SOAR Optical Imager (SOI)

Adapted by César Briceño from L. Fraga's guide
Remote access through VNC

Virtual Network Computing (VNC) allows you to connect remotely to another computer desktop.

For Windows or Mac OSX you need to install a VNC client like RealVNC: www.realvnc.com

Though most Linux distributions already come with some sort of VNC client, like vncviewer, vinagre or Remmina, RealVNC also has a Linux client.
Connecting to the SOI computers

1) The SOI data acquisition computer (GUI) is accessed with the following command:

vncviewer -Shared soaric1.ctio.noao.edu:9
or
vncviewer -Shared 139.229.15.131:9

2) The SOI data analysis computer (IRAF) is accessed with:

vncviewer -Shared soaric1.ctio.noao.edu:8
or
vncviewer -Shared 139.229.15.131:8

If you have obtained time through NOAO or the Chilean TAC, please contact Sean Points (spoints@ctio.noao.edu) or Cesar Briceño (cbriceno@ctio.noao.edu) to get the password information.

If you have time through the Brazil TAC, contact David Sanmartim (dsanmartim@ctio.noao.edu) or Bruno Quint (bquint@ctio.noao.edu)
This is what the SOI computer desktop looks like when you have successfully connected via VNC. If the SOI GUI is not already running, click on the SOI icon to start it.
Click on the SOI icon among the group of icons on the right. This is the SOI GUI, which is a LabView-based application.
Starting up the SOI GUI

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Starting up the SOI GUI

WAIT FOR CONNECTION

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Labview applications need you to click on the upper left arrow to run them. Once the SOI GUI is up and running this is what it looks like. All your connection LEDs in the upper right should be green, and overall no error messages should show up.
The SOI GUI layout

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1) Open a terminal and create a directory for the night's data. E.g. `mkdir /home2/images/NOAO/2015-10-15`
2) Modify the Basename to follow the preferred nomenclature, which is SOI_ProgramID, e.g. **SOI2015B0221**

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Telescope Control System (TCS)
The SOI GUI layout

Exposure Status

SOAR Optical Imager

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The SOI GUI layout

CCD Geometry

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Changing Filters in SOI

In order to change a filter:
1) Select any one of the filters by clicking inside the box “Filter List”, shown below.
2) Once the filter has been selected, click on the “Move” button (otherwise no filter change will take place!)

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Select the appropriate tab depending on the exposure type. This information will go into the image header keyword **OBSTYPE**.
In the Dflat tab, turn ON and OFF the Dome Flat lamps, and control their intensity. Click on the “ON (Dimmer)” option to turn the lamps on. Then indicate the intensity you want in the “Dimmer (%)) box (the SOI web page has the required intensities and exposure times to obtain dome flats with ~20000 ADUs), and finally click on the SET button.
Input the Observer information before you start

Click on the **Obs Editor** button to bring up the **Observer Data** window. Here you can input the information regarding your program.
Input the Observer information before you start

Click on the **Proposal ID** box to bring up the list of observing programs. If you don’t find yours listed don’t panic, you can add it to the list. See the next slides to find out how to do so.

Assuming your program is listed, simply fill in each of the boxes: **Observation ID, Date, Institution, Proposal Title, PI and Observer**, and then click on the blue **Apply** button.
If your program was not listed, click on the blue Edit button at the lower left corner of the Observer Data window.
This will bring up the **Observer Editor** window. Here, click on the **Edit Proposal ID list** button.
1) You will now be in the **Edit ID List** window. Here write your proposal ID in the “Enter new ID Name” box, then click on the “add tag” button, and then on the “save list” button. Now your proposal ID will appear in the list if you go down the menu at right. When done, click on the **CLOSE** button.
My program was not listed! How to add it.

Now, back in the **Observer Editor** window:

1) Add the Observation ID by selecting it on the **Label Name** menu and clicking on the “add” button at right
2) Enter the observation ID info and click **ENTER**.
3) Repeat for the other fields: Date, Institution, Proposal Title, PI, Observer, email.
4) Once done, click on the “apply” button, and then on the **CLOSE** button.
My program was not listed! How to add it.

Back in the **Observer Data** window, close it (CLOSE button) and open it again from the main GUI. Now your program should appear in the **Proposal ID menu**, and when you select it, all fields will be correctly populated.
There is a Filter Editor you can call up by clicking on the appropriate button in the main GUI. However, you would normally not need to bother with it, since the filter information should have been updated by our Observer Support staff when they changed filters or installed the SOI filter wheel.
Configuring the CCD Geometry

Modifying the binning:
1) Select the binning you want
2) Click on “Apply”
3) Verify that the value did change
In order to use the SOI Grid Tool:
1) Select the offset units (arcsec or pixels)
2) Select the dither pattern
3) Indicate the size of the offsets in “Step size” box
4) Indicate the number of steps and click Enter
5) Click on “Apply” and then on “Enable”
Executing the dithered observation:  
1) Set image name and exposure time in the Object tab. NOTE: set the number of exposures to 1 unless you want several exposures at each dither position.  
2) Select the appropriate filter  
3) Click “Start” to initiate your dithered observation. The “Grid” LED will turn on green.  
4) When finished, click on “Disable” to return to the normal non-dithered mode.
SOI has a scripting tool based on the LuaView scripting language. The best way to prepare your own script is to start with one of the existing ones.

If you have questions, consult with the SOI Support Scientist.
SOI Cookbook
Adapted by César Briceño from L. Fraga’s guide

Making offsets with SOI

SOI allows you to make telescope offsets using the “Offset” window. Simply select offsets in arcsec or in pixels, and then the East/West or Up/Down directions respectively.

Once the appropriate values and directions have been selected, click on the “Apply” button to execute the offset.
In case IRAF is not running, click on the IRAF icon to start it.
Looking at your SOI images in soaric1:8

1) Open DS9 from the IRAF command line: `!ds9 &`
2) Go to the data directory: `cd /home2/images/NOAO/2015-10-15/`
In order to work with the SOI Multi-extension (MEF) images, you need to load the MSCRED package in IRAF (just write “mscred” in the IRAF command line). Then, display the image with “mscdisplay SOI2015B-0221.132.fits” in the IRAF command line.

**NOTE:** you can still display any of the 4 sections of a SOI image with the IRAF command: “display SOI2015B-0221.132.fits[1]” will show the first quadrant in ds9.
1) If use MSCDISPLAY, you need the MSCRED version of IMEXAMINE: MSCEXAMINE
2) If you display only one section with DISPLAY, then you can use the normal IMEXAMINE routine, either after “display image.010.fits[1]” or with “imexamine image.010.fits[1]”