

	ReadoutShell	↑ _ □ >
File Data Source Settings		
itle: IC Pulser test		Run Number: 37
Start Begin Pause Record	□ Timed Run 0	0 00:00:00 Active Run Tim
main		
o event segments recorded yet		

Then press start and you should see the VME crate attach like

	ReadoutShell	+ - □ ×
File Data Source Settings		
Title: IC Pulser test		Run Number: 37
Start Begin Pause Record	Time	0 00:00:00 Active Run Time d Run 0
main SSHPipe@spdaq48:0		
06/15/2019 12:08:34 : output Unauthorized use is prohibite	: SSHPipe@spdaq48:0: [at Mic ad, and	higan State University.
06/15/2019 12:08:34 : output	: SSHPipe@spdaq48:0: [all ac	tivity may be monitored.
06/15/2019 12:08:34 : output	: SSHPipe@spdaq48:0: [
06/15/2019 12:08:34 : output the rules described in the	: SSHPipe@spdaq48:0: [Users	of this system are bound by
06/15/2019 12:08:34 : output available from Portal:	: SSHPipe@spdaq48:0: [Labora	tory Acceptable Use Policy
06/15/2019 12:08:34 : joutput https://portal.frib.m∍u.edu/o	: SSHPipe@spdaq48:0: [dcc/pages/dcclink.aspx?WBS=S102	04⋐=P0&SN=000020
06/15/2019 12:08:34 : output	: SSHPipe@spdaq48:0:	
06/15/2019 12:08:37 : output firmware: 3d000a00	: SSHPipe@spdaq48:0: Attached	VMUSB controller with
I segments recorded yet		

If this doesn't happen, make sure the VME crate is on and look at the section for restarting the DAQ.

You are now ready to take data. If you want to record data, make sure the record button is ticked. You can verify data is coming in by running ./dumper from the home directory. This just outputs everything being read in by the DAQ. You can also pass valid dumper command arguments through this wrapped. For example ./dumper --count 10 will only output the first 10 items. A full list of valid argumets can be found with man dumper .

SpecTcl

Right now, TTree generation is not completely automated in SpecTcl. This means there is an additional step that has to be done after each startup.

Launching SpecTcl

To launch SpecTc1, cd SpecTc1 and then ./SpecTc1. It will take a few seconds for it to fully load. After it is fully loaded, go to the terminal you used to open SpecTcl and type the command roottree create tr * . You can verify it worked with the command roottree list. For those curious, you can find the documentation for this command [here].(http://docs.nscl.msu.edu/daq/newsite/spectcl-5.0/cmdref/r3059.html) At this point that command line should look something like

	Terminal		+ _ □ ×
<u>File Edit View Terminal Tabs Help</u>			
the list of credits.			-
% Error in <rootx11errorhandler< td=""><td>'>: BadWindow (inval)</td><td>id Window parameter</td><td>) (XID: 713</td></rootx11errorhandler<>	'>: BadWindow (inval)	id Window parameter) (XID: 713
03188, XREQ: 15)			
Error in <rootx11errorhandler>:</rootx11errorhandler>	BadWindow (invalid	Window parameter)	(XID: 71303
Error in <pootx11errorhandlers:< td=""><td>BadWindow (invalid</td><td>Window parameter)</td><td>(XID· 71303</td></pootx11errorhandlers:<>	BadWindow (invalid	Window parameter)	(XID· 71303
188, XREQ: 15)	Badwindow (invacio	window parameter,	(/10: /1505
Error in <rootx11errorhandler>:</rootx11errorhandler>	BadWindow (invalid	Window parameter)	(XID: 71303
188, XREQ: 15)			
Error in <rootx11errorhandler>:</rootx11errorhandler>	BadWindow (invalid	Window parameter)	(XID: 71303
188, XREQ: 15)			
Error in <rootx11errorhandler>:</rootx11errorhandler>	BadWindow (invalid	Window parameter)	(XID: 71303
188, XREQ: 15)			
Error in <rootx11errorhandler>:</rootx11errorhandler>	BadWindow (invalid	Window parameter)	(XID: 71303
188, XREQ: 15)			
ſ			
ж. Т			
% roottree create tr *			
% roottree list			
{tr * -TRUE-}			
%			-

Closing SpecTcl

To close SpecTcl, you should always use the purple Exit button on the bottom of this window



Using SpecTcl

In order for SpecTcl to be of any use, you have to attach a data source. Usually, this will be an online data source (a ringbuffer) or a .evt file. The data source is selected from the data source tab. Make sure that ring11 is selected and the buffer size is set to 8192.

			tı	reegui							^ _	
File Edit Data Source	Filters Spe	ctra Gate Help										
pectra P Online	bles Gate	Folders										
File		Data Type								De	finition file:	
♦ 1D	nask		s)						l r	Unknown	1	
A 2D List of runs	nma1D	Long (32 bits)	5)							Load		/e
Filter File		A Dute (0 bits)								Cumula		Isale
Detach	IMa2D											
♦ Stripc_Detach												
SpectrumName		Create/	Replace		Clear		D	elete	Gat	e 🗆	Apply	
		🗆 Array		A	11		Du	olicate			Ungate	
Parameter	Low	High Bins	Units		Para	ameter	-	Low	High	Bins	Units	
Name	🛧 Туре	X Parameter	Low	High	Bins	Y Para	ameter	Low	High	Bins	Gate	
adc1.00	11	adc1.00	0	8191	8192							
adc1.01	11	adc1.01	0	8191	8192							
adc1.02	11	adc1.02	0	8191	8192							
adc1.03	11	adc1.03	0	8191	8192							
adc1.04	11	adc1.04	0	8191	8192							
adc1.05	11	adc1.05	0	8191	8192							
adc1.06	11	adc1.06	0	8191	8192							
adc1.07	11	adc1.07	0	8191	8192							
adc1.08	11	adc1.08	0	8191	8192							
adc1.09	11	adc1.09	0	9101	0192							
adc1.10	11	adc1.10	0	8101	8192							
adc1.12	11	adc1.12	0	8101	8102							
adc1.12	11	adc1.12	0	8191	8192							
adc1.14	11	adc1.14	0	8191	8192							
			0	8191	8192							
adc1.15	11	adc1.15	0									
adc1.15 adc1.16	11	adc1.15 adc1.16	0	8191	8192							
adc1.15 adc1.16 adc1.17	1 1 1	adc1.15 adc1.16 adc1.17	0	8191 8191	8192 8192							
adc1.15 adc1.16 adc1.17 adc1.18	1 1 1 1	adc1.15 adc1.16 adc1.17 adc1.18	0 0 0	8191 8191 8191	8192 8192 8192							
adc1.15 adc1.16 adc1.17 adc1.18	1 1 1 1	adcl.15 adcl.16 adcl.17 adcl.18	0 0 0	8191 8191 8191	8192 8192 8192							_

When connecting online, make sure the settings match those below

hostpromp	t ↑ _□	×
N Host:	spdaq48	
Ring:	e15507	
Buffer size in bytes:	8192	
Data format		
○ nscl ○ jumbo ○ ring10 ④ ring11	L	
Ok	Cancel Hel	p

For offline, the .evt files are located in ~/experiment/run#/

prompt	+ - □ X
lter	
/user/e15507/experiment/ru	n36/*.evt
Directories	Files
•	run-0036-00.evt
Calastian	
Selection	26/rup 0026 00 out
/user/e15507/experiment/ru	n36/run-0036-00.eVt
Buffer size:	8192
⊂ nscl ⊂ jumbo ⊂ ring10 ⊙ r	ing11
Ok	Cancel

Data should now be coming in. At list point, you will want to load in and def-files, making sure Cumulative is checked. Now window files can be

Every parameter defined in SpecTcl will be written to a TTree with the name run-#.root in ~/SpecTcl . After each run, this should be moved out of this directory to the analysis directory with

scp ~/SpecTcl/*.root e15507@fishtank:/mnt/analysis/e15507/SpecTclTTree/
rm ~/SpecTcl/*.root

In order for a TTree to be generated with online data, SpecTcl must be connected to the data source before the run starts. Otherwise it misses the start_run ringbuffer item.

Scalers

Coming soon!

Signal Switcher

Coming soon!

PulserGUI

To run the pusler GUI cd ~/pulser and run wish pulserGUI_BLUE_fission.tcl . You should see a window like

ВNC PB-5	5 Control BLUE	+ - □ ×
Connect	Exit	Pulse On
Current State: No	t Connected.	
	I	
Set Amplitude		Volts
Set Frequency		Hz
Set Attenuation	1 X	Factor
Ramp Pulser		
Set Negative	Min. Max.	(V) Num. Time (s)
Auto Flip		
	Num. I	nterval OffTime

To connect to the pulser press the **Connect** button, and then push **Pulse On** to start the pulser. The window should look like this now

🔳 ВМС РВ	BNC PB-5 Control BLUE 🔶 🗕 🗆 🗡					
Disconnect	Exit	Pulse Off				
Current State: Pulsing FREQUENCY: 100 Hz PULSE WIDTH: 100 ns DELAY: 250 ns RISE TIME: 50 ns FALL TIME: 100000 ns Polality Set At: Negative POLARITY: Negative CLAMP BASELINE: OFF						
Set Amplitude		Volts				
Set Frequency		Hz				
Set Attenuation	1 X	Factor				
Ramp Pulser						
Set Positive	Min. Max.	(V) Num. Time (s)				
Auto Flip						
	Num. I	nterval OffTime				

HV control

The HV control GUI used is a modified version of the standard NSCLDAQ vhqControl. It was changed to add more descriptive channel names. This program works through communication over the fiber optic interface between the DAQ computer and the VME crate. This means that the program has to be run on the DAQ computer that is physically attached to the VME crate. The launch scripts ~/goHVUS and ~/goHVDS handle this all for you. The actual program being called is ~/HVcontrol/vhgControl with the appropriate configuration scripts passed. All of the configuration scripts are located in ~/HVcontrol if they need to be modified. DO NOT try to change the configuration scripts through the GUI interface!

To launch the voltage control of the focal plane MCP, run \sim /goHVUS . You should see 2 windows pop up that look like

🗖 vhq0 🕆 _ 🗆 🗙	□ vhq1
File Configure Help	File Configure Help
Name: FocalPlaneMCP @ Crate: 0 Base: 0xdc00	Name: FocalPlaneFoil @ Crate: 0 Base: 0xed00
Channel A: MCP	Channel A: Foil
Current 1.32 uAmps	Current 0.0 uAmps
Voltage 0 Volts	Voltage 0 Volts
Target V 2000 🔮 Volts	Target V 1500 🗘 Volts
Ramp Off	Ramp Off
Channel B: E-Field	Channel B: Unused
Current 0.66 uAmps	Current 0.0 uAmps
Voltage 0 Volts	Voltage 0 Volts
Target V 3000 🔮 Volts	Target V 0 🖶 Volts
Ramp Off	Ramp Off
	2

The downstream HV control works the same way as the focal plane HV control, but there are three windows. The additional one is for control of the ion chamber bias.

Hornet Control

To launch the ion gauge control run ~/goHornet . This launches a Tcl GUI written by Adam to monitor the pressure in the MCP and Ion Chamber sections of the chamber. When it launches, you should see a small window with two tabs. It seems to like to crash after being open for a bit, if that happens just close it and reopen it

If the IC is on, it will display and update the pressure every two seconds and look like

Hornet I	G Control GU	I +_□×
1.12	E-06	torr
Off Status: OK IG is	Degas On	Reset

If the ion gauge is off, then you should see something like

Hornet IG	i Control GU	∥ +_□×
9.991	E+09	torr
On Status: OK IG is 0	Degas Off	Reset

The **On/Off** button toggles the power status. It will take up to 15 seconds to turn on, so be patient. You can also read the power status and any error from the status bar below the pressure reading.

ELog

Coming soon!

PanelMate Control

Coming soon!

FAQs

Below is a list of common problems I've encountered and how to fix them. As we find more problems, I'll add them to the list

Firefox

Because all of the computers share a home directory, I've found firerfox can often screw up its locks. To fix this problem cd ~/.mozilla/firefox and delete the files lock and .parentlock from the profile directory. I've found that the right profile to try is 2rbkukgx.Kyle.

Restarting DAQ

If you see something like this

ReadoutShell	+ _ □ X
File Data Source Settings	
Title: IC Pulser test	Run Number: 37
Start Begin Pause	0 00:00:00 Active Run Time Timed Run 0
main (2) SSHPipe@spdaq48:0 DataSourceMonitor	
06/15/2019 13:07:42 : output : SSHPipe@spdaq48:0:	[
06/15/2019 13:07:42 : output : SSHPipe@spdaq48:0: the rules described in the	[Users of this system are bound by
06/15/2019 13:07:42 : output : SSHPipe@spdaq48:0: available from Portal:	[Laboratory Acceptable Use Policy
06/15/2019 13:07:42 : output : SSHPipe@spdaq48:0: https://portal.frib.msu.edu/dcc/pages/dcclink.asp	[x?WBS=S10204⋐=P0&SN=000020
06/15/2019 13:07:42 : output : SSHPipe@spdaq48:0:	+
06/15/2019 13:07:43 : output : SSHPipe@spdaq48:0: exception CVMUSBusb::CVMUSBusb - some other proce	CTheApplication caught a char* ss has already claimed
06/15/2019 13:07:43 : output : SSHPipe@spdaq48:0: /usr/opt/nscldaq/11.3-014/bin/start.bash: line 5:	29514 Segmentation fault \$@
96/15/2019 13:07:43 : sarning : SSHPipegapdaq48:0 /usr/opt/nscldag/11:3-014/bin/WHISBRaadoutgapdaq4	h Saurce B exited
No event segments recorded yet	

then you'll need to, probably, fully restart the DAQ. This often occurs when there is already a process registered as the producer for the e15507 ringbuffer. Either beacuse the DAQ crashed, or there is a readoutshell open somewhere else connected to ringbuffer e15507.

To restart the DAQ, start by \sim /GoSpdaq . Then type ringbuffer status . You should see some output like

<pre><spdaq48:~>ringbuffer status</spdaq48:~></pre>									
Name	data-size(k)	free(k)	max_consumers	producer	maxget(k)	minget(k)	client	clientdata(k)	I
e15507 -	8194 -	8167 -	100 -	29294 -	26 -	26 -	- 29308	- 26	+
+	+	+	+	+	+	+	+	+	+

Kill the process that is registered as the producer kill 29294 and delete the ringbuffer ringbuffer delete e15507. You should then be able to use ReadoutShell to attach to the ringbuffer.

Slow Controls

Refused socket connection

Most problems with the slow controls stem from another copy of the program being open elsewhere. This is difficult to track down if you do not know where the program was opened last. This is particularly true of the PuslerGUI and Hornet Control as they both connect to a terminal server that only allows one connection at a time. When you try to connect to the terminal server if there is an existing open connection you will see an error like

```
<u3pc2:~ >./goHornet
Error in startup script: couldn't open socket: connection refused
while executing
"socket $terminalName.nscl.msu.edu 2001"
(procedure "start" line 6)
invoked from within
"start $server"
(file "/user/e15507/hornetIG/hornetGUI.tcl" line 47)
```

The challenge is tracking down the open process. The best way I've found is to ssh into each computer it might be open on (s2pc2, u3pc2, u3pc3) and kill any offending processes. You can find potential process IDs with the command ps aux | grep wish . This should fix the problem.