DirectSync SSX35 Installation

Step-by-Step Instructions for Installing the DirectSync SSX35 Motor Assembly to your SharpStar/Askar focuser.

The DirectSync SSX35 motor assembly fits directly in place of the coarse focus knob on the left side of the Sharpstar 3.4-inch dual-speed focusers. The right-side coarse and fine focus knobs are left intact on the focuser while the DirectSync clutch mechanism offers easy engagement and disengagement of the stepper motor for manual focus. When properly mounted, the DirectSync SSX35 provides approximately 1 micron per step resolution and superior repeatability and load carrying capacity. A digital temperature sensor is integrated into the DirectSync motor assembly. Connection to the observatory or telescope control computer can be made using any standard USB A-B cable. A separate 12VDC power connection provides sufficient power to vertically lift cameras or instrument packages exceeding 10 kg. Optec's new ASCOM Alpaca driver and field-proven FocusLynx Commander software round out the package for complete remote telescope focusing solution.

Sharpstar / Askar Focuser Compatiblity

The Sharpstar 3.4-inch focuser is included on several Askar and re-branded telescopes including:

- Askar 107PHQ, 130PHQ and 151PHQ,
- Askar FRA500,
- William Optics R&P 33,
- ZWO FF107-APO andFF130-APO.

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DirectSync SSX35 Package Contents

Confirm the contents of your FocusLynx DirectSync SSX35 package. The package should contain the following:

- DirectSync SSX35 motor assembly,
- 60-tooth drive shaft gear with 0.375” (9.5mm) long brass hub,
- 1/16” Allen hex key,
- 2mm hex key,
- 3/32” hex ball-driver,
- Short and Long USB A-B cables,
- 12VDC power supply with 2.1 x 5.5mm power plug and IEC power cord.

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Installation Procedure: Step-by-Step

Step 1

To install the DirectSync SSX35 motor, first remove the large coarse focus knob on the left side of the Stellarvue focuser with the 2mm hex key. The FSV-3B and other focusers may require a 5/64" hex key. No need to adjust or remove the fine focus knob on the right side.

Notice the flat section machined into the shaft. A setscrew holding the gear in place should make contact against this flat.

Step 2

Slide the 60-tooth gear hub-end first onto the pinion shaft. Rotate the gear so that the setscrew (either one) falls upon the flat. Make sure the gear is flush with the end of the shaft, do not push the gear on too far. Tighten the setscrews with the 1/16" hex key. **IMPORTANT: Tighten the setscrew securely before continuing.** Test the focuser function by moving the coarse and fine focus knobs on the right side of the focuser up and down ensuring smooth free movement.

Step 3

Set the DirectSync SSX35 motor to the disengaged position by rolling the motor clutch counterclockwise (away from you). Make sure the nylon tip setscrews are backed out for clearance.

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Step 4

Find the flat surface with the setscrew on the DirectSync SSX35 motor and align it with the flat surface of the pinion block. Slide the DirectSync SSX35 all the way onto the pinion block assembly. Wiggle it a bit to allow for clearance of the internal gear. If you cannot fully seat the motor onto the pinion block, try backing out the nylon-tipped setscrews a little bit.

Step 5

Keeping the two flat surfaces aligned, use the 3/32" ball driver to tighten all three setscrews. Note that one may be impossible to reach due to the curvature of the telescope tube. This will not be a problem – tighten the setscrew on the flat and the one accessible setscrew. If necessary, you can remove the motor and slightly adjust the inaccessible nylon-tipped setscrew.

Step 6

With the motor still disengaged move the right side manual focus knobs to test the feel. If focus travel feels smooth tighten up the three setscrews evenly (careful not to overtighten). If focus travel binds up or is very rough, loosen the setscrew on the flat while tightening the others to adjust.

Don't be too concerned if you cannot adjust the inaccessible screw.

Your DirectSync SSX35 is now ready for FocusLynx Software Setup. Contact Optec Support if you have any questions or problems when installing your DirectSync SSX35.

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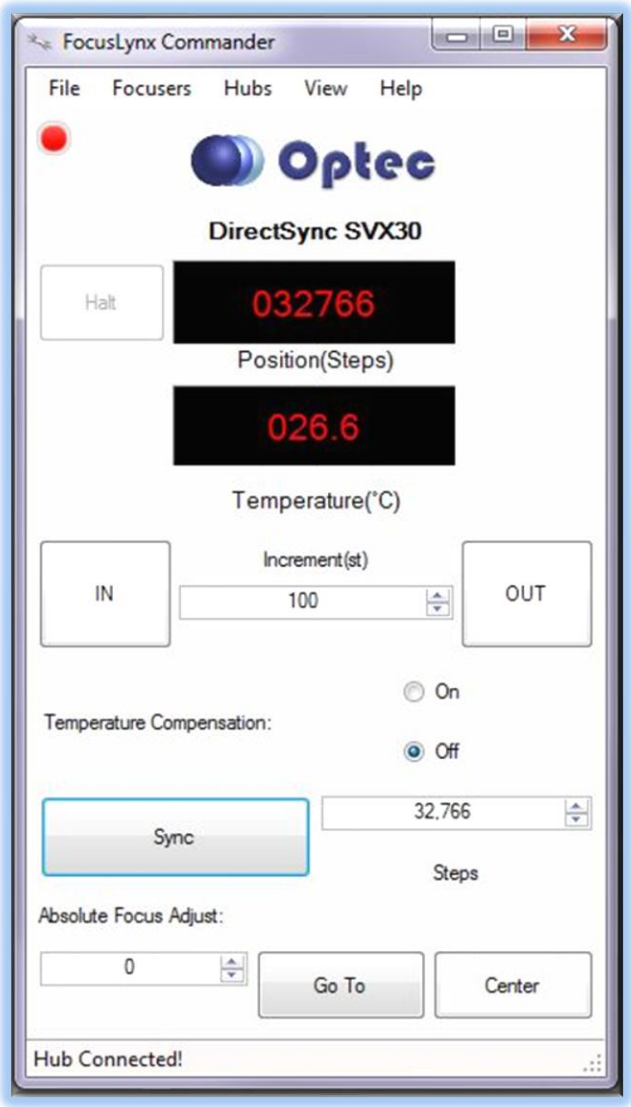
Download FocusLynx Commander Software

Visit Optec's download page to obtain the latest version of the FocusLynx Commander ASCOM driver and software package. FocusLynx Commander runs on any Windows 7 or higher operating system. Be sure to download version 3.1 or higher to operate the ThirdLynx control circuit. Separate installer packages for Mac and Linux will be available soon.

http://www.optecinc.com/astronomy/downloads/focuslynx.htm



The ThirdLynx controller is an iFocuser3 type device. Because FocusLynx Commander is an ASCOM client, you will need ASCOM Platform 6.4 to configure the focuser. Visit the ASCOM webpages for the latest version.

https://ascom-standards.org/

On non-Windows computers, there is no need to install the ASCOM platform. Optec's driver includes a built-in Alpaca standard server that will provide the required interface for any client –level software displaying the Alpaca logo.

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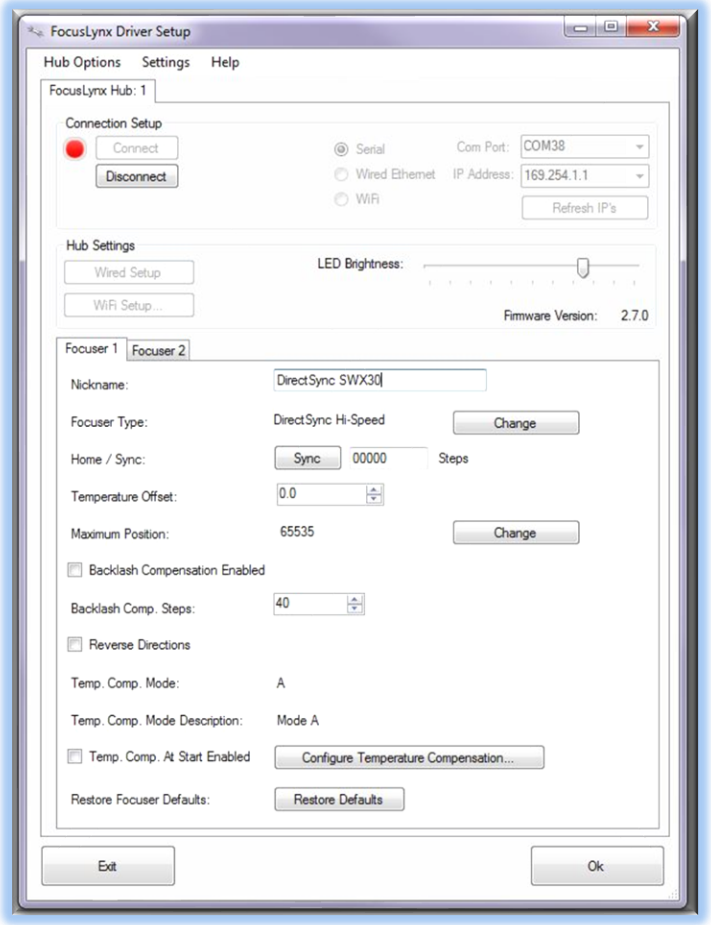
Windows Software Setup



Consult the ***FocusLynx Quick Start Guide*** to install FocusLynx Commander for Windows. Once installed, you will need to configure FocusLynx Commander for your new DirectSync motor. Configuration within FocusLynx Commander will also configure the ASCOM driver so that the same settings will apply when using auto-focusing software such as Maxim D/L, FocusMax, Sequence Generator Pro, or TheSky X for Windows. Control of FocusLynx or ThirdLynx focusers within TheSky X Windows version can be accomplished through either the ASCOM chooser or with the native X2 drivers for FocusLynx.

Focuser Type Selection

In FocusLynx Commander, click **Focusers – Setup** to open the FocusLynx Driver Setup dialog. The ThirdLynx USB-CDC controller will be automatically assigned a virtual COM port by Windows. (note the Wired Ethernet and WiFi connection types will be greyed out). Select the assigned COM port and click Connect. In the Focuser 1 section below, type in a Nickname for your telescope and click Change for the Focuser Type. Choose the **DirectSync** option and select either the Hi-Torque or Hi-Speed option using the slide bar near the bottom. With stepper motors speed and torque typically work inversely. That is, higher speeds will usually result in lower torque. The DirectSync Hi-Speed Focuser Type option coupled with the **DirectSync SSX35** motor assembly can reliably handle payloads of 10kg (22 lbs.) or more.

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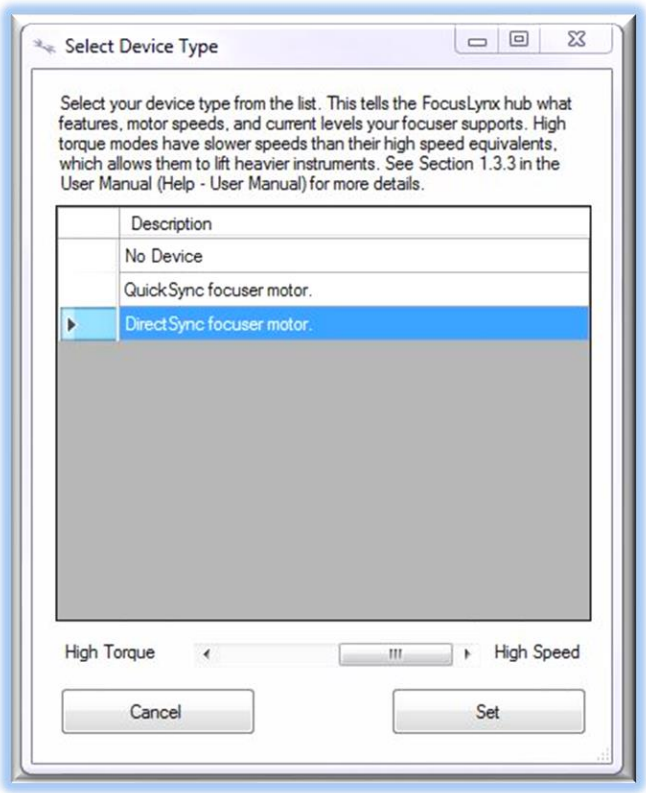

Click OK to exit the setup form and return to the main FocusLynx window. Click Focusers – **Connect**. Test the focuser movement by engaging the motor (roll the endcap clockwise as viewed from the cable end). Test both IN and OUT functionality with 1000 step increments. You should see the coarse and fine focus knobs move on the opposite side of the pinion block. All movements should be smooth. Disengage the motor to return to manual focus.

Contact Optec support (support@optecinc.com) if your focus motor cannot be adjusted without slippage or stalling. Some focusers present unique challenges with internal slipping.

Optional Setup Steps

Set the Position Units

The iFocuserV3 standard for ASCOM absolute focusers relates all focuser movements to actual step counts with the higher level client responsible for making the conversions to real-world measurements. FocusLynx Commander acts as a client and extends the property to easily convert the units to mm and microns. In the main form of the FocusLynx Commander window, you may left-click directly on the red Position digital read-out to toggle units between Steps, Microns, and Millimeters. Note that only the step count is passed through to the ASCOM driver.

Step Size and Focuser Range

The Stellarvue focuser drawtubes have a wide variety of travel ranges. The DirectSync SSX35 stepper motor has a step-size of approximately 1.1 microns so the default maximum position of 65,535 steps would allow for about 72mm. If your focuser has a longer drawtube travel, you may wish to increase the Maximum Position value in the FocusLynx/ThirdLynx Driver Setup screen.

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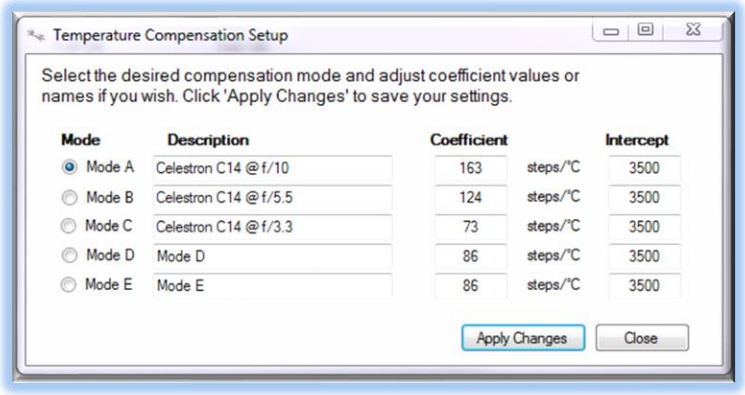
However, some focusers may have a smaller step size and greater travel. To take advantage of the full focuser travel, you may wish to change the Maximum Position value in setup to allow more steps for full travel. Click File- **Step Size Wizard** in FocusLynx Commander to calculate the exact step size and set the MaxStep values for your focuser and motor.

Recommended Sync Procedure

For most auto-focus routines, the required range of movement for the focuser is quite small compared to the total range of travel. The default 16-bit digital range of 65,535 steps is always more than adequate to allow successful auto-focusing. For best results, we recommend the focuser be manually moved to a rough focus and the position be synced to the center position of 32,767. The FocusLynx Hand Control offers an easy push-button method of accomplishing this "sync to center" operation. To "sync to center" with FocusLynx Commander, enter 32,767 (or simply round to 33,000) in the box immediately right of the Sync button. Press **Sync** and wait a few seconds. Test the IN and OUT button movements to ensure proper operation and function.

Alternatively, you can manually move the focuser drawtube all the way IN and Sync to 0. Then, use the hand control or FocusLynx Commander interface to move the drawtube outward to the end of travel. Note the step position and enter this value in the Maximum Position within setup. Subsequent connection to the focuser will automatically calculate the new center position (half of MaxPos) and display it as the new default Sync position on the main form and in the hand control "sync to center" feature.

Temperature Compensation



The DirectSync motor includes a built-in temperature sensor for temperature compensation. Within FocusLynx Commander click File – **Temp Comp Wizard** to let the software step you through the process and automatically calculate the "TC" or Temperature Coefficient for your particular telescope configuration. After completing the wizard, save the new TC value in any of the five available TC modes. Click the adjacent radio button next to Mode A through E to select that TempComp Mode for the current session.

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Turn on temperature compensation by selecting “On” just above the Sync button on the main FocusLynx Commander form. The FocusLynx controller will automatically adjust the focus for changing temperatures.

Linux and Mac Software Setup

Optec is developing a Linux based Commander program to provide much of the same functionality and features available with Windows FocusLynx Commander. Check the Optec website for the latest developments.

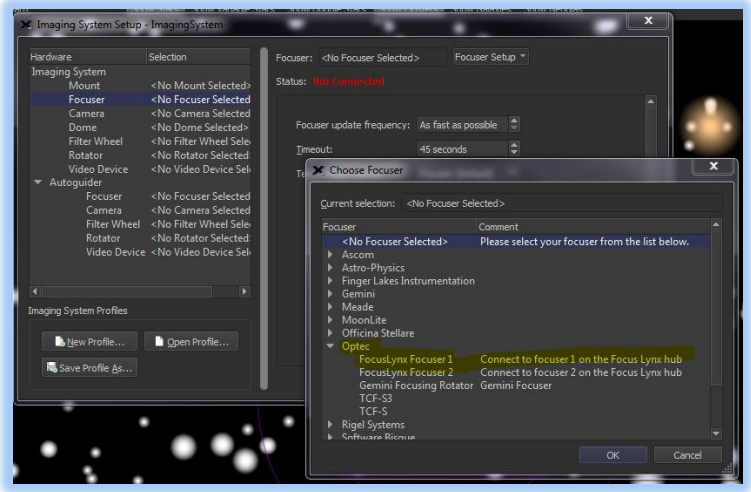
INDI Support

A group of dedicated volunteer programmers has developed the INDI Library which is a collection of programs designed to control astronomical equipment. Full details are available at the INDI Library website: https://www.indilib.org/

ThirdLynx uses the same low-level commands as FocusLynx and will function with the INDI FocusLynx driver developed by Mr. Philippe Besson and Jasem Mutlaq. Complete instructions and the INDI Linux driver are available for download here: https://www.indilib.org/devices/focusers/focuslynx.html

Third-Party Software

Visit the Optec website for the additional information describing FocusLynx configurations for ASCOM clients such as **FocusMax** and **Maxim D/L**, as well as non-ASCOM software such as Software Bisque’s **TheSky X** native X2 drivers for FocusLynx.



TheSky X Pro

Many users have asked for specific instructions to configure the DirectSync ThirdLynx controllers with TheSky X native X2 drivers. Currently, you should configure ThirdLynx as FocusLynx Focuser 1.

We expect a future daily build to offer the ThirdLynx as a separate option. Under settings, look for the COM port labeled **Optec ThirdLynx USB CDC**.

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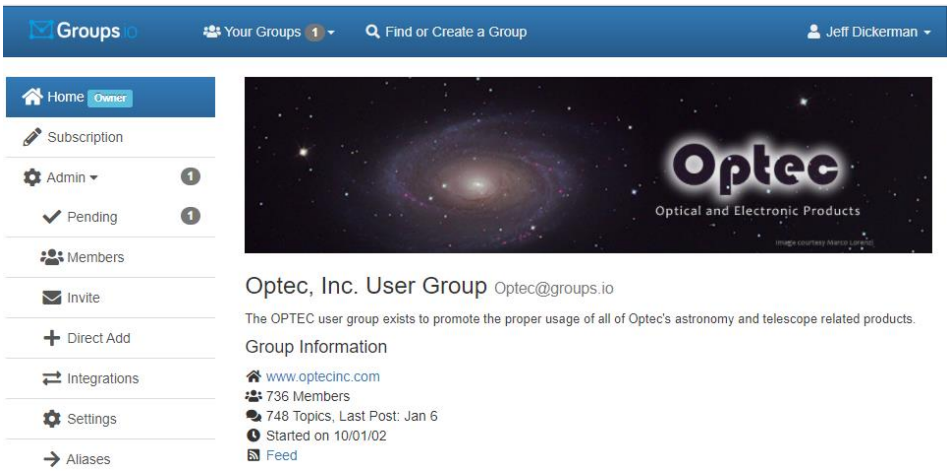
Video Channel

Optec is developing videos for installation and configuration of our many products for various software packages. Visit our Rumble video channel by searching "Optec" or clicking the link below.

https://www.optecinc.com/video

Optec User Group

The Optec User Group is now located at Groups.io which provides a forum to communicate with other users of Optec instruments. Other end-users can often provide answers to specific configuration questions and Optec staff routinely follow and answer many questions as well. Click the banner below to subscribe.



Or visit the Groups.io Optec User Group here: https://groups.io/g/Optec.

FocusMax is available through CCDWare - http://www.ccdware.com/products/focusmax/
Maxim D/L is copyright Diffraction Limited - http://diffractionlimited.com/product/maxim-dl/
TheSky X is offered by Software Bisque - http://www.bisque.com/
Sequence Generator Pro by Main Sequence Software - https://www.mainsequencesoftware.com/

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