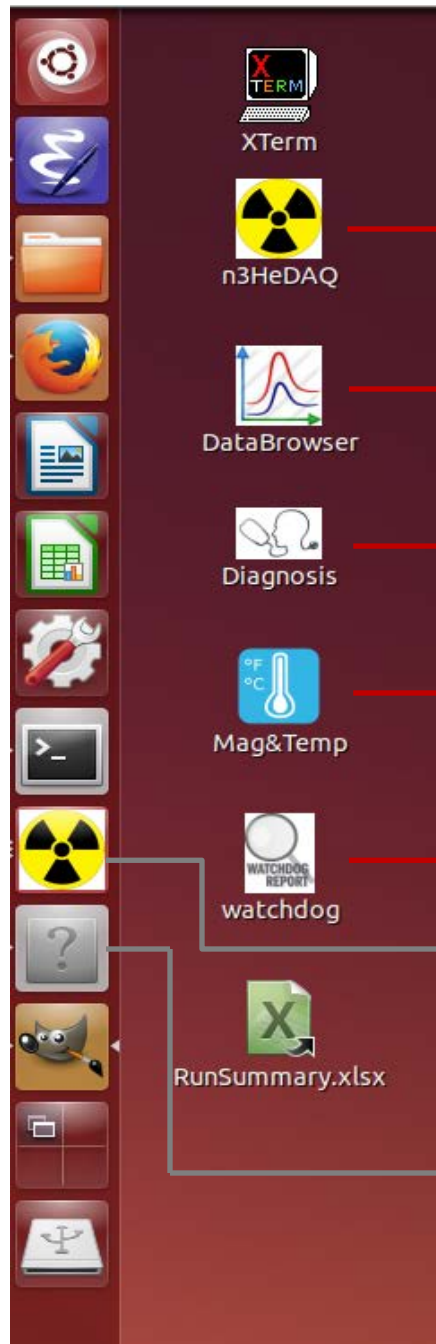


n³He DAQ Operational Manual for Shift Takers

Latiful Kabir

0. Which (icon) is which on Desktop



XTerm



n3HeDAQ



DataBrowser



Diagnosis



Mag&Temp



watchdog



RunSummary.xlsx

Main DAQ Control Program for taking data

Data Browser for quick look of data taken

Program to diagnose and fix DAQ issues

Program to display magnetic field and temperature

Program for 24/7 watchdog and data transfer

All of the above four programs when running, wrapped in a single icon

The data browser window icon when it's running

1. DAQ Control Program

Launching the program:

Launch the program by double clicking the icon

Starting the run :

Program starts with 'Start the run' button selected. Just press enter to start data taking process at n3He default run length.

Progress of the run :

Progress status of the current run is shown here.

Status of last run is shown here

Stopping data taking process:

Press Ctrl+C any time if this will be the last run. Wait until the run finishes.

Confirmation:

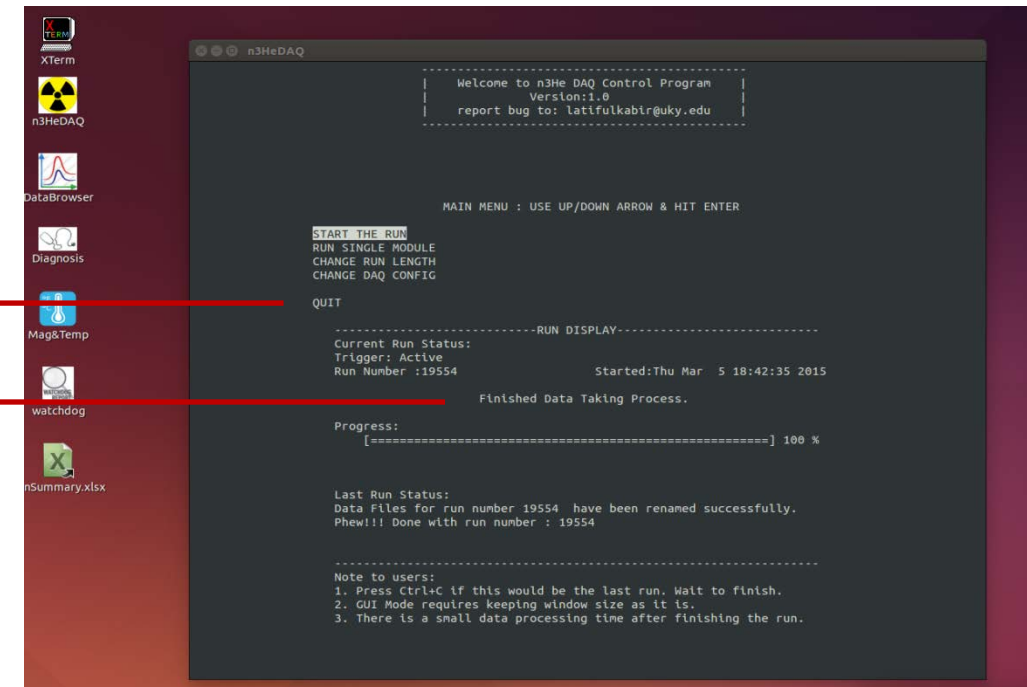
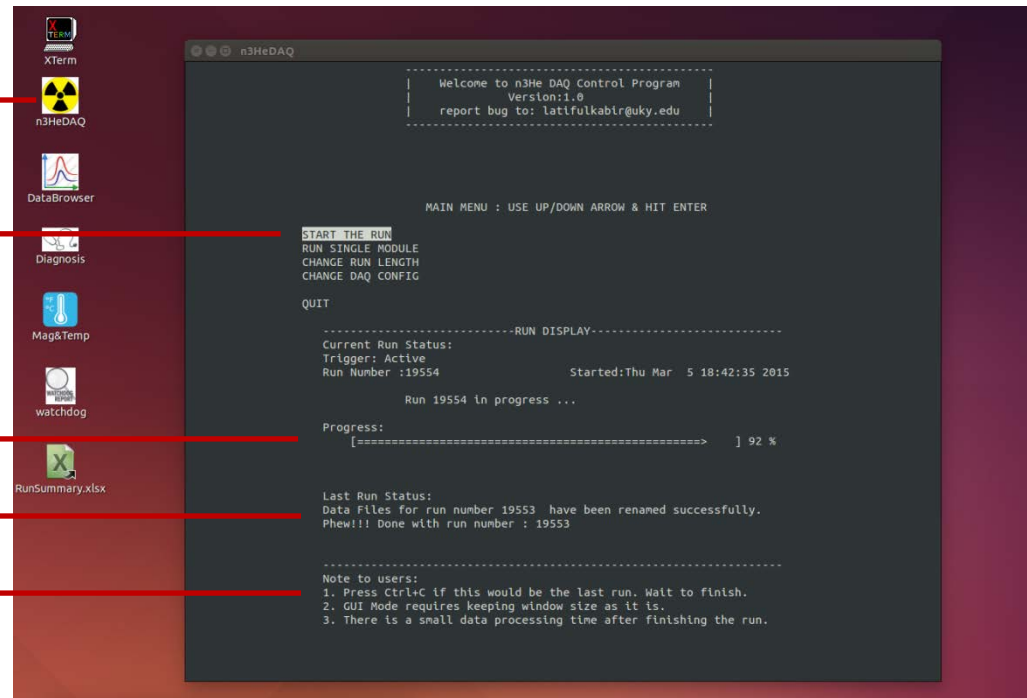
Wait for confirmation until it says Finished data taking process.

Quitting the program:

Use up/down arrow to select QUIT & hit enter to close the program in a systematic way.

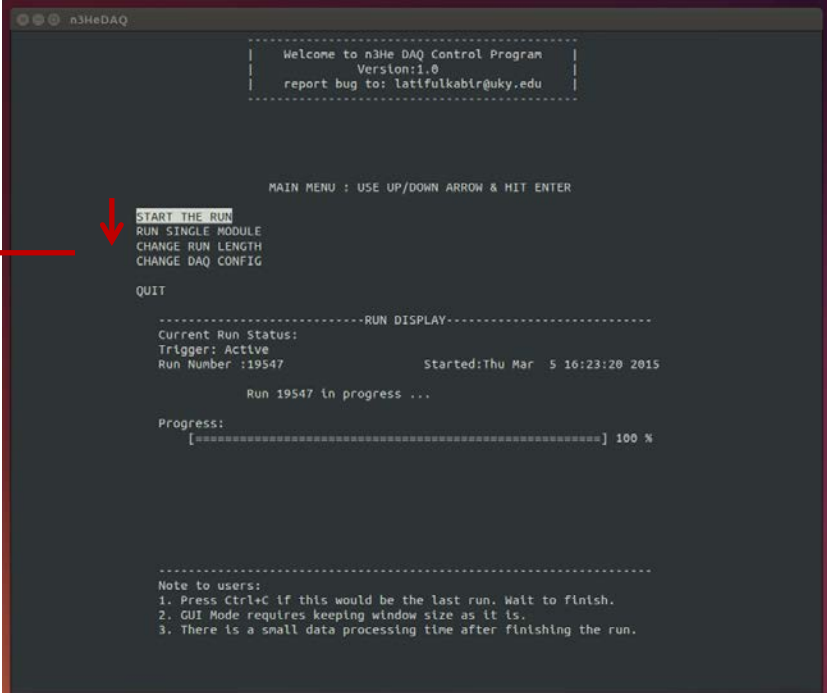
Quitting forcefully:

You can also quit the program forcefully by clicking the x button on top left corner.



Changing Run Length

Use Up/Down arrow to select
'Change Run Length' > Hit **Enter**



```

n3HeDAQ
-----
Welcome to n3He DAQ Control Program
Version:1.0
report bug to: latifulkabir@uky.edu
-----

MAIN MENU : USE UP/DOWN ARROW & HIT ENTER

START THE RUN
RUN SINGLE MODULE
CHANGE RUN LENGTH
CHANGE DAQ CONFIG
QUIT

-----RUN DISPLAY-----
Current Run Status:
Trigger: Active
Run Number :19547
Started:Thu Mar 5 16:23:20 2015

Run 19547 in progress ...

Progress:
[=====] 100 %

Note to users:
1. Press Ctrl+C if this would be the last run. Wait to finish.
2. GUI Mode requires keeping window size as it is.
3. There is a small data processing time after finishing the run.

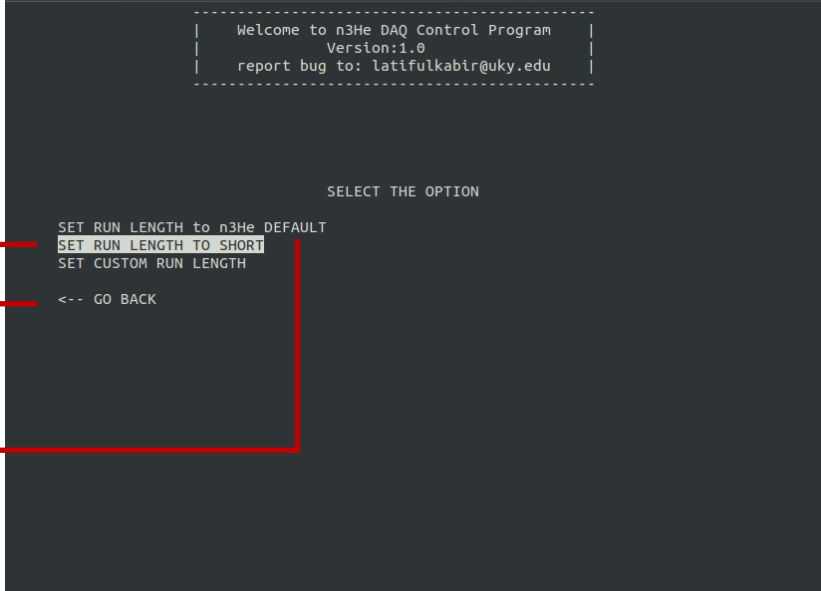
```

A new window will appear with run length option

Use Up/Down arrow to select
'Set Run Length to Short' > Hit **Enter**

Select 'Go back' > Hit **Enter** > This will
Take you to the main menu from where
You can start the run .

To resume run with n3He default, again select n3He
default from this window > Hit Enter > Again Go back
to main menu and start the run



```

Welcome to n3He DAQ Control Program
Version:1.0
report bug to: latifulkabir@uky.edu
-----

SELECT THE OPTION

SET RUN LENGTH to n3He DEFAULT
SET RUN LENGTH TO SHORT
SET CUSTOM RUN LENGTH

<-- GO BACK

```

Running the DAQ control program in command line mode:

It is also possible to run the DAQ control Program in command line mode. To run in command line mode, from the terminal do:

n3he start

This will start the data taking process in Default n3He run length.

A progress bar will show the run progress.

```
=====
||      Welcome to n3He DAQ Control Program v1.0      ||
=====
report bug to: latifulkabir@uky.edu

Trigger Disabled

=====Initializing Run number: 19555=====
Date & Time: Thu Mar  5 19:10:07 2015

Run 19555 in progress ... ..

Trigger Enabled

[=====>] 76 %
```

Any time press Ctrl+ C if this will be the last run.
Wait until the current run finishes. ←

```
n3HeDAQ
=====
||      Welcome to n3He DAQ Control Program v1.0      ||
=====
report bug to: latifulkabir@uky.edu

Trigger Disabled

=====Initializing Run number: 19555=====
Date & Time: Thu Mar  5 19:10:07 2015

Run 19555 in progress ... ..

Trigger Enabled

[=====>] 87 % ^C

Request to stop DAQ received.
Program will stop once current run finishes.Please wait...
To quit program forcefully press Ctrl+C again.

[=====] 100 %

/home/daq/DATA/data-21 has been renamed to /home/daq/DATA/run-19555data-21

/home/daq/DATA/data-22 has been renamed to /home/daq/DATA/run-19555data-22

/home/daq/DATA/data-23 has been renamed to /home/daq/DATA/run-19555data-23

/home/daq/DATA/data-24 has been renamed to /home/daq/DATA/run-19555data-24

/home/daq/DATA/data-30 has been renamed to /home/daq/DATA/run-19555data-300

Data file for DAQ 30 has been processed successfully
Temporary file has been deleted

Phew!!! Done with run number : 19555

Trigger Disabled
```

To learn all the possible options associated With command line mode, from terminal do:

n3he help

2.Data Browser for Checking the Data of the Run

2.Enter the run number

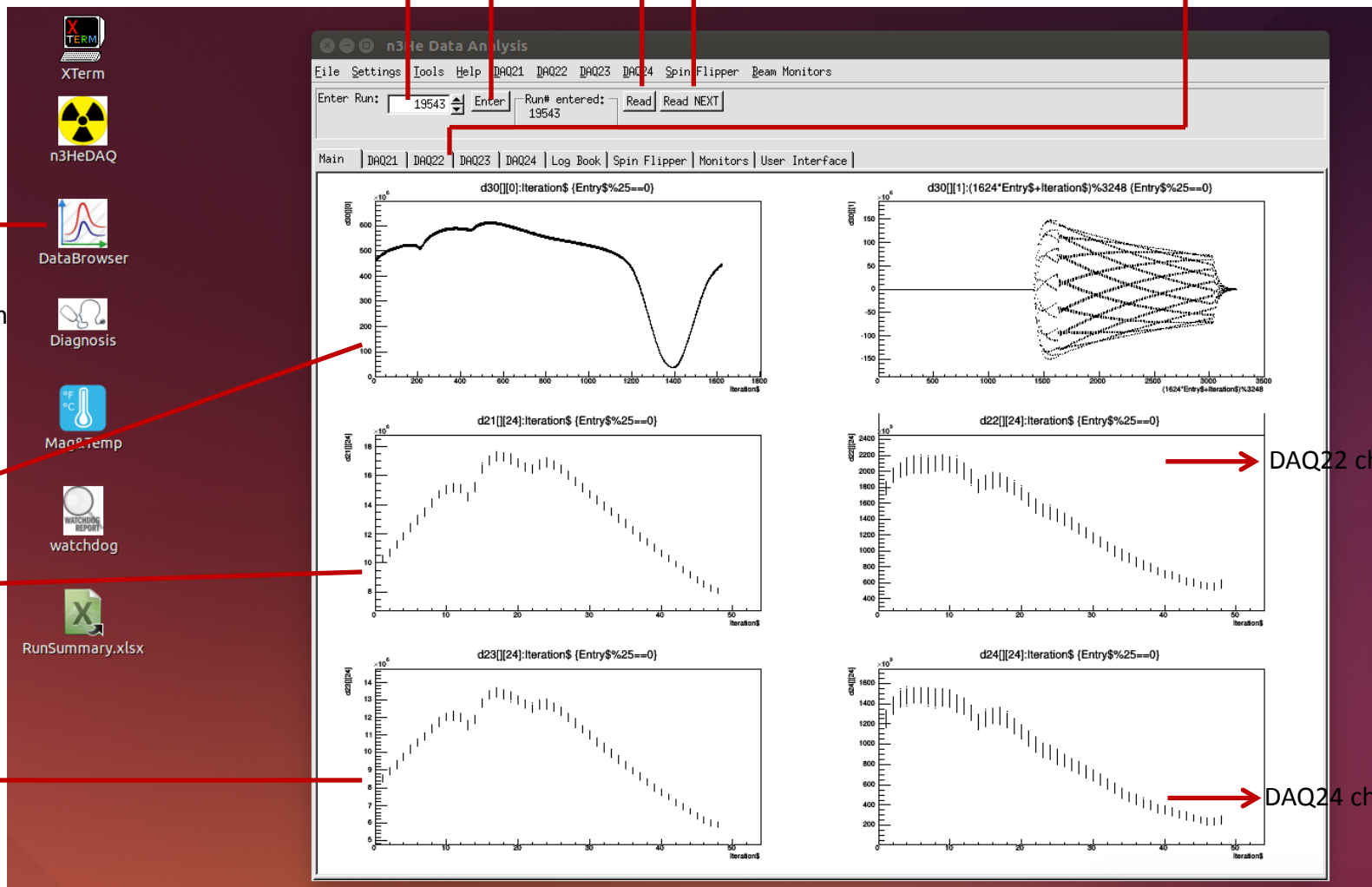
3.Hit Enter, to confirm entered run

4. Hit Read to Plot

5.Read Next to plot any successive run

6.Select any other tab and hit Read to see corresponding plots/signals

1. Double click on this icon to open the Data Browser if it is not already open



Monitor 1 Signal

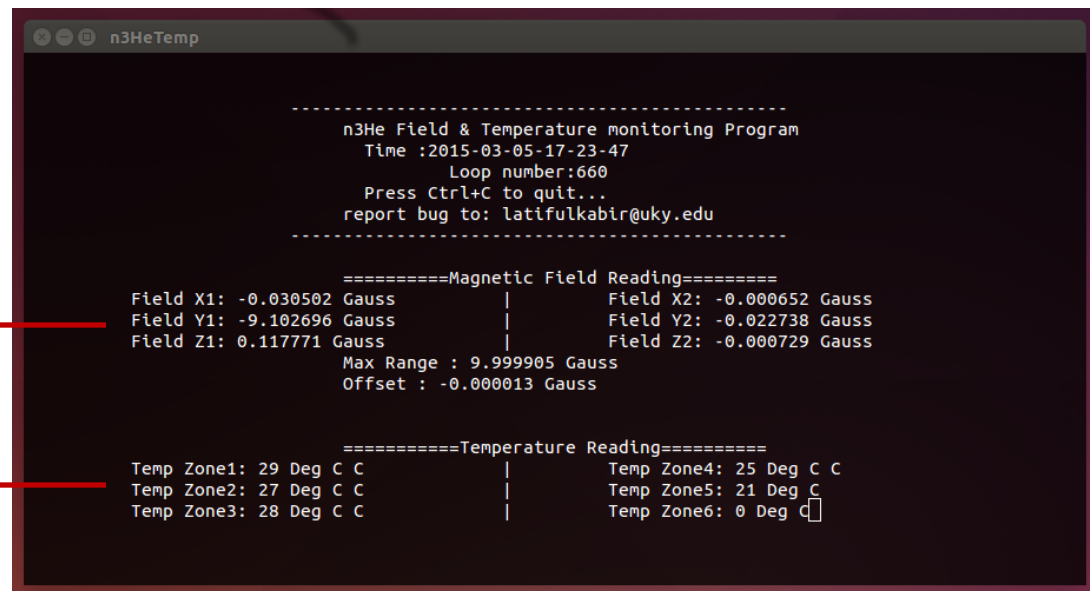
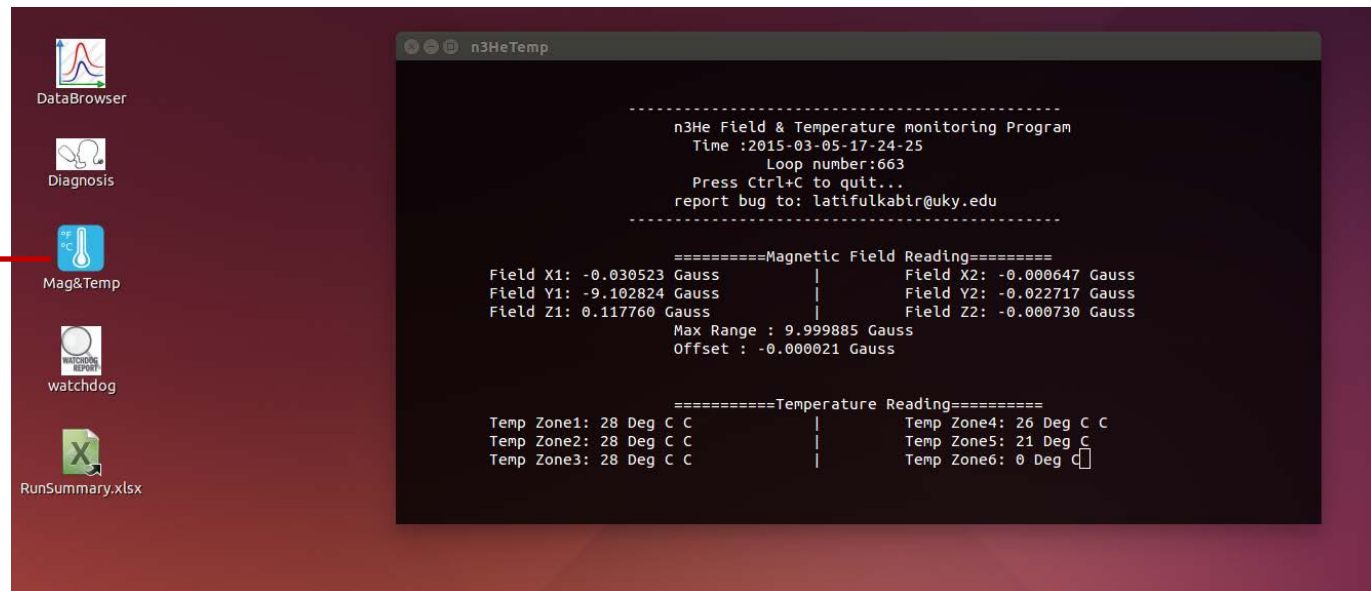
DAQ22 ch-24

DAQ21 ch-24

DAQ24 ch-24

DAQ23 Ch-24

3. Magnetic field and Temperature Monitoring Program



4.Diagnosis for the DAQ

Run the diagnosis program ,which is capable to detect DAQ issues and also fix it, if the DAQ is not taking data or frozen. Start the program by double clicking the icon on desktop



```
Welcome to DAQ's Healthcare Companion Baymax
report issues or bug to:latifulkabir@uky.edu

Checking if all files are in place ...
Found all files are in place
Starting the DAQ Diagnosis ...
Time:
Thu Mar 5 17:15:48 EST 2015

Checking if DAQ 21 is Active ...
Please wait ...

DAQ 21 is Active. --OK

Checking if DAQ 22 is Active ...
Please wait ...

DAQ 22 is Active. --OK

Checking if DAQ 23 is Active ...
Please wait ...

DAQ 23 is Active. --OK

Checking if DAQ 24 is Active ...
Please wait ...

DAQ 24 is Active. --OK

Checking if DAQ 30 is Active ...
Please wait ...

DAQ 30 is Active. --OK

Now testing if there is any configuration mismatch ...

Checking if there is any config mismatch for DAQ 21
Reading Current Config
Now Comparing two configs
The configuration for DAQ 21 is as expected. --OK

Checking if there is any config mismatch for DAQ 22
Reading Current Config
Now Comparing two configs
The configuration for DAQ 22 is as expected. --OK

Checking if there is any config mismatch for DAQ 23
Reading Current Config
Now Comparing two configs
The configuration for DAQ 23 is as expected. --OK
```

```
DAQ 30 is Active. --OK

Now testing if there is any configuration mismatch ...

Checking if there is any config mismatch for DAQ 21
Reading Current Config
Now Comparing two configs
PROBLEM with DAQ 21 Configuration Detected. --PROBLEM

Following is the corrupted config for DAQ 21
-----
rgm=1,0,1 enable d0 RISING
840
1
16,16
ABC
clk=1,1,0 external d1 FALLING
1
trg=1,1,1 external d1 RISING
-----

Checking if there is any config mismatch for DAQ 22
Reading Current Config
Now Comparing two configs
The configuration for DAQ 22 is as expected. --OK

Checking if there is any config mismatch for DAQ 23
Reading Current Config
Now Comparing two configs
The configuration for DAQ 23 is as expected. --OK
```

The program will detect if any DAQ has no activity or if there is any configuration mismatch.

Then it will ask for permission to fix it itself. Type 'y' to give permission. Wait until a confirmation printed before resuming data taking process.

```
Reading Current Config
Now Comparing two configs
The configuration for DAQ 23 is as expected. --OK

Checking if there is any config mismatch for DAQ 24
Reading Current Config
Now Comparing two configs
The configuration for DAQ 24 is as expected. --OK

Checking if there is any config mismatch for DAQ 30
Reading Current Config
Now Comparing two configs
The configuration for DAQ 30 is as expected. --OK

Successfully fixed the issues!!!. The DAQ is ready to resume data taking process.
```

The diagnosis program checks for DAQ Activity and configuration. So 10 OK Check will be expected if all 5 DAQs are working fine.

5. 24/7 Watchdog Program

The 24/7 watchdog program checks for DAQ status, critical parameters, send text alerts if DAQ is not taking data or any Critical parameter is out of range. It also transfer data to basestar. This program is expected to be running always even you are not taking data. This programs runs generally in the other workspaces, so check other workspaces to make sure it's always running.

Double click on this icon on desktop to start the watchdog program only if this not running.



The program will print all the status Periodically for verification.

It will print if everything is OK.
If not it will send text alert.

```
Loop number: 2 Time:Thu Mar 5 18:50:45 2015 run-19553 in progress ...
Progress:
The watchdog is running in automated mode [ 100 %]
Detected the DAQ program is Up for taking data
-----Printing status for verification-----
Daq Status:1
Run Status:1
Run Number:19554
Last run transferred:19553
Mag Field:9.1037
Temperatures: Zone 1: 28 Zone 2: 28 Zone 3: 28 Zone 4: 25 Zone 5: 20
-----the last run: WAIT TO FINISH.
The DAQ is working fine. 1. DAQ mode requires keeping window size up to 15.12.
The magnetic field is OK. 3. There is a small data processing time after finishing the run.
The temperatures are OK.
Now attempting to transfer the data files to basestar ...
Fedora release 16 (Verne, Jules Verne, <James Bond music>)
run-19554data-21 100% 229MB 7.6MB/s 00:30
run-19554data-22 100% 229MB 8.5MB/s 00:27
run-19554data-23 100% 229MB 7.9MB/s 00:29
run-19554data-24 100% 229MB 8.5MB/s 00:27
run-19554data-30 13% 43MB 9.0MB/s 00:29 ETA
```

It will periodically transfer data to basestar.
It keeps record of last transferred run. It can automatically catch up if the transfer is lagging behind from last run.

However if you need to transfer run manually,
From the terminal do:

transfer X Y

Where, X & Y defines the range of the runs
to be transferred starting from X and before Y.

```
daq@picard: ~
daq@picard: ~
Now Comparing two configs
The configuration for DAQ 23 is as expected. --OK
Checking if there is any config mismatch for DAQ 24
Reading Current Config
Now Comparing two configs
The configuration for DAQ 24 is as expected. --OK
Checking if there is any config mismatch for DAQ 30
Reading Current Config
Now Comparing two configs
The configuration for DAQ 30 is as expected. --OK
Successfully fixed the issues!!!. The DAQ is ready to resume data taking process.
Initializing alternative data taking program own it's own ...

=====
|| Welcome to n3He DAQ Control Program v1.0 ||
=====
report bug to: latifulkabir@uky.edu

Trigger Disabled

=====Initializing Run number: 19540=====
Date & Time: Thu Mar 5 14:43:04 2015

Run 19540 in progress ...

Trigger Enabled

[=====]

Request to stop DAQ received.
Program will stop once current run finishes.Please wait...
To quit program forcefully press Ctrl+C again.

[=====] 65 %
```

The watchdog program ,if running in auto mode, can call the DAQ diagnosis program automatically if any DAQ issue arises. The later program after detecting the issue and fixing the issue, can resume a new data taking process automatically.

6. Soft reboot and Power reset of the DAQ

Note: You are actually NOT expected to perform these two tasks since the diagnosis program can already do that for you. But in case if you need to perform any of them following is the procedure:

Soft reboot of DAQ:

If any DAQ experience any configuration mismatch, rebooting that DAQ through ssh can restore the configuration.

From the terminal do: `> ssh daq21`
`> reboot`

Wait to give the DAQ sufficient enough time to reboot properly. The above example is for DAQ 21. use daq22, daq23, daq24 or daq30 for Others.

Power Reset of the DAQ:

If the DAQ lose the activity (as a result sshing is not possible), then resetting the power can restore it. We use IP power strip to reset it to avoid entering the cave. It can be done either from the terminal or using the browser Mozilla Firefox.

Using terminal: From the terminal do: `power_reset 21`

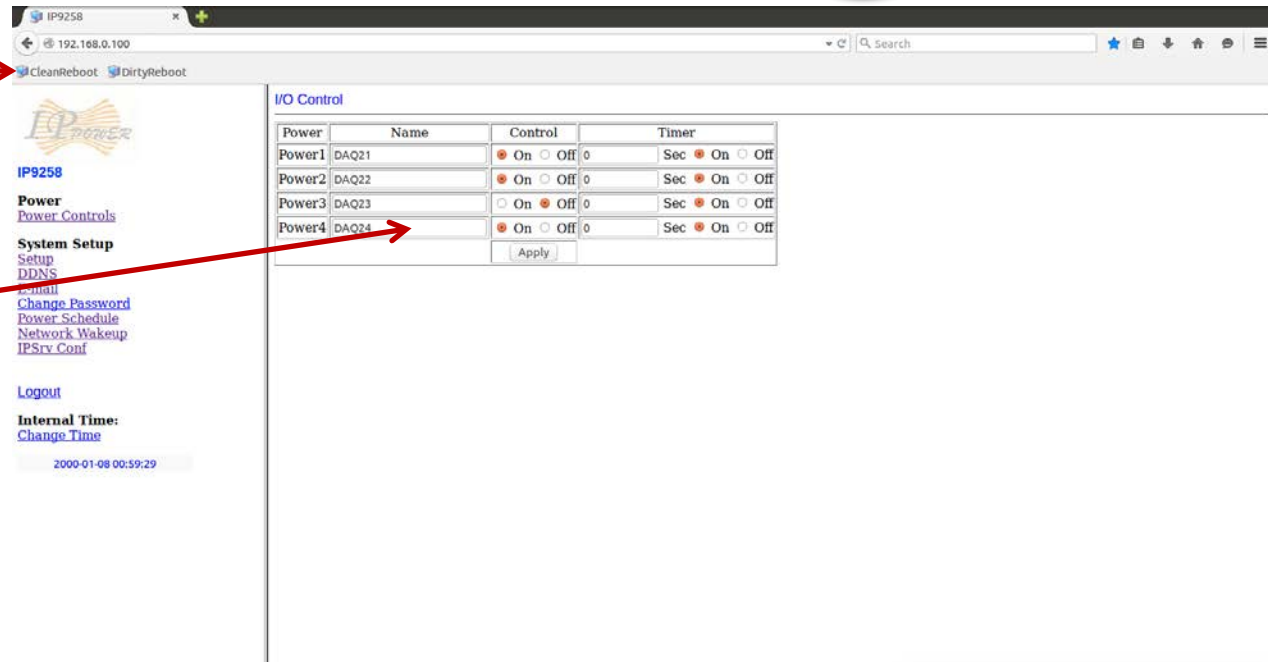
The above example is for DAQ 21. For others use 22,23,24 or 30 instead of 21.

Using browser:

1. Open Mozilla Firefox by double clicking this icon on desktop.



2. For DAQ 21 to 24 click on
Clean and for DAQ 30 click on dirty



Power	Name	Control	Timer
Power1	DAQ21	<input checked="" type="radio"/> On <input type="radio"/> Off	0 Sec <input checked="" type="radio"/> On <input type="radio"/> Off
Power2	DAQ22	<input checked="" type="radio"/> On <input type="radio"/> Off	0 Sec <input checked="" type="radio"/> On <input type="radio"/> Off
Power3	DAQ23	<input type="radio"/> On <input checked="" type="radio"/> Off	0 Sec <input checked="" type="radio"/> On <input type="radio"/> Off
Power4	DAQ24	<input checked="" type="radio"/> On <input type="radio"/> Off	0 Sec <input checked="" type="radio"/> On <input type="radio"/> Off

3. From the I/O Control window
For the corresponding DAQ:
Select Off > submit .
Now select On > submit.

Frequently Asked Questions (FAQ)

1. Q. The DAQ control program is frozen while taking data and I can not quit it in the systematic way as recommended ?
A. The other button is not expected to respond unless it finishes data taking process. Sometimes because of config mismatch in the DAQ the run will continue at a very tiny sample rate and will not finish. Only in that case use forced closure procedure(x button on left top) to close the program.
2. Q. The diagnosis program can not find any issue. Still why the DAQ control program is not taking data ?
A. Make sure the external hard disk is mounted and NOT full. If external hard disk is fine and diagnosis can not find any issue, then just close the DAQ control program and start the data taking process. This will fix if the data streaming was interrupted because of any other networking related issue.
3. Q. I see the program mostly freezes at the end of run. Why is that ?
A. The progress bar actually represents only one DAQ (DAQ21). Since all the DAQs are threaded. So that should also represent the progress of all others. But in case the problem happens for any one DAQ other than 21, then you see the progress bar reaches 100%, but does not start new run as one of them did not finish or has an issue. Run the diagnosis program to know which DAQ has issue.
4. Q. In the data browser main tab, I see all plots are OK, except for one or more DAQ signals which appear as straight line ?
A. That data file has a header in incorrect position which destroys the tree structure. Since header is way bigger than actual signal, you see a flat line. In this case just note down the run number in the paper log book.