

## Instructions for Instrument Cooldown and Thermal State Monitoring

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### 1. Contact Information

I can be reached for help 24 hours a day. Please call my cell phone at **443-824-4214** (except when I am on Kitt Peak).

### 2. Software Start or Restart Instructions

**Hardware:** The IRMOS software runs on two Windows 2000 PC. The gray lunchbox PC enclosed within the “computer” electronics rack is known as the Instrument Control Computer (ICC). The Dell Optiplex GX300 desktop is known as the Astronomer Work Station (AWS).

**Software:** The ICC hosts two programs: (1) the IRMOS DataBase (IDB) and (2) the IRMOS Operating System (IOS). The AWS supports the IRMOS User Interface (IUI). Each of these programs is a Java executable which is run from a Windows Command Prompt Window (aka a DOS Window).

**Computer Reboot:** If a computer has crashed, restart by power cycling. Windows 2000 requires a login. User name=`irmos` and Password=`irmos` (all lower case).

**Software Start:** First – note that the order of starting these programs is important.

- 1) On the ICC (Rack Mounted computer), open two DOS windows by clicking the “C:\” black icon in the lower left of the screen (to the right of the Windows START button) twice. Change each window to the `irmos` directory with the command: **`cd c:\irmos`**
- 2) In one window, start the IDB with the command: **`java -Xmx256M -jar idb.jar`**
- 3) In the other window, start the IOS with: **`java -Xmx256M -jar ios.jar`**
- 4) On the AWS, open one DOS window and change directory to `c:\irmos` in the same manner as on the ICC.
- 5) Start the IUI from that window with: **`java -Xmx256M -jar iui.jar`**
- 6) Several lines of output should appear in each window. You should not see exception messages. On the AWS a new window will appear with the IRMOS logo. All further commands are issued from this window (the IUI graphics interface). You will want to resize this window to make it about 1 inch taller.

**Software Operation:** These commands are run from the UI window. Each page is selected using the tabs at the top of the window. The window opens in the “Logo” tab.

- 1) Select the Manual tab – this takes you to the main instrument control page.
- 2) Start the operation of the system by pressing the green “Test Start” button located in the upper right (within the IOS controls section). This should generate seven (7) reply messages in the table at the bottom of the Manual page. Be patient... there is a 1 minute delay between the fourth and fifth message. The status of each message should be “OK” and the fifth message should show **TARGET=THERMAL** and **ACTION=INIT**. Do not press the Test Start button more than once – if you do, exit all three programs (control-C in the DOS windows) and start over.
- 3) Set the four LS321 Manual Heater controls (in the orange “Thermal Controls” section of the Manual page – lower center). These are labeled “Detector LS321 Manual”, “Instrument LS321 Manual”, “Primary DMD LS321 Manual”, and “Backup DMD LS321 Manual”. Do **not** press the SET buttons (these are for loading actual setpoints). Instead, click on the HEATER OFF pop-up menu and select HEATER HIGH. Each of these will result in a reply message with **ACTION=HEATHIGH** and (hopefully **STATUS=OK**). **Verify on the front panels of the four Lakeshore 321 units (two in each electronics rack) that Heater Range=HIGH – if not, manually set Heater=HIGH using the buttons on the front of each Lakeshore unit.**
- 4) Change the MANUAL pop-up menu (in the upper left section of Thermal Controls labeled “Thermal System” from MANUAL (the default) to COOLDOWN. This should result in a reply message with **TARGET=MONITOR** and **ACTION=COOLDOWN**.
- 5) Proceed to thermal verification. It is critical that the LS321 settings (HEAT=HIGH) and set-points be verified.

### 3. Thermal Verification

The performance of IRMOS must be verified after each software startup and at least twice per day.

- 1) Check the four (4) Lakeshore 321 units in the electronics racks. The computer rack contains the Detector and Primary DMD LS321 units. The support rack (the taller one) contains the Instrument and Backup DMD LS321 units. Each should have Heater Range set to HIGH (in the upper right of their small displays). The Instrument setpoint should be 60K, the Primary DMD should be 245K or 255K, and the Backup (Redundant) DMD 235K. The detector setpoint will vary as the instrument cools. If the actual temperature is close to the setpoint, some current will be indicated. **If the actual temperature is below the setpoint and the Heater % equals zero for more than 2 minutes you have a problem.**

- 2) Check the Telemetry page on the IUI for the following values.
  - a. InitStatusMessage block (left side of telemetry page)
    - i. TIMESTMP – should be close to current time (within 10 minutes)
    - ii. CMDLOOP, RELOOP, TELLOOP, THRMMOD should be true (green) – other values in this block do not matter during cooldown.
  - b. ThrmStatusMessage (center of Telemetry page)
    - i. TIMESTMP – should be close to current time (within 10 minutes)
    - ii. INIT = true (green)
    - iii. MODE = COOLDOWN
    - iv. BNCHCNT = 7 (if  $\leq 2$  call me)
    - v. DMD1TEMP and DMD2TEMP should be  $>235$
    - vi. CLDFTEMP should be pretty cold ( $<70\text{K}$  if cooler on  $>1$  hour)
    - vii. DMD1SETP = 245 and DMD2SETP=235
    - viii. INSTSETP=60
    - ix. DETHEAT, INSTHEAT, DMD1HEAT, DMD2HEAT all HIGH
    - x. DMD1CURR  $> 0$  (when BNCHTEMP  $< 240$  – i.e. one day into cooldown)
    - xi. MONTHRD, DETTHRD, INSTTHRD, DMD1THRD, DMD2THRD, C208THRD, S208THRD should all be true (green)
- 3) Please record and email at least daily to [mackenty@stsci.edu](mailto:mackenty@stsci.edu).
  - a. BNCHTEMP
  - b. DETSTEMP
  - c. INSTTEMP
  - d. DMD1TEMP
  - e. DMD2TEMP
  - f. CLDFTEMP
  - g. TOPPTEMP
  - h. BOTPTEMP
  - i. DETMTEMP
  - j. DBAFTEMP
  - k. DETSETP
  - l. DETCURR
  - m. DMD1CURR
  - n. DMD2CURR

#### **4. Thermal Data dump to Excel Spreadsheet**

Note: a bug in the software requires a software restart after eight (8) hours to perform this task (fixed in later versions).

- 1) Select the “IDB Query” page on the IUI.
- 2) Push the “Construct” button (upper right). A new window will pop-up.
- 3) Select the “ThrmStatusMessage” radio button (left side).

- 4) Enter a reasonable start time (i.e. 2-3 days ago). Do not try to get too much data since the database contains samples over many months). Note that the clock is a 24 hours time base. Fix the end time to correspond to the present (note that the 24 hour may be messed up – just enter the correct value).
- 5) Press the red WRITE button (lower right). The window will vanish and the appropriate SQL code for the database query appears in the window at the top of the IDB Query page.
- 6) Press the “Query” button – this may take several minutes for a large query. A multi-line, probably unreadable since the columns will be too narrow, spreadsheet appears. If not, you will need to restart all three IRMOS programs and try again with a smaller time interval.
- 7) Save the data by pressing the “Save” button. This will create a pop-up file dialog window. You must name the file with the extension “.csv” to create a MS-Excel compatible file.
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