



Pyxis Commander Software

Quick Start Guide for Installation and Configuration

Optec software engineers have developed a single unified driver for all versions of the Pyxis camera field rotators. Whether you're using the original 2-inch Pyxis, Pyxis 3" first or second generation, Pyxis LE, or the new Pyxis 2" GEN3 rotator, you can now use Pyxis Commander software to control one or more of these devices from multiple clients.

Pyxis Universal Driver

Introducing CrossCom

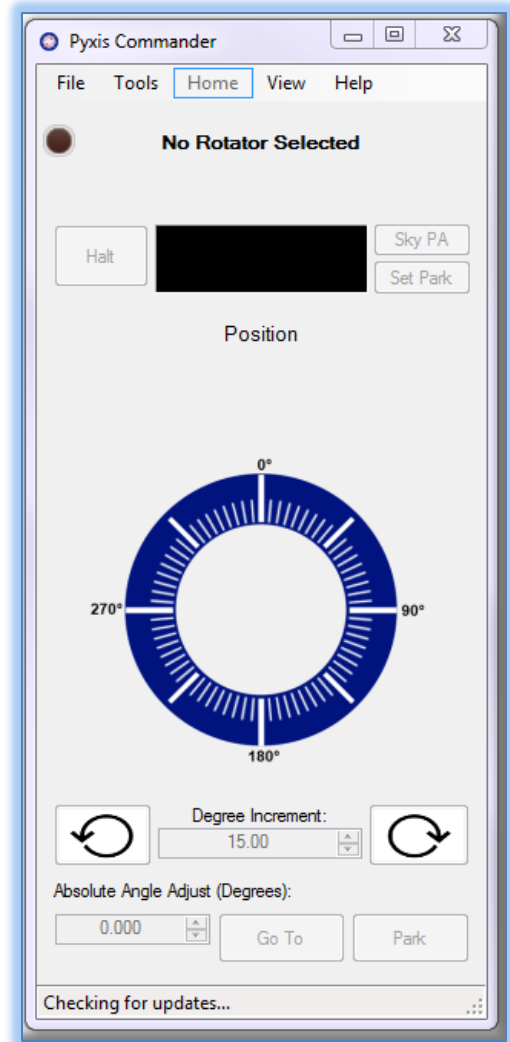
Built with Optec's new CrossCom architecture, you can use the Pyxis Commander software to control rotators using Windows, Mac OS, or Linux. For best compatibility Windows 7, 8, and 10 users will configure Pyxis Commander as an ASCOM local server which allows multiple clients to share access to the hardware level drivers.

CrossCom works on a layer just below ASCOM and SBIG's X2 standards to allow control through nearly any device. Simultaneous rotator access is allowed on any OS assuming the connection link is valid and accessible.

Download and Install

Visit Optec's download page to download the most recent version of Pyxis Commander Software and Unified Driver:

<http://www.optecinc.com/astronomy/downloads/pyxis.htm>



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Pyxis Commander Unified Rotator Driver



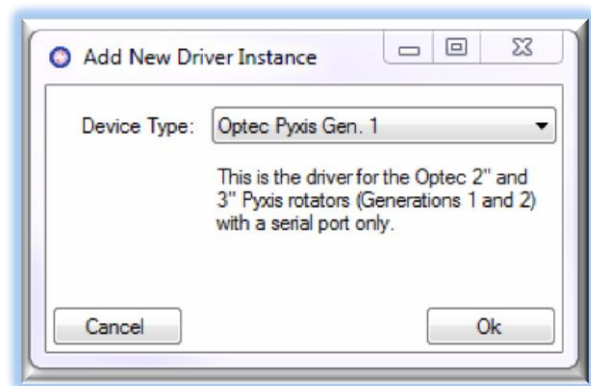
Once downloaded, open the zip file and click Setup.exe to begin the installation. Follow the onscreen instructions until setup completes.

For Windows users, ASCOM platform 6.1 or higher and .NET platform 4.0 are required. The Pyxis ASCOM components should be installed automatically. Locate and click **Pyxis Commander** (Start – All Programs – Optec – Pyxis Commander – Pyxis Commander.exe) to start the Commander program for configuration and control.

Configure Device Type and Instance

Click Tools – Settings to begin the configuration. For first time setup you will see an **Add New Driver Instance** dialog box. Select your correct Pyxis type from the **Device Type**: pulldown.

- **Optec Pyxis Gen 1** - Pyxis 2" and Pyxis 3" Gen 1 or Gen 2. These rotators feature serial communication only including Optec's USB/Serial cable.
- **Optec Pyxis Gen 3** - the Pyxis 3" Gen3 third generation rotator features a dual control circuit for USB/Serial or Ethernet connections.
- **Optec Pyxis LE** – Pyxis LE rotator with true USB connectivity.



Be sure to select the correct device type and click the **Ok** button. You will see the main **Pyxis Universal Driver Setup** dialog box. Note the Driver Instance number (default = 0) is displayed in the dialog box header. If you have multiple Pyxis Commander drivers in use, each will be assigned a unique ID.

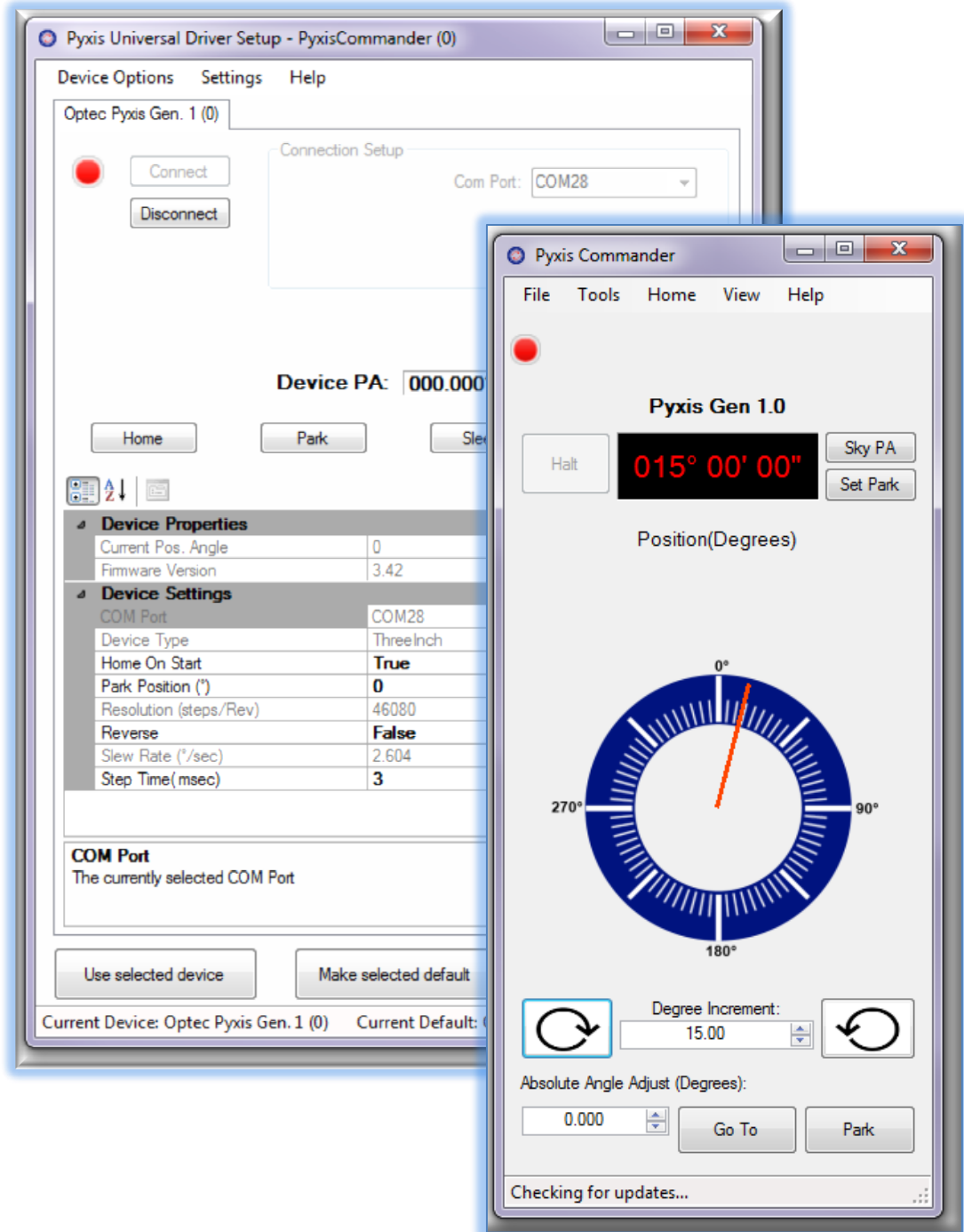
If you configure additional Pyxis rotators of the same device type, each will also be assigned a unique instance ID. Each configured Pyxis rotator will appear as a tab in the **Pyxis Universal Driver Setup** dialog box. However, if you have just one rotator in your system we suggest you configure and use just that one instance. It will be the default for all ASCOM client configurations as well as Pyxis Commander.



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Pyxis Commander Unified Rotator Driver



Configuring Multiple Rotators

If you have multiple rotators connected to your system you can configure each as desired. In the **Pyxis Universal Driver Setup** dialog, click **Device Options** to add a new device. You can also remove unused devices, use a selected device, or set one of the devices as your default. Note that each new device

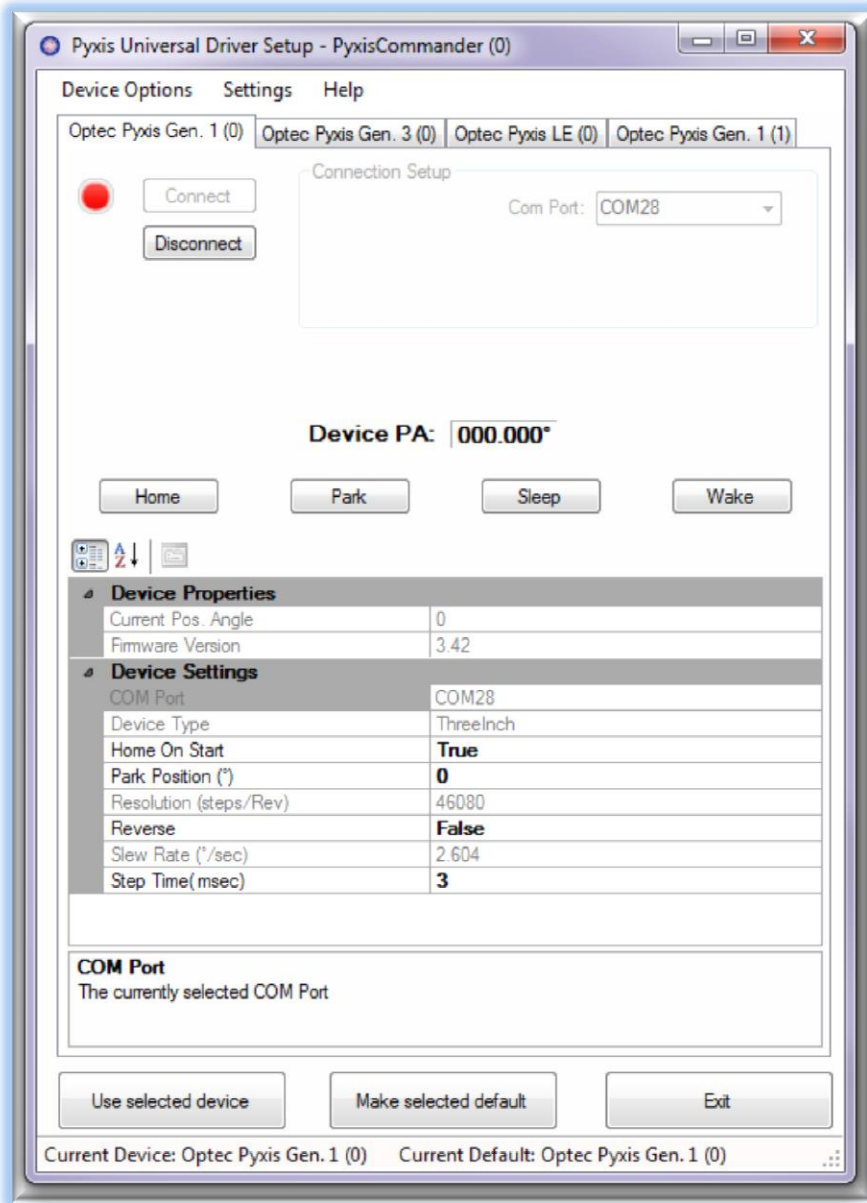
instance will be assigned a unique ID as shown in the parenthesis.

Click the tab to bring up the rotator device you wish to configure. Click **User selected device** to select this device for use with Pyxis Commander or a higher level ASCOM client.

You may also **Make selected default** so that it will be automatically selected whenever you configure a new client.

Device Persistence

Note that when you configure a Pyxis Commander instance or an ASCOM client, the selected device will be persistent. That is, you will not need to reset the device selection each time you open or use the ASCOM client.



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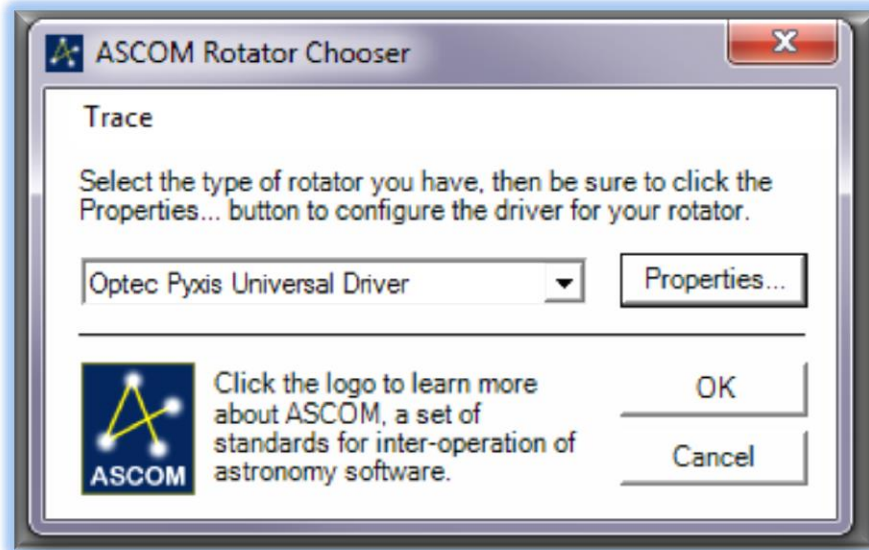
Pyxis Commander Unified Rotator Driver



Configuration

Configure ASCOM Clients

Each ASCOM rotator client will look a bit different, but all share a common ASCOM Chooser interface. In your client application, open the **ASCOM Rotator Chooser** dialog and select **Optec Pyxis Universal Driver**. Click **Properties...** to open the **Pyxis Universal Driver Setup** dialog. Note that the calling ASCOM client name will be displayed in the dialog box header.



Click the desired tab corresponding to the rotator device and instance. Confirm a valid connection by clicking **Connect** and adjust any parameter as needed. At the bottom, click **Use selected device** and then **Exit** to bind this instance to the ASCOM client.

Click **Ok** in the ASCOM Chooser to return to the calling ASCOM client and

confirm your connection. Because the Pyxis Universal Driver is constructed as an ASCOM local server you can also connect simultaneously with Pyxis Commander or another ASCOM client. However, for optimal performance we recommend limiting the simultaneous connected client list to no more than three higher level clients.

Configure TheSkyX

Software Bisque's **TheSky X Professional Edition** (TSX) planetarium and observatory control software is widely used by astronomers and observatories across the globe. On Windows platforms you can configure TSX as a standard ASCOM client similar to the procedures outlined above.

To start the configuration, click the Rotator tab in TSX and click **Rotator Setup...** Next, Choose **Ascom – ASCOM Rotator** and click **OK**. Click **Rotator Setup – Settings...** and you will see the ASCOM Chooser dialog. Select **Optec Pyxis Universal Driver** and **Properties**.



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Pyxis Commander Unified Rotator Driver



Click the desired tab corresponding to the rotator device and instance. Confirm a valid connection by clicking **Connect** and adjust any parameter as needed. At the bottom, click **Use selected device** and then **Exit** to bind this instance to the TheSky X ASCOM client.

For Mac users or Windows users wishing to use the native X2 drivers rather than ASCOM, contact Optec Technical Support (support@optecinc.com) for additional instructions.

Pyxis Commander Controls

The Pyxis Commander interface has been designed for ease of use with simple straight forward controls. Click **Help – Documentation** for details explanations of the interface. The **View** menu allows you to selective activate and de-activate the various controls to suit your interface preference. Re-size to fit your desktop. Click **Home – Home Rotator** to force the Pyxis rotator to perform a homing operation.

Click **Tools – Settings** to configure devices and instances as described above. Under the **File** menu you can Connect and Disconnect the rotator which will light up the red LED on the main form. You can also click directly on the LED to toggle connection states. Also under the File menu is the firmware upgrade wizard for the newer Pyxis 2" GEN3 rotators only. Contact Optec Sales (sales@optecinc.com) to upgrade any of the 1st or 2nd generation Pyxis 2" or Pyxis 3" rotators.

Sky PA vs. Instrumental PA

There can be some confusion regarding the Sky Position Angle or **Sky PA** compared to Instrumental Position Angle. Sky PA, in our context, refers to the rotation of an imaging camera on a telescope. Cameras oriented so that the resultant image exactly matches a star chart with the North Celestial Pole (NCP) at the top would be considered to have a Sky PA of 0 degrees. Sky PA is always reported in degrees east of the NCP and can be easily measured by performing a plate solution which calibrates an image plate scale and rotation angle to the actual sky. See <http://nova.astrometry.net/>.

Instrumental PA refers to the rotation angle of the Pyxis rotator that is not yet calibrated to match the actual Sky PA. Performing a Home on any Pyxis will cause the rotator to move to the fixed stop point (usually Instrumental PA = 180 degrees), then turn around half-way to end at Instrumental PA = 0 degrees. Most users install the Pyxis and camera such that Instrumental PA is very nearly due north to correspond with the NCP (North Celestial Pole. However, often the Sky PA and Instrumental PA differ by some amount which we define as the **Sky PA offset**. Adding to the complexity, when using a German Equatorial Mount and performing a meridian flip, the camera's Sky PA will be shifted by 180 degrees. However, the Instrumental PA will remain fixed. Ideally, we wish to think in terms of **Sky PA** only.



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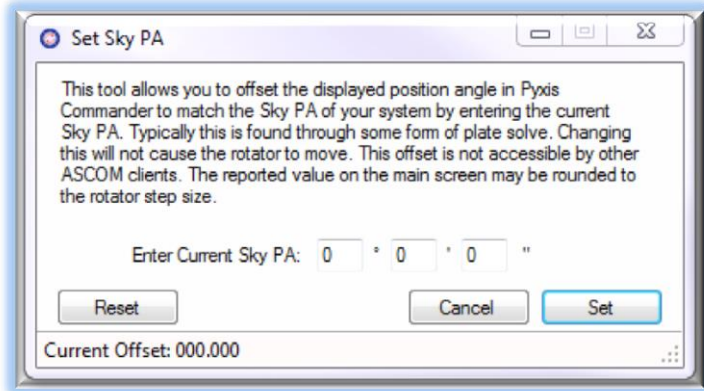


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Set Sky PA

The **Set Sky PA** button allows a user to enter the actual Sky PA from a plate-solve into the Pyxis Commander software. The displayed PA and rotator indicator will immediately change to match the new value. Simply click the button and enter the Sky PA from the plate solution results and click **Set**. Notice the Current Offset is displayed in the **Set Sky PA** dialog box at the bottom.



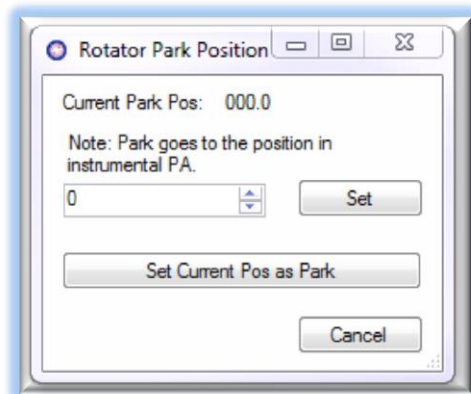
IMPORTANT NOTE: Because ASCOM does not support rotator offsets as a standard property, the **Sky PA Offset will not be passed through to a higher level ASCOM client.** This can be a source of confusion

for many users when setting or syncing an offset. Optec recommends applying a position angle offset separately in each of your preferred ASCOM clients. Typically, however, you will likely want to limit yourself to just one or two clients to avoid any confusion. For example, if TheSky X is your preferred client you should apply a Sky PA offset in that program (see **Rotate Using FOVI** below) and then apply the offset separately in Pyxis Commander if you wish to also use our program user interface.

With the current implementation of Pyxis Commander, only the Instrument PA is passed along the ASCOM driver to higher level clients. The Sky PA offset is not passed along. Also, the driver has no knowledge of additional offsets applied by higher level clients.

Set Park

Click the **Set Park** button to set the Instrumental PA where you wish to actually park the camera at the end of your imaging run. Normally, you would not want this to change regardless of the Sky PA. The **Rotator Park Position** dialog box allows you to set the current position as park or type in any desired Instrumental PA as the park position. The Current Park Position is also displayed.



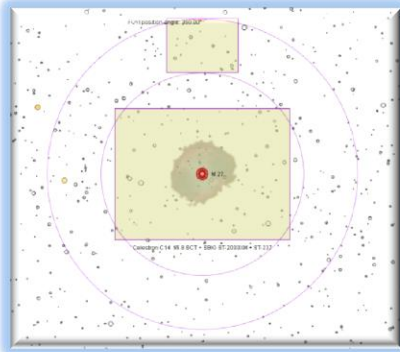
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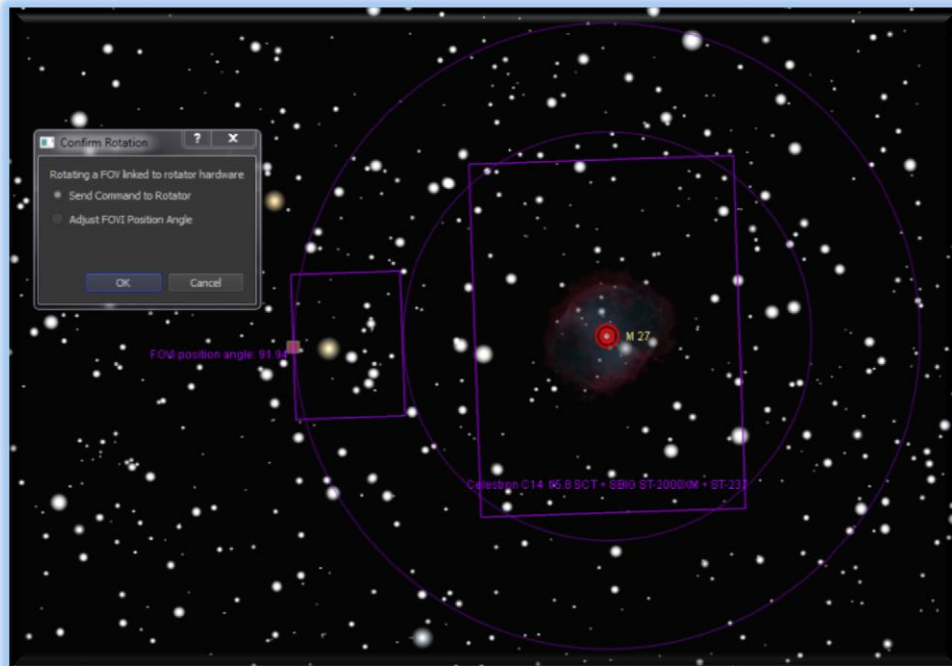
Rotate Using FOVI



Many client programs allow users to enter a Field of View Indicator or **FOVI** into the planetarium program. In programs such as Maxim D/L and TheSky X, the FOVI can be used interactively. That is, the FOVI can be used to select a desired guide star, for instance. By grabbing and dragging the guide camera field to encompass a suitable guide star the planetarium program which is linked to the rotator will send suitable commands to the Pyxis drivers to adjust the Sky PA.

The screen shot at left shows a FOVI within TSX. Click on the grab handle (small square above the guide star box) and drag it to a bright guide star. Upon releasing the handle, a dialog box will appear allowing you to “Send Command to Rotator”. Clicking OK here will move the Pyxis rotator to the desired position angle or Sky PA.

Clicking “Adjust FOVI Position Angle” will instead apply a Sky PA offset to current position angle in TSX. **IMPORTANT NOTE:** this offset will NOT be applied to the Pyxis Commander interface. To keep the two programs in sync, you will need to also apply the same Sky PA offset in Pyxis Commander.



Maxim D/L has a similar feature and functionality. ACP allows pre-planning by selecting a guide star in a Scheduler application using planetarium software and a scripting interface. Other ASCOM clients and software applications may have similar features.



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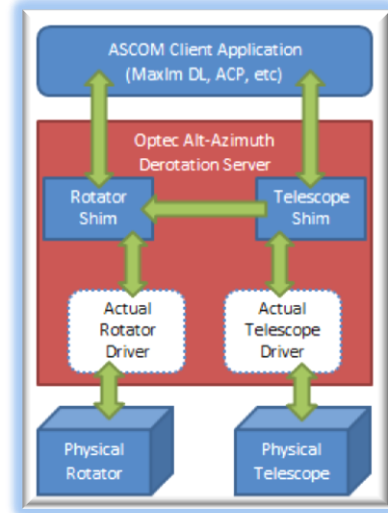


Pyxis De-Rotation Software

Users of Alt-Az mounted telescopes require de-rotation during imaging when exposures are longer than just a couple of minutes. Optec has developed a free application to use with any Pyxis rotator that acts as a shim between the ASCOM telescope and Pyxis drivers.

This **Alt-Az De-Rotation Server** software reads the current telescope altitude and azimuth, calculates the current de-rotation rate, and applies that rate to the Pyxis rotator. The software is easy to setup and functions whenever the telescope is not slewing and the rotator is not rotating to a new position.

To learn more and to download the software, visit http://www.optecinc.com/astronomy/downloads/altaz_server.htm

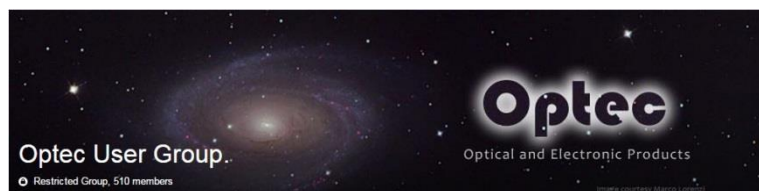


Additional Pyxis Information

Visit the Optec website for the additional information describing and of our Pyxis rotators. Contact Optec support (support@optecinc.com) for help configuring any ASCOM client including **Maxim D/L, ACP, CCD AutoPilot, Sequence Generator Pro, PhD2 Guide**, as well as non-ASCOM software such as Software Bisque's **TheSky X**. Our Resource page is may provide additional helpful information: <http://www.optecinc.com/astronomy/resources.htm>.

Optec User Group

The Optec User Group on Yahoo! can also provide answers to specific configuration questions and provides a forum to communicate with other users. Click the banner below to subscribe.



Or visit the Yahoo! site here: <https://groups.yahoo.com/neo/groups/Optec/info>.



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