

# Tragaldabas Initialization

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## 1 Initialization

On what follows we will describe step by step how to initialize the Tragaldabas DAQ system. Unless otherwise stated we will use 'labcaf' as login and the default LabCaf password.

1. **Start Trucha:** We must check that fptrucha is up and running and that nfs service is also started. To check that nfs server is running we can use the command **service nfs-kernel-server status** if the output is anything but 'nfs running' then the server must be initialized with the command **service nfs-kernel-server start**.
2. **Start Castor:** After starting fptrucha, we can switch on fpcastor. In this machine the services, nfs, ntp and dhcp must be running since the TRB's depend on them. You need root mode by *su* - with the usual password. fpcastor has a different flavour of linux so the checks also change a little:

- **service nfs status** for nfs.
- **service dhcpd status** for dhcp.
- **service ntpd status** for ntp.

The output of these commands must contain an **active**. If this is not the case we must start the services replacing the '*status*' argument by a '*start*' argument.

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3. **Connect the system:** Plug DAQ and LV (Low Voltage) cables into the electrical outlet. When you connect the DAQ you are also connecting both raspberries 01 & 02. This step must be done after switching on fpcastor, so that the raspberries will get the IPs and will start automatically.
4. **Start LV (Low Voltage):** Once fpcastor and its services are up and running, the low voltage power supply can be switched on.
5. **Check TRB's:** Connect via telnet to the TRB's (login: root, password: pass), log in as root and check that they have mounted the filesystem from fpcastor; a df should show an entry similar to the following line:

```
10.0.0.1:/var/diskless/etrax_fs 20510720 8224992 11220768 42% /home/hadaq
```

Should this not be the case, switch off the power supplies feeding the TRB's and go back to point (2).

6. **Set HV-PS (High Voltage-Power Supplies) in raspberry02:** Use ssh to log into the raspberry as trasgo (use the labcaf password), move to '/home/trasgo/i2c-system/bin' directory. The executable is called 'hv\_2019'. To show all options type './hv\_2019 -h'. In order to set the HV perform the following operations where bus\_number goes from 7 to 10 for T1 to T4 respectively:
  - Set the Maximum Voltage to 5.6 kV for all planes using the following command:  
**./hv\_2019 -b bus\_number -V 5.6.**
  - Set the Maximum Current to 1.5 uA for all planes using the following command:  
**./hv\_2019 -b bus\_number -I 1.5.**
  - Activate all HV-PS typing **./hv\_2019 -b bus\_number -on**
7. **Check or Set the trigger in raspberry01:** Use ssh to log into the raspberry as trasgo (use the labcaf password), move to '/home/trasgo/tfpga/bin/cmd'. Set which planes are in trigger linking:  
*ln -sf ctrun\_trasgo\_TXandTY\_CMD.sh ctrun\_trasgo\_default\_CMD.sh* where X and Y are the number of planes that will be used as trigger.
8. **Start environnement monitoring:** On fppolux log in as trasgo and start a screen session. It is recommend to label this session as 'environment' with the '-S' switch. On this screen start the environment monitoring system with the command *./read\_Environment.py* located in the directory '/home/trasgo/environment'. The program only takes measurements on times that are multiple of 10 minutes.
9. **Check netmen and eventBuild are running:** Check that two new screen sessions, labeled as 'netmem' and 'eventBuild' are created and keep running. In the directory '/home/trasgo/data/log' there are the logs for the eventBuilder and netmem programs and also for the initialization of the different TRB's.

10. **Start nagios monitoring:** On fpcastor log in as trasgo and start two screen sessions:
  - Enable active checks and notifications for all planes and services.
11. **Start data taking:** On fpcastor log in as trasgo and start a screen session:
  - It is recommended to label the session as 'DAQ' and run the command `./start-DAQ-Trasgo.sh` located in the directory `'/home/trasgo/bin'`.
12. **Check system is running:** Verify that the system is properly working, the following checks can be performed:
  - Log into the raspberries as hv and, in the directory `'/home/hv/logs/h0?'`, where '?' can be 3 or 4 depending on the raspberry; look for the file named after the current date and verify that it is measuring every minute and that the magnitudes (Voltage, currents, temps, etc) are reasonable.
  - Log into fppolux as trasgo and in the directory `'/home/trasgo/environment'` look for a file named  
`EnvironmentMeasurements_YYYYMM.txt`  
 where YYYY is the current year and MM the current month padded to two digits. The contents of this file are the internal and external temperatures and room pressure. The measurements are taken when the minutes are multiples of 10.
  - Log into fpcastor as trasgo and in the directory `'/home/trasgo/data/test01'` look for a file named  
`trYYDDDHHMMSS.hld`  
 where YY is the year and DDD the day of the year. The file should increase its size at about 2MB/min.
  - Also in fpcastor, in the directory `'/home/trasgo/slowcontrol/data'` look for a file named  
`OpCurrent_YYmmDD_HHMM.txt`  
 and verify that the system is properly measuring the currents. There are differences between the numbers obtained by the arduino and the numbers presented at the N741A NIM modules.
  - In the NIM module N145, the quad scaler, check that H1 and H2 have a rate of about 10kHz, and the number of coincidences is around 60-90.

## 2 De-Initialization

On what follows we will describe step by step how to stop the Tragaldabas DAQ system. Unless otherwise stated we will use 'labcaf' as login and the default LabCaf password.

1. **Shutdown DAQ:** Kill process `'./startDAQ_trasgo.sh'`
2. **Shutdown HV-PS:** Use ssh to log into the raspberry as trasgo (use the labcaf password),  
`move` to `'/home/trasgo/i2c-system/bin'` directory. The executable is called `'hv_2019'`. To show all options type `'./hv_2019 -h'`. In order to set the HV perform the following operations where `bus_number` goes from 7 to 10 for T1 to T4 respectively:
  - Set the Maximum Voltage to 0 kV for all planes using the following command:  
`./hv_2019 -b bus_number -V 0`.
  - Set the Maximum Current to 0 uA for all planes using the following command:  
`./hv_2019 -b bus_number -I 0`.
  - De-activate all HV-PS typing `./hv_2019 -b bus_number -off`
3. **Shutdown raspberries:** log into raspberry 01 & 02 and type: `sudo shutdown -h now`.
4. **Disconnect the system:** Un-plug DAQ and LV cables from the electrical outlet.