Optec Pyxis Help

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Section 1.0 - Introduction

Driver and Commander software

This documentation covers the Optec Pyxis Rotator control software (Pyxis Commander), drivers and some device specific setup. The new driver and control software offers many new and exciting features. With the new Multi-Instance model you can have any number of client programs connected to and controlling your rotator at the same time. Our control program and core drivers are ASCOM free, you can use and configure your rotator without the ASCOM platform. However if you install the optional ASCOM driver you can use your rotator with any ASCOM client. You can even connect our ASCOM free control program to your rotator while other ASCOM programs are connected.

In addition you can now control multiple Rotators, even different models, from the same computer at the same time. Adding new rotator instances (connections) and switching between them is simple and easy.

Supported Devices

Optec Pyxis 2 inch Generation 1

Optec Pyxis 3 inch Generation 1 and 2

Optec PyxisLE

Optec Pyxis 2 inch Generation 3

ASCOM Compatibility

The software package includes an optional ASCOM-compatible driver that is compatible with all the Pyxis rotators. Thus these drivers are usable with any ASCOM-compliant software. In order to use the ASCOM driver the ASCOM Platform 6.2 or higher is required.

Please Note: This manual documents only Optec software. Refer to the ASCOM Standards website (www.ascom-standards.org) for platform downloads and documentation.



Section 1.1 - License

Notice: this is a copy of the license agreement. If there are any differences between this license and the license you agreed to on installation the installation license takes precedence.

By installing and/or using any Pyxis Software, you agree to Optec, Inc's license and warranty terms below.

Pyxis software products and these informational 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 software products, including, without limitation, the implied warranties of merchantability or fitness for a particular purpose. Because some states / jurisdictions do not allowexclusions 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 these products, even if Optec, Inc. has been advised of the possibility of such damages. Because some states do not allowthe exclusion or limitation of liability for consequential or incidental damages, the above limitation may not apply to you.

You may not use this software in any life critical applications.

You may not:

Work around any technical limitations in the software.

Reverse engineer, decompile or disassemble the software, or otherwise attempt to derive the source code for the software except, and solely to the extent permitted by applicable law, despite this limitation.

Remove, minimize, block or modify any notices from Optec, Inc. in the software.

Use the software in any way that is against the law.

Share, publish, lend the software, provide it as a hosted solution for others to use or transfer the software or this agreement to any third party.

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

Components used in this software may be covered by additional 3rd party license terms. Any additional license terms may be found in the licenses folder.



Section 1.2 - What's new

Version 3.1.0: This is the Initial Release of the 3.1 drivers, so everything is new. Future features and documentation will be added here as this is updated.

Note: the instructions and screen shots included in this document may be from pre-release or older released versions and may not accurately reflect past or current versions of the software.



Section 2.0 - Getting Started

To get started quickly take a look at the System Requirements, Installation and Setup sections. If you want to control multiple rotators or different models take a look at the Adding new Instances section. Finally if you are having problems look at the Troubleshooting and Getting help sections.

If you are looking for help with a specific model rotator please read the Device Specific Section on that device.

System requirements



Section 2.1 - System Requirements

Pyxis Software and Drivers

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

- Windows Vista, Windows 7, Windows 8/8.1 or Windows 10 or higher
- ASCOM Platform 6.2 or later (only required to use the ASCOM driver or the Alt-Az Controller)
- Microsoft .NET Framework 4.5.2 or later

If you system can run these requirements you have almost certainly exceeded the requirements for the Pyxis Software.

If your computer meets the minimum system requirements and runs the software listed above, you should have no problem using the included software.

The complete Pyxis software should require less than **20 MB** of hard drive space.

Power Connection

All Pyxis Rotators requires 12VDC to function properly. A suitable power supply is provided with every controller purchase. Please contact Optec, Inc in the event that you require a replacement power supply. Using non Optec power supplies may cause damage to your unit.

Data Connections

Each Pyxis model offers different connection methods. Please see your device specifications for details.



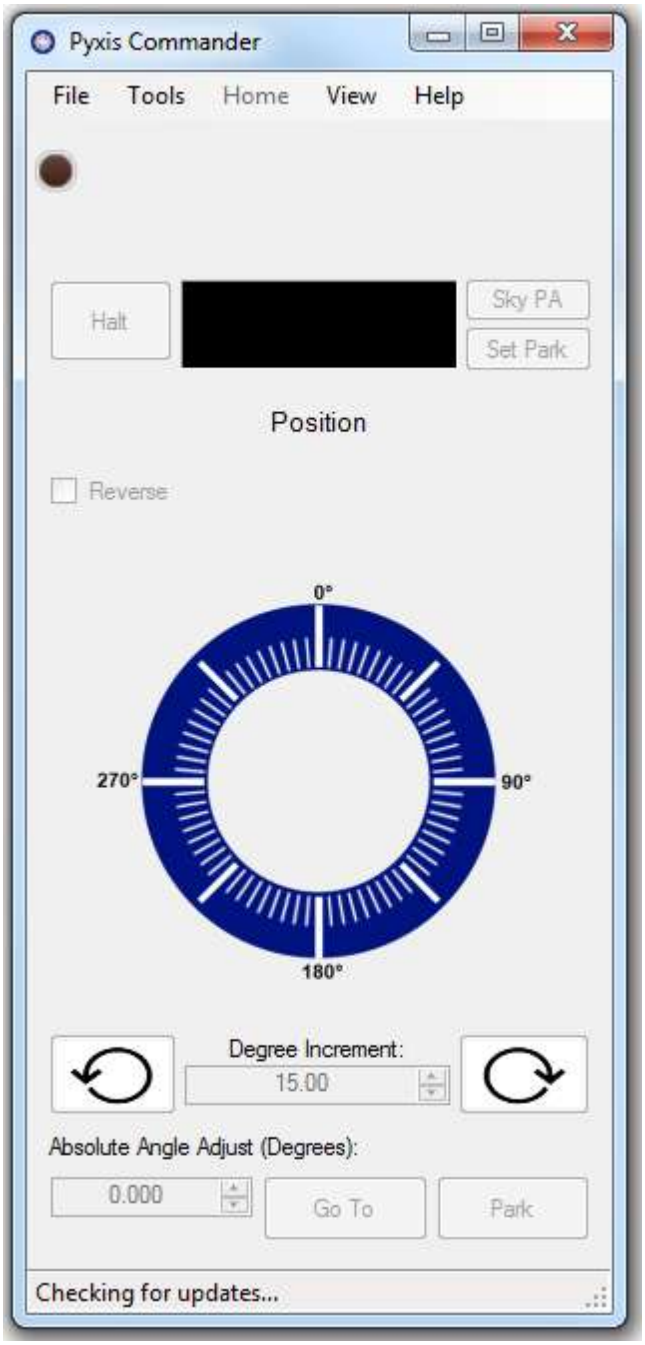
Section 2.2 - Installation

To install the Pyxis software please follow these steps:

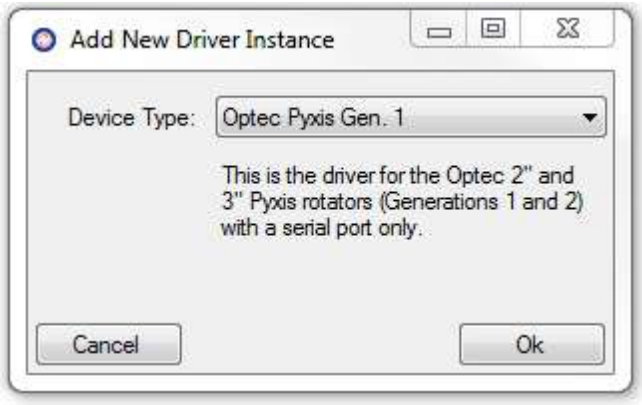
- Review the System Requirements to verify that your system is capable of running the Pyxis software and has the required programs installed. If you are reading this document on a post XP Windows machine it is almost certain that your computer far exceeds the minimum requirements.
- Obtain the latest version of the Pyxis installer from the Downloads page on the Optec website. If you do not have an Internet connection you can also download the program on another computer and transfer the installer to your computer.
- Unzip the downloaded folder (note: the folder name may include the version number). The same installer package will work for both 32 and 64 bit computers.
- Run Setup.exe (note: the filename may include the version number).
- Follow the instructions in the installer.

Section 2.3 - Setup

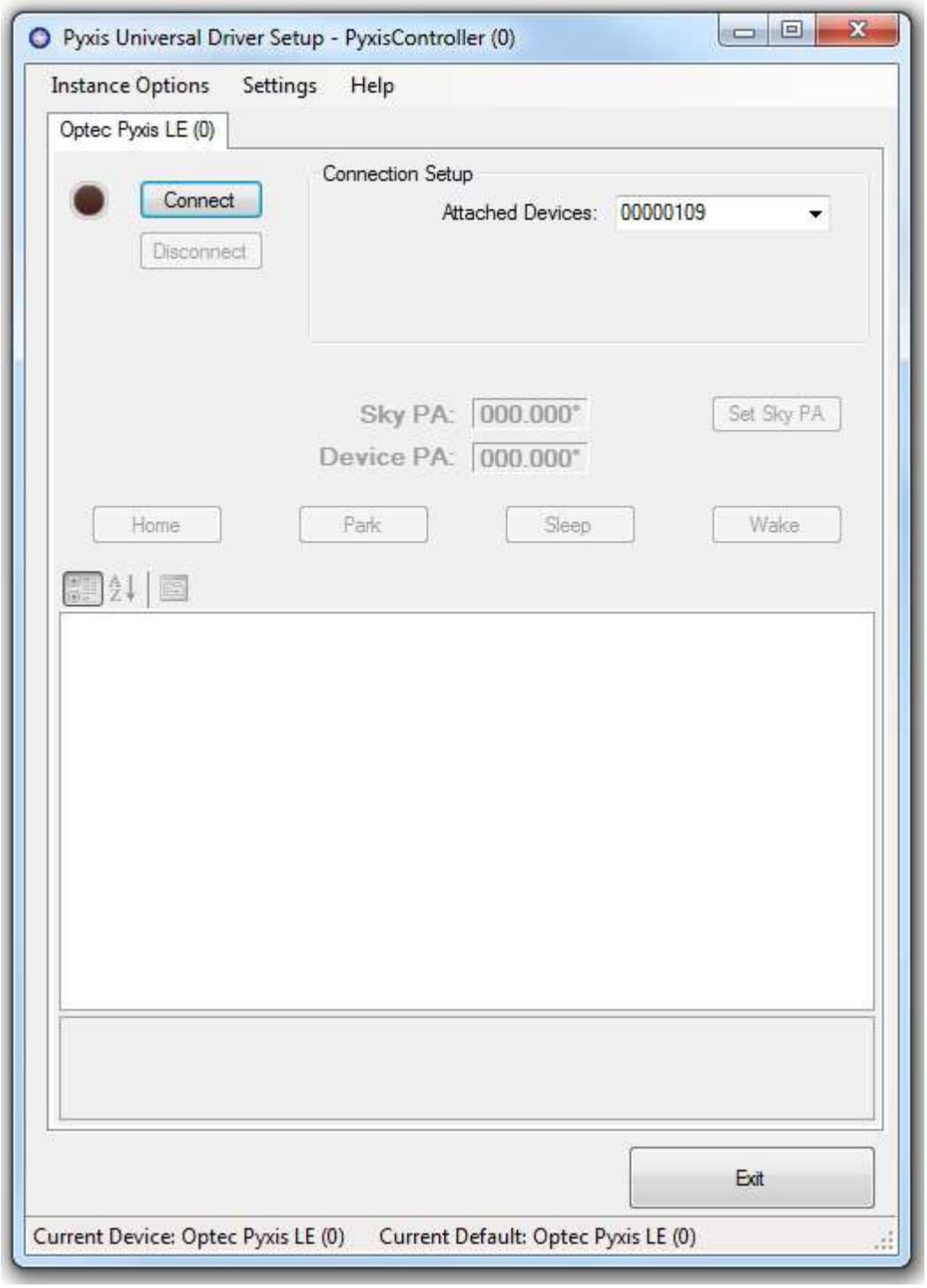
To setup your Rotator open the Pyxis Commander Software. You can start it from the desktop icon or from your program menu. The home screen should look like this:



Before you can use your rotator you will need to setup your device. To connect to your rotator click on **Tools** and then **Settings**. The first time you connect you should see this window:



Simply select your device type and press **OK**. When you select a device type from the drop down a brief description is shown. Once you have selected your device type and pressed **OK** you should see this window:



This is the device settings window, where you can access the device specific settings. Once you correctly set the **Connection Setup** you can connect and change device settings. Simply click a setting in the lower box to learn more. A summary of the settings can be found in the Device Specific Sections.

From this windows you can set your device specific settings. You can also add new instances. (see the Adding new Instances section)

Here you can see the which program and which device type (and instance) you are currently using as well as the currently set default device. Once you have setup the driver once all additional programs, both with and without ASCOM, will connect to the default driver without any further configuration. This can be overridden on a program by program basis (see the Adding

new Instances section).

If you have only one device to setup you can press **Exit** and begin using your device.

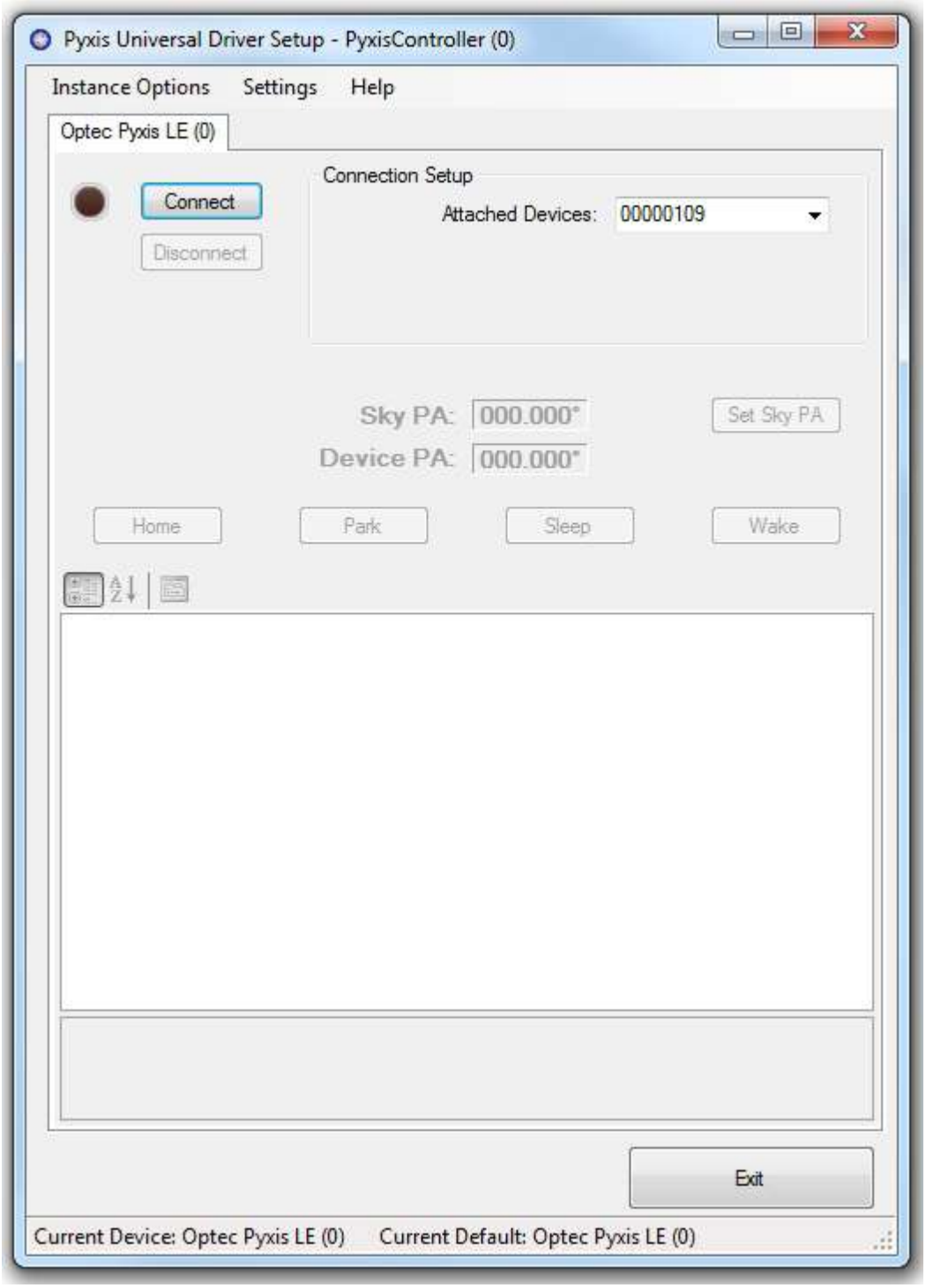
The ASCOM driver setup interface is identical to this one.



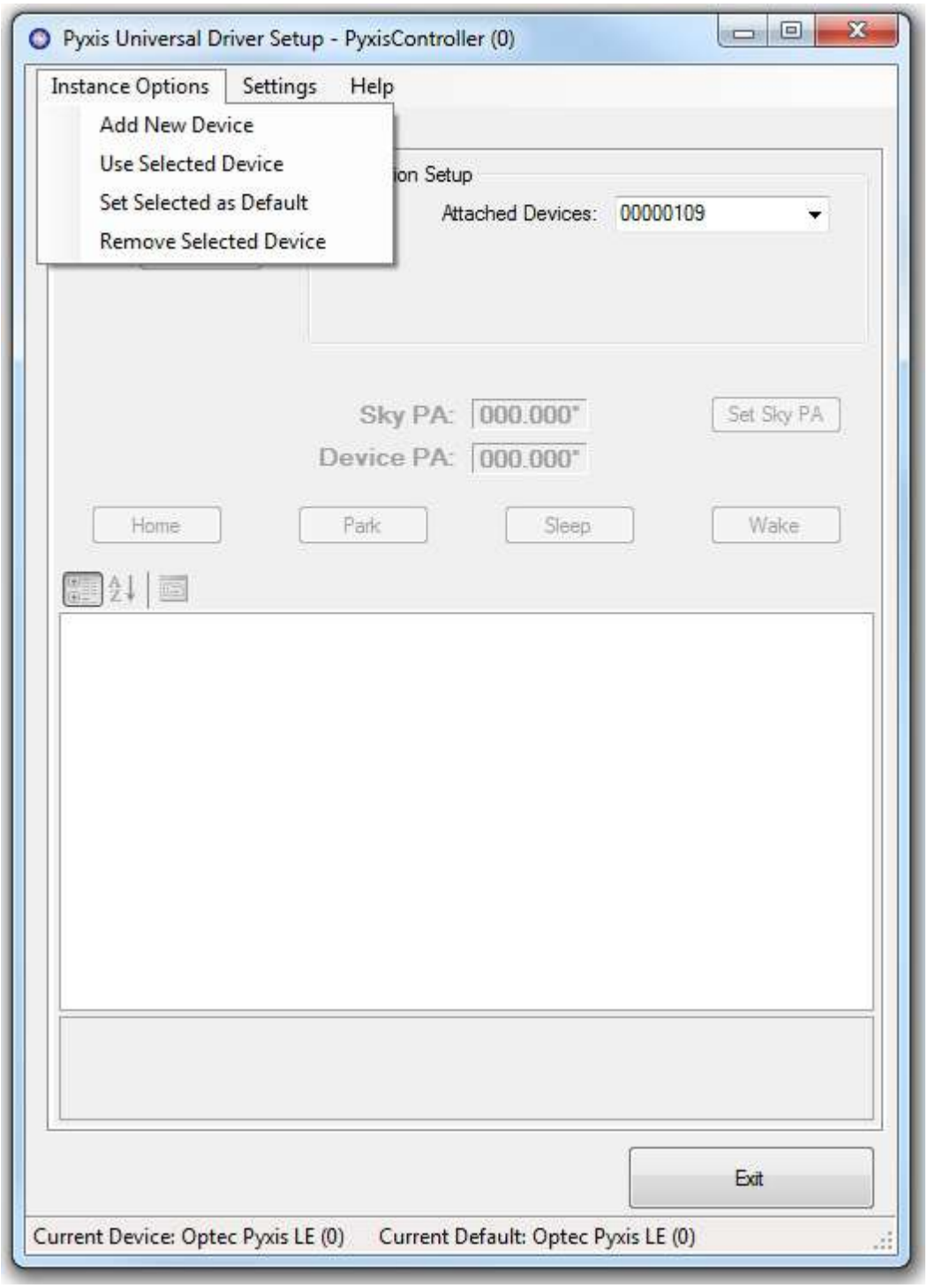
Section 2.4 - Adding new Instances

The new driver allows the creation of instances. An instance is simply a connection to a rotator that is shared with the different client programs. You can have as many instances as you like, they can even be to the same or different models of a rotator. Each instance can have as many connected clients as you like.

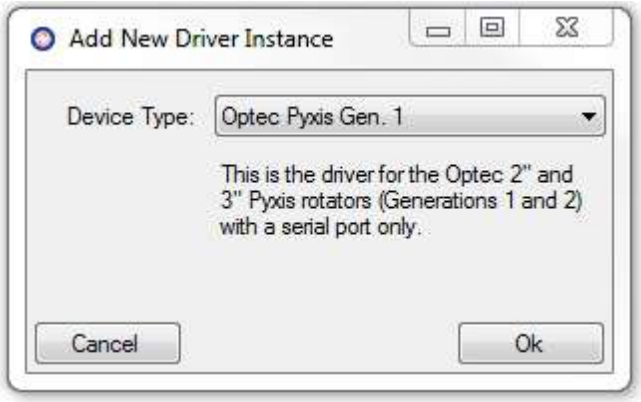
Adding new instances is quick an easy. For example lets say that I want to control two PyxisLE rotators from the same computer. First I open the Setup by clicking **Tools** -> **Settings** in Pyxis Commander or Setup Dialog in the ASCOM driver. Then the setup windows should appear.



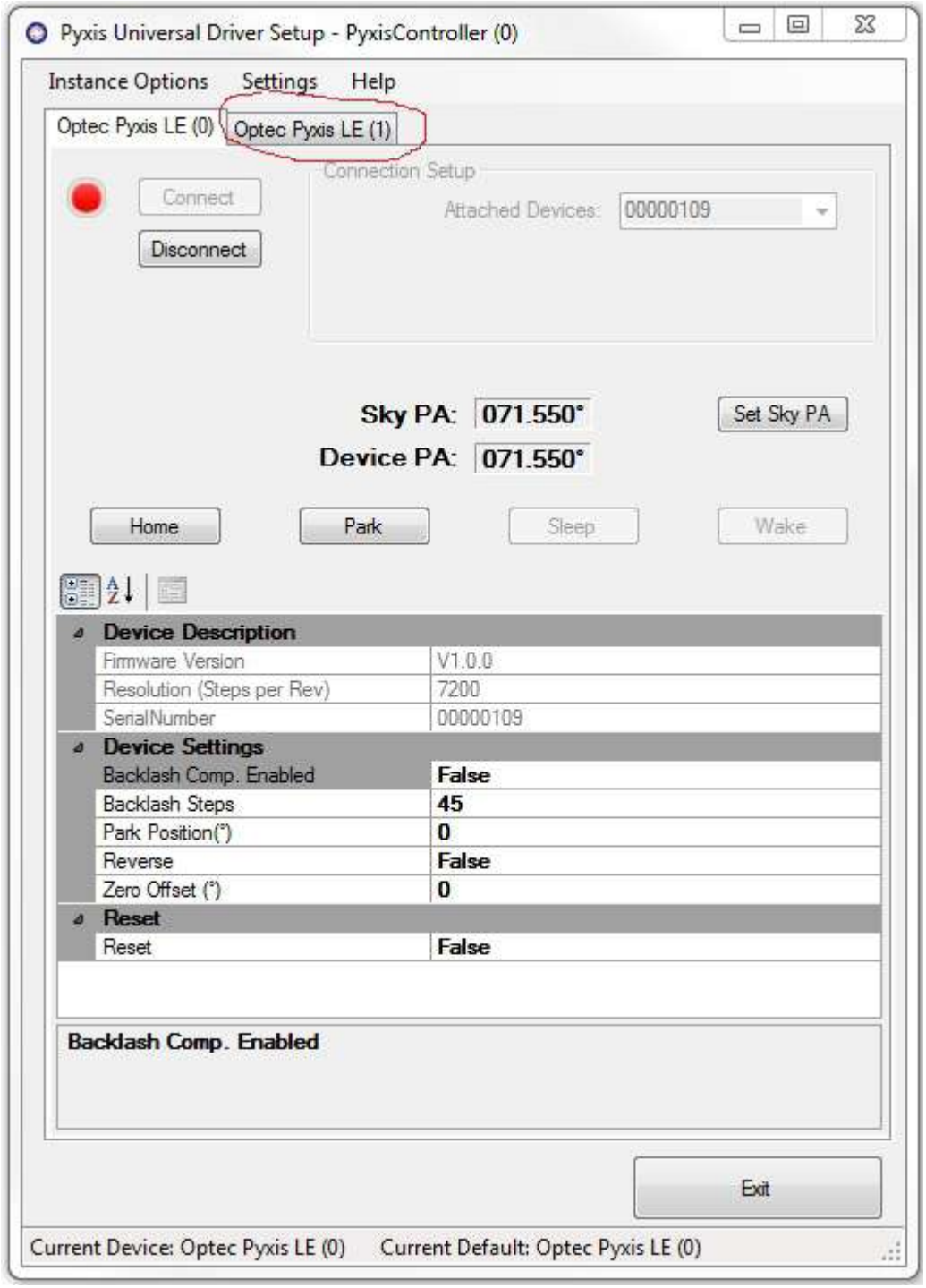
Next click the **Instance Options** menu to view and edit the instances on your machine.



As you can see here I have one PyxisLE instance already created. From here I can **Add a New Device**, access the setup for a selected driver (**Selected Device Setup**), use the selected instance (**Use Selected Device**) with the current client software (you only need to do this once per client), change the default device and remove a device. To add an instance click **Add New Device**. The same add new device screen will appear:



Once you press **OK** the device setup will appear. Once the setup is complete the new driver will be added to the list. You can tab between different instances to configure them.



To use the new instance with a client program simply open the setup with that program, select the device and click **Use Selected Device**. From this point on that specific client program will connect to the selected instance automatically. You can even connect different rotators to different copies of a program. For example if you open Pyxis Commander twice the first copy can connect to one rotator and the second could connect to a different one (or the same as each rotator can have effectively unlimited connections). Every time you start the program each instance will automatically connect to the same rotator.

Troubleshooting

Section 2.5 - Troubleshooting

If you are having issues connecting to you Pyxis please read the device specific section for your model. See the Getting Help section for details on how to access the required manual.

The first troubleshooting step (especially after an installation) is to reboot your computer. This ensures that any pending changes can be applied.

The core driver is registered as a Windows Service. If you constantly get a error reporting a failure to connect to a remote server open the Task Manger. The open the Services Tab and look for a CrossCOM.RotatorServer entry. The status should be "Running". If it is not "Running" either reboot or right click on it and select start. If the entry is missing un-install all components and then re-install. The driver registration occurs as part of the installation.

If you have issues starting the server after a reboot please contact Optec for further assistance.



Section 3.0 - Device Specific Settings

This section contains documentation and procedures for the different models of Pyxis. This includes the Pyxis Generation 1, the PyxisLE and the Pyxis Generation 3.

Pyxis Gen. 1



Section 3.1 - Pyxis Generation 1 Devices.

The Pyxis Generation 1 (and 2) includes the Pyxis 2" and Pyxis 3". These models only have a serial connection.

Configuring and Operation



Section 3.1.1 - Configuring and Operation

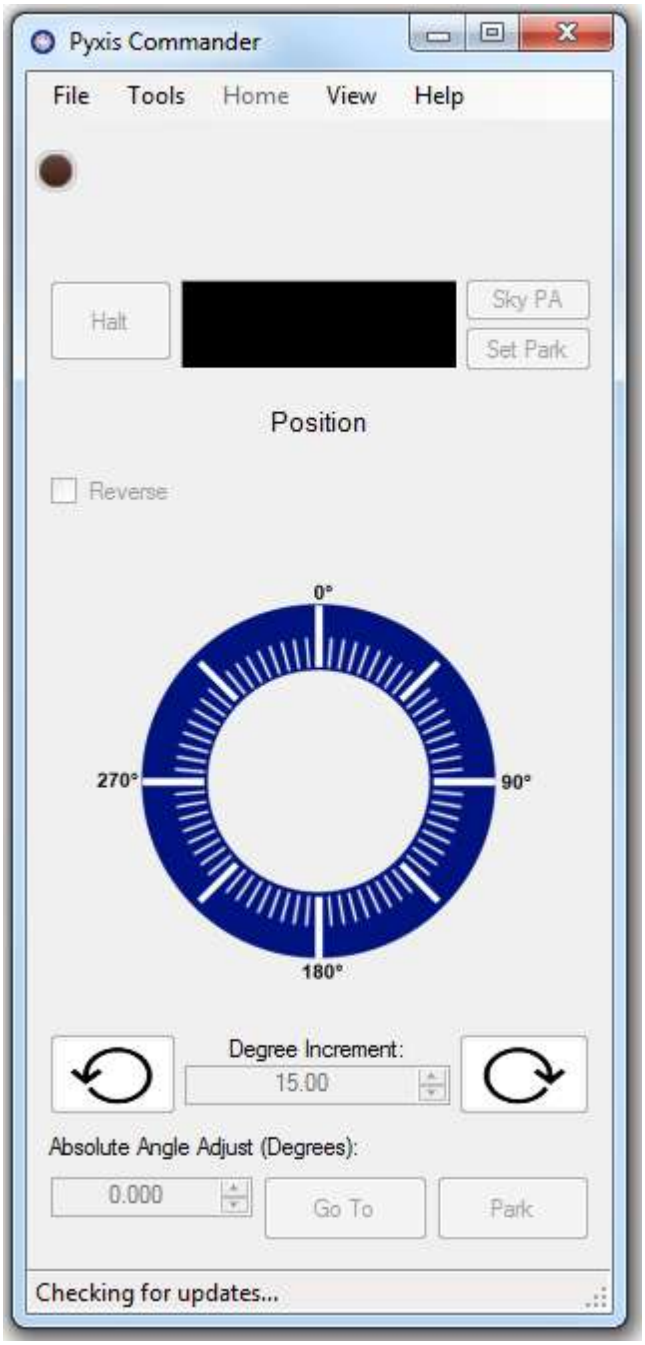
- Connecting to the Device - How to use the control program to connect to a Pyxis rotator.
- Device Setup - How to configure settings for your Pyxis.



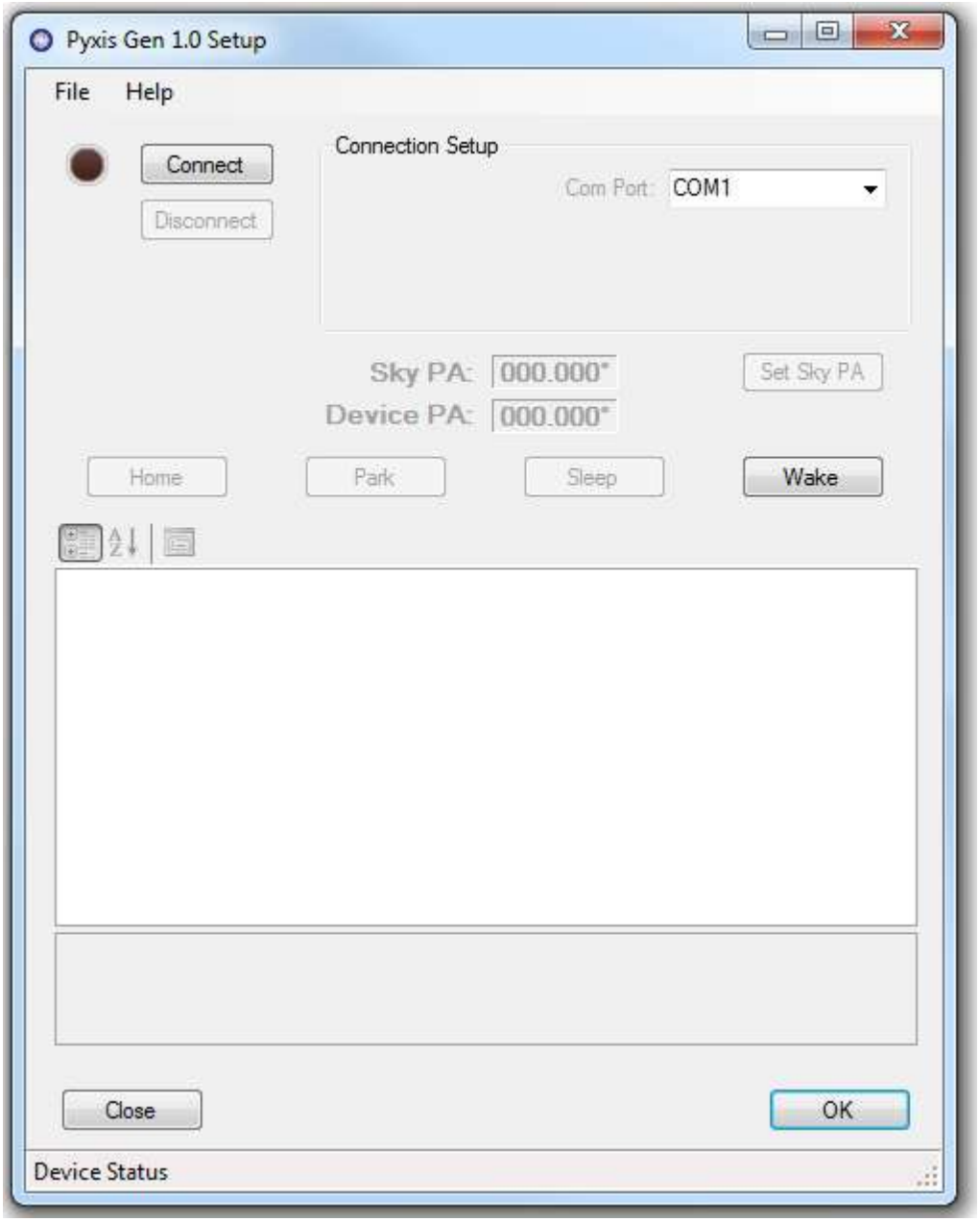
Section 3.1.1.1 - Connecting To A Pyxis Rotator

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 to serial) connection is established, open the Pyxis Control program to operate the camera field rotator.



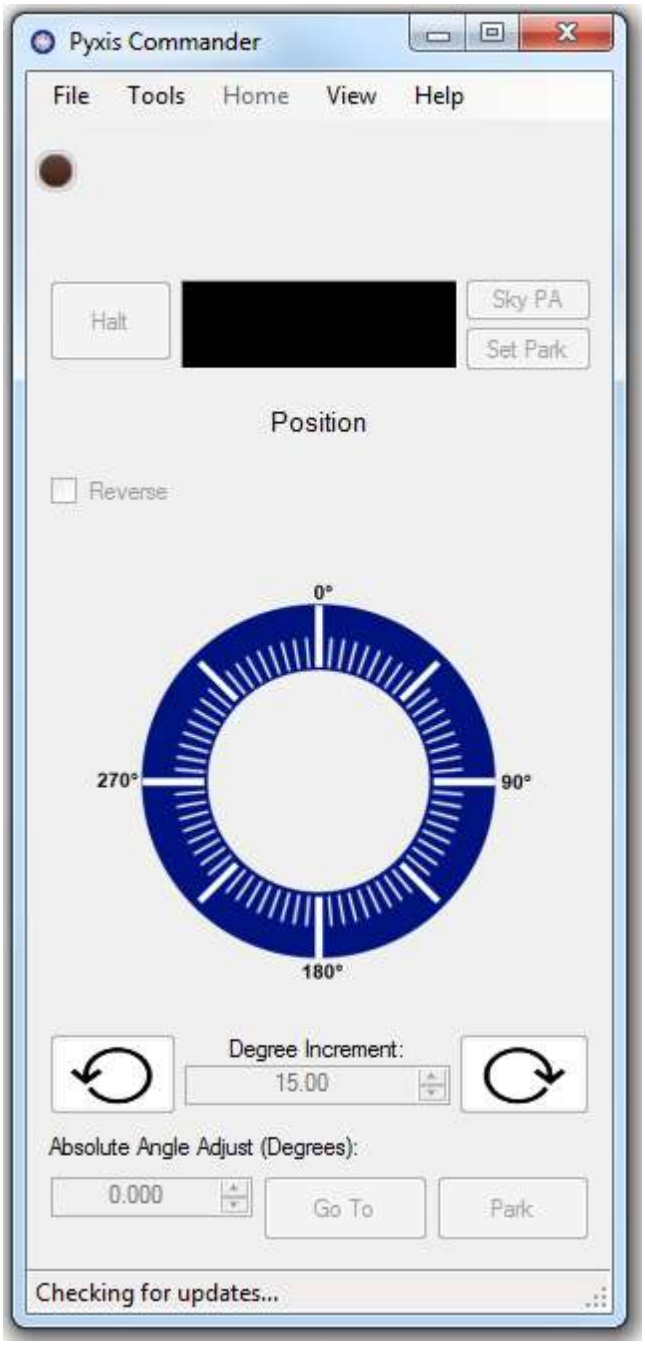
- **Open Setup** - Navigate to the Setup window (See Pyxis Commander documentation for details) and set your COM Port. Note that these models can not connect to the computer while homing or moving.



- **Connecting through ASCOM Client** - When setting the COM port in **Pyxis Rotator Control** you are also setting the COM port for the ASCOM driver. You can use both the ASCOM driver and Pyxis Commander at the same time.
- **Disconnecting From Your Pyxis** - If you need to disconnect the control program from your Pyxis rotator for any reason click ***Disconnect***. Alternatively, you can simply click the red LED in the upper left corner to toggle between connected and disconnected.

Section 3.1.1.2 - Configuring Your Pyxis

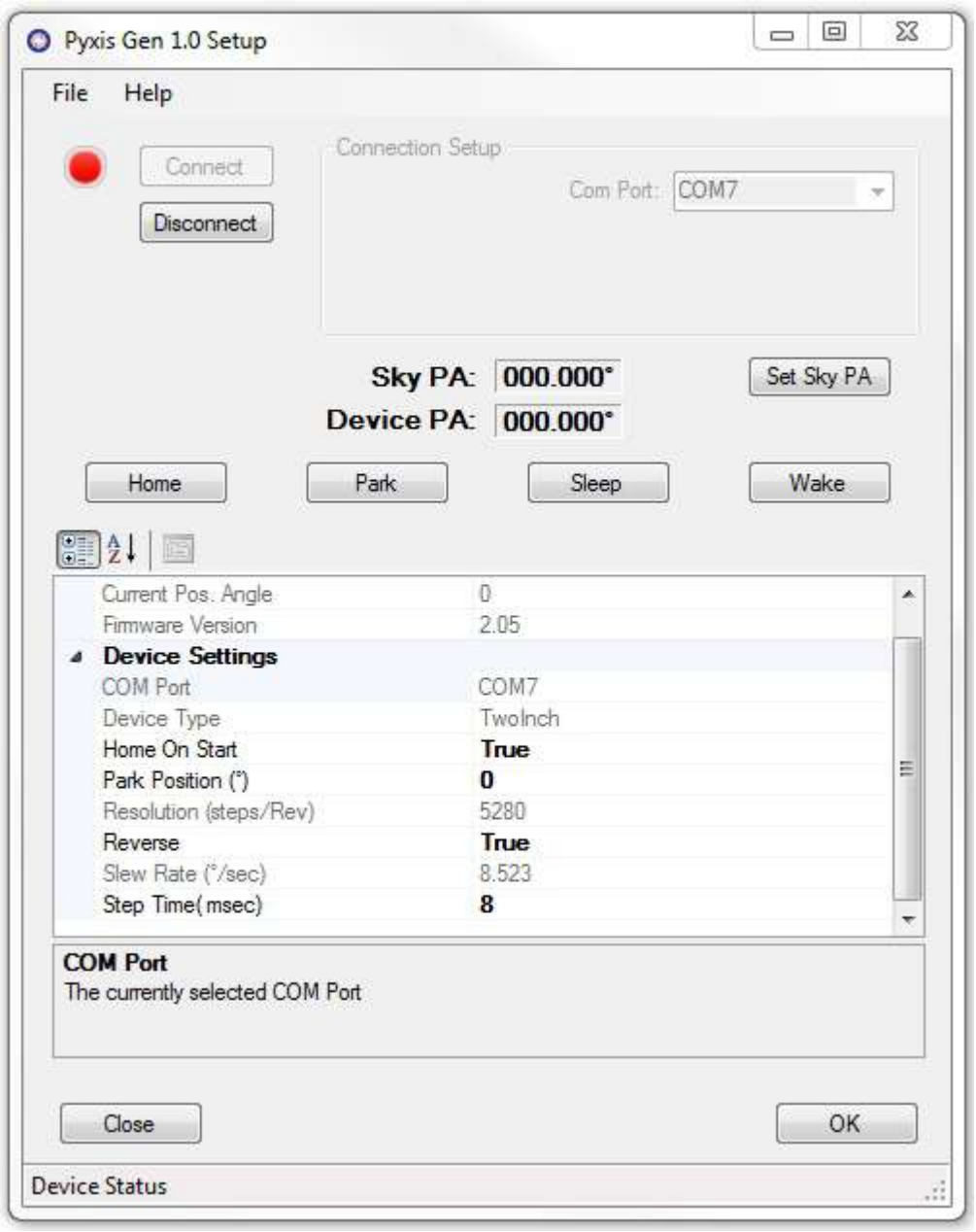
Pyxis rotator device and program settings can be configured via the **Pyxis Commander** program or the ASCOM Driver Setup Dialog. Any changes made in one will be reflected in the other.



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



Section 3.1.2 - 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 3.1.2.1 - 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 3.1.2.2 - 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.

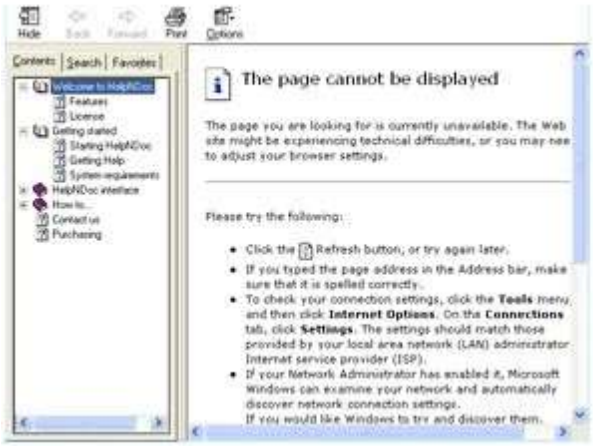
If you encounter problems connecting to your rotator, first check the integrity of your Pyxis' USB and power connections.

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. Note: the Pyxis Generation 1 and 2 cannot connect to the PC while is is homing or moving.

Finally, check for any updated versions of the software on the Optec website and reboot your computer.

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 3.1.2.3 - 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 3.2 - Pyxis LE Devices.

The Pyxis LE includes the USB connection PyxisLE.

Configuring and Operation



Section 3.2.1 - Configuring and Operation

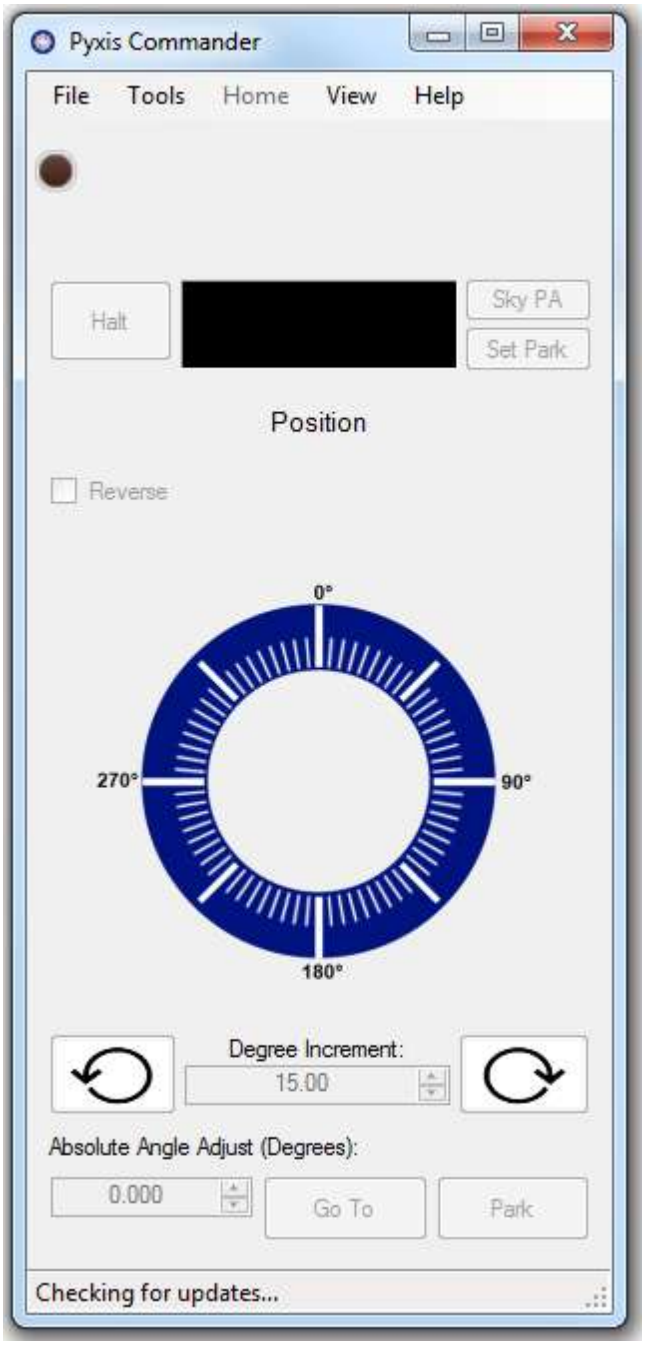
- Device Setup - How to configure settings for your Pyxis LE.
- Zero Offset vs. Sky PA Offset - An explanation of offset concepts and usage in the Pyxis LE control program.

Device Setup



Section 3.2.1.1 - Configuring Your Pyxis LE

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

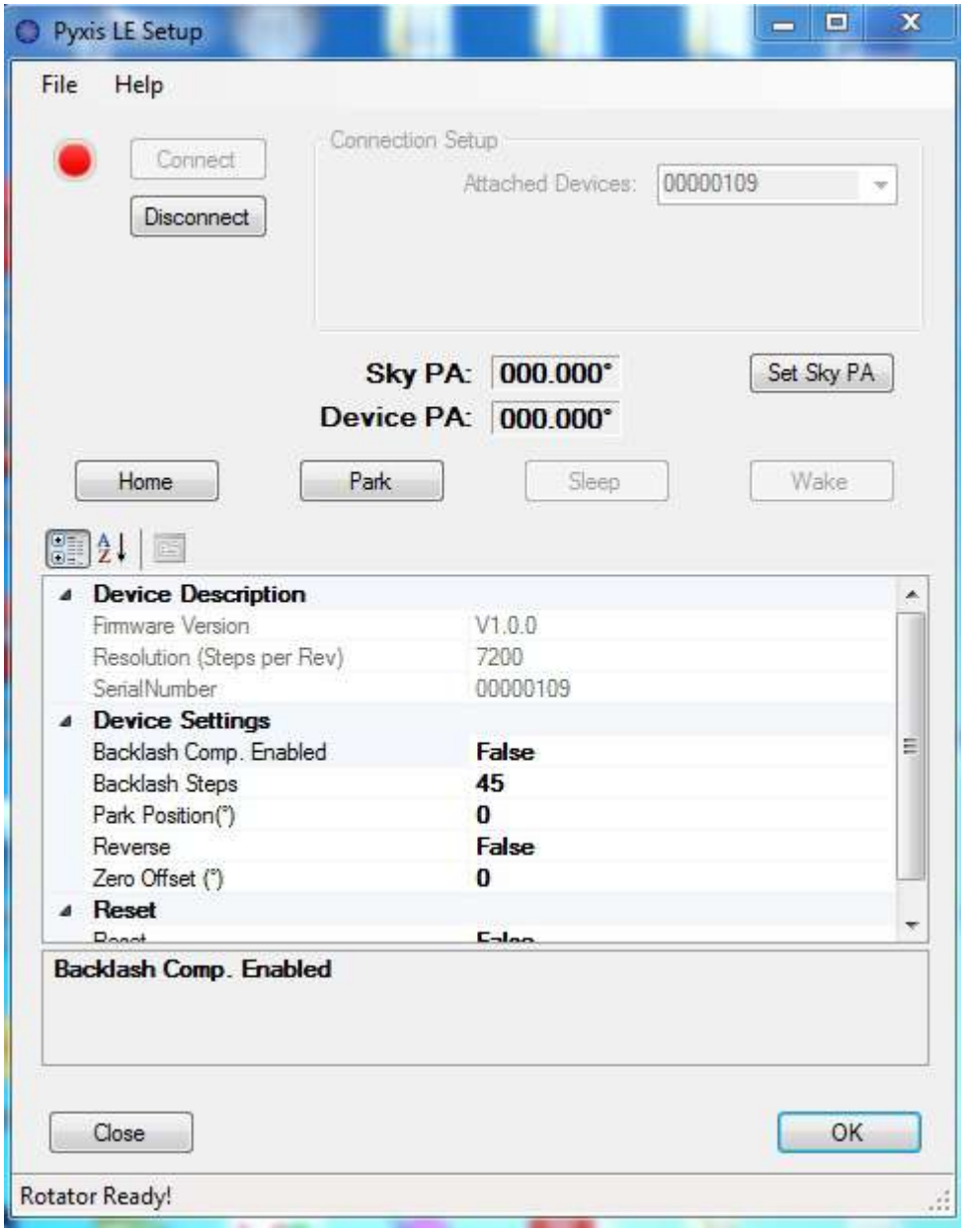


- **Pyxis Commander Settings** - To access the settings form in the Pyxis Commander program, click ***Tools*** on the main menu bar and select ***Settings***.

  -OR-

- **ASCOM Driver Settings** - To access the settings from the Optec Pyxis Universal 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 as follows:



- **Firmware Version (Read Only)** - This property displays the version number of firmware that is programmed in the device that is currently connected.
- **Resolution (Read Only)** - This property displays the rotation resolution of the rotator in units of stepper motor steps per one revolution of the rotator.
- **Serial Number (Read Only)** - Displays the serial number of the currently connected device. This number is unique to each device and cannot be changed.
- **Backlash Compensation Enabled** - This property can be used to enable or disable backlash compensation for the Pyxis LE. The backlash compensation works by traveling a specific number of steps beyond the target position, then turning around and returning to the target position. This ensures that the device reaches every position from the same direction and should reduce any backlash in the mechanical system.
- **Backlash Steps** - This property can be used to set the number of steps that the

device travels past its target position when performing backlash compensation.

- **Park Position** - The Park Position is a set position angle that the device will travel to during the Park process. **Note**: The park position is not affected by manually the changing the Sky PA (Sky PA Offset). The park position is affected when the Zero Offset is changed. This will ensure that under normal operation the device will always park at exactly the same physical position.

- **Reverse** - The reverse property is a feature that is required by the ASCOM standard rotator interface. By default, the reverse property is set to false and any positive change in position angle will result in a ***counter-clockwise*** adjustment of the physical position of the device. When the reverse property is set to true, positive position angle adjustments will result in a ***clockwise*** change of the physical position angle of the device.

- **Zero Offset** - This property adjusts the internal zero point of the device. See Zero Offset vs. Sky PA Offset for more information.

- **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.



Section 3.2.1.2 - Sky PA And Zero Offsets

Zero Offset Information

- **Definition** - The Zero Offset is a value stored in the device's firmware that internally offsets the rotator's zero degree point. By default, this value is set to zero. During the homing procedure the rotator travels counter-clockwise until a small magnet on the main pulley reaches a magnetic field sensor on the control circuit board. The rotator then rotates clockwise *180 degrees + Zero Offset* away from the hall-effect sensor. The final position reached is then considered to be 0 degrees.

- **When To Change The Zero Offset?** - Ideally, the Zero Offset should be set once, when the rotator is first installed in the scope, and never changed again thereafter. The intention of the Zero Offset is to allow the user to set the home position of the device approximately equal to the real world zero position angle regardless of the physical orientation of the rotator in the scope. **Note:** It is never truly necessary to reset the Zero Offset and the option to do so is included merely for completeness and convenience. Synchronizing the reported position angle of the device with the actual sky position angle can be done with significantly more ease using the Sky PA Offset as discussed below without requiring a home.

  Another reason for changing the Zero Offset is the device could be to shift the "point of no cross" for cable management purposes. The device firmware is intelligent enough to know that it should not rotate in such a way that will cause the cables to wrap up. The point which the rotator will not cross is always 180 degrees from the devices internal zero point. Thus, setting a zero offset shifts the "no-cross" point.

- **How Does Changing The Zero Offset Affect My System?**
  - The internal zero degree position is shifted by the amount specified by the Zero Offset..
  - The point of no crossing for the cable wrapping prevention system is shifted by the Zero Offset.
  - The final position of the home procedure is shifted by the Zero Offset.
  - The maximum radial distance the rotator can travel during a home procedure is increased to *360° + Zero Offset*, if the zero offset is positive. This means that the device may temporarily cross the cable wrapping *no-cross* point during a home but it will then cross back over so that a net wrapping affect will not occur.

Sky PA Offset Information

- **Definition** - When you use either the Pyxis LE ASCOM driver (in the Setup Dialog form) or the Pyxis LE Control program to change the Current Sky PA you are actually changing the Sky PA Offset. This offset is a software offset and has no effect on the device's firmware.

The value of the Sky PA Offset is not directly available through to the user. The current setting for the Sky PA Offset will be apparent whenever an attached Pyxis LE is homed. The difference between the displayed position angle and zero is equal to the current Sky PA Offset. For example, see the scenario below:

Action	Resulting Sky PA Offset	Displayed / Reported Sky PA
Initial Condition	0	0°
Rotate 10°	0	10°
Perform a plate solve and find the PA is actually 11.5°		
Change Sky PA to 11.5°	1.5°	11.5°
Rotate 25°	1.5°	36.5°
Home the rotator	1.5°	1.5°

- **When Should I Change The Sky PA?** - You may test the accuracy of your device's Sky PA by taking an image and performing a ***plate solve***. If the Sky PA you calculate is different than the value reported by the Pyxis LE control program or any client application using the Pyxis LE ASCOM driver, you should adjust the software's value to match the value calculated from your hardware.

- **How To Change The Sky PA** - Click the ***Sky PA...*** button on the main window of the Pyxis LE control program and input your calculated value to change the program's stored Sky PA to the correct value.

- **How Does Changing The Sky PA Affect My System?**
  Changing the Sky PA by manually entering a new number will not cause the rotator to physically rotate. Also, it will not change the physical position that the rotator travels to during a home procedure, but will instead change the current displayed position angle and the position angle reported by the ASCOM driver to a client application.

- **How Can I Reset My Sky PA?**
  In the Pyxis LE control program, you may reset the Sky PA by homing the rotator, then clicking the ***Sky PA...*** button to set the Sky PA to zero.

Conceptual Help

The Sky PA Offset/Zero Offset system used by the Pyxis LE has been designed for the convenience of the user. We understand that it can be confusing to figure out the subtle differences between Sky PA offset and Zero Offset. If after reading the above information you still have questions or concerns, please contact Optec technical support. We will be happy to assist you in understanding the concepts and execution of the offsets used by the Pyxis LE.

FAQ & Troubleshooting

Section 3.2.2 - FAQ & Troubleshooting

- Cable Wrapping - How the Pyxis LE 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 LE control program help file.
- Error Codes - A description of how software and firmware errors are handled by the Pyxis LE control program and by the ASCOM drivers, as well as basic error message troubleshooting information.
- Contacting Optec Technical Support - Helpful procedural advice for contacting Optec technical support to ensure a speedy and accurate solution to your problem.

Cable Wrapping



Section 3.2.2.1 - Cable Wrapping Concerns

The device firmware for the Pyxis LE goes to great lengths to prevent the device from wrapping its cables. The Pyxis LE uses 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 USB 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 3.2.2.2 - Connection Errors

As the Pyxis LE Camera Field Rotator uses USB for its computer communication, connection with the Pyxis LE should be very straightforward, as described in the Connecting to the Device portion of this manual.

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

Finally, check for any updated versions of the software on the Optec website and reboot your computer.

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 3.2.2.3 - HTML Help Viewer Display Issues



If the Help Viewer used by Pyxis LE 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** - This 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 Pyxis LE Help.chm file in your Pyxis LE Control installation and open it from a local drive.

If this does not work, your best solution is to simply continue using the Web-based help file that, since you are reading this article, you are presumably already using.



Section 3.2.2.4 - Pyxis LE Error Troubleshooting

If the Pyxis LE encounters an error condition, an internal error state will be set. The Pyxis Commander program and ASCOM drivers will translate these error codes into a meaningful error message to inform the user of the problem in plain terms.

If you encounter a recurring error with no apparent solution, we suggest unplugging the rotator's USB and power cables and plugging it back in. This will reset the device and hopefully remove the source of the error.

If this tactic does not work, we also suggest restarting your control program and your PC to determine if the problem is occurring purely in the controlling PC.

If the error is still present, we recommend contacting Optec directly.



Section 3.3 - Pyxis Generation 3 Devices.

The Pyxis Generation 3 includes the Serial and Ethernet Pyxis.

Configuring and Operation



Section 3.3.1 - Configuring and Operation

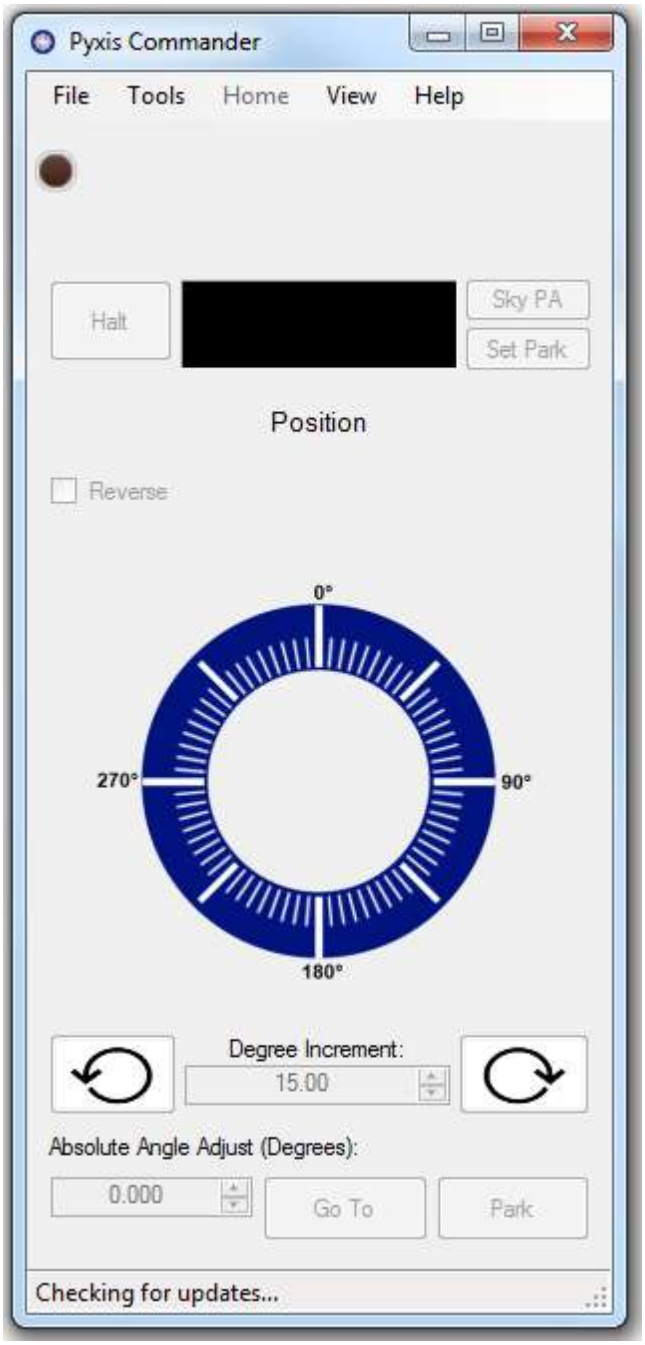
- Connecting to the Device - How to use the control program to connect to a Pyxis rotator.
- Device Setup - How to configure settings for your Pyxis.
- Firmware Update Tool - How to update your Pyxis firmware (Pyxis Gen 3 only).



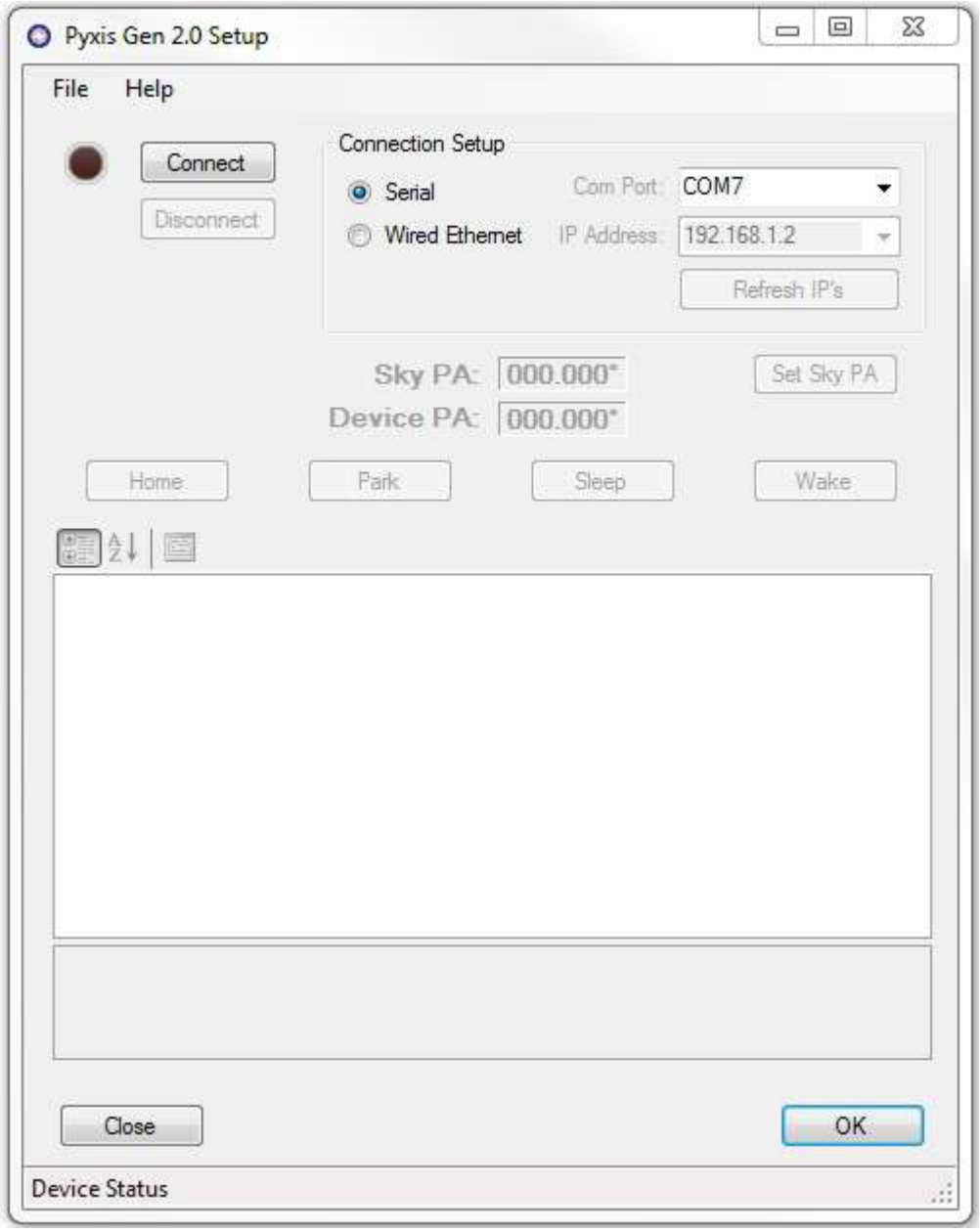
Section 3.3.1.1 - Connecting To A Pyxis Rotator

The following instructions will help you connect your Pyxis Generation 3 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 or Ethernet 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.



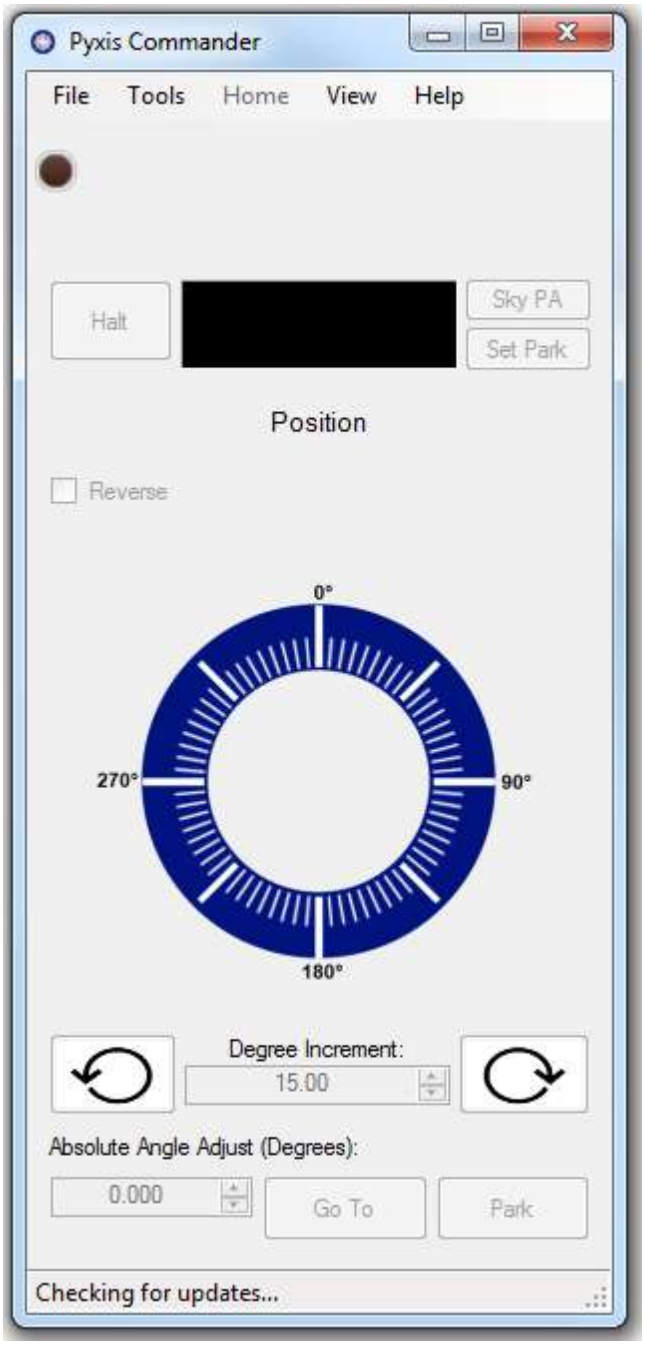
- **Open Setup** - Navigate to the Setup window (See Pyxis Commander documentation for details) and set your Connection settings



- **Connecting through ASCOM Client** - When setting the COM port in **Pyxis Rotator Control** you are also setting the COM port for the ASCOM driver. You can use both the ASCOM driver and Pyxis Commander at the same time.
- **Disconnecting From Your Pyxis** - If you need to disconnect the control program from your Pyxis rotator for any reason click ***Disconnect***. Alternatively, you can simply click the red LED in the upper left corner to toggle between connected and disconnected.

Section 3.3.1.2 - Configuring Your Pyxis

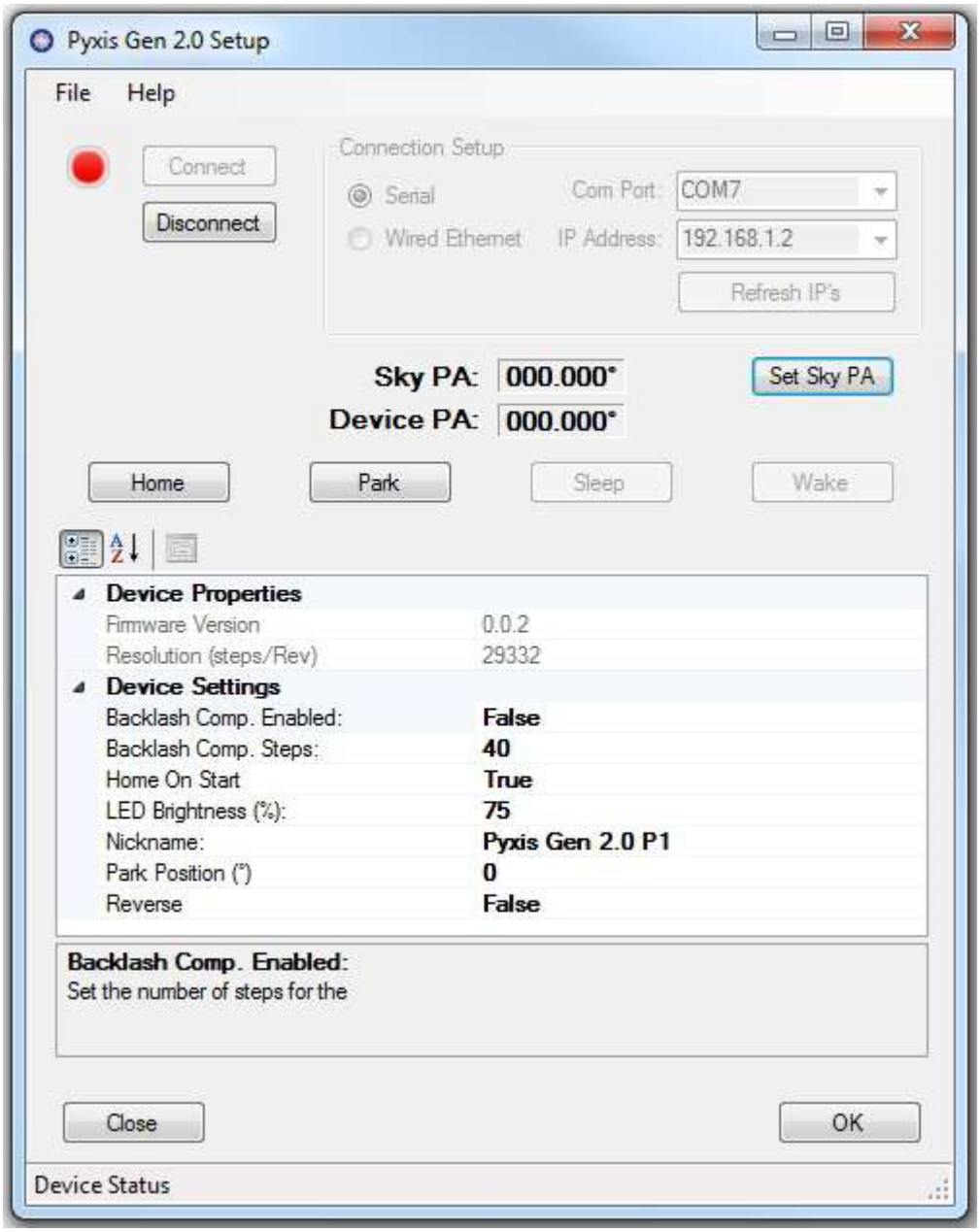
Pyxis rotator device and program settings can be configured via the **Pyxis Commander** program or the ASCOM Driver Setup Dialog. Any changes made in one will be reflected in the other.



- **Pyxis Control Program Settings** - To access the settings form in the Pyxis Control program, click ***Tools*** on the main menu bar and select ***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 Setup*** on the main menu bar and select ***Advanced Setup***.
- **Change Settings** - The settings available for viewing using either access option are listed below:



- **Firmware Version (Read Only)** - This property displays the version number of firmware that is programmed in the device that is currently connected.
- **Resolution (Read Only)** - This property displays the rotation resolution of the rotator

in units of stepper motor steps per one revolution of the rotator.

- **Backlash Compensation Enabled** - This property can be used to enable or disable backlash compensation for the Pyxis. The backlash compensation works by traveling a specific number of steps beyond the target position, then turning around and returning to the target position. This ensures that the device reaches every position from the same direction and should reduce any backlash in the mechanical system.
- **Backlash Steps** - This property can be used to set the number of steps that the device travels past its target position when performing backlash compensation.
- **Home On Start** - This property determines whether the rotator will automatically begin homing when it is connected to power.
- **LED Brightness** - Allows you to set the brightness of the LED on the Rotator body.
- **Nickname** - Allows you to set a Nickname for this Rotator.
- **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.
- **Reverse** - By default, the reverse property is set to false and any positive change in position angle will result in a ***counter-clockwise*** adjustment of the physical position of the device. When the reverse property is set to true, positive position angle adjustments will result in a ***clockwise*** change of the physical position angle of the device.



Section 3.3.1.3 - Firmware Update Tool (Pyxis Gen 3 Only)

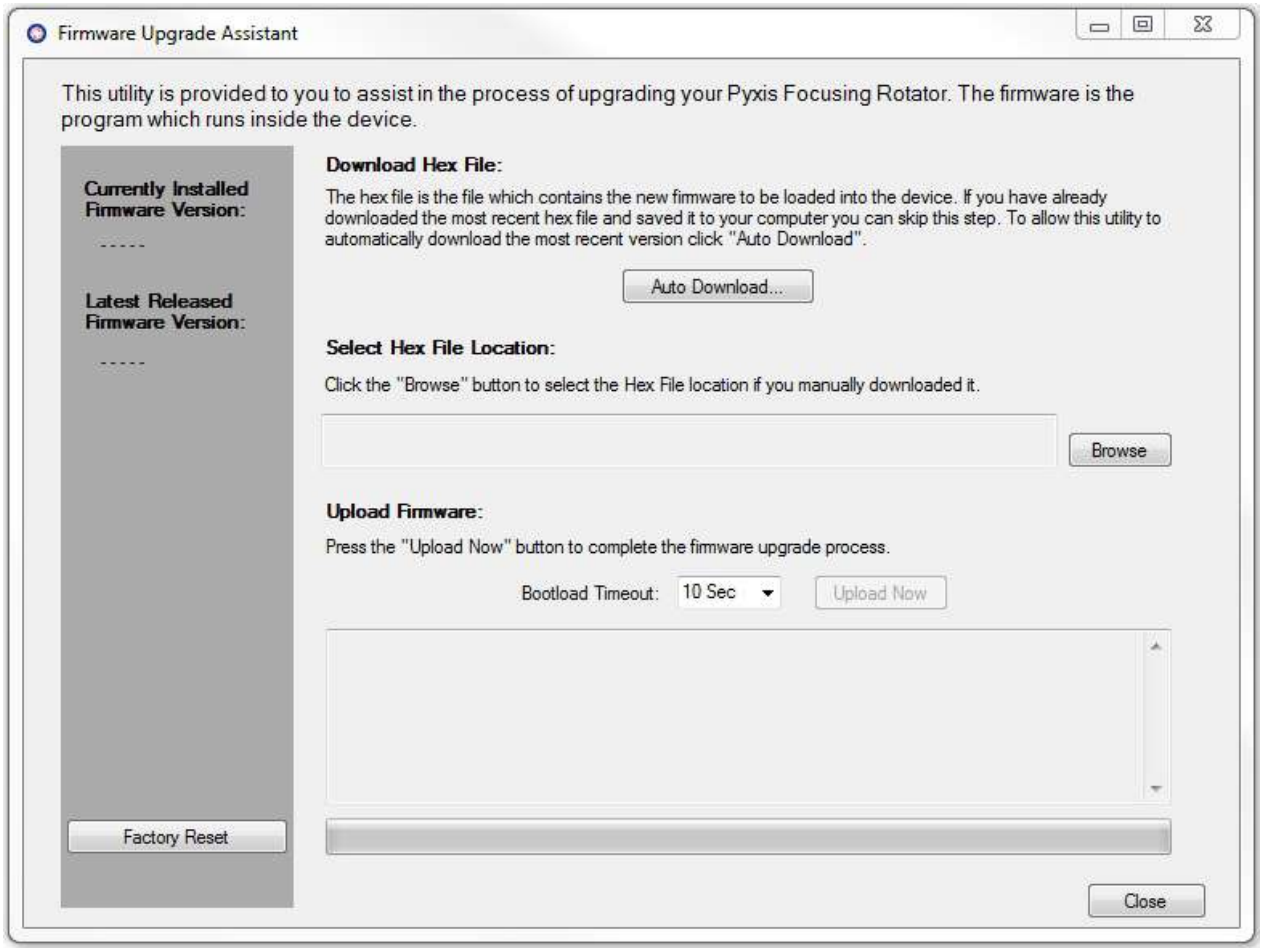
Firmware, as differentiated from software, is the set of programs loaded directly onto the Pyxis's internal microprocessor in order to enable the Pyxis to perform all of the functions that it needs to perform.

In the past, upgrading most focusers, cameras, or other instruments with new firmware would necessitate the expense and inconvenience of shipping the device back to the manufacturer and waiting several days for it to be returned. However, the Pyxis eliminates this hassle by allowing you to upgrade your firmware directly through the Pyxis Commander control software.

Notice! If you have recently updated your Pyxis firmware, we highly recommend updating your software as well to ensure that your Pyxis works properly.

To upgrade your firmware:

- **Connect Your Hub** - Ensure that your Pyxis is connected via an **RS-232 Serial** connection.
- **Open The Firmware Upgrade Wizard** - In Pyxis Commander, go to the ***File*** menu and select the ***Upgrade Firmware*** option.



- **Check For A New Version** - Using the ***Current Firmware Version*** and ***New Firmware Version*** displays, determine if there is a newer firmware version available for download. If not, click the ***Close*** button to return to the main Pyxis Commander window
- **Download New Firmware** - If a newer firmware version is available, you may download it in one of two ways:
    - **Auto-Download New Firmware** - Click the ***Auto Download*** button to automatically download and save your new firmware. In this case, the ***Hex File Location*** will be automatically filled in.

    -OR-

    - **Manually Download New Firmware** - You may manually download the newest firmware version from the Optec website. In this case, you must also manually select the ***Hex File Location*** (the location of your download).
- **Upload Your Firmware** - Once your firmware is downloaded, click the ***Upload Now*** button and follow the on screen instructions to upload the new firmware to your Pyxis.
- **Factory Reset** - The factory reset button will reset the Pyxis's internal settings to their factory defaults.
- **Return To The Main Window** - When you are finished uploading, click the ***Close*** button to return to the main Pyxis Commander window.

FAQ & Troubleshooting

Section 3.3.2 - 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 3.3.2.1 - Cable Wrapping Concerns

The device firmware for the Pyxis 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 cables are unplugged from the device while the device is in motion or the rotator is moved without power, it is possible that the device will wrap cables the next time it homes.



Section 3.3.2.2 - Connection Errors

If you encounter problems connecting to your rotator, first check the integrity of your Pyxis' USB or Ethernet, 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. For Ethernet connections make sure that you are on the same sub-net and that your firewall does not block connections.

Finally, check for any updated versions of the software on the Optec website and reboot your computer.

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 3.3.2.3 - 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 4: FAQ & Troubleshooting

If you encounter any problems, errors, or questions about using the Pyxis software that are not addressed by this owner's 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.

There are many resources on the Internet to help you use the Pyxis Software and the ASCOM Platform. We recommend visiting the Optec website first. In addition resources can be found at:

- The Optec User Group: http://tech.groups.yahoo.com/group/Optec/
- The ASCOM Website: http://ascom-standards.org/
- Optec Downloads: http://www.optecinc.com/astronomy/downloads/default.htm
- Optec Support: http://www.optecinc.com/support.htm

If you are unable to connect to the Internet, or you have any other questions at all, please feel free to contact Optec Support by telephone or email at:

- Optec Support phone: 1 (616) 897-9351
- Optec Support email: support@optecinc.com