxx-xxxx New AO test-bench in 051: Assembly and Programming Instructions, S. Deiries, ESO



GEN-MAN-ESO-21110-0028 1D2 05.03.08 6 of 135

Doc:

Issue:

Date:

Page:

4 LabView Modules

4.1 Acquisition Setup

(Acquisition_Setup.vi)

Purpose

This VI (Global variable) is used to set up for a data acquisition at the AO test bench in 051.

Prerequisites

It is strongly recommended to verify parameters before one of the following VI's is started:

- "LabViewPrism_New testbench.vi"
- "FIERA_standalone.vi"
- "MasterPanel2.0.vi"

Hardware

The described functionality for this VI is only available in case of the following hardware configuration:

- If you intend to use the internal monochromator shutter, connect the USB interface board to PULPO and verify that the hardware configuration is the same as described in this manual.
- In order to write "Weather station data" into the FITS header the weather station WS 2300 has to be turned on and connected to the serial port which can be specified in the "Heavy Weather" software ("Setup" >> "Global" >> "COM Port Nb.").

Furthermore the path to the data file ("ws_newdata.csv") which is created by the "Data Acquisition Software – V2.93.17" and later read out by LabView has to be specified in the "DeviceDriver_Setup.vi".

Operation

- In order to change settings right click on the control and select "Data Operations" >> "Make current value default" and save the VI ("File" >> "Save" or "Ctrl" + "S").
- In order to save the whole setup, press "Edit" >> "Make Current Values Default" and save the VI ("File" >> "Save" or "Ctrl" + "S").



GEN-MAN-ESO-21110-0028 1D2 05.03.08 7 of 135

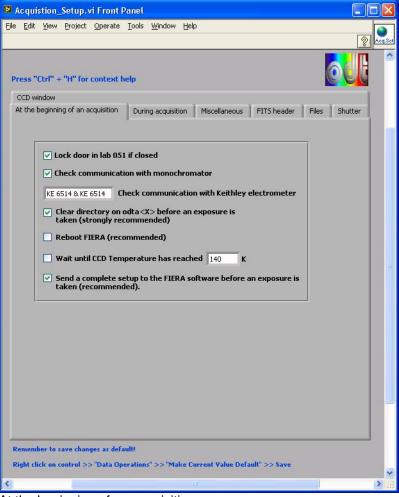
Doc:

Issue:

Date:

Page:

Front panel



At the beginning of an acquisition

Controls, indicators and functions

Lock door in lab 051 if closed

• If enabled the test bench door is locked (if it is closed) at the beginning of a data acquisition using the "MasterPanel2.0.vi".

Check communication with monochromator

• If enabled a monochromator (MSH 301) communication check is performed at the beginning of a data acquisition.



Doc:

Issue:

Date:

Page:

Check communication with Keithley electrometer

• A Keithley communication check is performed before the data acquisition begins.

Clear directory on odta<X> before an exposure is taken (strongly recommended)

• If enabled all FITS files in the "Path to FITS file on odta<X>" (See "Files") are deleted before an exposure is taken.

Reboot FIERA (recommended)

• If enabled FIERA is rebooted at the beginning of an acquisition ("MasterPanel2.0.vi")

Wait until CCD Temperature has reached < Set point temperature >K

• If enabled the "MasterPanel2.0.vi" waits for the cryostat to cool down or warm up to the temperature which is specified before the acquisition is started.

Wait until CCD Temperature has reached < Set point temperature >K

• This is the set point for the heaters 1 and 2 (PULPO).

Send a complete setup to the FIERA software before an exposure is taken (recommended)

 The following command is send to the FIERA software before an exposure is taken: msgSend \$RTAPENV fcdcon_\$CCDNAME SETUP "-file fcdSetupComplete.det"



GEN-MAN-ESO-21110-0028 1D2 05.03.08 9 of 135

Doc:

Issue:

Date:

Page:

📓 Acquistion_Setup.vi Front Panel	
Elle Edit View Project Operate Iools Window Help	
Press "Ctrl" + "H" for context help Image: CCD window CCD window At the beginning of an acquisition During acquisition Miscellaneous FITS header Files Shutter	Acq.Set
 Check test bench lamp status Check if door in lab 051 is closed Check room light conditions Dialog Action if an exposure fails Pause before dark acquisition starts to mount the metallic cover 	
Remember to save changes as default!	
Right click on control >> "Data Operations" >> "Make Current Value Default" >> Save	~
K	>

During acquisition

Controls, indicators and functions

Check test bench lamp status

- If enabled the test bench's lamp controller (Radiometric Power Supply Model 69931) is read out to determine the status of the lamp (turned on/off).
- If the lamp is turned of a window appears to ask for further instructions. If the lamp was turned on at the beginning of the acquisition and breaks down later the same window appears.

Check if door in lab 051 is closed

• Allows the user to make sure that the test bench door is closed for the duration of the data acquisition. If the door is opened the acquisition is paused and a window appears.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 10 of 135

Doc:

Issue:

Date:

Page:

Check room light conditions

- If enabled the acquisition is paused if the room light is turned on.
- A window appears to ask for further instructions.

Action if an exposure fails

- Allows the user to select how LabView applications react on failed exposures.
- Either a window appears to ask for further instructions by the user or the exposure is taken once more using the same parameters as before.

Pause before dark acquisition starts to mount the metallic cover

• If enabled the user is asked to mount the metallic cover before the "Dark current" acquisition ("MasterPanel2.0.vi") begins.



GEN-MAN-ESO-21110-0028
1D2
05.03.08
11 of 135

Doc: Issue:

Date: Page:

	on_Setup.v	ri Front P	anel								×
ile <u>E</u> dit <u>V</u> ie	ew <u>P</u> roject	<u>O</u> perate	<u>T</u> ools <u>W</u> ir	ndow	Help					<u> </u>	9 .S
CCD windo					ing Mic	cellaneous) erre ba	udan Ì ret			
L L	inning of an a ight acquisitio Maximum e Minimum e	n Dark xposure t)	s		FITS he	ader Fil	es Shutte	r	
Remember	to save chang				L. C.	t Value De	full ^a << 6				
Right click o	on control >>	· Data Upe	attons >.	Ind	Ke Curren	t value De	rault >> 3				

Controls, indicators and functions

Light acquisition Maximum exposure time

• Allows the user to specify the max. exposure time [s] for flat field images.

Minimum exposure time

• Allows the user to specify the min. exposure time [s] for flat field images.



Dark acquisition	Maximum exposure time
	•

• Allows the user to specify the max. exposure time [s] for dark exposures.

Doc:

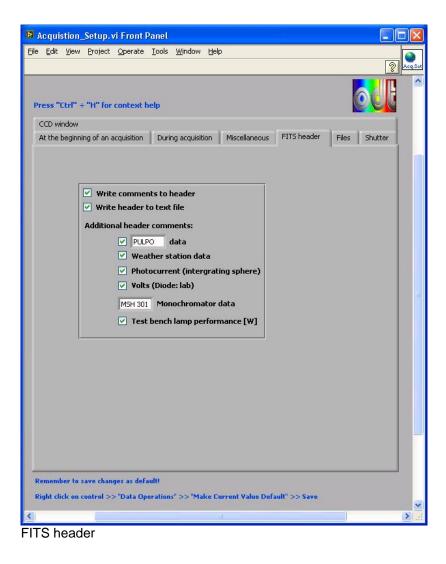
Issue:

Date:

Page:

Minimum exposure time

- Allows the user to specify the min. exposure time [s] for dark exposures.
- Remember that bias exposures are also dark exposures with an exposure time of 0 seconds. Therefore the minimum should be 0 seconds.





GEN-MAN-ESO-21110-0028 1D2 05.03.08 13 of 135

Doc:

Issue:

Date:

Page:

Controls, indicators and functions

Write comments to FITS header

- If enabled the following data are written into the FITS header:
- Example:

Write header to text file

• If enabled the header of each FITS file is written to a text file named "<FITS file name>_HDU.txt" and saved to the same location where the FITS file is stored.

<device>data

• If enabled the data gathered by either PULPO or JUMO ("device") is written into the FITS header: Temp.(CCD1) [K]; Temp.(CCD2) [K]; Vacuum [mbar]

Weather station data

- If enabled the latest readings stored in the data file "ws_newdata.csv", which is specified in the "DeviceDriver_Setup.vi" is written into the FITS header.
- The file "ws_newdata.csv" is created by the "Data Acquisition Software V2.93.17".

Photocurrent (integrating sphere)

• If enabled the photocurrent measured in the integrating sphere is written into the FITS header.

Volts (Diode: lab)

• If enabled the voltage of the diode located in lab 051 (measured by the Keithley 2100) is written into the FITS header.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 14 of 135

Doc:

Issue:

Date:

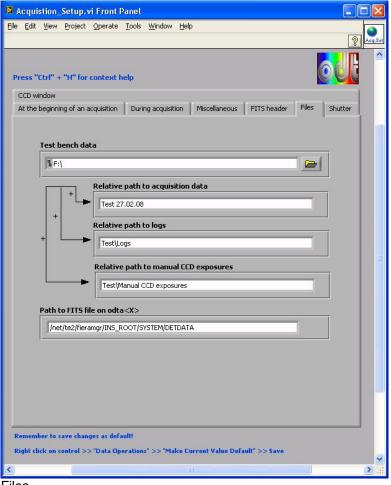
Page:

Monochromator data

- If you select a monochromator (MSH301 or MS257), its data are written into the FITS header.
- These are: Wavelength [nm]; Density; Bandwidth [nm]; Color filter; Readout mode; Type of exposure

Test bench lamp performance [W]

• If enabled the performance [W] of the test bench lamp is written into the FITS header.



Files



GEN-MAN-ESO-21110-0028 1D2 05.03.08 15 of 135

Doc:

Issue:

Date:

Page:

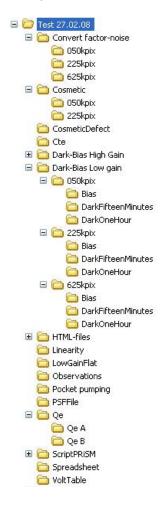
Controls, indicators and functions

Test bench data

- The base path (a folder or drive) to the data produced by LabView applications.
- This path must already exist!

Relative path to acquisition data

- Data acquired by the "MasterPanel2.0.vi" is saved in this directory: <Test bench data>\<Relative path to acquisition data>
- For example: <Test bench data> = F:\
 <Relative path to acquisition data> =DMarc\AphroditeL
- The fits files are saved in the existing folder: F:\DMarc\AphroditeL
- This folder must contain the following structure:





Doc:

Issue:

Date:

Page:

Relative path to logs

- Error logs as well as telnet logs are saved in this existing directory: <Test bench data>\<Relative path to logs>
- For example: <Test bench data> = F:\DMarc\ <Relative path to logs> =Logs20.01.08
- The logs are saved in the existing folder: F:\DMarc\Logs20.01.08

Relative path to manual CCD exposures

- If you take images with the "FIERA_standalone.vi" these images are saved in the existing directory: <Test bench data>\<Relative path to manual CCD exposures>
- For example: <Test bench data> = F:\
 <Relative path to manual CCD exposures> =DMarc\test_images
- The fits file is saved in the existing folder: F:\DMarc\test_images

Path to FITS file on odta<X>

- This is the directory where images taken by FIERA are saved. LabView picks up and afterwards deletes images in this directory.
- Example: "/net/te2/fieramgr/INS_ROOT/SYSTEM/DETDATA"



GEN-MAN-ESO-21110-0028
1D2
05.03.08
17 of 135

Doc: Issue:

Date: Page:

Acquistion_Setup.vi Front Panel	
ile <u>E</u> dit <u>V</u> iew Project <u>O</u> perate <u>T</u> ools <u>W</u> indow <u>H</u> elp	8 Acq.s
Press "Ctrl" + "H" for context help CCD window At the beginning of an acquisition During acquisition Miscellaneous FITS header	Files Shutter
 Enable to use the internal monochromator shutter. Disable to use the Prontor shutter. 	
Remember to save changes as default!	
Remember to save changes as derault: Right click on control >> "Data Operations" >> "Make Current Value Default" >> Save	

Control and function

Shutter

- Enable this control to use the internal monochromator shutter.
- Disable this control to use the Prontor shutter.
- Make sure the right shutter controller is connected to PULPO (either USB interface board or the Prontor shutter controller).



GEN-I	MAN-ESO-21110-0028
1D2	
05.03.	.08
18 of	135

Doc: Issue:

Date: Page:

🛿 Acquistion_Setu	p. vi Front Panel	
<u>File E</u> dit ⊻iew <u>P</u> roj	ect <u>O</u> perate <u>T</u> ools <u>W</u> indow <u>H</u> elp	
Press "Ctrl" + "H" At the beginning of CCD window		Image: Shutter
Xista 221 Xen 220	0 ccb1 ccb2	
Remember to save of		
	hanges as default! I >> "Data Operations" >> "Make Current Value Default" >> Save	
<		>

CCD window

Controls, indicators and functions

CCD window (Xstart; Xend; Ystart; Yend)

- Defines the dimensions of the CCD window which is used to determine the offset and the ADU mean level during a data acquisition with the "MasterPanel2.0.vi"
- Please refer to the graphic on the right
- In order to select the whole CCD image:
 - $\begin{array}{l} Xstart = 0\\ Xend = -1\\ Ystart = 0 \end{array}$
 - Yend = -1

Offset

• If "Automatic offset determination" is disabled the user can specify an offset.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 19 of 135

Doc:

Issue:

Date:

Page:

Automatic offset determination

• If enabled the offset is determined automatically by taking a bias exposure followed by a mean level calculation in the CCD window which is specified above.

SubVI´s

None

Block Diagram

None



GEN-MAN-ESO-21110-0028 1D2 05.03.08 20 of 135

Doc:

Issue:

Date:

Page:

4.2 Device Driver Setup

(DeviceDriver_Setup.vi)

Purpose

This VI (Global variable) is used to set device driver specific parameters. You will only have to verify these parameters if you intend to use one of the VI's listed under "Prerequisites"

Prerequisites

It is strongly recommended to verify parameters before one of the following VI's is started:

- "LabViewPrism_New testbench.vi"
- "FIERA standalone.vi"
- "MasterPanel2.0.vi"
- "MSH301_standalone2.0.vi"
- "JUMO_standalone2.0"

Hardware

The described functionality for this VI is only available in case of the following hardware configuration:

- If you intend to use the internal monochromator shutter, connect the USB interface board to PULPO and verify that the hardware configuration is the same as described in this manual.
- In order to write "Weather station data" into the FITS header the weather station WS 2300 has to be turned on and connected to the serial port which is specified in the "Heavy Weather" software ("Setup" >> "Global" >> "COM Port Nb.").

Furthermore the path to the data file ("ws_newdata.csv") which is created by the "Data Acquisition Software – V2.93.17" and later read out by LabView has to be specified in the "DeviceDriver_Setup.vi".

Operation

- In order to change settings right click on the control and select "Data Operations" >> "Make current value default" and save the VI ("File" >> "Save" or "Ctrl" + "S").
- In order to save the whole setup, press "Edit" >> "Make Current Values Default" and save the VI ("File" >> "Save" or "Ctrl" + "S").



GEN-MAN-ESO-21110-0028 1D2 05.03.08 21 of 135

Doc:

Issue:

Date:

Page:

Front panel

DeviceDriver_Setup.vi Front Panel	
Elle Edit Yiew Project Operate Iools Window Help	
	2 Dev.Set
Keithley electrometer	DWARDS
Keithley electrometer for diode mounted at integrating sphere KE 2100 GPIB port GPIB0::14::INSTR Measurements 10 Test bench in 054: KE 486 Measurements 10 Threshold for room illumination 2E-1 Volts	
2nd Keithley electrometer	
KE 6514 GPIB port % GPIE0::15::INSTR • Measurements 10 Test bench in 051: KE 6514	
Remember to save changes as default! Right click on control >> "Data Dperations" >> "Make Current Value Default" :	>> Save
	× 0070 ×
	

Keithley

Controls, indicators and functions

GPIB port (Keithley electrometer for diode mounted at integrating sphere)

• Allows the user to select the GPIB port of the Keithley electrometer that reads the photocurrent of the diode mounted at the integrating sphere.

Measurements (Keithley electrometer for diode mounted at integrating sphere)

• Allows the user to specify the number of measurements for the mean calculation as well as the standard deviation calculation.

GPIB port (2nd Keithley electrometer)

• Allows the user to select the GPIB port of the second Keithley (e.g. for test bench calibration).



Doc:

Issue:

Date:

Page:

Measurements (2nd Keithley electrometer)

• Allows the user to specify the number of measurements for the mean calculation as well as the standard deviation calculation.

USB port (KE 2100)

• Allows the user to select the USB port of the KE 2100.

Threshold for room illumination

- Readings that are higher than this threshold [V] are interpreted as: "Room light is turned on".
- Experience shows 2E-1V is an efficient threshold.

🗵 DeviceDriver_Setup.vi Front Panel												
Eile Edit Vie	ew <u>P</u> roject	<u>O</u> perate <u>T</u> ools <u>W</u> in	dow <u>H</u> elp									
					_	_	_	_	_			? Dev.Set
Press "C	trl"+"H" for	context help										
Keithley	Filter whee	Monochromator	Lamp (Power S	upply) Weather :	station	XYZ	able	CCD c	ontrolle	r JUMO PULPO BO		
1	Filter wheel	controller	Conne	cted to filter whe	el with	the fol	lowing	densi	y filte	rs mounted		
	Serial numb	er: 271										
	GPIB port	KGPIB0::4::INSTR		Position:	1	2	3	4	5	6		
	Serial numb	er: 265			0.0	0.15	0.3	0.6	1.0	1.3		
	GPIB port	^I ∕₀GPIB0::5::INSTR			0.0	0.15	1.6	2.3	3.0	3.6		
Rememb	per to save	changes as defau	It! Right click	k on control >>	"Data	Opera	ations	">>'	'Make	Current Value Defaul	t" >> Save	~
<		l.			0.000							>
Filter w	heel											



GEN-MAN-ESO-21110-0028 1D2 05.03.08 23 of 135

Doc:

Issue:

Date:

Page:

Controls, indicators and functions

GPIB port

• Allows the user to select the GPIB port of the filter wheel controller which is connected to the filter wheel with the density filters mounted as shown.

DeviceDriver_Setup.vi Front Panel	
Eile <u>E</u> dit <u>V</u> iew <u>P</u> roject <u>O</u> perate <u>T</u> ools <u>W</u> indow <u>H</u> elp	
	2 Dev. Sc
Press "Ctrl"+"H" for context help Keithley Filter wheel Monochromator Lamp (Power Supply) Weather station XYZ table CCD controller	JUMO PULPO BOCEDWARDS
MSH 301 GPIB port	MS 257 GPIB port
() e	Monochromator 1 4
Order sorting filters Enable filter table Start wavelength [nm]	Monochromator 2 ()6
Position 1 2 3 4 5 6 0<	
Grating Lines Offset Zero Factor 600 0.058617 0.087266 0.999994	
Wavelength range Default 632 nm Minimum 250 nm Maximum 1150 nm	
Bandwidth range	
Default 7 nm Minimum 0.1 nm Maximum 35 nm	
Remember to save changes as default! Right click on control >> "Data Operations" >> "Make C	Current Value Default" >> Save

Monochromator



Doc:

Issue:

Date:

Page:

Controls, indicators and functions

GPIB port

• The GPIB port of the monochromator MSH 301.

Enable filter table

• If enabled the order sorting filters are selected automatically depending on the wavelength (See the table next to this control).

Lines

• The number of lines of the mounted grating

Offset; Zero; Factor

• The grating's parameters (See the user manual of the monochromator MSH 301 for more information).

Wavelength range

- If the user specifies a wavelength (e.g. in the "MSH301_standalone2.0.vi") out of range a window appears to indicate that the parameter can not be accepted.
- The user is asked to specify a parameter in range.

Bandwidth range

- If the user specifies a bandwidth (e.g. in the "MSH301_standalone2.0.vi") out of range a window appears to indicate that the parameter can not be accepted.
- The user is asked to specify a parameter in range.

GPIB MONO 1

• GPIB address of the monochromator with the filter wheels mounted.

GPIB MONO 2

• GPIB address of the monochromator where the integrating sphere is mounted



GEN-MAN-ESO-21110-0028 1D2 05.03.08 25 of 135

Doc:

Issue:

Date:

Page:

DeviceDriver_Setup.vi Front Panel	
Elle Edit View Project Operate Iools Window Help	
	2 Dev.Set
Press "Ctrl" +"H" for context help	
Keithley Filter wheel Monochromator Lamp (Power Supply) Weather station XYZ table CCD controller JUMO PULPO BOC EDWARDS	
Serial port	
Remember to save changes as default! Right click on control >> "Data Operations" >> "Make Current Value Default" >> Save	
Remember to save changes as default: Right tlick on control >> Data uperations >> Make current Value Default >> Save	>
Lever (Derror Growthe)	

Lamp (Power Supply)

Control, indicator and function

Serial port

• Specifies the serial port of the lamp's power supply.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 26 of 135

Doc:

Issue:

Date:

Page:

DeviceDriver_Setup, vi Front Panel
Elle Edit View Project Operate Iools Window Help
Press "Ctrl" + "H" for context help Keithley Filter wheel Monochromator Lamp (Power Supply) Weather station XYZ table CCD controller JUMO PULPO BOC EDWARDS
Path to "ws_newdata.csv"
A D:\Program Files\Wswin\ws_newdata.csv
Remember to save changes as default! Right click on control >> "Data Operations" >> "Make Current Value Default" >> Save
Wasthen station

Weather station

Control, indicator and function

Path to "ws_newdata.csv"

• This file contains the latest readings of the weather station WS 2300. It is created by the "Data Acquisition Software – V2.93.17"



GEN-MAN-ESO-21110-0028 1D2 05.03.08 27 of 135

Doc:

Issue:

Date:

Page:

Elle Edit Yew Project Operate Iools Window Help	-
) ev.Set
Press "Ctrl" +"H" for context help Keithley Filter wheel Monochromator Lamp (Power Supply) Weather station XYZ table CCD controller JUMO PULPO BOC EDWARDS Newport motion controller Vertical and the station XYZ table CCD controller JUMO PULPO BOC EDWARDS	
Newport motion controller	
GPIB port	
ESP 300 GPIB port	
MM 4000 GPIB port	
Remember to save changes as default! Right dick on control >> "Data Operations" >> "Make Current Value Default" >> Save	×

XYZ table

Controls, indicators and functions

GPIB port (ITL 09; ESP 300; MM 4000)

- Allows the user to select the GPIB port from the list.
- Press "Refresh" to update the list of available ports.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 28 of 135

Doc:

Issue:

Date:

Page:

DeviceDriver_Setup.vi Front Panel File Edit View Project Operate Tools Window Help	
File Falc New Flodect Aberate Tools William Helb	? Dev.Set
Press "Ctrl"+"H" for context help	
Keithley Filter wheel Monochromator Lamp (Power Supply) Weather station XYZ table CCD controller JUMO PULPO BOC EDWARDS	
FIERA	
Login CCD	
Login	
fodrun	
Password	

Network address	
odta1.hq.eso.org	
Remote port	
23 😨	
Y Image	
ссри ссру	
Remember to save changes as default! Right click on control >> "Data Operations" >> "Make Current Value Default" >> Save	~
	>

CCD controller - Login

Controls, indicators and functions

Login

• Allows the user to specify the user name to open the telnet session.

Password

• Allows the user to specify the password to open the telnet session.

Network address

• Allows the user to specify the network address to open the telnet session.

Remote port

• Allows the user to specify the remote port to open the telnet session.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 29 of 135

Doc:

Issue:

Date:

Page:

DeviceDriver_Set	up.vi Front Panel					
e <u>E</u> dit ⊻jew <u>P</u> rojec	t <u>O</u> perate <u>T</u> ools <u>W</u> indow <u>H</u>	jelp				<u></u>
Press "Ctrl"+"H" Keithley Filter w FIERA	neel Monochromator Lamp	ı (Power Supply) 📗 V	Veather station 📗 XYZ table	CCD controller	JUMO PULPO BOCEDWARDS	
CCD nam				_		
CCD para	ameter					
DMarc	Model Grade Serial Number Pixel size [um] Number of photosensitive pixels Number of outputs	CCD 1 default 0 15 x 15 0 2	CCD 2 default 0 15 x 15 0 2		Y Image	
Remember to sa	ve changes as default! Ri	ght click on cont	rol >> "Data Operation	ıs" >> "Make	O Current Value Default" >> Save	x

CCD controller - CCD

Controls, indicators and functions

CCD name

• Allows the user to specify the "CCD name" (e.g. "giraffe" or "DMarc").

CCD parameter

- Allows the user to select between three parameter tables. These are: "DMarc"; "tbmite2v" and "New CCD"
- Within these three tables the user can specify the CCD's parameters which are written into the FITS header.
- The CCD parameters are selected according to the "CCD name".
- Example 1: CCD name = "tbmite2V"
- The table containing the "tbmite2v" parameters is written into the FITS header.
- Example 2: CCD name = "giraffe" The table containing the "New CCD" parameters is written into the FITS header.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 30 of 135

Doc:

Issue:

Date:

Page:

Available parameters for CCD 1 and CCD 2

 Model Grade Serial Number Pixel size[um] Number of photosensitive pixels Number of outputs

DeviceDriver_Setup.vi Front Panel		
ile Edit Yiew Project Operate Tools Window Help		
Press "Ctrl"+"H" for context help Keithley Filter wheel Monochromator Lamp (Por	wer Supply) Weather station XYZ table CCD controller JUMO PULPO BOC EDWARDS	
Serial port	7	
Slave address]	
) 1 Configuration		
Baud rate 9600 Data bits		
Parity None Stop bits 1.0 Timeout[ms] 10000		
Min. response 50 time[ms]		
Analog inputs Temperature CCD1	Ī	
1 Temperature CCD2		
Pressure		
96		
Remember to save changes as default! Right	click on control >> "Data Operations" >> "Make Current Value Default" >> Save	
		>

JUMO

Controls, indicators and functions

Serial port JUMO

• This control allows to specify the serial port of the JUMO IMAGO 500.

Slave address

• Allows the user to specify the slave address of JUMO IMAGO 500.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 31 of 135

Configuration Baud rate; Data bits; Parity; Stop bits

Timeout[ms]

• This is the number of ms to wait for a response after having sent a command to JUMO. If the time has elapsed an error message appears.

Doc:

Issue:

Date:

Page:

Min. response time[ms]

• This is the delay between send and read.

Temperature CCD1 (Analog input)

• Allows the user to specify the analog input where the sensor for the temperature of CCD 1 is connected to.

Temperature CCD2 (Analog input)

• Allows the user to specify the analog input where the sensor for the temperature of CCD 2 is connected to.

Pressure (Analog input)

• Allows the user to specify the analog input where the sensor for the pressure is connected to.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 32 of 135

Doc:

Issue:

Date:

Page:

🔀 DeviceDriver_Setup.vi Front Panel	
File Edit View Project Operate Iools Window Help	
2	Dev.Set
Press "Ctrl" + "H" for context help Keithley Filter wheel Monochromator Lamp (Power Supply) Weather station XYZ table CCD controller JUMO PULPO BOC EDWARDS EDWARDS Sensor	
Temperature CCD1	
Temperature CCD2	un al
Remember to save changes as default! Right click on control >> "Data Operations" >> "Make Current Value Default" >> Save	
	>
PULPO	

Controls, indicators and functions

Temperature CCD1 (Sensor)

• Allows the user to specify the temperature sensor of CCD 1.

Temperature CCD2 (Sensor)

• Allows the user to specify the temperature sensor of CCD 2.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 33 of 135

Doc:

Issue:

Date:

Page:

DeviceDriver_Setup.vi Front Panel	
Elle Edit View Project Operate Iools Window Help	
	2 Dev.Set
Press "Ctrl" +"H" for context help	
Keithley Filter wheel Monochromator Lamp (Power Supply) Weather station XYZ table CCD controller JUMO PULPO BOC	
Serial port	
%COMB V	
	1
Remember to save changes as default! Right click on control >> "Data Operations" >> "Make Current Value Default"	>> Save
BOC EDWARDS	

Serial port

• This control allows specifying the serial port of the BOC Edwards vacuum controller.

SubVI´s

None

Block Diagram

None



GEN-MAN-ESO-21110-0028 1D2 05.03.08 34 of 135

Doc:

Issue:

Date:

Page:

4.3 Interface for the Keithley 6514 Electrometer

(Keythley_6514_standalone2.0.vi)



Icon on the block diagram



Purpose

This VI is used to take current measurements with the Keithley 6514 electrometer.

Prerequisites

To avoid communication problems connect the Keithley 6514 to a GPIB port of your PC before the device is turned on. Make sure that no other device linked to this GPIB bus has the same GPIB address. ("Measurement & Automation Explorer" >> "Devices & Interfaces" >> "GPIB
sbus>" >> "Scan For Instruments")

Allow the instrument to warm up at least 2 hours to obtain rated accuracy. (See user manual)

Input

To execute this VI the files listed under "SubVI's" have to be available. If LabView can not find one or more of these VI's you are asked to specify the path.

Output

If an error occurs during operation an error message will appear. At the same time an error log named "Error log (KE_486) <date>.txt" is created in the directory which is specified in the "Acquistion_Setup.vi".

Operation

- Open the Measurement & Automation Explorer to make sure your PC has detected the new device (>> "Devices & Interfaces" >> "GPIB
bus>" >> "Scan For Instruments").
- Select the GPIB port on the front panel.
- By selecting "Refresh" new added GPIB ports are detected and added to the list.
- Specify the number of measurements on the front panel.
- Press the "Run" button in the upper left (



GEN-MAN-ESO-21110-0028 1D2 05.03.08 35 of 135

Doc:

Issue:

Date:

Page:

- The "Busy" button is visible for the duration of the acquisition.
- The VI stops after having acquired the data.

How to act if an error occurs directly after having started the VI: (Most likely there is a GPIB bus error)

- Stop the VI.
- Turn off all devices connected to the GPIB bus.
- Make sure that all devices have differing GPIB addresses.
- Turn on the devices connected to the GPIB bus.
- Retry the procedure described under "Operation".
- Press the "Run" button again (

Front panel

🔯 Keythley_65	14_sta	ndalone	2.0.vi	🔳	
<u>File E</u> dit <u>V</u> iew	Project	<u>O</u> perate	<u>T</u> ools	<u>W</u> indow	Keithley
¢				2	6514 2.0
GPIB port	Г ₀		-	0	
Measurements	10				
				Busy	•
Mean		Star	ndard d	leviation	
12.00656n		+- 3.0	8434	0	

Controls and functions

GPIB port

• Allows the user to select the GPIB port of the KE 6514.

Measurements

• Allows the user to specify the number of measurements.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 36 of 135

Doc:

Issue:

Date:

Page:

Indicators

Busy

• Indicates that the VI is busy.

Mean

• Displays the mean of the measurements.

Standard deviation

• Displays the standard deviation.

SubVI´s



Common_error_log2.0(SubVI).vi

Block diagram

Open the "Keythley_6514_standalone2.0.vi" and press "Ctrl" +"E" to view the LabView code (block diagram).

Known problems

None

References

Model 6514 Programmable Electrometer

www.keithley.de

Contact:

Keithley Instruments GmbH / Germany

Landsberger Strasse 65 P.O. Box 1909 D - 82110 Germering / Germany Tel: 49-89-8493070 Fax: 49-89-84930787 Email: <u>info@keithley.de</u>



GEN-MAN-ESO-21110-0028 1D2 05.03.08 37 of 135

Doc:

Issue:

Date:

Page:

4.4 Interface for the Keithley 486 Picoammeter

(Keythley_486_standalone.vi)



Icon on the block diagram

Purpose



This VI is used to take current measurements using the Keithley Picoammeter.

Prerequisites

To avoid communication problems connect the Keithley 486 to a GPIB port of your PC before the device is turned on. Make sure that no other device linked to this GPIB bus has the same GPIB address. ("Measurement & Automation Explorer" >> "Devices & Interfaces" >> "GPIB
sus>" >> "Scan For Instruments")

Allow the instrument to warm up at least 2 hours to obtain rated accuracy. (See user manual)

Input

To execute this VI the files listed under "SubVI's" have to be available. If LabView can not find one or more of these VI's you are asked to specify the path.

Output

If an error occurs during operation an error message will appear. At the same time an error log named "Error log (KE_486) <date>.txt" is created in the directory which is specified in the "Acquistion_Setup.vi".

Operation

- Open the Measurement & Automation Explorer to make sure your PC has detected the new device (>> "Devices & Interfaces" >> "GPIB<bus>" >> "Scan For Instruments").
- Select the GPIB port on the front panel.
- By selecting "Refresh" new added GPIB ports are detected and added to the list.
- Specify the number of measurements to take.
- Press the "Run" button in the upper left (
- The "Busy" button is visible for the duration of the acquisition.
- The VI stops after having acquired the data.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 38 of 135

How to act if an error occurs directly after having started the VI: (Most likely there is a GPIB bus error)

- Stop the VI.
- Turn off all devices connected to the GPIB bus.
- Make sure that all devices have differing GPIB addresses.

Doc:

Issue:

Date:

Page:

- Turn on the devices connected to the GPIB bus.
- Retry the procedure described under "Operation".
- Press the "Run" button again (

Front panel

🔁 Keythley_48	6_standa	lone.vi	Fro.		
File Edit View	Project <u>O</u>	perate	<u>T</u> ools	Window	Keithley 486
GPIB port	1%		•	0	E
Measurements	10			Busy	
Mean		Stand	dard d	eviation	
12.00656n	+	- 3.00	8434p		

Controls and functions

GPIB port

• Allows the user to select the GPIB port of the KE 486.

Measurements

• Allows the user to specify the number of measurements.

Indicators

Busy

• Indicates that the VI is busy.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 39 of 135

Doc:

Issue:

Date:

Page:

Mean

• Displays the mean of the measurements.

Standard deviation

• Displays the standard deviation.

SubVI's



7 Status.VI



Common_error_log2.0(SubVI).vi

ESS (PIE
Send
Flessage

Send Message.vi

ESS LAPIE
<u> </u>
Receive
Message

Receive Message.vi

Block diagram

Open the "Keythley_486_standalone.vi" and press "Ctrl"+ "E" to view the LabView code (block diagram).

Known problems

None

References

www.keithley.de

Contact:

Keithley Instruments GmbH / Germany

Landsberger Strasse 65 P.O. Box 1909 D - 82110 Germering / Germany Tel: 49-89-8493070 Fax: 49-89-84930787 Web: www.keithley.de Email: info@keithley.de



GEN-MAN-ESO-21110-0028 1D2 05.03.08 40 of 135

Doc:

Issue:

Date:

Page:

4.5 Interface for the Keithley 2100 USB Digital Multimeter

(Keithley 2100 Series Read Single.vi)



Icon on the block diagram

Purpose



This VI is used to measure the voltage or current using the Keithley 2100 USB Digital Multimeter.

Prerequisites

To avoid communication problems connect the Keithley 2100 to a USB port of your PC before the device is turned on.

Input

To execute this VI the files listed under "SubVI's" have to be available. If LabView can not find one or more of these VI's you are asked to specify the path.

Output

If an error occurs during operation an error message will appear. At the same time an error log named "Error log (KE_2100) <date>.txt" is created in the directory which is specified in the "Acquistion_Setup.vi".

Operation

- Select the USB port from the list on the front panel.
- The port to select should be similar to "USB0::0x05E6::0x2100::1148496::INSTR".
- If the USB device is not listed select "Refresh" to refresh the list.
- The "Busy" button is visible for the duration of the acquisition.
- The VI stops after having acquired the data.
- Press the "Run" button again (

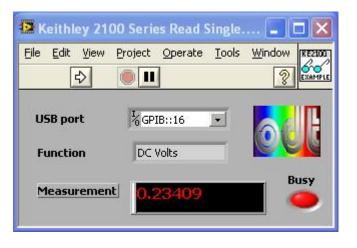


GEN-MAN-ESO-21110-0028
1D2
05.03.08
41 of 135
05.03.08

Doc: Issue:

Date: Page:

Front panel



Controls and functions

USB port

• Allows the user to select the USB port of the KE 2100.

Function

 This control allows the user to select the type of measurement. (DC/AC Volts; DC/AC Current)

Indicators

Busy

• Indicates that the VI is busy.

Measurement

- Displays a single measurement.
- The unit of the reading is either A (Amp) or V (Volt) depending to the chosen function.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 42 of 135

Doc:

Issue:

Date:

Page:

SubVI´s



Keithley 2100 Series.lvlib:Initialize.vi



Common_error_log2.0(SubVI).vi



Keithley 2100 Series.lvlib:Configure Measurement.vi



Keithley 2100 Series.lvlib:Configure DC Volts.vi



Keithley 2100 Series.lvlib:Configure AC Volts.vi



Keithley 2100 Series.lvlib:Configure DC Current.vi

<u>K</u> E2100	
5-	
-⊙-®-	

Keithley 2100 Series.lvlib:Configure AC Current.vi



Keithley 2100 Series.lvlib:Configure Trigger.vi



Keithley 2100 Series.lvlib:Action Send Trigger.vi

KE2100	
2.	
00	

Keithley 2100 Series.lvlib:Data Read Single.vi



Keithley 2100 Series.lvlib:Close.vi

Block diagram

Open the "Keithley 2100 Series Read Single.vi" and press "Ctrl"+ "E" to view the LabView code (block diagram).

Known problems

None



GEN-MAN-ESO-21110-0028 1D2 05.03.08 43 of 135

Doc:

Issue:

Date:

Page:

References

Model 2100/120 6½-Digit USB Digital Multimeter

www.keithley.de

Contact:

Keithley Instruments GmbH / Germany

Landsberger Strasse 65 P.O. Box 1909 D - 82110 Germering / Germany Tel: 49-89-8493070 Fax: 49-89-84930787 Email: <u>info@keithley.de</u>



GEN-MAN-ESO-21110-0028 1D2 05.03.08 44 of 135

Doc:

Issue:

Date:

Page:

4.6 Interface for the Motorized filter wheel (Newport Model 74041)

(Filter_wheel_standalone.vi)



Icon on the block diagram



Purpose

This VI is used to operate the motorized filter wheel (Newport Model 74041).

Prerequisites

In order to set several densities it is **recommended to use the "MSH301_standalone2.0.vi"** because this VI operates both filter wheels in combination and you get the possibility to select between 29 densities (0 to 4.9).

The third filter wheel with the order sorting filters mounted can also be operated more comfortably by the "MSH301_standalone2.0.vi". Nevertheless make sure the filter wheel controller have different GPIB addresses. ("Measurement & Automation Explorer" >> "Devices & Interfaces" >> "GPIB
bus>" >> "Scan For Instruments")

Input

To execute this VI the files listed under "SubVI's" have to be available. If LabView can not find one or more of these VI's you are asked to specify the path.

Output

If an error occurs during operation an error message will appear. At the same time an error log named "Error log (Filter wheel<serial number>) <date>.txt" is created in the directory which is specified in the "Acquistion_Setup.vi".

Operation

- Open the Measurement & Automation Explorer to make sure your PC has detected the new device (>> "Devices & Interfaces" >> "GPIB<bus>" >> "Scan For Instruments").
- Change the filter wheel position with the hand controller to make sure the filter wheel works properly.
- Select the "GPIB port" of the filter wheel controller on the front panel.
- Press the "Run" button in the upper left (🕏) to start the VI.
- "Filter" button and "Label" indicator of the present filter position will turn into light green.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 45 of 135

How to act if an error occurs directly after having started the VI: (Most likely there is a GPIB bus error)

- Stop the VI.
- Turn off all devices connected to the GPIB bus.
- Make sure that all devices have differing GPIB addresses.

Doc:

Issue:

Date:

Page:

- Turn on the devices connected to the GPIB bus.
- Retry the procedure described under "Operation".
- Press the "Stop VI" button to stop the VI.

Front panel

📴 Filter	_whee	l_stand	lalone. vi	
<u>Eile E</u> dit	: <u>V</u> iew	Project	<u>O</u> perate	Filter
	•			20
GPIB port				
Filter	Labe	el		
1	0.0			
2	0.15			
3	1.6			
4	2.3			
5	3.0			Change label
6	3.6			STOP

Controls and functions

1; 2; 3; 4; 5; 6

• Allows to select the filter position. "Filter" button and "Label" indicator of the present filter position will turn into light green.

STOP

• Stop this VI.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 46 of 135

Doc:

Issue:

Date:

Page:

Change label

• Allows the user to set the label for the filter 1 to 6.

Indicators

Label

• Displays the label of the filters (if it has one).

SubVI´s



Set Busy.vi



GPIB_read_write(SubVI).vi



Change_label.vi



Unset Busy.vi

Change_label.vi

Dialog box to change the filter's labels.

Front panel





GEN-MAN-ESO-21110-0028 1D2 05.03.08 47 of 135

Doc:

Issue:

Date:

Page:

Controls and functions

Label

• The new label with max. 8 characters

Filter

• Pull-down menu to select the filter to rename.

Abort

• Continue without any changes.

Change

• Changes the label of the selected filter.

Block diagram

Open the "Filter_wheel_standalone.vi" and press "Ctrl" + "E" to view the LabView code (block diagram).

Known problems

None

References

Oriel motorized filter wheel - catalog

Filter wheel controller

Website NEWPORT

Contact:

Herr Jacobs Newport Spectra-Physics GmbH Guerickeweg 7 D-64291 Darmstadt Germany **Tel:** +49-(0) 6151-708-923



GEN-MAN-ESO-21110-0028 1D2 05.03.08 48 of 135

Doc:

Issue:

Date:

Page:

Or

NEWPORT ORIEL PRODUCT LINE 150 Long Beach Boulevard Stratford, CT 06615 Phone: (203) 377-8282 (800) 714-5393 Fax: (203) 378-2457 E-mail: oriel.sales@newport.com



GEN-MAN-ESO-21110-0028 1D2 05.03.08 49 of 135

Doc:

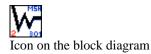
Issue:

Date:

Page:

4.7 Interface for the Monochromator MSH301

(MSH301_standalone2.0.vi)



Purpose

This VI is used to operate the monochromator MSH 301.

Prerequisites

To avoid communication problems connect the MSH 301 to a GPIB port of your PC before the device is turned on. Make sure that no other device linked to this GPIB bus has the same GPIB address.

Hardware

The described functionality for this VI is only available in case of the following hardware configuration:

- Three motorized slits mounted (one slit for each port).
- One filter wheel (Newport Model 74041) connected to the MSH 301 input port with color filters mounted. This filter wheel is controlled by the monochromator itself.
- Two additional filter wheels (including controller) connected to the MSH 301 input port with density filters mounted.
- Make sure that each filter wheel controller (2) is connected to the proper filter wheel with its different density filters as shown in the "DeviceDriver_Setup.vi".

Input

To execute this VI the files listed under "SubVI's" have to be available. If LabView can not find one or more of these VI's you are asked to specify the path.

Output

If an error occurs during operation an error message will appear. At the same time an error log named "Error log (MSH301) <date>.txt" is created in the directory which is specified in the "Acquistion_Setup.vi".

Operation



• Open the Measurement & Automation Explorer to make sure your PC has detected the new device (>> "Devices & Interfaces" >> "GPIB<bus>" >> "Scan For Instruments").

Doc:

Issue:

Date:

Page:

- Select the GPIB port of the monochromator in the "DeviceDriver_Setup.vi".
- Select the GPIB port of the two additional filter wheels in the "DeviceDriver_Setup.vi" and make sure these controllers are connected to the proper filter wheels with its different density filters.
- Select "Refresh" in the pull-down menu to refresh the list of available ports.
- Make sure that the mounted filters (at all filter wheels) are the same as specified in the "DeviceDriver_Setup.vi".
- Press the "Run" button in the upper left (🔂) to start the VI.
- All indicators are updated within 2 seconds.

How to act if an error occurs directly after having started the VI: (Most likely there is a GPIB bus error)

- Stop the VI.
- Turn off all devices connected to the GPIB bus.
- Make sure that all devices have differing GPIB addresses.
- Turn on the devices connected to the GPIB bus.
- Retry the procedure described under "Operation".
- Press the "Stop VI" button to stop the VI.



GEN-MAN-ESO-21110-0028
1D2
05.03.08
51 of 135

Doc: Issue:

Date: Page:

Front panel

😫 MSH301_standalone2.0.vi	
File Edit View Project Operate Tools	
Press "Ctrl"+"H" for context help Present wavelength	
550.764 mm	Calibrate Setup
Destination wavelength	Goto
3 ON550	Change
Density	Change
Shutter Open	Open/Close
Output port	Axial/Lateral
	Reset Stop

Controls and functions

Calibrate

• Allows the user to calibrate the monochromator.

Setup

• Brings up a window to set grating parameters, to rename filters and to adjust motorized slits (Bandwidth).



Doc:

Issue:

Date:

Page:

RW (rewind)

• Moves the grating fast backwards. (To lower wavelengths).

BS (step backward)

- Moves the grating one step backwards. (To lower wavelengths).
- One step is 0.075nm.

Stop

• Stop motion.

FS (step forward)

- Moves the grating one step forward. (To higher wavelengths).
- One step is 0.075 nm.

FF (fast forward)

• Moves the grating fast forward. (To higher wavelengths).

Destination Wavelength

• Allows the user to specify the destination wavelength. Press "Goto" to move monochromator to destination wavelength.

Change

• Allows the user to select color filters (the upper "Change" button) as well as density (the lower "Change" button).

Open/Close

• Allows the user to "OPEN" or "CLOSE" the internal monochromator shutter.

Axial/Lateral

• Allows the user to select the output port ("Axial" or "Lateral").

Reset

• Reset all of the monochromator's basic parameters to initialization values. This action will overwrite LINES, FACTOR, OFFSET, LABELS.

Stop

• Allows the user to stop this VI (LabView program).



GEN-MAN-ESO-21110-0028 1D2 05.03.08 53 of 135

Doc:

Issue:

Date:

Page:

Indicators

Present Wavelength

• Displays the present wavelength of the monochromator.

Color filter

• Displays the actual filter position of the filter wheel which is operated by the monochromator. (Color filters mounted)

Filter label

• Displays the filter label of the color filter which is currently in use.

Density filter

• Displays the density which results from the filter position of the two further filter wheels. (Density filters mounted)

Shutter

• Displays the status of the internal monochromator shutter. ("OPEN" or "CLOSED")

Output port

• Displays the output port which is currently in use ("Axial" or "Lateral").

SubVI's



MSH301_ok(SubVI).vi



MSH301_GetWave(SubVI).vi



MSH301_GetShutter(SubVI).vi



MSH301_GetUnits(SubVI).vi



MSH301_Comm(SubVI).vi

ESO, Karl-Schwarzschild-Str. 2, 85748 Garching bei München, Germany



1D2 05.03.08 54 of 135

Doc:

Issue:

Date:

Page:

Port?	MSH301	_GetPort(SubVI).vi
I OIC:		

filter?

MSH301_GetFilter2.0(SubVI).vi

1	filter
	labl?

MSH301_GetFrLabel(SubVI).vi

DeviceDriver_Setup.vi



Filter_wheel_remotecontrol.vi



FilterPosition to Density.vi

Error
log
2.0

Common_error_log2.0(SubVI).vi

move	
steps	

MSH301_MoveSteps(SubVI).vi



Check range(SubVI).vi

go wave

MSH301_GoWave(SubVI).vi

filter
box

MSH301_FilterDialog(SubVI).vi



MSH301_SetShutter(SubVI).vi



MSH301_SetupStandalone(SubVI).vi



MSH301_Callibration(SubVI).vi



MSH301_SetPort(SubVI).vi

senc MSH301_SendCommand(SubVI).vi cmd



GEN-MAN-ESO-21110-0028 1D2 05.03.08 55 of 135

Doc:

Issue:

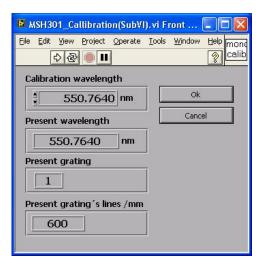
Date:

Page:

MSH301_Callibration(SubVI).vi

Dialog box for calibrating the monochromator

Front panel



Controls and functions

Ok

• Replaces the "Present wavelength" with the "Calibration wavelength".

Cancel

• Continues without any changes.

Calibration Wavelength

• The new wavelength.

Indicators

Present Wavelength

• Displays the present wavelength.

Present Grating

• This is the ID number of the chosen grating. It is possible to mount up to three gratings.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 56 of 135

Doc:

Issue:

Date:

Page:

Present grating's Lines/mm

• Displays the number of lines/mm of the mounted grating.

MSH301_SetupStandalone(SubVI).vi

Dialog box for setting the monochromator's parameters as well as the filter's labels.

Front panel

🛿 MSH301_SetupStandalone(SubVI). vi * 💦 🔲 🔀	🔛 MSH30
File Edit View Project Operate Tools Window Help mond 수 장 (응) 대	<u>File E</u> dit
Grating Rename filters	Gratin
Lines/mm #I200 Factor	
∯D.0000000 Offset ∯D.0000000	
Zero	
Label (blaze)	
Reinitialize to calibration parameters (default)	
Please refer to the Cornerstone Ok	Please

MSH301_SetupStandalone(SubVI)	
e Edit View Project Operate Tools	Window Help
5 B .	8
Grating Rename filters	
Position Label(max	.8 character)
Please refer to the Cornerstone	Ok
Please refer to the Cornerstone manual before setting the grating parameters	Ok Cancel

Ok

- Changes filter label as well as grating parameters "Lines/mm", "Factor", "Offset", "Zero" and "Label".
- WARNING: Changing the calibration parameter will affect monochromator accuracy.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 57 of 135

Doc:

Issue:

Date:

Page:

Cancel

• Continue without any changes.

Lines/mm; Factor; Offset; Zero

• Please refer to the Manual concerning these parameters.

Label

• The label of grating 1.

Position

• Allows the user to select a filter to rename.

Motorized Slits

• Brings up a window to adjust the motorized slits (Bandwidth)

Reinitialize to calibration parameters (default)

• Pressing "Ok" with this control enabled reinitializes the monochromator to its default parameters for grating 1. The calibration parameters are specified in the "DeviceDriver_Setup.vi".

Label (max.8 characters)

• Allows the user to rename the selected filter (Color filters mounted). The number of characters must not exceed eight characters.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 58 of 135

Doc:

Issue:

Date:

Page:

MSH301_SlitsDialog(SubVI).vi

Dialog box to adjust the motorized slits.

Front panel

🛤 MSH301_S	litsDialog(Sub¥I).	vi *		
	Project 9	Operate	<u>T</u> ools	<u>W</u> indow	Help Slits
\$					<pre> diag </pre>
					<u>^</u>
Bandpa	ss control	∇		Ok	7
Bandwidth				Cancel	-
		-1		Cancer	
	7.00	IM			
Manual slit	s control		<u></u>		-
Inport	# 480	um			
Axial	\$ 558	um			
Lateral	\$558	um	8		
		111			
0.					

Controls and functions

Bandwidth

• Allows the user to change the bandwidth of the monochromator. All (3) motorized slits are adjusted automatically. Make sure "Bandpass control" mode is enabled. (Pull-down menu above)

Inport; Axial; Lateral

 Allows the user to adjust the motorized slits of the monochromator maually. Make sure "Manual slits control" is enabled (in the upper left of this panel). Press "OK" for the changes to take effect.

Ok

• Accept the new parameters.

Cancel

• Continues without any changes.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 59 of 135

Doc:

Issue:

Date:

Page:

Mode control

- Select "Bandpass control" to adjust the bandwidth.
- Select "Manual slits control" to adjust the slits manually.

Block diagram

Open the "MSH301_standalone2.0.vi" and press "Ctrl"+ "E" to view the LabView code (block diagram).

Known problems

None

References

Data sheet MSH 301

Website

Contact:

Germany: Guerickeweg 7 D-64291 Darmstadt

Tel: +49-(0) 6151-708-0 **Fax:** +49-(0) 6151-708-952 E-mail: <u>Newport Spectra-Physics GmbH</u>

Jochen Mentges Phone: +49/6151/8806 35 Email: mentges@lot-oriel.de



GEN-MAN-ESO-21110-0028 1D2 05.03.08 60 of 135

Doc:

Issue:

Date:

Page:

4.8 Interface for the Newport Power Supply (Model 69931)

(PowerSupply_standalone.vi)



Icon on the block diagram



Purpose

This VI is used to operate the Newport Power Supply (Model 69931).

Prerequisites

To avoid communication problems connect the Newport Power Supply to a serial port of your PC before the device is turned on. It is strongly recommended not to use this VI during an automated data acquisition at the test bench in 051.

Do not use this VI if one of the following VI's is running:

- "MasterPanel2.0.vi"
- "FIERA_standalone.vi"
- "LabViewPrism_New testbench.vi"

Hardware

The described functionality for this VI is only available in case of the following hardware configuration:

• The 300W Radiometric Power Supply (Model 69931) is connected to a Newport Series Q Lamp Housing (Model 60090) and the appropriate lamp model. (See User Manual for 300W Radiometric Power Supply (Model 69931))

Input

To execute this VI the files listed under "SubVI's" have to be available. If LabView can not find one or more of these VI's you are asked to specify the path.

Output

If an error occurs during operation an error message will appear. At the same time an error log named "Error log (Power Supply) <date>.txt" is created in the directory which is specified in the "Acquistion_Setup.vi".



GEN-MAN-ESO-21110-0028 1D2 05.03.08 61 of 135

Doc:

Issue:

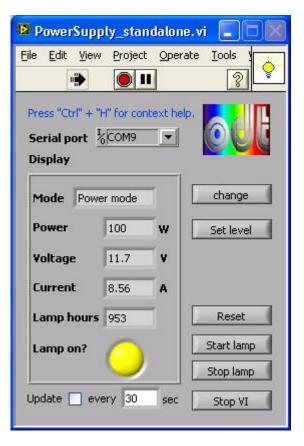
Date:

Page:

Operation

- Open the Measurement & Automation Explorer to make sure your PC has detected the new device (>> "Devices & Interfaces" >> "GPIB<bus>" >> "Scan For Instruments").
- Select the serial port on the front panel. Select "Refresh" to update the list of available ports.
- Press the "Run" button in the upper left (♣) to start the VI.
- All indicators are updated within 5 seconds.
- Press the "Stop VI" button to stop the VI.

Front panel





Doc:

Issue:

Date:

Page:

Controls and functions

Serial port

• Allows the user to select the serial port of the lamp's power supply.

Change

• Allows the user to switch between the two modes (constant current/constant power).

Set level

- Opens a further panel to set the current/power level.
- If the lamp is started ("Start lamp" button) a gradual ramp-up to the preset current or power level begins.
- Press the "Change" button above to change the mode (constant current/ constant power -mode).

Reset

• Resets the "Lamp hours" display

Start lamp

- This button begins a gradual ramp-up to the preset current or power level (Press the "Set level" button to change these parameters).
- The ramp-up time is approximately 15 seconds.
- The lamp needs to warm up about 1 hour to work properly.

Stop lamp

• This button begins a gradual ramp-down from the preset current or power level to 0 (AMPS or WATTS). The ramp-down time is approximately 15 seconds.

Stop VI

• Stops the VI

Time Target [every]

• Specifies how much time must elapse before all indicators are updated. (Therefore enable the control "Update" on the left)

Update

• If enabled the indicators are updated at regular intervals.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 63 of 135

Doc:

Issue:

Date:

Page:

Indicators

Busy

• Indicates that the VI is busy.

Mode

- Indicates the present mode.
- Mode 1 is "Current mode" (constant current)
- Mode 2 is "Power mode" (constant power)
- Press the "Change" button next to this indicator to change MODE.

Current

• Displays the current [AMPS].

Voltage

• Displays the voltage [VOLTS].

Power

• Displays the power [WATTS].

Lamp hours

- Indicates the number of hours since the last reset.
- Press the "RESET" button on the right to reset this indicator (to 0 hrs.).

Lamp on?

- Indicates if the lamp is turned on ("yellow"), or turned off ("black").
- Lamp should warm up at least 1 hour before operation.

SubVI´s

DeviceDriver_Setup.vi



Common_error_log2.0(SubVI).vi

VISA	
serial W B	

VISA_serial(SubVI).vi



GEN-MAN-ESO-21110-0028 1D2 05.03.08 64 of 135

Doc:

Issue:

Date:

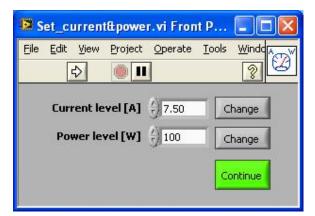
Page:



Set_current&power.vi

Dialog box to display or change the power level as well as the current level.

Front panel



Controls and functions

Continue

• Closes the window.

Change

• Changes the present level (power level / current level) to the specified value.

Indicators

Current level [A]

• Displays the present current level.

Power level [W]

• Displays the present power level.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 65 of 135

Doc:

Issue:

Date:

Page:

Block diagram

Open the "PowerSupply_standalone.vi" and press "Ctrl"+ "E" to view the LabView code (block diagram).

Known problems

None

References

Product Description

Website NEWPORT

Contact:

NEWPORT ORIEL PRODUCT LINE 150 Long Beach Boulevard Statford, CT 06615 Phone: (203) 377-8282 (800) 714-5393 Fax: (203) 378-2457 E-mail: oriel.sales@newport.com

Germany:

Guerickeweg 7 D-64291 Darmstadt

Tel: +49-(0) 6151-708-0 **Fax:** +49-(0) 6151-708-952 E-mail: <u>Newport Spectra-Physics GmbH</u>



GEN-MAN-ESO-21110-0028 1D2 05.03.08 66 of 135

Doc:

Issue:

Date:

Page:

4.9 Interface for the Newport ESP 300 Motion Controller

(ESP300_standalone.vi)

ſ		
I	ESP	
I	300	
l		

Icon on the block diagram

Purpose



This VI is used to operate the Newport ESP 300.

Prerequisites

To avoid communication problems connect the ESP 300 to a GPIB port of your PC before the device is turned on. Make sure that no other device linked to this GPIB bus has the same GPIB address ("Measurement & Automation Explorer" >> "Devices & Interfaces" >> "GPIB<bus>" >> "Scan For Instruments").

Hardware

The described functionality for this VI is only available in case of the following hardware configuration:

• 3 axes connected to the motion controller.

Input

To execute this VI the files listed under "SubVI's" have to be available. If LabView can not find one or more of these VI's you are asked to specify the path.

Output

If an error occurs during operation an error message will appear. At the same time an error log named "Error log (ESP 300) <date>.txt" is created in the directory which is specified in the "Acquistion_Setup.vi".

Operation

- Open the Measurement & Automation Explorer to make sure your PC has detected the new device (>> "Devices & Interfaces" >> "GPIB
bus>" >> "Scan For Instruments")
- Select the GPIB port of the ESP 300 Motion Controller on the front panel of the VI.
- Select "Refresh" to refresh the list of available ports.
- Press the "Run" button in the upper left (🕏) to start the VI.



Doc:

Issue:

Date:

Page:

- The actual position of all axes is read out within 3 seconds.
- The "busy" LED appears to indicate that the VI is busy.

How to act if an error occurs directly after having started the VI: (Most likely there is a GPIB bus error)

- Stop the VI.
- Turn off all devices connected to the GPIB bus.
- Make sure that all devices have differing GPIB addresses.
- Turn on the devices connected to the GPIB bus.
- Retry the procedure described under "Operation".
- Press the "Stop VI" button to stop the VI.

Front panel

😰 ESP 300_standalone.vi Front Panel 📃 🗖 🔀
Eile Edit Yiew Project Operate Tools Window Help Image: Comparison of the second sec
GPIB port % GPIB0::6::INSTR Busy Control Axis 1 Axis 2 Axis 3
Actual pos[mm] 0.0000 + Increment [mm] 0.0001 -
Absolute pos[mm] (0.0000 goto
Settings
Check Pos. Abort motion
Define home
Search for home Stop VI



Doc:

Issue:

Date:

Page:

Controls and functions

GPIB port

• Allows the user to select the GPIB port from the list.

Increment [mm]

- Allows the user to set the incremental step. Press the "+" button to step forward. Press the "-" button to step backward.
- New position= <Actual pos> +/- <Increment>.

Absolute pos[mm]

• Allows the user to specify the absolute position. Press "goto" to move the slide to the absolute position.

+

- Press this button to step forward (once or continuously).
- New position= <Actual pos> + <Increment>.

-

- Press this button to step backward (once or continuously).
- New position= <Actual pos> <Increment>.

goto

• Moves the slit to the absolute position specified under "Absolute pos".

Settings

• Allows the user to read and set the velocity as well as the acceleration for this axis.

Check Position

• Allows the user to read the actual position of all 3 axes.

Define home

• The actual position off all three axes is set to "0".

Search for home

• Move all axes to position "0".



GEN-MAN-ESO-21110-0028 1D2 05.03.08 69 of 135

Doc:

Issue:

Date:

Page:

Abort motion

• Stops all motion.

Stop VI

• Stops the VI.

Indicators

Busy

• Appears when the VI is in busy state.

Actual pos[mm]

• Indicates the actual slide position of this axis.

SubVI´s



esp_gpib_comm_ASCII.vi

INIT
SYSTEM
COTO
GPIB

esp_gpib_init_system.vi

Error
log
2.0

Common_error_log2.0(SubVI).vi



SettingsX_ESP300(SubVI).vi



SettingsY_ESP300(SubVI).vi

ESP 300 Settings 2

SettingsZ_ESP300(SubVI).vi



GEN-MAN-ESO-21110-0028 1D2 05.03.08 70 of 135

Doc:

Issue:

Date:

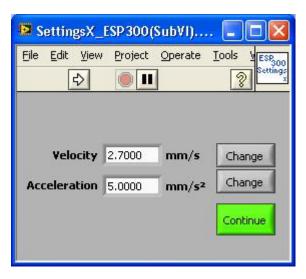
Page:

SettingsX_ESP300(SubVI).vi

(representative for "SettingsY_ESP300(SubVI).vi" and "SettingsZ_ESP300(SubVI).vi")

Dialog box to read and set the velocity and the acceleration for one axis.

Front panel



Controls and functions

Velocity [mm/s]

- Displays the actual velocity for one axis and allows the user to specify a new one.
- Press "Change" to apply the new velocity.

Acceleration [mm/s²]

- Displays the actual acceleration for one axis and allows the user to specify a new one.
- Press "Change" to apply the new acceleration.

Change

• Allows the user to change either the velocity (upper "Change" button) or the acceleration (lower "Change button") for one axis.

Continue

• Closes the dialog box.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 71 of 135

Doc:

Issue:

Date:

Page:

Indicators

Velocity [mm/s]

- Displays the actual velocity for one axis and allows the user to specify a new one.
- Press "Change" to apply the new velocity.

Acceleration [mm/s²]

- Displays the actual acceleration for one axis and allows the user to specify a new one.
- Press "Change" to apply the new acceleration.

Block Diagram

Open the "ESP300_standalone.vi" and press "Ctrl" +"E" to view the LabView code (block diagram).

Known problems

None

References

ESP300 3 Axis Motion Controller/Driver

Website NEWPORT

Contact:

Guerickeweg 7 D-64291 Darmstadt Germany **Tel:** +49-(0) 6151-708-0 **Fax:** +49-(0) 6151-708-952 E-mail: <u>Newport Spectra-Physics GmbH</u>



GEN-MAN-ESO-21110-0028 1D2 05.03.08 72 of 135

Doc:

Issue:

Date:

Page:

4.10 Interface for the Newport ITL 09 Motion Controller

(ESP300_standalone.vi)



Icon on the block diagram

Purpose

This VI is used to operate the Newport ITL 09.

Prerequisites

To avoid communication problems connect the ITL 09 to a GPIB port of your PC before the device is turned on. Make sure that no other device linked to this GPIB bus has the same GPIB address. ("Measurement & Automation Explorer" >> "Devices & Interfaces" >> "GPIB<bus>" >> "Scan For Instruments")

Hardware

The described functionality for this VI is only available in case of the following hardware configuration:

• 2 axes connected to the motion controller.

Input

To execute this VI the files listed under "SubVI's" have to be available. If LabView can not find one or more of these VI's you are asked to specify the path.

Output

If an error occurs during operation an error message will appear. At the same time an error log named "Error log (ITL 09) <date>.txt" is created in the directory which is specified in the "Acquistion_Setup.vi".

Operation

- Open the Measurement & Automation Explorer to make sure your PC has detected the new device (>> "Devices & Interfaces" >> "GPIB<bus>" >> "Scan For Instruments").
- Select the GPIB port of the ITL 09 Motion Controller on the front panel of the VI.
- Select "Refresh" to refresh the list of available ports.



Doc:

Issue:

Date:

Page:

- Press the "Run" button in the upper left (
- The actual position of all axes is read within 3 seconds.
- The "busy" LED appears to indicate that the VI is busy.

How to act if an error occurs directly after having started the VI: (Most likely there is a GPIB bus error)

- Stop the VI.
- Turn off all devices connected to the GPIB bus.
- Make sure that all devices have differing GPIB addresses.
- Turn on the devices connected to the GPIB bus.
- Retry the procedure described under "Operation".
- Press the "Stop VI" button to stop the VI.

Front panel

😰 ITL09_standalone.vi Front Panel 📃 🗖 🔀
File Edit View Project Operate Tools Window Help Image: Comparison of the second sec
GPIB port % GPIB0::13::INSTR • Axis 1 Axis 2 Busy •
Actual pos[mm] 12.455 + Increment [mm] 1.000 -
Absolute pos[mm] ()0.000 goto
Settings
Check Pos. Abort motion
Define home
Search for home StopVI



Issue:

Date:

Page:

Controls and functions

GPIB port

• Allows the user to select the GPIB port from the list.

Increment [mm]

- Allows the user to set the incremental step. Press the "+" button to step forward. Press the "-" button to step backward.
- New position= <Actual pos> +/- <Increment>.

Absolute pos[mm]

• Allows the user to specify the absolute position. Press "goto" to move the slide to the absolute position.

+

- Press this button to step forward (once or continuously).
- New position= <Actual pos> + <Increment>.

-

- Press this button to step backward (once or continuously).
- New position= <Actual pos> <Increment>.

goto

• Moves the slit to the absolute position specified under "Absolute pos".

Settings

• Allows the user to read and set the velocity as well as the acceleration for this axis.

Check Position

• Allows the user to read the actual position of the two axes.

Define home

• The actual position off all three axes is set to "0".

Search for home

• Move all axes to position "0".



GEN-MAN-ESO-21110-0028 1D2 05.03.08 75 of 135

Doc:

Issue:

Date:

Page:

Abort motion

• Stops all motion.

Stop VI

• Stops the VI.

Indicators

Busy

• Appears when the VI is busy.

Actual pos[mm]

• Indicates the actual slide position of this axis.

SubVI´s

ITL09 GPIB	ITL09_GPIB_communication (SubVI).vi
comm.	

TNITT
TLATI
SYSTEM
010101
GPTR
00,000

esp_gpib_init_system.vi

Error
log
2.0

Common_error_log2.0(SubVI).vi



ITL09_XSettings(SubVI).vi

Settings V	ITL09 Settings V	
---------------	------------------------	--

ITL09_YSettings(SubVI).vi



GEN-MAN-ESO-21110-0028 1D2 05.03.08 76 of 135

Doc:

Issue:

Date:

Page:

ITL09_XSettings(SubVI).vi

(representative for "ITL09_YSettings(SubVI).vi")

Dialog box to read and set the velocity for one axis.

Front panel



Controls and functions

Velocity [mm/s]

- Displays the actual velocity for one axis and allows the user to specify a new one.
- Press "Change" to apply the new velocity.

Change

• Allows the user to change the current velocity settings.

Continue

• Closes the dialog box.

Indicators

Velocity [mm/s]

- Displays the actual velocity for one axis and allows the user to specify a new one.
- Press "Change" to apply the new velocity.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 77 of 135

Doc:

Issue:

Date:

Page:

Block diagram

Open the "ITL 09_standalone.vi" and press "Ctrl" +"E" to view the LabView code (block diagram).

Known problems

After having connected the Newport ITL09 to the GPIB bus the first time an error occurs when the VI is started. In this case start the VI a second time.

References

Website NEWPORT

Contact:

Guerickeweg 7 D-64291 Darmstadt Germany **Tel:** +49-(0) 6151-708-0 **Fax:** +49-(0) 6151-708-952 E-mail: <u>Newport Spectra-Physics GmbH</u>



GEN-MAN-ESO-21110-0028 1D2 05.03.08 78 of 135

Doc:

Issue:

Date:

Page:

4.11 Interface for the Newport MM 4000 Motion Controller

(MM4000_standalone.vi)



Icon on the block diagram

Purpose

This VI is used to operate the Newport MM 4000.

Prerequisites

To avoid communication problems connect the MM 4000 to a GPIB port of your PC before the device is turned on. Make sure that no other device linked to this GPIB bus has the same GPIB address. ("Measurement & Automation Explorer" >> "Devices & Interfaces" >> "GPIB
bus>" >> "Scan For Instruments")

Hardware

The described functionality for this VI is only available in case of the following hardware configuration:

• 3 axes connected to the motion controller.

Input

To execute this VI the files listed under "SubVI's" have to be available. If LabView can not find one or more of these VI's you are asked to specify the path.

Output

If an error occurs during operation an error message will appear. At the same time an error log named "Error log (MM 4000) <date>.txt" is created in the directory which is specified in the "Acquistion_Setup.vi".

Operation

- Open the Measurement & Automation Explorer to make sure your PC has detected the new device (>> "Devices & Interfaces" >> "GPIB<bus>" >> "Scan For Instruments").
- Select the GPIB port of the MM 4000 Motion Controller on the front panel of the VI.
- Select "Refresh" to refresh the list of available ports.



Doc:

Issue:

Date:

Page:

- Press the "Run" button in the upper left (🔂) to start the VI.
- The actual position of all axes is read out within 3 seconds.
- The "busy" LED appears to indicate that the VI is busy.

How to act if an error occurs directly after having started the VI: (Most likely there is a GPIB bus error)

- Stop the VI.
- Turn off all devices connected to the GPIB bus.
- Make sure that all devices have differing GPIB addresses.
- Turn on the devices connected to the GPIB bus.
- Retry the procedure described under "Operation".
- Press the "Stop VI" button to stop the VI.

Front panel





Issue:

Date:

Page:

Controls and functions

GPIB port

• Allows the user to select the GPIB port from the list.

Increment [mm]

- Allows the user to set the incremental step. Press the "+" button to step forward. Press the "-" button to step backward.
- New position= <Actual pos> +/- <Increment>.

Absolute pos[mm]

• Allows the user to specify the absolute position. Press "goto" to move the slide to the absolute position.

+

- Press this button to step forward (once or continuously).
- New position= <Actual pos> + <Increment>.

-

- Press this button to step backward (once or continuously).
- New position= <Actual pos> <Increment>.

goto

• Moves the slit to the absolute position specified under "Absolute pos".

Settings

• Allows the user to read and set the velocity as well as the acceleration for this axis.

Check Position

• Allows the user to read the actual position of all 3 axes.

Define home

• The actual position off all three axes is set to "0".

Search for home

• Move all axes to position "0".



GEN-MAN-ESO-21110-0028 1D2 05.03.08 81 of 135

Doc:

Issue:

Date:

Page:

Abort motion

• Stops all motion.

Stop VI

• Stops the VI.

Indicators

Busy

• Appears when the VI is in busy state.

Actual pos[mm]

• Indicates the actual slide position of this axis.

SubVI´s



esp_gpib_comm_ASCII.vi



esp_gpib_init_system.vi

-
Error
log
- ño

Common_error_log2.0(SubVI).vi



SettingsX(SubVI).vi



SettingsY(SubVI).vi



SettingsZ(SubVI).vi



GEN-MAN-ESO-21110-0028 1D2 05.03.08 82 of 135

Doc:

Issue:

Date:

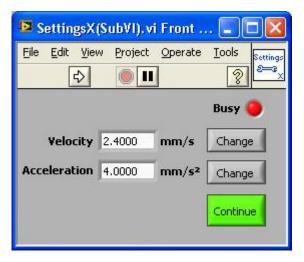
Page:

SettingsX(SubVI).vi

(representative for "SettingsY(SubVI).vi and SettingsZ(SubVI).vi")

Dialog box to read and set the velocity and the acceleration for one axis.

Front panel



Controls and functions

Velocity [mm/s]

- Displays the actual velocity for one axis and allows the user to specify a new one.
- Press "Change" to apply the new velocity.

Acceleration [mm/s²]

- Displays the actual acceleration for one axis and allows the user to specify a new one.
- Press "Change" to apply the new acceleration.

Change

• Changes either velocity (upper "Change" button) or acceleration (lower "Change button") for one axis.

Continue

• Closes the dialog box.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 83 of 135

Doc:

Issue:

Date:

Page:

Indicators

Velocity [mm/s]

- Displays the actual velocity for one axis and allows the user to specify a new one.
- Press "Change" to apply the new velocity.

Acceleration [mm/s²]

- Displays the actual acceleration for one axis and allows the user to specify a new one.
- Press "Change" to apply the new acceleration.

Block Diagram

Open the "MM4000_standalone.vi" and press "Ctrl" +"E" to view the LabView code (block diagram).

Known problems

None

References

Website NEWPORT

Contact:

Guerickeweg 7 D-64291 Darmstadt Germany **Tel:** +49-(0) 6151-708-0 **Fax:** +49-(0) 6151-708-952 E-mail: <u>Newport Spectra-Physics GmbH</u>



GEN-MAN-ESO-21110-0028 1D2 05.03.08 84 of 135

Doc:

Issue:

Date:

Page:

4.12 Interface for FIERA

(FIERA_standalone.vi)



Icon on the block diagram

Purpose

This VI is used to operate FIERA in order to take, save and display single exposures.



Prerequisites

It is strongly recommended not to use this VI during an automated data acquisition at the test bench in 051. Make sure the FIERA system you intend to use is not used by another person or program.

Do not run this VI if one of the following VI's is executed:

- "MasterPanel2.0.vi"
- "LabViewPrism_New testbench.vi"

Hardware

The described functionality for this VI is only available in case of the following hardware configuration:

- The shutter type you intend to use is connected to PULPO. Connect the USB interface board to PULPO in order to use the internal monochromator shutter.
- FIERA has to be turned on.
- PULPO is connected to FIERA.
- Keithley electrometer (KE 2100 and KE 6514), Monochromator MSH 301 and the two filter wheel controller connected to the GPIB ports which are specified in the "DeviceDriver_Setup.vi".

Input

To execute this VI the files listed under "SubVI's" have to be available. If LabView can not find one or more of these VI's you are asked to specify the path.



Issue:

Date:

Page:

Verify the following input parameters and save changes by default before the VI is started:

"DeviceDriver_Setup.vi":

• "CCD controller"

if you decided to write additional comments into the FITS header:

- "Keithley"
- "Filter wheel"
- "Monochromator"
- "Lamp (Power Supply)"
- "Weather station"
- "PULPO"

"Acquistion_Setup.vi"

- "At the beginning of an acquisition"
 > "Clear directory on odta<X> before an exposure is taken (strongly recommended)"
 > "Send a complete setup to the FIERA software before an exposure is taken (recommended)."
- "During acquisition" >> "Action if exposure fails"
- "Miscellaneous"
- "FITS header"
- "Files"
- "Shutter"

In order to save changes right click on the control and select: Data Operations >> Make Current Value Default Afterwards save the whole setup as follows: File >> Save (or press "CTRL" + "S")

Output

If an exposure is taken the following files are created in the directory which is specified in the "Acquistion_Setup.vi" ("Files" >> "Relative path to manual CCD exposures"). :

- <file name>.fits
- <file name>.fits.det

if you decided to write the FITS header into a text file:

• <file name>_HDU.txt



GEN-MAN-ESO-21110-0028 1D2 05.03.08 86 of 135

Doc:

Issue:

Date:

Page:

if an error occurs:

• Error log (FIERA) <date>.txt

Operation

- The "busy" LED appears to indicate that the VI is busy. In busy state you won't be able to press any button.
- The telnet session to the remote location (see "Input") is opened.
- The "opState" (operational state) is read out. Make sure the "opState" is "online" in order to take exposures.
- Otherwise use the controls to put FIERA online. (See "Controls and functions" for a detailed description)
- Determine parameters for the exposure(s) (Exposure time, Type ...).
- Press "Start exposure" to take the exposure(s) with the specified parameters.
- Press the "Stop VI" button to stop the VI.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 87 of 135

Doc:

Issue:

Date:

Page:

Front panel

FIERA_standalone.vi	
File Edit View Project Operate Tools Window Help	
	_
Press "Ctrl" + "H" for context help	
Setup Indicators	
Type TDI delay [ms]	
Exposure time [s]	
3.8837	
Readout mode (DMarc)	
2 225kpx/rr/HG/512 2	
Number of exposures	
Delay [s]	
4)5	
Save file as	
default	
Display	
Image V Start Fiera	
Table Put Fiera ONLINE	
Start exposure	
Put Fiera in standby	
Exit	
STOP VI	
STUP 41	

Setup



GEN-MAN-ESO-21110-0028 1D2 05.03.08 88 of 135

Doc:

Issue:

Date:

Page:

FIERA_standalone.vi	
Eile Edit View Project Operate Tools Window Help	
Die far Ven Deler Zheine Teen Warnen Teh	FIERA
Press "Ctrl" + "H" for context help	
Temp. CCD 1 [K] 140.7 Temp. CCD 2 [K] 140.0 Vacuum [mbar] 1.1e-05 Temp. FIERA [K] 288.7 Update every 30	
opState expStatus	-
online NONE Exposure 0 of 0	
Telnet log 1	
Outal root: 510 > echo \$? 0 odtal root: 517 > msgSend -n \$RTAPENV fcdpServer 1 "TT,2" MESSAGEBUFFER: OK,180.0 odtal root: 518 > echo \$? 0 odtal root: 519 > Send	
Telnet log 2 (expStatus)	
STOP VI	

Indicators



Issue:

Date:

Page:

Controls and functions

Busy

• Indicates that the program is busy.

Туре

- Allows the user to specify the exposure type.
- Available exposure types are: Normal; Dark; TDI (Time Delayed Integration)

TDI delay [ms]

• If you select "TDI" for the exposure type this is the delay between the command to start the exposure and the open shutter command.

Exposure time [s]

• Allows the user to specify the exposure time (integration time).

Readout mode

• Allows the user to select the available readout modes for the specified CCD name.

Number of exposures

• The number of exposures to take.

Delay [s]

• If you intend to take more than one exposure, this defines the delay between them.

Save file as

- If enabled the file is going to be saved in the directory which is specified in the "Acquisition_Setup.vi" ("Files" >> "Relative path to manual CCD exposures").
- Allows the user to specify the name of the FITS file(s). If more than one exposure is taken the files are numbered.
- A file name mustn't contain any of the following characters: / . \ : " ? | < >

Display Image

• Allows the user to display the previously taken image.

Display Table

• Allows you to display the FITS table of the previously taken image.



Issue:

Date:

Page:

Start FIERA

• Starts the FIERA software from the instrument workstation.

Put FIERA online

• Puts the FIERA software online.

Start exposure

• Starts the exposure with the user defined parameters.

Put FIERA in standby

• Puts the FIERA software in standby.

Exit

• Shuts down the FIERA software.

Stop VI

- Stops the program when the last operation has finished.
- Press the red "Abort Execution" button in the upper left to abort the execution of the VI immediately.

Update

• If enabled the table above is updated continuously.

Update every <Number of seconds> sec.

• Specifies how much time must elapse before the table is updated. (Therefore the control "Update" on the left has to be enabled)

Send

• Executes the UNIX command you typed into the single line under the "Telnet log".

Indicators

Table

 Displays relevant PULPO sensor values: Temp. CCD 1 [K]; Temp. CCD 2 [K]; Vacuum [mbar]; Temp. FIERA [K]; Set point CCD1 [K]; Set point CCD2 [K]



GEN-MAN-ESO-21110-0028 1D2 05.03.08 91 of 135

Doc:

Issue:

Date:

Page:

Exposure

• Displays the current exposure's number.

of

• Displays the number of exposures to be taken.

opState

• Displays the operational state of the FIERA system.

expStatus

 Indicates the status of the current exposure: NONE, inactive, wiping, pending, integrating, reading, reading & transferring, paused processing, transferring, aborted, failed, loop finite, loop infinite.

Telnet log

• Displays the commands sent and the data received from FIERA via telnet connection.

Telnet log 2 (exposure status)

• Logs the commands sent and the data received from FIERA via telnet connection to read the exposure status.

SubVI´s

DeviceDriver_Setup.vi



Fiera_login.vi



MSH301_SetShutter(SubVI).vi

Error	
log	
2.0	

Common_error_log2.0(SubVI).vi Acquistion_Setup.vi



Check range(SubVI).vi



Remove fits files (SubVI).vi



GEN-MAN-ESO-21110-0028 1D2 05.03.08 92 of 135

Doc:

Issue:

Date:

Page:

Build &
execute.
corint
2.0

Build&execute_script2.0(SubVI).vi

delete
not allo
wed
1.000
charact.

Delete_not_allowed_characters(SubVI).vi

File
transfer

File_transfer.vi



Search for fits files.vi



HDU_comment(SubVI).vi

2	er i	ite Ud		
h c	õ	m	er	
Π	he	nt	2.	0

write_header_comment2.0(SubVI).vi

HDU	
to	I
TEXT	

HDU to text file (SubVI).vi

FITS	
viewer	
inches.	

read_fits_real_image_file3.1.vi

. //	
The second second	
write	
com	

Fiera_write_command (SubVI).vi



opState(SubVI).vi

David
Lineare 1
Pulpo I
A 17 1
Sensor

ReadPulpoSensors (SubVI).vi



Fiera_close_session (SubVI).vi



GEN-MAN-ESO-21110-0028 1D2 05.03.08 93 of 135

Doc:

Issue:

Date:

Page:

read_fits_real_image_file3.1.vi

Allows the user to view the header, the image and the table of a FITS file.

Front panel

leader Ima							2
1	nage Table			X Y 4296 X 512		busy min max 923 2084	00
BITF	PIX =	16	/ 2 byte twos-compl integers (16 bits)		<u> </u>		
NAX	XIS =	2	2 axis (two dimensions)				
NAX	XIS1 =	296	/ # pixels/row				
NAX	XIS2 =	512	/ # rows				
ORI	IGIN = 'ESO '		/ European Southern Observatory				
DAT	TE = '2008-02-05	T10:05:	04.857' / Date this file has been written				
CRV	VAL1 =	1.0	/ Coordn first column (x-start)				
CRP	PIX1 =	1.0	/ Always referenced to first pixel in x				
CDE	ELT1 =	1.0	/ Increment along × (×-step)				
CTY	YPE1 = 'PIXEL '		/ Units along ×				
CRV	VAL2 =	1.0	/ Coordn first row (y-start)				
CRP	PIX2 =	1.0	/ Always referenced to first row (y)				
CDE	ELT2 =	1.0	/ Increment along y (y-step)				
CTY	YPE2 = 'PIXEL '		/ Units along y				
BSC	CALE =	1.0	/ Real = File*BSCALE+BZERO				
BZE	ERO = 32	768.0	/ Real = File*BSCALE+BZERO				
MJD	D-OBS = 5450	1.42008	0 / Start of exposure				
EXP	PTIME = 1	0000	/ Total integration time				
EXT	TEND =	F	/ Extension may be present				
CON	MMENT Temp.(CCI	01)[K]	/ 140.6				
CON	MMENT Temp.(CCI	2) [K]	/ 140.0		~		

Header



GEN-MAN-ESO-21110-0028 1D2 05.03.08 94 of 135

Doc:

Issue:

Date:

Page:

Edit View Project Operate Iools Window Help			busy 💳	9
eader Image Table	X 4296	¥ 512	min max 923 2084	00
514 -				-1020
500 480 460 440 440 420 400				1010 -1000 -990 -980 Intensity
300 560 340 320 300				-960 950 -940 -930
280 260 240 220 200				-923
180 160 140 120 100				
80 60 40 20				
1 200 400 600 800 1000 1200	0 1400 1600 1800 2000 2200 2400 2600 X=Coloum	2800 3000 3200 3400 3		
Lew Cursors: X Y → Cursor 851 250	2 = = = = = = = = = = = = = = = = = = =		× F	

Image

Controls and functions

Toolbar

Left button

- (The three buttons in the upper left)
- Press this control to be able to move the yellow cursor over the image.
- The cursor's position (X,Y) and the ADU level (Z) of the pixel is displayed in the "Cursor table" next to the toolbar.

Center button

 Press this control to be able to zoom in and out several areas of the FITS image.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 95 of 135

Doc:

Issue:

Date:

Page:

Right button

• Press to be able to move the whole FITS image.

Intensity scale (Z scale)

• Allows the user to change upper and lower threshold for a better visualization of the FITS image.

Indicators

Intensity graph

• Displays the FITS image.

Х

• Displays the number of columns of the FITS image.

Υ

• Displays the number of rows of the FITS image.

min

• Displays the lowest ADU level in the FITS image.

max

• Displays the highest ADU level in the FITS image.

busy

• Indicates that the program is busy.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 96 of 135

Doc:

Issue:

Date:

Page:

Indeg Indeg <th< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>x</th><th></th><th>Y</th><th></th><th></th><th>min</th><th>busy 📕 max</th><th>- 6</th></th<>											x		Y			min	busy 📕 max	- 6
Part Num Num <th>Image</th> <th>Table</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>4296</th> <th>×</th> <th>512</th> <th></th> <th></th> <th>923</th> <th>2084</th> <th>•</th>	Image	Table									4296	×	512			923	2084	•
Part No. No. <th></th>																		
Ince 93 1007 103 <th>(+) 433</th> <th>1007</th> <th>1002</th> <th>995</th> <th>1000</th> <th>1000</th> <th>1004</th> <th>1014</th> <th>1003</th> <th>1001</th> <th>1008</th> <th>998</th> <th>1000</th> <th>997</th> <th>998</th> <th>1003</th> <th>999</th> <th>~</th>	(+) 433	1007	1002	995	1000	1000	1004	1014	1003	1001	1008	998	1000	997	998	1003	999	~
Inc. 93 Ind. 101 94 101 <td>2367</td> <td>997</td> <td>1001</td> <td>999</td> <td>1000</td> <td>995</td> <td>1001</td> <td>1005</td> <td>998</td> <td>999</td> <td>998</td> <td>1007</td> <td>1012</td> <td>1004</td> <td>1005</td> <td>1003</td> <td>995</td> <td></td>	2367	997	1001	999	1000	995	1001	1005	998	999	998	1007	1012	1004	1005	1003	995	
99 94<		1002	993	1007	1003	1001	998	999	1003	1005	1001	997	1005	999	1000	999	999	
Pick Pick <th< td=""><td></td><td>1005</td><td>1007</td><td>994</td><td>1006</td><td>1005</td><td>1002</td><td>1006</td><td>1002</td><td>1006</td><td>997</td><td>1010</td><td>1000</td><td>998</td><td>1003</td><td>997</td><td>997</td><td></td></th<>		1005	1007	994	1006	1005	1002	1006	1002	1006	997	1010	1000	998	1003	997	997	
99 101 94 95 101 96 96 106 100		998	992	996	1008	997	1009	1002	1005	990	996	1012	990	1003	1004	1006	1002	
Ince Ince <th< td=""><td></td><td>998</td><td>993</td><td>993</td><td>1000</td><td>995</td><td>1009</td><td>1000</td><td>1001</td><td>1000</td><td>998</td><td>1009</td><td>1000</td><td>996</td><td>1003</td><td>1003</td><td>998</td><td></td></th<>		998	993	993	1000	995	1009	1000	1001	1000	998	1009	1000	996	1003	1003	998	
192 104 104 102 <td></td> <td>993</td> <td>1010</td> <td>994</td> <td>998</td> <td>999</td> <td>1010</td> <td>989</td> <td>995</td> <td>998</td> <td>1006</td> <td>1005</td> <td>1002</td> <td>996</td> <td>1009</td> <td>1001</td> <td>1003</td> <td></td>		993	1010	994	998	999	1010	989	995	998	1006	1005	1002	996	1009	1001	1003	
Ince ince <th< td=""><td></td><td>1005</td><td>1001</td><td>1000</td><td>1006</td><td>1000</td><td>997</td><td>1005</td><td>999</td><td>1003</td><td>1004</td><td>996</td><td>994</td><td>999</td><td>1003</td><td>1003</td><td>996</td><td></td></th<>		1005	1001	1000	1006	1000	997	1005	999	1003	1004	996	994	999	1003	1003	996	
Incode Incode<		992	1001	1000	1002	1002	1001	1002	1010	997	1002	995	1004	999	993	997	1002	
994 1005 994 1002 964 964 1004 1004 975 1005 1001		1012		1002		1000	996	1003	1005	1003			1007	_	_	_		
98 100 94 94 94 960 100 100 970 100		1000		995	-	997			997	999	-		-					
98 106 98 93				- Price Price			(Panes)				_				a la contrata de la c	and the second s		
Incode Incode<				_	-	of the second second	-	-			-		-				and the second se	
966 104 904 106 970 <td></td> <td>-</td> <td>_</td> <td></td> <td>-</td> <td></td> <td>-</td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>_</td> <td>_</td> <td></td> <td></td>		-	_		-		-		-						_	_		
1000 1000 1000 1000 1000 9000 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>_</td><td></td><td>-</td><td>- Concentration</td><td></td><td></td><td></td><td></td></t<>											_		-	- Concentration				
917 100 100 100 910 <td></td> <td></td> <td></td> <td>1</td> <td>- Contraction</td> <td></td> <td>C. ANIAN</td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>- Contraction</td> <td>- Contractor</td> <td></td> <td></td>				1	- Contraction		C. ANIAN	-							- Contraction	- Contractor		
987 977 102 1000 1000 970 940 1000 980 982 9100 </td <td></td> <td>-</td> <td></td> <td></td> <td>-</td> <td></td> <td>-</td> <td></td> <td>-</td> <td></td> <td>-</td> <td></td> <td>-</td> <td>in generation</td> <td></td> <td></td> <td></td> <td></td>		-			-		-		-		-		-	in generation				
1010 945 945 1005 905 1005 904 944 980 9100 905 1003 905 1003 906 9103 900 9103 900 9103 900 9103												_	_		_	_		
1000 950 944 1002 957 950<										_			-				_	
966 100 968 910 <td></td> <td>1000000</td> <td></td> <td>a francisco de la construcción d</td> <td>_</td> <td></td> <td>CRANKS</td> <td>a contractor</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>and the second s</td> <td></td> <td>- contractor</td> <td></td>		1000000		a francisco de la construcción d	_		CRANKS	a contractor							and the second s		- contractor	
991 993 993 1005 1001 1000 1003 910 1005 1001 100					-		-	-				_	-	in press	and here and		_	
998 995 1007 996 997 1005 1000 993 1002 994 1006 1005 995 995 1003 933 1005 930 937 1011 937 1000 981 1011 955 910 910 910 911 955 910 <t< td=""><td></td><td></td><td>_</td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td>_</td><td></td><td></td><td></td></t<>			_						-						_			
995 1005 993 1005 990 997 1011 997 1000 986 1011 995 996 1011 995 991 1011 995 991 1011 995 991 1011 997 1011 995 1011 995 1011 995 1011 995 1011 995 1011 995 1011 995 1011 995 1001 <th1< td=""><td></td><td></td><td></td><td>_</td><td>-</td><td></td><td></td><td>_</td><td></td><td>_</td><td></td><td></td><td>-</td><td></td><td></td><td></td><td>_</td><td></td></th1<>				_	-			_		_			-				_	
994 998 1005 992 990 995 994 1005 1003 997 1001 997 994 994 1001 1002 997 1000 991 991 997 994 991 1001 991 1001 991 1001 991 1001 991 1001 991 1001 991 1001 991 1001 991 1001 991 1001 991 1001 991 1001 991 1001 1001 1001 1001 991 1001 991 1001 991 1001 1001 1001 1001 1001 1001 1001 1001 992 1006 1000 1004			- Charles	- Anness		- Annotation	Charles	1		1.000			- Contraction	- Antonio		- Andrews		
1001 1002 999 1000 991 997 994 999 1001 991 1002 1009 994 995 910 911 1002 1009 994 995 1006 911 1002 1009 994 995 1006 1004 1000 1001 1001 1001 1001 1001 1001 994 1000 992 1006 1004				and descentions		at the second		-					-	in simon	and generation	- Contraction		
							_						_		_	_	_	
		1000	1001	990	1007	1000	994	1001	1001	1005	1001	994	1000	992	1006	1000	1004	
999 994 1004 992 996 995 999 1001 999 997 995 1002 991 995 1004		999	994	1004	992	996	996	995	999	1001	999	997	995	1002	991	995	1004	
997 998 994 1004 1000 999 995 993 1000 1001 997 999 998 992 1000 1002 🗸		997	998	994	1004	1000	999	995	993	1000	1001	997	999	998	992	1000	1002	~
		<		2	-	- 20)	~	-				>	

Block diagram

Open the "FIERA_standalone.vi" and press "Ctrl"+ "E" to view the LabView code (block diagram).

Known problems

None



GEN-MAN-ESO-21110-0028 1D2 05.03.08 97 of 135

Doc:

Issue:

Date:

Page:

4.13 Interface for PULPO (rev 1.0)

(Pulpo1_standalone2.0.vi)



Icon on the block diagram

Purpose

This VI is used to operate PULPO (rev.1.0).





Make sure to have all the peripherals connected to PULPO before turning the power on, otherwise, some internal flags and status will show wrong values.

Hardware

The described functionality for this VI is only available in case of the following hardware configuration:

 Make sure PULPO is connected to your PC via null modem connection cable (RS 232)

Input

To execute this VI the files listed under "SubVI's" have to be available. If LabView can not find one or more of these VI's you are asked to specify the path.

Output

If an error occurs during operation an error message will appear. At the same time an error log named "Error log (PULPO) <date>.txt" is created in the directory which is specified in the "Acquistion_Setup.vi".

Operation

- Open the "Measurement & Automation Explorer" (See "Devices and Interfaces") to make sure your PC has detected the new device (the new COM port). Press "F5" to refresh the list of available serial ports.
- Select the serial port on the front panel of the VI.
- Select "Refresh" in the pull-down menu to refresh the list of available ports.
- Specify the "Delay between read out" under "Controls".



Issue:

Date:

Page:

- Press the "Run" button in the upper left (
- Depending on the number of connected sensors one read out takes about 10 seconds.
- Press the "Stop VI" button to stop the VI.

Front panel

ss "Ctrl	l"+"H" for con	text help							00
ble	Controls C	hart					E	iusy 🥚	STOP
				Global alarm (enabled	۲			
C	onnected	Value	Ref./Trip point	Status/Alarm	Туре	*			
E	leater1 [W]	0.0	140.00	Enabled					
F	leater2 [W]	0.1	140.00	Enabled					
Т	emp1 [K]	140.5	140.0	Enabled					
	emp2 [K]	140.0	140.0	Enabled					
Т	emp6 [K]	290.1	295.0	Enabled					
Т	emp7 [K]	273.2							
V	'acuum [mbar]	9.2e-06	1.0e-03	Disabled	Balzers				
						Ť_			
	11					T			
-						P-			

Indicators

Busy

• Indicates that the VI is busy.

Global alarm enabled

• If the global alarm for PULPO is enabled this LED is light green. Otherwise the LED is dark green.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 99 of 135

Doc:

Issue:

Date:

Page:

Table

- Displays the sensor's values, trip points, reference temperatures (set points), alarm values and the type of vacuum gauge.
- Initialize PULPO (See "Init") to add peripherals (sensors) to the list that had not been connected to PULPO when it was turned on.

🕼 Pulpo1_standalone2.0.vi		
Eile Edit View Project Operate Tools Window Help		
Press "Ctrl"+"H" for context help		
Table Controls Chart		STOP
Serial port		
Save data Basepath to data file	file name	type
R F:\Test	default	.xls
RealTime plot		
Delay between readout 15 sec.		
Shutter Open Close		Init Settings

Controls

Controls and functions

Stop

• Stops the VI.

Serial port

• Allows the user to select the serial port from a list of available ports.



Issue:

Date:

Page:

Save data

• Enable this control to save data at regular intervals to the specified file.

Base path to data file

• The directory where the data file is located.

file name

• The file name of the data file.

type

• Allows the user to select the type of data file (excel file or text file).

Real-time plot

• Enable to display the real time plot of the connected sensors (See "Chart").

Delay between readout

• Specifies how much time must elapse before all indicators are refreshed.

Shutter open

• Opens the shutter connected to PULPO.

Shutter close

• Closes the shutter connected to PULPO.

Init

- Initializes Pulpo. This should not take more than 45 sec.
- New added peripherals are going to be displayed in the table afterwards.

Settings

• Press to change alarm values and trip points.



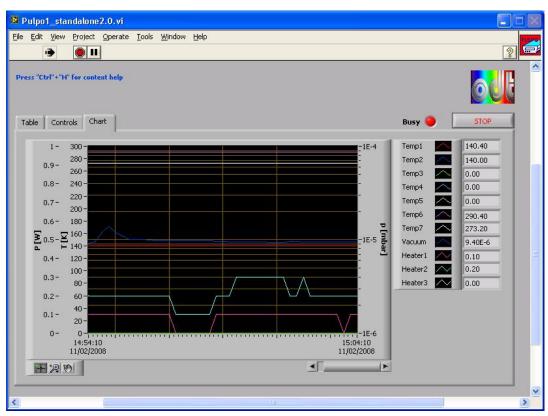
GEN-MAN-ESO-21110-0028 1D2 05.03.08 101 of 135

Doc:

Issue:

Date:

Page:



Chart

Controls and functions

Toolbar

+ @ @

Left button

•

- (The three buttons in the upper left)

Is not used. Center button

• Press to be able to zoom in and out several areas of the plot.

Right button

Press to be able to move the whole plot • area.

Right click on the chart and select "Data Operations" >> "Export Simplified Image" to save an image of the current graph with the digital displays included.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 102 of 135

Doc:

Issue:

Date:

Page:

Indicators

Chart

• Displays the connected sensors.

SubVI´s



ConfigureSerialPort2.0(SubVI).vi

Serial R+W 2.0

SerialWrite2.0 (SubVI).vi



Delete OK, cr 2.0 (SubVI).vi



STB2_2.0(SubVI).vi



STB2.0(SubVI).vi



Connection2.0(SubVI).vi

Alsen
apphlad
or
Alarm enabled or diabled?

 $A larm Enabled_Disabled 2.0 (SubVI).vi$

Edwards
er or Balance
Palzers ??

Edwards or Balzers2.0(SubVI).vi



Append tab2.0 (SubVI).vi



Append data to file2.0(SubVI).vi



Settings2.0(SubVI).vi

Acquistion_Setup.vi



MSH301_SetShutter(SubVI).vi



Common_error_log2.0(SubVI).vi



GEN-MAN-ESO-21110-0028 1D2 05.03.08 103 of 135

Doc:

Issue:

Date:

Page:

Settings2.0(SubVI).vi

Dialog box to set trip points, set points and gauge type.

Front panel



Controls and functions

Heater

• Press this control to change settings for heaters.

Pressure

• Press to change the gauge type. (Edwards; Balzers)

Alarm

• Press to change alarm settings of the connected sensors.

Continue

• Press to close this dialog box. Make sure that this panel's sub panels (Heater; Pressure; Alarm) are previously closed.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 104 of 135

Doc:

Issue:

Date:

Page:

SettingsHeater2.0(SubVI).vi

Dialog box to change settings for the connected heaters.

Front panel

SettingsHeater 2.0	ub∀l).vi 🛛 🔀
Heater	Set Point Temperature [K] ON/OFF
Heater 1 💎	€]140
	Change
	Continue

Controls and functions

Heater

• Pull-down menu to select heater (1-3).

Set Point Temperature [K]

• Allows the user to specify the set point of the selected heater.

ON/OFF

• Enable control to turn on the selected heater. Disable control to turn it off.

Change

• Applies the settings above.

Continue

• Closes this panel.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 105 of 135

Doc:

Issue:

Date:

Page:

SettingsPressure2.0(SubVI).vi

Dialog box to change the gauge type.

Front panel

🖼 SettingsPress	ure2.0 (SubVI).	.vi 🧧	
Gauge type	Edwards 🤝	Change	
		Continue	

Controls and functions

Gauge type

• Pull-down menu to select the gauge type (Edwards; Balzers).

Change

• Press this control to change the gauge type.

Continue

• Closes the dialog box.



Issue:

Date:

Page:

SettingsTemp2.0(SubVI).vi

Dialog box to change alarm settings of the connected sensors.

Front panel

ettingsTemp2.	.0(SubVI).vi		
Sensor	Alarm value [K]	Enable alarm	Enable global alarm
Temp.1 🗸	150		
			Change
			Continue

Controls and functions

Sensor

• Pull-down menu to select the sensor.

Alarm value [K]

• Allows the user to specify the alarm value of the selected temperature sensor.

Enable alarm

• Enables alarm warning of the selected sensor.

Enable global alarm

• Enables alarm warning for all sensors connected to PULPO.

Change

• Applies the settings above.

Continue

• Closes this panel.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 107 of 135

Doc:

Issue:

Date:

Page:

Block diagram

Open the "Pulpo1_standalone2.0.vi" and press "Ctrl"+ "E" to view the LabView code (block diagram).

Known problems

None

References

User Manual



GEN-MAN-ESO-21110-0028 1D2 05.03.08 108 of 135

Doc:

Issue:

Date:

Page:

4.14 Interface for the BOC Edwards TIC

(BOC Edwards TIC.vi)

WRG-D
8 8

Icon on the block diagram



Purpose

This VI is used to read the pressure as well as the configuration from the BOC EDWARDS TIC. Basic settings are configurable.

Prerequisites

To avoid communication problems connect the controller to a serial port of your PC before the controller is turned on.

Input

To execute this VI the files listed under "SubVI's" have to be available. If LabView can not find one or more of these VI's you are asked to specify the path.

Output

If an error occurs during operation an error message will appear. At the same time an error log named "Error log (BOC EDWARDS TIC) <date>.txt" is created in the directory which is specified in the "Acquistion_Setup.vi".

Operation

- Open the "Measurement & Automation Explorer" (See "Devices and Interfaces") to make sure your PC has detected the new device (the new COM port).
 Press "F5" to refresh the list of available serial ports.
- Before you start the "BOC Edwards TIC.vi", select the serial port from the pull-down menu on the front panel.
- Select a gauge under "Gauge Number"
- Press the "Run" button in the upper left (⇔) to start the VI.
- All indicators are updated within 2 seconds.
- Hit the "Stop VI" button to stop the VI.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 109 of 135

Doc:

Issue:

Date:

Page:

Front panel

😰 BOC Edwards TIC.vi *	😰 BOC Edwards TIC.vi *
Eile Edit View Project Operate Tools Window Help Image: State	Eile Edit View Project Operate Tools Window Help Image: State
Serial port	Serial port COM8 COM8 Comparison Comparison Cauge I Gauge State Not Connected No Alert Gauge Type Unknown TIC Temp [°C] 0.0 Gas Type Nitrogen Filter Enabled Settings
Update every 30 sec	Update every 30 sec

Pressure

Gauge info

Controls and functions

Serial port

• This control allows selecting the serial port of the BOC Edwards vacuum controller.

Gauge number

• Allows you to select a gauge (1, 2 or 3).

Settings

• Allows the user to set name and type of the gauge, to enable or disable the filter and also to perform a calibration of the vacuum controller.

Update indicators

• Specifies how much time must elapse before all indicators are updated.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 110 of 135

Doc:

Issue:

Date:

Page:

Indicators

Gauge state

- Indicates the gauge state (e.g. if connected or not).
- See the user manual for the different states and how to behave.

TIC temp [°C]

• Displays the motherboard temperature [C°] of the controller.

Gauge type

• Indicates the type of gauge connected to the controller.

Pressure

• Indicates the pressure of the selected gauge.

Gas type

• Indicates the gas type that is used. You can select the gas type from the pulldown menu under "Settings".

Filter enabled

Allows the user to select filter status

Gauge name

• Indicates the gauge name which can be changed under "Settings".

Status

- Indicates the gauge status.(e.g. Temperature alert)
- See the user manual for the different states and how to behave.

SubVI´s

E	iOC
e	dwards
s	 3

Configure gauge.vi



TIC Read Gauge Status.vi



TIC Read Gauge Type.vi



GEN-MAN-ESO-21110-0028 1D2 05.03.08 111 of 135

Doc:

Issue:

Date:

Page:

JBW TIC	
P P	
9 ~	
0	

TIC Read Gauge Pressure or Volts.vi



TIC Read Gauge Configuration.vi



TIC Read Controller Temperature.vi



Common_error_log2.0(SubVI).vi

Configure gauge.vi

Dialog box to configure the gauge.

Front panel



Controls and functions

Abort

• Continue without any changes.

Change

• Change settings.



Doc:

Issue:

Date:

Page:

Filter Enable

• Allows the user to select filter status. Filter "ON" applies a one second moving average to the readings.

Perform calibration

• Allows the user to adjust the APGX at atmosphere and vacuum. For more information refer to the User Manual.

Gauge Name

• Allows the user to name the selected gauge.

Block Diagram

Open the "BOC Edwards TIC.vi" and press "Ctrl" +"E" to view the LabView code (block diagram).

Known problems

None

References

Edwards Website



GEN-MAN-ESO-21110-0028 1D2 05.03.08 113 of 135

Doc:

Issue:

Date:

Page:

4.15 Interface for the USB Interface Board

(USB Interface Board_standalone2.0.vi)



Icon on the block diagram

Purpose



This VI is exclusively used to operate USB interface board **before and/or after manual CCD exposures**. It provides the following features (Lab 051: AO test bench):

- Operate test bench warning light
- Turn on/off room light
- Lock/unlock test bench door
- Determine test bench door status (open/closed)

Prerequisites

Do not run this VI during the "MasterPanel.vi" is executed and while using the internal monochromator shutter!



GEN-MAN-ESO-21110-0028 1D2 05.03.08 114 of 135

Hardware

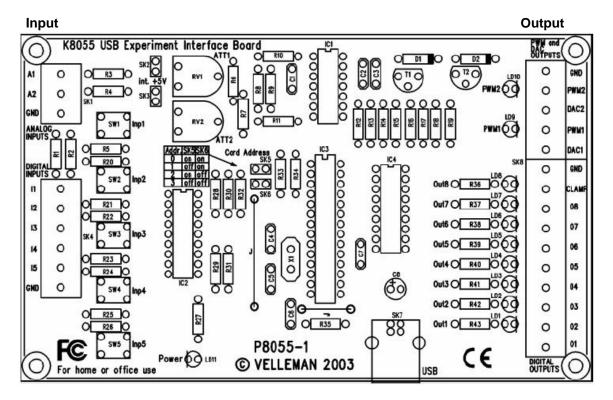
The described functionality for this VI is only available in case of the following hardware configuration:

Doc:

Issue:

Date:

Page:



Input	Connected to	Color
A1 A2 GND I1 I2 I3 I4 I5 GND	Not connected Not connected Not connected Test bench door PULPO Warning light (blink) Warning light (constant) Test bench door PULPO	- - yellow brown brown brown green white
Output	Connected to	Color
GND PWW2 DAC2	Not connected Not connected Not connected	- -



GEN-MAN-ESO-21110-0028 1D2 05.03.08 115 of 135

Doc:

Issue:

Date:

Page:

PWW1	Not connected	-
DAC1	Not connected	-
GND	Power Supply	black
CLAMP	Power Supply	white
	Test bench door	brown
	Room light	brown
08	Not connected	brown
07	Not connected	yellow
O6	Not connected	green
O5	Warning light (constant)	white
O4	Warning light (blink)	white
O3	Test bench door	white
O2	Room light	white
01	Not connected	-

Input

To execute this VI the dynamic link library "K8055D.dll" has to be available. If LabView can not find it you are asked to specify the path.

Operation

- Select task (See "Control and function").
- Press the "Run" button in the upper left (
- Press the "Stop VI" button to stop the VI.

Front panel

🔁 USI	B Interface Board_standalone2.0.vi 🔳 🗖	×
<u>Eile</u>	Edit View Project Operate Tools Window Help	SE
	\$ ₴ ● ■	
	Task	^
	Constant ON	
	Door closed?	
	Q	
		~
5		1



GEN-MAN-ESO-21110-0028 1D2 05.03.08 116 of 135

Doc:

Issue:

Date:

Page:

Control and function

Task

- Constant ON Turn on test bench lamp (constant light)
- Constant OFF Turn off test bench lamp (constant light)
- Blink ON Turn on test bench lamp (blinking light)
- Blink OFF Turn off test bench lamp (blinking light)
- Lock door Lock the door in 051
- Unlock door Unlock the door in 051
- Door closed? If the door in 051 is closed the LED below will turn into light green
- Room light ON/OFF
 Turn ON/ OFF the room light in 051 depending on the current status

Indicator

Door closed?

• After execution of the "Door closed?" task the door status is indicated. If closed (light green), if open (dark green).

SubVI´s

None

To execute this VI the dynamic link library "K8055D.dll" has to be available.

Block Diagram

Open the "USB Interface Board_standalone2.0.vi" and press "Ctrl" +"E" to view the LabView code (block diagram).

Known problems

None

References

Product description

Assembly Manual

<u>User Manual</u>

Contact:

http://www.velleman.be/ot/en/support/company/



GEN-MAN-ESO-21110-0028 1D2 05.03.08 117 of 135

Doc:

Issue:

Date:

Page:

4.16 Interface for automated data acquisition

(MasterPanel2.0.vi)



Icon on the block diagram

Purpose

This VI is used to automatically acquire data at the new AO test bench in 051. It combines the functionality of the following devices:

- USB Interface Board
- Radiometric Power Supply Model 69931
- Keithley electrometer (KE2100 and KE 6514)
- 2 motorized filter wheels (Newport Model 74041)
- Monochromator MSH 301
- FIERA
- PULPO rev 1.0

Prerequisites

Make sure the FIERA system you intend to use is not used by another person or program. IMPORTANT: Never rename file names of VI's (LabView programs)!

Do not run if one of the following VI's is executed:

- "LabViewPrism_New testbench.vi"
- "PowerSupply_standalone.vi"
- "Keythley_486_standalone.vi"
- "Keithley 2100 Series Read Single.vi"
- "Keythley_6514_standalone2.0.vi"
- "MSH301_standalone2.0.vi"
- "Filter wheel standalone.vi"
- "FIERA_standalone.vi"



Hardware

The described functionality for this VI is only available in case of the following hardware configuration:

Doc:

Issue:

Date:

Page:

- FIERA is turned on.
- PULPO is connected to FIERA.
- USB interface board hardware configuration as described in this manual.
- The shutter you intend to use is connected to PULPO. Connect the USB interface board in order to use the internal monochromator shutter.
- Power supply of the test bench lamp is connected to the serial port which is specified in the "DeviceDriver_Setup.vi".
- Keithley electrometer (KE 2100 and KE 6514), Monochromator MSH 301 and the two filter wheel controller are connected to the GPIB ports which are specified in the "DeviceDriver_Setup.vi".
- Make sure that each filter wheel controller (2) is connected to the proper filter wheel with its different density filters as shown in the "DeviceDriver_Setup.vi".

Input

To execute this VI the files listed under "SubVI's" have to be available. If LabView can not find one or more of these VI's you are asked to specify the path.

Verify the input parameters in the following setup files and save changes by default before you start the VI:

- "DeviceDriver_Setup.vi"
- "Acquistion_Setup.vi"

Acquisition parameters can (don't necessarily have to) be specified for the following acquisitions: Noise/Gain; Cosmetic; Quantum efficiency; Linearity; Pocket Pumping; Dark current The corresponding setup files are:

- "Noise Gain_Setup<Nb. of setup>.vi"
- "Cosmetic_Setup<Nb. of setup>.vi"
- "QESetup<Nb. of setup>.vi"
- "Linearity_Setup<Nb. of setup>.vi"
- "Pocket Pumping_Setup<Nb. of setup>.vi"
- Dark Current_Setup<Nb. of setup>.vi

For each acquisition there are 3 different parameter setups available. The setup files for each acquisition are identical to the front panel of the "MasterPanel2.0.vi".



Doc:

Issue:

Date:

Page:

In order to save settings right click on the control and select: Data Operations >> Make Current Value Default Afterwards save the whole setup as follows: File >> Save (or press "CTRL" + "S")

Output

If an error occurs during operation an error message will appear. At the same time an error log named "Error log (<device>) <date>.txt" is created in the directory which is specified in the "Acquistion_Setup.vi".

Operation

• Open the Measurement & Automation Explorer to make sure your PC has detected the new devices (See "Devices & Interfaces")

GPIB: 2 Keithley 6514; Monochromator MSH 301; 2 motorized filter wheels Model 74041

Serial: Radiometric Power Supply Model 69931

- Select the ports (GPIB/Serial) of these devices in the "DeviceDriver_Setup.vi".
- Select "Refresh" in the pull-down menu to refresh the list of available ports.
- Make sure that the mounted filters (at all filter wheels) are the same as specified in the "DeviceDriver_Setup.vi".
- Set up for the acquisition **before** the VI is started. (See "Input")
- Press the "Run" button in the upper left (
- Select a setup from the pull-down menu for each acquisition you intend to do or change parameters manually.
- Press the "Start acquisition" button to start the data acquisition.

How to act if an error occurs directly after having started the VI: (Most likely there is a GPIB bus error)

- Stop the VI.
- Turn off all devices connected to the GPIB bus.
- Make sure that all devices have differing GPIB addresses.
- Turn on the devices connected to the GPIB bus.
- Retry the procedure described under "Operation".
- Press the abort button ()) to immediately stop the VI.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 120 of 135

Doc:

Issue:

Date:

Page:

Front panel

📓 MasterPanel2.0. vi Front Panel	
<u>Eile Edit View Project Operate Iools Window H</u> elp	Master
⇒ ● ■	Panel Panel
Press "Ctrl" + "H" for context help Start acquisition	
Noise/Gain Cosmetic Quantum efficiency Linearity Pocket P	umping Dark current Progress
Noise/Gain setup	
default	
Wavelength	
632 nm	
Bandwidth	
7 nm	
Flat field mean level	
20000 ADU (incl. offset)	
Readout modes (DMarc)	
1 3 50kpx/m/HG	50kpx
2 1 225kpx/rr/HG	225kpx
3 7 625kpx/rr/HG	625kpx
<u>}</u>	



Controls, indicators and functions

Noise/Gain (🗹)

• Enable this control in order to proceed the Noise/Gain data acquisition after having started the data acquisition by pressing the "Start acquisition" button.

Noise/Gain setup

- Pull-down menu to select the setup.
- The selected setup's parameters are displayed below.
- However it is possible to change parameters temporarily.



Doc:

Issue:

Date:

Page:

Wavelength

- Indicates the wavelength for the Noise/Gain acquisition according to the specified setup ("Noise/Gain setup").
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "Noise Gain_Setup<Nb. of setup>.vi" to change and save settings.

Bandwidth

- Indicates the bandwidth for the Noise/Gain acquisition according to the specified setup ("Noise/Gain setup").
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "Noise Gain _Setup<Nb. of setup>.vi" to change and save settings.

Flat field mean level

- Indicates the ADU mean level of all flat field images according to the specified setup ("Noise/Gain setup"). The flat field mean level includes the offset.
- It is possible to change this parameter temporarily (it won't be saved).
- Open the "Noise Gain_Setup<Nb. of setup>.vi" to change and save settings.

Readout modes

- Indicates the selected readout mode(s) (depending on the specified "CCD name") for the Noise/Gain acquisition according to the specified setup ("Noise/Gain setup").
- It is possible to change these parameters temporarily but they won't be saved!
- Open the "Noise Gain_Setup<Nb. of setup>.vi" to change and save settings.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 122 of 135

Doc:

Issue:

Date:

Page:

MasterPanel2.0. vi Front Panel	
Eile Edit View Project Operate Iools Window Help	Master
\$ I	2 Panel
Press "Ctrl" + "H" for context help	
Start acquisition	
Noise/Gain Cosmetic Quantum efficiency Linearity Pocket Pumping Dark current Progre	ss
Cosmetic setup	
default	
Flat field mean (Low Level) Flat field mean level 2 1500 ADU (incl. offset) 20000 ADU (incl. offset)	
Bandwidth 7	
Readout mode (DMarc)	
1 225kpx/rr/HG	

Cosmetic

Controls, indicators and functions

Cosmetic (🗹)

• Enable this control in order to proceed the Cosmetic data acquisition after having started the data acquisition by pressing the "Start acquisition" button.

Cosmetic setup

- Pull-down menu to select the setup.
- The selected setup's parameters are displayed below.
- However it is possible to change parameters temporarily.



Doc:

Issue:

Date:

Page:

Flat field mean (Low Level)

- Indicates the ADU mean level of the low level flat field images according to the specified setup ("Cosmetic setup"). The flat field mean level includes the offset.
- It is possible to change this parameter temporarily. (it won't be saved)
- Open the "Cosmetic_Setup<Nb. of setup>.vi" to change and save settings.

Flat field mean level 2

- Indicates the ADU mean level of the further flat field images according to the specified setup ("Cosmetic setup"). The flat field mean level includes the offset.
- It is possible to change this parameter temporarily. (it won't be saved)
- Open the "Cosmetic_Setup<Nb. of setup>.vi" to change and save settings.

Bandwidth

- Indicates the bandwidth for the Cosmetic acquisition according to the specified setup ("Cosmetic setup").
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "Cosmetic_Setup<Nb. of setup>.vi" to change and save settings.

Readout mode

- Indicates the selected readout mode(s) (depending on the specified "CCD name") for the Cosmetic acquisition according to the specified setup ("Cosmetic setup").
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "Cosmetic_Setup<Nb. of setup>.vi" to change and save settings.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 124 of 135

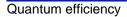
Doc:

Issue:

Date:

Page:

MasterPanel2.0. vi Front Panel	
Eile Edit View Project Operate Iools Window Help	Master
	2 Panel
Press "Ctrl" + "H" for context help	
Start acquisition	
Noise/Gain Cosmetic Quantum efficiency Linearity Pocket Pumping Dark curren	nt Progress
QE setup	
Test setup	
Start wavelength Target Increment	
From 320 nm to 400 nm in 20 nm steps	
From 450 nm to 1100 nm in 50 nm steps	
Bandwidth	
7 nm	
Flat field mean level	
20000 ADU (incl. offset)	
Readout mode (DMarc)	-
9 225kpx/rr/LG/512	



Controls, indicators and functions

QE (🗹)

• Enable this control in order to proceed the QE data acquisition after having started the data acquisition by pressing the "Start acquisition" button.

QE setup

- Pull-down menu to select the setup.
- The selected setup's parameters are displayed below.
- However it is possible to change parameters temporarily.



Doc:

Issue:

Date:

Page:

Start wavelength

- Indicates the wavelength where the QE acquisition starts.
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "QE_Setup<Nb. of setup>.vi" to change and save settings.

Target

- Indicates the first wavelength target.
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "QE_Setup<Nb. of setup>.vi" to change and save settings.

Increment

- Indicates the incremental step between the first start wavelength and the first wavelength target.
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "QE_Setup<Nb. of setup>.vi" to change and save settings.

Start wavelength2

- Indicates the wavelength from which the QE acquisition goes on after the first wavelength target has been reached.
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "QE_Setup<Nb. of setup>.vi" to change and save settings.

Target2

- Indicates the second wavelength target.
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "QE_Setup<Nb. of setup>.vi" to change and save settings.

Increment2

- Indicates the incremental step between the second start wavelength and the second wavelength target.
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "QE_Setup<Nb. of setup>.vi" to change and save settings.

Bandwidth

- Indicates the bandwidth for the QE acquisition according to the specified setup ("QE setup").
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "QE_Setup<Nb. of setup>.vi" to change and save settings.

Flat field mean level

• Indicates the ADU mean level of all flat field images according to the specified



GEN-MAN-ESO-21110-0028 1D2 05.03.08 126 of 135

Doc:

Issue:

Date:

Page:

setup ("QE setup"). The flat field mean level includes the offset.

- It is possible to change this parameter temporarily. (it won't be saved)
- Open the "QE_Setup<Nb. of setup>.vi" to change and save settings.

Readout mode

- Indicates the selected readout mode(s) (depending on the specified "CCD name") for the QE acquisition according to the specified setup ("QE setup").
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "QE_Setup<Nb. of setup>.vi" to change and save settings.

Ele Edit View Project Operate Tools Window Help Press "Ctrf" + "H" for context help Start acquisition Noise/Gain Cosmetic Quantum efficiency Linearity Pocket Pumping Dark current Progress Inearity setup default 630 mm Bandwidth 7 mm Exposure time 2.5 sec. From density 0.0 to density: 3.6 Readout modes (Marc) 1 6 50kpx/rhl/H5/512 2 15 225kpb:/rhl/H5/512 3 7 625kpx/rr/H6	MasterPanel2.0. vi Front Panel
Press "Ctrl" + "H" for context help Start acquisition Noise/Gain Cosmetic Quantum efficiency Inearity setup default Bandwidth 7 Bandwidth 7 Progress Progress Bandwidth 7 Progress Bandwidth 7 Progress Bandwidth 7 Bandwidth 7 Image: Sec. Prom density 0.0 to density: 3.6 Readout modes (DMarc) 1 5 25 25 25 3 7 6 1 5 25 1 5 1 5 25 25 3 7 6 1 1 5 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 <td></td>	
Start acquisition Noise//Gain Cosmetic Quantum efficiency Inearity Pocket Pumping Dark current Progress Inearity setup Imearity Vavelength 30 nm Bandwidth 7 7 nm Bandwidth 7 7 10 10 10 11 12 12 13 13 14 15 20kx/nt/hl/HG/512 15 15 15 16 17 18 19 19 10 10 11 11 12 13 13 14 15 15 16 17 18 19 19 10 10 11 11 12 13 14 15 15 16 17 18 19 19 10 10 10 11 11 12 13 14 15 16 <td></td>	
Noise/Gain Cosmetic Quantum efficiency Linearity Pocket Pumping Dark current Progress Inearity setup default Wavelength 630 nm Bandwidth 7 7 m Exposure time 2.5 sec. From density 0.0 to density: 3.6 Readout modes (1 6 50kpx/hkl/Hs/512 2 15 225kps/rt/Hs	Press "Ctrl" + "H" for context help
Incarity setup default Barbourde 03 m Bandwidth 7 1 2.5 Second Image: Second Se	Start acquisition
Incarity setup default Barbourde 03 m Bandwidth 7 1 2.5 Second Image: Second Se	Noise/Gain Cosmetic Quantum efficiency Linearity Pocket Pumping Dark current Progress
Linearity setup default Wavelength 630 nm Bandwidth 7 nm 2.5 sec. From density 0.0 to density: 3.6 Readout modes (DMarc) 1 6 50kpx/rhl/HG/512 2 15 225kpix/rhl/HG/512 3 7 625kpx/rr/HG	
default 630 630 630 Bandwidth 7 7 8andwidth 7 9 2.5 sec. From density 0.0 to density: 3.6 Readout modes (DMarc) 1 6 50kpx/ht/lHG/512 2 15 225kpix/ht/lHG/512 3 7 625kpx/ht/lHG/512 3 7 625kpx/ht/lHG/512 3 7 625kpx/ht/lHG/512	
wavelength 630 mm Bandwidth 7 mm 2.5 sec. From density 0.0 to density: 3.6 Readout modes (DMarc) 1 6 50kpx/rhl/HG/512 2 15 225kpix/rhl/HG/512 3 7 625kpx/rrl/HG	
630 nm Bandwidth 7 7 nm Exposure time 2.5 2.5 sec. From density 0.0 to density: 3.6 3.6	
Bandwidth 7 Tom Exposure time 2.5 2.5 sec. Tom density 0.0 to density: 3.6 Readout modes (DMarc) 1 6 5 225kpix/rhfl/HG/512 3 7 625kpx/rhfl/HG/512 3 7	Wavelength
7 nm Exposure time 2.5 2.5 sec. From density 0.0 to density: 3.6 3.6 3.6 Readout modes (DMarc) 1 1 6 50kpx/rhl/HG/512 2 15 22Skpix/rhl/HG/512 3 7 62Skpx/rr/HG	630 nm
Exposure time 2.5 sec. From density 0.0 to density: 3.6 Readout modes (DMarc) 1 6 50kpx/rhl/HG/512 2 15 25kpix/rhl/HG/512 3 7 625kpx/rhl/HG	Bandwidth
2.5 sec. From density 0.0 to density: 3.6 Readout modes (DMarc) 1 6 50kpx/rhl/HG/512 2 15 225kpix/rhl/HG/512 3 7 625kpx/rr/HG	7 nm
From density 0.0 to density: 3.6 Readout modes (DMarc) 1 6 50kpx/rhl/HG/512 2 15 225kpix/rhl/HG/512 3 7 625kpx/rr/HG	Exposure time
3.6 Readout modes (DMarc) 1 6 50kpx/rhl/HG/512 2 15 225kpix/rhl/HG/512 3 7 625kpx/rr/HG	2.5 sec.
Readout modes (DMarc) 1 6 50kpx/rhl/HG/512 2 15 225kpix/rhl/HG/512 3 7 625kpx/rr/HG	From density 0.0 to density:
1 6 50kpx/rhl/HG/512 2 15 225kpix/rhl/HG/512 3 7 625kpx/rr/HG	3.6
2 15 225kpix/trl/HG/512 3 7 625kpx/trl/HG	Readout modes (DMarc)
2 15 225kpix/trl/HG/512 3 7 625kpx/trl/HG	1 6 50km//////G/512
3 7 625kpx/m/HG	
	2 15 225kpix/rirl/HG/512
	3 7 625kpx/rr/HG
in o ority	Linearity



GEN-MAN-ESO-21110-0028 1D2 05.03.08 127 of 135

Doc:

Issue:

Date:

Page:

Controls, indicators and functions

Linearity (🗹)

• Enable this control in order to proceed the Linearity data acquisition after having started the data acquisition by pressing the "Start acquisition" button.

Linearity setup

- Pull-down menu to select the setup.
- The selected setup's parameters are displayed below.
- However it is possible to change parameters temporarily.

Wavelength

- Indicates the wavelength for the Linearity acquisition according to the specified setup ("Linearity setup").
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "Linearity_Setup<Nb. of setup>.vi" to change and save settings.

Bandwidth

- Indicates the bandwidth for the Linearity acquisition according to the specified setup ("Linearity setup").
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "Linearity_Setup<Nb. of setup>.vi" to change and save settings.

Exposure time

- Indicates the exposure time for the Linearity acquisition according to the specified setup ("Linearity setup").
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "Linearity_Setup<Nb. of setup>.vi" to change and save settings.

Density

- Indicates the final density for the Linearity acquisition according to the specified setup ("Linearity setup"). The Linearity acquisition starts at density 0.0 and ends at the specified density (0.0 to max. 4.9).
- Select a new density to change this parameter temporarily. (it won't be saved)
- Open the "Linearity_Setup<Nb. of setup>.vi" to change and save settings.

Readout modes

- Indicates the selected readout mode(s) (depending on the specified "CCD name") for the Linearity acquisition according to the specified setup ("Linearity setup").
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "Linearity_Setup<Nb. of setup>.vi" to change and save settings.



GEN-MAN-ESO-21110-0028 1D2 05.03.08 128 of 135

Doc:

Issue:

Date:

Page:

🛿 MasterPanel2.0.vi Front Panel
Eile Edit View Project Operate Tools Window Help
Press "Ctrl" + "H" for context help
Noise/Gain Cosmetic Quantum efficiency Linearity Pocket Pumping Dark current Progress
Pocket Pumping setup
default
Wavelength
632
Bandwidth
7
Readout mode (DMarc)
11 225kp×/rr/HG/PocketPumping
Flat field mean level
18000 ADU (incl. offset)
Use readout mode
(DMarc)
2 225kpx/rr/HG/512



Controls, indicators and functions

Pocket Pumping (🗹)

• Enable this control in order to proceed the Pocket Pumping data acquisition after having started the data acquisition by pressing the "Start acquisition" button.

Pocket Pumping setup

- Pull-down menu to select the setup.
- The selected setup's parameters are displayed below.
- However it is possible to change parameters temporarily.



Doc:

Issue:

Date:

Page:

Wavelength

- Indicates the wavelength for the Pocket Pumping acquisition according to the specified setup ("Pocket Pumping setup").
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "Pocket Pumping_Setup<Nb. of setup>.vi" to change and save settings.

Bandwidth

- Indicates the bandwidth for the Pocket Pumping acquisition according to the specified setup ("Pocket Pumping setup").
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "Pocket Pumping_Setup<Nb. of setup>.vi" to change and save settings.

Readout mode

- Indicates the selected readout mode(s) (depending on the specified "CCD name") for the Pocket Pumping acquisition according to the specified setup ("Pocket Pumping setup").
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "Pocket Pumping_Setup<Nb. of setup>.vi" to change and save settings.

Flat field mean level

- Indicates the ADU mean level of all flat field images according to the specified setup ("Pocket Pumping setup"). The flat field mean level includes the offset.
- It is possible to change this parameter temporarily. (it won't be saved)
- Open the "Pocket Pumping_Setup<Nb. of setup>.vi" to change and save settings.

Readout mode for flat field mean level

- Indicates the selected readout mode(s) (depending on the specified "CCD name") which is used while adjusting exposure time and density to reach the ADU mean level.
- It is possible to change this parameter temporarily. (it won't be saved)
- Open the "Pocket Pumping_Setup<Nb. of setup>.vi" to change and save settings.



GEN-MAN-ESO-21110-0028
1D2
05.03.08
130 of 135

Doc: Issue:

Date: Page:

🔯 MasterPanel2.0.vi Front Panel	
Eile Edit View Project Operate Iools Window Help	Master
	Panel
Press "Ctrl" + "H" for context help Start acquisition	
Noise/Gain Cosmetic Quantum efficiency Linearity Pocket F	Pumping Dark current Progress
Dark current setup	
Test setup	
Bias	
Nb. (-)3	
Dark	
Number 🗍 3 Integration time 🗍 15 min	15min
Number 4 3 Integration time 4 60 min	1h
integration time 300 milli	
Readout modes (DMarc)	
1 6 50kp×/r/r//HG/512	50kpx
2 15 225kpix/rlrl/HG/512	225крх
	<u>.</u>

Dark current

Controls, indicators and functions

Dark current (🗹)

• Enable this control in order to proceed the Dark current data acquisition after having started the data acquisition by pressing the "Start acquisition" button.

Dark current setup

- Pull-down menu to select the setup.
- The selected setup's parameters are displayed below.
- However it is possible to change parameters temporarily.



Doc:

Issue:

Date:

Page:

Bias

- Indicates the "Number" of bias exposures to take.
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "Dark current_Setup<Nb. of setup>.vi" to change and save settings.

Dark

- Indicates the "Number" of dark exposures to take as well as the "Integration time" in minutes.
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "Dark current_Setup<Nb. of setup>.vi" to change and save settings.

Readout modes

- Indicates the selected readout mode(s) (depending on the specified "CCD name") for the Dark current acquisition according to the specified setup ("Dark current setup").
- It is possible to change this parameter temporarily but it won't be saved!
- Open the "Dark current_Setup<Nb. of setup>.vi" to change and save settings.



GEN-	MAN-ESO-21110-0028
1D2	
05.03	.08
132 c	f 135

Doc: Issue:

Date: Page:

MasterPanel2.0. vi
Eile Edit Yiew Project Operate Tools Window Help
Press "Ctrl" + "H" for context help
Noise/Gain Cosmetic Quantum efficiency Linearity Pocket Pumping Dark current Progress
Global
Acquisition Inactive
Exposure nb. 0 of 0
Operational state
online
Exposure status
pending
Telnet log 1
_
Telnet log 2

Progress

Controls and functions

Start Acquisition

• Press this button to start the selected acquisition(s) beginning from the left.

Indicators

busy

• Indicates that the VI is busy.



Doc:

Issue:

Date:

Page:

Acquisition

• Displays the acquisition that is currently proceeded.

Exposure nb.

• Displays the current exposure's number.

of

• Displays the number of exposures to take for the "Acquisition" which is in progress.

Operational state

• Indicates the status of the FIERA software.

Exposure status

• Indicates the Status of the current exposure.

Telnet log

• Displays the commands sent and the data received from FIERA via telnet connection to prepare and take exposures.

Telnet log 2

• Logs the commands sent and the data received from FIERA via telnet connection to read the exposure status.

SubVI´s



USB Interface Board_remote2.0.vi



Check range(SubVI).vi

|--|

Wavelength select.vi

camp on
PWS.
OK?

Lamp ok.vi



Common_error_log2.0(SubVI).vi



GEN-MAN-ESO-21110-0028 1D2 05.03.08 134 of 135

Doc:

Issue:

Date:

Page:

KE2100	Keithley 2100 Series Read Single.vi
Ĕ	

MSH301_ok(SubVI).vi



mond

OK?

MSH301_SetShutter(SubVI).vi



Fiera_login.vi



Fiera_write_command (SubVI).vi



Build name(SubVI).vi

Build name Cosmet
name
Cosmet

Build name Cosmetic(SubVI).vi

Build
name
Linearity

Build name Linearity(SubVI).vi



Build DIR DarkCurrent(SubVI).vi

ľ	Build
	name
	dar/d
	Dias

Build name dark_bias (SubVI).vi



ADU mean level2.0.vi



MSH301_remotecontrol2.0.vi



FIERA_remotecontrol2.0.vi



Exposure Time Correction(SubVI).vi



Fiera_close_session (SubVI).vi

Pocket Pumping_Setup1.vi

Pocket Pumping_Setup2.vi



GEN-MAN-ESO-21110-0028 1D2 05.03.08 135 of 135

Doc:

Issue:

Date:

Page:

Pocket Pumping_Setup3.vi

Cosmetic_Setup3.vi

Cosmetic_Setup1.vi

Cosmetic_Setup2.vi

Noise Gain_Setup1.vi

Noise Gain_Setup2.vi

Noise Gain_Setup3.vi

Dark Current_Setup1.vi

Dark Current_Setup2.vi

Dark Current_Setup3.vi

Linearity_Setup1.vi

Linearity_Setup2.vi

Linearity_Setup3.vi

QESetup1.vi

QESetup2.vi

- QESetup3.vi
- Acquistion_Setup.vi
- DeviceDriver_Setup.vi

Block diagram

Open the "MasterPanel2.0.vi" and press "C+""+"E" to view the LabView code (block diagram).

Known problems

None

References and contact

Refer to the user manuals of the devices listed under "Purpose"