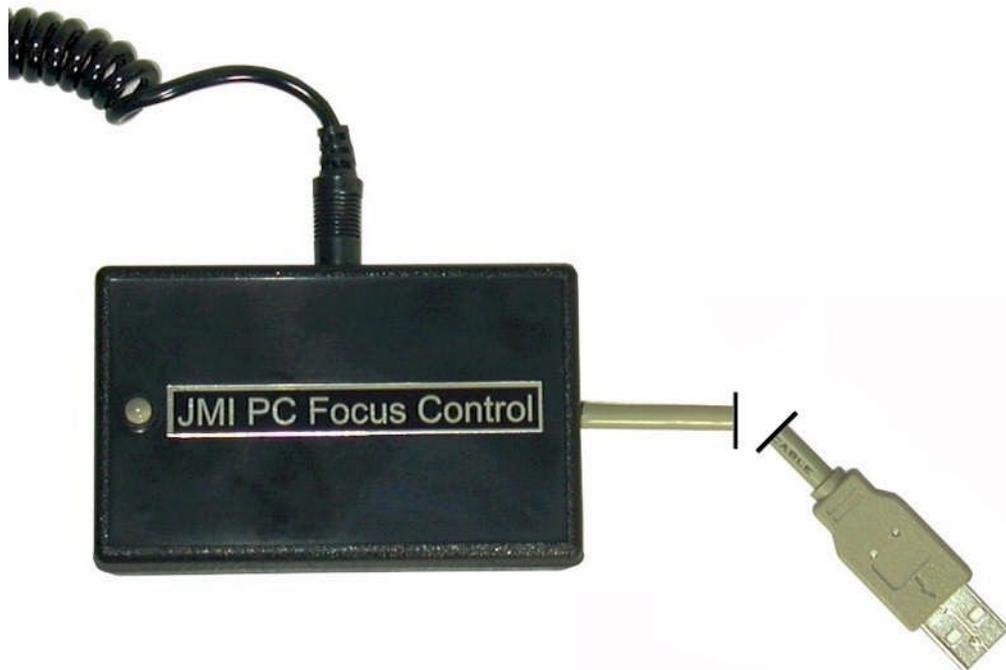


PC Focus Control Operator's Guide



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INTRODUCTION

The JMI PC Focus Control motor controller is designed to allow personal computers to control direct current (DC) motors that are commonly found on telescope focusers. Because it is a USB device, it is very convenient to install, is compatible with many operating systems and requires no additional power source.

The PC Focus Control (PCFC) system includes both hardware and software that allows you to control your focuser from a personal computer. Using the free downloadable JMI software, PCFC is a computerized replacement for a focuser hand control. You can also use any third-party software that supports the ASCOM focuser standard using the ASCOM Platform and JMI's PCFC ASCOM Driver.

Your PCFC purchase should include a control box (with integral USB cable, jack for motor cable and LED indicator light) and this manual. The software can be downloaded from our web site (www.jmitelescopes.com). You must provide the motor and cable. There is no positional display or encoder feedback with PCFC.

Features

The PC Focus Control motor controller is very easy to install and operate. It includes the following features:

- Plugs directly into your computer's USB port.
- Receives power from your computer via the USB port, therefore no battery or external power source is necessary.
- Uses the USB HID (Human Interface Device) class driver, which is included with most operating systems such as Windows 98 (Second Edition—must be USB1.1), 2000, XP and Vista. There is no need for a proprietary USB driver.
- Compatible with any DC focus motor that uses 5 to 12 volts but works best with 5 volt motors.
- Output is a standard 1/8" (3.5mm) mono jack, so making a cable specific to your focus motor is easy if one is not already available.
- Includes a red-green LED for software-dependent status indication.
- Software speed control and PWM frequency control allow you to tune the controller to optimize its performance with your specific model of motor.
- The software control panel also includes a Counter with Reset function, a Move to Zero button, a Motor Running indicator and an Always On Top window option.

Requirements

The PC Focus Control motor controller software requires USB version 1.1 or higher. It also requires Windows 98 Second Edition (may need to upgrade USB version), 2000, XP or Vista and the USB HID (Human Interface Device) class driver (normally included with the operating system). Operating systems prior to Windows 98 Second Edition do not support USB and the HID class of devices.

You will need a 5 volt to 12 volt DC motor (5V is best) and compatible cable. One end of the cable must have a 1/8" (3.5mm) mono plug to connect to the PCFC control box. This cable has most likely been supplied with your focuser motor.

Installation

The first time you plug the PCFC into a computer, it will automatically be identified as a new device. See the section below that applies to your operating system. After the first installation is complete, the next time you plug the PCFC into your computer, it will remember that this device has already been installed and will automatically recognize it. To remove the PCFC from your computer, simply unplug it from the USB port. If you wish to uninstall the software, go to Start, All Programs, JMI, Uninstall PCFC.

Installation under Windows Vista, XP or 2000

Plug the device into a USB port. The red LED on the PCFC should light immediately. A "Found New Hardware" balloon will pop up on your monitor. Wait a few moments and the text in the balloon should change to say "Your new hardware is installed and ready to use". It really is that simple!

Installation under Windows 98 Second Edition

The Windows 98SE installation is a little more work, but still pretty simple. Please note that PC Focus Control will not work with Win98SE if you are using USB version 1.0.

- 1) Plug the device into a USB port. The red LED on the PCFC should light immediately.
- 2) The "Add New Hardware Wizard" should open up. Click the "Next" button.
- 3) The wizard will then say, "What do you want Windows to do?" Select "Search for the best driver..." then click the "Next" button.
- 4) The wizard then says, "Windows will search for new drivers...". Uncheck all the boxes and click "Next".

- 5) Next the wizard says "Windows driver file search for the device:" and should show the location as C:\WINDOWS\INF\HIDDEV.INF. Just click the "Next" button.
- 6) At this point, you will probably be asked to insert the Windows 98 Second Edition CD-ROM. Do this, then click "OK", then click "OK" again.
- 7) Finally, click "Finish" and you should be done!

Connecting to Your Focus Motor

The output of the PCFC is a standard 1/8" (3.5mm) mono jack. Many focus motor manufacturers already use this type of connector. If your motor does not, then you will need a cable that has a 1/8" (3.5mm) mono plug at one end and the appropriate focuser-specific connector at the other end. Plug one end of the motor cable into the mono jack in the PCFC box and the other end into the motor jack. Plug the USB cable into the USB port on your Personal Computer.

OPERATION

Once you have completed the initial installation, you will want to verify that the PCFC hardware is working properly. To do this, follow the instructions below to download and install the software from our website.

Even if you intend to use third-party focuser software, you should do this first to verify that everything is working properly. Should you have trouble getting your third party focuser software working properly, using PCFC software will allow you to troubleshoot your setup. If everything works with our software, then your problem most likely is with your third-party software.

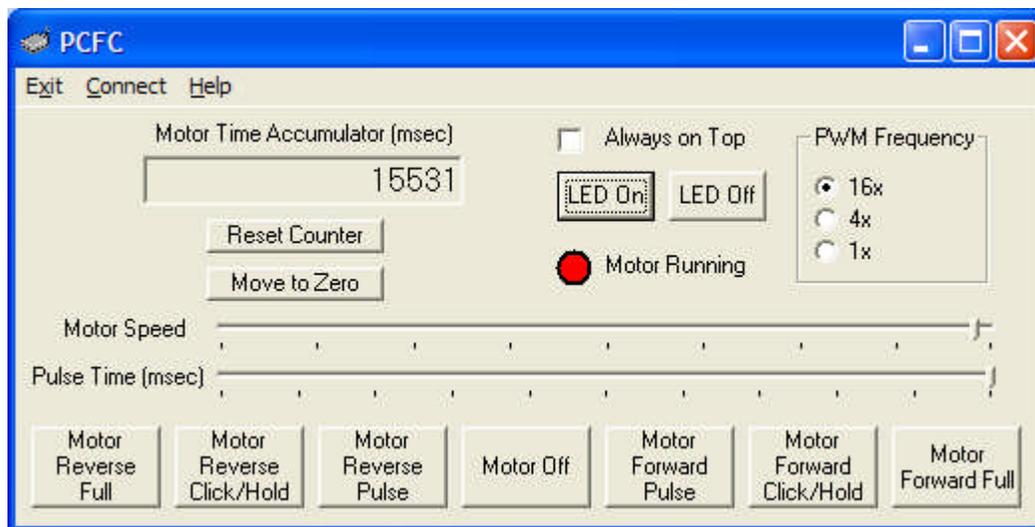
WARNING

The PCFC, and any software used with it, has no capability to sense when the focuser reaches the end of travel. Damage may result if you run the focuser too far in either direction. Know your focuser and decide for yourself if this could be an issue.

Using the Software

Download and install the software from our website at www.jmitelescopes.com. Plug the PCFC control box into a USB port on you computer or a USB hub. Plug your focus motor cable into the PCFC output jack, then the other end into your focus motor. Now, start the software. A message box should pop up telling you that it has found the PCFC adapter. Click OK to proceed to the main console. If the message box says that it cannot find the PCFC, then either the PCFC is not properly plugged

into a USB port, the USB port is bad or the PCFC is no longer operating properly. Try unplugging and reconnecting the PCFC into a USB port and click Connect on the menu bar.



JMI PCFC Software Console

Motor Time Accumulator Counter

The counter is based on motor running time. To mark a position, simply select the Reset Counter button which will clear the counter to zero. You can return to this position at any time by selecting the Move to Zero button.

Always On Top Checkbox

Select this checkbox to keep the control panel window on top of all other windows.

LED On / Off

Normally, the LED on the PCFC will be red and will change to green when the PCFC is energizing the motor. If you wish to extinguish the LED, click LED Off. Click LED On to re-enable the LED indicator.

Motor Running Indicator

When the motor is running, this indicator will change from gray to red.

PWM Frequency

Motors also behave differently as a function of the frequency used by the pulse-width modulator. This radio button allows you to select one of three frequencies to further optimize the performance of your focuser motor. The 16x setting provides a PWM frequency of about 25 kilohertz, which is above most human hearing. Selecting 4x (about 6 kHz) or 1x (about 1.6 kHz) may provide better performance, but it may also result in more audible noise when the motor is energized.

Motor Speed

The output of the PCFC is a pulse-width modulated voltage that can be varied from an average value of 5V down to 0V. The Motor Speed slider allows you to control the average voltage in a linear fashion. Note however that the speed of DC motor does not respond linearly to the voltage applied across it, so the actual motor speed will not necessarily vary linearly with the position of the Motor Speed slider.

Pulse Time

This slider allows you to adjust the amount of time the motor is energized when you click on one of the Motor Pulse buttons.

Motor Forward Pulse and Motor Reverse Pulse

These buttons will energize the motor for the amount of time set by the Pulse Time slider. One click will energize the motor, then it will turn off automatically once the pulse time is complete.

Motor Forward Click/Hold and Motor Reverse Click/Hold

Clicking and holding down on the mouse button will leave the motor energized for as long as you hold. Once you release the mouse button, the motor will stop.

Motor Forward Full, Motor Reverse Full, and Motor Off

Clicking the Motor Forward Full or Motor Reverse Full buttons will energize the motor until either the Motor Off button is clicked or you exit out of the software completely. The settings of PWM Frequency, Motor Speed, and Pulse Time will automatically be saved when you exit the software and recalled the next time you start it.

Operating Hints and Tips

- 1) Unless specifically outfitted with a positional encoder, DC motors provide no indication of their position. Thus, repeatability of focuser position is not guaranteed.
- 2) Temperature will affect how your motor performs, so you may need to retune the motor speed and PWM frequency as the temperature changes.
- 3) In spite of points 1 and 2, it is quite possible that you can get very good results with automated focus software. Experiment with the pulse time and PWM frequency parameters to optimize the performance of your PCFC and focuser.

CCDSOFT DRIVER

A special driver for Software Bisque's CCDSoft CCD imaging software can be downloaded from our website at jmitlescopes.com. Execute the downloaded file to install the driver.

ASCOM Driver and Third-Party Software

If you wish to use the PCFC with third-party ASCOM-compatible focusing software, a free ASCOM driver is available for downloading from our website. Follow these steps:

- 1) Download and install the ASCOM platform from www.ascom-standards.org
- 2) Download and install the PCFC ASCOM driver from www.jmitelescopes.com.
- 3) Finally, install your third-party focuser software.



The PCFC ASCOM driver provides a Setup window that allows you to set the motor speed and PWM Frequency as described above. You can also reverse the operation of the motor using the Setup window. The settings you select in the Setup window will be saved and recalled each time you invoke the PCFC ASCOM driver through ASCOM-compliant software.

Operating Two Motors at the Same Time

In order to run two PC Focus Control units to control two focusers, you will need two different and separate pieces of hardware (PCFC and PCFC2 firmware) and two sets of software (PCFC and PCFC2 software). Request part number PCFC2 for the second control unit and download the appropriate PCFC2 software from our website (www.jmitelescopes.com) to control the second unit.

TROUBLESHOOTING

If you are having problems getting the PCFC to function properly, first make sure both cables (USB and Motor) are plugged in. Next, refer to the Troubleshooting Guide (below) to find possible causes.

Troubleshooting Guide

Symptom	Possible Cause
I receive a "PCFC adapter found" message when connecting the hardware but then receive a "Not Connected to PCFC" message when selecting operational buttons.	You may have USB version 1.0 (Windows 98 Second Edition). The PCFC system only works with USB version 1.1 and above.
When I start the PCFC program, no window appears.	Unplug the PCFC hardware and plug it in again. If necessary, try starting up the program again. You should receive a "PCFC adapter found!" message.
Sometimes I have the motor running fine at a slow speed but after stopping I cannot get the motor running again.	You can sustain motor operation under conditions that are below minimum requirements to start the motor operating. Increase the motor speed slider and try again.

NOTES

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