PlaneWave™ INSTRUMENTS

HEDRICK FOCUSER

TROUBLESHOOTING GUIDE

OVERVIEW AND TABLE OF CONTENTS

Through a variety of factors, there may be times when the focuser does not respond to move commands. These factors will relate to either software and controller settings, or to mechanical adjustments that are needed. If the focuser stops very suddenly or does not move at all, this may indicate a software or controller issue. If the focuser stops gradually, makes a grinding / struggling sound, or moves only a small amount, this likely indicates a mechanical issue.

SOFTWARE & ELECTRONICS

Software issues can usually be solved just by resetting the Home position. Using the PWI software:

1) From the Focuser tab press the Config button to bring up the Configuration screen.

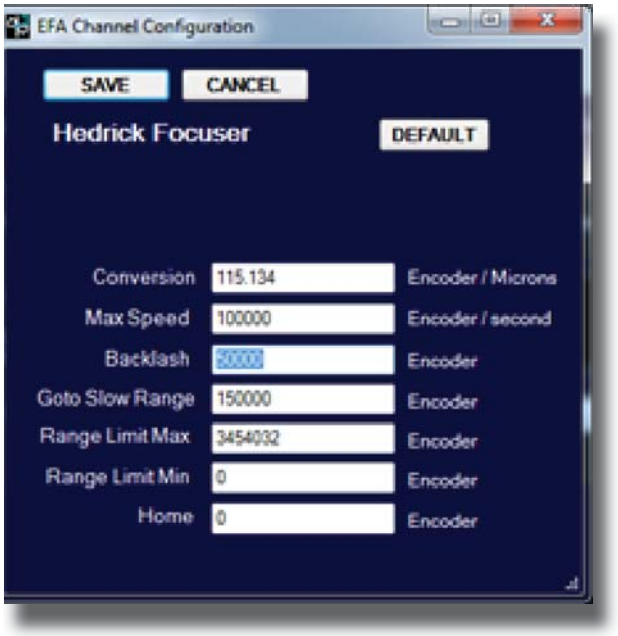
2) Select Hedrick Focuser from the drop down list and press the Focuser Config button.

3) Press the Default button to return all settings to their defaults then press Save.

4) Under the Focuser tab, hold down the IN button until the focuser is at its innermost position. When the focuser reaches the innermost mechanical position, the position reported by the software should be close to 0 (within a few hundred microns).

5) If the reported position is much different from 0, press the Home button on the Focuser tab. This will send the focuser all the way in to its inner hardstop, and then reset the reported position to 0.

IMPORTANT:
If you are unable to move the focuser through PWI3, check to see if the hand controller is plugged into the EFA. If it is, unplug it from the EFA box and try again. In rare cases, a hand controller may develop a problem that prevents PWI3 from controlling the focuser.



If that does not help, try unplugging the PC cable from the EFA and plug the hand controller into the H/C port. Try moving the focuser using the hand controller. If it works in this configuration, this could indicate a problem with the cabling between the computer and the EFA, a problem with the EFA box, or a problem with the PWI3 software itself.

CABLE CONNECTIONS

If the focuser still does not appear to move with either PWI3 or the hand controller, take a look at the cabling between the EFA and the focuser. The type of cabling will depend on when the focuser was purchased:

For Hedrick focusers shipped before February 2015 (with an exposed motor), there should be a cable that plugs into the Focus port on the EFA on one end, and plugs into the motor in two places on the other end. Check all of these connections. On the motor end, the 4-pin blue plug should be securely connected to the back of the motor, and the 2-pin white plug should be securely plugged into the corresponding plug.

For Hedrick focusers shipped after February 2015 (with an enclosure around the motor), an Ethernet-style cable runs between the port labeled "EFA" on the Hedrick focuser and the port labeled Focus on the EFA box. PlaneWave ships black cables with blue strain relief boots on either end. These are special "low-noise" cables made by PlaneWave to improve motor performance. If this cable has developed a problem, you can temporarily use a short (6ft or shorter) Ethernet cable between the EFA and the focuser. If this solves the problem, contact PlaneWave Instruments for a replacement low-noise cable.

HARD-STOP ADJUSTMENTS

If a mechanical issue is suspected, first try unscrewing the two hardstop set screws a small amount (maybe 1/4 to 1/2 a turn). See the picture, to the right.

In addition to the set screw indicated in the picture, there is a second set screw on the opposite side of the focuser.

When the focuser tube is racked out the full 1.3 inches, these set screws make contact with a ledge on the moving tube to prevent the focuser from coming out any farther. If these screws are a bit too tight, they could be rubbing against the drawtube and causing things to bind up prematurely.

CAUTION:
Do not to remove or loosen these screws too much, or the focuser may be prevented from safely coming to a stop when it is racked all the way out.

For best performance, tighten the screws until you just start to feel them bottom out, and then unscrew them by ½ turn. If you have access to Loctite, try adding a drop to each set screw before setting them in the "1/2 turn out" position so that they do not move in the future.

PRELOAD BLOCK ADJUSTMENTS

If after adjusting the hard-stops, the focuser still seems to be binding, you should try loosening the preload block, pictured to the right.

1) Start by marking the position of each screw using a Sharpie marker so that you can always return to screws back to their original tension.

2) Next, try loosening each screw just a bit; (1/8 of a turn or less).

3) Using the hand-controller or software, command the focuser to move, in order to check if the adjustment was correct.

4) If that doesn't seem to help, try loosening the screws a little bit more, and re-test.

IMPORTANT:
Note that if you loosen things too much, the sliding focuser tube will be able to wobble freely and your imaging equipment will not be held firmly in place!

5) If these adjustments do not seem to help, tighten the screws back down to their original positions.

LESS COMMON ISSUES

Symptom: The focuser does not respond when the Up/Down hand control buttons are pressed.

Solution: This can be caused by either a defective cable or a problem with the electronics on the EFA control box.

1) Check the cable by plugging the focuser cable into the EFA port labeled “Rotate”.

2) Now use the left/right buttons on the hand control to see if you can control the travel on the focuser.

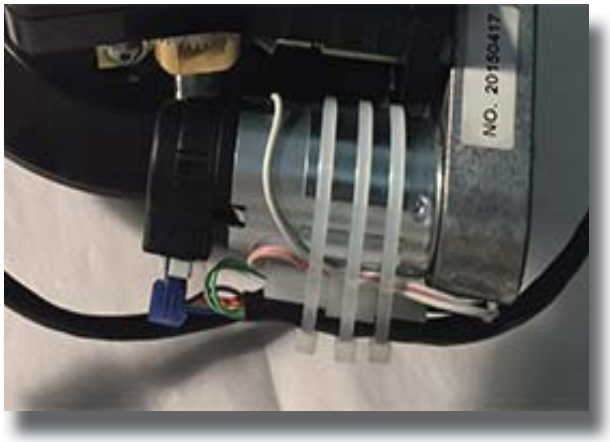
If the focuser is now responding properly, then most likely the Focuser port on the EFA box is defective ad will require repair. However, if the focuser is still not functioning then the cable should be replaced, and this test should be run again.

Symptom: Once the focuser starts moving it will not stop until it hits a hard stop.

Solution: This generally means that the motor has stopped communicating with the encoder on the motor. This is usually caused by a loose connection between the focuser cable and the motor.

Check the connection of the blue connector on the motor encoder and make sure that it is well seated on the pins on the encoder, pictured to the above-right.

For some focusers it may be necessary to remove the cover plate in order to access the cable connector.



For additional help:
If none of the suggestions in this trouble-shooting guide are succesful in restoring normal operation of your focuser, please contact PlaneWave support for additional suggestions or assistance, at (310) 639-1662 or support@planewave.com. We are normally reachable between 9AM and 5PM, Pacific Time, Monday through Friday.