

Backlash adjustment on IRF90 Rotating Focuser

1. Remove any imaging equipment from the IRF90.
2. Move the focuser out until it is about 1" from the "fully racked in" position.
3. Unplug the "Rotate" and "Focus" cables from the IRF90, and remove the IRF90 from the telescope. Set the IRF90 on a table with the rotating plate facing upward, as shown below.



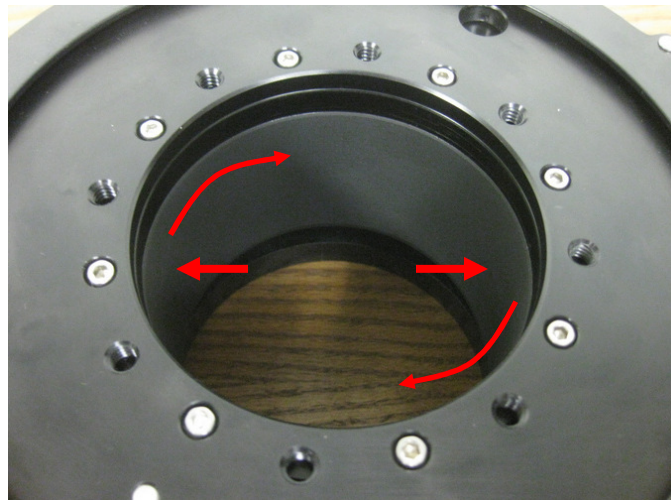
4. Unscrew the two screws that hold the "Rotate" connection socket in place.



5. Pull out the "Rotate" connection socket, and unclip the RJ-45 plug from the rear end of the socket.



6. Press firmly outward on the inner surface of the baffle tube located inside the IRF90, and try to twist the baffle tube clockwise (viewed from above the rotating surface). This tube should eventually start to unthread. After 5-8 full turns the tube should come free. Pass the tube through the back of the IRF90 to remove it. This baffle tube provides the hardstop mechanism that normally prevents you from racking the focuser out beyond its limit. By removing this tube, we will be able to fully extend the focuser and separate the rotating assembly.





7. Move the IRF90 close to the EFA box so that you can reconnect the "Focus" cable, but leave the IRF90 resting so that the rotating surface is facing up if possible. **In a later step the focuser will be fully racked out and the rotating mechanism will eventually become disengaged from the IRF90 body. If the IRF90 cannot be oriented face-up while plugged into the EFA, somebody must be available to firmly hold the rotating mechanism while it is being racked out or else the mechanism could fall to the ground when the two pieces become disengaged.**
8. Launch the PWI3 control software on a computer, and connect to the focuser.
9. Under the "Focuser" tab of PWI3, click the "CONFIG" button. Then in the Configuration window, click "FOCUSER CONFIG". Change the "Backlash" value to 0 and change the "Range Limit Max" value to 9999999. Click Save. This will allow you to move the focuser beyond the normal racked-out software limit.

EFA Channel Configuration

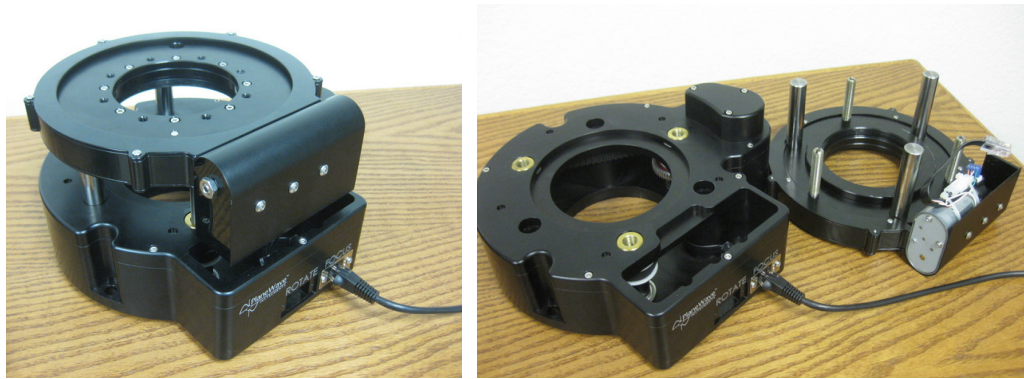
SAVE CANCEL

IRF90 Focuser DEFAULT

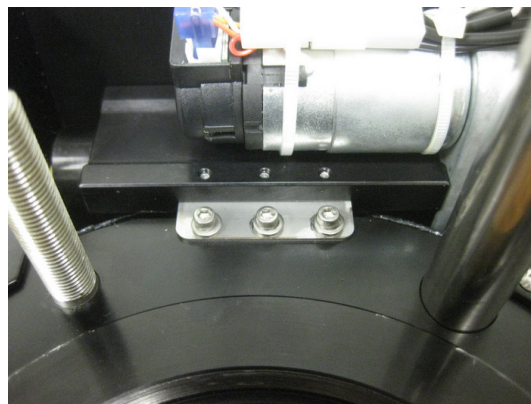
Conversion	207.288	Encoder / Microns
Max Speed	100000	Encoder / second
Backlash	0	Encoder
Goto Slow Range	150000	Encoder
Range Limit Max	9999999	Encoder
Range Limit Min	0	Encoder
Home	0	Encoder

10. In PWI3, move the focuser OUT until the rotating plate assembly comes fully disengaged from the main IRF90 body. There are two ways to do this:
- Option 1) If two people are available at the telescope or if the control computer is positioned close to the IRF90, hold down the "OUT" button under the Focuser tab while monitoring the IRF90.
- Option 2) If only one person is available and there is some distance between the computer and the IRF90, enter a target position of 40000 microns and click GOTO. Hurry to the IRF90 and be ready to separate the rotating unit from the main body.

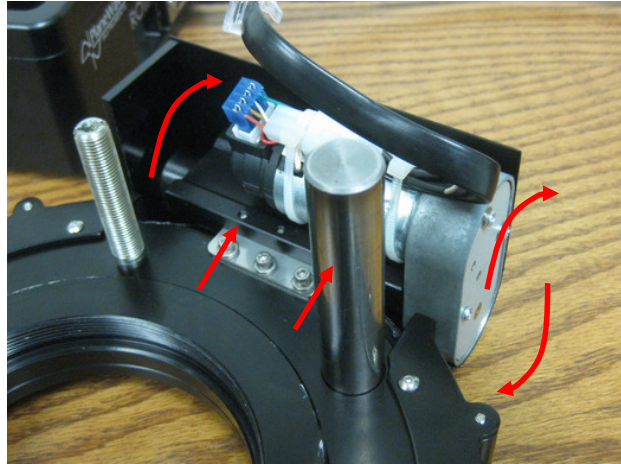
Once there is a gap of approximately 1.75 inches between the rotating plate and the main IRF90 body, the rotating section can be separated from the main body. **IF THE IRF90 WAS STILL MOUNTED TO THE TELESCOPE AT THIS POINT AND LEFT UNATTENDED, THE ROTATING SECTION COULD FALL OUT AND BECOME DAMAGED!**



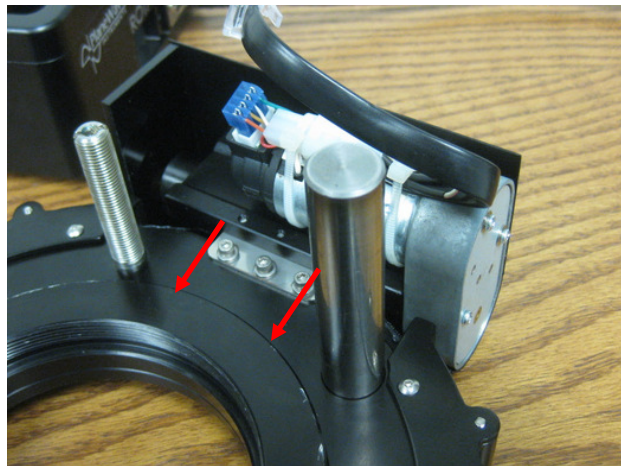
11. Locate the 3 screws that hold the rotation motor and worm in place. Unscrew these screws by 1/2 a turn, and pull to slide the assembly out away from the rotating plate.



12. Torque the motor/worm assembly so that the mounting plate bends very slightly and provides spring tension to hold the worm against the main rotation gear.



13. Slide the motor/worm assembly back towards the main rotation gear, making sure that the worm engages with the teeth on the gear. You may need to rock the assembly back and forth a bit until the teeth engage. Then, hold the assembly firmly against the gear while tightening the three screws.



14. Place the rotating plate assembly back on top of the main IRF90 body, aligning the 3 pins and 3 screws properly. Be careful to pass the rotator motor's cable down to where it can be reconnected to the Rotate socket connection.



15. Begin racking the focuser back in. The three screws should engage evenly and begin pulling the rotator plate assembly back down. Continue racking the focuser in until the gap between the rotating plate and the main IRF90 body is less than 1 inch.
16. Thread the internal baffle tube back into place. This baffle tube provides the hard stop mechanism which will prevent you from being able to fully rack out the focuser in the future.
17. Reconnect the Rotate socket connector, and screw it back into place
18. Connect the Rotate port to the EFA and test the rotator using either the hand controller or the computer. Make sure that the rotator does not appear to be binding at any locations.
19. Reinstall the IRF90 on your telescope, and reattach your optical equipment.
20. In PWI3 under the "Focuser" tab, click "CONFIG". In the configuration window, click "FOCUSER CONFIG". Change the "Backlash" value back to 50000, and "Range Limit Max" back to 6218628. Save the changes.
21. In PWI3 under the "Focuser" tab, click "HOME" to reinitialize the focuser position. In the "Rotator" tab, click "HOME" to reinitialize the rotator position.