74 inch Change: HIPPO (Polarimeter) ON

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In the New 74"Warm room

Ensure that **TCS** is locked out by turning the **TCS Lockout** switch on the mimic panel (refer to figure 1) to **ON** state. TCS Control indicator will flash as a warning that the TCS is locked out.

Figure 1: *TCS LOCKOUT SWITCH*

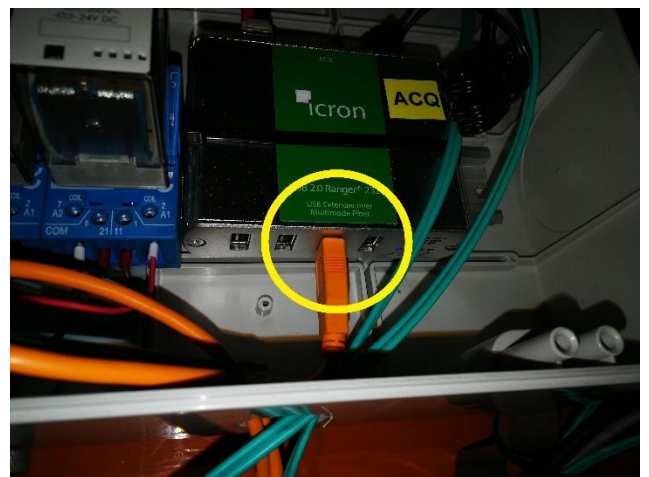**Figure 2: XY-Slides control box**

Figure 3: Port to be used on ACQ Icron device for Hippo and Instrument Selector acq. Cameras

Observing Floor

1. Mount SAAO acquisition box on large flange.

2. Mount "XY-SLIDES CONTROL BOX" on the telescope (See Figure 2) and connect up the 2 25way d-type connectors, 15way d-type connector, 4 circular connectors and 1 IEC power plug.

3. Mount XY slides and auto-guider on the acquisition box on the South side. Reconnect IEC mains cable and 15-way ribbon cable to the acquisition box.

4. Connect Hippo acquisition camera USB to port shown in Figure 3.

5. Mount HIPPO (Polarimeter) with cables to instrument computer in the warm room already connected.

6. Plug the mains power cable to the instrument frame, at the UPS extender on the telescope. The electronics is powered via a mains strip on the instrument frame.

7. Ensure the two cold box power supplies are running.

8. Cycle power to the Indexer on extender plug on the instrument frame. (This is a precaution as sometimes the indexer needs to be reset if it's been standing unused for a long time)

9. Also ensure that:

   - Dark Slides are closed
   - Eye Pieces are in beam
   - PMT's power supplies (HT supplies) are OFF
   - There is a handset on the telescope

Old 74"Warm Room (observation floor)

The instrument control PC (polarimeter) is mounted in the rack in the old 74"warm room. Use the computer peripherals for Hippo – found behind the SpUpNIC dual monitors at the control station – all marked Polarimeter:

PC Monitor (Phillips model no. 109 e5), keyboard and mouse.

1. **Power ON the control PC**

   The screen goes blank for ~20 seconds before the login prompt is displayed.

   Login: ccd
   Password: Saaoccd

New 74" Warm Room (ground floor)

1. **Ensure that the following is connected to TCS74v3 PC:**
    - Acquisition camera USB
    - 2 HDMI cables on Dell display ports
    - USB for mouse and keyboard.

2. **Do the following tests:**
    - Initialize the XY-slides. If it fails, make sure that the XY-slides control box is powered on and that the Reset XY-slides button at the east side of the north pier has been pressed.
    - Do an exposure on the acquisition camera and make sure that there are some counts.

3. On SpUpNic machine – exit SpUpNic, Quicklook and ROS Camera view
4. **Start the polarimeter software:**
    - Open a terminal on the SpUpNIC machine.
    - Type the following "ssh -Y ccd@tcs74v2.suth.saao.ac.za" press enter.
    - Type "cd "then press enter.
    - Now type "source runit" press enter.

    Any username and password that is requested should be the same as above.

    If you have any trouble with getting the polarimeter software started on the SpUpNIC machine, contact Steve Potter for help. Also update this change note if the trouble was due to incomplete or incorrect information in the change note.

5. After starting the polarimeter software the following GUI is displayed on the screen. The instrument checkout procedure will focus on the Main page – see panels 1 (controls), 2 (status) and 3 (photometer counts), shown Figure 4 below.
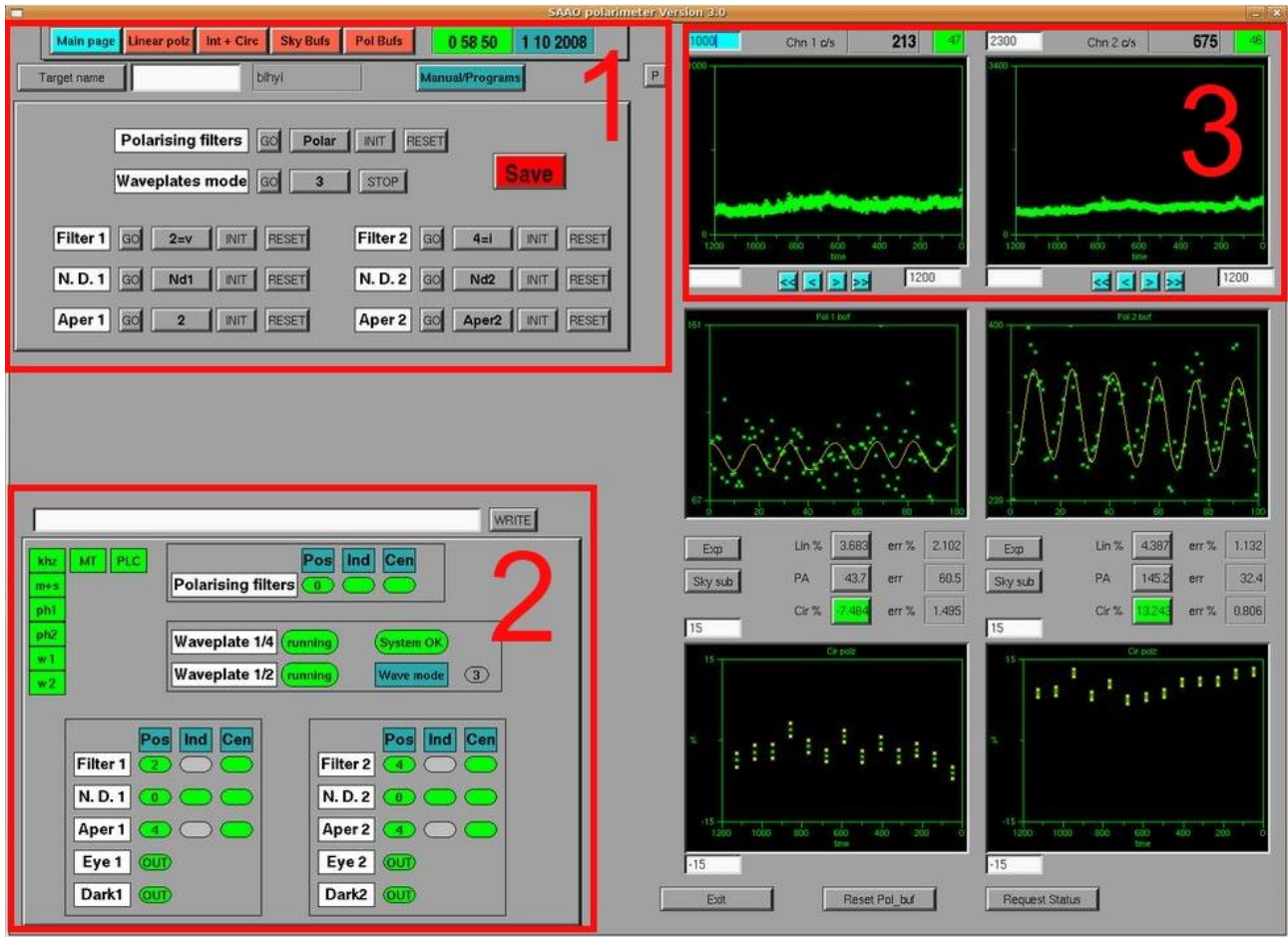
Figure 4: Instrument Control GUI Main page

6. Check instrument control PC communications:

Locate the status indicators on the control GUI (Panel 3 in Figure 4). Note the following:

- The status indicator is green if communications is OK.
- The two photometer indicators ph1 and ph2 (circled in the Figure 5, below) are red until the high-tension voltage to the photometer is turned ON.

   NB! The lights in the dome must be turned OFF before testing the photometer with high-tension voltage switched on – section 3.3.
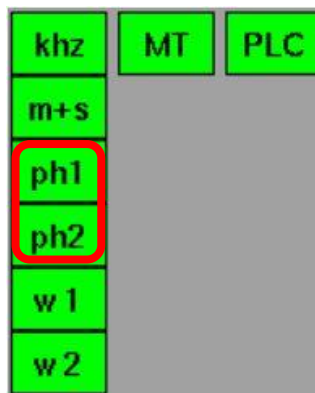

Figure 5: PC communications status indicator

Below is a description of each indicator, listing possible remedy for a fault state (indicated as red).
Check each status indicator.

- **khz** This is the indicator for the **khz signal** between the time service and the time card in the PC. *The indicators below this, in the same column, are meaningless unless the khz signal is present.*

  The khz signal may be red **khz** if:

    - the cables between the time service and the PC (time card) are not connected.
    - the software has not been restarted after boot-up of PC.

- **m+s** This is the **minute and second pulse** indicator.

  The minute and second pulse signal may be red **m+s** if:

    - The cables between the time service and the PC (photometry card) are not connected; these are separate cables to the khz cables.
    - The software has not been restarted after boot-up of PC.
    - The khz signal is not present (**khz**).

- **ph1** and **ph2** These are the **photometer** indicators.

  There should always be dark counts of 1 to 5 (cs-1 or counts per second). Further details on photometer check can be found in Section 7.

  If there are 0 cs-1 then these indicators will turn red **ph1** **ph2** :
    - the cables between the instrument and the PC (photometry card) are not connected.
    - the software has not been restarted after boot-up of PC.
    - the power supply to the photometers is off.

    - the khz signal is not present (**khz**).

- **w1** and **w2** These are the indicators for the rotating **waveplates pulses**.

  These will turn red **w1** **w2** if:
    - you have not yet set the waveplates to rotate (i.e. they are stopped). Set them rotating in program mode 3.
    - the khz signal is not present (**khz**).
    - the software has not been restarted after boot-up of PC.

    - the communications with the PLC failed - indicated by red PLC indicator (**PLC**).
    - problem with the indexer on the instrument - Power cycle the indexer.
    - the waveplates have stalled. i.e. they may have physically become stuck.
    - the waveplate sensors have malfunctioned.

- **MT** This is the **time service** indicator.

  The time service indicator may be red (**MT**) if:

    - the cables between the time service and the PC (time card) are not connected. These are separate to the khz and m+s cables.
    - the software has not been restarted after boot-up of PC.

- **PLC** This is the **PLC communications** indicator.

  The PLC communications indicator may be red (**PLC**) if:
    - the cables between the PLC and the PC (serial port) are not connected.
    - the plc is not switched on.
    - the software has not been restarted after boot-up of PC.

7. Check the time

Check that the software is displaying the time (Figure 1, panel 1) as displayed on the SAAO time server. The date should also be correct. The PC system time can be ignored.

8. Initialize everything

At the beginning of every night, or every restart of the software, or every power cycle of anything, initialize: polarising filters, filter1, filter2, ND1, ND2, Aper1, Aper2 (Figure 1, panel 1).

Check that the status indicators report position 0 as green, and that the Ind and Cen indicators are green.

9. Check the waveplates

At the beginning of every night, or every restart of the software, or every power cycle of anything, it is usually necessary to power cycle the indexer. To do this go to the power strip on the instrument and find the plug labeled "indexer". Switch it off, count to 5, then switch it back on.

Start the waveplates rotating by choosing mode 3 and pressing GO. The waveplate status indicators should change from yellow "stopped" to green "running". The waveplate pulses indicators should be green (**w1** and **w2**).

10. Check the photometers

Note that these tests need to be performed in a dark dome and PMT power supplies switched on. That is, the dome lights are off and the warm room door is closed.

The photometers are prone to electronic interference that can introduce spurious signals. Two known sources of possible interference are the acquisition camera during readout and/or the rotating waveplates. Proper insulation will eliminate such interference.

Counts from both photometers are always reported as cs-1 (counts per second) in their respective boxes on the top right of the main screen. Irrespective of observing mode and dark counts it should be about 1 to 5 (cs-1).

Interference from the two sources should be tested separately. With the waveplates stopped and the acquisition camera reading out (set to full screen and 0.05s integrations) the dark counts should remain at about 1 to 5 (cs-1) with no obvious increase during acquisition camera readout.

Similarly, with the acquisition camera not integrating, start the waveplates rotating and check that the dark counts do not increase.

IN WARMROOM:

> **NB!!!** Ensure that **TCS Lockout** switch on the mimic panel is set to **OFF** state. TCS Control indicator will stop flashing.