Pyxis Rotator Help File

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Welcome to the Optec Pyxis Rotator Help

The **Pyxis Control** program has been designed for use with the original Pyxis 2" and Pyxis 3" Camera Field Rotators. These rotators differ from the Pyxis LE camera field rotator which is a native USB device. Visit the Pyxis LE download page for software and help files ot use with the Pyxis LE.

This help document is organized into the following chapters:

- Installation
  - About
  - License
  - Requirements
  - Installing
- Configuring and Operation
  - Connecting to the Device
  - Device Setup
    - Rotator Instances
  - Using The Control Program
- FAQ & Troubleshooting
  - Cable Wrapping
  - Connection Errors
  - HTML Help Viewer Display Issues
  - Contacting Optec Technical Support
- Additional Resources

Optec, Inc. makes no warranties either expressed or implied regarding ***Pyxis Control*** *software.*

Please note: These help files are occassionally updated. The latest version can always be found online at:

http://www.optecinc.com/astronomy/software/docs/pyxis/PyxisHelp.htm

Revisions to this Help document

Rev 1.00 - 2011/08/01	initial release.
Rev 1.01 - 2012/04/18	Reformated document to corrrect Word import errors. Recompiled as .chm, .pdf, and .html.

Chapter 1: Installation

- About - Background and capabilities of the Pyxis control program and drivers.
- License - The End-User License Agreement for the Pyxis control program and ASCOM drivers.
- Requirements - Software and Hardware requirements for use of the Pyxis 2" and 3" rotators, the Pyxis control program, and the Pyxis ASCOM drivers.
- Installing - How to install the Pyxis control program and ASCOM drivers.

About

Section 1.1 - About The Pyxis Control Program

What is the Pyxis Control Program?

Thank you for installing the **Pyxis Control Program**. The control program is a stand-alone Windows application designed for setting device configuration parameters, testing, and operating the Optec **Pyxis 2"** and **Pyxis 3"** Camera Field Rotators (CFR). The latest version of this program will communicate with and control the **Pyxis 2"** and **Pyxis 3"** Camera Field Rotators only. This software is not suitable for the Pyxis LE Camera Field Rotator . See the Pyxis LE Downloads page (http://www.optecinc.com/astronomy/downloads/pyxis_le.htm) for Pyxis LE software and Help.

ASCOM Initiative Pyxis Drivers

The Pyxis Control Program installer package optionally installs ASCOM drivers for the Pyxis rotators which allows these devices to be used with other ASCOM-compliant software. Configuration parameters and settings assigned in the **Pyxis Control Program** are also used by the ASCOM driver. Thus setting the COM port in the control program also sets the COM port in the ASCOM driver.

About The Pyxis Rotator

The Pyxis 2" and Pyxis 3" rotators are described in detail in the **Pyxis Camera Field Rotator** *Technical Manual for Theory of Operation and Operating Procedures.* The latest Technical Manual can also be downloaded from the Pyxis Software Download page and is also linked in the Additional Resources section below.

Section 1.2 - End-User License Agreement

*By installing and using **Pyxis 2"/3" Camera Field Rotator** software, you agree to Optec's license terms:*

PYXIS CONTROL AND THESE MATERIALS ARE PROVIDED "AS-IS": NEITHER OPTEC, INC., ITS AUTHORS, NOR ITS SUPPLIERS MAKES ANY WARRANTY, EXPRESS OR IMPLIED WITH RESPECT TO THE CONTENT OF THESE MATERIALS OR THE ACCURACY OF THE PYXIS CONTROL PRODUCT, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. BECAUSE SOME STATES / JURISDICTIONS DO NOT ALLOW EXCLUSIONS OF IMPLIED WARRANTIES, THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

IN NO EVENT SHALL OPTEC, INC., THE AUTHOR, OR ITS SUPPLIERS BE LIABLE FOR ANY DAMAGES WHATSOEVER (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, OR OTHER PECUNIARY LOSS) ARISING OUT OF THE USE OF OR INABILITY TO USE THIS PYXIS CONTROL PRODUCT, EVEN IF OPTEC, INC., HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. BECAUSE SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

*Optec, Inc. makes no warranties either expressed or implied about **Pyxis Control** software.*

Section 1.3 - System Requirements

Pyxis Control Program Requirements

In order to use the Pyxis control program, you will need the following software installed on your system:

- Windows XP, Vista, or 7
- Microsoft .NET Framework 3.5 or later

Pyxis Control is a very lightweight program, so if your computer meets the minimum system requirements for the software listed above and has a serial port available (or USB port with USB-to-Serial Converter) for connection to a Pyxis 2" or 3" , you should have no problem using the Pyxis control program.

ASCOM Driver Requirements

In order to use a Pyxis rotator with ASCOM-compliant software, you will need the following software installed on your system:

- Windows XP, Vista, or 7
- ASCOM Platform 6.0 or later (available at the ASCOM website)
- Microsoft .NET Framework 3.5 or later

Power Connection

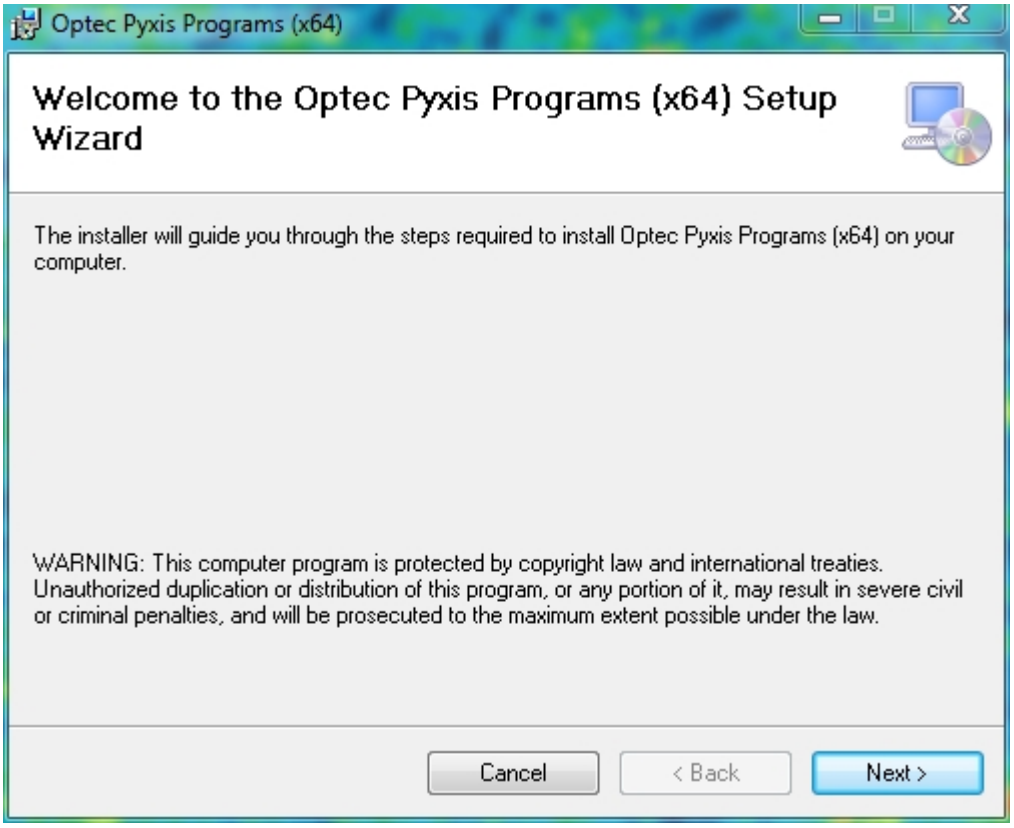
The Pyxis 2" rotator requires 12VDC to function properly, while the Pyxis 3" requires 15VDC. A suitable power power supply is provided with every rotator purchase. Please contact Optec, Inc in the event that you require a replacement power supply.

Data Connection

The connection from the Pyxis Camera Field Rotator to the PC requires an RS-232 serial cable (not included with purchase of rotator). Serial cables of various lengths are available for purchase from the Optec website, as well as a USB-to-Serial converter that will allow connection to computers without a serial port.

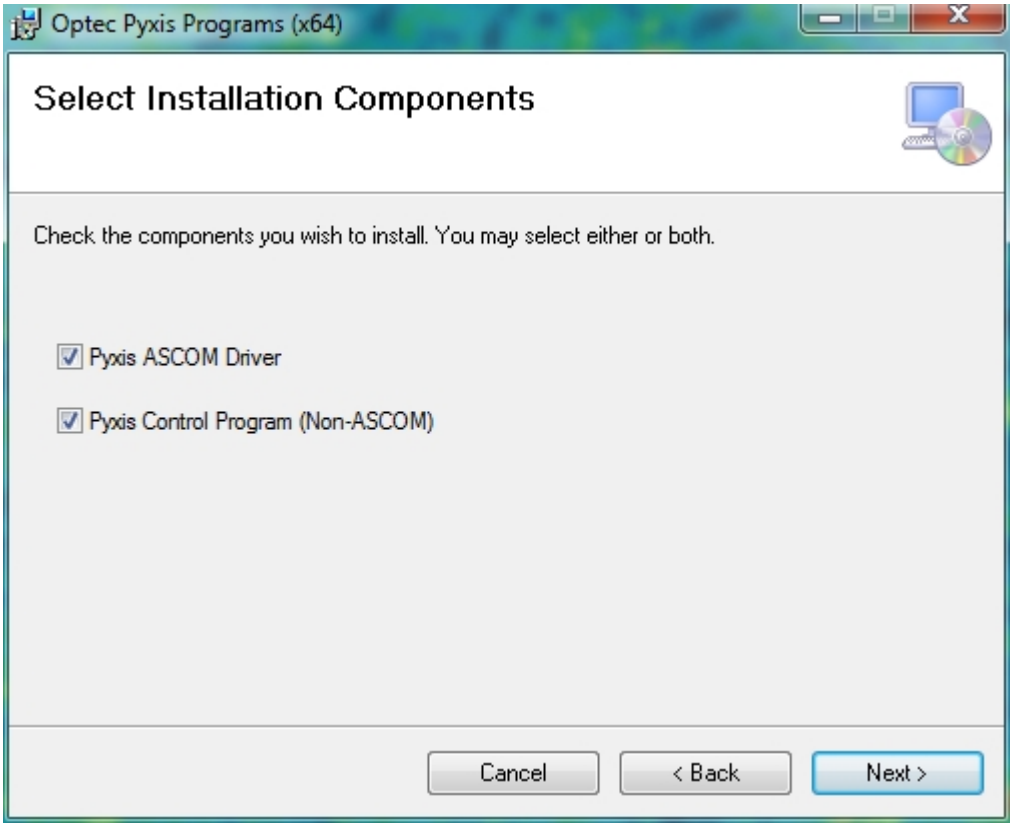
Section 1.4 - Installing And Opening Pyxis LE Software

- **Download Software** - The software is available as a .zip file on the Downloads page of the Optec website. There are two versions available: one for 32-bit operating systems, and one for 64-bit operating systems. The files for these versions are denoted by the suffix _x86 or _x64, respectively. After downloading the correct zip file save it to a location on your hard drive and extract the files.



- **Run The Installer** - The zip folder you downloaded will contain two files. Double-click the file named ***Setup.exe*** to begin the install. Your Windows user should have full administrator privledges on the PC to successfully complete the installation. You may also try to right-click on the ***Setup.exe*** file and select "Run as administrator" to complete the installation. Follow the on-screen instructions until you get to the page titled ***Select Install Components***. The installer gives the user the choice of installing the Pyxis Rotator Control Program and/or the Pyxis ASCOM Driver. Check the check-boxes for the components you wish to install and click next.

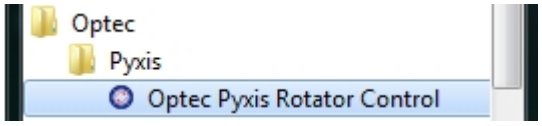
Note: You do not need to install the ASCOM Driver unless you plan to use your Pyxis Rotator with ASCOM compliant software.



- **Location of Files** - The default location for the program files including the data files is in the ***Program Files*** folder under ***Optec/Pyxis***. The user cannot specify any other location for the files during the installation.

- **Opening Pyxis Control Program** - After installation is complete, a shortcut will be automatically placed in the following location:

Start/All Programs/Optec/Pyxis/



You may click this shortcut to open the control program.

-OR-

Double-click the **Optec *Pyxis Rotator Control*** shortcut on your desktop to start the program.

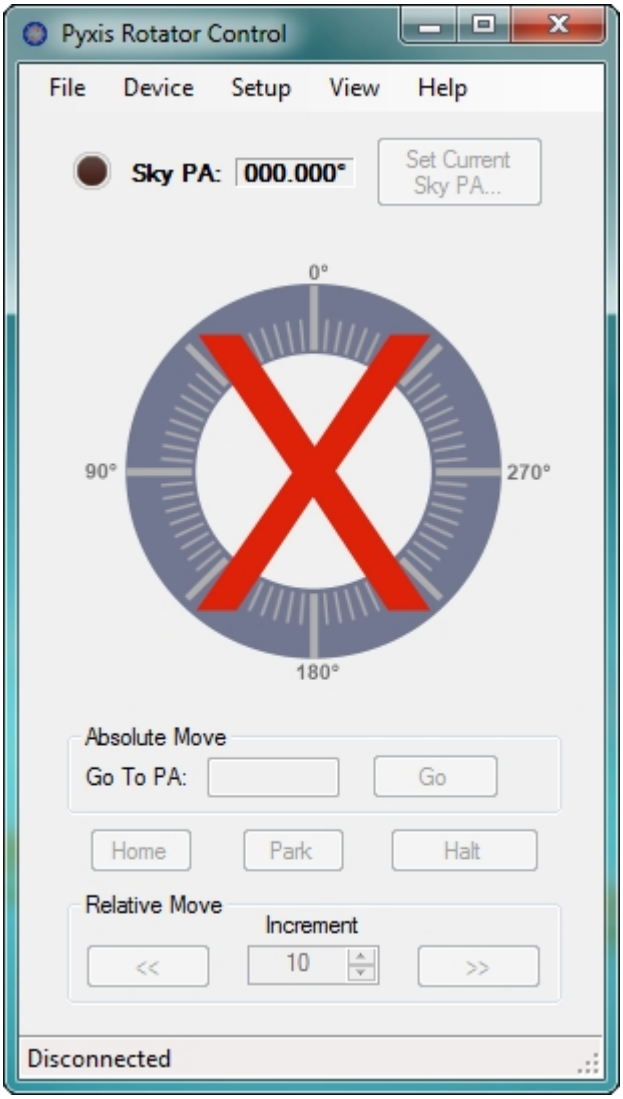
Chapter 2: Configuring and Operation

- Connecting to the Device - How to use the control program to connect to a Pyxis rotator.
- Device Setup - How to configure settings for your Pyxis.
    - Rotator Instances - An explanation of rotator instance concepts and usage in the Pyxis control program.
- Using The Control Program - An overview of how to use the Pyxis control program to control your rotator.

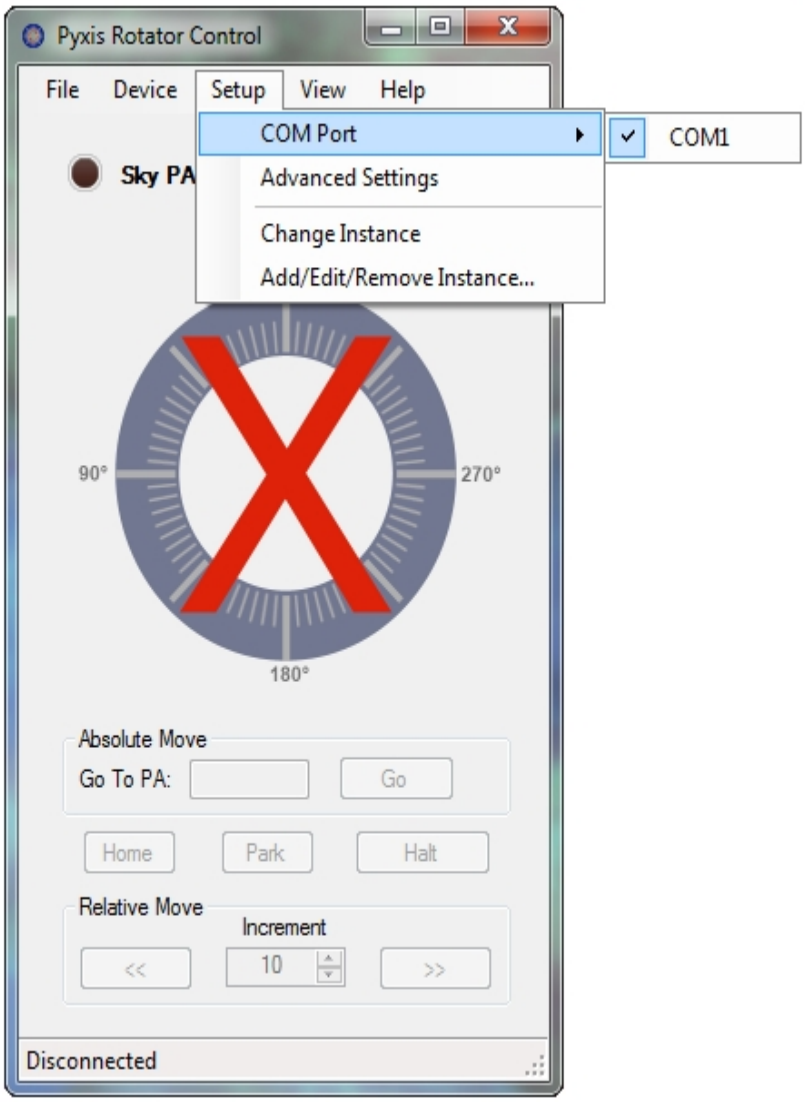
Section 2.1 - Connecting To A Pyxis Rotator

The following instructions will help you connect your 2" or 3" Pyxis rotator to the Pyxis control software.

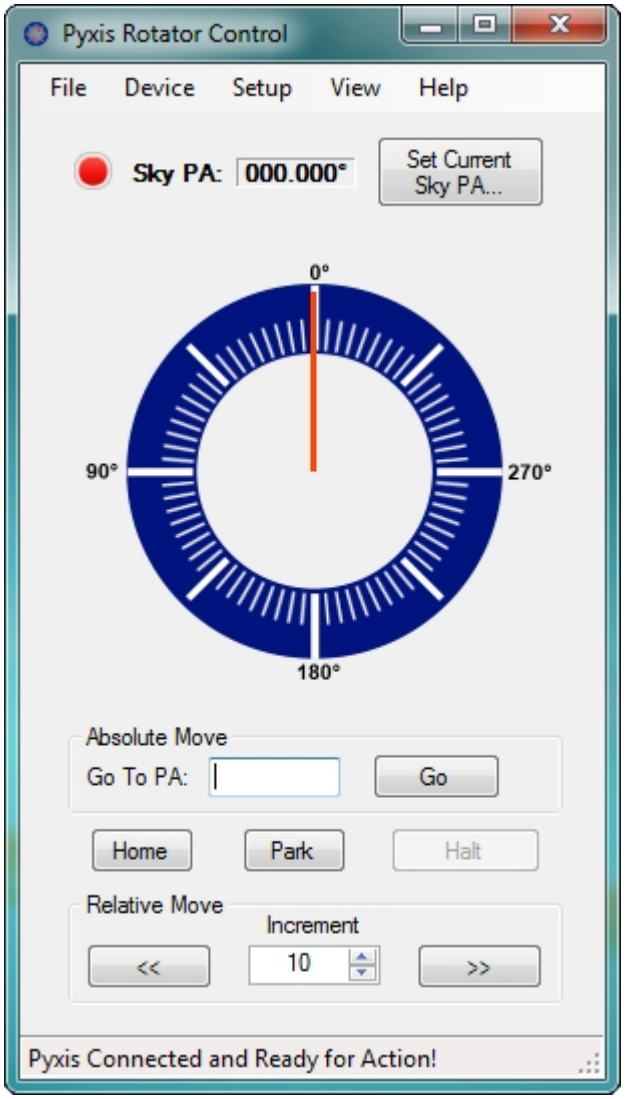
- **Power Your Rotator** - Ensure that your rotator is plugged into its DC power adapter and that the adapter is plugged into a power outlet. The red LED on the front of the rotator should light up. Once plugged into power, the rotator will automatically begin homing. Please wait for the rotator to stop moving before you continue.
- **Plug In Your Rotator** - Ensure that you have your rotator connected via RS-232 cable to your computer.



- **Open The Control Program** - Once the physical serial (or USB) connection is established, open the Pyxis Control program to operate the camera field rotator. The bottom status bar of the control program should display ***Disconnected*** and there should be a large red ***X*** covering the rotator diagram.

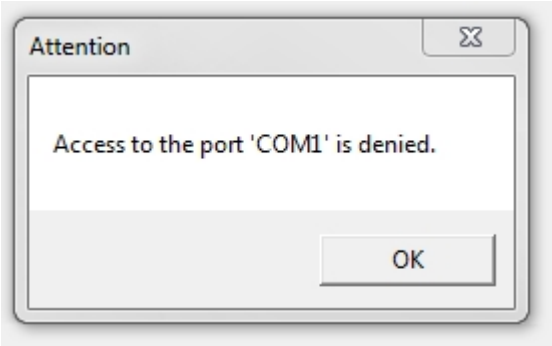


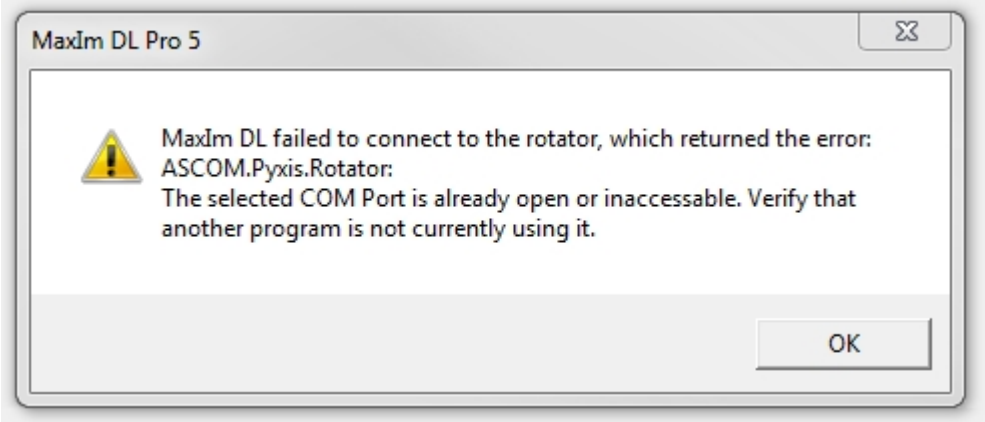
- **Verify COM Port** - Go to the ***Setup*** menu and use the ***COM Port*** menu item to verify that the COM port number selected matches that of the port that your rotator is connected to.
- **Connect Your Rotator** - Go to the ***Device*** menu and click the ***Connect*** button to establish a connection to the control software, or click the unlit LED next to the ***Sky PA*** display.



- **Begin Using Your Pyxis** - Once the automatic configuring is complete, the status bar will show ***Pyxis Connected Ready for action!***, the red ***X*** will be gone, and the red ***LED*** in the upper left corner will be lit. These indicators show that the Pyxis Camera Field Rotator is now ready for use.

- **Connecting through ASCOM Client** - When setting the COM port in **Pyxis Rotator Control** you are also setting the COM port for the ASCOM driver. However, because the Pyxis 2" and Pyxis 3" are native serial devices, multiple simulateous connections to the serial port are not allowed. If connecting to the Pyxis through an ASCOM client, you MUST first disconnect from the **Pyxis Rotator Control** application. Attempting to connect to the Pyxis from an ASCOM client while already connected to through the **Pyxis Rotator Control** program will result in a warning dialog box similar to one of the following:

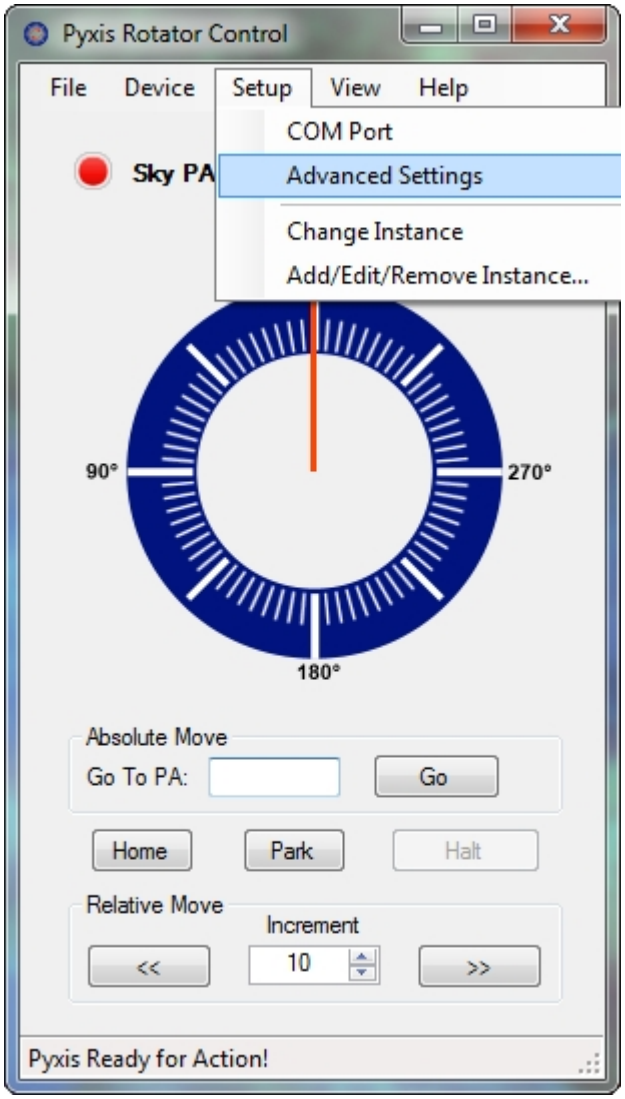




- **Disconnecting From Your Pyxis** - If you need to disconnect the control program from your Pyxis rotator for any reason, go to the ***Device*** menu and click ***Disconnect***. Alternatively, you can simply click the red LED in the upper left corner to toggle between connected and disconnected.

Section 2.2 - Configuring Your Pyxis

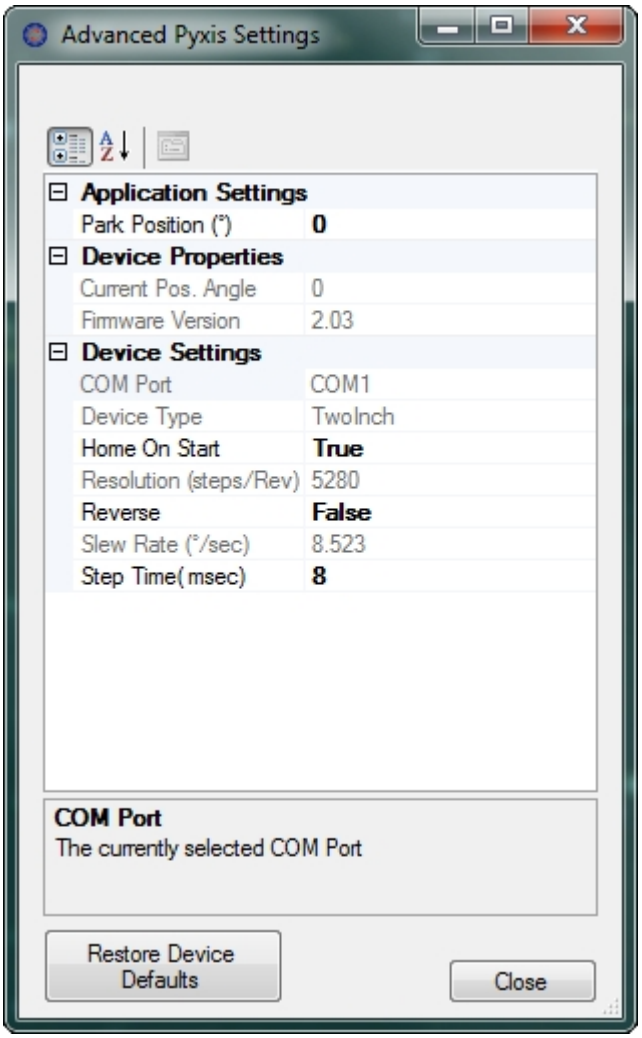
Pyxis rotator device and program settings can be configured via the **Pyxis Rotator Control** program or the ASCOM Driver Setup Dialog. Any changes made in one will be reflected in the other.



- **Pyxis Control Program Settings** - To access the settings form in the Pyxis Control program, click ***Setup*** on the main menu bar and select ***Advanced Settings***.

-OR-

- **ASCOM Driver Settings** - To access the settings from the Pyxis ASCOM Driver simply open the setup dialog from whichever client application you are using. Then click ***Device*** on the main menu bar and select ***Advanced Setup*** to access a table containing the same properties as the above control program window.
- **Change Settings** - The settings available for viewing using either access option are listed below:



  - **Park Position** - The Park Position is a fixed device position angle that the rotator will travel to during the Park procedure (i.e. when the Park button is pressed). It is often a good idea to park the Pyxis rotator at the end of the evening's observations to ensure a clean startup the next evening. It is usually a good idea to set the initial alignment of the Pyxis so that the Home and Park positions are at the same location. In this case, leave the default Park Position set to 0-degrees.
  - **Current Pos. Angle (Read Only)** - The current Sky PA position angle of the rotator.
  - **Firmware Version (Read Only)** - This property displays the version number of firmware that is programmed in the device that is currently connected.
  - **COM Port (Read Only)** - The Serial COM port number that this rotator is using to

connect to the computer.

- **Device Type (Read Only)** - Reads *TwoInch* for the Pyxis 2" or *ThreeInch* for the Pyxis 3" depending upon which type of rotator is attached to the computer.
- **Home On Start** - This property determines whether the rotator will automatically begin homing when it is connected to power. By default, this property is true but can be set to false for the Pyxis 3".
- **Resolution (Read Only)** - This property displays the rotation resolution of the rotator in units of stepper motor steps per one revolution of the rotator.
- **Reverse** - The Reverse property allows the user to set the rotation direction to match the actual sky apparent motion when rotating. The correct setting will depend upon the optical system in use and the number of refelcting surfaces. The Reverse property is provided as an optional ASCOM IRotatorV2 interface standard and is also incorporated into the **Pyxis Rotator Control** program. If the Pyxis appears to move in the opposite direction as expected, try changing the Reverse property. To confirm the correct setting for this property, take an image and perform a plate-solve. Click the **Set Current Sky PA.** button to synchronize the software to the sky, move the rotator, and take another image. If the plate solve for the new image is not reasonably close to the solved postion angle (sometimes referred to as roll angle), try changing the Reverse property and testing again.

  IMPORTANT NOTE: The Reverse property can only be changed at *Device PA* =0 or at the Home position. A warning message will appear when the property is changed and the rotator will automatically move to Home. Note that the 90° and 270° indicators will swap sides when this property is changed. By default, the reverse property is set to True for the Pyxis 2" and False for the Pyxis 3".

- **Slew Rate (Read Only)** - A function of the device type, the slew rate is the number of degrees of rotation that the rotator can travel in one second.
- **Step Time** - An adjustable setting that allows you to adjust the time in thousandths of a second between steps taken by the rotator's stepper motor. **Note:** Reducing this time will result in your rotator producing less torque.
- **Resetting The Device** - Press the ***Restore Device Defaults*** button to reset the device back to its original factory configuration. **Note:** The device will automatically perform a home procedure after the defaults are restored.

- **Rotator Instances** - If you are using multiple rotators, with different settings needed for each, consider using the ability of the Pyxis control program's ability to create ***Rotator Instances***. For more information on instances and how to create and use them, see the Rotator Instances portion of this manual.

- **Additional Settings For ASCOM Control** - When using the Pyxis 2" or 3" with an ASCOM client application, open the ASCOM Rotator Chooser, select **Optec Pyxis Rotator**, and click Properties. First click the desired Rotator Instance then click **Setup Driver...** You will notice this properties dialog box is very similar to the properties dialog box available with **Setup - Properties**. Any configuration changes here will be also be effective with the **Pyxis Rotator Control** software (and vice-versa).

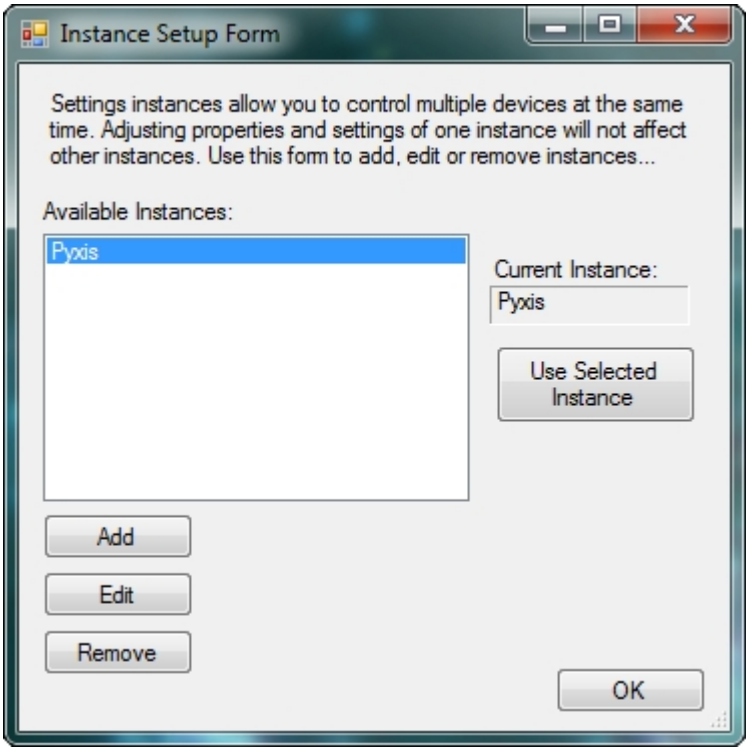
Section 2.2.1 - Rotator Instances

The Pyxis control program allows users to create preset configurations of the settings displayed in the ***Advanced Settings*** menu. These presets are called ***Rotator Instances***. When using multiple Pyxis rotators, multiple ***Rotator Instance*** capability allows the user to control more than one Pyxis rotator through the ASCOM interface. By default, the Pyxis control program uses an instance called *Pyxis* to store its settings.

The following instructions will explain how to create, edit, apply, and remove instances.

Creating And Removing Instances

- **Open The Instance Setup Form** - While on the main control window of the Pyxis control program, go to the ***Setup*** menu and click the ***Add/Edit/Remove Instance*** option to open a new dialog.



- **Adding Instances** - On the Instance Setup Form, click the ***Add*** button to add a new instance. A text box will appear. Input a descriptive name for this new instance here, and click ***Add Now*** button.

- **Editing Instance Names** - To edit the name of an already-created instance, select the instance from the ***Available Instances*** display and click the ***Edit*** button. A text box will appear to allow you to edit the instance name. When you are finished, click the ***Update*** button.

- **Removing Instances** - To remove an instance, select the instance from the ***Available Instances*** display and click the ***Remove*** button. You will have to confirm your decision, and if you do, the instance and all settings it contained will be removed.

- **Closing The Form** - When you are finished adding, editing, and removing instances, click the ***OK*** button to return to the main control window.

Applying Instances And Changing Settings

To apply a specific instance's settings to your control program or **ASCOM** chooser application, follow these instructions:

- **Within The Instance Setup Form** - If you click the ***Use Selected Instance*** button on the instance setup form, the instance selected in the ***Available Instances*** display (and all settings stored within it) will be applied as the rules by which the attached rotator will be controlled. **Note:** The application process will automatically disconnect the rotator, so you will have to reconnect to it according to the steps detailed in the Connecting to the Device portion of this manual.

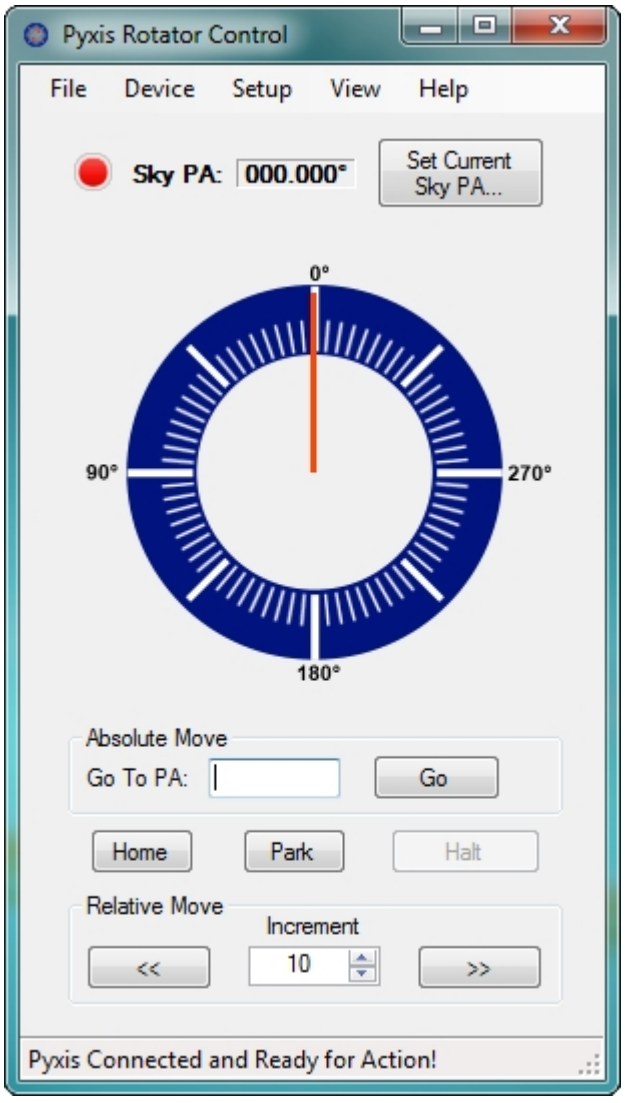
-OR-

- **Within The Main Control Window** - Alternatively, you may apply an instance from the main control window by first disconnecting the control program from your rotator, and then going to the ***Setup*** menu, highlighting ***Change Instance***, and clicking the name of the instance you wish to apply. **Note:** The rotator must be disconnected in order to change instances.

- **Changing Settings** - To change the settings stored within the active instance, you need only use the ***Advanced Setup*** menu option on the ***Setup*** menu to adjust settings. These will automatically be stored within the currently active instance.

Section 2.3 - Using The Pyxis Control Program

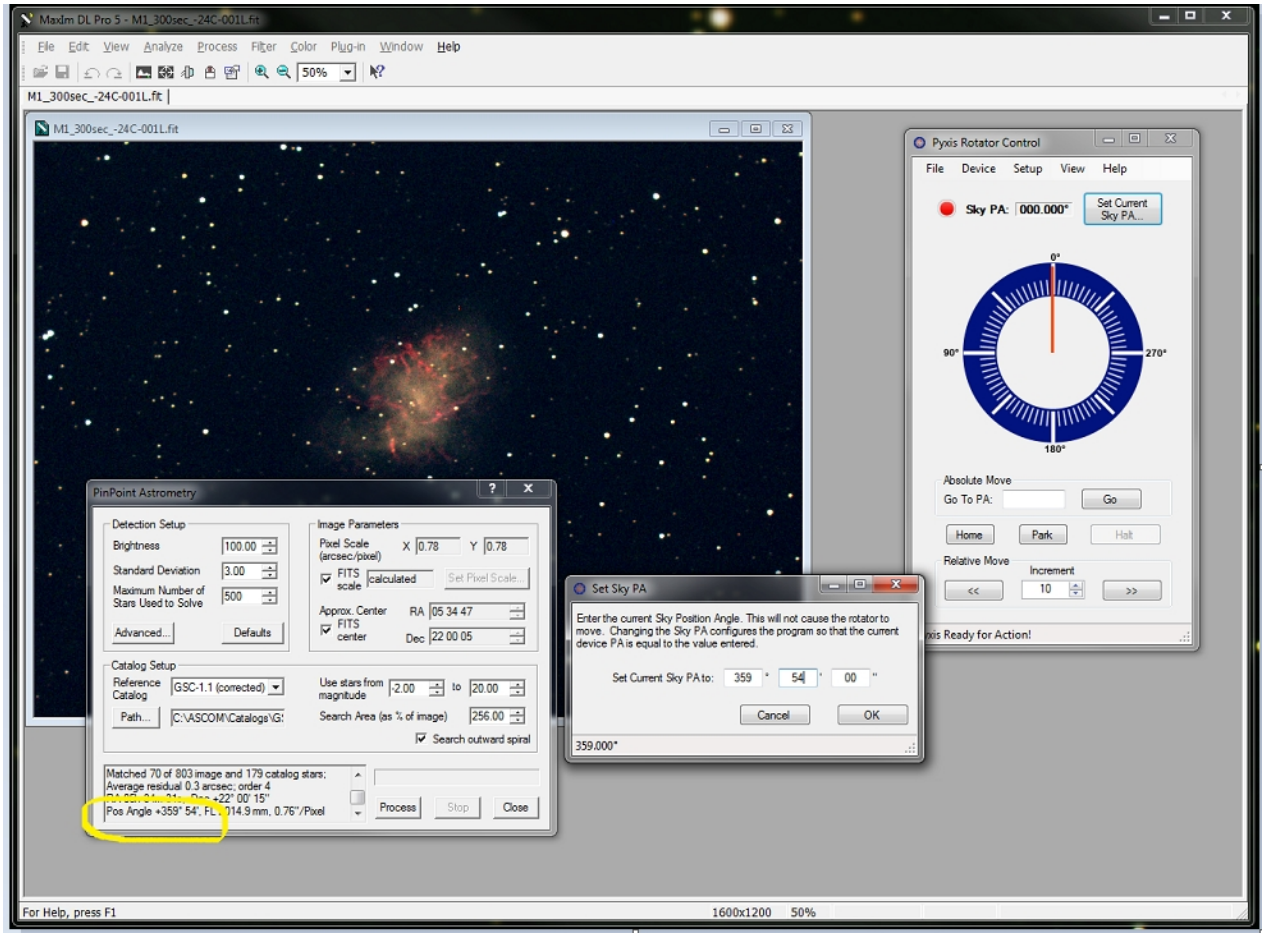
The Pyxis Control program, shown below, gives you complete control over your Camera Field Rotator device.



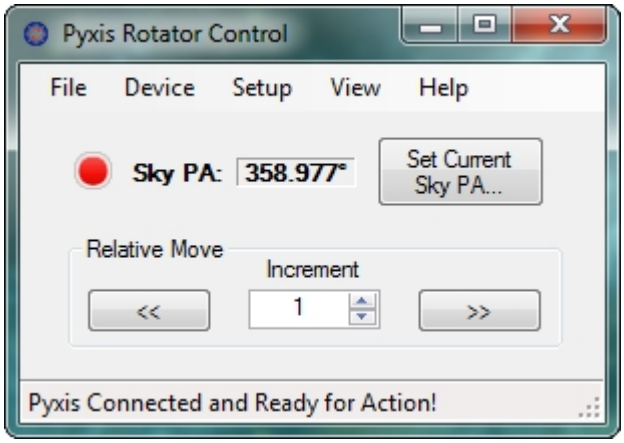
Controlling Your Rotator

- **Sky Position Angle** - The ***Sky PA*** display box indicates the rotator's current Sky Position Angle. The Sky PA can be changed by clicking the ***Set Current Sky PA...*** button. This will open a dialog that will let you enter a new Sky PA. When you are finished, click ***Ok***. To match the ***Sky PA*** to the actual Sky Postion Angle take an image and perform a plate-solve. With a successful solve the Position Angle (sometimes referred to as Roll Angle) will be displayed in the solution and can be entered into the Set Sky PA dialog box. *(see example screen below).*

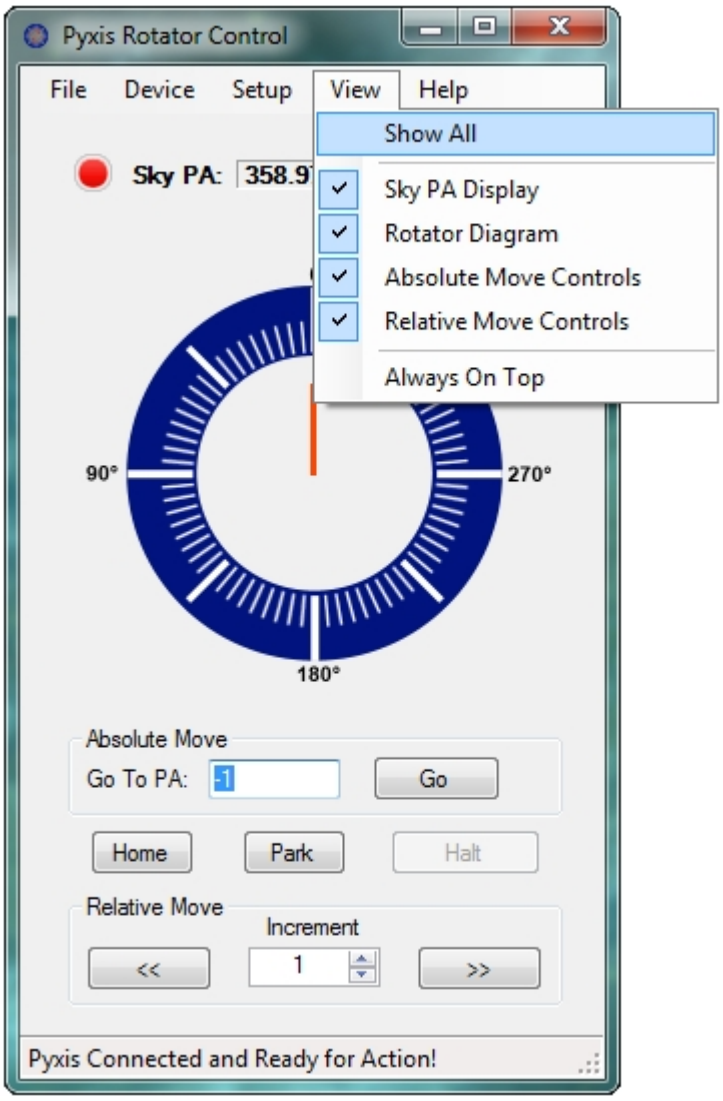
- **Home Device** - The device will re-home itself when the ***Home*** button is clicked on the main window or the ***Device*** menu.
- **Park Device** - The device will travel to the park position specified in the Advanced Setup form when the ***Park*** button is clicked on the main window or the ***Device*** menu.
- **Absolute Move** - The ***Go To PA*** field allows you to specify an absolute position. When the ***Go*** button is clicked, the rotator will move to the position entered in the "Go To PA:" window.
    - **Note:** Specifying a position that is less than 0 or greater than 360 will be interpretated as valid Positon Angles. For example, entering -5 in the Absolute Move field and pressing **Go** will cause the rotator to move to 355° (360 - 5). LIkewise, entering 390 in the Absolute Move field and pressing **Go** will move the rotator to PA=30°. *(This feature is to provide backward compatiblity with certain relative move programs.)*
- **Relative Move** - The user can set the ***increment*** value anywhere from 1 to 180 degrees. Clicking the **<<** button will move the rotator toward 0 degrees (decreasing PA), and clicking the **>>** button will move the rotator toward 360 degrees (increasing PA)..
- **Halt** - While the rotator is in motion, it can be stopped immediately by clicking the ***Halt*** button. To restore the internal position of the Pyxis rotator, a **Home** must be completed immediately following a **Halt** command.
- **Sleep Mode** - To prevent overheating or to conserver power, the rotator can be put into sleep mode by clicking the ***Sleep*** option on the ***Device*** menu. The rotator can be awakened by clicking the ***Wake*** option on the ***Device*** menu. **Note:** The rotator cannot be moved or have settings adjusted while in sleep mode.



Adjusting The Display



The ***View*** menu allows the user to customize the appearance of the Pyxis Control program. By clicking any display element on this menu, the user can enable or disable its appearance on the control program display. The ***Show All*** button will reset all display elements to their default visibility.

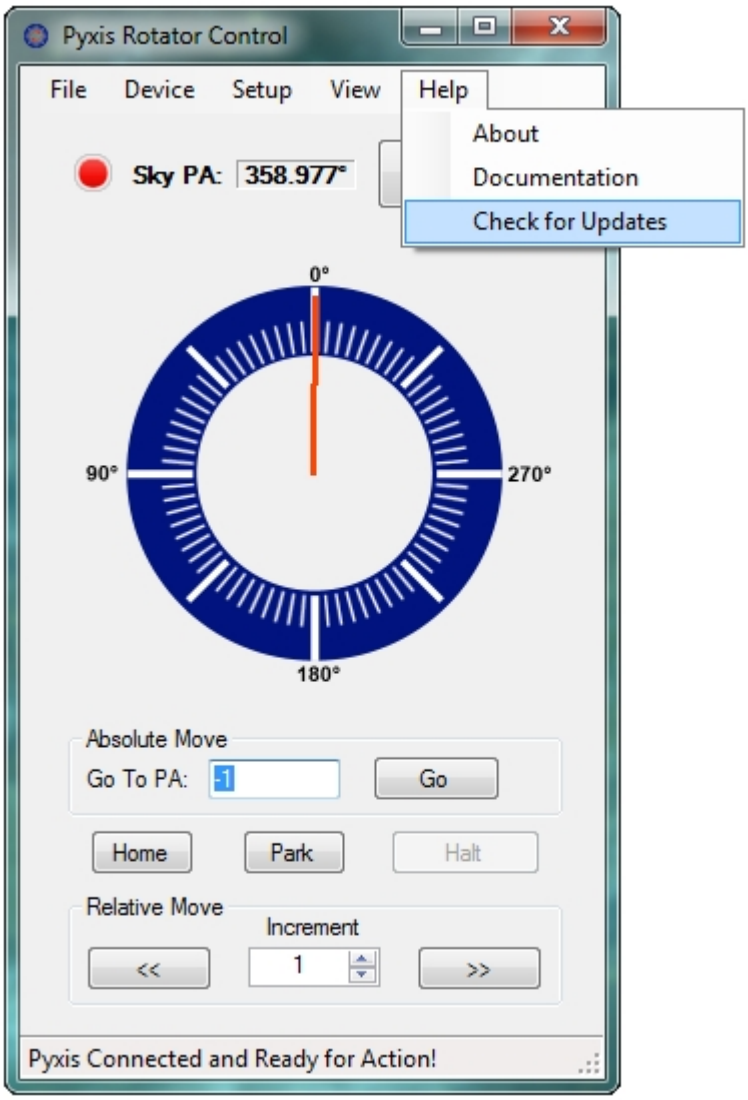


The ***Always On Top*** option will place the control program window on top of all other program windows you may have open, no matter which window is selected, so you can always see your rotator controls.

Your view preferences will be saved, so you can close Pyxis control and have the same view settings applied the next time the program is opened.

Getting Help

Clicking **Help - About** will display the current software version. Click **Check for Updates** will check for any software updates that may be available.



You can access the Pyxis Control Program help file by clicking ***Documentation***.

Chapter 3: FAQ & Troubleshooting

- Cable Wrapping - How the Pyxis addresses the problem of cable wrapping
- Connection Errors - How to resolve the most common connection errors
- HTML Help Viewer Display Issues - How to ensure that you can use the in-program Pyxis control program help file
- Contacting Optec Technical Support - Helpful procedural advice for contacting Optec technical support to ensure a speedy and accurate solution to your problem.

Section 3.1 - Cable Wrapping Concerns

The device firmware for the Pyxis 2" and 3" goes to great lengths to prevent the device from wrapping its cables. These devices use a firmware-set ***no-cross*** point to determine where the cables are in the rotator's travel so that crossing that point for an extended period of time can be prevented.

However, the system is not foolproof. If the serial cable is unplugged from the device while the device is in motion, it is possible that the device will wrap cables the next time it homes.

Section 3.2 - Connection Errors

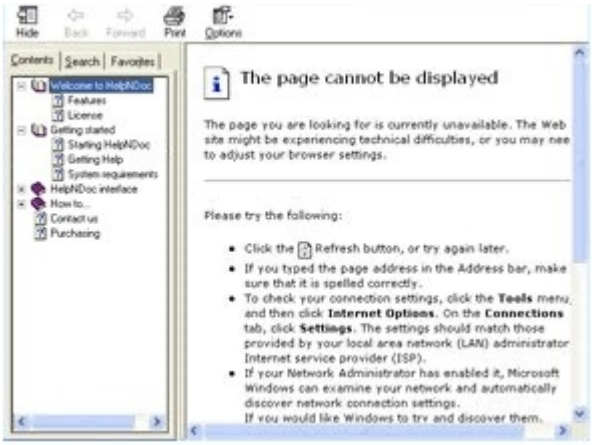
As the Pyxis 2" and 3" Camera Field Rotators use a simple serial cable for their computer communication, connection with these devices should be very straightforward, as described in the Connecting to the Device portion of this manual.

If you encounter problems connecting to your rotator, first check the integrity of your Pyxis' USB and power connections.

Next, verify that the ***COM Port*** setting on the ***Setup*** menu of the control program matches the COM port that the rotator is plugged into.

If this does not solve the problem, it is likely that the problem is not one that may be easily solved. Therefore, it may be best for you to simply contact Optec directly if you encounter a connection error.

Section 3.3 - HTML Help Viewer Display Issues



If the Help Viewer used by Pyxis Control to view this help file displays an error message saying either : *"This action has been canceled* or *"The page cannot be displayed"*, thus forcing you to view this help file via the Optec website, the following solution may help you resolve the issue:

- **Make A Local Copy** - The Microsoft help viewer will only work when opened from your computer's local drive(s) (i.e. the C:\ Drive as opposed to a network path or mapped network drive). Find the PyxisHelp.chm file in your Pyxis Control installation and open it from a local drive.

Section 3.4 - Contacting Optec Technical Support

If you encounter any problems, errors, or questions about using the Pyxis 2" or 3" rotators or control software that are not addressed by this Help file or the Pyxis Technical Manual, the recommended next step is to contact Optec Technical Support for assistance.

However, providing certain resources when contacting Optec will greatly increase the speed and completeness with which your problem is solved. When using email, these resources should be included in text or spreadsheet files attached to the email. When contacting Optec by phone, simply have the documents available for ready access, as our technical support team may need you to refer to them. The resources you will need are as follows:

- **Description of Your Problem** - Naturally, to solve a problem, Optec tech support must know what the symptoms of the problem are.
- **How The Problem Occurs** - If there is a specific procedure required for the problem to appear, make a note of the steps for doing so.
- **Text Of Your Error** - If your problem is related to an error message received in your control program, you should retrieve a verbatim copy of the error message. Since the text of the error may not be selectable, you should instead select the error message box and press ***Ctrl +C*** to copy the entire text of the message box to the Windows clipboard.

Chapter 5: Other Resources

There are many resources on the internet to help you use the Pyxis Rotators. We recommend visiting the Optec website first.

If unable to connect to the internet, or with any other questions at all, please feel free to contact Optec Support by telephone at:

- Optec Support: 616-897-9351