



Pulsar Observatories

Rigel Observatory Automation

Congratulations on purchasing the Pulsar Observatories Rigel Rotation Drive and (optional) Shutter Drive. These new modules add a new dimension to your observing and imaging experience and will allow you to fully automate the operation of your observatory.

Rotation Drive

The Rotation Drive can be used without a PC and will allow you to select any azimuth angle to match the position of your telescope and to then track continuously at sidereal rate or any other rate of your choice. Accurate tracking is controlled by the built in microprocessor with positional input supplied by a digital encoder. Accuracy is further refined by a homing sensor that ensures that the dome starts its operation from a known point. A simple calibration routine makes setting up quick and easy.

Access to the various built in features is gained via the soft touch panel buttons and illuminated LCD display.



Current Features

- Move left and right
- Go to angle
- Open and close shutter
- Change brightness
- Stop
- Sidereal speed display
- Home
- Charging status of shutter
- Angle display
- Change sidereal speed
- Park
- Backlight timeout

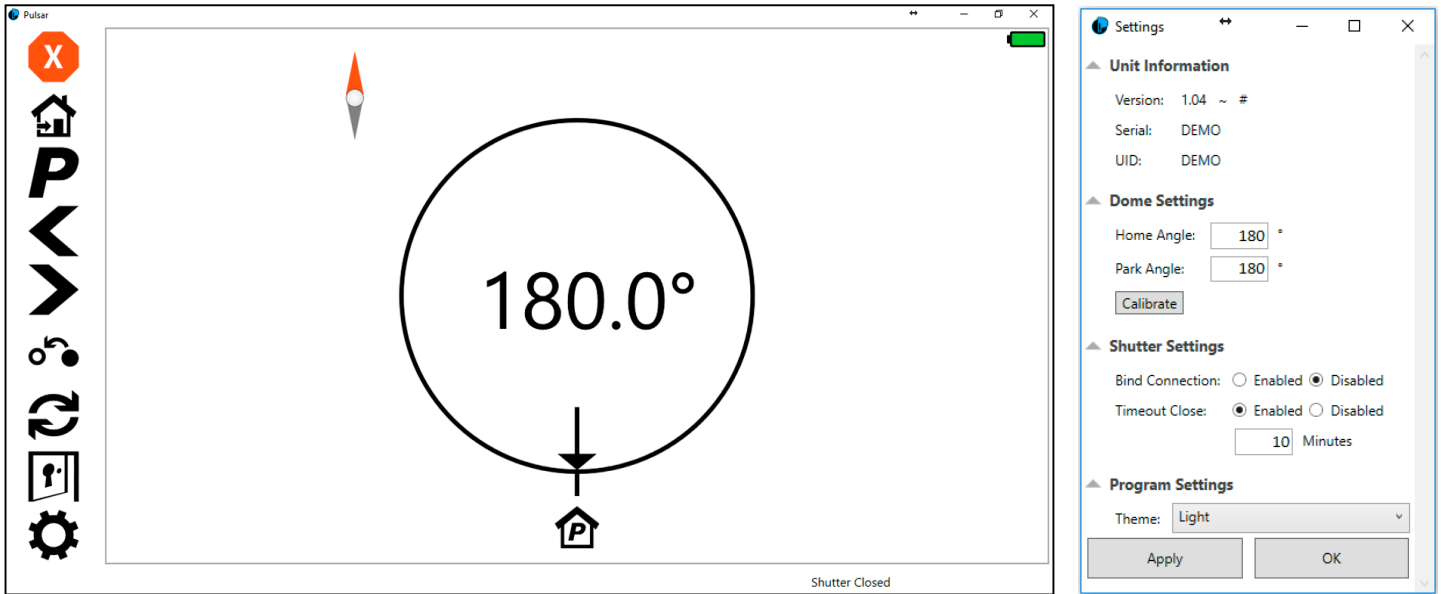
Shutter Drive

The optional shutter drive can be used to open and close the dome's shutter, either at the press of a button or by selection from the menu system on the Rotation Drive via a two-way Bluetooth wireless connection.

Software

The Rotation Drive is supplied with the Pulsar Observatories software package which gives full control of the observatory from a computer. The drive unit is flash upgradeable to allow additional features to be implemented as they are developed in the future. The Pulsar Observatories software will currently control the following functions:-

- Move left and right
- Go to angle
- Open and close shutter
- Change home angle
- Charging status of shutter
- Stop
- Sidereal speed display
- Home
- Change park angle
- Calibrate
- Angle display
- Change sidereal speed
- Park
- Shutter status
- Day/Night colours



Also included is an ASCOM driver for use with third party software like MaxIm DL, CCD Commander and Sequence Generator Pro to allow fully automatic synchronisation of the dome's aperture to match the pointing of the telescope at any point in the sky using a process known as 'dome slaving'. It is here that the Rigel system really comes into its own as part of a fully automated system ideal for remote imaging. You must also install the latest ASCOM platform available from <http://ascom-standards.org> to use dome slaving.

Setting up

Access to the observatory settings can be achieved by clicking on the 'cog' icon. We recommend setting the dome's home position to 180° if you are in the Northern hemisphere or 0° if you are in the Southern hemisphere as this ensures that the solar panel that maintains the charge in the shutter drive controller's embedded battery, receives the maximum charge available from a fixed position. To achieve this, manually rotate the dome to the angle that you want, using a magnetic compass to cross-reference exactly where you are pointing and then attach the encoder position tag so that it fits centrally between the two probes on the home sensor unit. You should now run the built in calibration routine by clicking on the **Calibrate** button. The dome will then revolve one or two complete turns as it calibrates the encoder against the circumference of the dome.

The park position can be any azimuth angle that suits your requirements but unless you have a specific reason for doing so, it makes sense for this to match the Home position.

If you have opted for Pulsar Observatories to install the drive unit(s) for you, they will already have carried out the above procedures.

Dome Slaving

A complex set of calculations have to be performed to carry out this process but all you have to do is supply some dimensions taken from your mount, pier/tripod and the dome itself and enter them into the relevant fields in your own dome control software. The dimensions required for any dome control program are shown overleaf with a brief description.

Measurement	Inches	mm
Total North/South Offset		
Total East/West Offset		
Total Up/Down Offset		
Dome Diameter or		
Dome Radius		
GEM Axis Offset		

Enter your spreadsheet results here for future use

Total North/South Offset

This is the \pm offset of the RA axis centre towards the north or south

Total East/West Offset

This is the \pm offset of the pier centre towards the east or west

Total Up/Down Offset

This is the \pm offset of the RA axis centre from the base of the dome section

Dome Diameter

This is the measurement of the dome diameter or

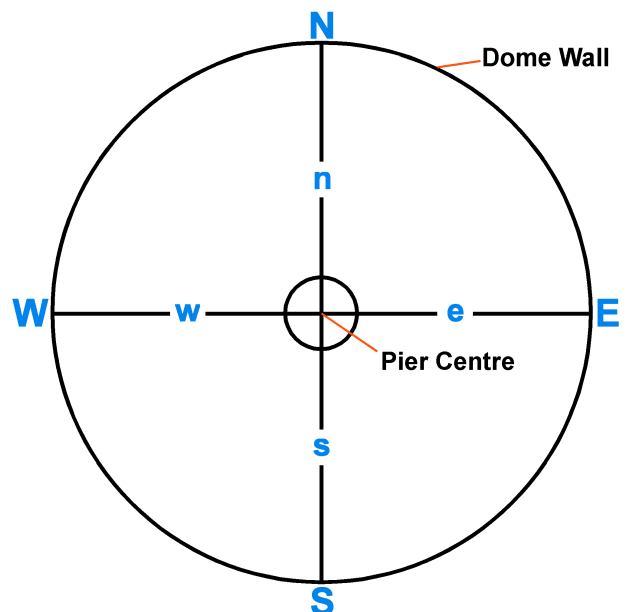
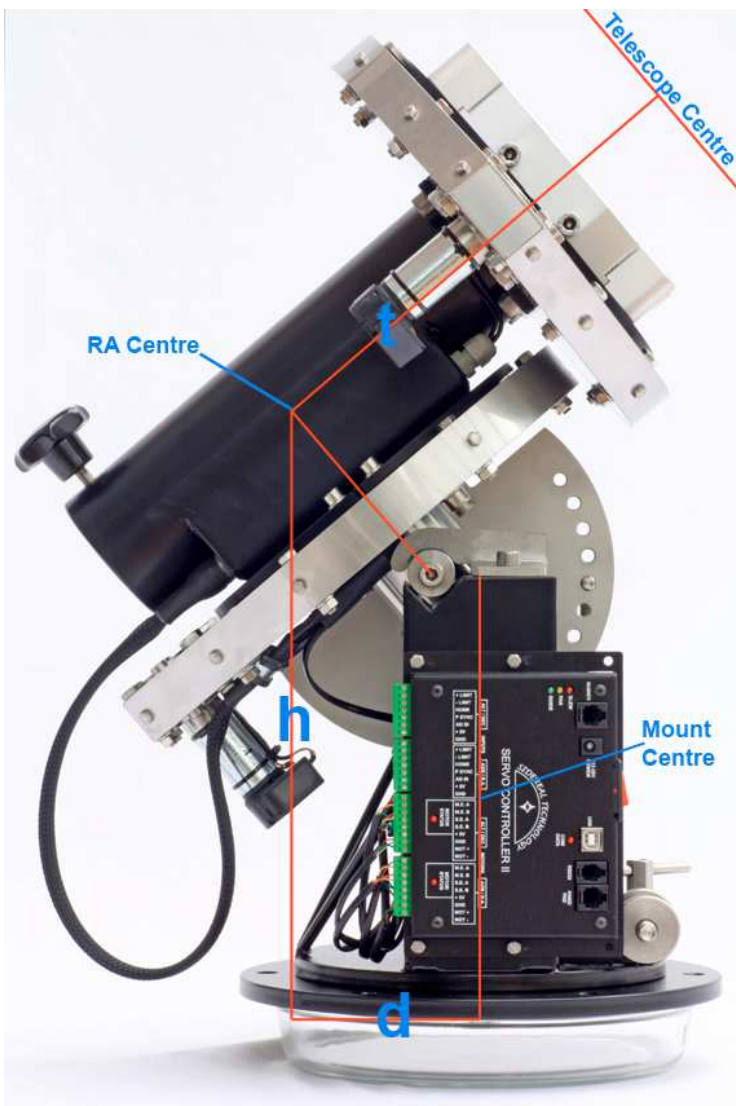
Dome Radius

This is the measurement of the dome radius

GEM Axis Offset

This is the distance from the RA axis centre to the centre of the optical tube

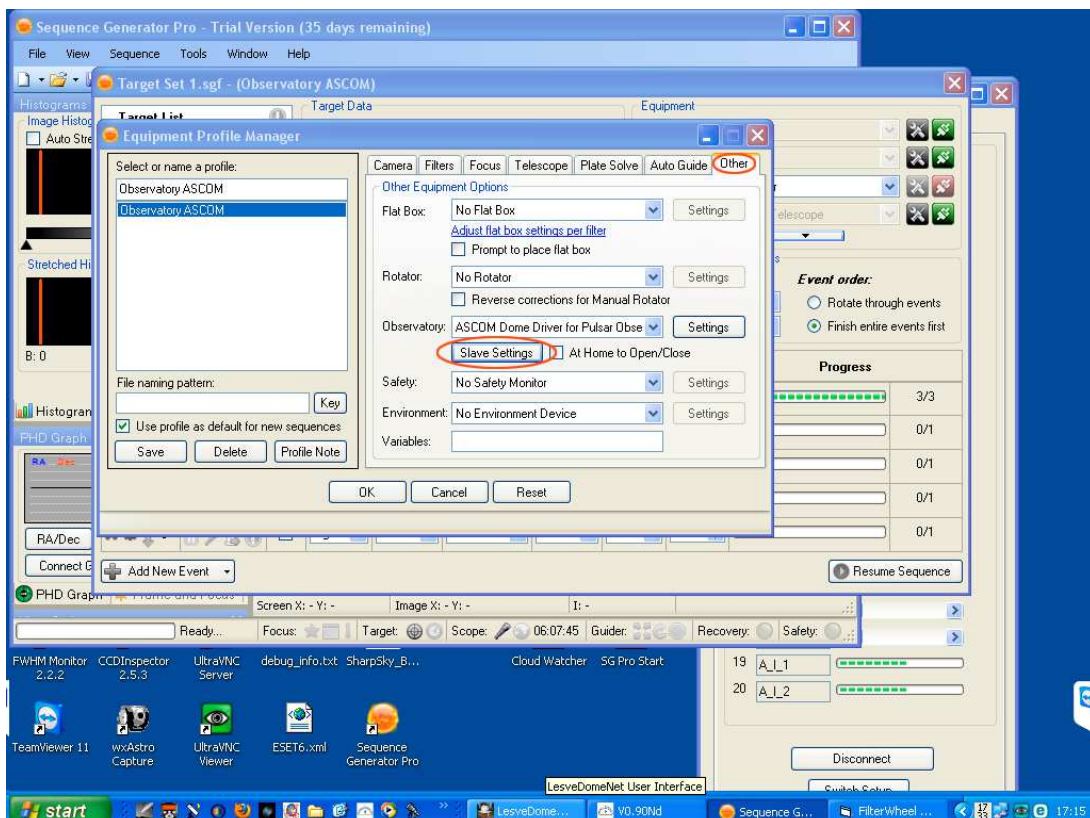
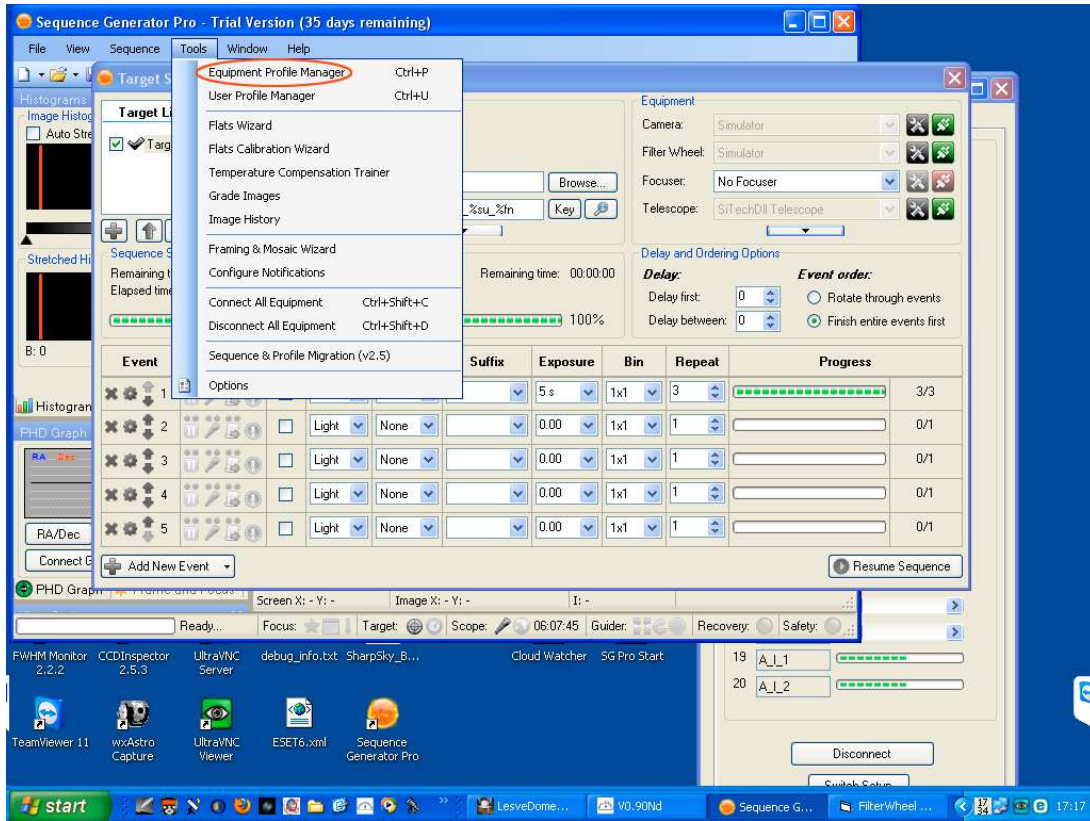
These dimensions can be measured and calculated quite simply but we include a simple downloadable spreadsheet on our website that will make the task even easier. Please note that some programs require Metric measurements and others require Imperial measurements. There is also some variation between programs for the use of the dome diameter or dome radius but our spreadsheet shows both for you to enter into your software as applicable.

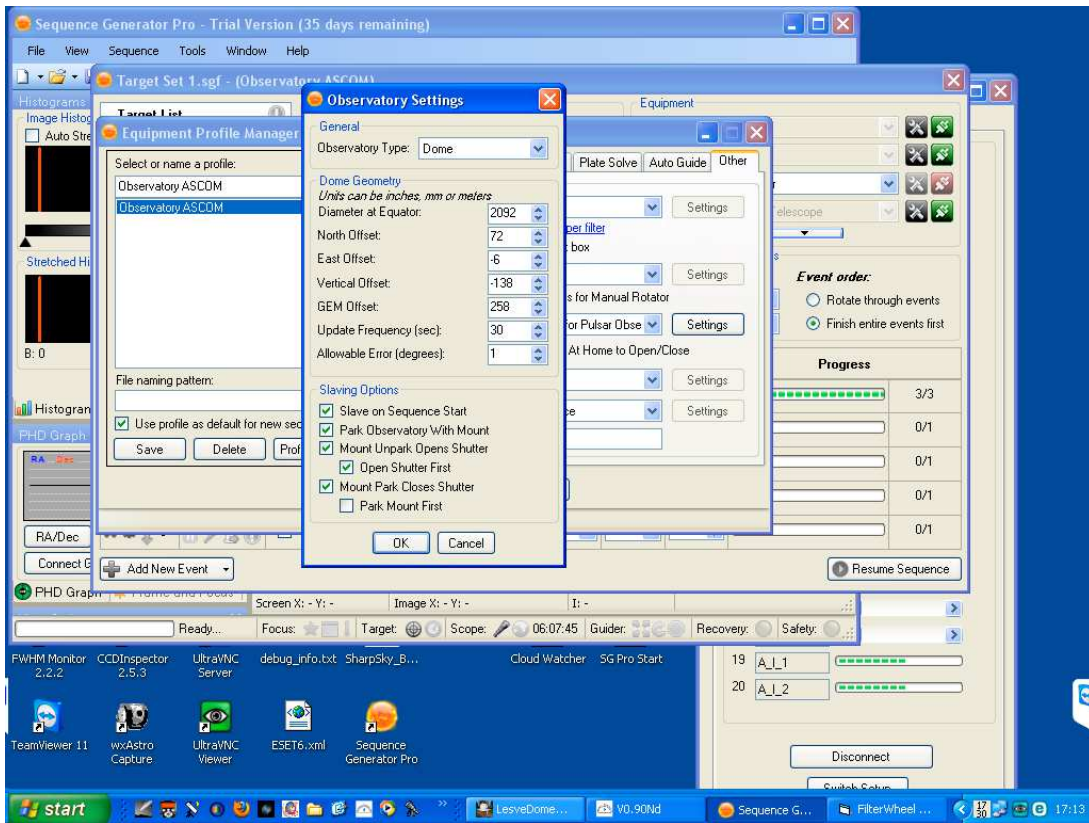


Sequence Generator Pro

Sequence Generator pro is a powerful image capture and sequencing tool. However, its rich feature set includes slaving of the dome to the telescope. At the start of an imaging sequence, the dome shutter will open and then the aperture will follow the pointing of the telescope throughout the session, including a meridian flip. Finally, at the end of the sequence, the software will park the dome and close the shutter.

We would strongly recommend that you acquaint yourself with the general operation of this software but, to set up the slaving parameters, select **Tools – Equipment Profile Manager – Other**. Under the Observatory heading, click on **Slave Settings** to bring up the Observatory Settings dialogue box. Enter the parameters from your spreadsheet. SG Pro is not concerned with Metric or Imperial units so just be careful not to mix them!



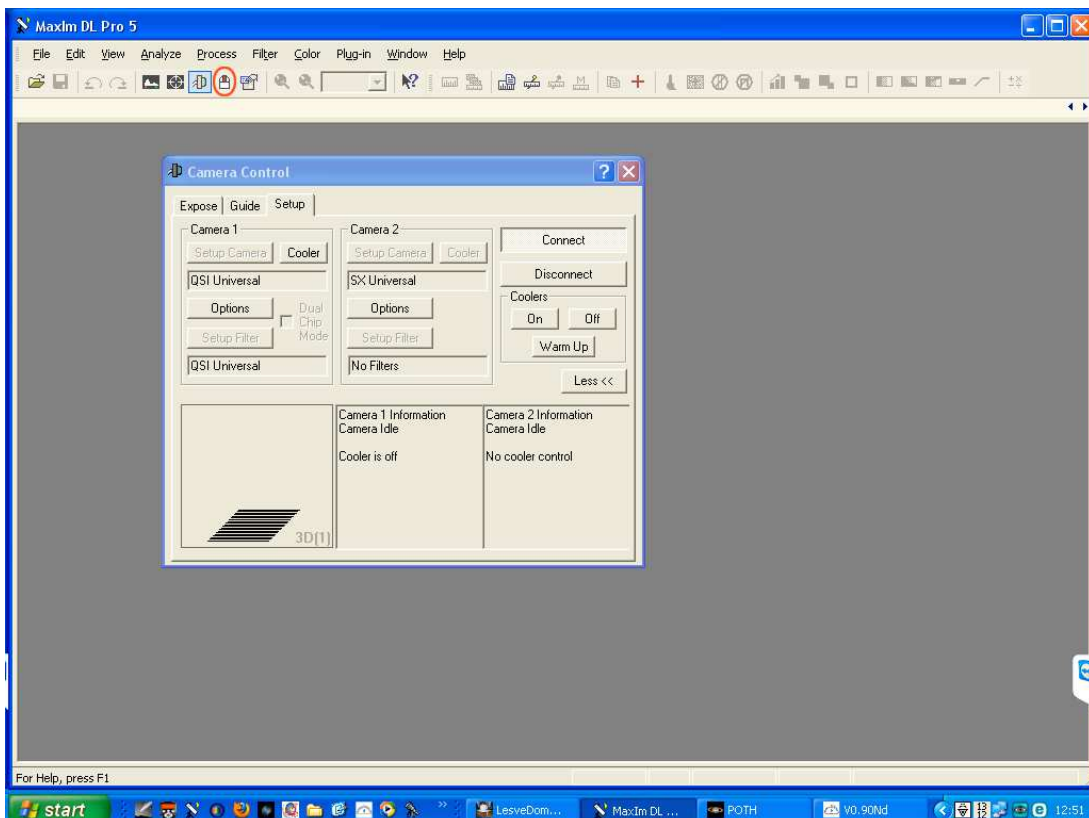


Having entered the observatory settings, you can complete the Slaving Options by ticking all the boxes, with the last one - Park Mount First - being optional. Click on **OK** then save the profile with a name of your choice or by using the existing profile name if you have already generated one.

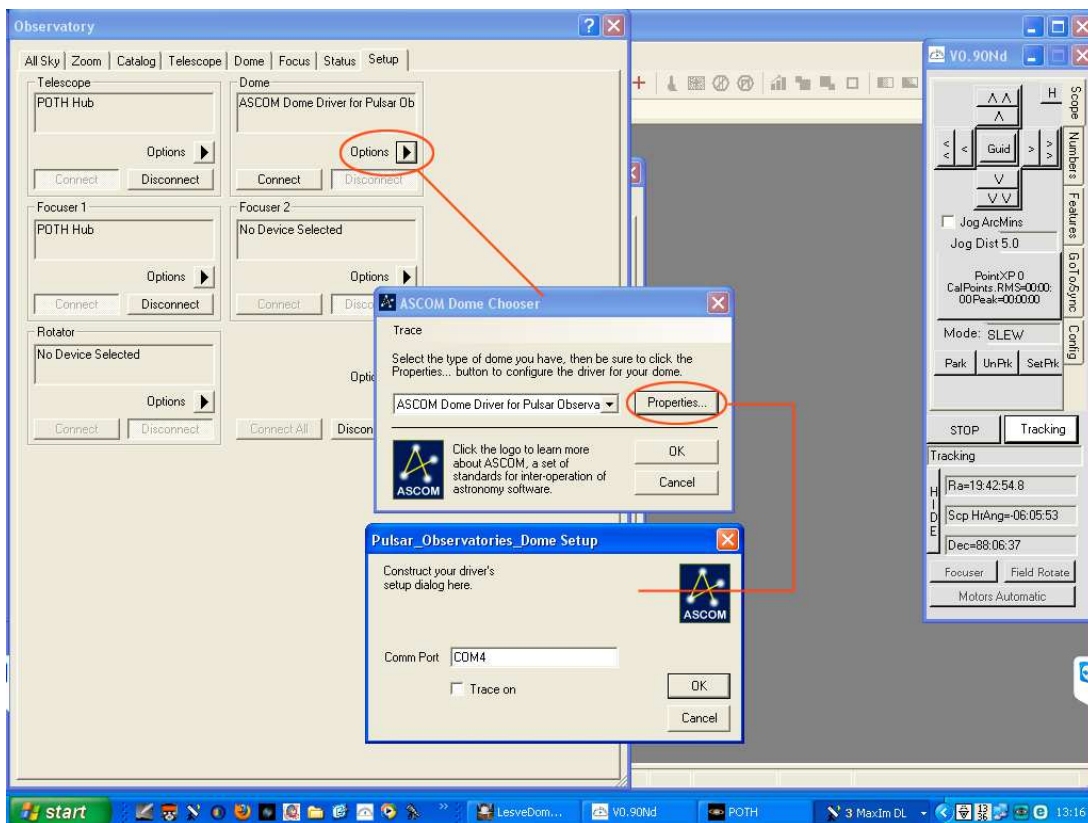
MaxIm DL

MaxIm DL has a convenient dome control feature built in and this will allow automatic dome slaving. However, we would strongly recommend that you acquaint yourself with the general operation of this software before you start setting up the dome control functions.

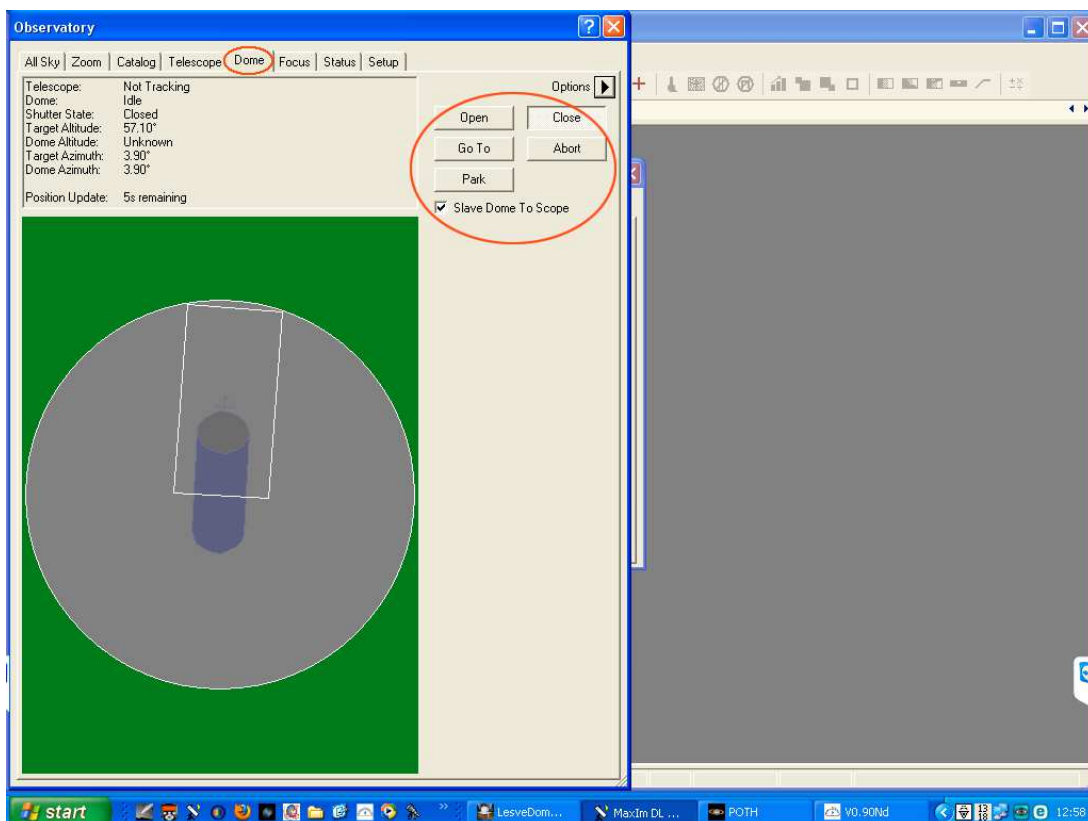
To set up dome slaving, start by selecting the '**dome icon**' button.



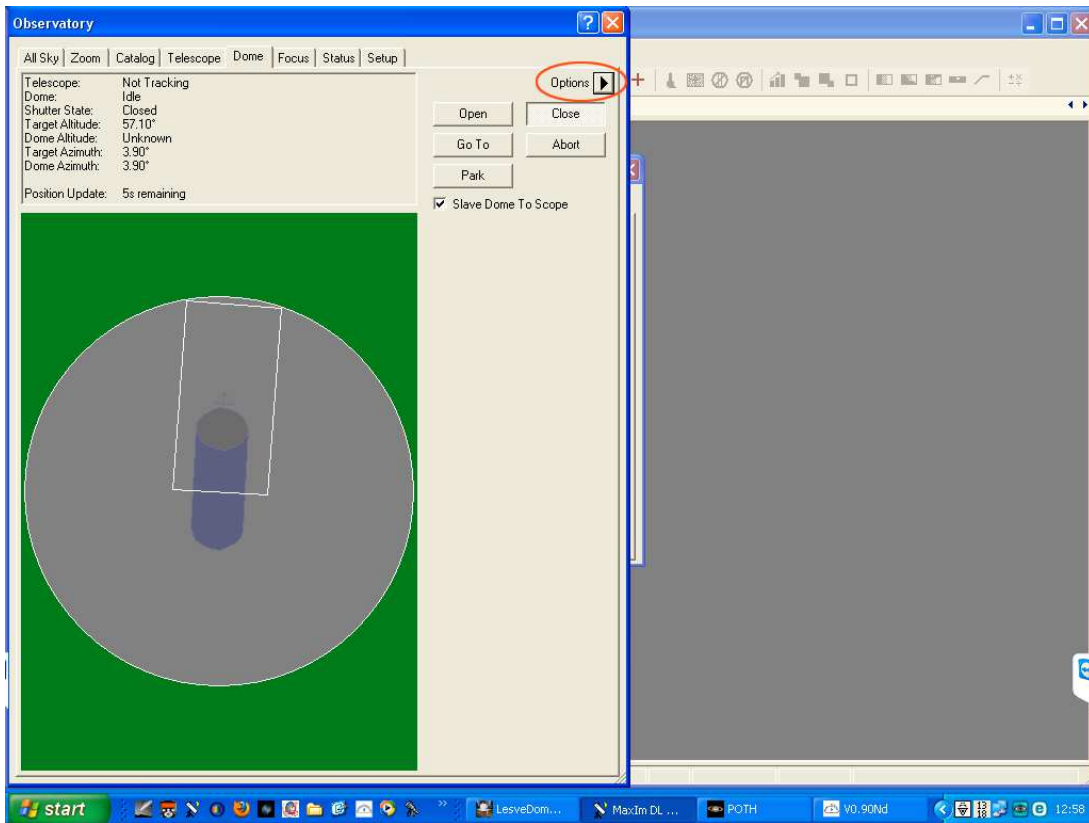
Click on the **Options** button and choose *ASCOM Dome Driver for Pulsar Observatories*. To complete the driver set up, click on the **Properties** button and confirm the correct COM port. Click on **OK** to close the dialogue box. Now click on the **Connect** button to connect to the dome. Finally, click on the Dome Tab to perform the rest of the setting up procedure.



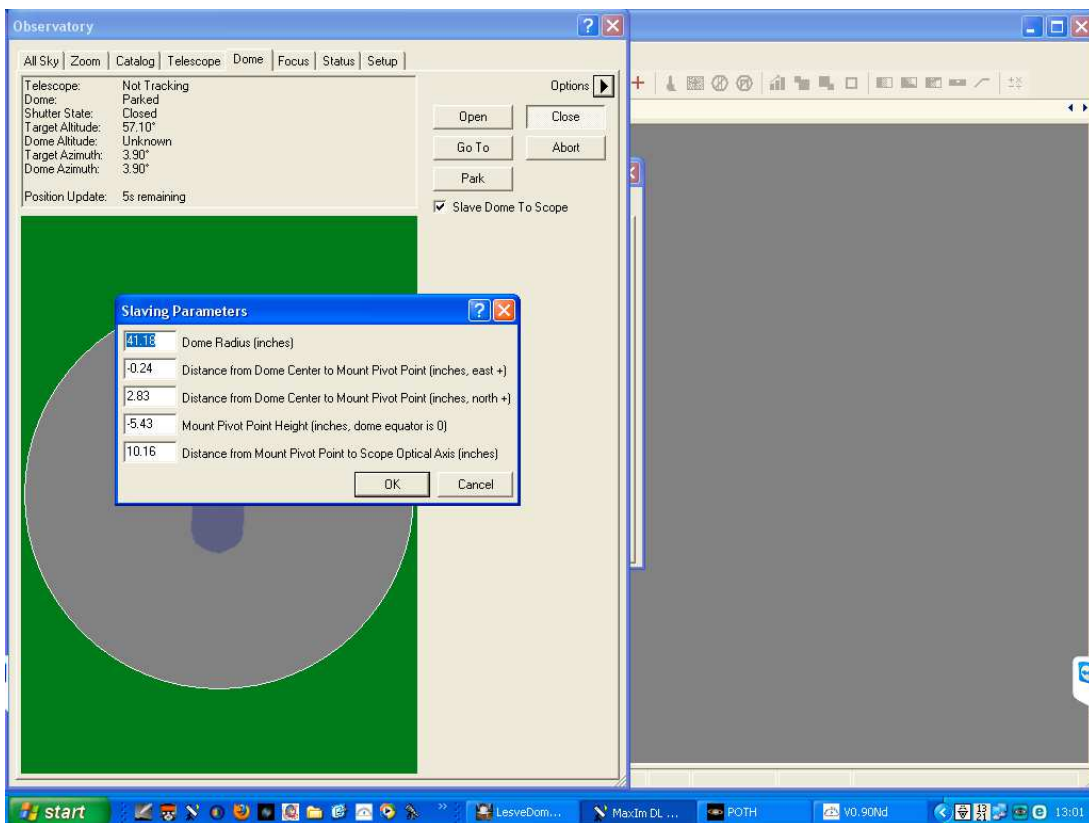
You will note here that there are various actions that you can carry out including opening and closing the shutter.



Select the *Slave Dome to Scope* tick box then click on the **Options** button.



Fill in the Slaving Parameters noting that Imperial measurements are required.

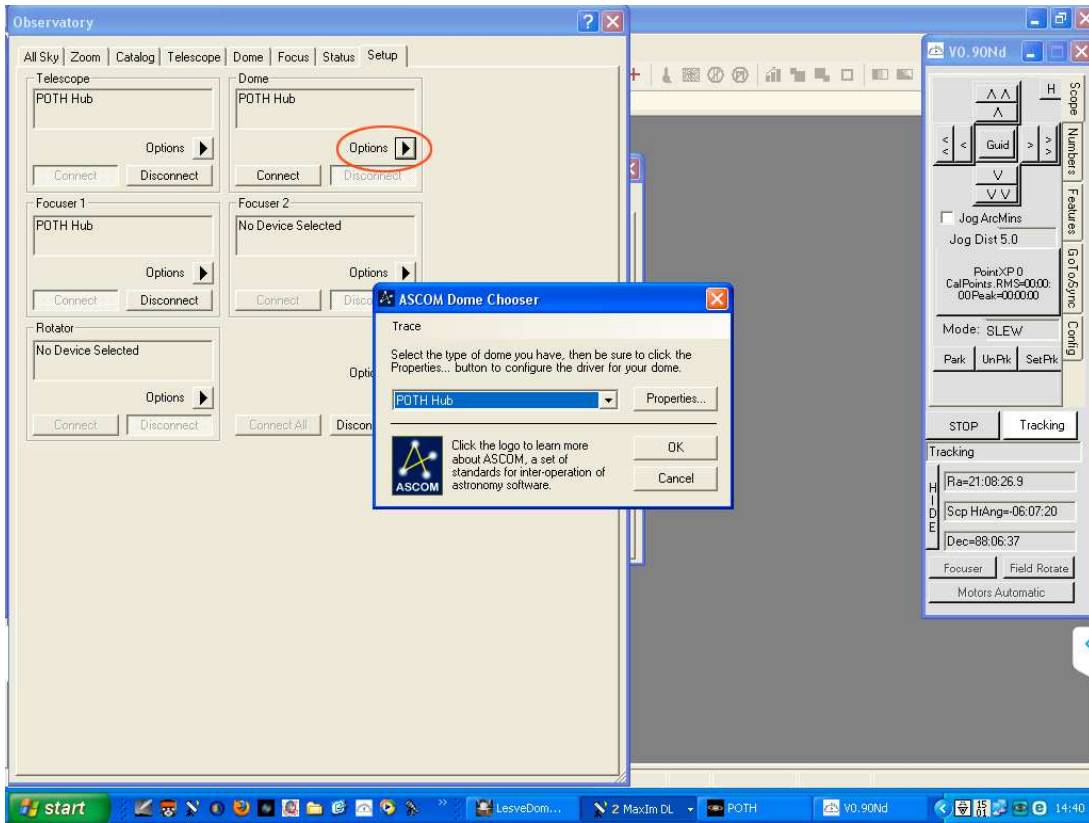


Finally click on **OK** to save your data.

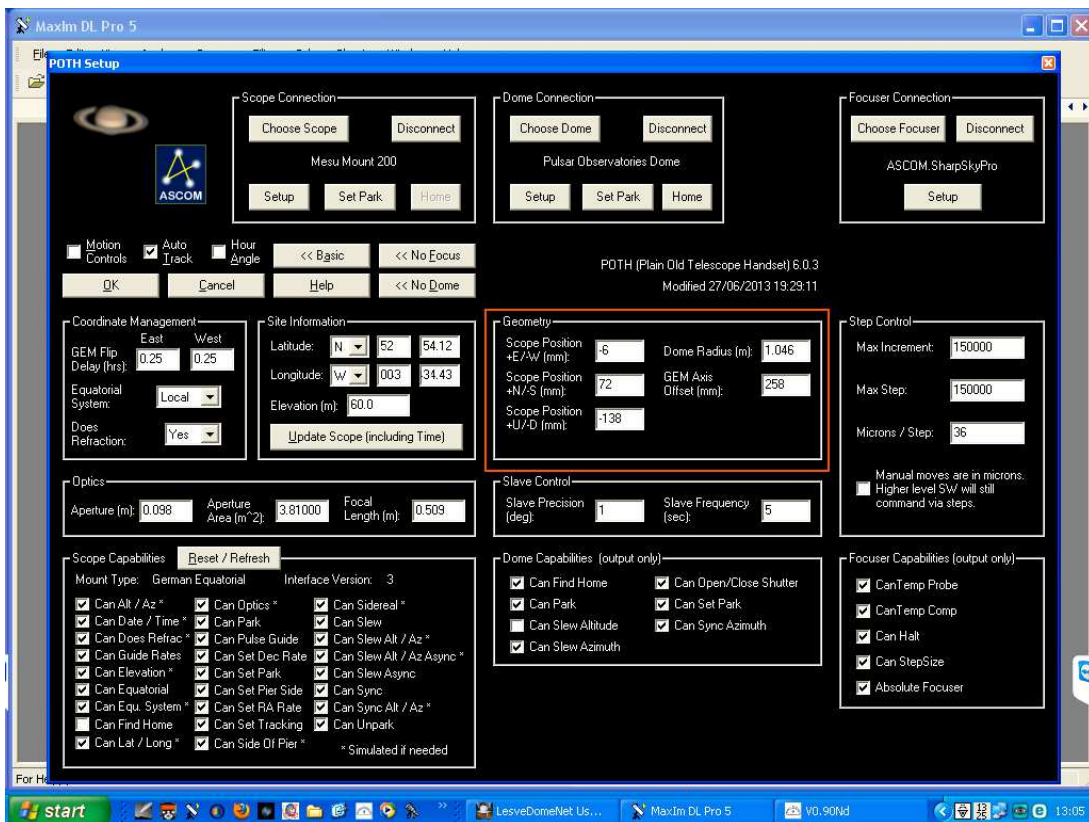
Using POTH

POTH stands for 'Plain Old Telescope Handset' and is a very powerful tool supplied with the ASCOM platform. Any device connected to POTH can be accessed by any and several ASCOM compatible programs at the same time so that you can, for example, operate your telescope from within MaxIm DL and see the results of your actions in the Planetarium software, Cartes du Ciel. As an alternative to connecting to the dome directly

from within MaxIm or any other control software like CCD Commander for example, you can use POTH as your dome slaving controller as it too has full slaving capabilities. To connect to your dome via POTH, click on the **Options** button to bring up the ASCOM Chooser dialogue box.



Next, click on the **Properties** button and fill in the slaving information from your spreadsheet into the 'Geometry' section in the Metric units shown.



Finally click on the **OK** button to save your settings.

Should you have any difficulty in either the installation or operation of your Rigel dome control system, please contact Pulsar Observatories for support.

Contact details

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