



Sudikshan Ravinthiran

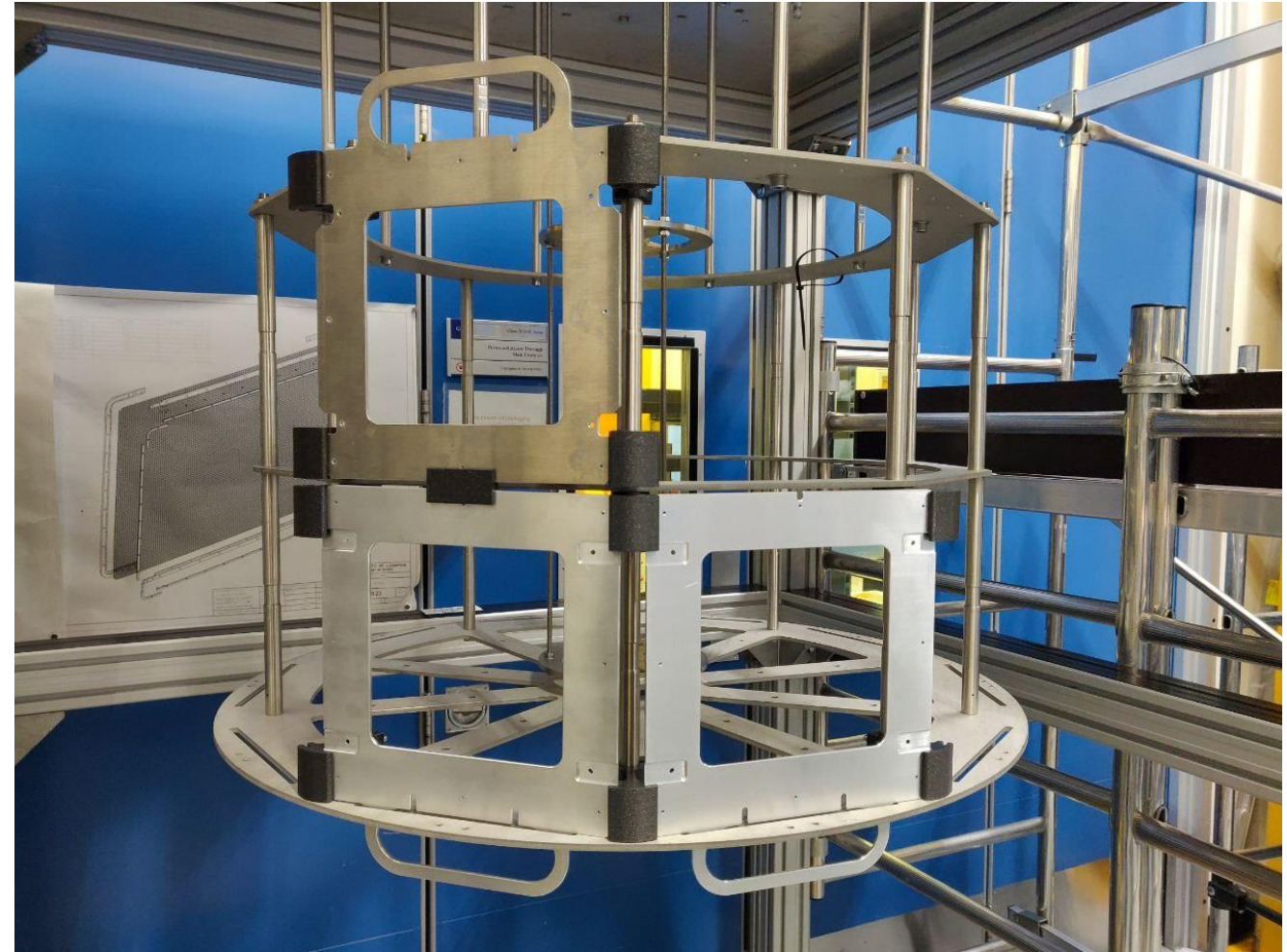


This is PHAIDRA

Planned to contain 40 VPDUs for Nitrogen cold testing.



Current progress on the PDU Frame



PHAI DAQ

Current functions and commands



This is PHAIDAQ

A DAQ system with the following principle components:

- Currently with a single digitizer board.
- A power supply.
- A laptop acting as the DAQ for this setup.



The laptop

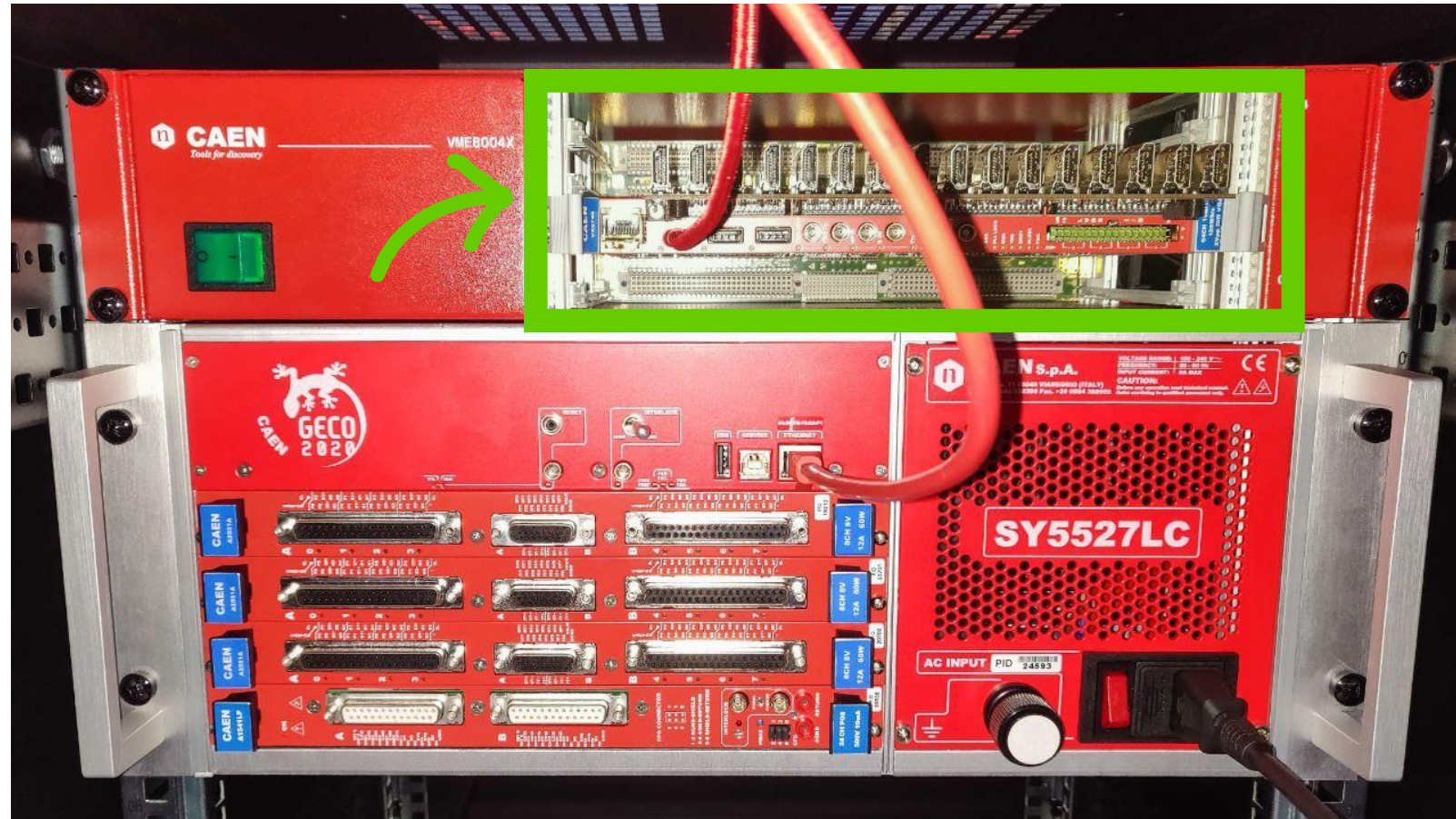
The DAQ laptop has a Windows 11 OS with a Linux virtual machine. The virtual machine has the following specs:

- Ubuntu 20.04
- 1000 Gb storage
- 32 Gb RAM
- A laptop acting as the DAQ for this setup.



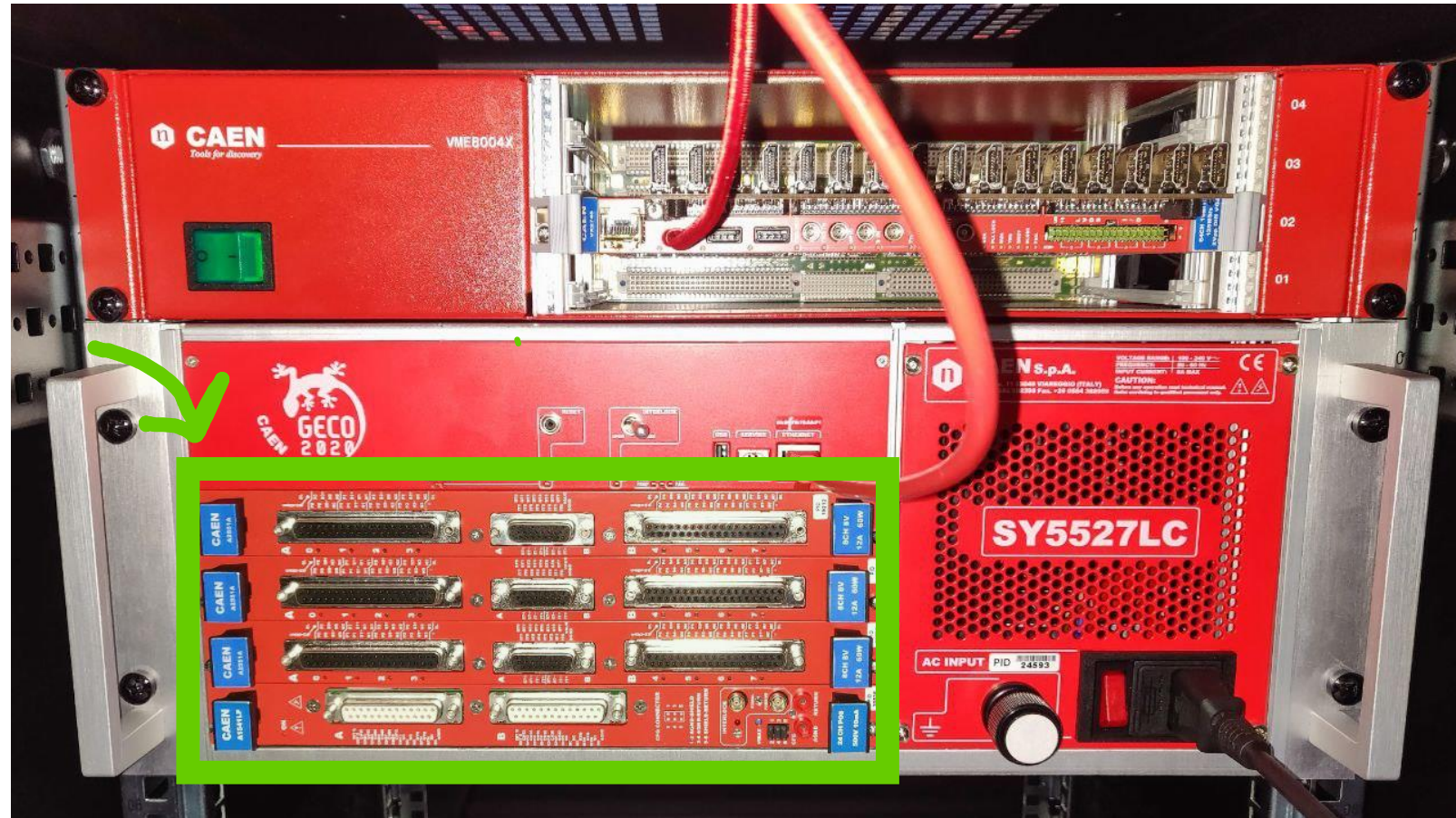
The current setup

- Digitizer: Single VX2745 board currently in slot #2 of 4 in the VME80D4X rack:
 - It is currently connecting to the laptop via USB.
 - Has **64 channels**.
 - Every 4 channel port is also connected to a single HDMI port. **16 HDMI** ports in total.
 - **DC offset** of ± 2.5 V.



The current setup

- Power Supply: Geco 2020 SY5527LC with:
 - 3 CAEN A2551A boards inserted in the top 3 slots.
Low Voltage with 8 channels.
 - A CAEN A1541LP board inserted in the bottom slot. The power supply is connected to the laptop via ethernet port.
High Voltage with 24 channels.



Midas page

☰ phaidra

Alarms: None

13 Mar 2023, 15:46:39 UTC

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- VX2740 Settings
- dsanana

Run Status

Run 103	Start: Fri Mar 10 15:01:13 2023	Stop: Fri Mar 10 15:06:13 2023
Stopped	Alarms: On	Restart: Off
<input type="button" value="Start"/>	Data dir: /home/darkside/online/dsdata/phaidra/sandbox	

Experiment Name: **Phaidra (ds)**

Run type: testing sequencer

Shifter: SR

Comment: test run

Write Data:

1678722354 15:45:54.444 2023/03/13 [mhttpd,INFO] Alarm "Logger" reset

Equipment

Equipment +	Status	Events	Events[/s]	Data[MB/s]
VX2740_Errors_Group_000	VX2740_Group_00@localhost	0	0.0	0.000
VX2740_Config_Group_000	VX2740_Group_00@localhost	0	0.0	0.000
VX2740_Data_Group_000	VX2740_Group_00@localhost	0	0.0	0.000
CAEN_HV	CAENHV@localhost	0	0.0	0.000

Logging Channels

Channel	Events	MB written	Compr.	Disk Level
#0: run00094sub0000.mid	0	0.000	0.0%	7.1%

Lazy Label	Progress	File Name	# Files	Total
runcopy	0.0%	run00094sub0000.mid	54	0.0%

Clients

Lazy_runcopy [localhost]	mhttpd [localhost]	Logger [localhost]
VX2740_Group_00 [localhost]	CAENHV [localhost]	dsanana [localhost]
Sequencer [localhost]		

VX2745 Settings

phaidra

Alarms: None

13 Mar 2023, 15:46:39 UTC

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Run Status

Run 103	Start: Fri Mar 10 15:01:13 2023	Stop: Fri Mar 10 15:06:13 2023
Stopped	Alarms: On	Restart: Off
<input type="button" value="Start"/>	Data dir: /home/darkside/online/dsdata/phaidra/sandbox	

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VX2740_Config_Group_000	VX2740_Group_00@localhost	0	0.0	0.000
VX2740_Data_Group_000	VX2740_Group_00@localhost	0	0.0	0.000
CAEN_HV	CAENHV@localhost	0	0.0	0.000

Logging Channels

Channel	Events	MB written	Compr.	Disk Level
#0: run00094sub0000.mid	0	0.000	0.0%	7.1%

Lazy Label	Progress	File Name	# Files	Total
runcopy	0.0%	run00094sub0000.mid	54	0.0%

Clients

Lazy_runcopy [localhost]	mhttpd [localhost]	Logger [localhost]
VX2740_Group_00 [localhost]	CAENHV [localhost]	dsanana [localhost]
Sequencer [localhost]		

VX2740 Settings

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The VX2740 group frontend structure lets you set some "default" parameters that apply to all boards, then specific "override" values for individual boards. Parameters that have been overridden for specific boards are highlighted in yellow. Use the +/- buttons to add/remove overridden values.

If you no longer want to run the "group" frontends, and want to revert to the "single" frontends, delete the ODB key /VX2740 defaults, then refresh this page to see an updated interface.

Midas does not support 64-bit values in the ODB, so some channel masks are split into two - one for channels 0-31 and one for channels 32-63.

The VX2740 has *two* internal self-triggers for comparing waveforms to threshold values; these are referred to as A and B; you can enable neither, either, both, or require a coincidence of both.

Jump to: [Main settings](#) [Waveform readout](#) [Global Trigger](#) [CAEN threshold trigger \(Scope only\)](#) [Darkside trigger \(DPP only\)](#) [Darkside filter \(DPP only\)](#) [Veto](#) [Run start](#) [Front panel](#) [Signal conditioning](#) [Test pulse](#)

[Apply settings to group 000 now](#)

Per-frontend group settings	
Parameter	000
Num boards (restart on change)	1
Merge data using event ID	<input checked="" type="checkbox"/>
Debug data	<input type="checkbox"/>
Debug settings	<input type="checkbox"/>
Debug ring buffers	<input type="checkbox"/>
Multi-threaded readout	<input checked="" type="checkbox"/>

Per-board settings		
Parameter	Default value	Group/board overrides
Main settings		
Hostname (restart on change)	localhost	caendgtz-usb-23201
Model name (readback)		VX2745
Firmware version (readback)		2022052302
Enable	<input checked="" type="checkbox"/>	
Read data	<input checked="" type="checkbox"/>	
Scope mode (restart on change)	<input checked="" type="checkbox"/>	
Waveform readout		
Scope waveform length <small>Max 524280 samples; multiples of 4 samples</small>	1000 samples (8 <input type="text"/> μs)	
Scope pre-trigger <small>Max 2042 samples</small>	100 samples (0.8 <input type="text"/> μs)	
Readout channel mask (31-0)	0xffffffff [00] <input checked="" type="checkbox"/> [01] <input checked="" type="checkbox"/> [02] <input checked="" type="checkbox"/> [03] <input checked="" type="checkbox"/> [04] <input checked="" type="checkbox"/> [05] <input checked="" type="checkbox"/> [06] <input checked="" type="checkbox"/> [07] <input checked="" type="checkbox"/>	

VX2740 Settings

Global Trigger		
Trigger on ch over thresh A	<input type="checkbox"/>	+
Trigger on ch over thresh B	<input type="checkbox"/>	+
Trigger on ch over thresh A&&B <i>Only trigger if A and B fire at the same time</i>	<input type="checkbox"/>	+
Trigger on external signal	<input checked="" type="checkbox"/>	+
Trigger on software signal	<input type="checkbox"/>	+
Trigger on user mode signal <i>See 'Darkside trigger' section for threshold and LVDS logic settings</i>	<input type="checkbox"/>	+
Trigger on test pulse	<input checked="" type="checkbox"/>	+
Trigger on LVDS Sync signal <i>This is the default CAEN logic. Not the same as the Darkside-specific 'Enable LVDS pair 12 trigger' setting!</i>	<input type="checkbox"/>	+
Test pulse period (ms)	100	+
Allow trigger overlap	<input type="checkbox"/>	+
Trigger delay (samples) <i>Max 4294967295 samples</i>	0 samples (0 <input type="text"/> μ s)	+
Trigger ID mode <i>TriggerCnt, EventCnt, LVDSpattern</i>	TriggerCnt	+
Trigger out mode <i>Disabled, TRGIN, P0, SwTrg, LVDS, ITLA, ITLB, ITLA_AND_ITLB, ITLA_OR_ITLB, EncodedClkIn, Run, RefClk, TestPulse, Busy, UserTrgout, Fixed0, Fixed1, Syncln, SIN, GPIO, LBinClk, AcceptTrg, TrgClk</i>	TRGIN	+

Chan over thresh thresholds <i>See also 'Use relative trig thresholds'</i>	[00] 32768 [01] 32768 [02] 32768 [03] 32768 [04] 32768 [05] 32768 [06] 32768 [07] 32768 [08] 32768 [09] 32768 [10] 32768 [11] 32768 [12] 32768 [13] 32768 [14] 32768 [15] 32768 [16] 32768 [17] 32768 [18] 32768 [19] 32768 [20] 32768 [21] 32768 [22] 32768 [23] 32768 [24] 32768 [25] 32768 [26] 32768 [27] 32768 [28] 32768 [29] 32768 [30] 32768 [31] 32768 [32] 32768 [33] 32768 [34] 32768 [35] 32768 [36] 32768 [37] 32768 [38] 32768 [39] 32768 [40] 32768 [41] 32768 [42] 32768 [43] 32768 [44] 32768 [45] 32768 [46] 32768 [47] 32768 [48] 32768 [49] 32768 [50] 32768 [51] 32768 [52] 32768 [53] 32768 [54] 32768 [55] 32768 [56] 32768 [57] 32768 [58] 32768 [59] 32768 [60] 32768 [61] 32768 [62] 32768 [63] 32768	+
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CAEN HV

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Alarms: None

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Run Status

Run 103	Start: Fri Mar 10 15:01:13 2023	Stop: Fri Mar 10 15:06:13 2023
Stopped	Alarms: On	Restart: Off
<input type="button" value="Start"/>	Data dir: /home/darkside/online/dsdata/phaidra/sandbox	

Experiment Name: **Phaidra (ds)**

Run type: testing sequencer

Shifter: SR

Comment: test run

Write Data:

1678722354 15:45:54.444 2023/03/13 [mhttpd,INFO] Alarm "Logger" reset

Equipment

Equipment +	Status	Events	Events[/s]	Data[MB/s]
VX2740_Errors_Group_000	VX2740_Group_00@localhost	0	0.0	0.000
VX2740_Config_Group_000	VX2740_Group_00@localhost	0	0.0	0.000
VX2740_Data_Group_000	VX2740_Group_00@localhost	0	0.0	0.000
CAEN_HV	CAENHV@localhost	0	0.0	0.000

Logging Channels

Channel	Events	MB written	Compr.	Disk Level
#0: run00094sub0000.mid	0	0.000	0.0%	7.1%

Lazy Label	Progress	File Name	# Files	Total
runcopy	0.0%	run00094sub0000.mid	54	0.0%

Clients

Lazy_runcopy [localhost]	mhttpd [localhost]	Logger [localhost]
VX2740_Group_00 [localhost]	CAENHV [localhost]	dsanana [localhost]
Sequencer [localhost]		

CAEN HV

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CAEN HV - Slot 0							
Model A1541L (24 Ch Pos 500V 10mA). All settings Full status Clear alarms							
Ch #	Channel name	On/off	V set (V)	V meas. (V)	I limit (uA)	I meas. (uA)	State
0	CHANNEL00	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
1	CHANNEL01	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
2	CHANNEL02	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
3	CHANNEL03	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
4	CHANNEL04	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
5	CHANNEL05	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
6	CHANNEL06	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
7	CHANNEL07	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
8	CHANNEL08	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
9	CHANNEL09	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
10	CHANNEL10	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
11	CHANNEL11	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
12	CHANNEL12	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
13	CHANNEL13	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
14	CHANNEL14	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
15	CHANNEL15	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
16	CHANNEL16	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
17	CHANNEL17	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
18	CHANNEL18	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
19	CHANNEL19	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
20	CHANNEL20	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
21	CHANNEL21	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
22	CHANNEL22	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable
23	CHANNEL23	<input type="checkbox"/>	0.00	0.00	1000.00	0.00	ExternalDisable

CAEN HV - Slot 3							
Model A2551A (8 CH 8V/12A 60W FLOATING). All settings Full status Clear alarms							
Ch #	Channel name	On/off	V set (V)	V meas. (V)	I limit (A)	I meas. (A)	State
0	CHANNEL00	<input type="checkbox"/>	0.00	0.00	0.01	0.00	Off
1	CHANNEL01	<input type="checkbox"/>	0.00	0.00	1.20	0.00	ExternalDisable
2	CHANNEL02	<input type="checkbox"/>	0.00	0.00	1.20	0.00	ExternalDisable
3	CHANNEL03	<input type="checkbox"/>	0.00	0.00	1.20	0.00	ExternalDisable
4	CHANNEL04	<input type="checkbox"/>	0.00	0.00	1.20	0.00	ExternalDisable
5	CHANNEL05	<input type="checkbox"/>	0.00	0.00	1.20	0.00	ExternalDisable
6	CHANNEL06	<input type="checkbox"/>	0.00	0.00	1.20	0.00	ExternalDisable
7	CHANNEL07	<input type="checkbox"/>	0.00	0.00	1.20	0.00	ExternalDisable

CAEN HV - Slot 1							
Model A2551A (8 CH 8V/12A 60W FLOATING). All settings Full status Clear alarms							
Ch #	Channel name	On/off	V set (V)	V meas. (V)	I limit (A)	I meas. (A)	State
0	CHANNEL00	<input type="checkbox"/>	0.00	0.00	1.20	0.00	(empty)
1	CHANNEL01	<input type="checkbox"/>	0.00	0.00	1.20	0.00	(empty)
2	CHANNEL02	<input type="checkbox"/>	0.00	0.00	1.20	0.00	(empty)
3	CHANNEL03	<input type="checkbox"/>	0.00	0.00	1.20	0.00	(empty)
4	CHANNEL04	<input type="checkbox"/>	0.00	0.00	1.20	0.00	(empty)
5	CHANNEL05	<input type="checkbox"/>	0.00	0.00	1.20	0.00	(empty)
6	CHANNEL06	<input type="checkbox"/>	0.00	0.00	1.20	0.00	(empty)
7	CHANNEL07	<input type="checkbox"/>	0.00	0.00	1.20	0.00	(empty)

CAEN HV - Slot 2							
Model A2551A (8 CH 8V/12A 60W FLOATING). All settings Full status Clear alarms							
Ch #	Channel name	On/off	V set (V)	V meas. (V)	I limit (A)	I meas. (A)	State
0	CHANNEL00	<input type="checkbox"/>	0.00	0.00	1.20	0.00	(empty)
1	CHANNEL01	<input type="checkbox"/>	0.00	0.00	1.20	0.00	(empty)
2	CHANNEL02	<input type="checkbox"/>	0.00	0.00	1.20	0.00	(empty)
3	CHANNEL03	<input type="checkbox"/>	0.00	0.00	1.20	0.00	(empty)
4	CHANNEL04	<input type="checkbox"/>	0.00	0.00	1.20	0.00	(empty)
5	CHANNEL05	<input type="checkbox"/>	0.00	0.00	1.20	0.00	(empty)
6	CHANNEL06	<input type="checkbox"/>	0.00	0.00	1.20	0.00	(empty)
7	CHANNEL07	<input type="checkbox"/>	0.00	0.00	1.20	0.00	(empty)

Making a run

phaidra

Alarms: None

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Run Status

Run 103 Stopped

Start: Fri Mar 10 15:01:13 2023 Stop: Fri Mar 10 15:06:13 2023

Alarms: On Restart: Off Data dir: /home/darkside/online/dsdata/phaidra/sandbox

Start

Experiment Name: **Phaidra (ds)**

Run type: testing sequencer

Shifter: SR

Comment: test run

Write Data:

1678722354 15:45:54.444 2023/03/13 [mhttpd,INFO] Alarm "Logger" reset

Equipment

Equipment +	Status	Events	Events[/s]	Data[MB/s]
VX2740_Errors_Group_000	VX2740_Group_00@localhost	0	0.0	0.000
VX2740_Config_Group_000	VX2740_Group_00@localhost	0	0.0	0.000
VX2740_Data_Group_000	VX2740_Group_00@localhost	0	0.0	0.000
CAEN_HV	CAENHV@localhost	0	0.0	0.000

Logging Channels

Channel	Events	MB written	Compr.	Disk Level
#0: run00094sub0000.mid	0	0.000	0.0%	7.1%

Lazy Label	Progress	File Name	# Files	Total
runcopy	0.0%	run00094sub0000.mid	54	0.0%

Clients

Lazy_runcopy [localhost]	mhttpd [localhost]	Logger [localhost]
VX2740_Group_00 [localhost]	CAENHV [localhost]	dsanana [localhost]
Sequencer [localhost]		

Making a run

Start a new run

Start Cancel

Run number	104
Write data	<input type="checkbox"/>
Comment	test run
Shifter	SR
Run type	testing sequencer
Run duration (seconds)	300
Event limit	0

Sequencer run

phaidra

Alarms: None

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Run Status

Run 103 Start: Fri Mar 10 15:01:13 2023 Stop: Fri Mar 10 15:06:13 2023
Stopped Start Alarms: On Restart: Off Data dir: /home/darkside/online/dsdata/phaidra/sandbox

Experiment Name: **Phaidra (ds)**
Run type: testing sequencer
Shifter: SR
Comment: test run
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1678722354 15:45:54.444 2023/03/13 [mhttpd,INFO] Alarm "Logger" reset

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Equipment +	Status	Events	Events[/s]	Data[MB/s]
VX2740_Errors_Group_000	VX2740_Group_00@localhost	0	0.0	0.000
VX2740_Config_Group_000	VX2740_Group_00@localhost	0	0.0	0.000
VX2740_Data_Group_000	VX2740_Group_00@localhost	0	0.0	0.000
CAEN_HV	CAENHV@localhost	0	0.0	0.000

Logging Channels

Channel	Events	MB written	Compr.	Disk Level
#0: run00094sub0000.mid	0	0.000	0.0%	7.1%

Lazy Label	Progress	File Name	# Files	Total
runcopy	0.0%	run00094sub0000.mid	54	0.0%

Clients

Lazy_runcopy [localhost]	mhttpd [localhost]	Logger [localhost]
VX2740_Group_00 [localhost]	CAENHV [localhost]	dsanana [localhost]
Sequencer [localhost]		

Sequencer run

phaidra

Alarms: None

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```
Load Script Start Script Debug Script Edit Script

Sequencer File
Filename: start-stop-loop.msl Comment: $comment
1 PARAM runs, "Number of runs to take"
2 PARAM duration_time, "seconds"
3 PARAM wait_time, "seconds"
4 PARAM comment, "Description of run setup"
5 PARAM run_type, "Laser,Na,Ar,background etc..."
6 PARAM shifter, "Name of shifter"
7
8
9
10 ODBSET "/Experiment/Edit on start/Comment" $comment
11 ODBSET "/Experiment/Edit on start/Run type" $run_type
12 ODBSET "/Experiment/Edit on start/Shifter" $shifter
13
14 ODBSET "/Logger/Write data", "1"
15
16 COMMENT $comment
17 RUNDESCRIPTION $run_type
18
19 LOOP $runs
20     TRANSITION START
21     WAIT SECONDS, $duration_time
22     TRANSITION STOP
23     WAIT SECONDS, $wait_time
24 ENDLOOP
```

Sequencer run

Start script

runs:	<input type="text"/>	Number of runs to take
duration_time:	<input type="text"/>	seconds
wait_time:	<input type="text"/>	seconds
comment:	<input type="text"/>	Description of run setup
run_type:	<input type="text"/>	Laser,Na,Ar,background etc...
shifter:	<input type="text"/>	Name of shifter

Midas files save format - LazyLogger

```
darkside@phaidaq: ~/online/dsdata/phaidra
darkside@phaidaq: ~
darkside@phaidaq: ~/online/dsdata/phaidra$ ls
run00008 run00016 run00026 run00048 run00068 run00080 run00089 sandbox
run00009 run00017 run00028 run00049 run00070 run00081 run00090 utils
run00010 run00018 run00029 run00050 run00071 run00083 run00091
run00011 run00020 run00042 run00051 run00072 run00084 run00092
run00012 run00022 run00043 run00052 run00075 run00085 run00093
run00013 run00023 run00045 run00053 run00076 run00086 run00094
run00014 run00024 run00046 run00061 run00077 run00087 run00104
run00015 run00025 run00047 run00062 run00078 run00088 run00105
darkside@phaidaq:~/online/dsdata/phaidra$
```

Midas files save format - LazyLogger

```
darkside@phaidaq: ~/online/dsdata/phaidra/run00105
darkside@phaidaq: ~
darkside@phaidaq: ~/online/dsdata/phaidra$ ls
run00008 run00016 run00026 run00048 run00068 run00080 run00089 sandbox
run00009 run00017 run00028 run00049 run00070 run00081 run00090 utils
run00010 run00018 run00029 run00050 run00071 run00083 run00091
run00011 run00020 run00042 run00051 run00072 run00084 run00092
run00012 run00022 run00043 run00052 run00075 run00085 run00093
run00013 run00023 run00045 run00053 run00076 run00086 run00094
run00014 run00024 run00046 run00061 run00077 run00087 run00104
run00015 run00025 run00047 run00062 run00078 run00088 run00105
darkside@phaidaq: ~/online/dsdata/phaidra$ cd run00105
darkside@phaidaq: ~/online/dsdata/phaidra/run00105$ ls
run00105sub0000.mid run00105sub0002.mid run00105sub0004.mid
run00105sub0001.mid run00105sub0003.mid run00105sub0005.mid
darkside@phaidaq: ~/online/dsdata/phaidra/run00105$
```

Midas files save format - LazyLogger

```
darkside@phaidaq: ~/online/dsdata/phaidra/run00105
darkside@phaidaq: ~
darkside@phaidaq: ~/online/dsdata/phaidra$ ls
run00008 run00016 run00026 run00048 run00068 run00080 run00089 sandbox
run00009 run00017 run00028 run00049 run00070 run00081 run00090 utils
run00010 run00018 run00029 run00050 run00071 run00083 run00091
run00011 run00020 run00042 run00051 run00072 run00084 run00092
run00012 run00022 run00043 run00052 run00075 run00085 run00093
run00013 run00023 run00045 run00053 run00076 run00086 run00094
run00014 run00024 run00046 run00061 run00077 run00087 run00104
run00015 run00025 run00047 run00062 run00078 run00088 run00105
darkside@phaidaq: ~/online/dsdata/phaidra$ cd run00105
darkside@phaidaq: ~/online/dsdata/phaidra/run00105$ ls
run00105sub0000.mid run00105sub0002.mid run00105sub0004.mid
run00105sub0001.mid run00105sub0003.mid run00105sub0005.mid
```