

# QFI INFRASCOPE THERMAL CAMERA QFI SOP

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**NOTE:** This tool requires liquid nitrogen please notify the staff 24 hours before your scheduled session to make sure liquid nitrogen is available for the system.

## STARTING UP THE SYSTEM

1. Log into the tool with your FOM account.
2. Adorn the blue cryogenic gloves and face shield. Fill the infrared dewar with liquid nitrogen and the supplied funnel. The dewar must be cooled for **20 minutes before** taking IR 2000 the power strip sitting on the desk.
3. Turn **ON** the power strip sitting on the desk by the monitor.
4. Turn **ON** the key switch on the front of the system.
5. Press the green button.
6. Turn **ON** the Thermal Stage Controller sitting on the shelves next to the system.
7. Open the small black door on the front of the system and press the momentary switch to start the computer.
8. Click on the **THERMAL MAP** icon to start the system.
9. Click **OK**.
10. Click **OK** when prompted to **Move Lens Into Position**.
11. The system will now go through a series of system checks. Contact the MNTC staff if you experience any problems.



## LOADING SAMPLES AND ACQUIRING IMAGES

1. Go to the **TEMP STAGE** tab and enter a set point temperature of 50°C. Look at the Thermal Stage Controller to verify the set point temperature has been received.
2. Mount your device on the thermal stage and move the stage with the stage hand cranks into a general location under the lenses. The device must be secured for any movement will generate bad data.
3. Click on the **TURRET** tab and select one of the **2.5 vis lens**. Click on **GO** and **OK** when prompted to Move the Lens Into Position.
4. Move the head slide, the aperture slide and the lens turret into the proper configuration to view the black and white video on the computer monitor and on the small screen on the front of the instrument.

5. Click on the **LIGHT** tab and set lighting to a value higher than 0.10.
6. Click on the **ACQUIRE** tab and the **VIDEO** icon.
7. On the **Motion Controller** icon press the down arrow to move the head assembly and adjust focus on your sample. If you need to move the sample to the region of interest either move the stage with the hand cranks or the motion controller with the arrows.
8. Click on **STOP** to turn off the video mode.
9. Go to the **TEMP STAGE** tab and set the stage temperature to 70°C. Look at the front of the thermal controller to make sure the set point was received.
10. Click on the **TURRET** tab, select the preferred IR lens and click **GO** and **OK** when prompted to Move Lens Into Position.
11. Move the head slide, the aperture slide and the lens turret into the proper configuration for the selected IR lens.
12. Go to the **ACQUIRE** tab and click on **BACKGROUND** icon. Depending on the lens a small metal arm will move in front of the lens to take reference data.
13. Click the **IR FOCUS** icon and move the head assembly up or down to fine tune the focus. Click on **STOP** when focus is acceptable.
14. Click on the **REFERENCE** icon. After 5 seconds click on **STOP**. This acquires the reference image and calculates the emissivity map at 70°C.
15. Set the slider to **MAP 1** and click on the **TEMPERATURE** icon, and this will start the temperature image acquisition of the unpowered device. The image should be largely uniform, at a similar temperature, without dramatic edges or with severe color shifts. The goal is a uniform image with random noise. The max and min temperatures on the color bar should not be excessively far apart. If there is an excessively large range between max and min temperature movement may have affected the reference reading. Do not proceed and perform steps 12 through 14 again.
16. When satisfied with the unpowered temperature image apply power to your device.
17. To perform data analysis of the thermal image, click on **STOP**.
18. Go to the **ANALYZE** icon and utilize the tools of interest. The **HISTOGRAM** icon will develop a chart of all temperatures within the image and the number of pixels that correspond with those values.
19. For the **LINE TRACE** tool use the mouse to draw a line on the thermal image. Click on **LINE TRACE** line trace and a chart will be potted showing the individual temperature value experienced by each pixel in the line. Line Trace data can be exported to a text file by clicking on the **SAVE LINE TRACE TO TEXT FILE** button.
20. For videos select the **MOVIES** icon. Click on the **ACQUIRE MOVIE** icon when ready to power the device. The system will record a video of your device and will prompt you where to save it at the end of the recording. You may stop the video at any time with the **STOP** icon, but it will not save the video.
21. The **FILE** command at the top of the screen can be used to save the **Job, Images and Data**.

## SHUTTING DOWN THE SYSTEM

1. Go to the **TEMP STAGE** tab and set the Thermal Stage Controller to 50°C.
2. Click on the **TURRET** tab and select one of the **2.5 vis lens**. Click on **GO** and **OK** to Move Lens Into Position.
3. Move the head slide, the aperture slide and the lens turret into the proper configuration to view the black and white video on the computer monitor and on the small screen on the front of the instrument.
4. Click on the **ACQUIRE** tab and the **VIDEO** icon.
5. Once you see your image click on **STOP**.
6. Exit the software and shut down the computer.
  1. Turn **OFF** the Thermal Stage Controller.
  2. Turn **OFF** key switch on the front panel to make the green button turn off.
  3. Turn **OFF** the power strip sitting on the desk by the monitor.
  4. Log out of FOM.