

Miscellaneous Software Commands

To Start the JCI and Display Tool on the Desktop in Lab (ufnewton)

1. Logon to "cancam" account.
2. To start the JCI, type `ufjci`. Wait for text to scroll by on the window until the JCI is displayed.
3. To start the JDD (Java Data Display), type `ufjdd`.
4. Note: Do NOT run JCI or JDD on kepler. The LCU kepler is reserved for agents and data acq.
5. If you cannot run on ufnewton, then `ssh -l cancam newton`. Run JCI as above.

To Install New Version of JCI / JDD :

1. `cd ~/ufcc`
2. `make newjava`

To Use the Motors (normal quick start):

1. Power on the motor indexers box in the LCU (Local Control Unit) rack.
2. Press the "**Check Locations**" button on Motor High-Level Panel of JCI, thereby verifying communication with the motor indexers (Motor Control agent automatically sends motion parameters).
3. The **TEST** button on Master Panel of JCI will also verify communication with the motor indexers and with MCE-4. But if the MCE-4 is not connected or not powered an error message indicating such will occur. So if you are just using the motors it is simpler to press the "**Check Locations**" button. The top right Motor status should show IDLE (or MOVING). If instead an error or failure is indicated then consult the Trouble-shooting Guide section at end of document.

To Use the Motors (detailed startup to check indexer memory):

1. Power on the motor indexers box in the LCU (Local Control Unit) rack.
2. Press the "**Query Parameters**" button on Motor Parameters panel to check current indexer parameters. This query will check the parameters stored in indexer permanent memory. Examine the column for the "Drive Current": all values should be a single number. If any fields show two numbers surrounded by asterisks report the indexer name to Frank Varosi, Chris Packham or Jeff Julian. The first such number indicates that the hold current for indexer is not zero.
3. Press the "**Read Parameter File**" button.
4. Press "**Send All Parameters**" button (this will set all hold currents to zero).

To Change the Motor Parameters File:

1. `ssh -l cancam kepler`
2. `cd ~/ufcc/config`
3. `co -l MotorParams.dat`
4. `xemacs MotorParams.dat &`
5. `make` (when you want to try changes by having MC agent access the new params)
6. Then in JCI Motor Parameter Panel press "**Read Parameter File**" button. This commands the MC agent to read the parameters file and send values to all JCI clients (so do not mess up file).
7. If any of the first 5 motor operating parameters have been changed, press "**Send All Parameters**" button, or you can send parameters for an individual indexer/motor by pressing the respective button.
8. If position steps/names were changed, then press "**Check Locations**" on Motor High-Level panel.
9. `ci -u MotorParams.dat` (when you are done and ready to commit on kepler)

Notes about Motor Parameters and JCI

1. The first 5 parameter columns (Initial Speed thru Drive Current) on the Motor Parameters Panel in JCI are the only parameters actually sent to the motor indexers. If there are other JCI clients connected to the Motor Control Agent then the last sent bundle of parameters is used by the indexers even if some other JCI client may show old parameter values. Press "Query Parameters" to see.
2. The next 4 parameter columns (BackLash thru Datum Direction) are used by the MC agent only. If they are changed in JCI they should be sent to MC agent. Permanent changes should be made in the MotorParams.dat file. If other JCI clients need to see the new parameters, press "Query Parameters".

To Datum the HWP angle and Lyot Mask Rotator

In the real instrument, both the HWP and Lyot "carrier" wheels must be in a particular location before the "inner" rotating wheels can be datum'd. Currently, for testing purposes the datum disable feature is not used, so datum of the inner wheel can be attempted at anytime, but unless the carrier wheels are in the following positions the datum will not complete:

1. For the HWP-Angle wheel, the HWP-Plate wheel must be moved to "hwp-10um" or +415 steps.
2. For the Lyot Mask Rotator, the Lyot wheel must be moved to "Rose_Petal" or +271 steps.

Features of Motor Control Agent and JCI

1. The Motor Control (MC) agent can be left running all the time and does not need to be restarted even if the motor indexers are turned off and back on. The JCI can be left connected to MC agent.
2. If motor indexers are powered off and motion is attempted, the MC agent will report to JCI status that agent "Failed Communication with Indexers...".
3. Before any action is performed the MC agent always checks if indexers have been just turned on (indexers give a boot prompt), so all motor parameters are automatically resent when motor indexers are powered back on and a command is sent to indexers (such as "**Check Locations**"). Press the "**Query Parameters**" button on Motor Parameters panel to check the current indexer parameters.
4. In fact all control agents can be left running in real mode even if hardware is turned off, and agents will resume connection and communications with hardware automatically. The DC agent will send error messages and cause JCI to beep once a minute if MCE-4 is not available.

Steps To Use the MCE-4 and Detector Array:

1. Physically power on the MCE-4. When correctly booted the MCE-4 will show the following LED configuration on boards from right to left:
 - UFB (Upper Fiber Board): small Green LED is ON blinking fast.
 - ADC (Analog Digital Converter) Boards (4): middle Green LEDs are ON
 - PGB (Pattern Generator Board) : all LEDs are OFF
 - CPU Board: top Yellow LED is ON at the end of the boot sequence (blinks out then back on).If any of the ADC boards have one of the Yellow LEDs on, this indicates that the Xilinx FPGA did not program correctly. Cycle the power on the MCE until all ADC LEDs are green. If the top light on CPU board (first board on left) is not yellow then the MCE will not work, so cycle the power and wait until boot sequence on CPU board completes, and top light on CPU board is yellow.
2. On the Master Panel of JCI press the TEST button. The TEST button can be pressed at any time, to check communication with the MCE-4 and the motor indexers (see Trouble-shooting Guide if errors or failures are reported). If JCI is not connected to DC/MC agent a dialog should popup asking if user wishes to reconnect, and select YES if you think reconnection is required.
3. On the Master Panel of JCI press the INIT button, and select YES for the popup questions that follow. This will initialize the MCE-4: the Fiber Optic Interface (FOI : between EDT-PDV in LCU and GRCI in MCE) will be configured, all bias voltages will be set, detector will be powered on (if so chosen). If any errors or failures are indicated in the Action-Response field, then consult the Trouble-shooting Guide. Note that the history of Action-Responses can be monitored by pressing the right mouse button over the A-R field and choosing to view the log from the popup menu. This can be done before pressing the INIT button and you will then see each Action and corresponding Response.
4. Select the Detector Panel of JCI tabbed panes. Press the CONFIGURE button, assuming that the currently displayed configuration is desired. Otherwise set Input Parameters and press COMPUTE first, then CONFIGURE. The usual parameters for lab testing should be:
 - Obs Mode = stare
 - Readout Mode = S1R3 or S1R1 or S1R1_CR or S1 (in order of preference)
 - Frame Time about 25 msec
 - Save Frequency about 1 Hz.The first time configuration of MCE after power up takes a long time because readout pattern must be loaded. After DC agent responds the Active parameter values should equal the Desired parameter values. Note that the history of Active values or Action-Responses can be monitored by pressing the right mouse button over the field and choosing to view the log from the popup menu.
5. Back to Detector Panel of JCI: decide if data will be Saved or Discarded via Data Mode selector, then press the START button on. The counts of #DMAs, #grabbed, etc. should start incrementing after a few seconds. Data counts shown for Bkgrd & Read should be 9000 ADU or more. However, if EDT timeout error occurs then maybe the Fiber Optic Interface (FOI) was not initialized, so press INIT MCE FOI button on Detector panel, and try START again.
6. The JDD (Java Data Display tool) should start displaying data frames from the MCE. If MCE is operated in stare mode then data is stored in "SrcA" buffer, so make sure that buffer is selected in JDD. A reference frame (for subtraction from data) can be obtained by turning Vgate OFF on the Bias Panel of JCI, then using the "Buffer:" menu in JDD display, select "grab as REF" (or REF2), then select "Buffer - REF". Turn Vgate ON in Bias Panel to get detector array data again with reference frame subtracted in JDD.

Trouble-Shooting Guide:

If CONNECT button on Detector Panel turns RED, then press it to connect JCI to Detector Control (DC) agent and wait till it turns green or error is displayed. If it never turns green then check network connectivity to host kepler, and/or check if DC agent is running on kepler (logon to cancam@kepler and enter "psg ufdet" and you should see: /usr/local/ufcancam/bin/ufdetcond). If not, enter "ufrestart dc", press the Re-CONNECT button, and try from beginning.

If an EDT timeout error occurs then maybe the Fiber Optic Interface (FOI) was not initialized, so press INIT MCE FOI button on Detector panel, and try START again. The FOI in UFB (see step 1) of MCE should finally show slow blinking green LED.

If "No Response from DC agent" error keeps occurring after all directives (like TEST), and MCE-4 is powered on, then check for proper Serial I/O connection with the MCE-4.

Check the BIAS panel of JCI:

- a) at top left, make sure Active values of Bias Level = High and Well Depth = Deep, if not select them and press respective buttons to apply.
- b) enter password "engineering" and press Send Password button (bottom right).
- c) press APPLY All Desired Voltages button: after 3 seconds Active values should = Desired. For real detector, the values should be:
 - V_Clout = -3.9V
 - V_offset = -2.5V
 - V_detgrv = -6.5V (when Bias Level = High, lower for Medium or Low)
- d) detector power indicators at top right of panel should be green, else, press Power & Vgate ON buttons.

On PreAmp panel of JCI: Press READ ALL button. If Active offsets are not around 9V, then enter 9 volts in the "Set All Offsets" field (bottom right) and press the button. The Active values should all show 9V.

Options for restarting agents

Note that the device agents and data acq. server should be started in real mode only on the CanariCam LCU (currently host = kepler). On other computers the agents/server should be run in simulation mode. All agents and data server can be left running on LCU even if hardware is turned off. JCI will post hardware failure error messages and beep if MCE-4 is not powered on. To stop the beeping, on Detector Panel, select hostname and enter non-existent hostname, then press the "Connect" button and JCI will fail to connect.

1. Logon to CanariCam account on host kepler: `ssh -l cancam kepler`

Typing `ufrestart -h` (or `help`) will give the following help:

```
ufrestart agentname -option -option
```

2. The following are example usages:

```
ufrestart acq   to restart the Data Acq Server (DAS)
ufrestart dc    to restart the Detector Control agent
ufrestart mc    to restart the Motor Control agent
ufrestart tc    to restart the Temperature Control/Monitor agent for Lakeshore-331
ufrestart tm    to restart the Temperature Monitor agent for Lakeshore-218
ufrestart pm    to restart the Pressure Monitor agent
```

3. To restart the Detector Agent so that MUX can be used for imaging while dewar is warm:

```
ufrestart dc -fakecold
```

Option `-fakecold` will cause DC agent to always send temperature of 7K to MCE-4 thus pretending that the dewar is cold, allowing use of detector even if dewar is still above 14K.

4. To restart any agent in simulation mode add the option `-sim` after agent name above. To restart an agent in verbose logging mode add the option: `-v` . Then the agents log file in `/var/tmp/log.*` will contain more verbose output.

5. To start all agents/server in real instrument mode: `ufstart`
To start all agents/server in simulation mode: `ufsim`

To stop all agents but leave Data Acq Server running: `ufstop -agents`
To stop all agents and the Data Acq Server: `ufstop`

If Data Acq Server (DAS) is left running (normal), subsequent `ufstart` will not create a second DAS, and the original DAS will keep running.