

MicroTouch Autofocuser Operating Instructions

The MicroTouch Autofocuser is designed to work with Feathertouch Focusers from Starlight Instruments. It allows automatic focusing with CCD and DSLR cameras. Included is FocusMax software to automatically focus the telescope for imaging. Manual focus is also possible using the hand controller. The hand control features an LCD screen for displaying a digital readout of focus position as well as information used for programming the temperature compensation feature.

The MicroTouch Autofocuser is compatible with Feathertouch Crayford focusers, Feathertouch SCT MicroFocusers, and Feathertouch MicroFocusers for Takahashi and TeleVue refractors. Optional larger focus motors allow use with the Starlight Instruments 2.5", 3.0" and 3.5" focusers. Motors are also available for non-Feathertouch focusers on Sky-Watcher, Stellarvue and Takahashi refractors.

Included Parts

- **Hand Control**
- **Focus Motor**
- **Focuser Gear**
- **Motor Connector Cables**
- **USB Cable**
- **12-Volt Power Cord (AC or DC, user selected)**
- **Hex-Head Wrenches**
- **MicroTouch & FocusMax Software**

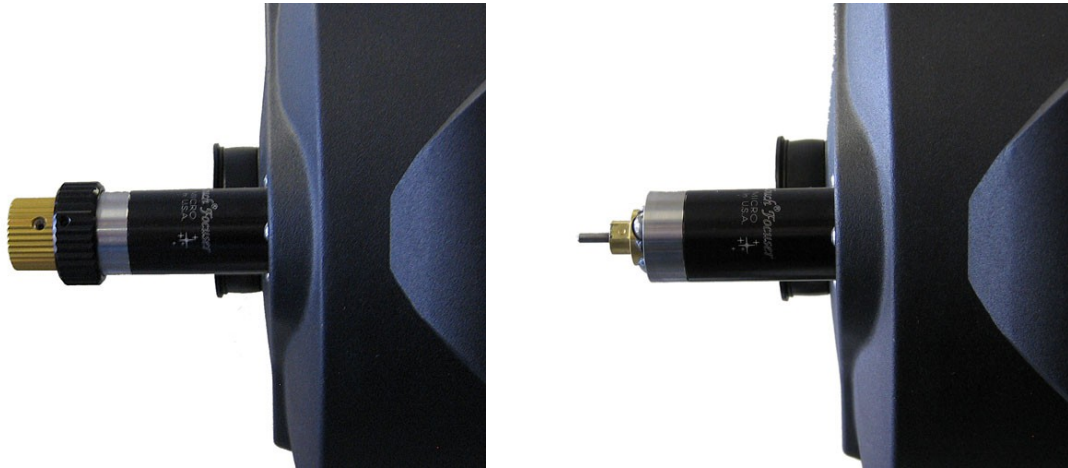


Hand control, motor, cables

Installing the Focus Motor

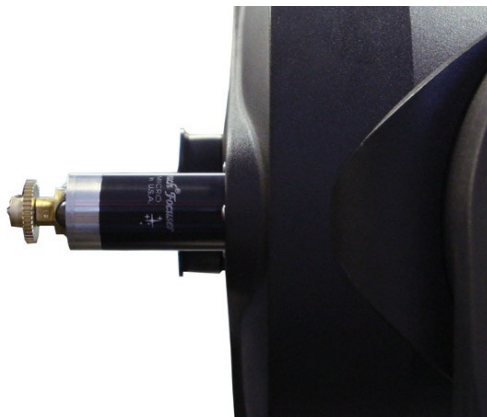
The following directions are illustrated using a Feathertouch SCT MicroFocuser, but the instructions are identical for any Feathertouch focuser.

- 1) Begin by removing both the brass fine focus and black standard focus knobs from the focuser. Use the included medium size hex-head wrench to remove the knobs.

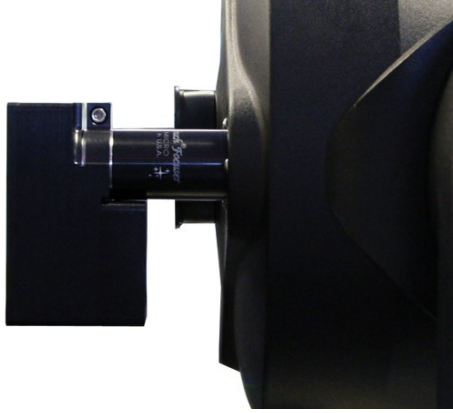


- 2) Install the small brass gear onto the focus shaft. The gear goes toward the telescope, with the smaller gear hub away from the scope, as shown below. The gear should NOT quite touch the brass bearing hub on the focuser. Insert the gear all the way onto the shaft then back it off slightly. Use the small hex-head wrench to lock the gear in place.

Note: *The gear has a small insert to allow installation on different size focus shafts. The insert can only be removed from one side. Using one of the hex-head wrenches to push the insert out can be helpful.*

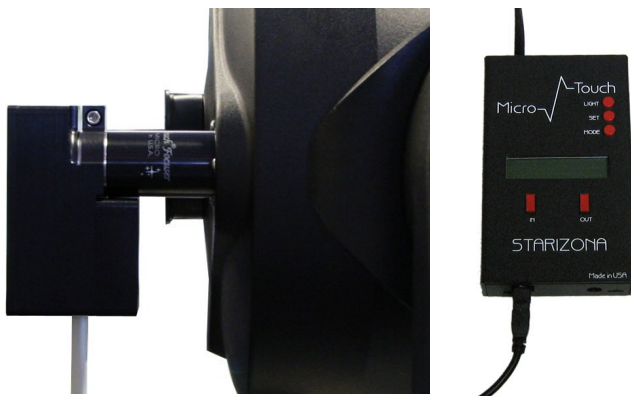


- 3) Slide the focus motor onto the focuser. You may need to rotate the motor slightly to allow the motor gear and focuser gear to mesh. The motor can be rotated to the desired position after the gears have meshed. When installed properly, the motor will completely cover the silver portion of the focuser. Use the large hex-head wrench to lock the motor in place.



Connect Hand Control

- 4) Use the included RJ11 cable to connect the motor to the hand control.



Using the MicroTouch Autofocuser Manually

You can use the MicroTouch focuser to focus the telescope visually by using the **IN** and **OUT** buttons. This is also how you will approximately focus the telescope when using a camera, before using the autofocus routine.

MicroTouch Hand Control Menus

The LCD screen light turns on when the hand control is powered up. If desired, press the **LIGHT** button to turn the light off.

Pressing **MODE** once displays the current ambient temperature. The default display is °F. To change to °C, press the **SET** button while the temperature is displayed.

The following menus are accessed sequentially by pressing the **MODE** button: **Temp Comp**, **Learning**, **Wireless**, **Motor Rev**, and **Reset Position**. Each is described in detail below.

Temp Comp

This activates the Temperature Compensation feature of the MicroTouch Autofocuser. Press **SET** to turn this feature on. In order for the Temperature Compensation feature to work, it must learn how to compensate for changes based on the optical system being used. This is done using the **Learning** menu (below).

Learning

The Temperature Compensation feature works by learning how much focus change is necessary to compensate for a given temperature change. For example, on a certain system, a temperature drop of 1°F might require a focus position shift of 25 counts. Therefore, if the temperature drops by 2 degrees, the focuser would move 50 counts to keep the telescope in focus. The focuser must learn the exact focus shift required for a given telescope and configuration (so adding a focal reducer, for example, would require the focuser to be recalibrated).

To activate the Learning mode, press and hold the **SET** button for a few seconds until the display shows **Mode: Learning**. The word Learning will blink while the focuser is being calibrated. The current position of the focuser is displayed.

Press **MODE** once to view the current temperature. Wait until the temperature has changed. A temperature change of 5°F is recommended for the most accurate calibration. Once the temperature has changed, refocus the telescope (either manually or using the autofocus routine described in the next section). Return to the Learning menu and hold **SET** again until the display shows **Mode: Idle**. The temperature compensation is now set.

Go to the Temp Comp menu and press **SET** to turn the temperature compensation on. More advanced temperature compensation control is available through the MicroTouch software.

Wireless

This turns the wireless communications on or off. The default for the MicroTouch Autofocuser is **OFF**. If the autofocuser is upgraded to the wireless version, the mode must be changed to **ON**.

Motor Rev

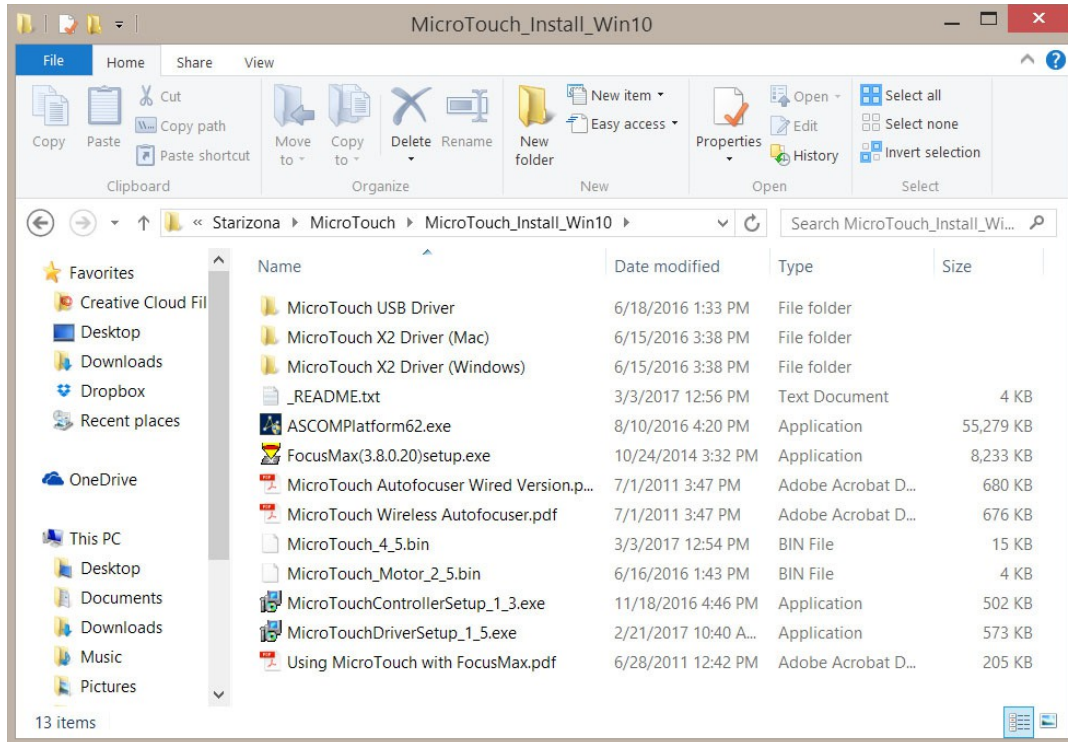
This reverses the direction of the motor.

Reset Position

The default position of the digital readout is 30000. The range of focus is 0-60000. If the focuser is moved to either end of this range, press **MODE** until **Reset Position?** appears. Press and hold the **SET** button until the display blinks and resets. The position has now been reset to 30000. If a different default position is desired, it is possible to program this using the MicroTouch software (described below).

Installing the MicroTouch and FocusMax Software

Load the included CD. Alternatively, you can download the latest installer from the MicroTouch product page on *Starizona.com*.



There are several files that must be installed.

If you do not already have the ASCOM Platform installed on your computer, begin by running the **ASCOMPlatformXX.exe** file. This will take a couple minutes to install.

Next, install FocusMax by running the **FocusMax(3.8.0.20)setup.exe** file.

Now we need to install the hardware drivers for the MicroTouch unit. Go into the MicroTouch USB Driver folder. There are two driver installers, depending on whether you have a 64-bit or 32-bit operating system. Most computers with Windows 7 or newer will be 64-bit. Run the **StarizonaUSBDriverInstaller_x64.exe** (or x32.exe if you have a 32-bit OS).

Go back out of the Starizona USB Drivers folder to the main directory. Run the **MicroTouchControllerSetup_X_X.exe** installer. This will install the MicroTouch Controller application.

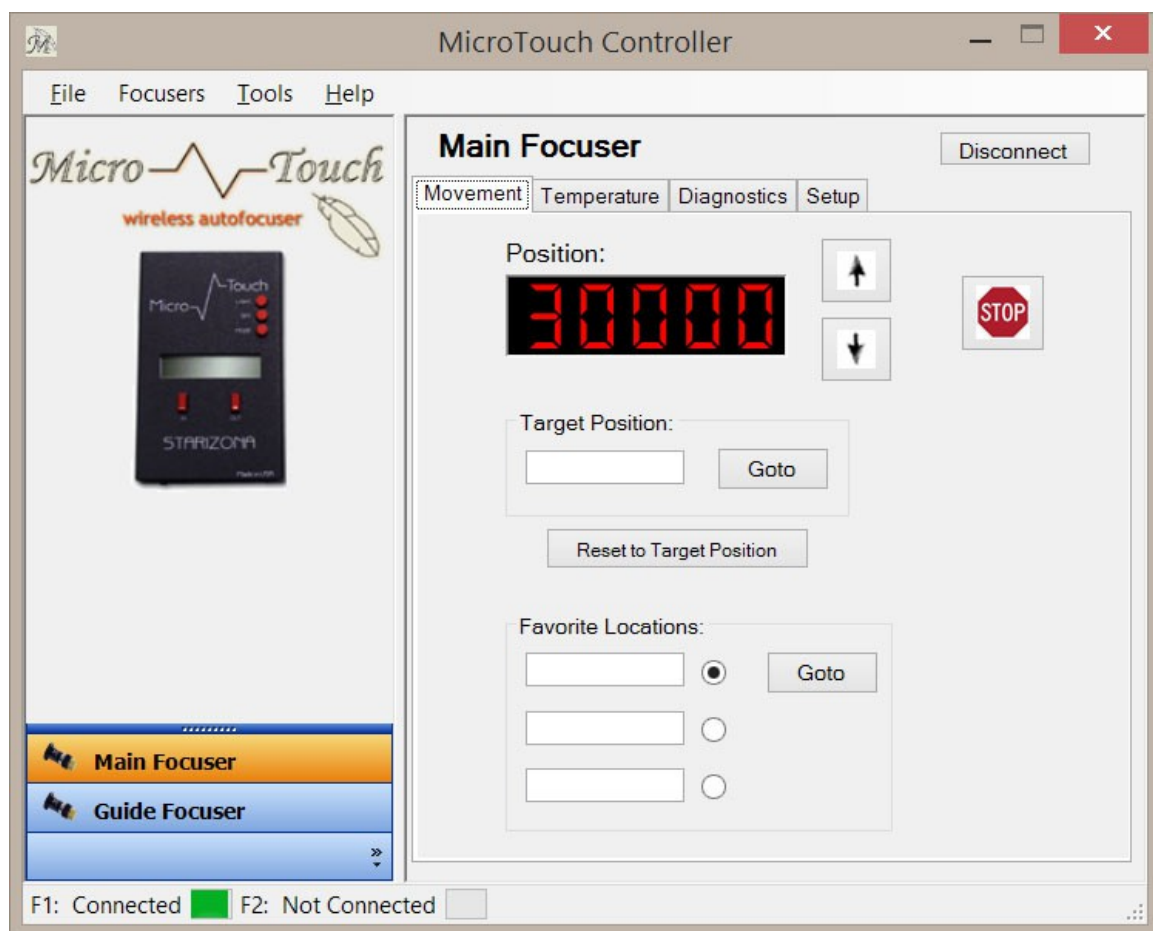
Finally, run the **MicroTouchDriverSetup_X_X.exe** file that will install the ASCOM drivers for the MicroTouch.

MicroTouch Software

The standalone MicroTouch Controller software lets you manually operate the MicroTouch autofocuser, configure settings, train the temperature compensation, and update the firmware.

Launch the MicroTouch Controller application. If you are only using one MicroTouch unit, you should be able to simply press **Connect**. If you are using multiple units, see the instructions below.

Movement Tab



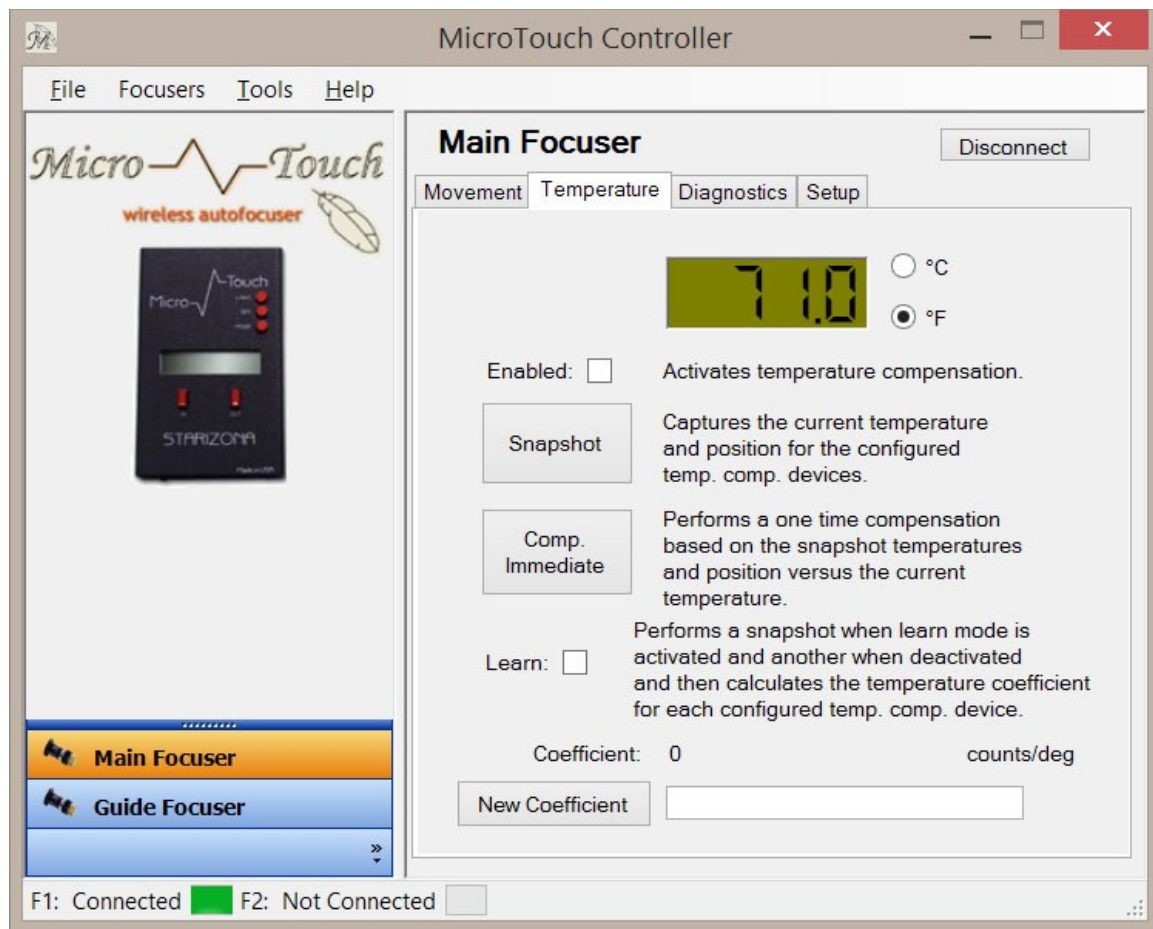
When you first connect, you should be on the **Movement** tab and will see the current position of the MicroTouch displayed in red numbers. You can move the focuser motor in or out by pressing the up and down arrow buttons.

To move to a specific position, enter the desired value in the **Target Position** box and press **Goto**. To stop the focuser during a goto movement, press the **Stop** button at any time.

You can reset the current position to any value between 0 and 60000 by entering that value in the **Target Position** box and pressing **Reset to Target Position**.

Common positions that you use can be stored in the Favorite Locations boxes. For example, if you know your telescope focuses at about 12000 steps with an eyepiece and about 41000 counts with a camera, you can quickly go between those positions.

Temperature Tab



The **Temperature** tab is where you can view the current temperature reading from the temperature sensor on the MicroTouch unit, and where you can train and enable temperature compensation.

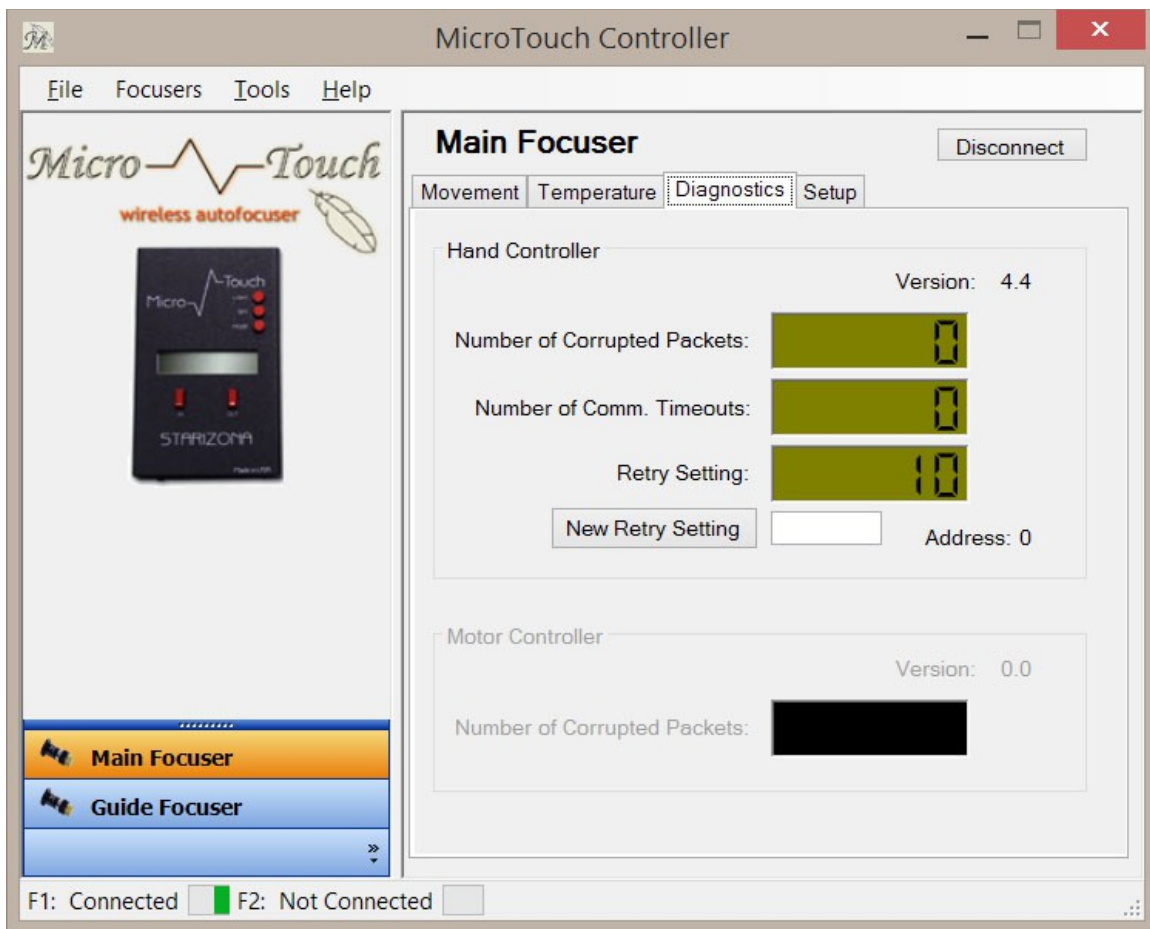
To train temperature compensation, first focus the telescope, then check the box next to **Learn**. This will snapshot the current position and temperature. You should then wait some time while the temperature drops by several degrees. During this period you can otherwise use the MicroTouch as normal. Once the temperature has dropped by a few degrees, refocus the telescope and uncheck **Learn**. This will take a second snapshot of the current position and temperature and determine a **Coefficient** in counts per degree.

(It is also possible to manually enter a coefficient in the bottom box and press **New Coefficient** to apply it, but this normally isn't necessary.)

Once trained, you can click the **Snapshot** button to get the current info from the MicroTouch unit. You can then click **Comp Immediate** to update the position based on the current temperature.

To run the temperature compensation continuously, check the box next to **Enabled**. This will continuously read the temperature and update the position as needed until you uncheck **Enabled**.

Diagnostics Tab

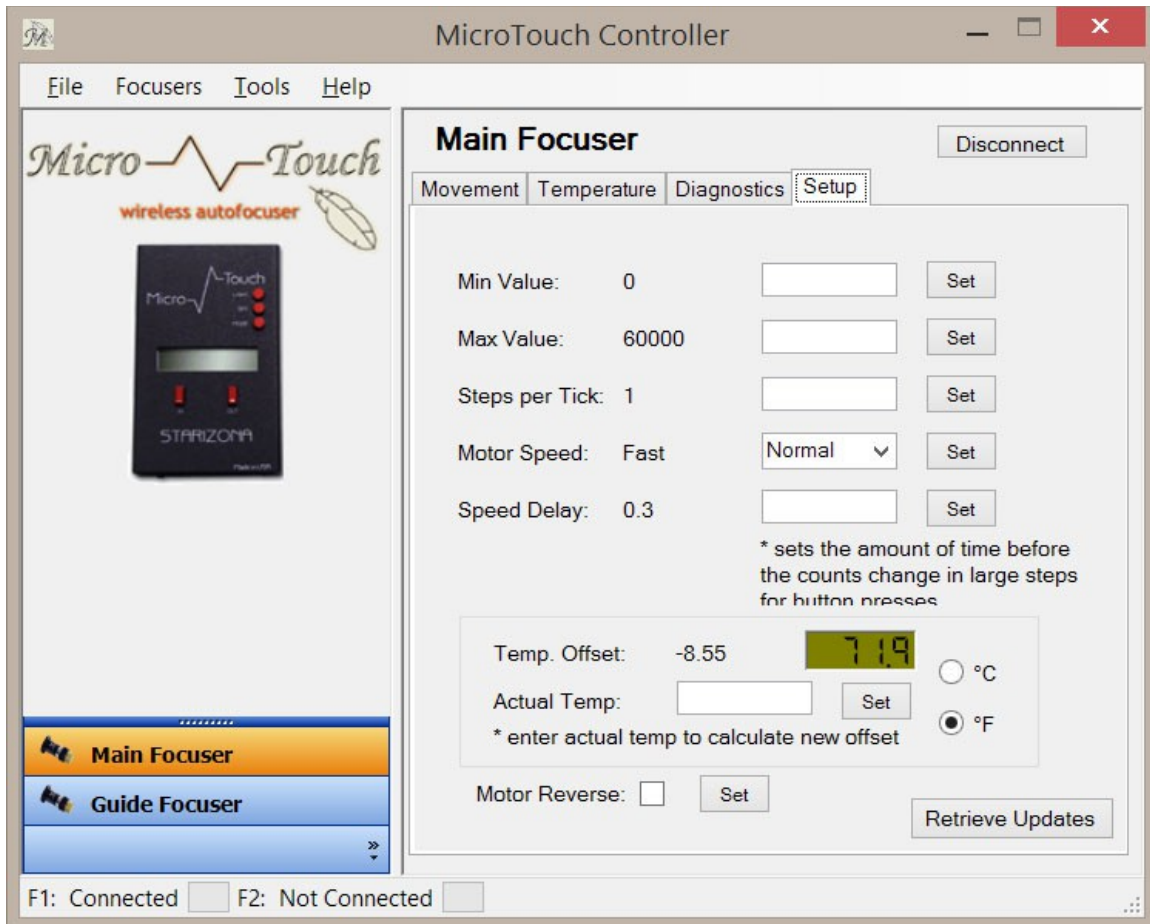


In the **Diagnostics** tab you can get info on the hand controller unit and (if you have the wireless MicroTouch) the motor controller unit.

The info on the hand controller will show the firmware version number. If you do not have a wireless version, the Number of Corrupted Packets and Number of Comm Timeouts will always read zero. If connected to a wireless unit, you will also see the

firmware version of the motor controller and may have values for corrupted packets and timeouts.

Setup Tab



The **Setup** tab lets you adjust the parameters of the MicroTouch unit.

Normally the **Min** and **Max Values** are set to 0 and 60000, respectively. This is the full range of the MicroTouch digital steps (but not necessarily the physical range, depending on the focuser). If your focuser has less physical range, you can limit the **Min** and **Max Values** to keep the focuser from traveling too far.

The default value of **Steps per Tick** is 1. This means each position step corresponds to one step of the stepper motor. This gives the best resolution. Changing this value to 2, for example, moves the motor 2 steps per position number, making the movement faster but less precise.

The **Motor Speed** option has possible values of **Fast** and **Normal**. **Fast** turns the motor at a higher speed, but provides less torque. If you have a heavy payload on your focuser, you want to use the **Normal** setting to provide more lifting power.

Speed Delay has a default of 0.3 seconds. When you press the **In** or **Out** buttons either in the MicroTouch Controller application or on the hand controller unit, this is the delay before the motor ramps up to full speed. This allows you to easily make smaller steps by giving the button short pushes, without the motor wanting to immediately go running off at full speed.

Temp Offset allows you to calibrate the temperature sensor. If the sensor reads, for example, 78°F, but you know the actual temperature is 72°F, you can enter the actual temperature and press the **Set** button to calibrate the temperature offset (in this case -6°F).

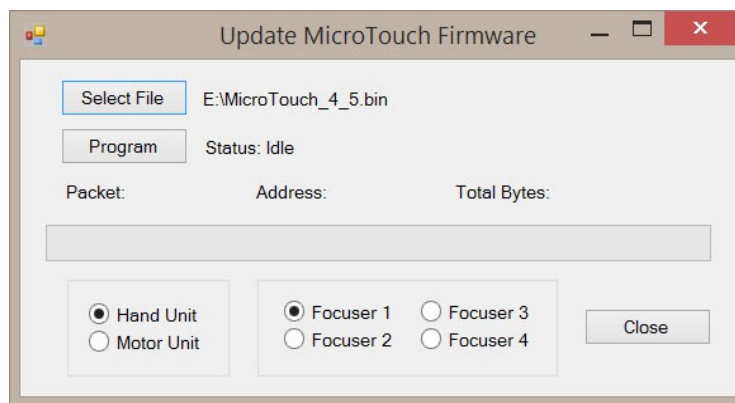
Motor Reverse allows you to reverse the direction the motor runs so that **In** and **Out** actually correspond with the focuser movement, depending on which focuser you use.

Updating Firmware

Note: *The MicroTouch Shuttle uses different firmware than the standard MicroTouch unit. Be careful to upload the right file!*

The latest version of the MicroTouch firmware is available in the download from the MicroTouch product page on *Starizona.com*. There are two firmware files, one for the hand controller unit and one for the motor controller unit. The motor controller firmware is only used with the wireless version of the MicroTouch.

To update the firmware, make sure the MicroTouch is connected in the MicroTouch Controller application. Then go to the **Tools** menu at the top and select **Upload Firmware**.



In the Update MicroTouch Firmware window, click on **Select File** and navigate to the firmware file you downloaded from the Starizona website. The hand controller firmware will be **MicroTouch_X_X.bin**, where the X's represent the latest version number. The

motor controller firmware will be **MicroTouch_Motor_X_X.bin**. Firmware for the MicroTouch Shuttle will be **MicroTouch_Shuttle_X_X.bin**.

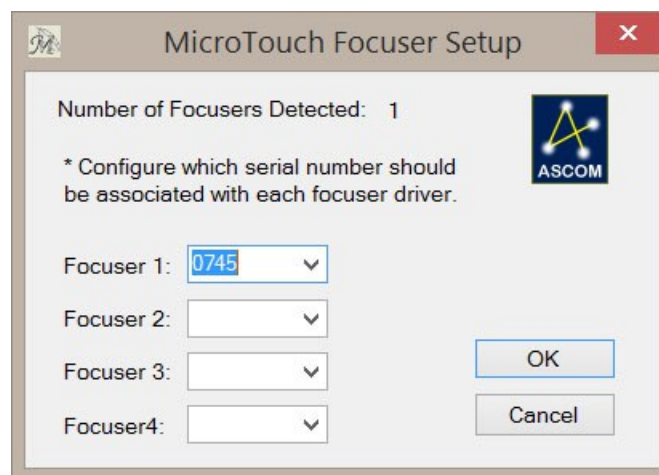
Be sure to check whether you are programming the **Hand Unit** or **Motor Unit** at the lower left of the window.

To upload the new firmware, you must press and hold the **In** and **Out** rectangular red buttons on the hand controller unit, then press the **Program** button in the Update MicroTouch Firmware window, then you can release the red buttons. You should see the programming happening. After a few seconds, the program will complete. If you close the Update MicroTouch Firmware window and select the **Diagnostics** tab, you should see the newest firmware version number displayed.

Using Multiple MicroTouch Units

Each MicroTouch hand controller unit has a unique 4-digit identifier. This means you can control multiple units on the same computer.

To connect multiple units, go to the **Focusers** menu at the top and select **ASCOM Setup**. Any currently connected focusers will be disconnected and the MicroTouch Focuser Setup window will appear.



In the pulldown menu next to each focuser, you will see the numbers listed of each MicroTouch unit that is currently plugged into the computer. To sort out which number corresponds to which hand controller unit, we recommend plugging them in one at a time to begin with.

You can select the number for the unit you want to be Focuser 1 and Focuser 2, etc. Then click **OK**. You can then select which unit you are controlling using the buttons in the column on the left side of the main window, **Main Focuser**, etc. Only two buttons show by default. You can show more or less buttons by clicking on the >> icon at the lower right of the column.