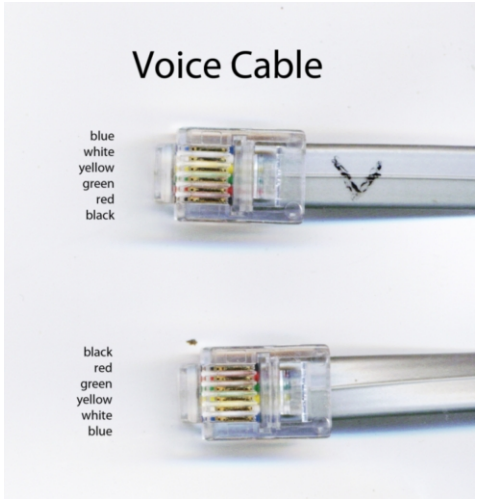
usb-nSTEP Instructions

Hardware Connection

1) Connect Stepper motor to usb-nSTEP using supplied **VOICE** cable. Do **not** use DATA cables. **VOICE** cables can be identified by looking at the ends of the cable. Color of wires are reversed comparing one end to the other.
2) Connect usb-nSTEP to external 12V DC using supplied power cable -- steppers will not work without 12V DC connected
3) Connect usb-nSTEP to PC usb port using supplied USB cable



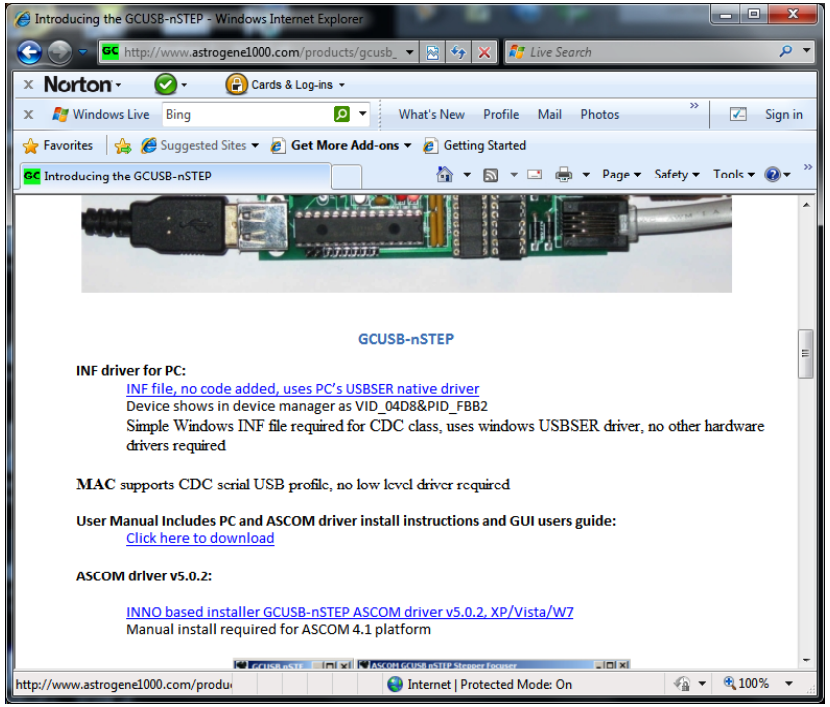
4) Optional temperature probe plugs into 2.5mm jack next to usb socket on usb-nSTEP.

BEFORE INSTALLING SOFTWARE

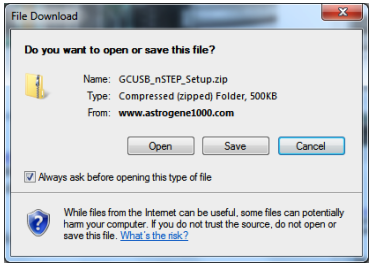
Make sure that your windows account has ADMIN privilege as ADMIN privilege is required to install drivers in Windows

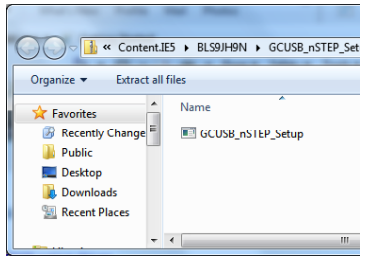
Software Installation

1) Download and install the ASCOM platform from http://ascom-standards.org/index.htm
2) Go to http://www.astrogene1000.com/products/gcusb_nstep/gcusb_nstep.htm

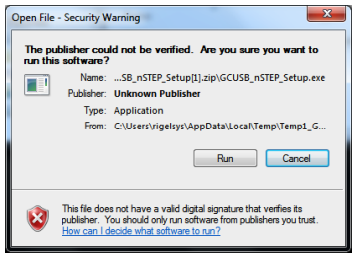


3) Click on "**INNO Based installer GCUSB-nSTEP ASCOM Driver**" and **OPEN**

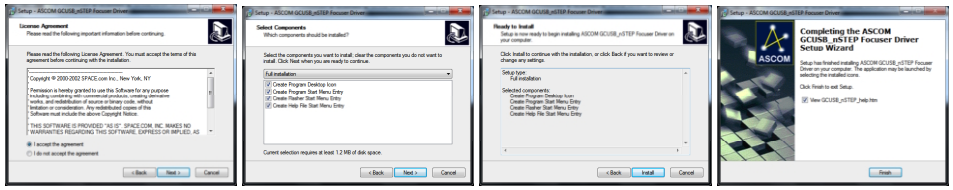




4) Double click on the "**GCUSB_nSTEP Setup.exe**" and run the exe

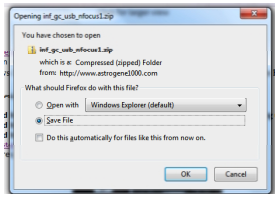


5) Accept license agreement and proceed

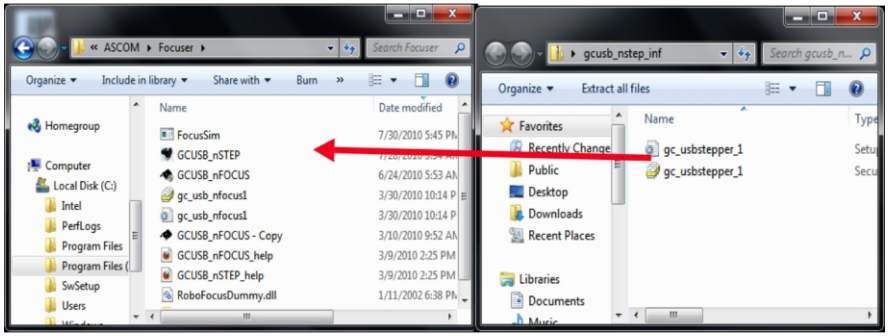


6) Go Go to http://www.astrogene1000.com/products/gcusb_nstep/gcusb_nstep.htm

7) Download and save the "**INF file, no code added**" zip file, then double click the zip file to unzip.



8) Open the folder where the **GCUSB_nSTEP** executable is installed (left side of image below), and drag the "**gc_usb_nSTEP1**" setup information and security catalog files into it. . REMEMBER the directory in case you in step 10 you need to point the Device Manager explicitly to the directory.

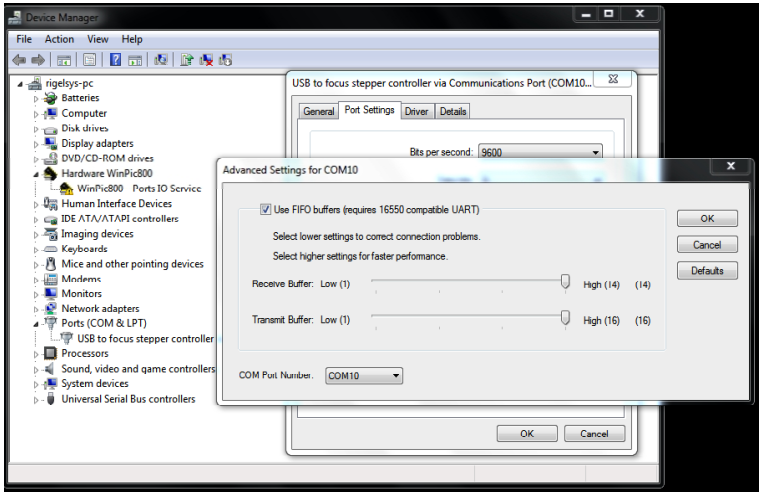


9) Plug the **usb-nSTEP** hardware into a USB port and device drive should install. If it doesn' then follow step 10.

10) Open **Device Manager**, click on **Other Devices**, click on **USB nSTEP** device, pick **Driver** tab and select **Update Driver**. On next screen, select "browse local disk" and let it go to town!

11) Driver is installed ☺ so select **Close**.

12) Select **PORTS (COM & LPT)** in the **Device Manager**. **USB to focus stepper controller (COM#)** is displayed, with COM port assigned. You will need to know this COM port to setup the **GCUSB-nSTEP** application. You **must** change the COM port assignment by clicking on the USB to focus stepper controller, select the **Port Settings** tab, select **Advanced** and selecting a "**virgin**" **COM Port Number (one that doesn't say "in use") to avoid problems with settings from other applications.** For backwards compatibility, values are 1-16.



13) Ready to go ☺ Use the shortcut on your desktop to activate the **GCUSB-nSTEP** application.

Tips on Connecting to FocusMax

Usb-nSTEP is ascom compatible and can be interfaced to FocusMax. Note: FocusMax is not our software. FocusMax is a freeware program written by LARRY WEBER and STEVE BRADY for use with commercial telescope focusing devices used by amateur astronomers. FocusMax can be downloaded from the FMaxUG on Yahoo Groups. Below are tips to help interface to FocusMax.

1) Make sure your windows account has ADMIN privileges.

2) Join the Yahoo FMaxUG, Download and install the latest version of FocusMax (3.5.0 as of this writing). Start FocusMax. If it doesn't start and produces an error message about log files, then you need to create the directories that it's expecting for data, image, and log files. Open the FocusMax HELP file which talks about the directories, they may not be where help file states. Run the ASCOM PROFILER and under focuser, select FocusMax and read the profile file. In it you will find where FocusMax thinks the directories are. Go to those locations and create the data, image and log file directories. Then you should be able to start FocusMax and inside of FocusMax change the path to where you really want those directories. Any problems, ask the FMaxUG.

3) Right click on the gcusb_nFOCUS shortcut and check the properties / compatibility tab and make sure the "run in compatibility ..." and "run with admin..." check boxes are **NOT** checked.

4) Start the gcusb_nFOCUS application, plug in the gcusb_nfocus hardware, and "connect" to the hardware. Run CIN/COUT to move motor to confirm hardware is working. Minimize the gcusb_nfocus app to the dock.

5) Right click FocusMax shortcut and check properties/compatibility tab and and make sure the "run in compatibility ..." and "run with admin..."check boxes are **NOT** checked.

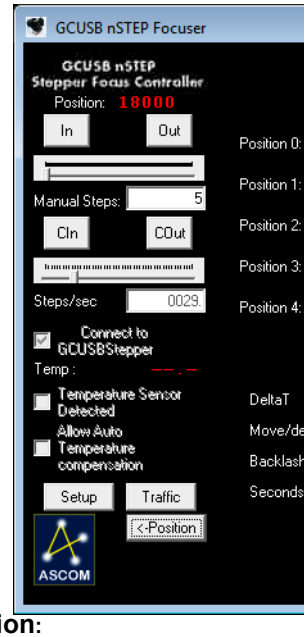
6) Start FocusMax and pick the system tab, select gcusb_nFOCUS and connect.

7) Select the focuser tab. Correct focus position and temperature should be displayed. Maximize the gcusb_nFOCUS app from the dock and compare to its value.

8) Click on "jog" at the top of the FocusMax focuser tab and jog the motor in/out to verify FocusMax is working with nfocus.

9) Ready to go ☺

Control Window



Position:

Where the driver thinks the focuser is. For nSTEP this is truly always relative to a point you set in the SETUP screen.

In/Out:

Press to move in or out the number of “steps” indicated by the 'sliders' setting.

Slider

Select number of 'pulses' to do for each press of an In/Out or C

Cln/COut

Equivalent to repeatedly pressing the In/Out buttons. nSTEP will continue to move until you release the button.

Manual Steps

Displays the value selected on 'slider', or you can manually enter the number of “pulses

Connect to nSTEP:

Check box to connect control software to usb-nSTEP hardware via the COM port selected in the setup screen (below).

Note: Once connected to the nSTEP you cannot disconnect without quitting program.

Note: An ASCOM application opening the driver will force this connection when “Linked”

Temp:

Displays the current temperature in degC or degF for the temperature probe is attached to the usb-nSTEP

Temperature Sensor Detected

The software will “check” this box if it detects that a temperature probe is connected to the usb-nSTEP. If temp probe detected then you can choose to allow automatic temperature compensation.

Temperature Compensation

Check box to enable temperature compensation but note that manual focusing is disabled while in temperature compensation mode.

Setup

Select to display usb-nSTEP setup window.

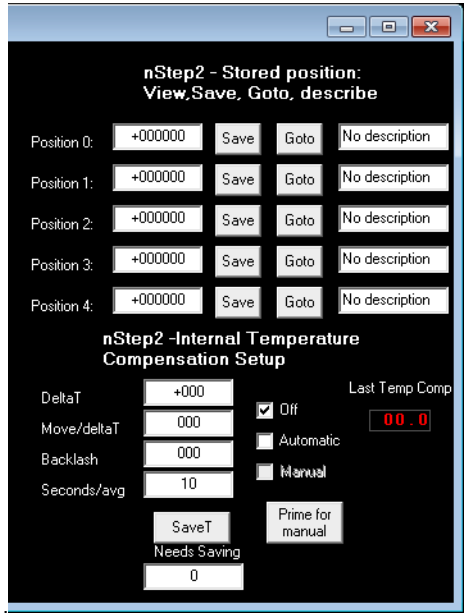
Traffic

Select to display ASCOM usb-nSTEP command traffic with usb-nSTEP hardware.

Position Button

Select to expand window to display the Stored Position / Internal Temperature Compensation features.

Stored Position



Lets user make change major elements with large differences in focal plane easily by focusing once and then saving the position with annotation for later 'GoTo' when this element is used (camera1 to camera2 to eyepiece type '1' to eyepiece type '2').

Save

Saves the current position

Goto

Moves the focuser to the saved position

Description

Lets the user label the position for ease of operation.

Internal Temp Comp

This function runs the temperature internally to the nSTEP so a user can actually configure it and then exit the ASCOM driver, the nSTEP will keep on 'auto' compensating.

This internal temperature compensation is -not- controlled by the higher level ASCOM API for temperature compensation, the higher level API uses the temp comp of the ASCOM driver. The internal compensation should not be used if the higher level API's are used.

DeltaT

This is the temperature change x10 to trigger a compensation. The nSTEP uses a fixed point value here which is 10X the real temperature change desired. Examples: -005 = move in "-" direction when temp changes by 0.5C, +015 = +1.5C change must be detected before triggering a compensation. The values can range from -100 (-10.0C) to +100(+10.0C) in increments of 5(0.5C). The sign signifies whether to move + or - steps on a change.

Move/DeltaT

Move this many steps for each Delta Temp change. Direction of movement controlled by sign of DeltaTemp

Backlash

Apply this number of steps in last move direction before reversing direction. Range 0 through 100 with 0 = no backlash takeup

Second/Avg

Temperature will be averaged over this number of seconds. Range 1 to 75 seconds. Set to a lower value for more immediate changes. A lower value may cause 'hunting' if the sensor is detecting a value that is just toggling slightly (e.g. from 17.5C to 18.0C to 17.5C).

Off

Internal compensation turned off.

Auto

Internal compensation runs all the time. Mutually exclusive with the ASCOM drivers temperature compensation.

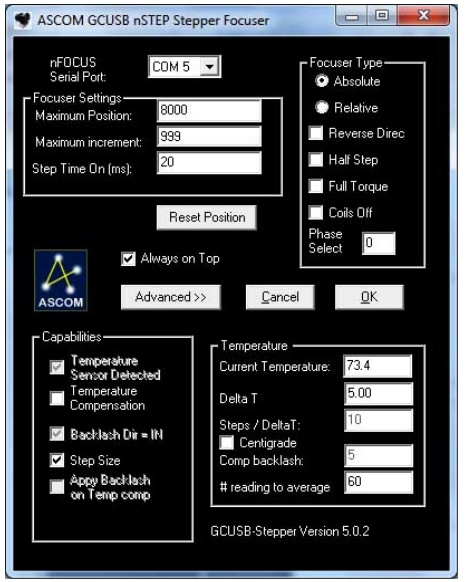
Manual

Temperature compensation done once on demand. Mutually exclusive with the ASCOM drivers temperature compensation.

Prime for manual

Must press **'Prime for Manual'** then **'SaveT'** to set the device's current temperature and position so it knows where to start from. After that, press SaveT while **'Manual'** is set to force a compensation at the current temperature. Useful for focusers with backlash when you do not want compensation running in the middle of an exposure as taking up the backlash will throw image out of focus even more if direction of motion reverses.

Setup Window



nSTEP Serial Port:

Set to the COM port number assigned to the usb-nSTEP hardware when first plugging it into a usb port on your computer. You can confirm/change the usb-nSTEP hardware COM port number using the WINDOWS DEVICE MANAGER. For backwards compatibility, valid values are 1-16.

Focuser Settings

Maximum Position: Value is used by the **Absolute Focuser Type** (see below).

Maximum Increment: Maximum number of "steps" to send to the nSTEP at one time. Generally used to limits the number of "moves" an ASCOM autofocus application can execute during each call to the usb-nSTEP ASCOM driver.

Step Time On (ms): Sets the duration of a "step". Valid range is 1-250 ms.

Focuser Type

Absolute: Select **Absolute Focuser Type**, rack focuser all the way in (to 'Home') and then press **Reset Position**. The gcusb-nSTEP software will will set the racked-all-the-way-in position to 00000. **Absolute Focuser Type** limits focuser position to between 00000 and **Maximum Position** in ASCOM applications.
Relative: Does not enforce limits on focuser position. Uses **Maximum Position** value to set the current position to half the max position value, when you press **Reset Position**.

Reverse Direc: Reverse In/Out directions to reflect peculiarities of focusers and focus motors.

Half Step: Energizes 1 or two coils at a time, doubling step resolution.

Full Torque: Highest power mode, two coils always energized.

Coils Off: Turn coils off after stepping to save power and reduce heating of the stepper motor. Only use with a gear-head stepper a non-gearhead stepper may slip lifting heavy loads

Phase Select: **set to 0 for usb-nSTEP**. Can be used for any possible the phase wirings. Allow a person to wire the phases in any order then chose one of 3 settings in software to drive them.

Reset Position

Press to set the current focuser position to zero.

Basic/Advanced

Toggles between displaying the **Advanced** (full screen as shown at left) or **Basic** setup (only upper half of screen)

Cancel

Cancel setup changes and, return to the control window.

OK

Apply all changes to setup and return to control window.

Capabilities

Temperature Sensor Detected: If temperature probe is attached this box will be 'checked' and enable other menu items.

Temperature Compensation: Enable automatic temperature compensation. Manual movement is disabled If "Apply Backlash on Temp Comp" is chekced then apply backlash if moving "IN", else if moving "OUT"

Temperature

Current Temperature: As read from temperature probe (if attached).

Delta T: For a change of Delta T, move "Steps/DeltaT"

Steps/DeltaT: Number of "steps" to move if "Delta T" temperature change is detected

Centigrade: Check box to report temperature in Centigrade, otherwise temperature will be displayed in Farenheit.

Comp Backlash: Move this number of pulses to compensate for backlash in DC motor gears.

 # readings to average: Read the temperature probe this number of times, average the readings, and display the result as the temperature and use when applying temperature compensation.

5 Year limited warranty: Rigel Systems, 26850 Basswood Ave, Rancho Palos Verdes CA, 90275 warrants to the original consumer purchaser of its product that the product will be free of defects in material or workmanship 5 years from the date of purchase under normal use. During this warranty period, **Rigel Systems** will, at its option, repair or replace the product without charge for parts or labor when delivered to **Rigel Systems** with proof of the date of purchase and a statement of the problem with the product. Shipping and handling charges to **Rigel Systems** are your responsibility. This warranty does not apply if the product has been altered or repaired by anyone other than **Rigel Systems** or has been subjected to purchaser abuse, accident, negligence or damage subsequent to purchase including battery damage to product. This warranty excludes incidental or consequential damages resulting from the product or use of the product. The product is not a toy. Keep away from children.

For more information visit
http://www.rigelsys.com