

FOCUSMASTERTM

Computer Interface for Focusmate Driver/Digital Indicator

Operating Guide



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Introduction

Your new Focusmaster is the link necessary for computer readout and control of Tele Vue's Digital Indicator Kit and Focusmate Driver. Focusmaster was designed to be easy and convenient to use, from its in-line connectors which allow easy draping of cables to the TVFocusPlus display/control software. Focusmaster is compatible with ASCOM compliant focusing software.



Connection

Focusmate Driver to Focusmaster: Using the telephone handset cord supplied with the Focusmate Driver, plug one end into the driver motor and the other into the Focusmaster receptacle marked "Motor (RJ22)."

Digital Micrometer to Focusmaster: Connecting the Indicator measuring device to the Focusmaster requires the optional cable (RSC-2320). This cable contains electronics that provide power from the computer to the indicator and also reliably senses and transmits indicator movement to the computer.

First remove the indicator's battery tray. Remove the two screws using a jeweler's Philips head screw driver and pry out the battery tray with the tip of the screw driver. Slide the electronics end of the cable into the indicator with the electronic contact side down. Reinsert the screws to hold the cable in the indicator. Next, plug the other end of the cable into the Focusmaster's port labeled "Indicator (RS232)" and tighten the hold-down screws.

Focusmaster to Computer: Using the cable supplied with Focusmaster, plug the corresponding ends into the connectors marked "Computer (USB)" on the Focusmaster and the USB connector in your computer.



Pry out the battery tray by sticking the end of a jeweler's screwdriver into the tray's cutout.

Insert
RSC-2320
Cable Assy.



Proper orientation of inserting the RSC-2320 cable.



Focusmaster Installation

The first time you plug the Focusmaster into a computer, it will automatically be identified as a new device. See the section below that applies to your operating system. Operating systems prior to Windows 98 Second Edition do not support USB devices.

After the first installation is complete, the next time you plug the Focusmaster into your computer, it will remember that this device has already been installed once and will automatically recognize it.

To remove the Focusmaster from your computer, simply unplug it from the USB port.

Installation under Windows XP or Windows 2000

Plug Focusmaster into a USB port in your computer. The red LED on the face of Focusmaster should light immediately. A "Found New Hardware" balloon will pop up on your monitor. The text in the balloon should change to say "Your new hardware is installed and ready to use."

Installation under Windows 98 Second Edition

Plug the device into a USB port in your computer. The red LED on the Focusmaster should light immediately.

- 1) The "Add New Hardware Wizard" should open up. Click the "Next" button.
- 2) The wizard will then say "What do you want Windows to do?" Select "Search for the best driver...", then click the "Next" button.
- 3) The wizard then says "Windows will search for new drivers...". Uncheck all the boxes and click "Next".
- 4) 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.
- 5) 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.
- 6) Finally, click "Finish" and you should be done!

TVFocusPlus Software

Once you have completed the initial installation, you will want to verify that the Focusmaster is working properly. To do this, you should download and install TVFocusPlus from the TeleVue.com website and follow the TVFocusPlus instructions below. Even if you intend to use third-party focuser software instead of TVFocusPlus, you should do this first to verify that everything is working properly. Should you have trouble getting your third-party focuser software to work; using TVFocusPlus will allow you to troubleshoot your setup. In other words, if everything works with TVFocusPlus, then your problem most likely lies with your third-party software.

Start TVFocusPlus. The screen will look like this:



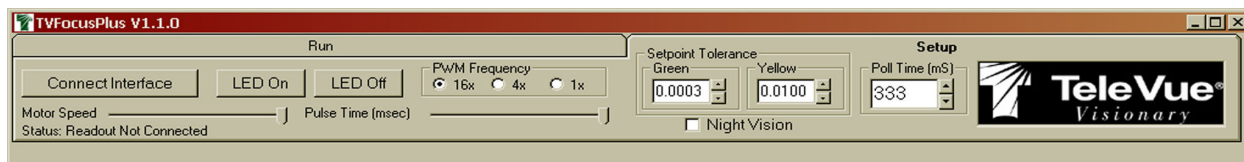
IMPORTANT: These instructions assume that you have the Focusmate Driver installed on the right hand side of the telescope when viewed from the eyepiece end. This is important since the motor controls are marked "Forward" and "Reverse," forward indicating the focuser is being racked "in" toward the objective, reverse indicating the focuser is being racked "out" toward you.

When the connections have been made and TVFocusPlus has been loaded on your computer, you can quickly verify that everything is in working order. First, make sure your focuser is NOT in its fully extended position. Click the "Rev Full" button and your focuser should start to move out.

If you have the Digital Indicator installed, turn it on by pressing the “set” button. Then in TVFocusPlus click the “Read Continuously” button and you should see numbers appear in the “Focus Position” display box. Those numbers should change when the motor is running provided the Digital Indicator is in contact with the Rest.

The following descriptions pertain to the function of each button, window and slider in the TVFocusPlus program. Take a moment to familiarize yourself with the function of each and you will quickly discover the utility of TVFocusPlus. The program is broken into two tabbed functions. They are “Run” and “Setup.” “Run” is the default, and is the mode you will be using most.

Setup Tab



Connect Interface

Should you start the TVFocusPlus software prior to connecting Focusmaster, the program will recognize that the device is not connected. Click “OK” and the program will start. After plugging in the USB cable the program still needs to recognize the Focusmaster has been attached. Clicking the “Connect Interface” button will prompt a pop up window verifying the Focusmaster has been found. Click “OK” and Focusmaster can now be controlled via TVFocusPlus.

LED On / Off

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

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 Focusmaster 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 motors 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 either the Fwd or Rev Pulse buttons.

Night Vision

Click the “Night Vision” check box to turn the programs on your computer screen red. The “Motor Speed” and “Pulse Time” sliders need to each be clicked in order to turn them red. Conversely, when switching “Night Vision” off both sliders need to be clicked in order to return them to “regular” mode.

Set Point Tolerance

This feature permits setting a \pm amount of leeway to visually alert you when you are approaching one of your focus presets (the box turns yellow) or at focus (box turns green). Values may be typed in or scrolled using the buttons.

Poll Time

Poll time is how often in milliseconds Focusmaster samples the readout of the digital indicator when in “Read Continuously” mode. The range is from 200 to 1000 milliseconds (1000mS = 1 second). The quicker the polling speed

the easier it is to follow the movement of the focus position.

The settings of Motor Speed, PWM Frequency, and Pulse Time will automatically be saved when you exit TVFocusPlus.



Plus and recalled when you start it next time.

Run Tab

Forward Full, Reverse Full, and Motor Stop

Clicking the Fwd Full or RevFull buttons will energize the motor until either the Motor Stop button is clicked, or you exit out of TVFocusPlus software completely.

Motor Forward Pulse and Motor Reverse Pulse

These buttons will energize the motor for the amount of time set by the Pulse Time slider found under the Setup tab. 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.

IMPORTANT: The Focusmaster and any software used with it have no capability to sense when the focuser is run completely in or out. 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.

Read Focus Position

(With the Digital Indicator attached, TVFocusPlus shows nothing in the "Focus Position" window when first started. Click either the "Read Focus Position" or "Read Continuously" buttons to activate.)

The "Read Focus Position" button will give you the absolute indicator value at the moment the button is clicked. In other words, it will tell you how far along in its travel it is from its full extension. The screen readout will not change until the "Read Focus Position" button is clicked again.

Read Continuously

Click the "Read Continuously" button to monitor the movement of the indicator on a real-time basis. Remember that the "Poll Speed" will dictate how often the numbers are refreshed.

Set Zero

This function is related to the "Display Offset" check box and is only active when the box is checked. Click it to designate a relative zero point. This will come in handy for determining focus positions relative to a baseline of your choosing.

Display Offset

Click this check box to switch the reading mode of the indicator from the absolute value of the indicator to a position relative to a zero point of your choosing. The "Read Focus Position" and "Read Continuously" buttons will now show a display relative to the zero position you set.

Set Point

TVFocusPlus can store up to ten focus positions of your choosing. Click the "down" arrow on the set point number you would like to view. The information related to that set point is displayed in the windows.

Set

Click the "Set" button when you want to associate a position with the set "Set Point" displayed. You will notice that when you set the point the numbers appear in a green background. As you return to that setting the background will

turn yellow when you are close and then green when you have hit it within the tolerance defined in the Setup Tab. After you have set a focus position, you may want to add some text to describe what that set point relates to. Click the "Add" button to store the information. If you forget to click the add button the text will not be stored but the set point will remain.

Limited Warranty

Tele Vue Optics Inc. guarantees Focusmaster to the original purchaser to be free from defects in material and workmanship for a period of one year from the date of purchase. At its option, Tele Vue Optics, Inc. will repair or replace the defective product. Tele Vue Optics, Inc. is not responsible for damage caused by the freight carrier, i.e.: UPS, FED EX, etc., to our product. A claim to repair or replace the product must be initiated by the recipient. Warranty coverage excludes normal wear and tear, or damage caused by improper installation, any modification, abuse, misuse, improper maintenance, and unauthorized repairs or modifications to the original product. Warranty does not cover those parts prone to failure under normal wear and tear. A request for Return Authorization must be made by calling Tele Vue Optics, Inc. (845) 469-4551 before shipment, otherwise the package will be refused by our shipping department. Shipper is responsible for proper packaging, shipping, and insurance on approved repair items. Tele Vue Optics, Inc. will package, insure and return ship at no cost to the customer.