FocusLynx Focuser Hub Help File

Table of contents

FocusLynx Help 3
Setup 7
About 8
License 10
Quick Start 11
Software Installation 12
Connecting To Your FocusLynx 17
Configuring Focuser Type 21
Temperature Coefficients 25
Completing The Configuration 29
Configuring Software 32
FocusLynx Commander Serial 33
FocusLynx Commander Ethernet 39
FocusLynx Commander Wi-Fi 45
Webpage Ethernet 52
Webpage Wi-Fi 54
Direct Serial Connection 60
Uninstalling Software 62
Operation 65
FocusLynx Commander 66
Focus Presets And Offsets 73
Webpage Control 77
Direct Serial Control 80
Accessories 81
FocusLynx Hand Control 82
Remote IN/OUT Keypad 83
FAQ & Troubleshooting 85
Hub Connection Issues 86
Configuring USB Converters 88
HTML Help Viewer Display Issues 91
Updating Firmware 92
Updating FocusLynx Commander 94
Contacting Optec Technical Support 96
Accessing The Event Logger 97
Reference 103
System Requirements 104
Hardware 106
Supported Devices 107
Command List 108
Error List 111
Additional Resources 114
Optec Website 115
Optec User Group 115
Optec Software Downloads 115
Optec Support 115
ASCOM Website 115

Welcome to the Optec FocusLynx Focuser Hub Help

This help document is organized into the following chapters:

- Setup
  - About
  - License
  - Quick Start
    - Software Installation
    - Connecting To Your FocusLynx
    - Configuring Focuser Type
    - Temperature Coefficients
    - Completing The Configuration
  - Configuring Software
    - FocusLynx Commander Serial Connection
    - FocusLynx Commander Ethernet Connection
    - FocusLynx Commander Wi-Fi Connection
    - Webpage Ethernet Connection
    - Webpage Wi-Fi Connection
    - Direct Serial Connection
  - Uninstalling Software
- Operation
  - FocusLynx Commander

- Focus Presets And Offsets
- Webpage Control
- Direct Serial Control
- Accessories
  - FocusLynx Hand Control
  - TCF-S In/Out Remote

FAQ & Troubleshooting
- Hub Connection Issues
  - Configuring USB Converters
- HTML Help Viewer Display Issues
- Updating Firmware
- Updating FocusLynx Commander
- Contacting Optec Technical Support
  - Accessing The Event Logger

Reference
- System Requirements
- Hardware
- Supported Devices
- Command List
- Error List

Additional Resources

Revisions to this Help document

Rev 1.00 - 2011/09/27 initial release.

Rev 1.01 - 2011/11/07
added information regarding FocusLynx Hand Control,
minor updates to Technical Support section.

Rev. 1.02 - 2012/01/11 minor updates and corrections.

Rev. 1.03 - 2012/04/09 layout updates for .chm and .pdf formats.

Rev. 1.04 - 2012/10/07 updates for FocusLynx FT options.

- Rev. 1.05 - 2013/03/14 updates for Focuser Device Types.
- Rev. 1.06 - 2014/07/01 updates for Focuser Device Types.

Chapter 1: FocusLynx Focuser Hub Setup

- About- Capabilities of the FocusLynx focuser hub
- License - The End-User License Agreement for the FocusLynx Commander software and FocusLynx control website
- Quick Start - A digital copy of the paper Quick-Start Guide that is included with the purchase of every FocusLynx focuser hub
    - Software Installation - How to install FocusLynx Commander on your system
    - Connecting To Your FocusLynx - How to connect your focuser hub to your computer using FocusLynx Commander
    - Configuring Focuser Type - How to configure your focuser hub to work with the type of focuser you are using.
    - Temperature Coefficients - How to use FocusLynx Commander to automatically calculate and store temperature compensation coefficients.
    - Completing The Configuration - How to complete the FocusLynx Commander configuration process for your focuser hub
- Configuring Software - How to configure software on your computer to control the FocusLynx
    - FocusLynx Commander Serial Connection - Configuring your focuser hub software with a serial connection
    - FocusLynx Commander Ethernet Connection - Configuring your focuser hub software with an ethernet connection
    - FocusLynx Commander Wi-Fi Connection - Configuring your focuser hub software with a Wi-Fi connection
    - Webpage Ethernet Connection - Configuring browser-based control with an ethernet connection
    - Webpage Wi-Fi Connection - Configuring browser-based control with a Wi-Fi connection
    - Direct Serial Connection - Configuring direct serial control with a serial terminal application
- Uninstalling Software - How to remove FocusLynx Commander from your system

Section 1.1 - About The FocusLynx

What Is The FocusLynx?

The FocusLynx focuser hub is a truly universal telescope focuser controller. Designed with the user in mind, the FocusLynx incorporates many new features which make the often difficult task of setting up an observatory and operating an optical system much more fluid and much less frustrating.

Dual Focuser Control

Note: The FocusLynx package comes standard with a single focuser control board. However, the system is capable of controlling two focusers with the optional secondary stepper board. Contact Optec or your dealer for pricing information.

As many astrophotographers strive to achieve more vivid images they find it necessary to increase the exposure time of their images to allow greater amounts of light onto the imaging sensor. Of course, the more you extend the exposure time the more necessary it becomes to perform guided tracking in order to maintain a crisp star field. Consequently, many of our users have begun adding a secondary guide-telescope (which also requires a focuser) to their instrument package. Until now, installing a second focuser meant purchasing an additional focuser controller, managing twice as many cables, and dealing with twice as many software controller headaches. With the FocusLynx focuser hub, adding a second focuser to your optical system is as simple as plugging it into the second focuser port. The hardware and software are specifically designed to allow you to instantly begin controlling both focusers seamlessly and without fuss!

The Ever-Reliable Serial Port

Everyone knows that the serial port is almost extinct, right? In truth, the serial port is still the most reliable standard communications protocol available and is used in several industries and applications, including observatory control. The RS-232 serial protocol is simple to implement, capable of communication over great distances and very reliable when used properly. To allow the hobbiest to easily write software for control of the focuser and for firmware upgrades, the FocusLynx system includes an RS-232 interface as standard.

Using Optec's Serial-USB communications cable, users can easily connect the FocusLynx controller to any modern PC even when no DB-9 serial port is available. The Serial-USB cable includes an RJ-12 plug on the controller end and terminates in a USB converter on the PC end. The original TCF-S focuser has enjoyed overwhelming success with these new communications cables. Additionally, with the Serial-USB cable the 5 meter distance limitation of USB 2.0 is negated. The FocusLynx controller includes a single 6-ft.long Serial-USB cable, but much longer cables, up to 50 meters in length, are available from Optec.

Wired Ethernet Connectivity

When designing the FocusLynx system, Optec engineers looked beyond USB for the future of device communications. We quickly realized that packet-based communications using the Ethernet framework are the future. Just as factory floors are bypassing USB and converting to Ethernet, so too will all observatory installations. Ethernet and packet-based communications allow far more flexibility and productivity than is possible with USB.

In the near future, we believe all device communications will be through an Ethernet framework allowing remote device control from anywhere in the world. Optec engineers are leading the way to this future with the introduction of FocusLynx. We have designed the FocusLynx to accommodate remote observers by allowing software connectivity via wired ethernet and the optional Wi-Fi connectivity.

Optional Wi-Fi Connectivity

With the explosion of mobile devices capable of direct network communications, the FocusLynx system includes easy mobile access through iPhones, Droid OS devices, and any other device with an internet browser. With the purchase of the optional Wi-Fi control board, connectivity to a FocusLynx hub and both focusers is a snap. Now observers, astrophotographers, and astronomy enthusiasts can completely eliminate the hassle of computer control cables by connecting to the FocusLynx over a wireless network and with any mobile device! Focusing can be accomplished without ever touching your telescope eliminating vibrations and thermal effects.

ASCOM Compatibility

The FocusLynx software package includes an ASCOM-compatible driver. Therefore, the FocusLynx focuser hub is usable with any ASCOM-compliant software. Acting as an ASCOM Local Server, the FocusLynx requires ASCOM Platform 6.0 or higher for use.

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

Section 1.2 - FocusLynx Software Warranty

By installing and/or using **FocusLynx Control** software, you agree to Optec's license and warranty terms below.

FOCUSLYNX COMMANDER, FOCUSLYNX CONTROL WEBSITE, 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 FOCUSLYNX COMMANDER/CONTROL WEBSITE PRODUCTS, 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 THESE PRODUCTS, 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.

Section 1.3 - FocusLynx Focuser Hub Quick-Start Guide

If you are now the proud owner of a new FocusLynx focuser hub, congratulations! You are on the cutting edge of focuser control technology!

We invite you to use this quick-start guide to get a fast introduction to the installation, connection, and configuration process that you will need to go through to get your FocusLynx up and running. However, we also suggest that you read the full FocusLynx Technical Manual in order to gain a more complete understanding of the advanced features and multiple connection methods that will help you to get the most out of your focuser hub.

- Software Installation - How to install FocusLynx Commander on your system
- Connecting To Your FocusLynx - How to connect your focuser hub to your computer using FocusLynx Commander
- Configuring Focuser Type - How to configure your focuser hub to work with the type of focuser you are using
- Temperature Coefficients - How to use FocusLynx Commander to automatically calculate and store temperature compensation coefficients
- Completing The Configuration - How to complete the FocusLynx Commander configuration process for your focuser hub

Section 1.3.1 - FocusLynx Commander Installation Instructions

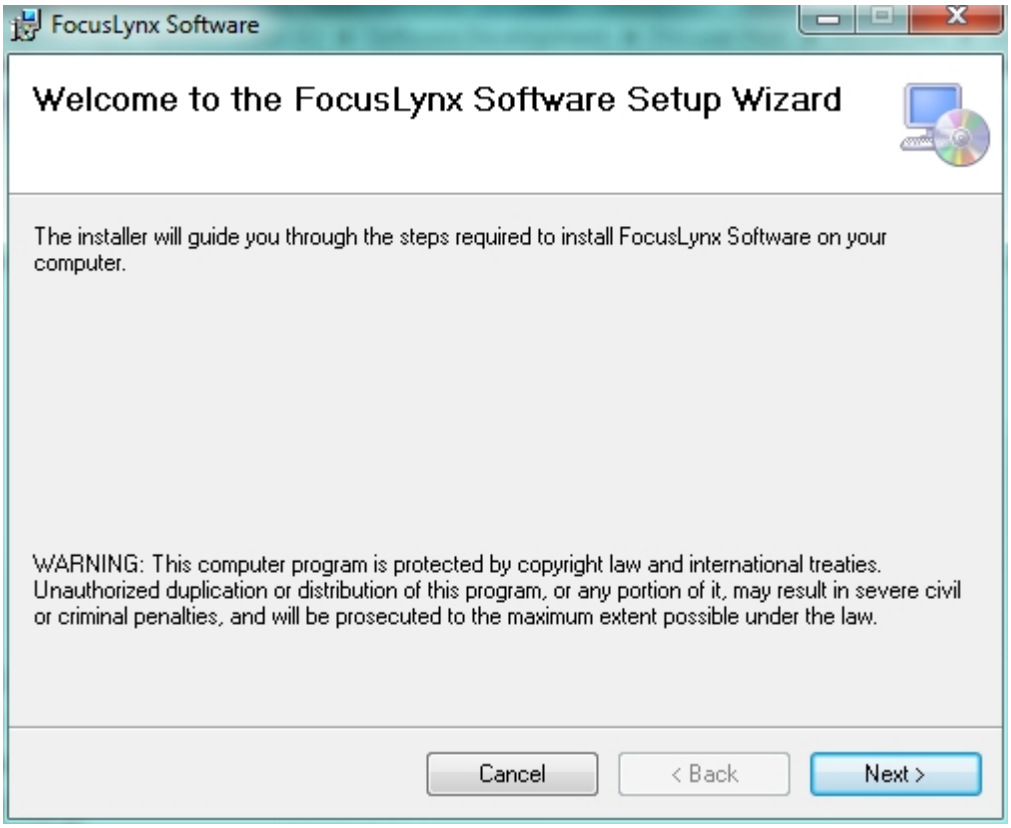
WARNING: Do not plug any focuser into your focuser hub until you have completed the **Set Focuser Type** step described later in this guide. If you do not wait, you may cause **damage** to your focuser motor drive assembly.

Installing FocusLynx Commander

To install the FocusLynx Commander control software and ASCOM FocusLynx drivers, please follow these steps:

- Review the System Requirements to verify that your system is capable of running FocusLynx Commander.
- Obtain the latest version of FocusLynx Commander installer from the Downloads page on the Optec website. If you do not have an internet connection, the release version of FocusLynx Commander is available on the CD included with the hub.

- Double-click the installer file to run it.



- Follow the instructions in the installer to complete the installation.

Congratulations! Your FocusLynx Commander software is installed and ready for configuring with your focuser system.

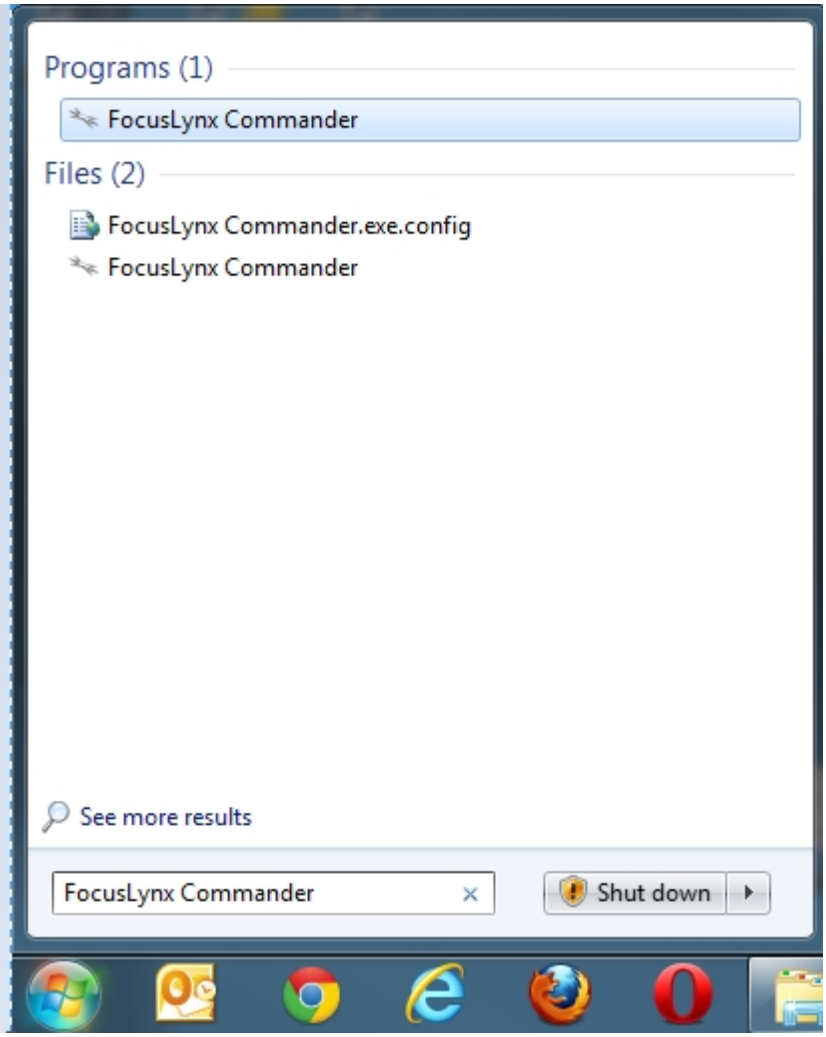
Opening FocusLynx Commander

For first-time use, FocusLynx Commander will open when the installation is finished unless you specified otherwise.

For later use, you can open FocusLynx Commander by picking one of the following options:

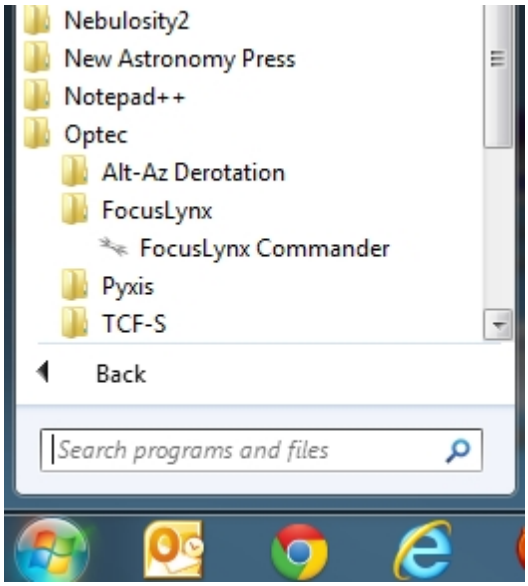
- Double-click the shortcut for ***FocusLynx Commander*** that the installer creates on your ***Desktop***.

-OR-



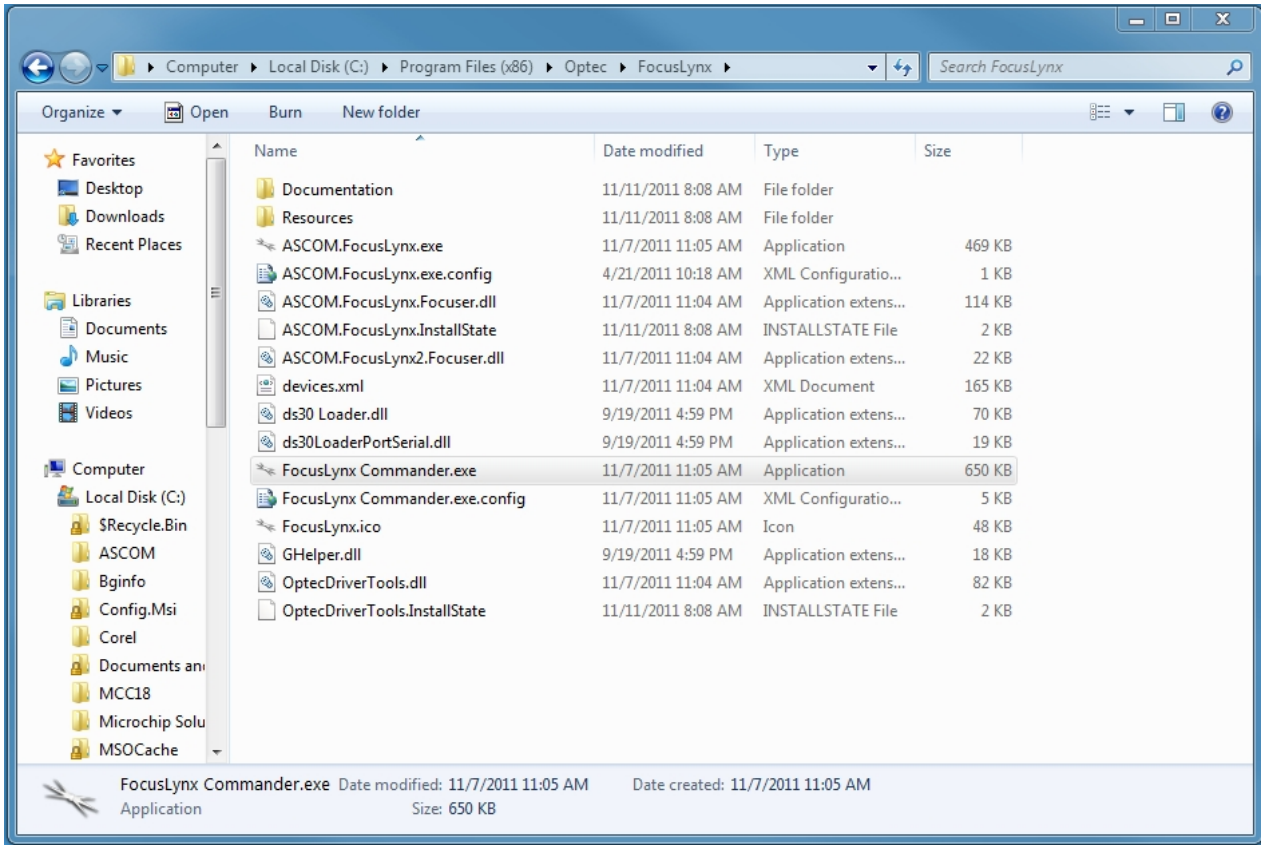
- If you are using Windows Vista or Windows 7, go to the ***Start*** menu, then search for ***FocusLynx Commander*** in the search bar.

-OR-



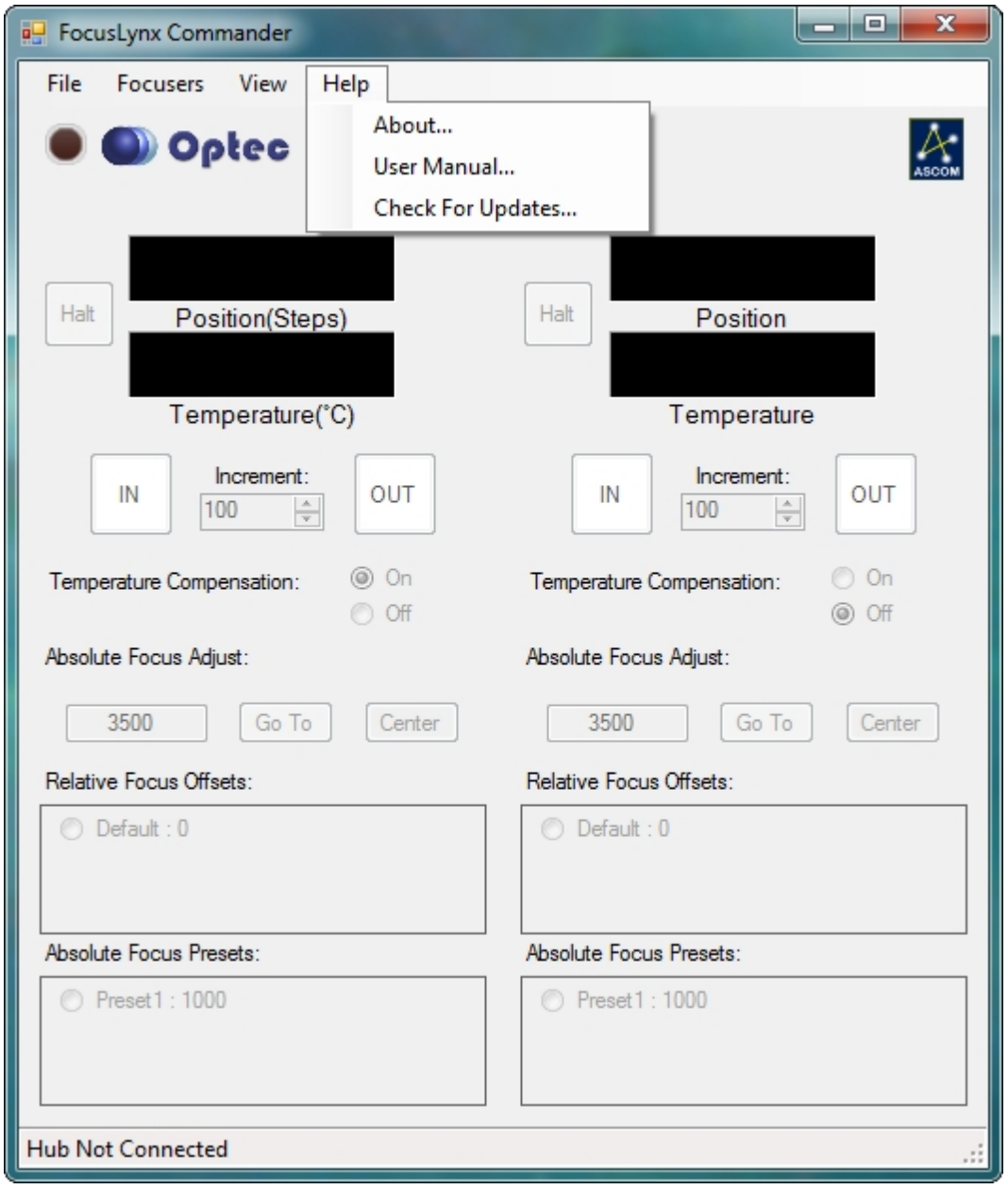
- Go to the ***Start*** menu, and choose All programs. Click the ***Optec*** folder (or ***Starlight*** folder if you purchased your FocusLynx from StarLight instruments), click the ***FocusLynx*** folder, and click the ***FocusLynx Commander*** shortcut that appears.

-OR-



- Go to ***My Computer***, then follow the file path you specified during installation to find the ***FocusLynx Commander.exe*** file, which will open the program. The default installation path for Windows XP and 32-bit versions of Windows Vista and Windows 7 is ***C:\Program Files \FocusLynx Commander***. The default installation path for 64-bit versions of Windows Vista and Windows 7 is ***C:\Program Files (x86)\FocusLynx Commander***.

Getting Help



If you encounter any problems during connection, configuration, or operation, please contact Optec Technical Support by telephone or email.

Section 1.3.2 - Connecting To Your FocusLynx

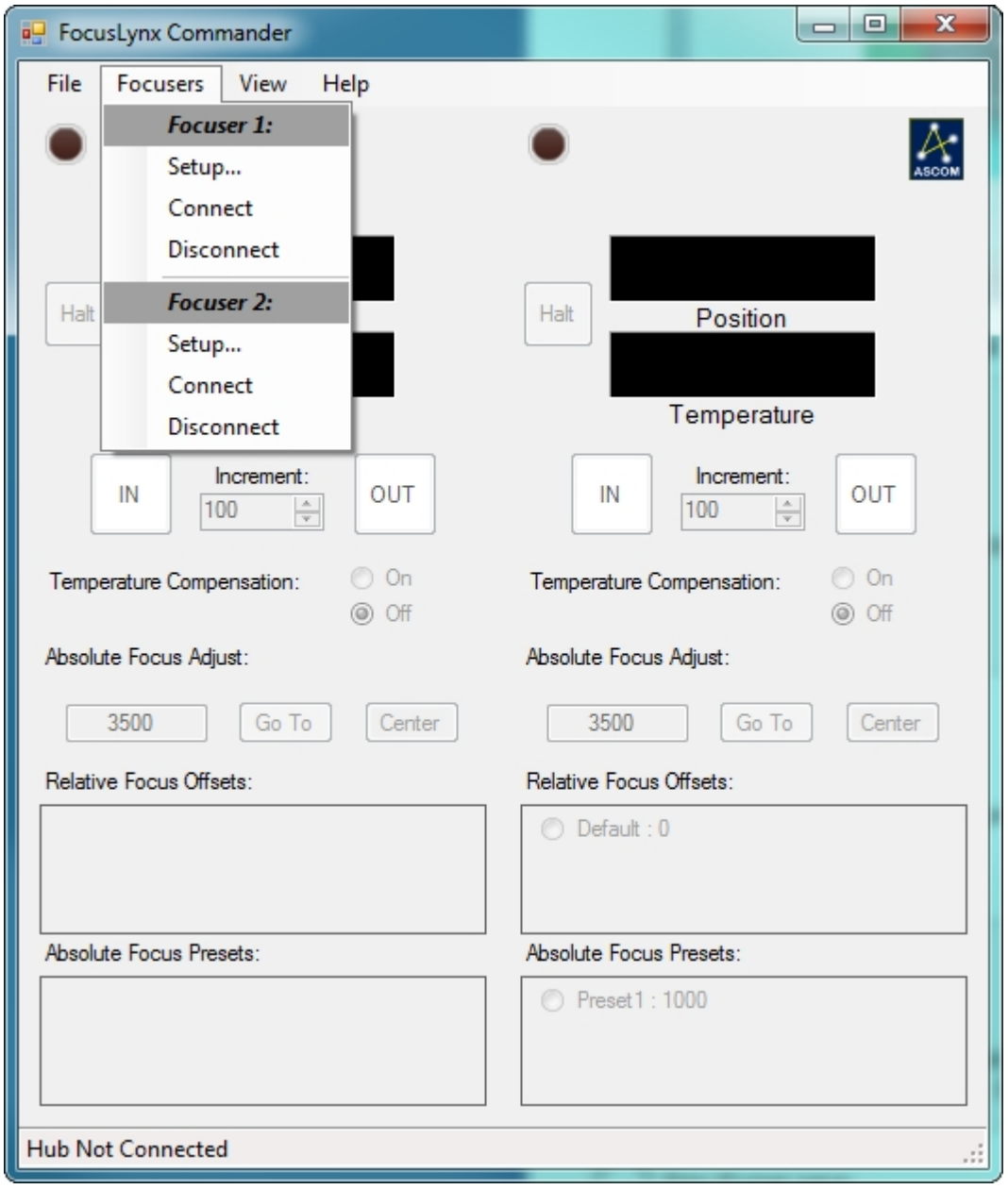
WARNING: Do not plug any focuser into your focuser hub until you have completed the **Set Focuser Type** step described later in this guide.

Once you have installed your FocusLynx Commander software, the next step is to connect your hub to your computer. These instructions will help you connect over an ***RS-232 Serial*** connection using the Serial-USB cable included with the FocusLynx controller hub. For instructions on connecting and configuring over other types of connections, please consult the Configuring Software section of the FocusLynx manual.

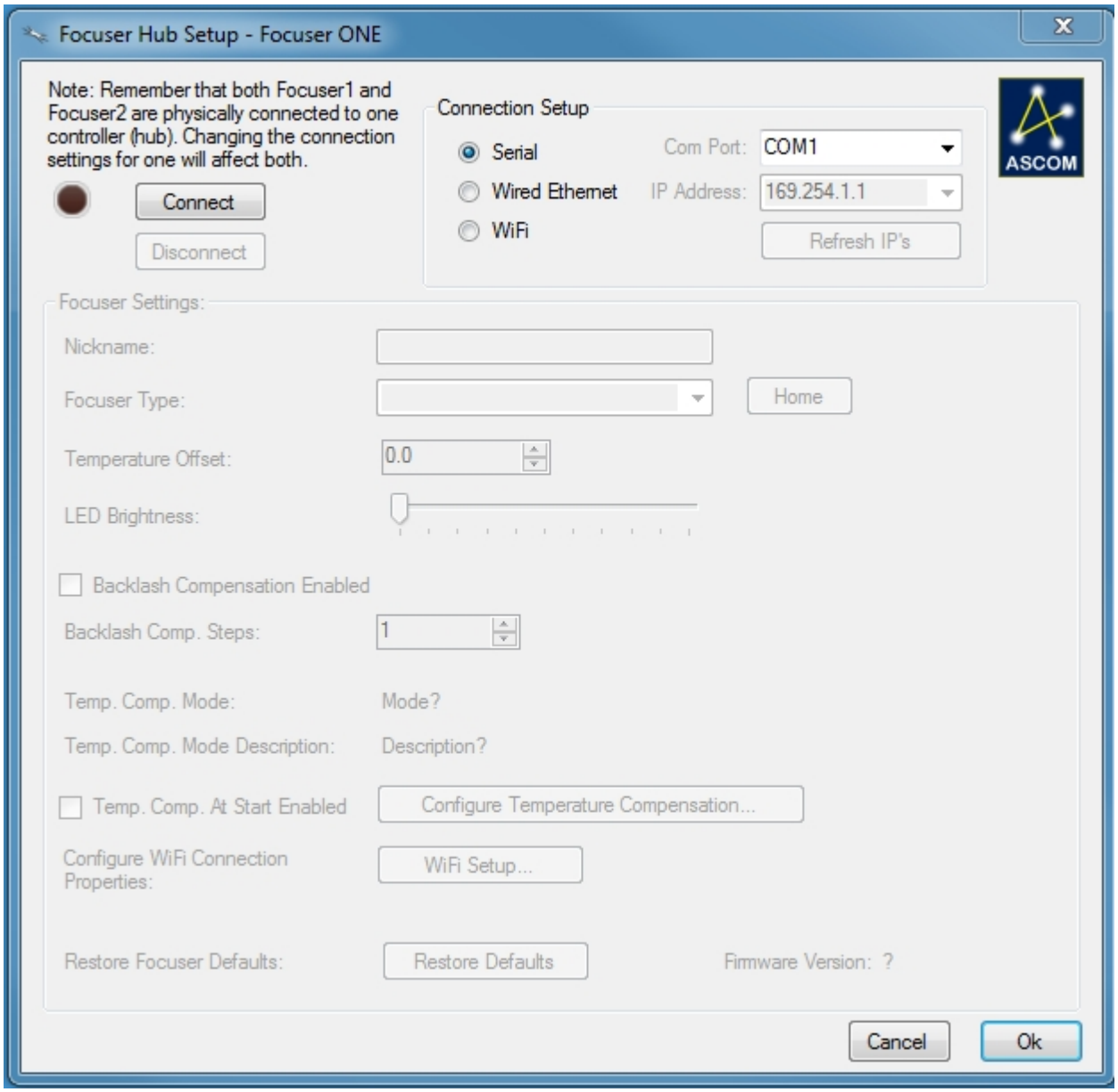
To establish a serial connection using FocusLynx Commander:

- **Plug In Your FocusLynx Hub** - Plug the universal 12VDC power supply into a wall outlet using a locally compatible power cord. Insert the 2.5mm x 5.5mm plug into the 12VDC power port on the FocusLynx control hub and move the slide switch up to turn on the FocusLynx hub. The LED power indicator will light after a few seconds to indicate the boot sequence was successful.

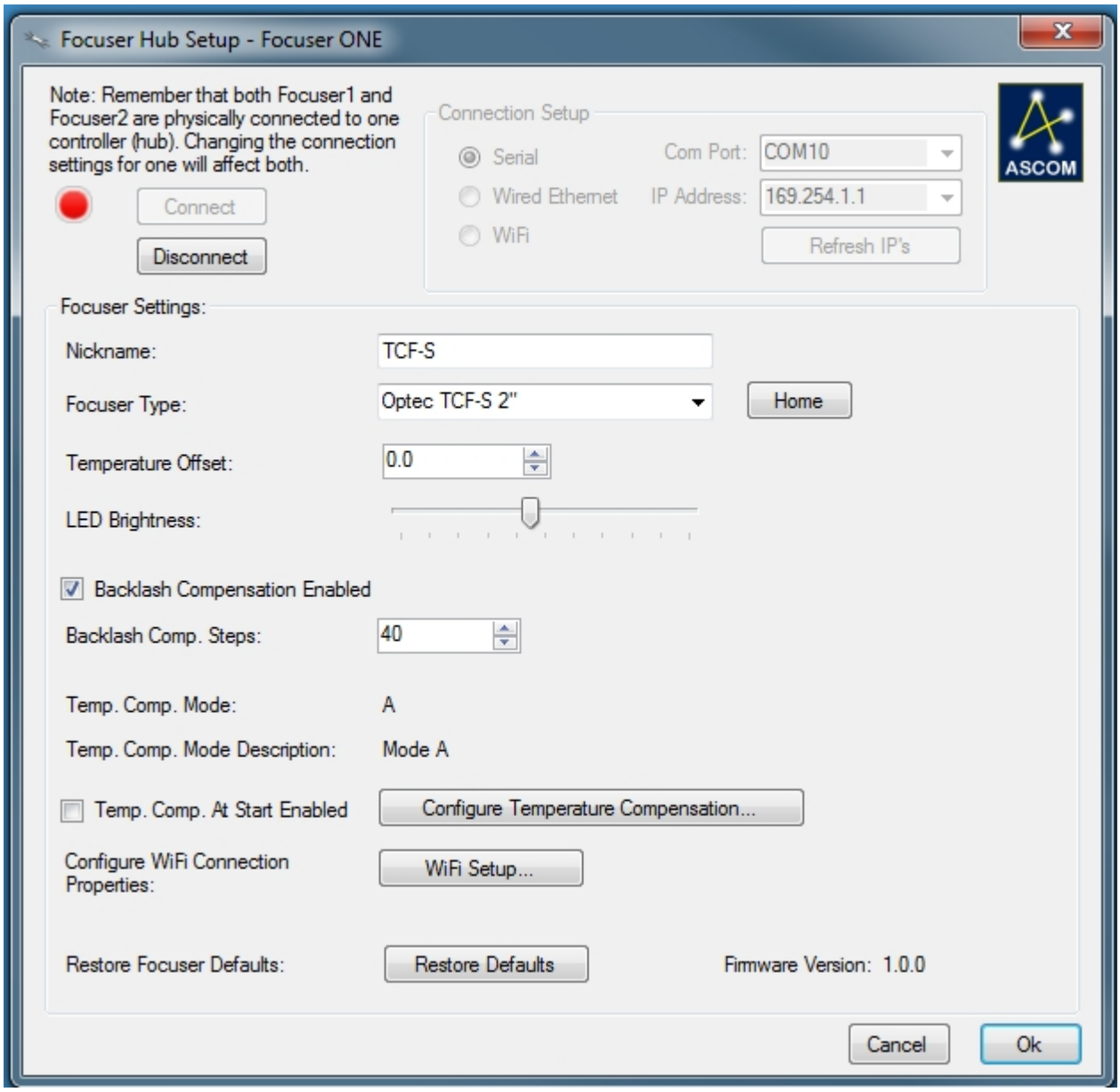
- **Connect the Serial-USB Cable** - For serial communication, connect the RJ12 plug into the FocusLynx socket labled "Serial" and connect the USB-A plug into an open USB port on the PC computer.



- **Go To The Setup Screen** - Open FocusLynx Commander and go to the ***Focusers*** menu. Choose the ***Setup*** option under either *Focuser 1* or *Focuser 2.* The setup screen will open. The Setup Screen will appear in the upper left screen - If not initially visible, check the taskbar for the second FocusLynx instance. If you wish to leave the setup screen at any time without changing any settings, click the ***Cancel*** button at the bottom of the window. If you wish to reset this focuser's configuration to factory defaults, click the ***Restore Defaults*** button.



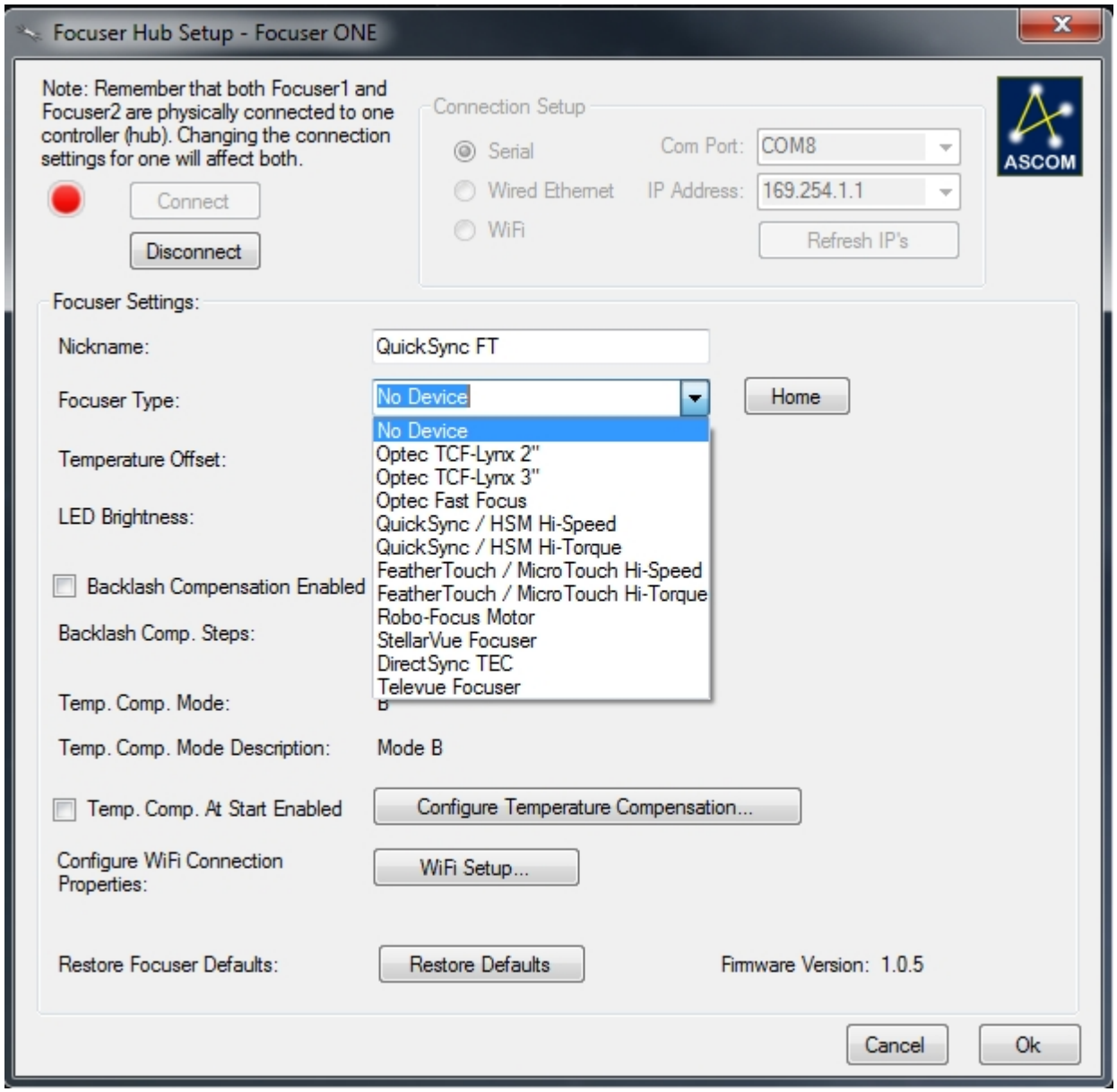
- **Connect To The Focuser Hub** - For serial communication, select the ***Serial*** option in the ***Connection Setup*** section and use the ***Com Port*** drop-down to select the appropriate communications port. This drop-down list will display only active serial ports so the virtual com port (VCP) assigned to the Serial-USB cable should be easy to identify. Next click the ***Connect*** button. If the LED indicator next to the ***Connect*** button does not light or if you receive an error, try selecting a different serial port in the ***Com Port*** drop-down list. If you encounter persistent problems determining which COM port to use, contact Optec Technical Support for assistance.


Focuser Hub Setup - Focuser ONE
Note: Remember that both Focuser1 and Focuser2 are physically connected to one controller (hub). Changing the connection settings for one will affect both.
Connect
Disconnect
Connection Setup
Serial
Wired Ethernet
WiFi
Com Port:
COM10
IP Address:
169.254.1.1
Refresh IP's
ASCOM
Focuser Settings:
Nickname:
TCF-S
Focuser Type:
Optec TCF-S 2"
Home
Temperature Offset:
0.0
LED Brightness:
Backlash Compensation Enabled
Backlash Comp. Steps:
40
Temp. Comp. Mode:
A
Temp. Comp. Mode Description:
Mode A
Temp. Comp. At Start Enabled
Configure Temperature Compensation...
Configure WiFi Connection Properties:
WiFi Setup...
Restore Focuser Defaults:
Restore Defaults
Firmware Version: 1.0.0
Cancel
Ok

Section 1.3.3 - Configuring Focuser Type

Once you have installed FocusLynx Commander software and your hub is connected, the first thing you must do is configure the focuser hub for the focuser and motor type you will be using.

IMPORTANT NOTE: The Focuser Type options have been simplified to make configuration easier. The screenshot below is visible in the Focus Hub Setup dialog box for FocusLynx Commander v1.2.7. Occasionally, additional Focuser Types may be added as new focusers are supported. Contact Optec Technical Support (support@optecinc.com) if you have any question regarding your particular setup.



- When selecting the correct focuser type, keep these guidelines in mind:
  - **Optec TCF-Lynx** focusers are Absolute focusers that will automatically home upon power-up. The **TCF-Lynx** focusers have a large, bi-polar, low impedance motors that will be driven at maximum speed with fixed travel and known step resolutions.
  - **Optec Fast Focus** focusers are Absolute focuses that will home automatically with a limit switch setting the full IN or 00000 position. The **Fast Focus** includes a low impedance bi-polar motor that will be driven by the **FocusLynx** controller at the maximum speed with fixed travel and known step resolutions.
  - **Optec TCF-S Classic Converted** focusers are Absolute focusers that will automatically home. The **TCF-S Classic** focusers use the original high-impedance unipolar motor supplied with the **TCF-S** focuser. The **TCF-S Classic Converted** focuser will be driven at the maximum speed with fixed travel and known step resolutions. This focuser option has been removed with FocusLynx Commander v1.2.7.

Optec QuickSync FT / Starlight HSM Handy Stepper Motor

- **QuickSync / HSM Hi-Speed** focusers include the Optec QuickSync FT series and Starlight Instruments HSM Handy Motor add-ons for FeatherTouch focusers. The FeatherTouch focusers are non-homing Absolute focusers with varying step resolutions and no fixed travel limits. The **QuickSync / HSM Hi-Speed** option will drive the QuickSync motor at the maximum safe speed.

  NOTE: Select the **QuickSync / HSM Hi-Torque** if you experience any slipping or motor stall with the FeatherTouch focuser with this option selected.

- **QuickSync / HSM Hi-Torque** focusers include the Optec QuickSync add-on motor and the Starlight Instruments HSM Handy Stepper Motor add-on for FeatherTouch focusers. QuickSync and HSM Handy Stepper Motors include low-impedance bi-polar motors. The FeatherTouch focusers are non-homing Absolute focusers with varying step resolutions and no fixed travel limits. The **QuickSync / HSM Hi-Torque** option will drive the bi-polar motor at a slower speed to avoid stepper motor stalling. Contact Optec Technical Support (support@optecinc.com) if you experience slipping with this configuration.

- **FeatherTouch / MicroTouch Hi-Speed** focusers include the original Micro-Touch motor and the current Starlight Instruments MSM series uni-polar motors for Feather Touch. The FeatherTouch focusers are non-homing Absolute focusers with varying step resolutions and no fixed travel limits. The **FeatherTouch Motor Hi-Speed** option will drive the unipolar motor at the maximum safe speed.

  NOTE: Select the **FeatherTouch / MicroTouch Hi-Torque** if you experience any slipping or motor stall with the FeatherTouch focuser with this option selected.

- **FeatherTouch / MicroTouch Hi-Torque** focusers include the original Micro-Touch

motor and the current Starlight Instruments MSM series uni-polar motors for Feather Touch. The FeatherTouch focusers are Relative focusers with varying step resolutions and no fixed travel limits. The **FeatherTouch /MicroTouch Hi-Torque** option will drive the unipolar motor at the slower speed to avoid slippage or motor stalling.

- **DirectSync TEC** focusers include the DirectSync TEC direct-drive motor for the TEC Large Focusers. This DirectSync TEC focuser is a non-homing Absolute focuser with fixed step resolution of 1.25 micron and no fixed travel limits. The focuser can be synchronized anywhere within the range of travel to any step position between 00000 and 65,535. See

- **Stellarvue Focuser** option should be selected when using the Optec QuickSync SV motor option with a Stellarvue focuser. The **Stellarvue Focusers** are Relative focusers with varying step resolutions and no fixed travel limits.

- **TeleVue Focuser** option should be selected when using the Optec QuickSync TV motor option with a TeleVue focuser. The **TeleVue Focusers** are Relative focusers with varying step resolutions and no fixed travel limits.

- To set the focuser type, first follow the steps in the previous sections of this guide. Then, in the ***Focuser Hub Setup*** dialog, examine the ***Focuser Type*** drop-down list. Select your focuser model from the ***Focuser Type*** drop-down list. Be aware that true ABSOLUTE focusers (all Optec focuser types) will home automatically when the focuser type is selected, so you will lose your current focus position.

- **You May Now Connect A Focuser To Your FocusLynx.**
  Your focuser type is now set. As long as you make sure to keep this focuser plugged into the same port on your hub, you will not need to change this setting again. If you change the focuser attached to this port on your hub, or reset this focuser port to its default settings, you **must** repeat this procedure in order to ensure the safe operation of your focuser.

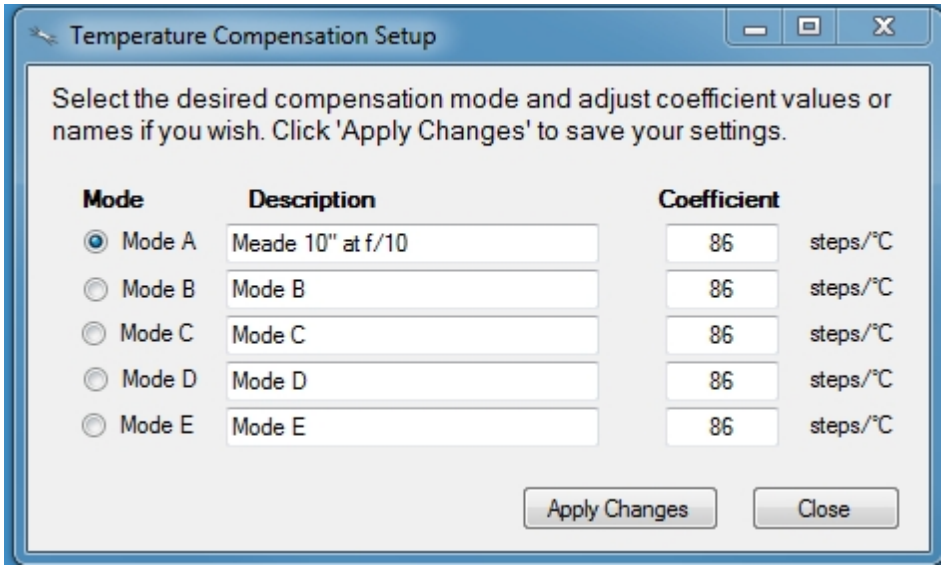
Section 1.3.4 - Configuring Temperature Coefficients

Note: If the focuser you are currently configuring does not have temperature compensating capabilities, you may skip this portion of the quick start guide.

While it is possible to manually calculate and configure the temperature coefficients for your temperature compensating focuser, there is also a handy setup wizard available in the FocusLynx Commander control program that will assist you in setting up your temperature coefficients.

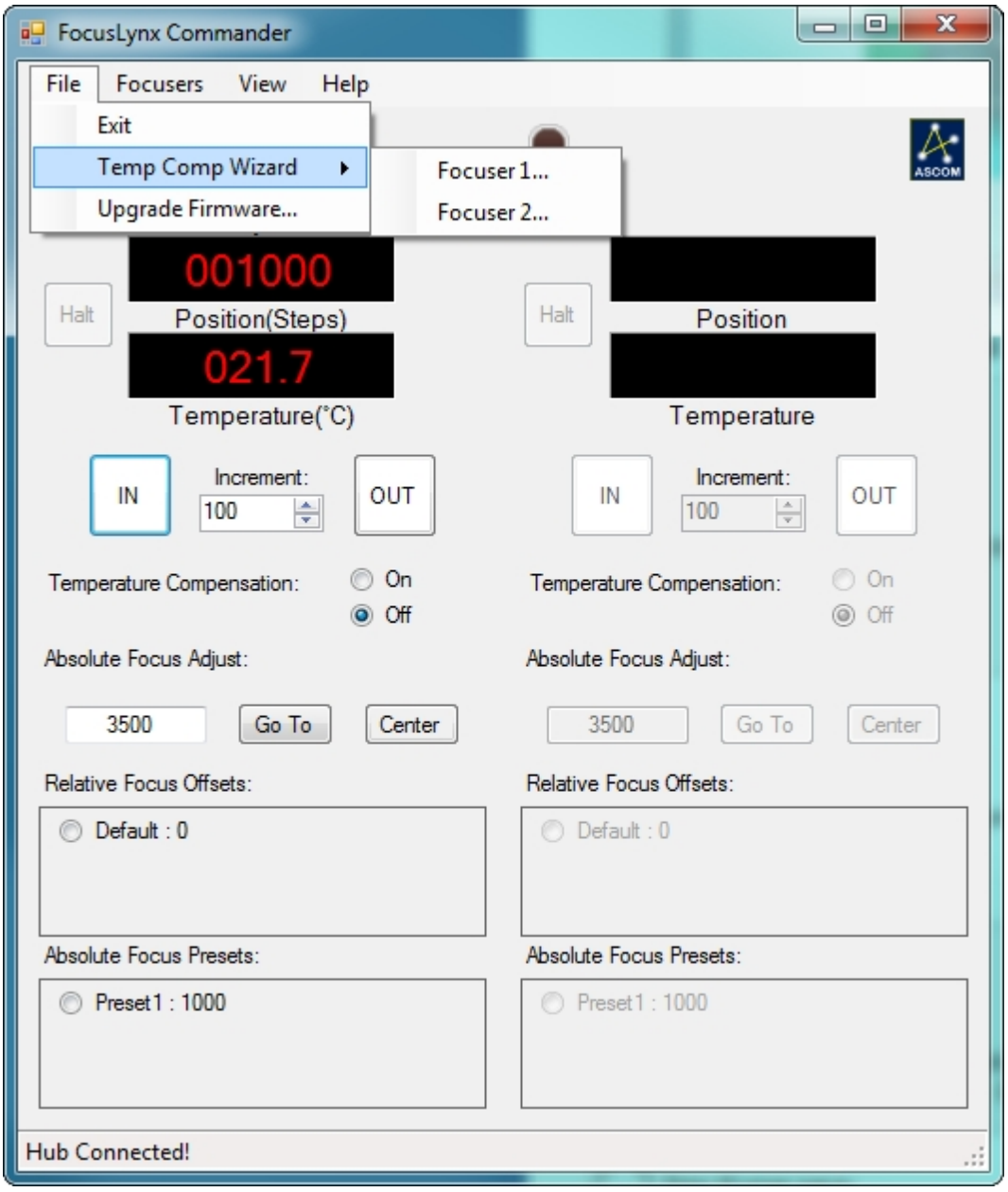
- **Connect To Your Hub** - Connect to the focuser hub in FocusLynx Commander via the method described in the Connecting To Your FocusLynx portion of this Quick-Start Guide.

- **Plug In Your Focuser And Temperature Probe** - Ensure that both the focuser and its temperature probe are properly connected. In the ***Focuser Hub Setup*** dialog box you may click the ***Configure Temperature Compensation*** button to make changes. Accept the default temperature coefficients or change the ***Description*** and ***Coefficient*** if you already know your system's unique temperature coefficient, then ***Apply Changes.***

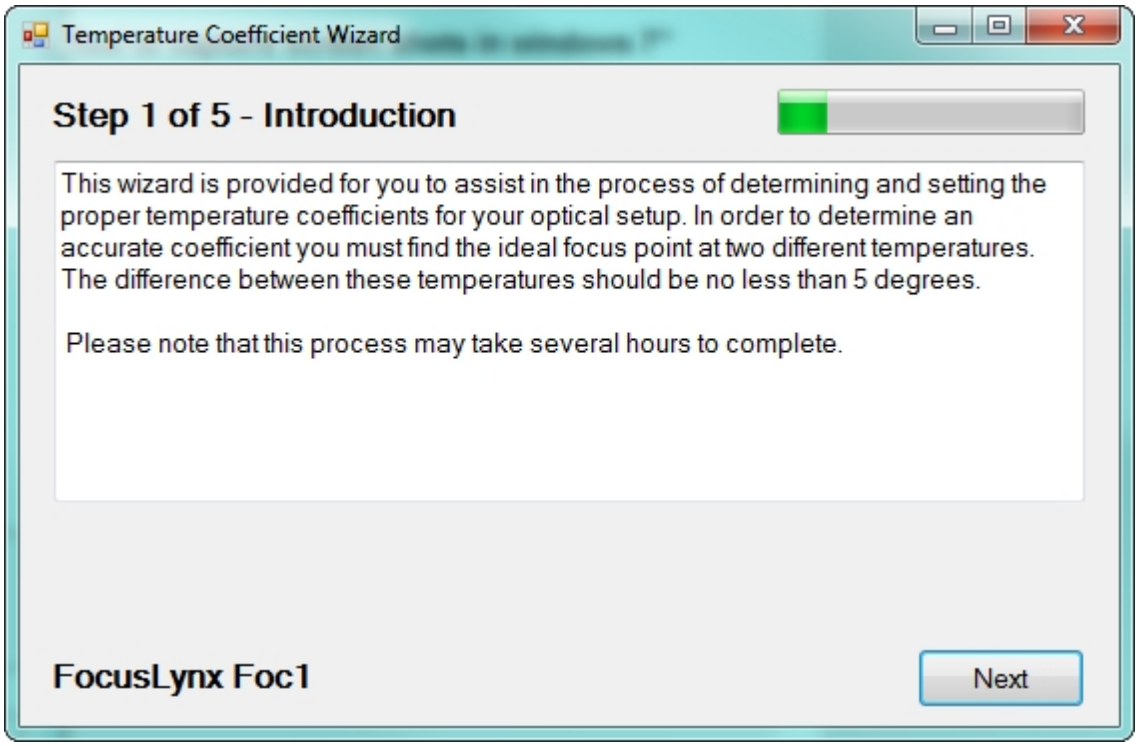


- Select the active ***Mode*** to be used when turning ON temperature compensation in the FocusLynx Commander main window or when using other ASCOM applications.

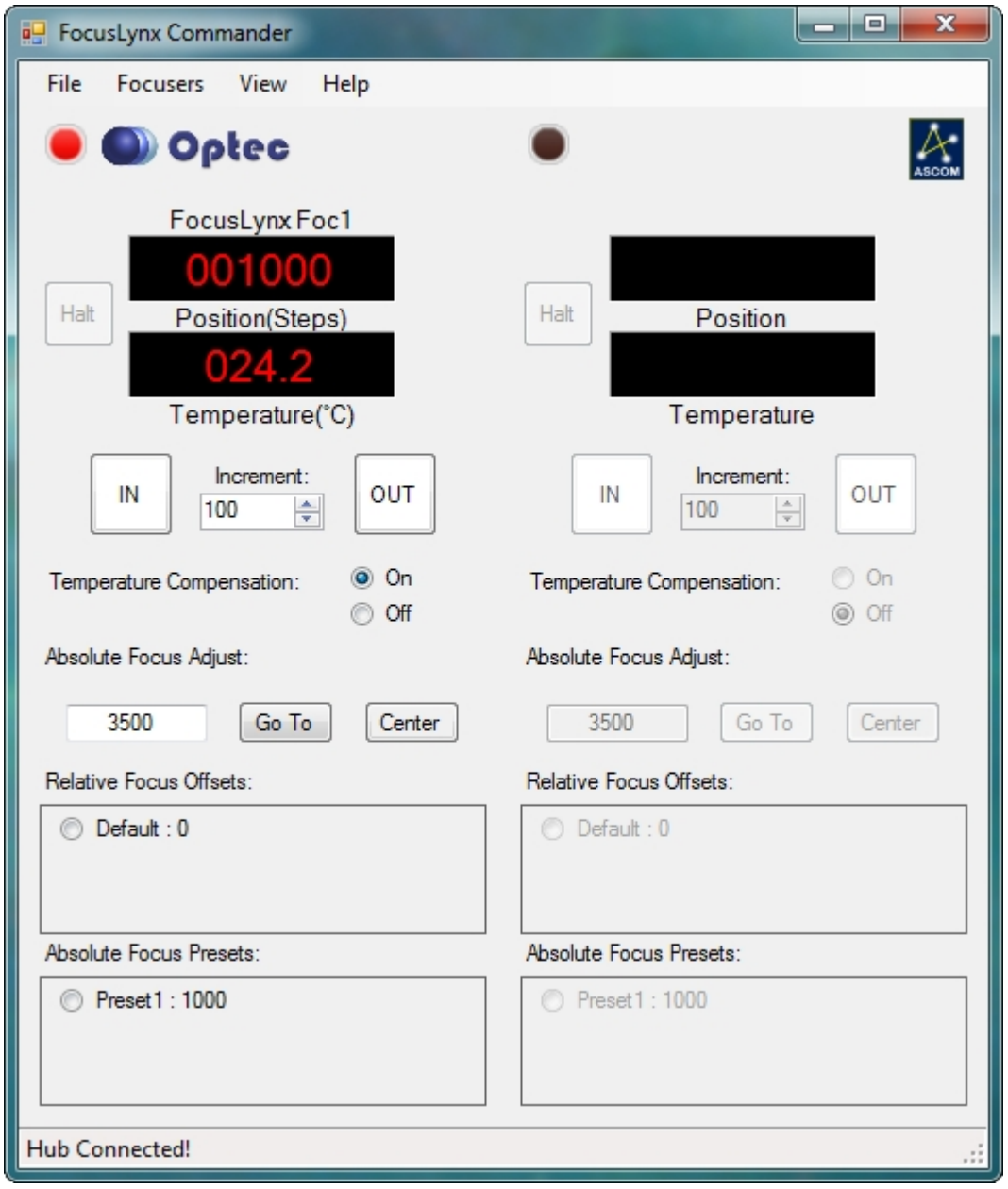
- Alternatively, you may choose to run the **Temperature Compensation Wizard** to determine your optical system's unique temperature coefficient.



- **Open The Temperature Compensation Wizard** - Open FocusLynx Commander and go to the ***File*** menu and select either *Focuser 1* or *Focuser 2* from the ***Temp. Comp. Wizard*** option, depending on which focuser you would like to set coefficients for.



- **Complete The Temperature Compensation Wizard** - Follow the directions provided by the wizard to calculate and save a temperature compensation coefficient as the compensation mode of your choice.

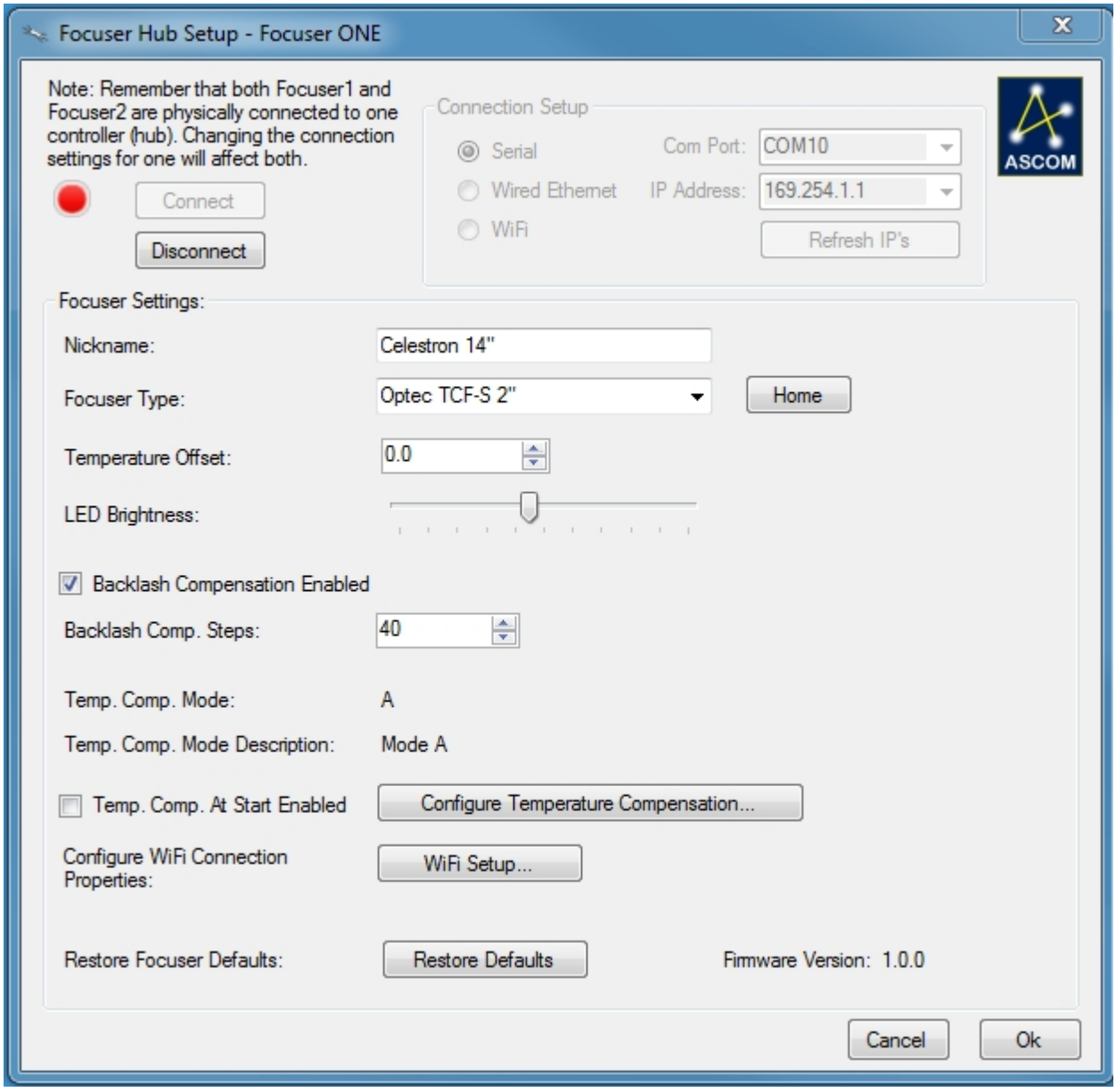


- **Enable Temperature Compensation** - When you return to the main Commander window, make sure to enable temperature compensation by selecting ***On*** in the ***Temperature Compensation*** section of the main window.

Section 1.3.5 - Completing A Serial Configuration

Having successfully installed the FocusLynx software, connected to your focuser hub, and configured your focuser type, you can now use the following instructions to complete a focuser serial configuration. Alternatively, you may use any of the other connectivity options detailed in the Configuring Software section of the FocusLynx manual.

To complete a **serial configuration**:



- **Set Nickname** - It might be a good idea to identify which focuser or telescope is associated with Focuser 1 and Focuser 2. You may set the focuser nickname by entering any description into the ***Nickname*** text box.

- **Immediate Temperature Compensation** - If you want to begin temperature compensation immediately upon opening FocusLynx Commander, check the ***Temp. Comp. At Start Enabled*** checkbox.

- **Set Temperature Compensation Offset** - The digital temperature sensors used in the temperature probe are very precise but not necessarily very accurate. If the reported temperature varies a few degrees from the actual ambient temperature, you may use the ***Temperature Offset*** text box to apply a positive or negative adjustment within a range of plus or minus 10 degrees Celsius. Contact Optec if your temperature probe varies more than a few degrees from the actual ambient temperature.
  NOTE: Remember that temperature compensation relies upon temperature differentials only and not absolute temperatures. Be sure to affix the temperature probe to the telescope tube as it is only the actual telescope temperature variation that will affect focus.

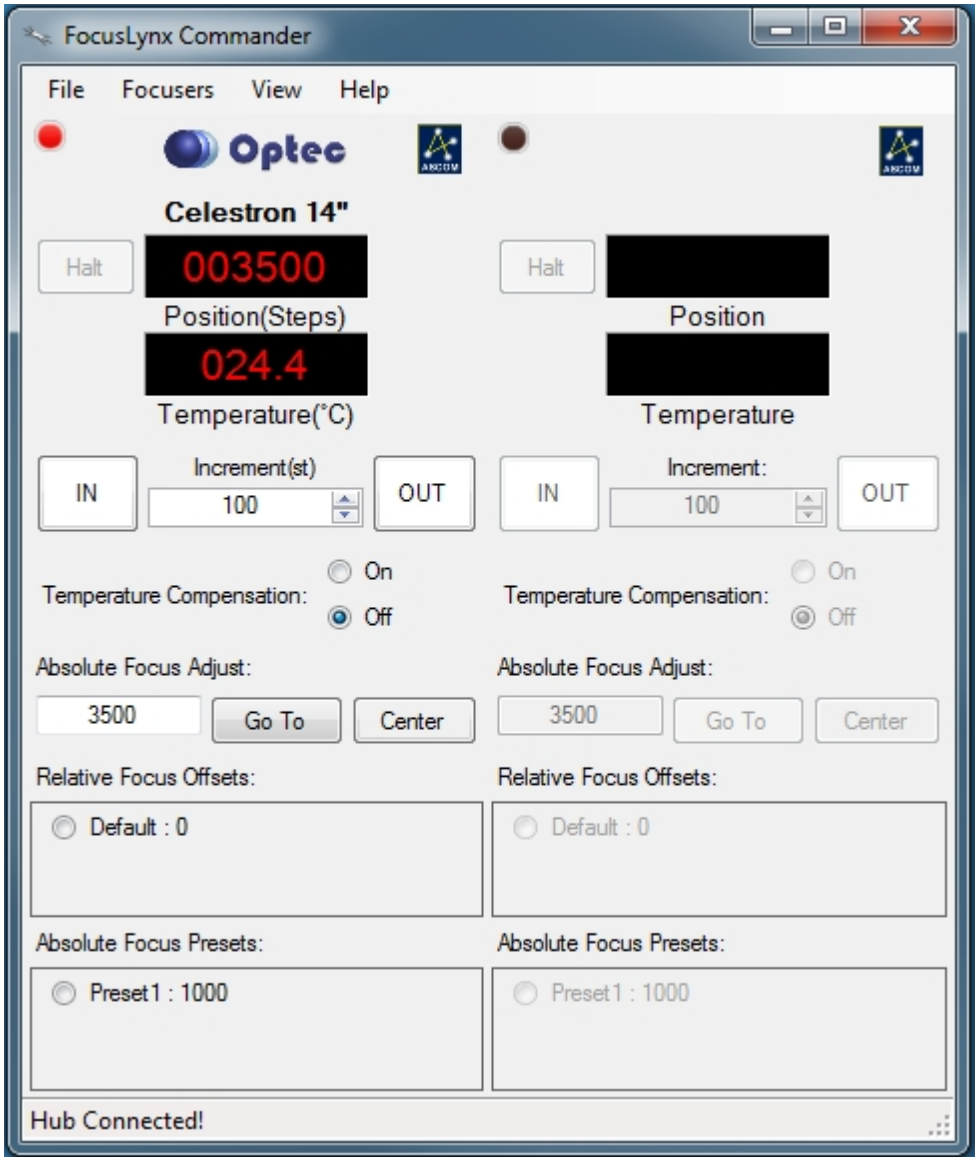
- **Enable Backlash Compensation** - If your focuser has a noticeable amount of backlash, check the ***Backlash Compensation Enabled*** checkbox to enable compensation.

- **Set Backlash Steps** - Enter a number of steps into the ***Backlash Comp. Steps*** text box to adjust to the level of backlash compensation you require. Make your number of steps negative for inward compensation and positive for outward compensation. You may set the number of steps to a maximum of 99 steps in either direction.

- **Adjust LED Brightness** - if you find the focuser hub's power indication LED adversely affects your night vision, you may adjust its brightness with the ***LED Brightness*** slider. The range of brightness varies from left to right, starting with no light at all and moving to full brightness.

- **Home The Focuser** - If you want to start the focuser at its factory-set "Home" position, click the ***Home Device*** button.

- **Confirm Your Configuration** - When you are finished, click the ***Ok*** button to save your changes and return to the main FocusLynx Commander window.



Congratulations! Your hub and focuser are now ready to use! You may use the current configuration to connect or disconnect from a focuser by clicking the ***Connect*** or ***Disconnect*** buttons in the *Setup Window*, the ***Connect*** or ***Disconnect*** buttons in the ***Focusers*** menu of the main window, or by clicking the LED above each focuser information display in the main window.

Section 1.4 - Configuration Of The FocusLynx Hub

The FocusLynx focuser hub accepts three different forms of computer communication protocols and connections: RS-232 for Serial-USB, Wired Cat5e Ethernet, and Wi-Fi wireless Ethernet (using the optional Wi-Fi Add-in Board). Consequently, there are a variety of ways to configure the FocusLynx Commander software for use with a computer. Each method works equally well for controlling focusers through the hub, so the best choice is very much dependent upon the user's preference and observatory local network configuration.

Configuring A Connection Using FocusLynx Commander

FocusLynx Commander is an easy-to-use, all-in-one program for controlling your focusers through the FocusLynx. It can handle connections of all three types. Instructions for connecting with each type of connection are given in detail below:

- FocusLynx Commander Serial Connection
- FocusLynx Commander Ethernet Connection
- FocusLynx Commander Wi-Fi Connection

Configuring A Connection Using The FocusLynx Control Website

Another option for controlling focusers through the FocusLynx is to use the webpage that is automatically generated by the FocusLynx onboard web server. This webpage is accessible whenever a FocusLynx hub is connected to a computer by Ethernet or Wi-Fi. As FocusLynx Commander is only compatible with Windows systems, using the webpage is a much better option for Mac and Linux users. Additionally, once the webpage is configured, owners of smartphones may access this webpage to, in essence, turn their phone into a hand controller! Instructions for connecting with either connection option are given in detail below:

- Webpage Ethernet Connection
- Webpage Wi-Fi Connection

Configuring A Direct Serial Connection Using A Serial Terminal Application

In addition to the options described above, commands may be sent to control focusers through the FocusLynx by using the **Optec Terminal Application** or another a serial terminal application to directly send commands to the focuser hub over a serial connection. Instructions for connecting to the focuser hub via a serial terminal application are given in detail here:

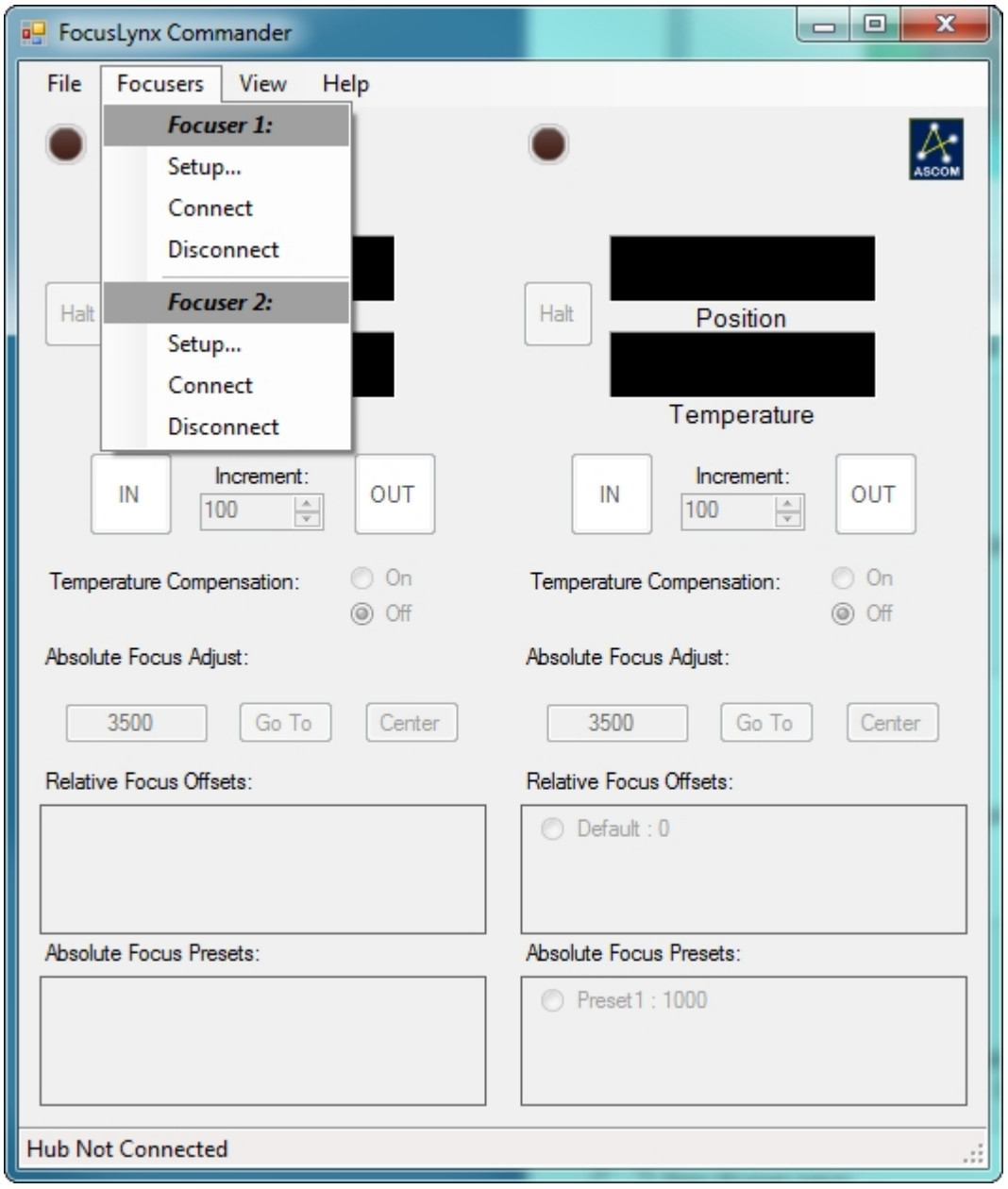
- Direct Serial Connection

Section 1.4.1 - How To Configure A FocusLynx Commander Serial Connection

WARNING: Do not plug any focuser into your focuser hub until you have completed the **Set Focuser Type** step described below. If you do not wait, you may cause **severe, permanent focuser damage**.

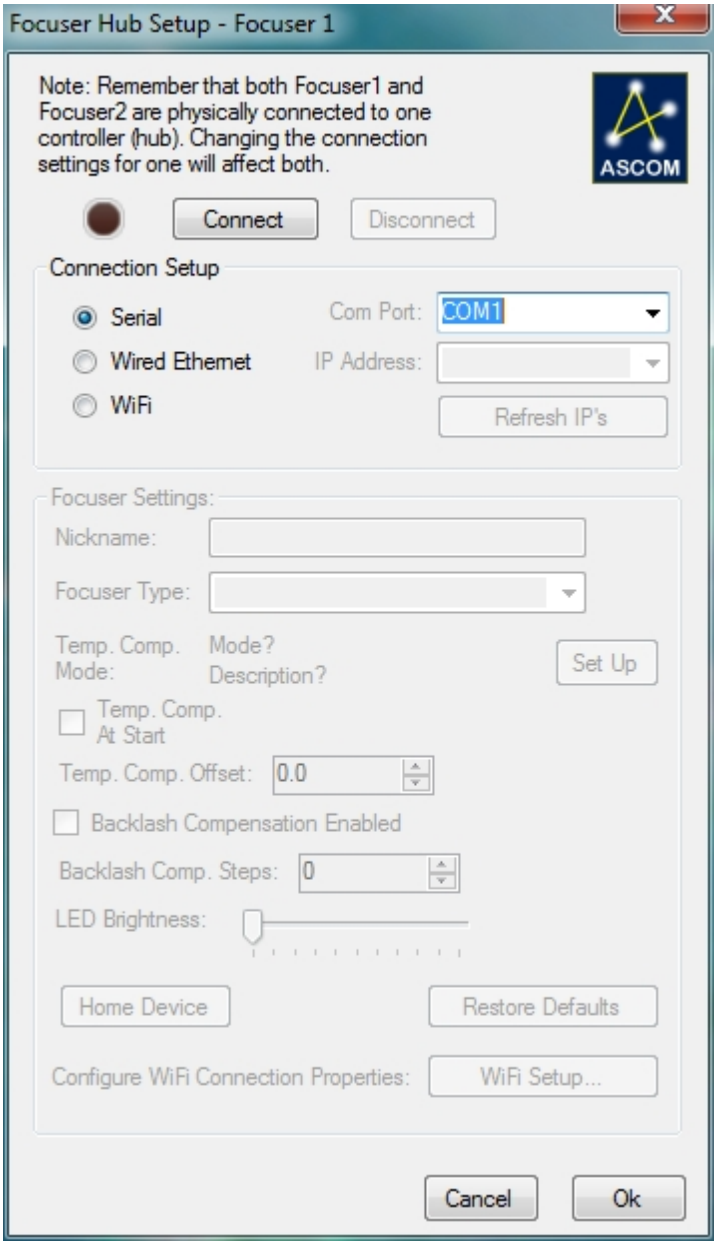
FocusLynx Commander is a suite of focuser hub control tools developed by Optec specifically for use with the FocusLynx focuser hub. To configure this software to operate over a serial connection, follow the directions below:

- **Install And Open FocusLynx Commander** - Follow the Software Installation instructions to install and open this control software.



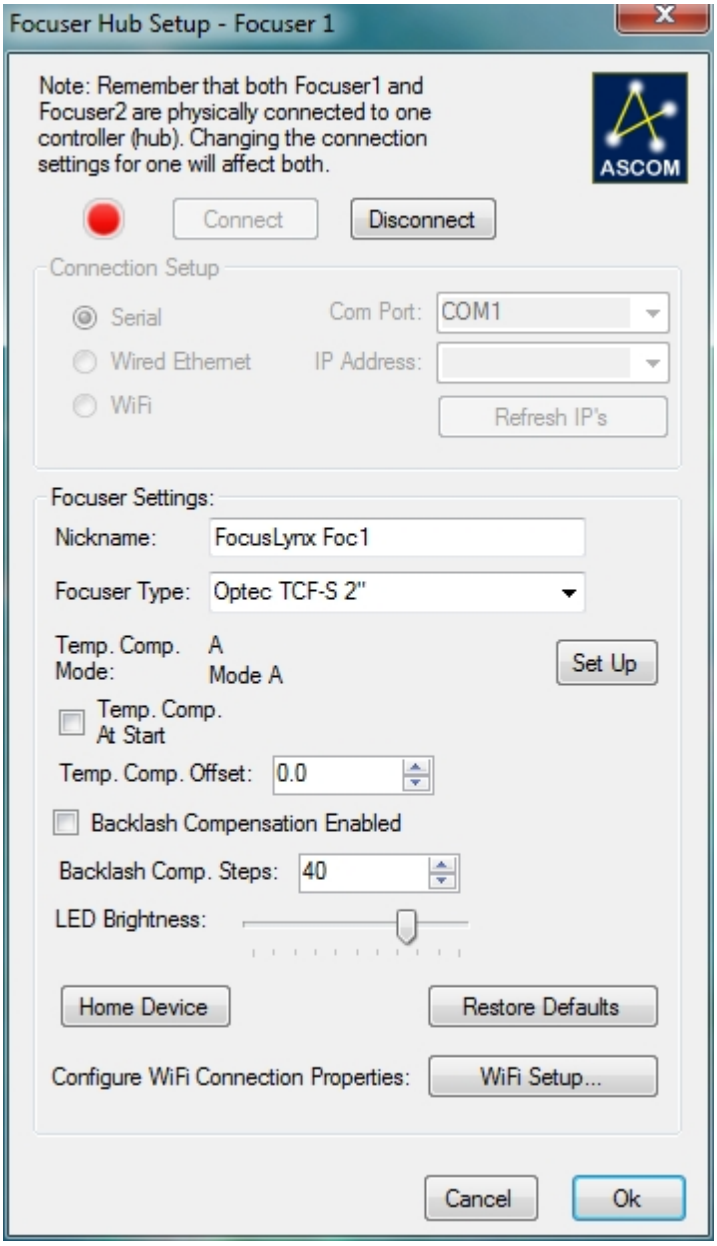
- **Go To The Setup Screen** - Once FocusLynx Commander is open, go to the ***Focusers*** menu and choose the ***Setup*** option under *Focuser 1* or *Focuser 2*, depending on which focuser you want to configure. The setup screen will open. If you wish to leave the setup screen at any time without changing any settings, click the ***Cancel*** button at the bottom of the window. If you wish to reset this focuser's configuration to factory defaults, click the ***Restore Defaults*** button.

- **Plug In Your Focuser Hub** - Ensure that there is a serial cable connection between your computer and the FocusLynx focuser hub and that the hub has a valid 12VDC power connection.



- **Connect To The Focuser Hub** - Verify that the ***Connection Setup*** selection is set to *Serial* and the ***Com Port*** setting is set to the port into which your hub is plugged, then click the ***Connect*** button. If you are not sure which COM port your focuser hub is plugged into, guessing and checking among the available options should work, as there will be very few COM ports on any given computer. If you encounter persistent problems determining which COM port to use, contact Optec for assistance.

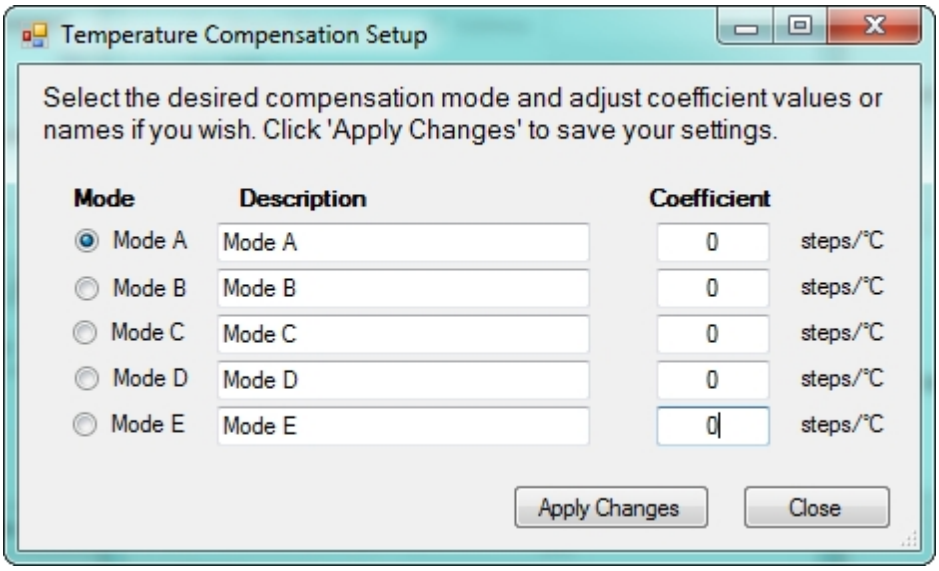
- **Confirm Connection** - The red LED simulation should turn on, indicating that the connection has been established.



- **Set Nickname** - If you do not want to use the auto-generated default nickname, you may set the focuser nickname by entering your new nickname into the ***Nickname*** text box.

- **Set Focuser Type** - If the focuser type auto-generated by the Commander is incorrect, select your focuser type from the ***Focuser Type*** drop-down list. Be aware that your focuser will home itself automatically when the focuser type is selected, so you will lose your current focus position.

- **You May Now Connect A Focuser To Your FocusLynx**

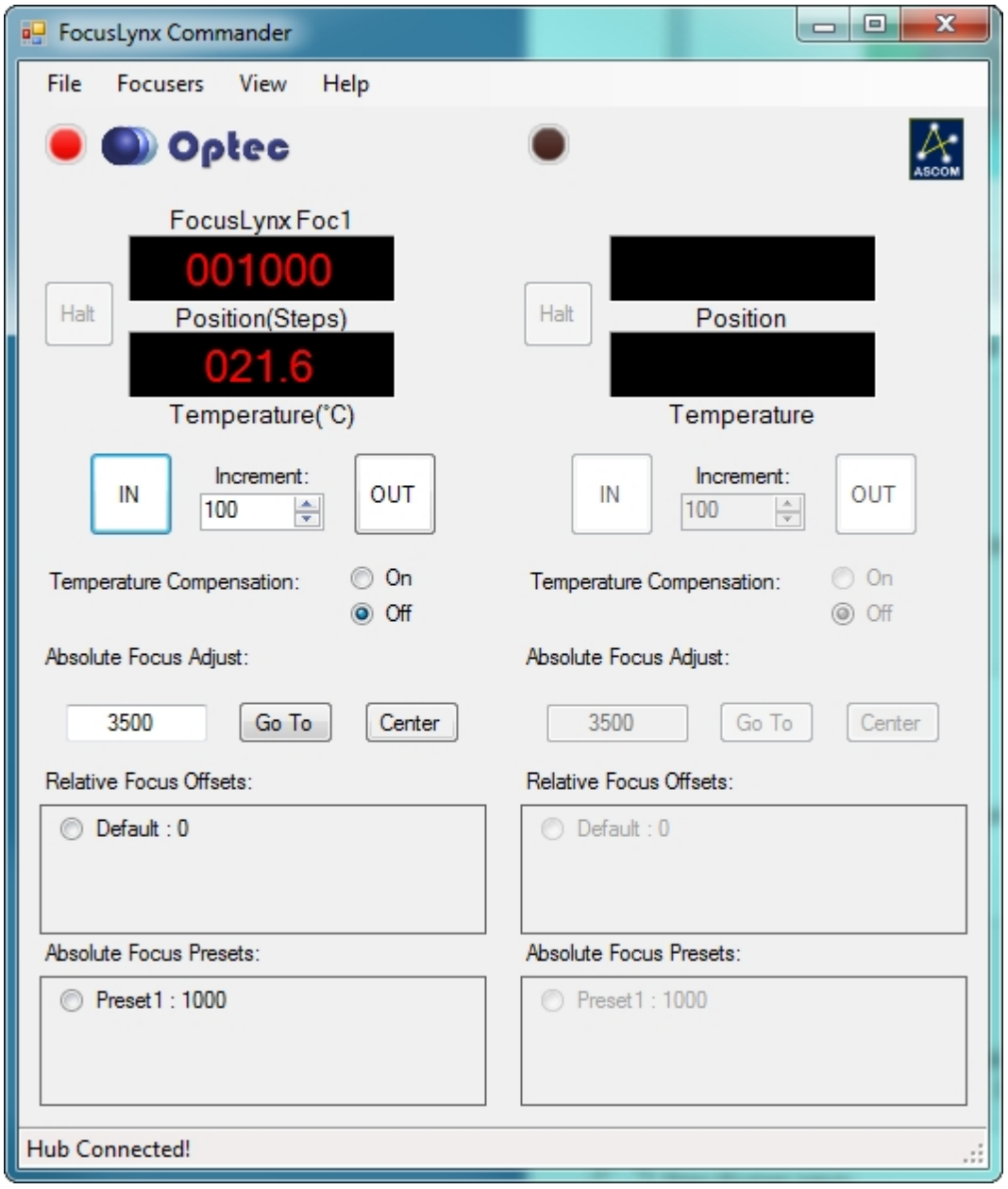


- **Set Temperature Compensation Settings** - If you have a temperature compensating focuser with a temperature probe plugged in, you may click the ***Set Up*** button next to the *Temp. Comp. Mode* entry to go to the *temperature compensation setup* window:
  - **Add Descriptions** - In the temperature compensation (TC) setup window, enter the names of your TC modes into the ***Description*** boxes. If you have less than five modes that you wish to use, don't worry about modifying the other modes' information.
  - **Add Coefficients** - Enter the temperature coefficients for each of your TC modes into the ***Coefficient*** boxes.
  - **Select A Mode** - Click one of the ***Mode*** buttons to select which TC mode you would like to use.
  - **Save Changes** - Click the ***Apply Changes*** button to save your changes.
  - **Continue Setup** - Your TC Modes are now configured. Click ***Close*** to confirm your selection.
- **Immediate Temperature Compensation** - If you want to begin temperature compensation immediately upon opening FocusLynx Commander, check the ***Temp. Comp. At Start*** checkbox.
- **Set Temperature Compensation Offset** - If your focuser's temperature probe is known to provide inaccurate readings, you may use the ***Temp. Comp. Offset*** text box to adjust the temperature up or down. Temperature offsets are limited to a range of ten degrees Celsius up or down.
- **Enable Backlash Compensation** - If your focuser has a noticeable amount of backlash, check the ***Backlash Compensation Enabled*** checkbox to enable compensation.
- **Set Backlash Steps** - Enter a number of steps into the ***Backlash Comp. Steps*** text box to adjust to the level of backlash compensation you require. Make your number of steps negative for inward compensation and positive for outward compensation. You may set the number of steps to at most 99 steps in either direction.
- **Adjust LED Brightness** - if you find the focuser hub's power indication LED to be affecting

your night vision, you may adjust its brightness with the ***LED Brightness*** slider. The range of brightness varies from left to right, starting with no light at all and moving to full brightness.

- **Home The Focuser** - If you want to start the focuser at its factory-set "Home" position, click the ***Home Device*** button.

- **Confirm Your Configuration** - When you are finished, click the ***Ok*** button to save your changes and return to the main FocusLynx Commander window.



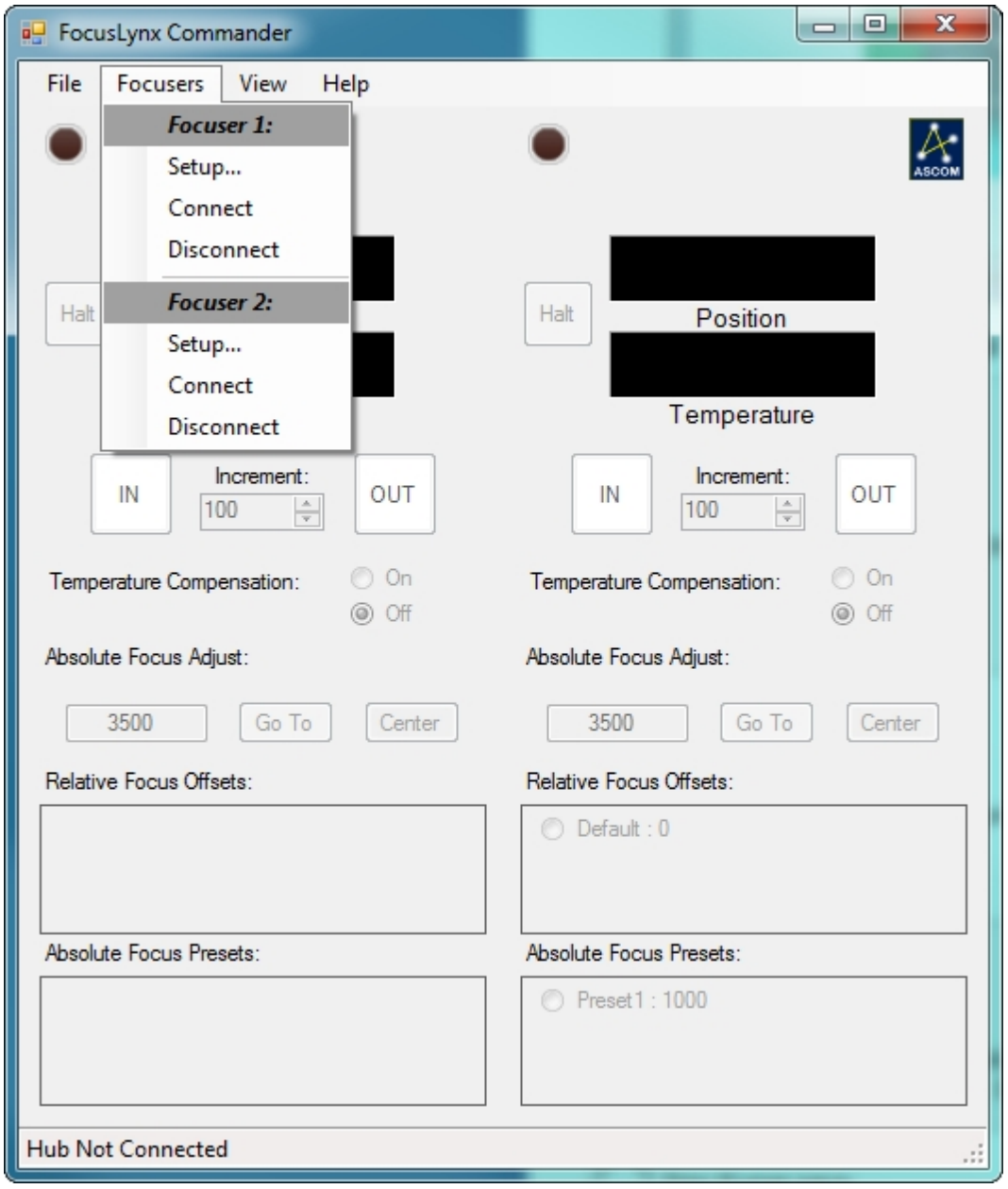
Congratulations! Your hub and focuser are now ready to use! You may use the current configuration to connect or disconnect from a focuser by clicking the ***Connect*** or ***Disconnect*** buttons in the *Setup Window*, the ***Connect*** or ***Disconnect*** buttons in the ***Focusers*** menu of the main window, or by clicking the LED above each focuser information display in the main window.

Section 1.4.2 - How To Configure A FocusLynx Commander Ethernet Connection

WARNING: Do not plug any focuser into your focuser hub until you have completed the **Set Focuser Type** step described below. If you do not wait, you may cause **severe, permanent focuser damage**.

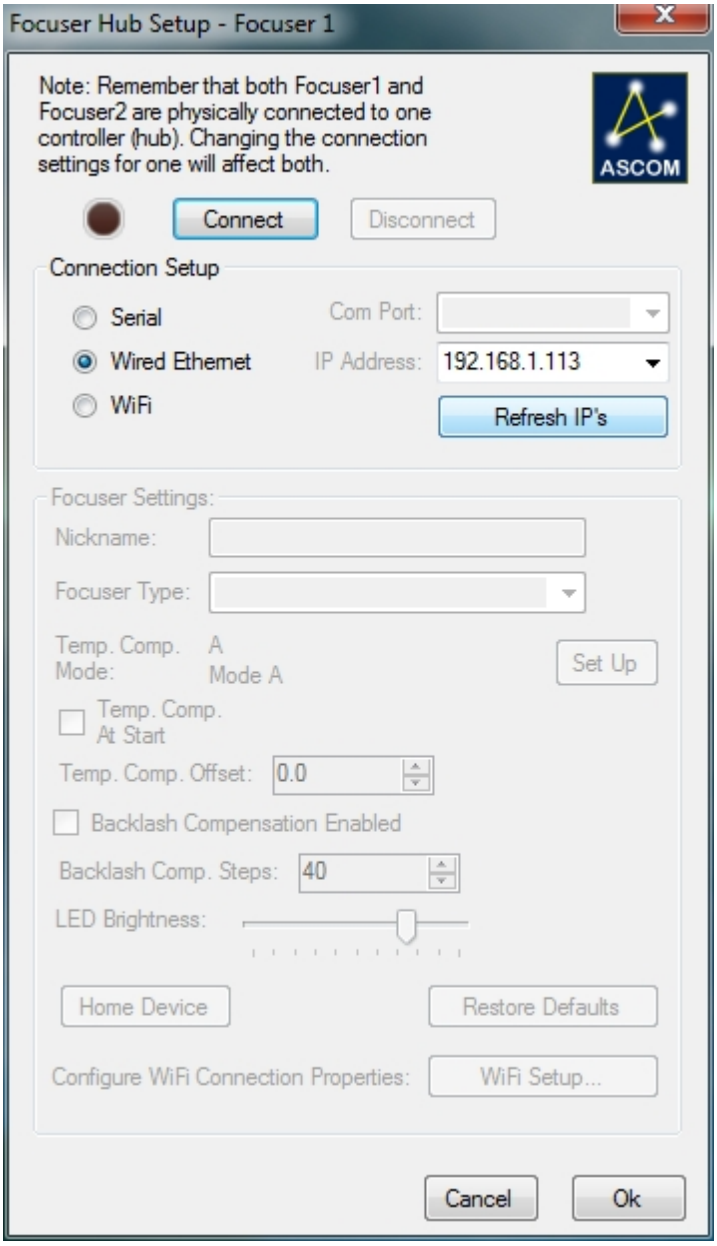
FocusLynx Commander is a suite of focuser hub control tools developed by Optec specifically for use with the FocusLynx focuser. To configure this software to operate over an ethernet connection, follow the directions below:

- **Install And Open FocusLynx Commander** - Follow the Software Installation instructions to install and open this control software.



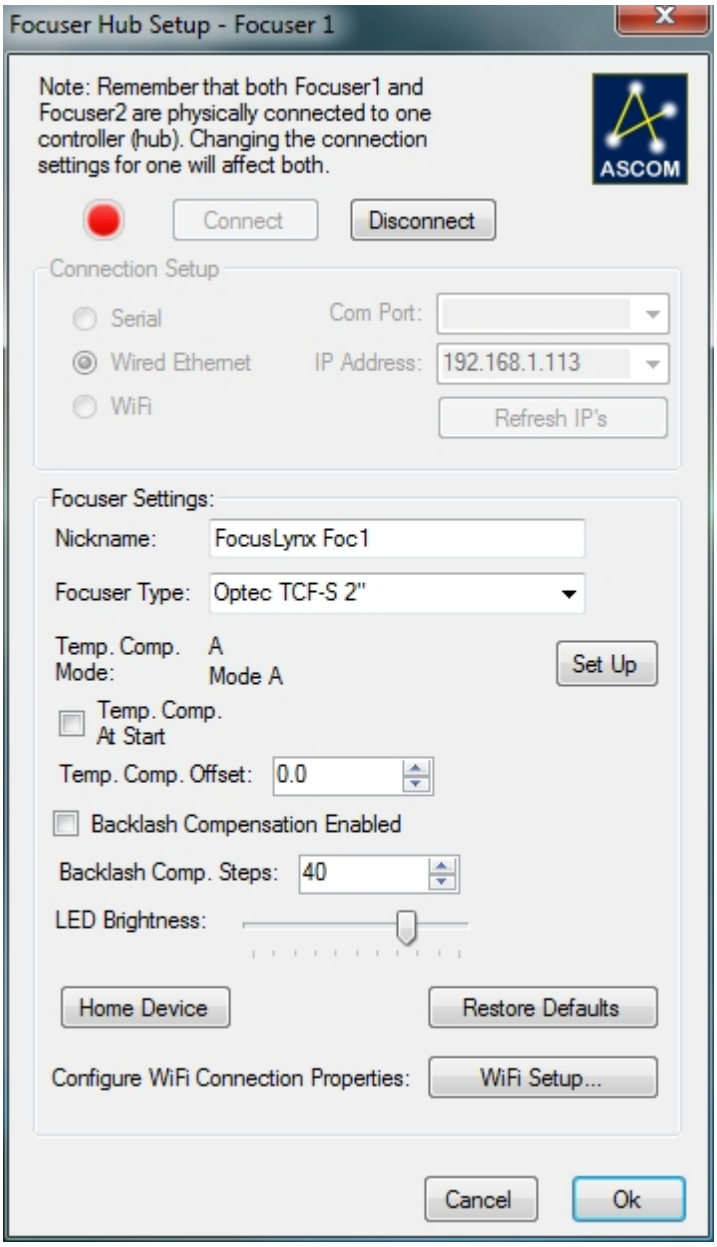
- **Go To The Setup Screen** - Once FocusLynx Commander is open, go to the ***Focusers*** menu and choose the ***Setup*** option under *Focuser 1* or *Focuser 2*, depending on which focuser you want to configure. The setup screen will open. If you wish to leave the setup screen at any time without changing any settings, click the ***Cancel*** button at the bottom of the window. If you wish to reset this focuser's configuration to factory defaults, click the ***Restore Defaults*** button.

- **Plug In Your Focuser Hub** - Ensure that there is a valid ethernet cable connection between your computer and the FocusLynx focuser hub and that the hub has a valid 12VDC power connection.



- **Connect To The Focuser Hub** - Verify that the ***Connection Setup*** selection is set to *Ethernet* and the ***IP Address*** setting has been autofilled (if it has not, then click the ***Refresh IP's*** button to try again, then click the ***Connect*** button. If the IP address that is autofilled is incorrect, contact Optec for support.

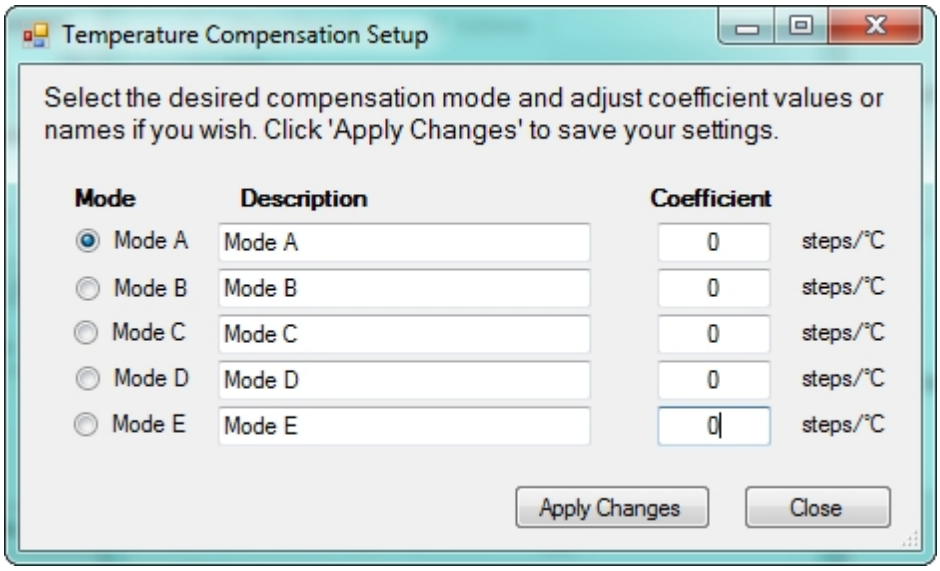
- **Confirm Connection** - The red LED simulation should turn on, indicating that the connection has been established.



- **Set Nickname** - If you do not want to use the auto-generated default nickname, you may set the focuser nickname by entering your new nickname into the ***Nickname*** text box.

- **Set Focuser Type** - If the focuser type auto-generated by the Commander is incorrect, select your focuser type from the ***Focuser Type*** drop-down list. Be aware that your focuser will home itself automatically when the focuser type is selected, so you will lose your current focus position.

- **You May Now Connect A Focuser To Your FocusLynx**

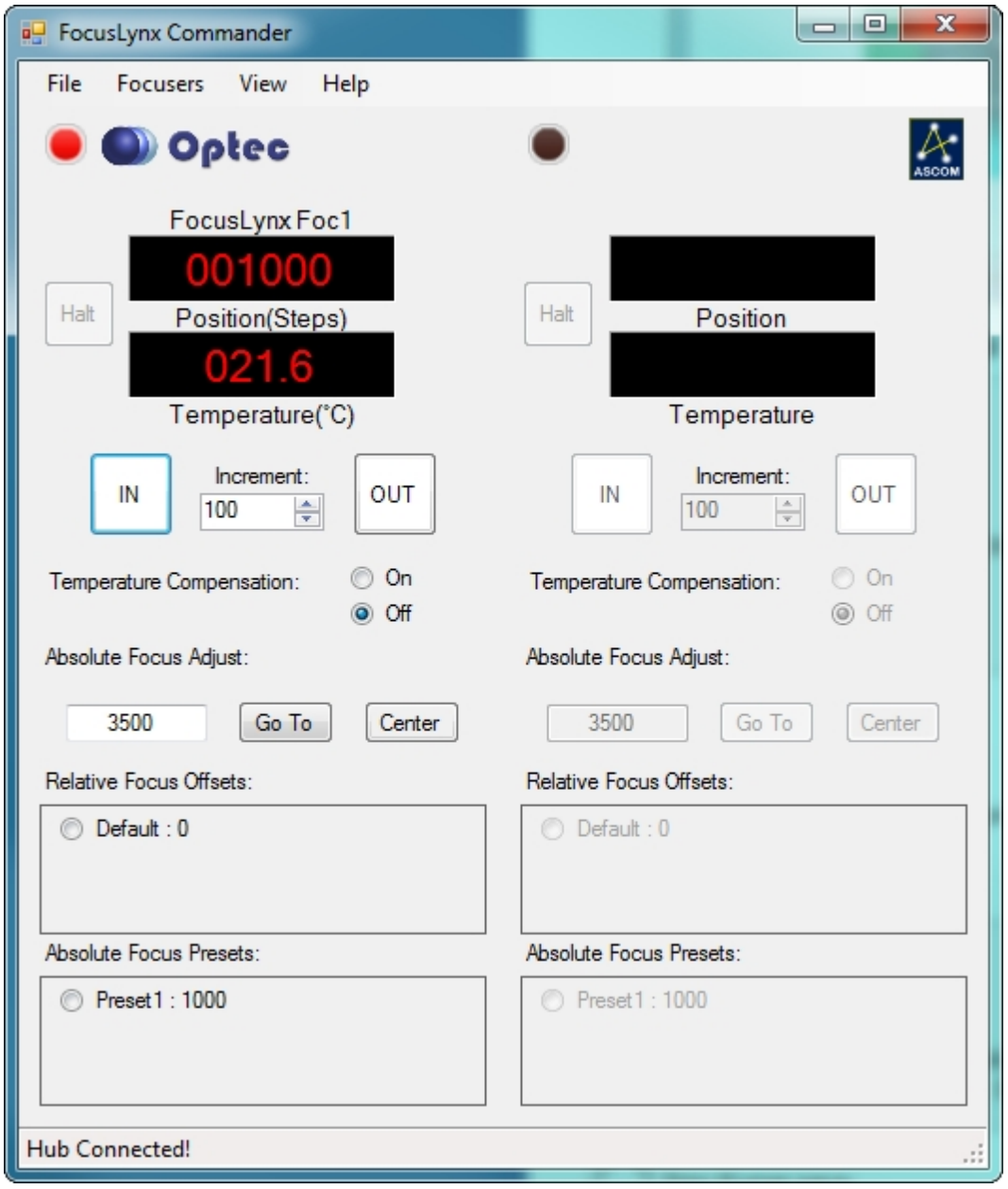


- **Set Temperature Compensation Settings** - If you have a temperature compensating focuser with a temperature probe plugged in, you may click the ***Set Up*** button next to the *Temp. Comp. Mode* entry to go to the *temperature compensation setup* window:
    - **Add Descriptions** - In the temperature compensation (TC) setup window, enter the names of your TC modes into the ***Description*** boxes. If you have less than five modes that you wish to use, don't worry about modifying the other modes' information.
    - **Add Coefficients** - Enter the temperature coefficients for each of your TC modes into the ***Coefficient*** boxes.
    - **Select A Mode** - Click one of the ***Mode*** buttons to select which TC mode you would like to use.
    - **Save Changes** - Click the ***Apply Changes*** button to save your changes.
    - **Continue Setup** - Your TC Modes are now configured. Click ***Close*** to confirm your selection.
- **Immediate Temperature Compensation** - If you want to begin temperature compensation immediately upon opening FocusLynx Commander, check the ***Temp. Comp. At Start*** checkbox.
- **Set Temperature Compensation Offset** - If your focuser's temperature probe is known to provide inaccurate readings, you may use the ***Temp. Comp. Offset*** text box to adjust the temperature up or down. Temperature offsets are limited to a range of ten degrees Celsius up or down.
- **Enable Backlash Compensation** - If your focuser has a noticeable amount of backlash, check the ***Backlash Compensation Enabled*** checkbox to enable compensation.
- **Set Backlash Steps** - Enter a number of steps into the ***Backlash Comp. Steps*** text box to adjust to the level of backlash compensation you require. Make your number of steps negative for inward compensation and positive for outward compensation. You may set the number of steps to at most 99 steps in either direction.
- **Adjust LED Brightness** - if you find the focuser hub's power indication LED to be affecting

your night vision, you may adjust its brightness with the ***LED Brightness*** slider. The range of brightness varies from left to right, starting with no light at all and moving to full brightness.

- **Home The Focuser** - If you want to start the focuser at its factory-set "Home" position, click the ***Home Device*** button.

- **Confirm Your Configuration** - When you are finished, click the ***Ok*** button to save your changes and return to the main FocusLynx Commander window.



Congratulations! Your hub and focuser are now ready to use! You may use the current configuration to connect or disconnect from a focuser by clicking the ***Connect*** or ***Disconnect*** buttons in the *Setup Window*, the ***Connect*** or ***Disconnect*** buttons in the ***Focusers*** menu of the main window, or by clicking the LED above each focuser information display in the main window.

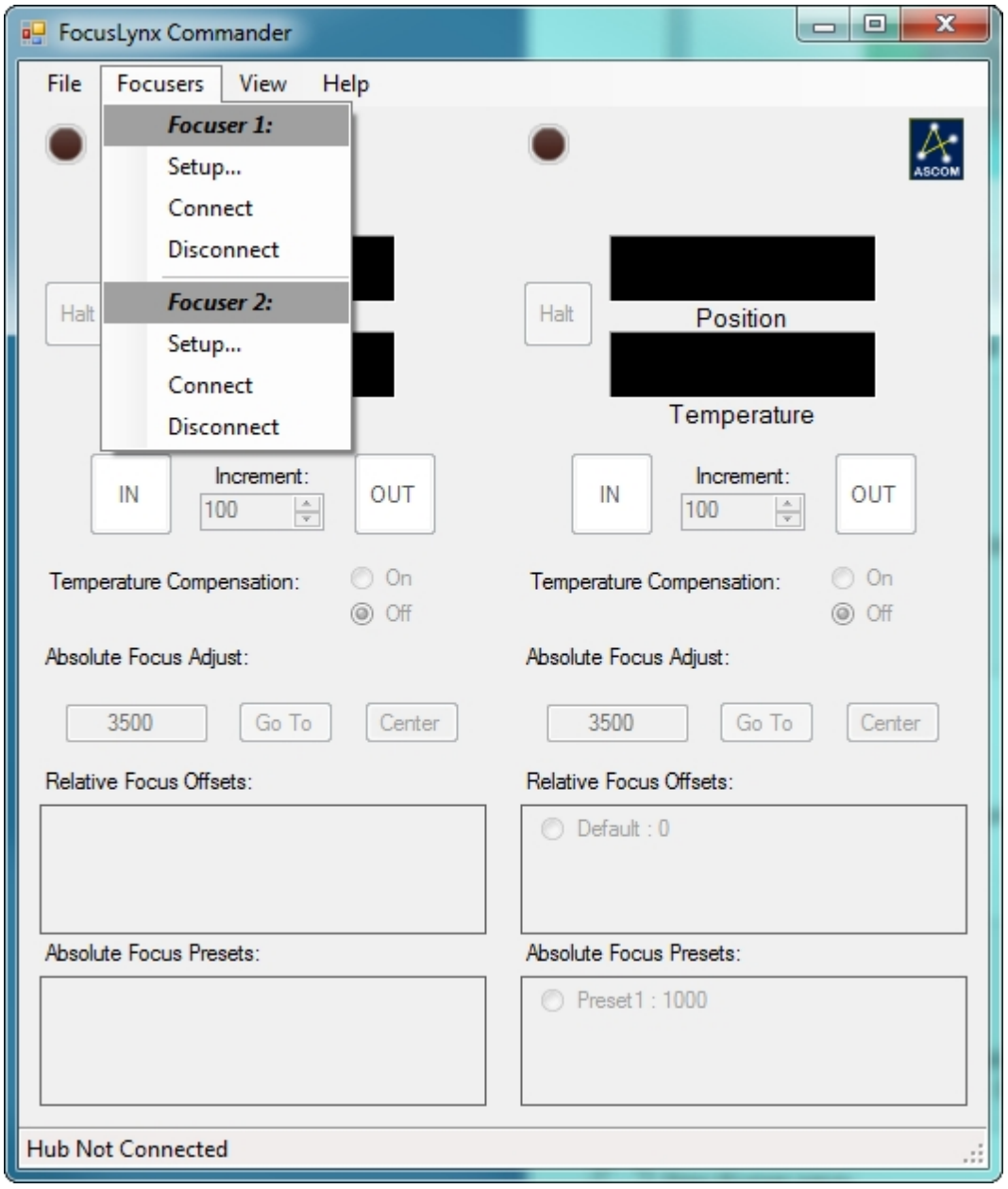
Section 1.4.3 - How To Configure A FocusLynx Commander Wi-Fi Connection

WARNING: Do not plug any focuser into your focuser hub until you have completed the **Set Focuser Type** step described below. If you do not wait, you may cause **severe, permanent focuser damage**.

FocusLynx Commander is a suite of focuser hub control tools developed by Optec specifically for use with the FocusLynx focuser. To configure this software to operate over a Wi-Fi connection, follow the directions below:

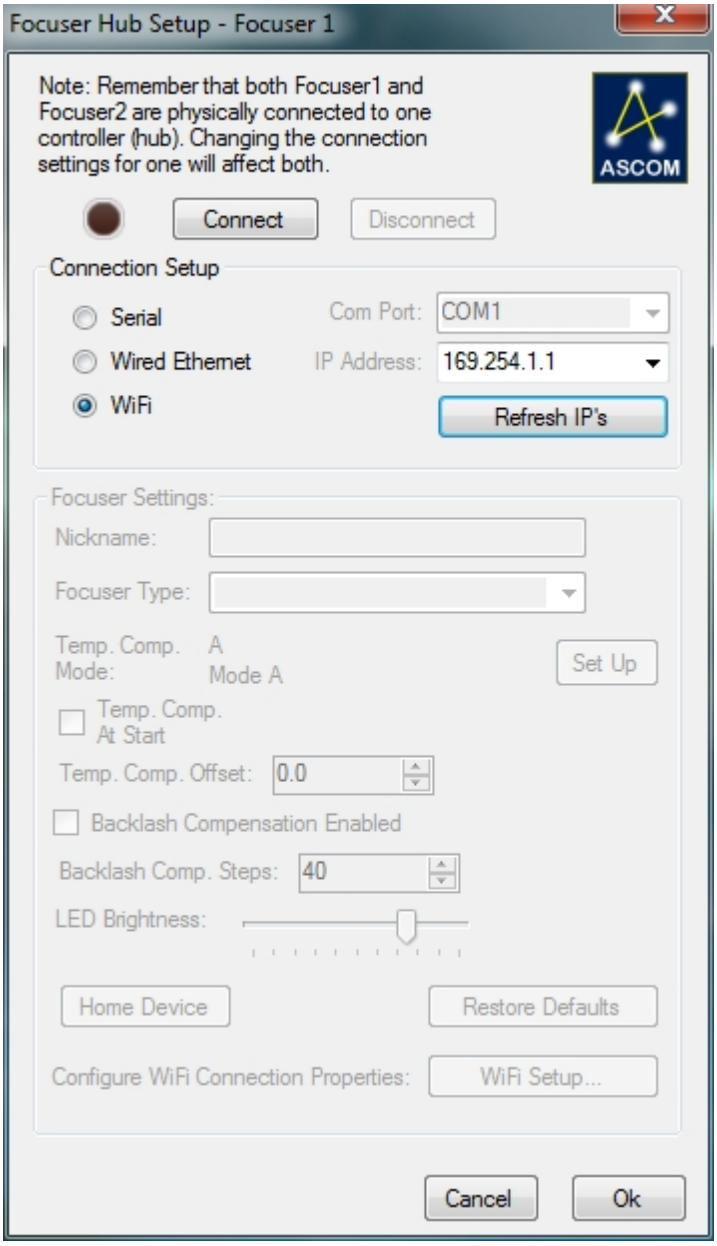
WARNING: To connect to the FocusLynx via Wi-Fi, purchase of the Wi-Fi Daughter Board is a necessity! If you have not purchased this board, you **must** use another method to connect to the FocusLynx! Additionally, your computer **must** be able to connect to Wi-Fi networks!

- **Install And Open FocusLynx Commander** - Follow the Software Installation instructions to install and open this control software.



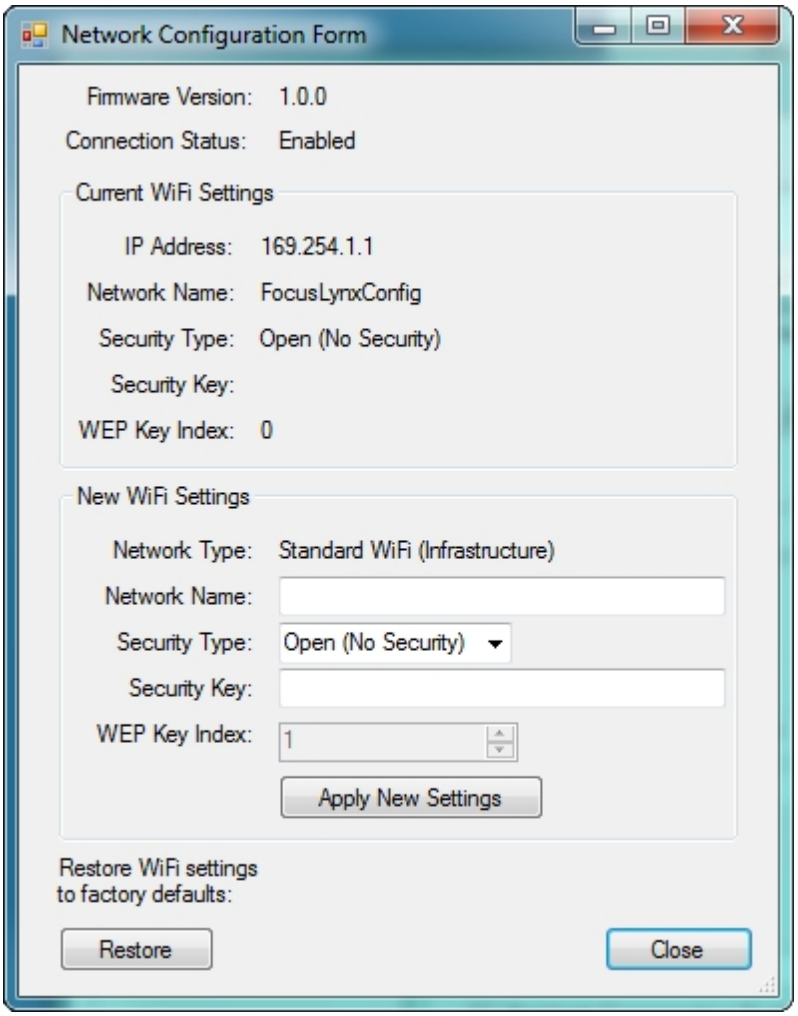
- **Go To The Setup Screen** - Once FocusLynx Commander is open, go to the ***Focusers*** menu and choose the ***Setup*** option under *Focuser 1* or *Focuser 2*, depending on which focuser you want to configure. The setup screen will open. If you wish to leave the setup screen at any time without changing any settings, click the ***Cancel*** button at the bottom of the window. If you wish to reset this focuser's configuration to factory defaults, click the ***Reset To Defaults*** button.

  Note: To perform the connection to the focuser hub over Wi-Fi, it is possible to connect automatically to the network that is auto-generated by the FocusLynx, or if you are already connected via another method you may swap to any Wi-Fi network using the Wi-Fi setup dialog.



- **Connect To The Focuser Hub Automatically** - Connect your computer to the ***FocusLynxConfig*** Wi-Fi network that is auto-generated by the focuser hub. In FocusLynx Commander, verify that the ***Connection Setup*** selection is set to *WiFi* and the ***IP Address*** setting has been autofilled (if it has not, then click the ***Refresh IP's*** button to try again, then click the ***Connect*** button. If the IP address that is autofilled is incorrect, contact Optec for support.

-OR-

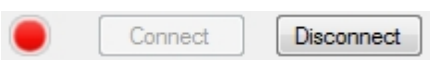


- **Connect To The Focuser Hub Manually** - Connect to the hub via serial or ethernet, then click the ***WiFi Setup*** button. Current Wi-Fi configuration information will be displayed. If at any time, you wish to restore the hub's Wi-Fi settings to default, click the ***Restore*** button.

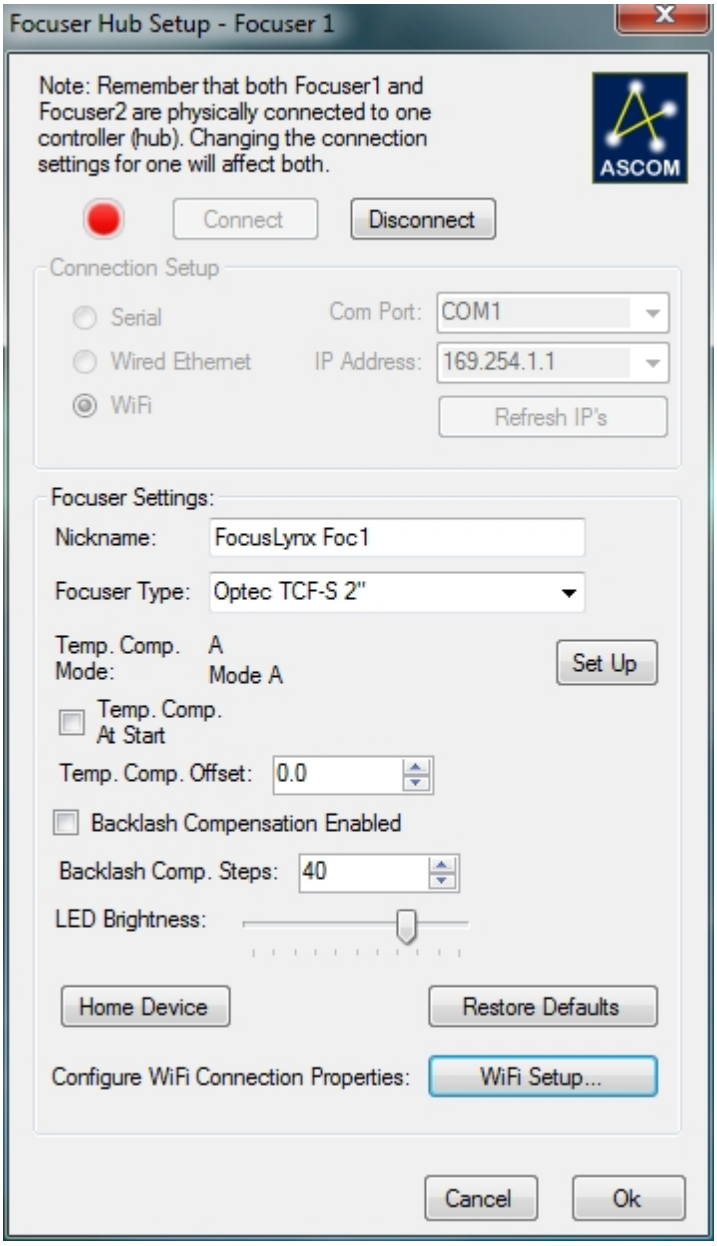
    - **Enter A New Configuration** - Enter a **network name**, **security type**, security key (if necessary), and WEP Key Index (if necessary) that matches the Wi-Fi network to which you want to connect.

    - **Confirm Your Changes** - Click the ***Apply New Settings*** button to connect to the new network. Allow one to two minutes for the focuser hub to reconnect. A message will be displayed to confirm your changes. Click the ***Close*** button to exit this window.

    - **Connect To The Focuser Hub** - Connect your computer to the Wi-Fi network that you entered information for above. Verify that the ***Connection Setup*** selection is set to *WiFi* and the ***IP Address*** setting has been autofilled (if it has not, then click the ***Refresh IP's*** button to try again, then click the ***Connect*** button. If the IP address that is autofilled is incorrect, contact Optec for support.



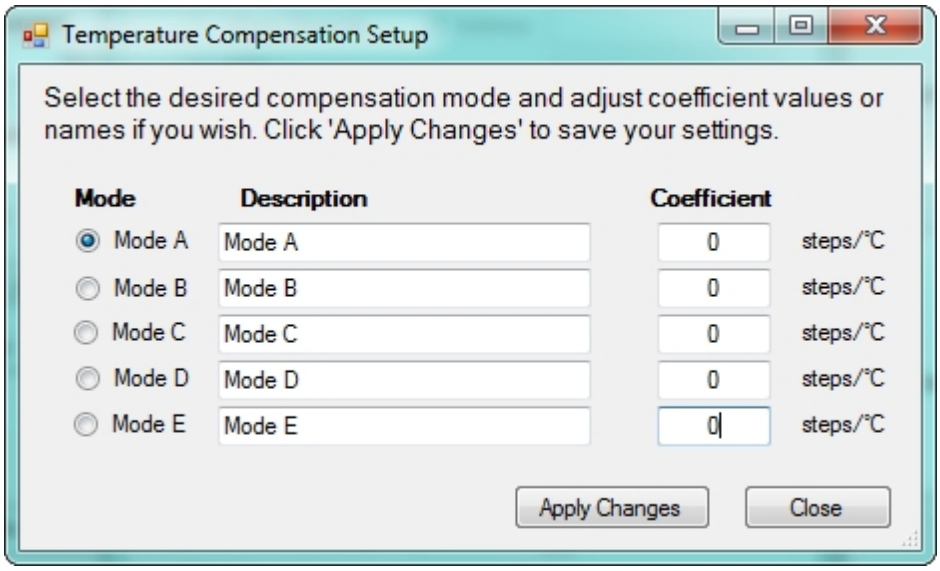
- **Confirm Connection** - The red LED simulation should turn on, indicating that the connection has been established.



- **Set Nickname** - If you do not want to use the auto-generated default nickname, you may set the focuser nickname by entering your new nickname into the ***Nickname*** text box.

- **Set Focuser Type** - If the focuser type auto-generated by the Commander is incorrect, select your focuser type from the ***Focuser Type*** drop-down list. Be aware that your focuser will home itself automatically when the focuser type is selected, so you will lose your current focus position.

- **You May Now Connect A Focuser To Your FocusLynx**

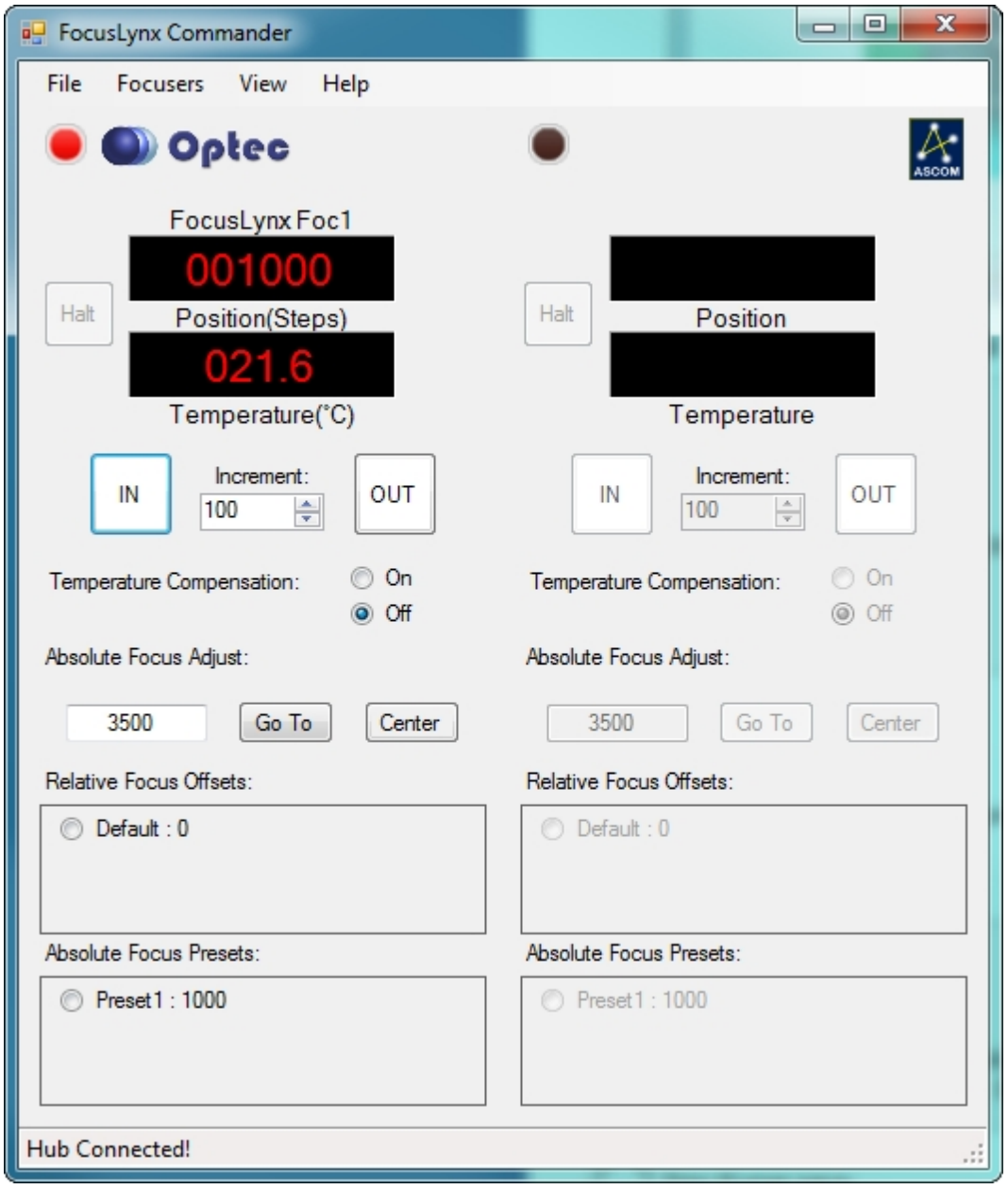


- **Set Temperature Compensation Settings** - If you have a temperature compensating focuser with a temperature probe plugged in, you may click the ***Set Up*** button next to the *Temp. Comp. Mode* entry to go to the *temperature compensation setup* window:
    - **Add Descriptions** - In the temperature compensation (TC) setup window, enter the names of your TC modes into the ***Description*** boxes. If you have less than five modes that you wish to use, don't worry about modifying the other modes' information.
    - **Add Coefficients** - Enter the temperature coefficients for each of your TC modes into the ***Coefficient*** boxes.
    - **Select A Mode** - Click one of the ***Mode*** buttons to select which TC mode you would like to use.
    - **Save Changes** - Click the ***Apply Changes*** button to save your changes.
    - **Continue Setup** - Your TC Modes are now configured. Click ***Close*** to confirm your selection.
- **Immediate Temperature Compensation** - If you want to begin temperature compensation immediately upon opening FocusLynx Commander, check the ***Temp. Comp. At Start*** checkbox.
- **Set Temperature Compensation Offset** - If your focuser's temperature probe is known to provide inaccurate readings, you may use the ***Temp. Comp. Offset*** text box to adjust the temperature up or down. Temperature offsets are limited to a range of ten degrees Celsius up or down.
- **Enable Backlash Compensation** - If your focuser has a noticeable amount of backlash, check the ***Backlash Compensation Enabled*** checkbox to enable compensation.
- **Set Backlash Steps** - Enter a number of steps into the ***Backlash Comp. Steps*** text box to adjust to the level of backlash compensation you require. Make your number of steps negative for inward compensation and positive for outward compensation. You may set the number of steps to at most 99 steps in either direction.
- **Adjust LED Brightness** - if you find the focuser hub's power indication LED to be affecting

your night vision, you may adjust its brightness with the ***LED Brightness*** slider. The range of brightness varies from left to right, starting with no light at all and moving to full brightness.

- **Home The Focuser** - If you want to start the focuser at its factory-set "Home" position, click the ***Home Device*** button.

- **Confirm Your Configuration** - When you are finished, click the ***Ok*** button to save your changes and return to the main FocusLynx Commander window.



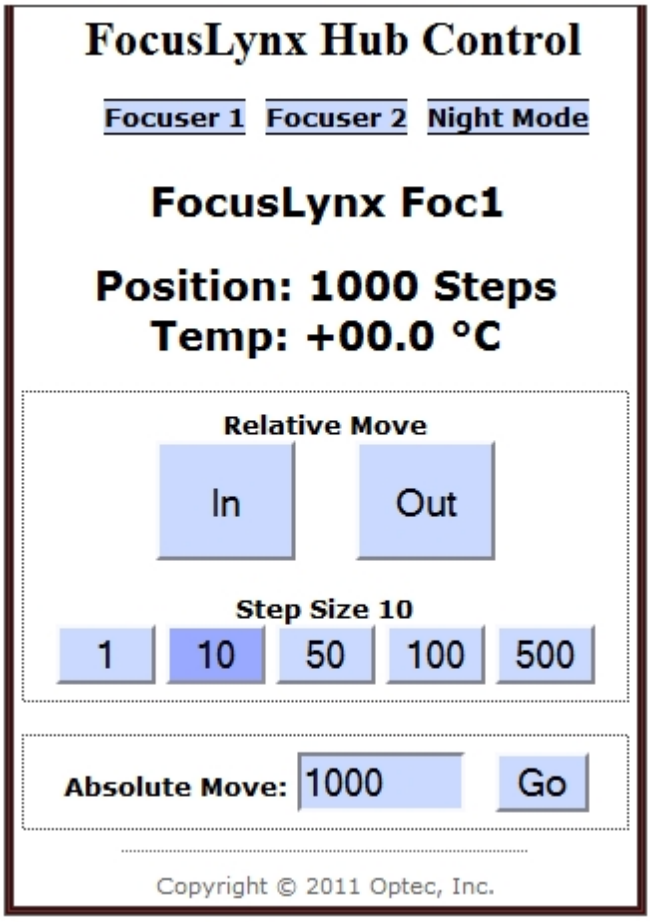
Congratulations! Your hub and focuser are now ready to use! You may use the current configuration to connect or disconnect from a focuser by clicking the ***Connect*** or ***Disconnect*** buttons in the *Setup Window*, the ***Connect*** or ***Disconnect*** buttons in the ***Focusers*** menu of the main window, or by clicking the LED above each focuser information display in the main window.

Section 1.4.4 - How To Configure A Web-Based Ethernet Connection

BEFORE YOU BEGIN: Please complete the steps described on the ***Quick-Start Guide*** you received with your FocusLynx focuser hub through **Configuring Focuser Type**. These steps are also listed in the Quick Start portion of this manual. Failure to perform the focuser type configuration procedure may result in **severe, permanent damage** to your focusers!

As an alternative to the FocusLynx Commander control software, the FocusLynx focuser hub can be controlled via a webpage. This webpage can be accessed and configured through either an ethernet connection or via Wi-Fi. To access and configure the webpage, follow these simple steps:

- **Power Up And Connect The FocusLynx** - Ensure that the 12VDC power adapter is plugged into both the FocusLynx and a power outlet, then flip the switch on the side of the focuser hub to turn it on. A red LED should turn on to confirm that the focuser hub is now running. Ensure that there is a valid ethernet connection between the computer and the focuser hub.



- **Go To The Webpage** - Accessing the webpage works slightly differently depending on whether you are using a Windows machine or not.
  - **Windows** - Using any of the supported browsers listed in the System Requirements, access the control website at ***focuslynx/focuser1.htm***.
  - **Non-Windows** - First, find the ***IP address*** of your FocusLynx by opening FocusLynx Commander, opening the *Setup* window, and selecting the Ethernet connection option. Now, access the control website with any supported browsers by going to ***[IP Address Here]/focuser1.htm***.

Congratulations! You are now ready to use the control website to control your focusers with the FocusLynx focuser hub.

Section 1.4.5 - How To Configure A Web-Based Wi-Fi Connection

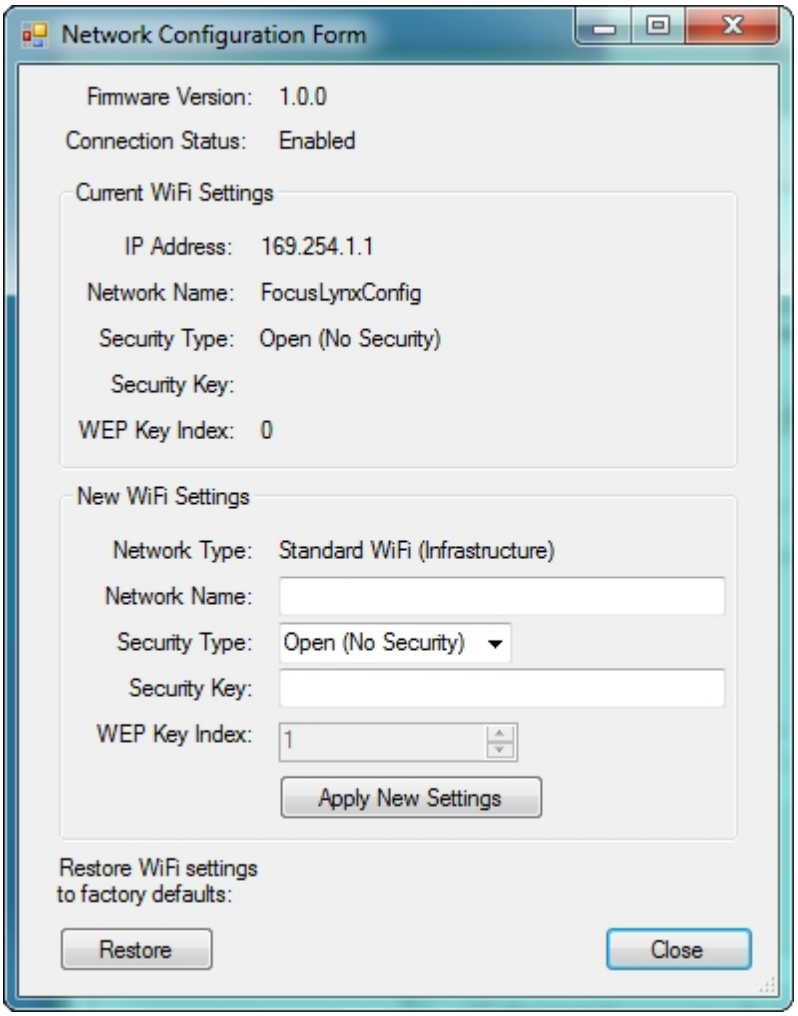
BEFORE YOU BEGIN: Please complete the steps described on the ***Quick-Start Guide*** you received with your FocusLynx focuser hub through **Configuring Focuser Type**. These steps are also listed in the Quick Start portion of this manual. Failure to perform the focuser type configuration procedure may result in **severe, permanent damage** to your focusers!

WARNING: To connect to the FocusLynx via Wi-Fi, purchase of the Wi-Fi Daughter Board is a necessity! If you have not purchased this board, you **must** use another method to connect to the FocusLynx! Additionally, your computer **must** be able to connect to Wi-Fi networks!

As an alternatiive to the FocusLynx Commander control software, the FocusLynx focuser hub can be controlled via a webpage. This webpage can be accessed and configured through either an Ethernet Connection or via Wi-Fi. To access and configure the webpage, follow these simple steps:

- **Power Up The FocusLynx** - Ensure that the 12VDC power adapter is plugged into both the FocusLynx and a power outlet, then flip the switch on the side of the focuser hub to turn it on. A red LED should turn on to confirm that the focuser hub is now running.

Note: There are several methods that can be used to connect to the board via Wi-Fi. Please pick ONE of the following options:



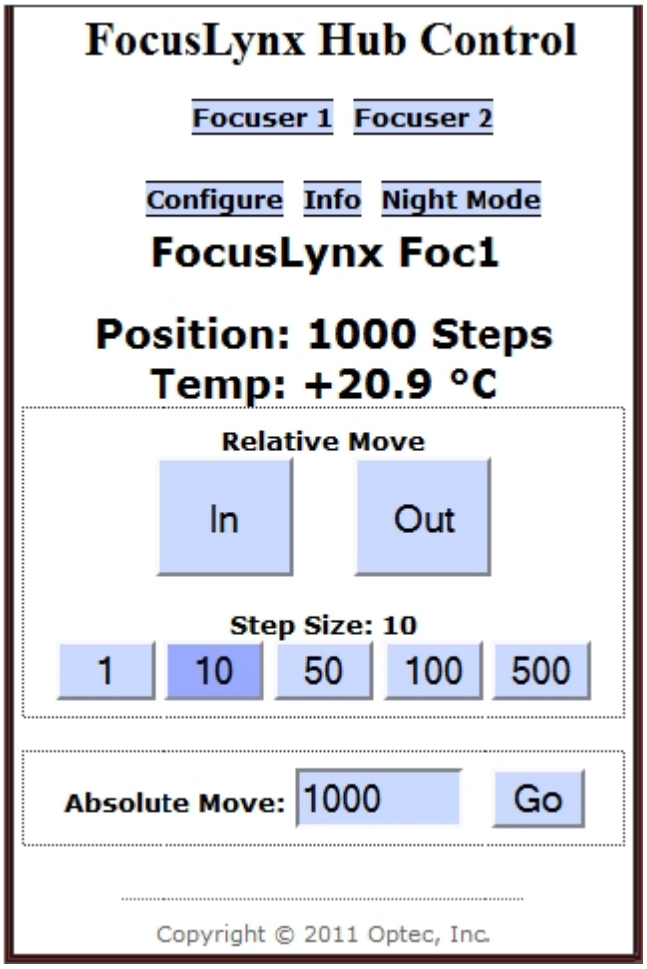
- **If The Hub Is Already Connected By Any Method In FocusLynx Commander** - You may use the ***Wi-Fi Setup*** window in FocusLynx Commander to switch the hub to a wireless connection method. More details on this procedure can be found on the FocusLynx Commander Wi-Fi page.

-OR-

- **If The Hub Is Already Connected Via Direct Serial Connection** - You may use the Wi-Fi information commands found in the Command List to switch the hub to a wireless connection method.
    - **Set The Basics** - At minimum, you will need to set the **name** and **security type** of your network.
    - **Provide Security Information** - If your network is not an open network, you will also need to provide a **passphrase**.
    - **Provide A WEP Index** - If your network uses WEP security, you will also have to provide a **WEP Key Index**.
    - **Confirm Network Settings** - When you have set all of this information, use the ***Push Settings*** command to tell the hub to switch to the wireless connection.

-OR-

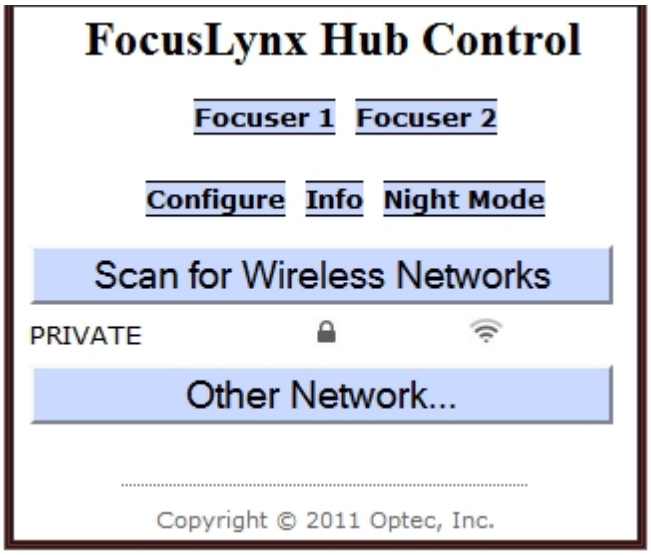
- **If The Hub Is Unconnected** - When the FocusLynx is started, it will begin to generate its own Wi-Fi network that will allow you to connect to the webpage.
    - **Connect To The Setup Network** - This setup network will be called *FocusLynxConfig*, and you should connect your computer to it now. Note that the control website is the only site that can be accessed on this network.



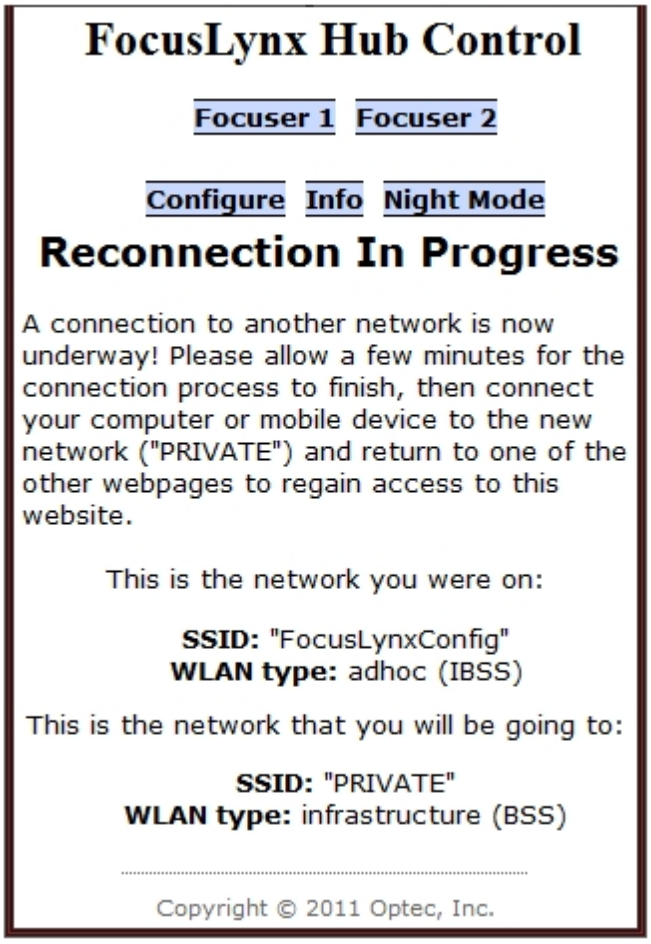
    - **Go To The Webpage** - Now you will be able to access the control website at ***focuslynxwifi/focuser1.htm***
    - **Begin Focusing or Swap To Your Own Network** - If you just want to have quick access to your focusers, you are all set! You may begin using the control website to control focusers. However, if you want to be connected on a secure network and/or have access to other webpages, you can use this setup network to swap your connection to any wireless network in the area.

Note: The following instructions are only necessary if you want to swap to a new network. These steps must be repeated every time the FocusLynx is turned on. If you are fine with using the hub-generated network, stop here!

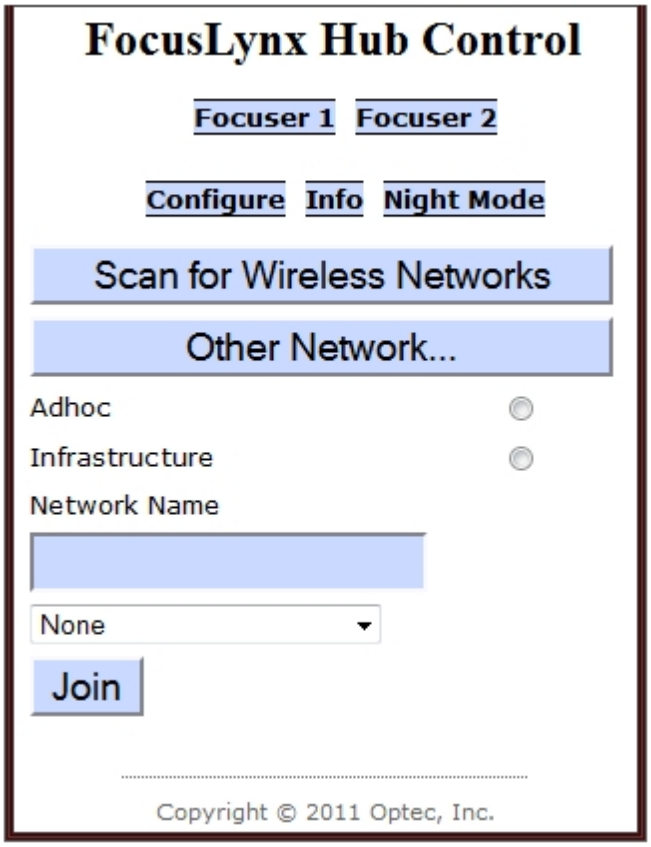
    - **Go To The Configuration Page** - Once on the control website, click the ***Configure*** link to go to the Wi-Fi configuration page.



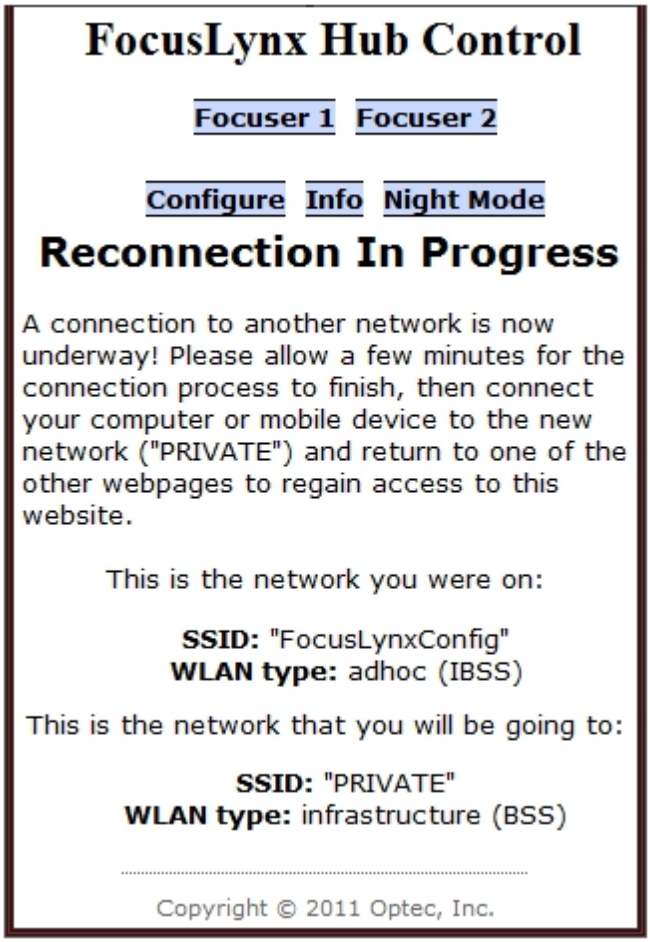
- **Find Your Network** - Click the ***Scan For Wireless Networks*** button to search the area for all available networks and click the one to which you wish to connect. The focuser hub will begin connecting. You will be prompted for a security key if necessary. The webpage will then change to one that gives instructions on finalizing your connection.



-OR-



- **Specify Your Network** - Click the ***Other Network...*** button to enter information about the network you want to connect to.
    - **Input Network Settings** - You will need to input the **network type**, **name**, and **security type**.
    - **Submit Your Settings** - When you are finished, click the ***Join*** button to swap to the new network. You will be prompted for a security key if necessary. The webpage will then change to one that gives instructions on finalizing your connection.



- **Go To The Webpage** - The webpage may now be accessed by any device connected to the configured Wi-Fi network. Accessing the webpage works slightly differently depending on whether you are using a Windows machine or not.
    - **Windows** - Using any of the supported browsers listed in the System Requirements, access the control website at ***focuslynxwifi/focuser1.htm***.
    - **Non-Windows** - First, find the ***IP address*** of your FocusLynx by opening FocusLynx Commander, opening the *Setup* window, and selecting the Ethernet connection option. Now, access the control website with any supported browsers by going to ***[IP Address Here]/focuser1.htm***.

Congratulations! Your focuser hub is now configured to work over the Wi-Fi connection of your choice! This ability is not limited to regular computers. The control website has been designed to accommodate **Android** and **iPhone** smartphones, so accessing the webpage with these devices is now possible!

Section 1.4.6 - How To Configure A Direct Serial Command Connection

BEFORE YOU BEGIN: Please complete the steps described on the ***Quick-Start Guide*** you received with your FocusLynx focuser hub through **Configuring Focuser Type**. These steps are also listed in the Quick Start portion of this manual. Failure to perform the focuser type configuration procedure may result in **severe, permanent damage** to your focusers!

- **Install A Serial Terminal Application** - In order to send direct serial commands, you need a serial terminal application to send them. The **Optec Terminal Application** is available for free download on the Optec website and requires no installation. Other, similar applications such as HyperTerminal are available for free download on the internet. The following instructions assume that you are using the Optec application, but the configuration for other applications should work in a similar fashion.

- **Configure Serial Connection Settings** - To connect to the FocusLynx with the Optec Terminal Application, ensure that the following configuration options are set correctly:

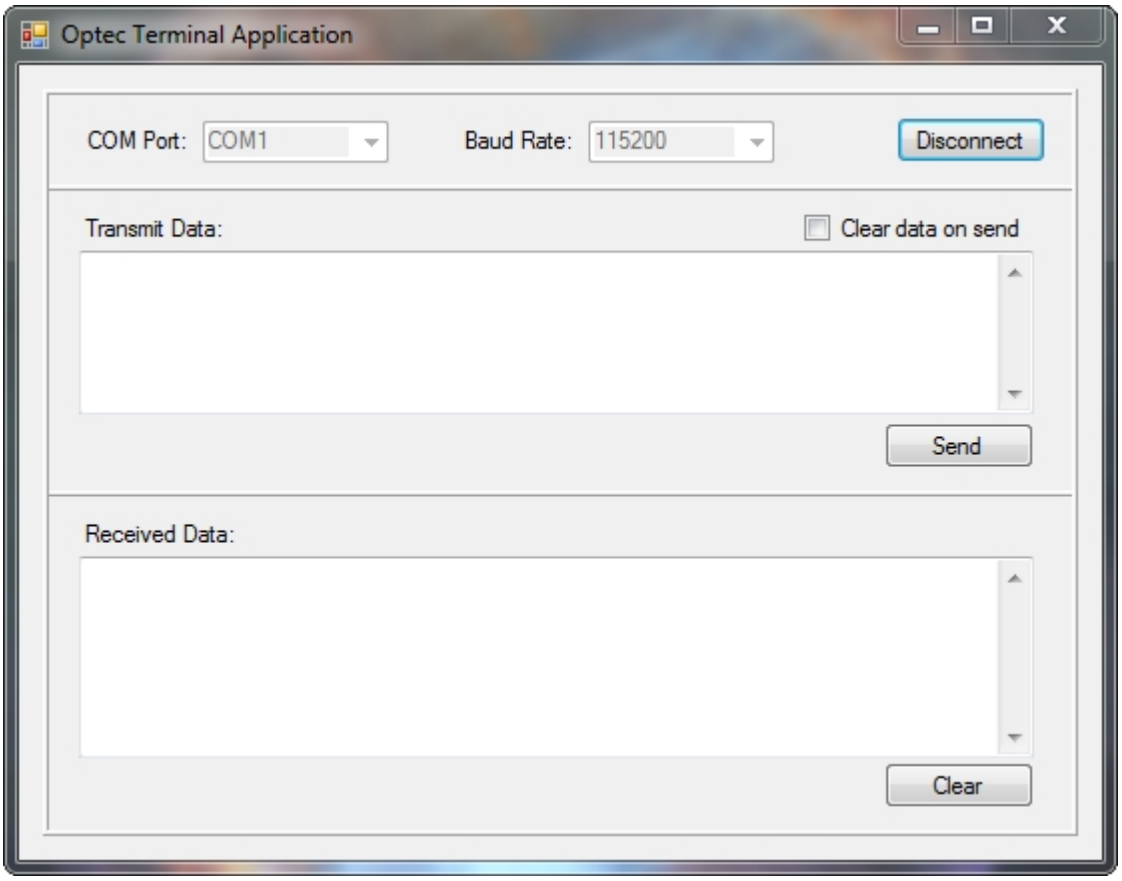
  Port Number: Variable
  Baud Rate: 115200

  For other serial terminal applications, you may also have to specify these options:

  Parity: None
  Byte Size: 8
  Stop Bits: 1

  The port number of your focuser hub is determined by which serial port on your computer the hub is connected to. If you are not sure which COM port your focuser hub is plugged into, guessing and checking among the available options should work, as there will be very few COM ports on any given computer. If you encounter persistent problems determining which COM port to use, contact Optec for assistance.

- **Power Up And Connect Your FocusLynx** - Before the next step, ensure that the 12VDC power adapter is plugged into both the FocusLynx and a power outlet, then flip the switch on the side of the focuser hub to turn it on. A red LED should turn on to confirm that the focuser hub is now running. Also ensure that your FocusLynx focuser hub is connected via RS-232 serial cable to your computer.



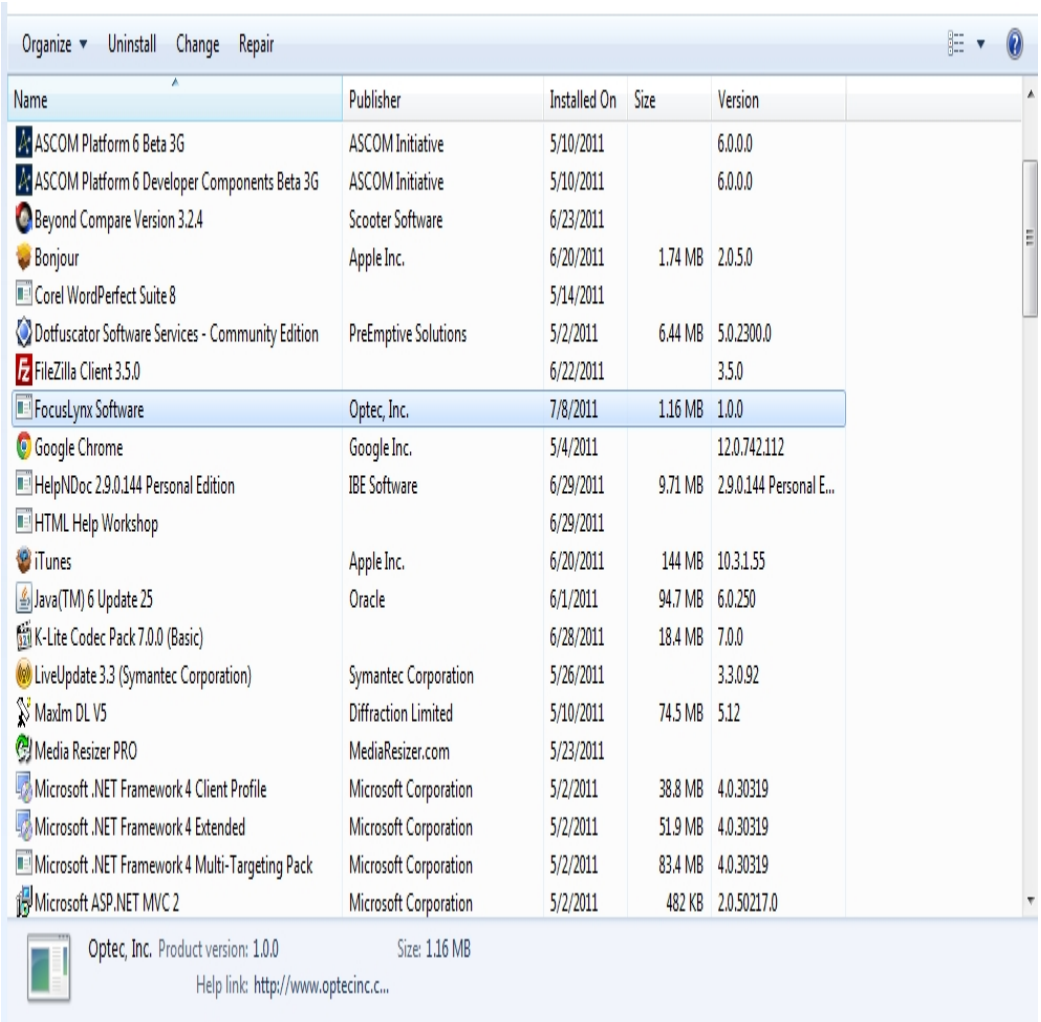
- **Open Connection** - Click the ***Connect*** button to open a connection to the device. When the connection is open, the same button will be labeled ***Disconnect*** and will disconnect you from the focuser hub when clicked.

Congratulations! Your focuser hub is ready to receive focuser commands directly from your terminal application!

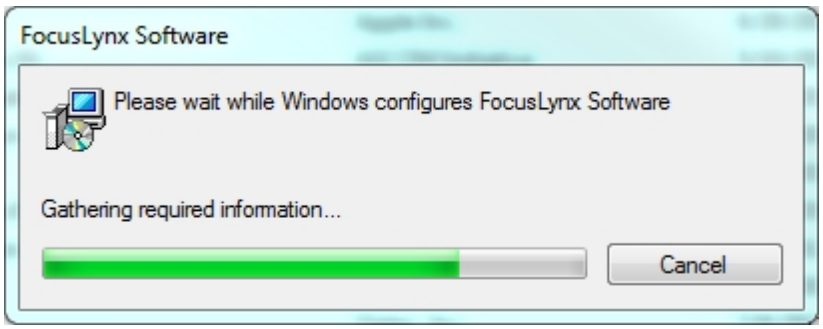
Section 1.5 - FocusLynx Commander Uninstallation Instructions

To uninstall the FocusLynx Commander control software, please follow these steps:

- Go to the ***Start*** menu, and click ***Control Panel***.
- Within the control panel, if you are running Windows 7 or Vista, click the ***Uninstall*** option to choose a program to uninstall. If you are running Windows XP, click ***Add/Remove Programs*** to choose a program to uninstall.



- Scroll through the list of programs to find ***FocusLynx Software***. If you are running Windows 7 or Vista, click ***Uninstall*** to open the uninstaller. If you are running Windows XP, click ***Change/Remove*** to open the uninstaller.



- Follow the prompts provided to uninstall FocusLynx Commander.

When the uninstaller has finished, FocusLynx Commander and the FocusLynx software drivers will have been removed from your computer.

Chapter 2: Operation Of Focusers With The FocusLynx

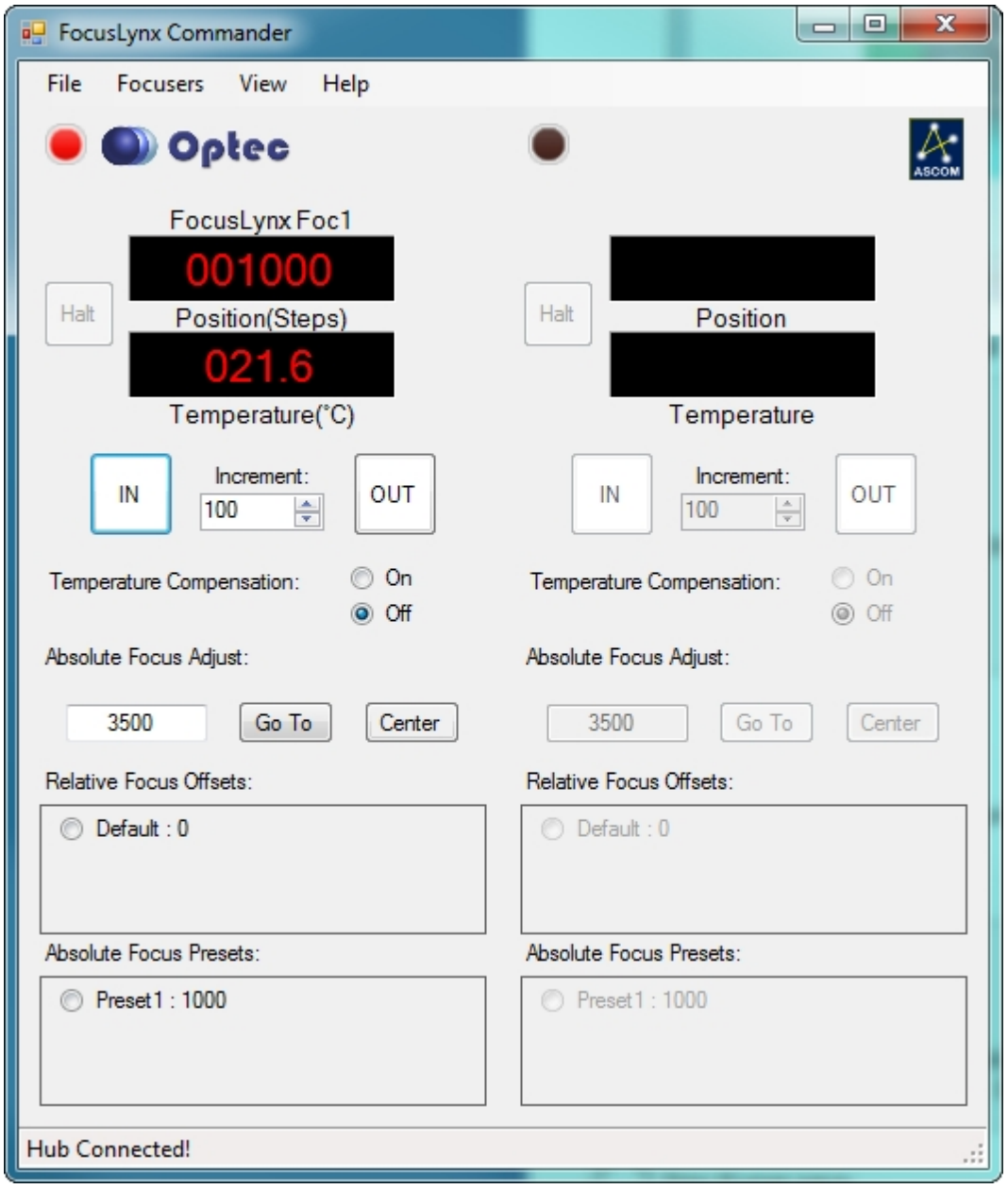
- FocusLynx Commander - Operating a focuser with the FocusLynx Commander software
  - Focus Presets And Offsets - How to add and remove focus offsets and presets
- Webpage Control - Operating a focuser with the FocusLynx control website
- Direct Serial Control - Operating a focuser manually by sending serial commands directly to the hub
- Accessories - Operating a focuser with Optec accessory items
  - FocusLynx Hand Control - Operating a focuser with the FocusLynx hand controller
  - TCF-S In/Out Remote - Operating a focuser with the TCF-S In/Out Remote

Section 2.1 - Operating Focusers With FocusLynx Commander

The FocusLynx Commander control software is the easiest and most user-friendly method for controlling a FocusLynx focuser hub with a Windows computer. Once you have installed FocusLynx Commander and configured it for connection with a focuser hub, you can use the following instructions to control a focuser:

Controlling Your Focuser

- **Plug In Your Focuser** - Ensure that there is a valid connection between your focuser and one of the two focuser ports on the FocusLynx.



- **Relative Move** - The ***In*** and ***Out*** buttons found below the position and temperature displays on the main Commander window can be used to move the focuser in and out, respectively. With each click, the focuser will move by the number of steps displayed in the ***Increment*** text box.

- **Adjust Increment** - To adjust the amount by which the Relative Move buttons move a focuser, enter a number (or use the up and down arrows) into the ***Increment*** text box that is located between the In and Out buttons.

- **Absolute Move** - To move the focuser to a specific location, use the ***Absolute Focus Adjust*** text box located below the temperature compensation toggle. Enter a number of steps into the text box, then click the ***Go To*** button to start the focuser moving. The number of steps must be between zero and the maximum number of steps for your focuser (you can find this in your focuser's documentation) or the move will not be allowed.

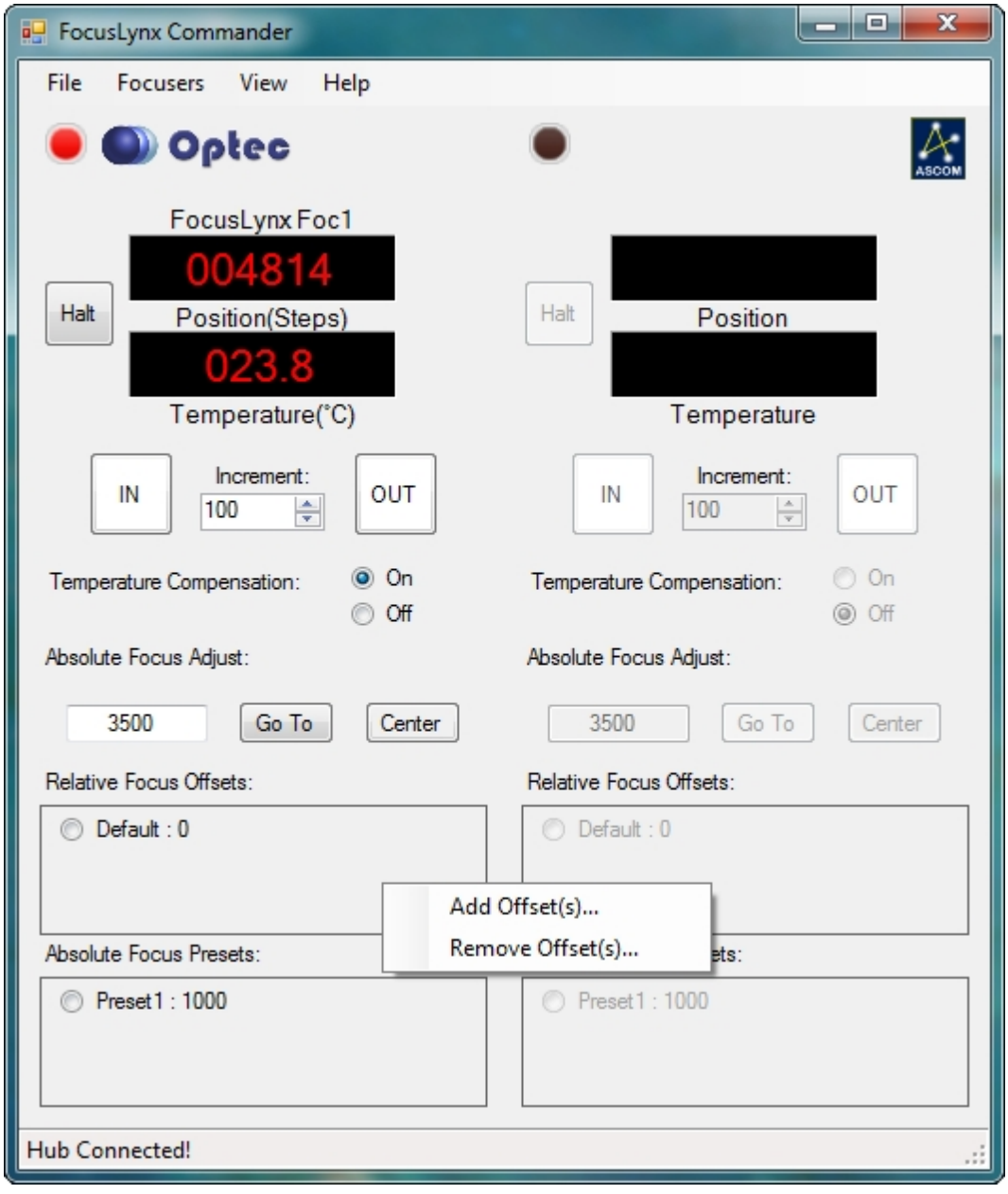
Note: With both relative and absolute moves, if you try to move beyond the physical limits of the focuser the program will stop you from doing so to prevent you from damaging the focuser. **This is why it is extremely important to ensure that you have configured your focuser type!**

- **Centering** - To move the focuser to the exact center of its travel, click the ***Center*** button. The focuser will automatically begin moving.

- **Halting** - To stop the focuser once it has begun moving, click the ***Halt*** button that is immediately to the left of the position and temperature displays.

- **Temperature Compensation** - If your focuser is capable of compensating for temperature variations and you properly set a compensation mode when you configured your focuser connection, you can use the ***Temperature Compensation*** buttons located below the Relative Move buttons to turn temperature compensation on or off. Unless you specify otherwise during focuser configuring, temperature compensation will be off by default.

Presets And Offsets

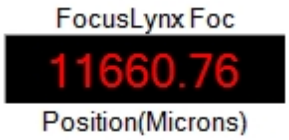


At the bottom of the window is a listing of all Relative Move Offsets and Absolute Move Presets. These tools allow you to preset a relative move distance or an absolute move position that can be quickly entered without changing the present values in the relative or absolute move text

boxes. To use a preset or offset, simply click it. Refer to Focus Presets And Offsets for information on setting offsets and presets.

Changing Display Units

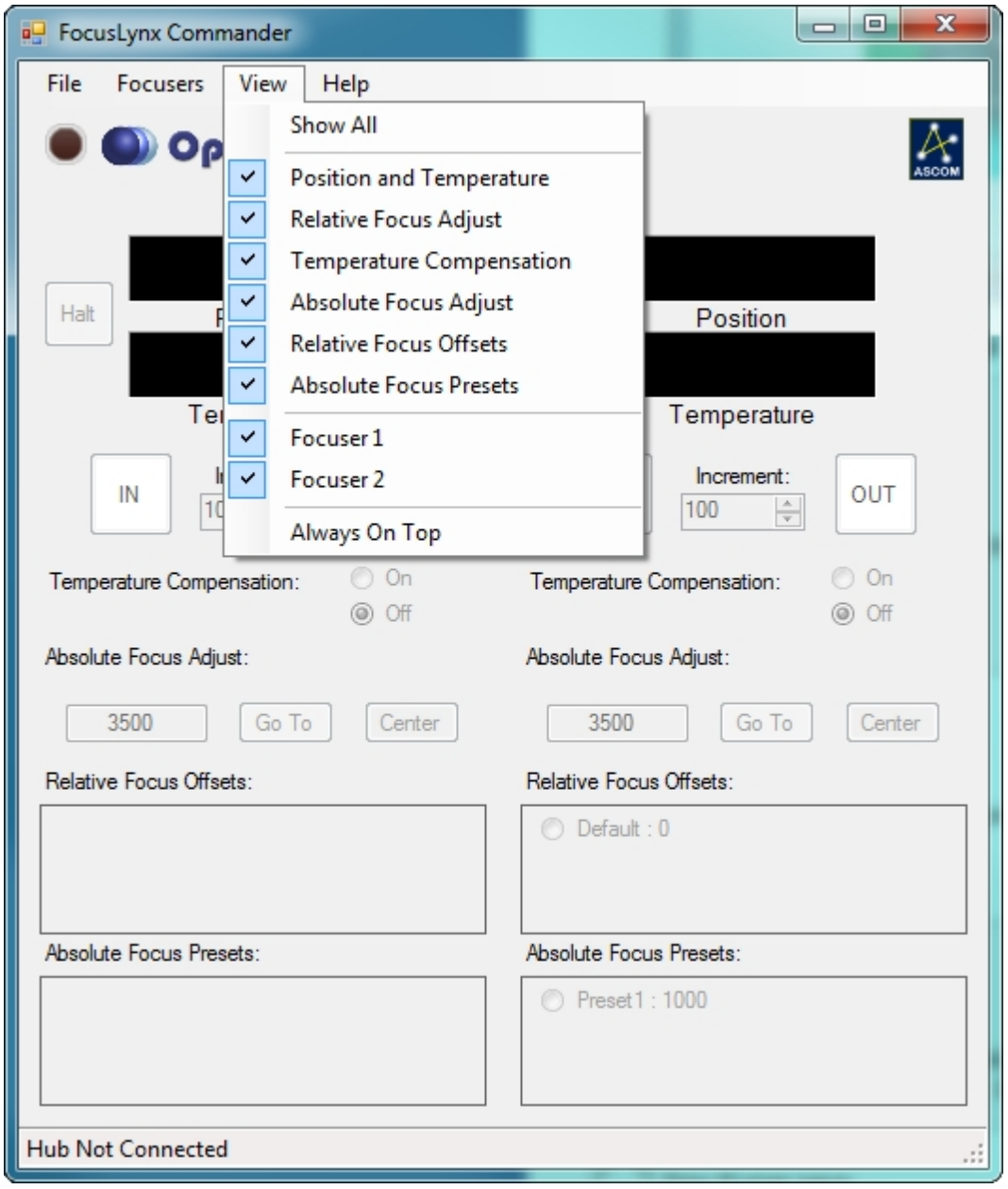
You can adjust the units of the position and temperature display for the focusers simply by clicking the respective quantity's display.



Position units can be switched between **steps** and **microns**.

Temperature units can be cycled between **Celsius**, **Fahrenheit**, and **Kelvin**.

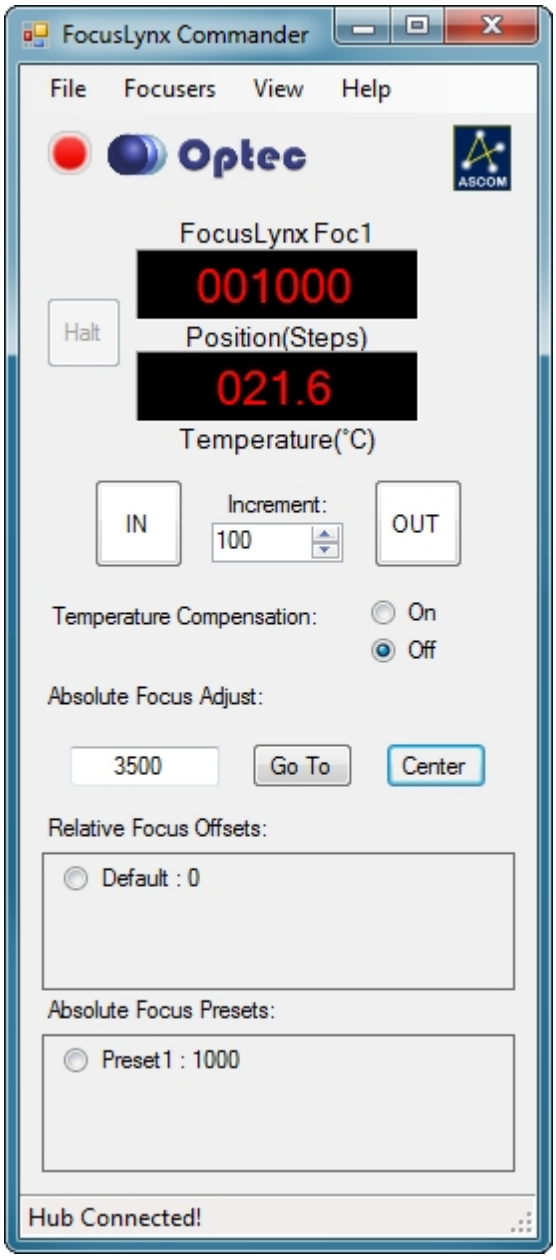
Adjusting The Display



Using the ***View*** menu on the main Commander page, you can select what focuser control information is visible to you. You can click on each item to toggle its display on or off, and use the ***Show All*** selection to return to the default setting of showing all possible items.

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

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



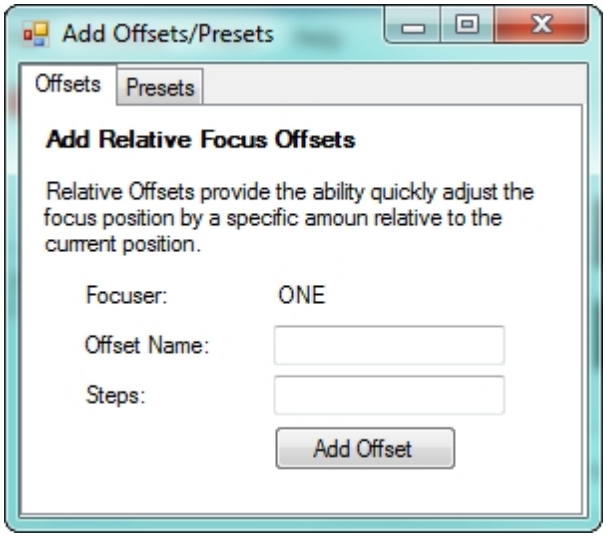
In addition to controlling display of general classes of information, you may control which of the two focusers' information is displayed on screen. You may choose to display information from one or both focusers. **You may not hide the display of both focusers**, as this would cause the Commander window to disappear!

Section 2.1.1 - Setting/Removing Focus Presets And Offsets

Undoubtedly, different instrument packages will have focuser positions that may be used time and time again to achieve prime focus. Therefore, FocusLynx Commander supports the use of Relative Focus Offsets and Absolute Focus Presets.

Setting Offsets

The purpose of the focus offset is to accommodate customers who are using the FocusLynx in conjunction with one or more filter wheels. When changing from one filter to another, a focus change is often required because the optical system does not always focus all wavelengths at the same focal plane. A small offset can be entered for each filter used.



- **Open The Add Offsets/Presets Window** - On the FocusLynx Commander main window, right-click anywhere within the ***Relative Focus Offsets*** list at the bottom of the window. Select the ***Add Offset(s)*** option. You may add as many offsets as you like from the same window.

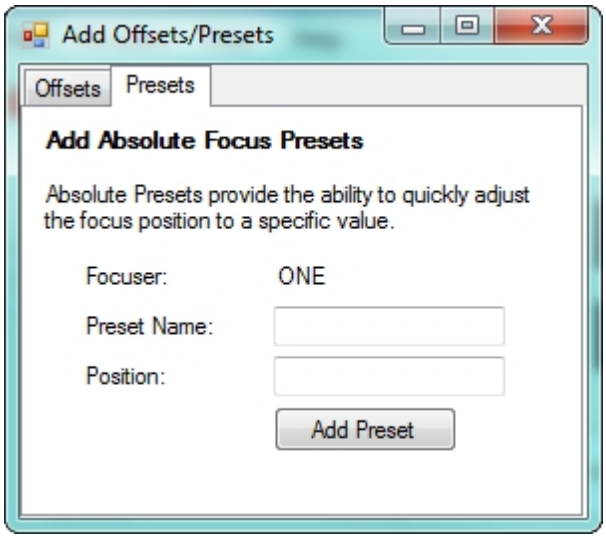
- **Add A Name** - Give the offset a name by filling in the ***Offset Name*** text box.

- **Add A Step Number** - Specify the number of steps associated with the offset by filling in the ***Steps*** text box.

- **Save Your Offset** - Click the ***Add Offset*** button to add your offset. The offset should appear in the ***Relative Focus Offsets*** list on the Commander main window.

Setting Presets

The purpose of these presets is to provide the user the ability to quickly change focus to a specific stored position. For example, if you know that your optical system focuses somewhere near 1000 steps, you may want to create an absolute focus preset at 1000. With such a preset, you may be able to shorten the time of a focusing routine by quickly moving close to your focus point before beginning the routine.



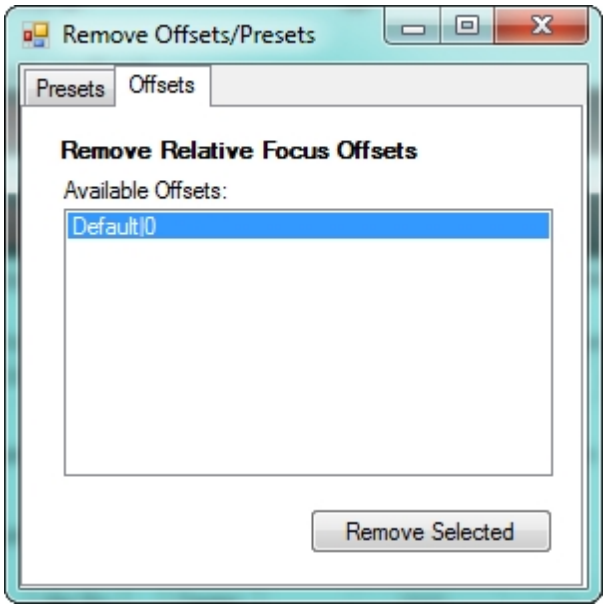
- **Open The Add Offsets/Presets Window** - On the FocusLynx Commander main window, right-click anywhere within the **Absolute Focus Presets** list at the bottom of the window. Select the ***Add Preset(s)*** option. You may add as many presets as you like from this window.

- **Add A Name** - Give the preset a name by filling in the ***Offset Name*** text box.

- **Add A Step Number** - Specify the position associated with the preset by filling in the ***Position*** text box.

- **Save Your Preset** - Click the ***Add Preset*** button to add your preset. The preset should appear in the ***Absolute Focus Presets*** list on the Commander main window.

Removing Offsets

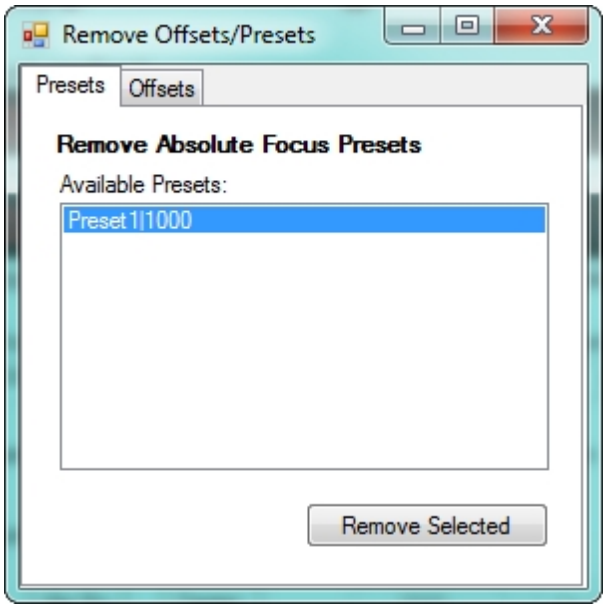


- **Open The Add Offsets/Presets Window** - On the FocusLynx Commander main window, right-click anywhere within the ***Relative Focus Offsets*** list at the bottom of the window. Select the ***Remove Offset(s)*** option.

- **Select The Offsets** - Select the offset you wish to remove by clicking on it in the ***Available Offsets*** list. Use *Ctrl+Click* to select multiple offsets from the list.

- **Remove The Offsets** - Remove the selected offsets by clicking the ***Remove Selected*** button.

Removing Presets



- **Open The Add Offsets/Presets Window** - On the FocusLynx Commander main window, right-click anywhere within the ***Absolute Focus Presets*** list at the bottom of the window. Select the ***Remove Preset(s)*** option.

- **Select The Presets** - Select the preset you wish to remove by clicking on it in the

Available Presets list. Use *Ctrl+Click* to select multiple presets from the list.

- **Remove The Presets** - Remove the selected presets by clicking the ***Remove Selected*** button.

Section 2.2 - Operating Focusers With The FocusLynx Control Website

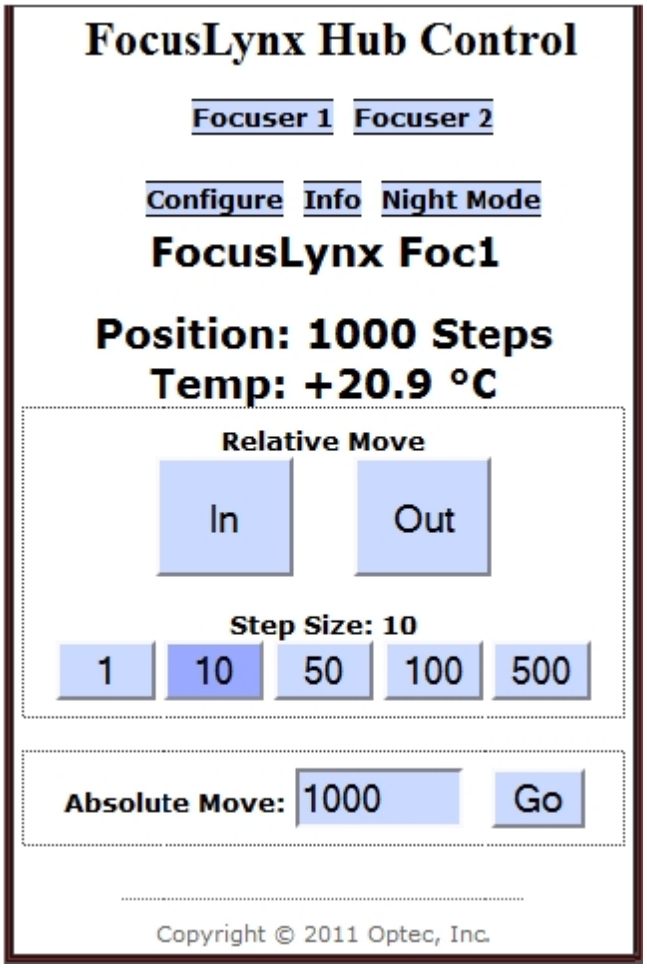
The FocusLynx control website offers an easy-to-use and quickly configurable alternative to the FocusLynx Commander control software for users with Ethernet and Wi-Fi connections.

Moreover, use of the webpage is not limited to Windows computers. The control website is equally usable on Mac or Linux computers. Also, the webpage been designed to accommodate **Android** and **iPhone** browsers, so controlling your focusers over Wi-Fi with these smartphones is now possible!

Controlling Your Focuser

To control a focuser over the webpage, follow these steps:

- **Plug In Your Focuser** - Ensure that there is a valid connection between your focuser and one of the two focuser ports on the FocusLynx.
- **Configure And Access The Webpage** - Follow the configuration directions in the Configuring Software section of this manual to connect to the hub over Ethernet or Wi-Fi to access the control website.



- **Go To A Focuser Page** - On any page of the website, use the links at the top of the page to go to the page for *Focuser 1* or *Focuser 2*, depending on which focuser you want to control.

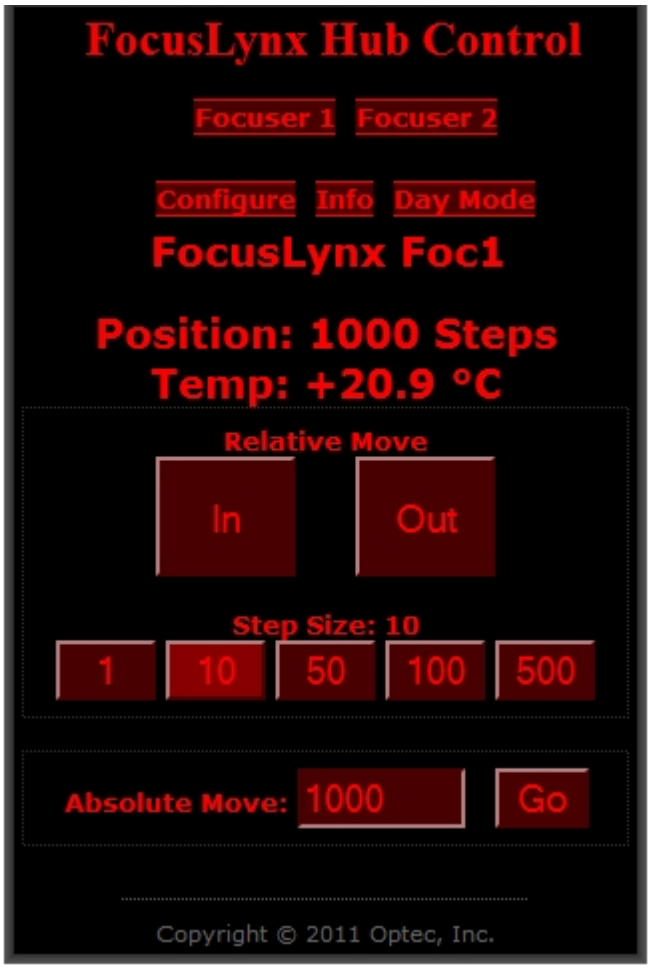
The page will now show some information about the focuser, including its user-defined nickname, position in travel (in steps), and temperature (if a temperature probe is attached). Below this information are two methods for controlling the focuser. With either method, if you try to move beyond the physical limits of the focuser the webpage will stop you from doing so to prevent you from damaging the focuser. **This is why it is extremely important to ensure that you have configured your focuser type before using the website!** The two control methods are:

- **Relative Move** - Use the large buttons labeled ***In*** and ***Out*** to move the focuser in and out by the amount specified on the step size display. If you try to move the focuser beyond its physical limits, the relative buttons will do nothing to prevent you from damaging your focuser.
    - **Adjust Step Size** - Each time a relative move button is clicked, the focuser will move by the number of steps given by the selected step size button. Click one of the ***step size*** buttons to adjust the step size to the length you desire.

-OR-

- **Absolute Move** - Enter a number (in steps) in the ***Absolute Move*** text box and click the ***Go*** button to move the focuser to that position.

Night Mode



As anyone who has spent a night observing with a computer will know, a bright, backlit screen is an excellent way to continuously ruin your night vision. Therefore, by clicking the ***Night Mode*** button on the top of the page, you can change the color scheme of the webpage to a darker, night-vision-friendly set of colors. Once in night mode, you can click the same button, now labeled ***Day Mode***, to switch back to the default color scheme.

Section 2.3 - Operating Focusers With Direct Serial Commands

The following instructions assume that you are using the **Optec Terminal Application**, available from the Optec website. If you are using another serial terminal application, the interface and commands should be very similar.

After opening a connection to the focuser hub, you should be able to send serial commands to the FocusLynx using the following instructions:

- **Plug In Your Focuser** - Ensure that there is a valid connection between your focuser and one of the two focuser ports on the FocusLynx.
- **Enter A Command** - Enter the command into the ***Transmit Data*** text box.
- **Send The Command** - When your command is finished, click the ***Send*** button or press the *Enter* key to send the command.

  Note: It is possible to send more than one command simultaneously! Just enter each command into the ***Transmit Data*** text box as you would a single command, and when you send them off, they will be executed in the order they were written.
- **Check The Response** - Within moments, a response (if any) will appear in the ***Received Data*** text box.
- **Clearing Responses** - To clear old responses out of your received data log, click the ***Clear*** button.

Note: With both relative and absolute moves, if you try to move beyond the physical limits of the focuser the focuser hub firmware will stop you from doing so to prevent you from damaging the focuser. **This is why it is extremely important to ensure that you have configured your focuser type!**

For a listing of serial commands accepted by the focuser hub, please visit the Command List page.

Section 2.4 - FocusLynx Accessories

In addition to control with a computer or smartphone, the FocusLynx and focusers connected to it are operable with handheld controls.

- FocusLynx Hand Control - Operating a focuser with the FocusLynx hand controller.
- Remote IN/OUT Keypad - Operating a focuser with the TCF-S In/Out Remote.

Section 2.4.1 - Using The FocusLynx Hand Control

The FocusLynx Hand Control is optionally available to allow control of the FocusLynx controller while at the telescope. The Hand Control provides a digital read-out and IN and OUT focus functionality. A MODE button is also provided to switch between the two available focusers. The Hand Control should be connected to the Hand Controller port of the FocusLynx control box using the supplied 4-pin coiled cable. Any telephone handset cable will work if a longer cord is desired.

The Hand Control can be plugged in or disconnected anytime without concern about damaging either the FocusLynx control box or the Hand Control. Using a serial protocol, the PIC in the Hand Control communicates with the main PIC in the FocusLynx box receiving position updates and sending new position requests. All position changes are instantly communicated to the control PC so that each display system is simultaneaously updated with the current focuser position.

The **FocusLynx Hand Control QuickStart Guide** describes the various functions of the hand control buttons and can be found on the Hand Control order page: http://www.optecinc.com/astronomy/catalog/focuslynx/19695.htm.

Section 2.4.2 - Using The TCF-S In/Out Remote

The ***FocusLynx*** focuser hub is fully backward-compatible with the original **TCF-S Remote IN/OUT Keypad** (Optec stock #17680). The **Remote IN/OUT Keypad** plugs directly into the 6-pin DIN temperature probe socket on the TCF-S focuser body in place of the temperature probe and is intended for visual use when temperature compensation is not required.

As with the original TCF-S implementation, the 2-button keypad is "hot-swappable" with the temperature probe used with the ***FocusLynx*** system. In fact, the **Remote IN/OUT Keypad** can be used to override any currently active movements effectively ensuring that you are always in complete control of your focuser when used in this "manual" mode.

Moreover, the ***FocusLynx*** control software and firmware have been designed to accommodate the **Remote IN/OUT Keypad** when used with the Starlight Instruments focuser cable splitter hub. Therefore, the computer-control programs for the ***FocusLynx*** will follow the movements ordered by the remote, thus ensuring that the focuser hub control systems remain in sync with the focuser's physical movements.

The **Remote IN/OUT Keypad** can be a lower cost alternative to the FocusLynx Hand Control add-on described above. TCF-S owners wishing to upgrade to the ***FocusLynx*** controller system can continue to use their existing keypads.

Chapter 3: FocusLynx FAQ & Troubleshooting

Please consult the topics in this chapter for answers to some of the most frequently asked questions about the FocusLynx focuser hub, as well as technical assistance and solutions to common problems you may experience with the FocusLynx.

- Hub Connection Issues - How to solve issues that may arise while trying to maintain a connection to your FocusLynx focuser hub
    - Configuring USB Converters - How to configure and troubleshoot your USB-to-Serial Converter
- HTML Help Viewer Display Issues - How to ensure that you can use the in-program FocusLynx Commander help file.
- Updating Firmware - How to update the software that runs on your focuser hub.
- Updating FocusLynx Commander - How to update the computer software that controls the focuser hub.

If your problem is not solved within this help file, please contact Optec directly and we will be happy to assist you.

- Contacting Optec Technical Support - How to ensure when contacting Optec for support that your problem is resolved as quickly as possible.
    - Accessing The Event Logger - How to configure, retrieve, and view FocusLynx Commander event logs.

Section 3.1 - FocusLynx Hub Connection Issues

If you experience issues getting connected or staying connected to your FocusLynx focuser hub, the following techniques may assist you in solving your connection problems:

- **Check Your Physical Connections** - The first step to diagnose any connection problem is to *check all connections*.
  - Ensure that the 12VDC power adapter included with your FocusLynx is plugged into both a wall outlet and the focuser hub and that the focuser hub is turned on.
  - If you are attempting to connect via serial or ethernet, ensure that the connection cable is properly plugged into both the hub and your computer.
  - If you are attempting to connect via Wi-Fi, ensure that your computer has a strong connection to the wireless network. Also note that unless you have purchased the **Wi-Fi Daughter Board** upgrade, you will not be able to connect via Wi-Fi.
- **Check Your Connection Settings** - Once all physical connections have been verified, the next most likely issue is with the connection configurations in your control software.
  - If you are attempting to connect via serial cable, ensure that your software is set to connect using the same port number that the focuser hub is plugged into. This port number is dependent on the specific serial plug that your cable is using. Also, if you are using a program other than FocusLynx Commander, ensure that the baud rate is set to **115200**.
  - If you attempting to connect via ethernet cable or Wi-Fi, ensure that you are connecting to the correct IP Address. Waiting a few minutes since your last connection attempt and clicking the ***Refresh IPs*** button on the *Setup* dialog of FocusLynx Commander should solve this problem.
  - Additionally, if you are attempting to connect via Wi-Fi, ensure that you are connected to the same network that the FocusLynx hub is configured for. If you have not specifically defined another network for the hub to connect to, the network you must use is called ***FocusLynxConfig***.
  - If you are using a USB-to-Serial Port Converter, ensure that it is configured correctly by following the instructions in the Configuring USB Converters section of this manual.
- **Try Another Connection Method** - If all else fails and you find yourself unable to connect to your hub using your preferred method, we suggest attempting to use one of the many other methods (serial instead of ethernet, webpage Wi-Fi instead of FocusLynx Commander Wi-Fi, etc.) described in the Configuring Software section of this manual to connect to your focuser. *Whether trying a new method works or not, you will have gained valuable*

knowledge. If you succeed in maintaining a connection with another method, then you know how to solve your problem. If not, you know that the cause of this problem is not specific to a connection method and is more likely systemic in nature.

If your problem is not resolved by following these steps, then it is highly recommend that you Contact Optec directly for assistance.

Section 3.1.1 - Configuring USB-To-Serial Converters

If you are using a USB-to-Serial port converter to provide a serial connection, one of the first problem you may encounter is trying to determine which COM port is assigned to the converter. The instructions below provide the easiest way to install the converter drivers and configure the USB-to-Serial port converter. To display the Device Manager in Windows, click ***Control Panel*** on the ***Start*** menu, or right-click on the ***My Computer*** icon and select ***Manage***. Select ***Device Manager*** under *System Tools*.

- **Remove Old Drivers** - Before plugging your new converter into your computer, make sure that any existing old drivers for the FTDI chips set have been removed. Do this by going to the Add/Remove Programs in the Control Panel and find any listing of *FTDI drivers* and remove it. If you have any older USB-to-Serial Converters using the FTDI chip set, you can remove them now.

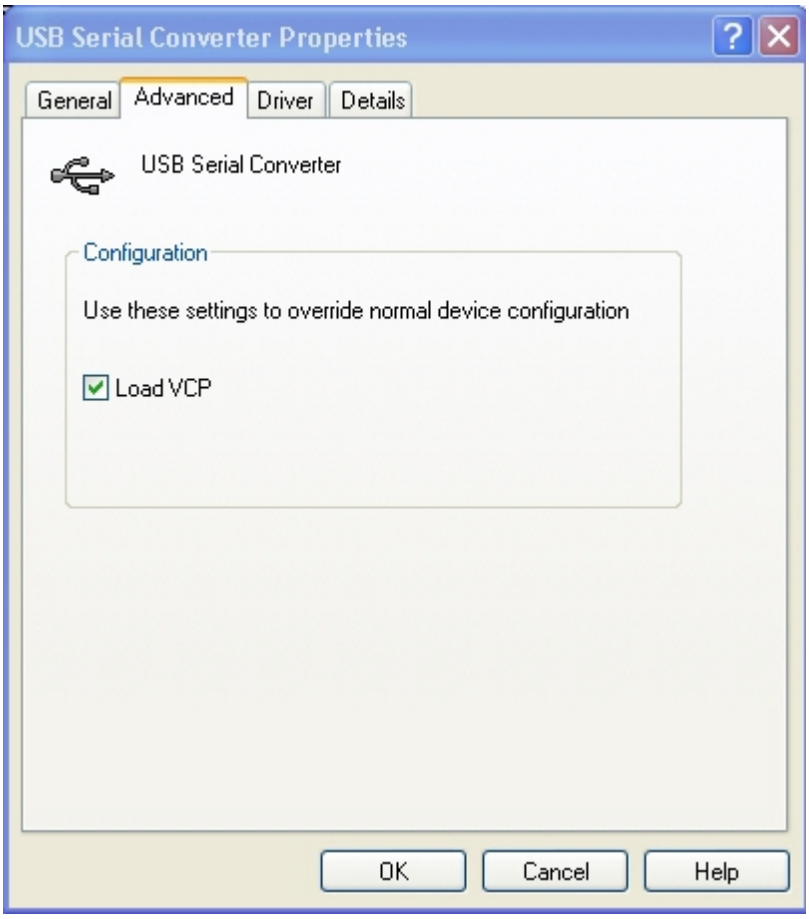
- **Download And Install New Drivers** - From the Optec Install disk or from the Optec Downloads page, at download and run the FTDI driver executable setup program. This setup program is compatible with Windows XP, Vista, and 7. You will not see any message if the program loads successfully.

- **Plug In Your Converter** - After running the setup program, you can now plug in one of your FTDI chip set USB-to-Serial converters.

- **Open Device Manager** - To find the COM number that was selected for each USB-to-Serial converter, go to your Device Manager by clicking the ***Control Panel*** option on the ***Start*** menu, and selecting ***Hardware and Sound***, followed by ***Devices and Printers -> Device Manager***.

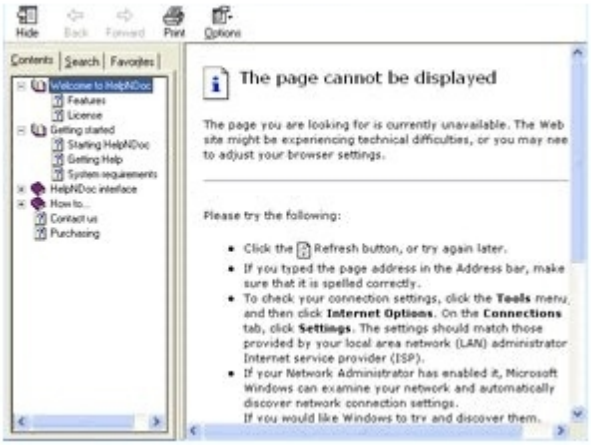
- **Find The Converter Port** - Browse the list of devices to see the COM port number listed under ***Ports (COM & LPT)***. In the diagram above, the USB-to-Serial Converter is using port COM7. You can then plug your other converters in one at a time to see which COM numbers have been selected for those.

- **Additional Modification May Be Necessary** - If you purchased your converter from Optec before July 2007, you may have to modify an additional setting. If you do not see the COM port number in the Device Manager screen as above, but do see messages that indicated that the USB-to-Serial converter is installed and ready, then right-click the ***USB Serial Port*** device and select ***Properties***.



- **Check The Checkbox** - Select the ***Advanced*** tab in the properties window and check the ***Load VCP*** box. Unplug the USB-to-Serial converter and then plug it back in. You should see the COM port number appear under Ports. This will affect all converters connected to the computer.

Section 3.2 - HTML Help Viewer Display Issues



If the Help Viewer used by FocusLynx Commander 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 FocusLynx.chm file in your FocusLynx Commander 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 3.3 - Updating Firmware

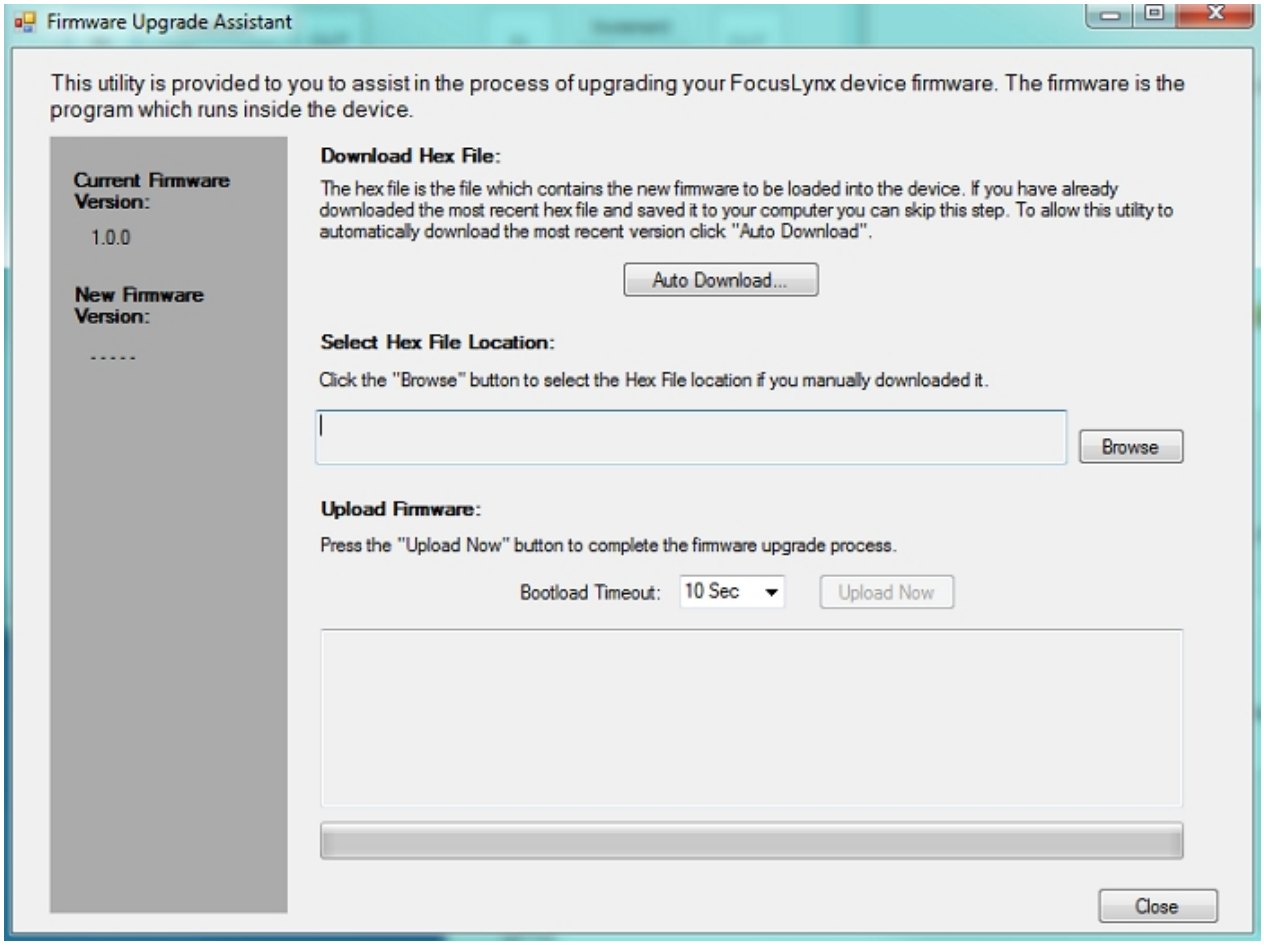
Firmware, as differentiated from software, is the set of programs loaded directly onto the FocusLynx focuser hub's internal microprocessor in order to enable the hub to perform all of the functions that it needs to perform.

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 days for it to be returned. However, the FocusLynx eliminates this hassle by allowing you to upgrade your firmware directly through the FocusLynx Commander control software.

WARNING! If you have recently updated your FocusLynx focuser hub firmware, we highly recommend updating your software as well to ensure that your FocusLynx works properly.

To upgrade your firmware:

- **Connect Your Hub** - Ensure that your FocusLynx focuser hub is connected via an **RS-232 Serial** connection.
- **Open The Firmware Upgrade Wizard** - In FocusLynx 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 FocusLynx 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 to upload the new firmware to your focuser hub.

- **Return To The Main Window** - When you are finished uploading, click the ***Close*** button to return to the main FocusLynx Commander window.

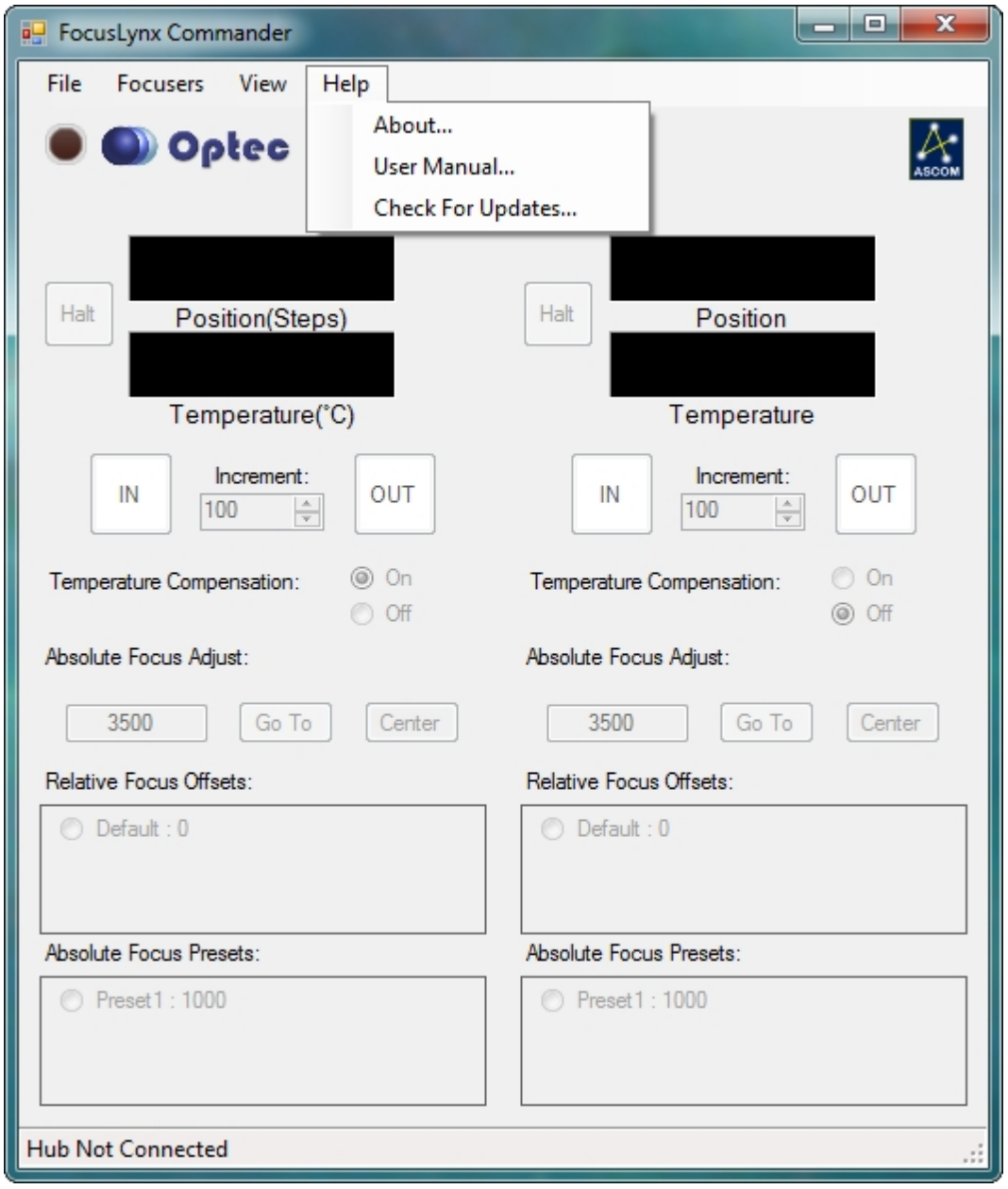
Section 3.4 - Updating FocusLynx Software

WARNING! If you have recently updated your FocusLynx focuser hub firmware, we highly recommend updating your software as well to ensure that your FocusLynx works properly.

In order to ensure the best possible experience with your FocusLynx, you should do your best to keep your FocusLynx Commander software up to date. To do this, you can either:

- **Go To The Optec Website** - We will always make the latest version of FocusLynx Commander and its associated drivers available for download on our Downloads page.

-OR-



- **Check For Updates** - Within FocusLynx Commander, access the ***Help*** menu and click the ***Check For Updates*** option to determine if you need updates. If there is a newer version of the FocusLynx software package available, you may choose to download and install it or not.

Section 3.5 - Contacting Optec Technical Support

If you encounter any problems, errors, or questions about using the FocusLynx focuser hub 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 FocusLynx Commander, you should retrieve a verbatim copy of the error message.
- **Error Logs** - If your problem is related to FocusLynx Commander, you should retrieve your Error Logs as directed in the Accessing The Event Logger section of the manual.
- **Focuser Hub Firmware Version** - The firmware version number can be found by opening the ***Firmware Upgrade Assistant*** in FocusLynx Commander, or by sending a ***GETHUBINFO*** command through a serial terminal application.
- **Focuser Type** - If the problem you are having relates to the use of or connection to a focuser with the hub, you should know the manufacturer and model of your focuser.

Section 3.5.1 - Accessing And Configuring The FocusLynx Commander Event Logger

While using FocusLynx Commander, if the program encounters any sort of problem, it will notify you with an error message describing the problem. If this problem is consistently and preventing you from using the program the way you need to use it, we highly recommend contacting Optec Technical Support for assistance.

FocusLynx Commander has been programmed with the capability to log every major event that occurs during normal program operations, as well as the full details of every error that is capable of occurring.

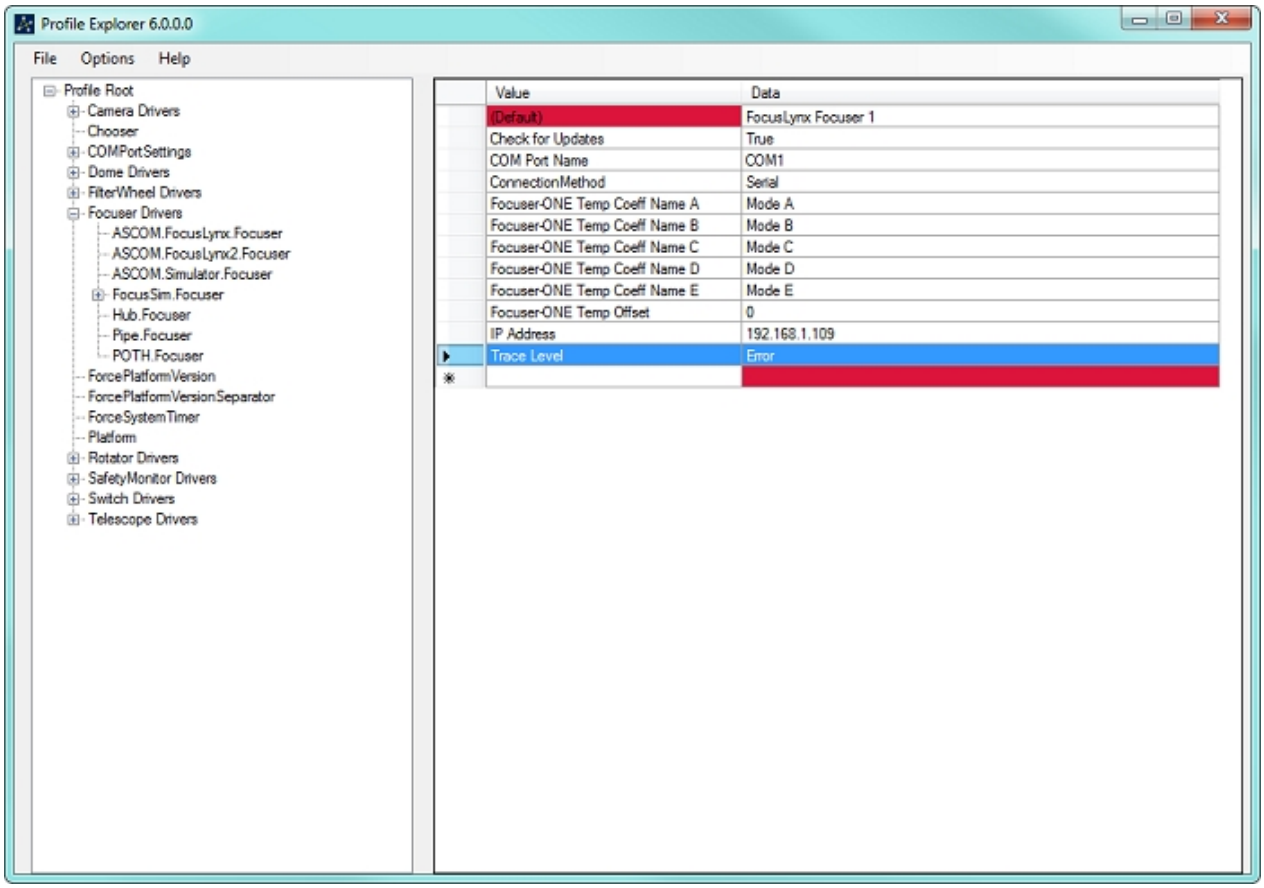
When preparing to contact Optec for support, having your FocusLynx Commander error log at the ready and, if possible, sending that log to Optec can greatly increase our ability to solve your your problem quickly and completely.

If you are contacting Optec for support, we also recommend following the other guidelines outlined in the Contacting Optec Technical Support section of this manual.

Configuring Event Logging

By default, the FocusLynx Commander event logger will only log major errors. However, the logger can be configured to include more mundane events in its logging, or to remove all events completely.

- **Open ASCOM Profile Explorer** - Incuded with the ASCOM driver package required to run FocusLynx Commander is a program called *ASCOM Profile Explorer*. Open this program now.



- **Find The FocusLynx Profile** - On the left side of the explorer window, you should see a listing of all ASCOM profiles on your computer. Click ***Focuser Drivers*** to expand it into a listing of all ASCOM focuser drivers. Select ***ASCOM.FocusLynx.Focuser*** to view the FocusLynx focuser profile.

- **Find The Trace Level Setting** - On the right side of the window is a display of all settings stored in the FocusLynx profile. The ***Trace Level*** setting is located near the bottom and specifies what events are logged by the event logger. This setting is set to ***Error*** by default.

- **Change The Setting** - If you wish to adjust your event logging, you may double-click the ***Data*** column of the profile display to edit the ***Trace Level*** setting. Settings will be saved without any other action by the user. The trace levels are:

    - **Off** - No events are logged.

    - **Error** - Only major errors are logged. This is the default setting.

    - **Warning** - Major and minor errors and warnings are all logged by the event logger.

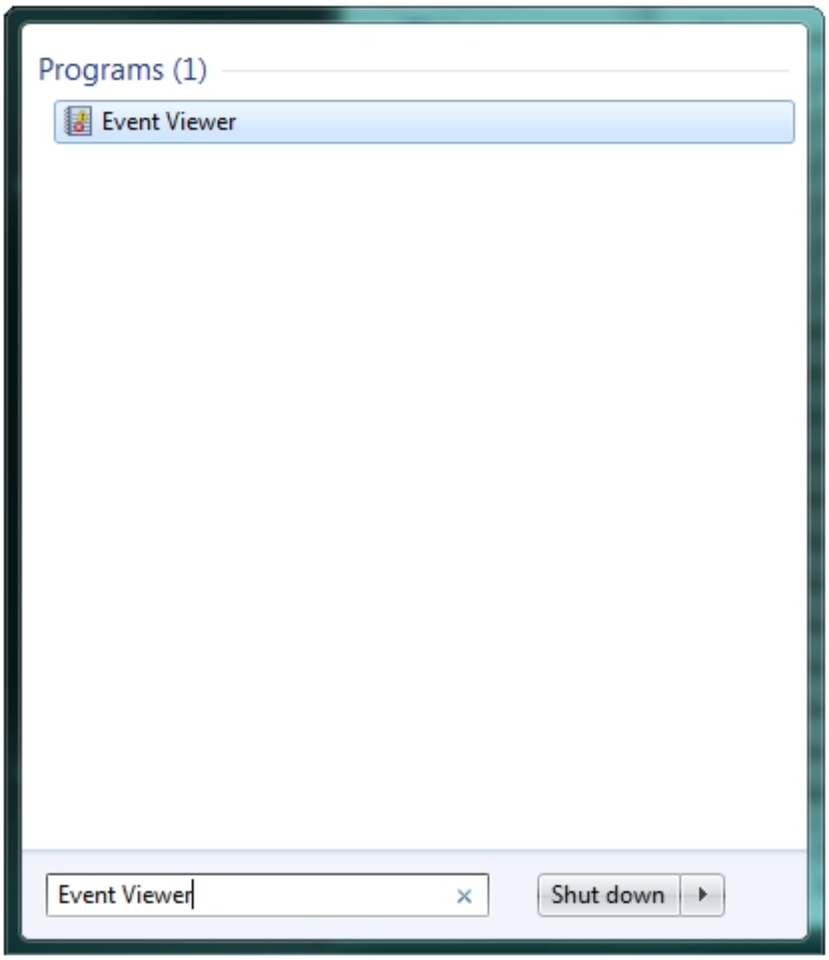
    - **Info** - Most, but not all, events are logged. Basic and repeatedly performed tasks such as retrieval of hub status/configuration information are excluded.

    - **Verbose** - All events are logged. **Note**: Setting the trace level to Verbose will cause significant slowdown of technical support, as even one use of FocusLynx Commander will generate many events, all of which must be searched for problems.

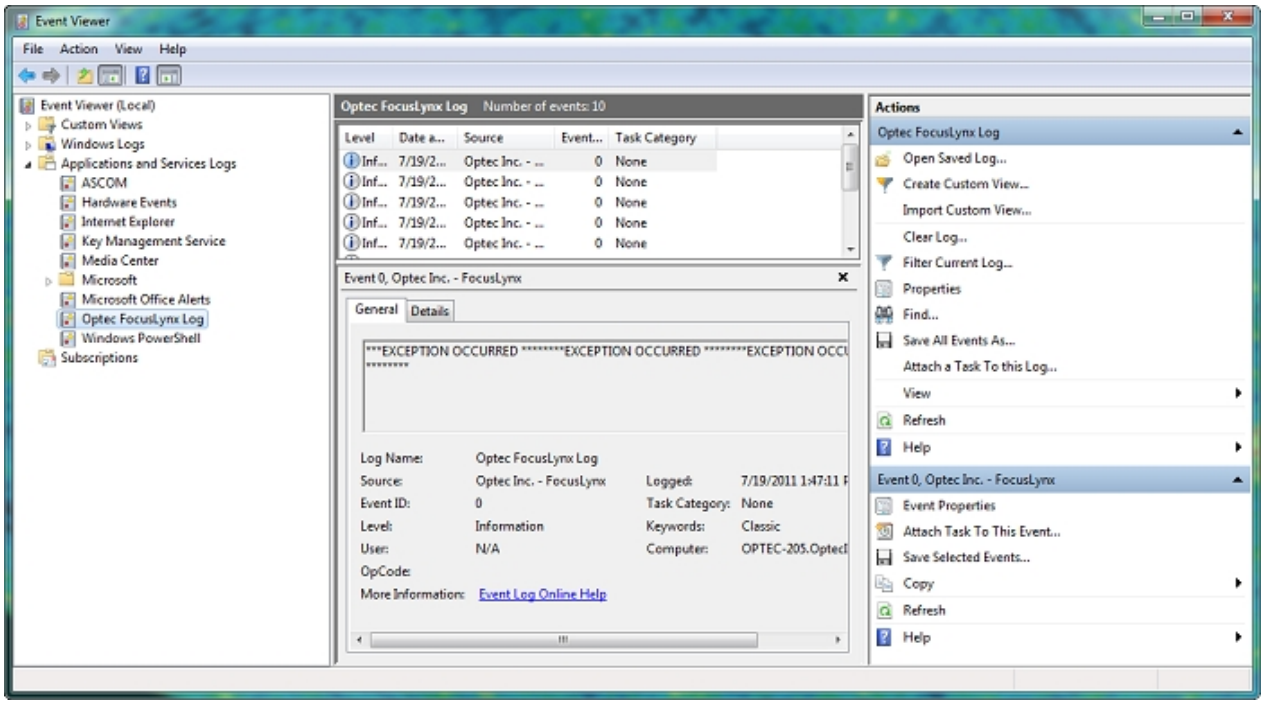
Accessing Event Logs

Events logged by the event logger are stored in the Windows ***Event Viewer*** utility.

To access FocusLynx event logs in the event viewer:



- **Open Event Viewer** - Windows Vista and 7 users can find the Event Viewer can be found by searching in the ***Start*** menu for *Event Viewer*. Windows XP users must go to



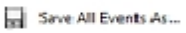
- **Open Application Logs** - On the left side of the viewer, a listing of all classes of events can be found. Click the ***Applications And Services Logs*** folder to open it.

- **Find FocusLynx Logs** - In this folder, the FocusLynx Commander event log can be found under the title ***Optec FocusLynx Log***. Click on this log to open it.

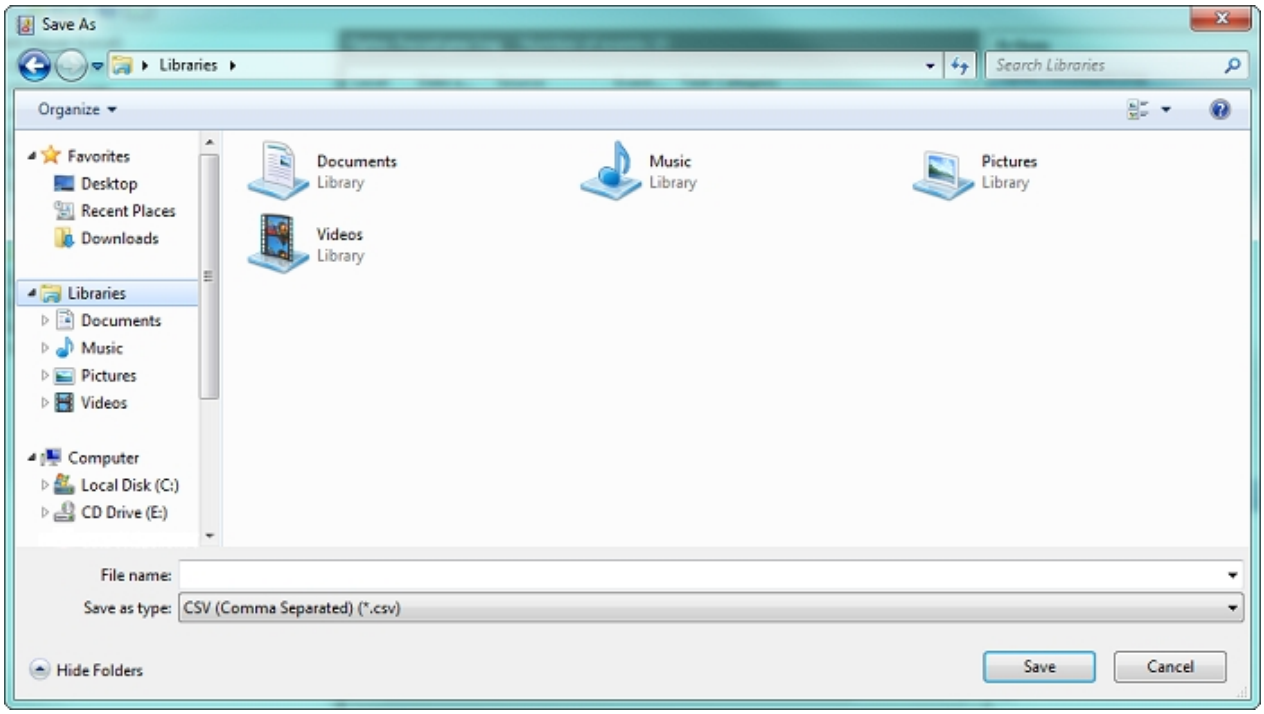
- **View Events** - Now, the full list of FocusLynx Commander events is viewable in the center portion of the Event Viewer window. By default, the events are organized chronologically from newest to oldest.

Saving Event Logs

- **Open The Event Viewer** - Follow the previously described steps to open your Windows Event Viewer and access the FocusLynx event log.



- **Save Events** - Click the ***Save All Events As...*** button on the right side of the Event Viewer to open a *Save As* dialog.



- **Save Events As A CSV** - Using the ***Save As Type*** drop-down selection, choose the **.csv** file extension. Choose a location to save the event log, and click ***Save*** to save it.

Chapter 4: FocusLynx Reference

- System Requirements - Required software and hardware for use of FocusLynx Commander and the FocusLynx control website.
- Hardware - Physical characteristics the FocusLynx focuser hub.
- Supported Devices - Focusers currently supported by the FocusLynx focuser hub.
- Command List - Listing of commands usable to directly communicate with the FocusLynx via a serial connection.
- Error List - Listing of errors that may be returned during direct serial communication.

Section 4.1 - System Requirements

FocusLynx Commander

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

- Windows XP, Vista, or Windows 7
- ASCOM Platform 6.0 or later
- Microsoft .NET Framework 3.5 or later

FocusLynx Commander is a very lightweight program, so if your computer meets the minimum system requirements for the software listed above, you should have no problem using FocusLynx Commander.

FocusLynx Commander requires less than **5 MB** of hard drive space.

If you are unsure of whether you have the correct .NET Framework and/or ASCOM Platform installed, simply run the installer for FocusLynx Commander. The installer will automatically search your system for the required components and provide a link where you can download any that are missing.

Control Website

To run the webpage-based controls for the FocusLynx hub, all you need is an updated version of one of the following supported browsers and a wireless or wired ethernet connection to the hub.

The FocusLynx control website is supported on the following browsers:

- Internet Explorer
- Mozilla Firefox
- Google Chrome
- Safari (in both Mac OS X and iOS)
- Opera
- Android Browser
- iPhone Browser

Power Connection

The FocusLynx focuser hub requires 12VDC to function properly. A suitable power power supply is provided with every controller purchase. Please contact Optec, Inc in the event that you require a replacement power supply.

Data Connections

There are three options for establishing the data communication link between your PC and the FocusLynx hub: standard RS-232 serial, wired Ethernet, and wireless Ethernet via Wi-Fi (requires purchase of the Wi-Fi optional board). See the Hardware reference for details.

Section 4.2 - FocusLynx Hardware

The FocusLynx hardware is simply designed and straightforward to use. The FocusLynx Hub box has reserved one end exclusively for **control** connections and the opposite end reserved entirely for **focuser** connections.

Dimensions

- 5.01 x 3.21 x 1.05 inches
- 12.73 x 8.15 x 2.67 cm

Focuser Connections

- **Focuser 1** - Allows connection to one focuser with a *CAT-5E* Ethernet cable (not included). Within the FocusLynx controls and this manual, the focuser plugged into this port will always be referred to as *Focuser 1*.
- **Focuser 2** - Allows connection to one focuser with a *CAT-5E* Ethernet cable (not included). Within the FocusLynx controls and this manual, the focuser plugged into this port will always be referred to as *Focuser 2*.

Control Connections

- **12VDC** - Power connection for the FocusLynx. Connect your included 12VDC power adapter here.
- **Network** - Allows connection with a standard *CAT-5E* Ethernet cable (not included) to a computer. This allows FocusLynx Commander or Webpage control.
- **Hand Control** - Allows connection via RS-232 serial cable (not included) to the soon-to-be-released FocusLynx Hand Controller, allowing portable handheld control.
- **Serial** - Allows connection via RS-232 serial cable (not included) to a computer. This allows FocusLynx Commander or Direct Command control.

Microprocessors

- **Main Board** - Microchip PIC24HJ128GP 204-I/PT
- **Wi-Fi Daughter Board** - Microchip PIC24HJ128GP 202-I/SP

Section 4.3 - Supported Devices

The FocusLynx focuser hub currently supports the focusers listed on this page. This device listing can also be found in Appendix A of the Command Guide. While your focuser may still be usable with the focuser hub if it is not supported, there is a very high risk of **severe, permanent focuser damage** if you choose to use an unsupported focuser. Listed after each focuser type is the **device type code** used by the direct serial command set to represent this focuser. The focusers supported by the FocusLynx are:

- Optec TCF-S 2" - Code **OA**
- Optec TCF-S3 3" - Code **OB**
- Optec TCF-S 2" with Extended Travel - Code **OC**
- Optec Fast Focus (EdgeHD) for 11" Telescopes - Code **OD**
- Starlight Focuser FTF2008BCR - Code **SA**
- Starlight Focuser FTF2015BCR - Code **SB**
- Starlight Focuser FTF2020BCR - Code **SC**
- Starlight Focuser FTF2025 - Code **SD**
- Starlight Focuser FTF2515B-A - Code **SE**
- Starlight Focuser FTF2525B-A - Code **SF**
- Starlight Focuser FTF2535B-A - Code **SG**
- Starlight Focuser FTF3015B-A - Code **SH**
- Starlight Focuser FTF3025B-A - Code **SI**
- Starlight Focuser FTF3035B-A - Code **SJ**
- Starlight Focuser FTF3515B-A - Code **SK**
- Starlight Focuser FTF3545B-A - Code **SL**
- Starlight Focuser AP27FOC3E - Code **SM**
- Starlight Focuser AP4FOC3E - Code **SN**

Section 4.4 - Command List

When connected to the FocusLynx with a direct serial connection, you must use a set of specific commands to control the hub and any focusers attached to it. The basic structure of each command is as follows:

- Each command begins with a <, called the **start character**. If you do not remember to place this character, the focuser hub will not know that you are trying to send it a command.
- The second character of every command is F. This, too, tells the focuser hub that you are sending it a command.
- The third character will always be either 1, 2, or H. Taken together, the second and third characters will then show F1 (**Focuser 1**), F2 (**Focuser 2**), or FH (**Focuser Hub**), thus telling the FocusLynx what device this command is targeting.
- The **command text** comes after the device target and will vary widely according to which command is needed.
- All commands must end with a >, called the **end character**. If you do not remember to place this character, the focuser hub will not know that your command is finished and will keep waiting for more data.
- Each command can be no more than 23 characters long, including those described above

This is the basic structure common to each command. However, the format of the command text varies greatly according to what you want to tell the focuser to do. For a full description of each command, please consult the Command Guide. For a short summary of each command's purpose, find the command text you are looking for on the list below. If you receive errors in response to your commands, please consult the Error List in this document or contact Optec for assistance.

Command List:

- <F*x*HELLO> - ask focuser number *x* to 'say hello' by responding with its user-defined nickname.
- <F*x*HALT> - causes focuser number *x* to halt its motion and disable temperature compensation.
- <F*x*HOME> - causes focuser number *x* to begin its homing routine.
- <F*x*CENTER> - causes focuser number *x* to move to the center of its travel.
- <F*x*MA*z*> - causes focuser number *x* to move to absolute position *z*, measured in steps. *z*

must be a 6-digit number (i.e. 000100 instead of 100).

- <F*x*MIR*z*> - causes focuser number *x* to begin a relative move inward until it reaches the end of its travel or is told to stop. *z* must be 0 or 1, and tells the focuser to move at high or low speed, respectively.

- <F*x*MOR*z*> - causes focuser number *x* to begin a relative move outward until it reaches the end of its travel or is told to stop. *z* must be 0 or 1, and tells the focuser to move at high or low speed, respectively.

- <F*x*ERM> - tells focuser number *x* to stop an inward or outward relative move.

- <F*x*GETSTATUS> - gets status information about focuser number *x*, such as current position, temperature, target position, etc.

- <F*x*GETCONFIG> - gets configuration information about focuser number *x*, such as focuser nickname, maximum allowable position, focuser type, etc.

- <FHGETHUBINFO> - gets information about the focuser hub, such as its firmware version, wireless network information, whether the Wi-Fi Daughter Board is attached, etc.

- <F*x*SCNN*z*> - sets a custom nickname *z* for focuser number *x*. *z* must be at most 16 characters in length.

- <F*x*SCDT*z*> - sets focuser number *x* to be classified as device type *z*. *z* consists of a unique, two-character code specific to every supported focuser type. These codes are given on the Supported Devices page.

- <FxSCCPzzzzzz> - sets focuser number x current position to the position passed in zzzzzz. This command is only usable with focusers that are incapable of homing.

- <F*x*SCTE*z*> - enables or disables the temperature compensation for focuser number *x*. If *z=1*, temperature compensation is enabled. If *z=0*, temperature compensation is disabled.

- <F*x*SCTM*z*> - sets focuser number *x* to temperature compensate according to a pre-saved compensation mode designated by *z*. *z* is a capital letter between A and E.

- <F*x*SCTC*msz*> - sets temperature mode *m* for focuser number *x* to the temperature coefficient specified by *s* and *z*. *m* is a capital letter between A and E. *s* represents the sign of the coefficient, and must therefore be + or -. *z* is a four-digit number representing the temperature coefficient in steps per degree.

- <F*x*SCTS*z*> - enables or disables temperature compensation being activated on startup for focuser number *x*. *z=1* enables startup compensation. *z=0* disables startup compensation.

- <F*x*SCBE*z*> - enables or disables backlash compensation for focuser number *x*. *z=1* enables backlash compensation. *z=0* disables backlash compensation.

- <F*x*SCBS*zz*> - sets the number of backlash compensation steps to *z* and the direction of backlash compensation to *s* for focuser number *x*. *zz* is a two-digit number of compensation steps.

- <FHSCLB*z*> - sets the brightness of the power indication LED on the focuser hub to *z*, where *z* is a three-digit number from 0 to 100. A value of 0 will turn the LED off.

- <F*x*RESET> - resets the configuration and status information for focuser number *x* to

factory defaults.

Note: The following commands allow you to connect the focuser hub to a new Wi-Fi network. Each submission of information will be stored, but will not be submitted until the **Push Wi-Fi Settings** command is sent. Before pushing your settings, you must input all necessary information about the Wi-Fi network. So, if you want to change the Wi-Fi SSID, you must also input a security type (and security key and WEP Index if necessary), even if this information has not changed!

- <FHSWSS*nz*> - sets segment number *n* of the Wi-Fi network's SSID to *z*. An SSID (i.e. network name)can be up to 32 characters long, but since *z* is limited to 16 characters, the SSID must be transferred in segments. The segment number *n* can be either 0 or 1, representing characters 1-16 and 17-32, respectively.

- <FHSWSM*z*> - sets the Wi-Fi security mode to *z*. *z* is a code representing a security mode and must be a capital letter between A and E. From A to E, the codes represent: Open (No Security), WPA w/ Passphrase, WPA w/ Key, WEP-40, and WEP-104.

- <FHSWSK*nz*> - sets segment number *n* of the Wi-Fi network's security key to *z*. A security key can be up to 64 characters long, but since *z* is limited to 16 characters, the key must be transferred in segments. The segment number *n* can be 0, 1, 2, or 3, representing characters 1-16, 17-32, 33-48, and 49-64, respectively.

- <FHSWWI*z*> - sets the Wi-Fi WEP security key index to *z*. *z* can be a number between 1 and 4 and is determined when the wireless network security is initially configured.

- <FHSWPS> - instructs the focuser hub to **push Wi-Fi settings**. The hub will save and apply the Wi-Fi settings stored by the previous four commands. This command **must** be sent in order to change the Wi-Fi network to which the FocusLynx is connecting.

- <FHWIFIRESET> - instructs the focuser hub to restart the Wi-Fi Daughter Board.

- <FHWIFIDEFAULTS> - instructs the focuser hub to reset its Wi-Fi connection settings to the defaults that are used every time the hub is turned on.

Section 4.5 - Error List

This section is a short listing of all errors that may be returned as a response to one of the direct serial commands described on the Command List, as well as common solutions to those errors. If you are having trouble finding the cause of the error code you have received, please contact Optec for assistance. Possible errors returned by the FocusLynx focuser hub are as follows:

- **ER=1 Unacceptable Parameter Received In Command** - This error means that one of the parameters in your command was not what the focuser hub expected. The actual problem may vary widely depending on the command in question, and could be anything from an unusable character to a parameter that is shorter or longer than expected, or something entirely different.

- **ER=2 Received Command Was Too Long** - This error occurs when the command as a whole is over the maximum size of 25 characters in length. Check your parameters to make sure they are no longer than 16 characters and try again.

- **ER=3 Unknown Command Was Received** - This error occurs when the command code (i.e. FHGETHUBINFO or F1MA) is not recognizable by the focuser hub. Most likely, this is due to a typo in your command.

- **ER=4 Cannot Execute Command While Device Is Moving** - This error occurs because certain commands cannot be issued while a focuser is in motion. Wait until the focuser finishes moving and try again.

- **ER=5 Cannot Execute Command While Device IS Sleeping** - This error occurs because most focuser commands cannot be issued when the focuser is in sleep mode. Issue the command to wake up the focuser and then try again.

- **ER=6 Cannot Execute Command Without Temp Probe Attached** - This error occurs when a temperature compensation command is issued without a temperature probe attached to the focuser. Check the connection between probe and focuser and try again.

- **ER=7 Comm Problem With Wi-Fi Board** - This error occurs when a Wi-Fi-related command is issued and the focuser hub cannot communicate properly with the Wi-Fi board. Try restarting your hub and allow approximately five to ten seconds and try issuing your command again. If this problem persists, please contact Optec for assistance.

- **ER=8 Cannot Push Settings. Necessary Settings Are Missing** - This error occurs when the command to push Wi-Fi settings is sent without first entering all necessary configuration information. Please make sure you have set the Wi-Fi SSID, security mode, security key (if necessary), and WEP key index (if necessary) before pushing your settings.

- **ER=9 Device Type Is Set Incorrectly** - This error occurs when the user-set device type for

a focuser does not match the physical qualities detected by the FocusLynx focuser hub. If this error appears while using an Optec FastFocus focuser, **do not** move the focus on your focuser without first correcting this problem, or else you are risking **severe, permanent focuser damage**.

Chapter 5: Additional Resources

There are many resources on the internet to help you use the FocusLynx focuser hub. We recommend visiting the Optec website first.

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 at:

- Optec Support: 616-897-9351