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

Voice Cable

blue
white
yellow
green
red
black

black
red
green
yellow
white
blue

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 rigelsystems.com web page, click on Stepper focus motors link and at bottom of Stepper focus motors page there is a link to download the usb-nSTEP software, **or** go directly to
http://www.astrogene1000.com/products/Firmware/nstep/GCUSB_NSTEP1/GCUSB_nSTEP1_Setup.exe

3) Double click on the "**GCUSB_nSTEP1_Setup.exe**" to run the exe. Note depending upon your version of Windows and AntiVirus you may have to go through the steps to approve running this exe.


4) Accept license agreement and proceed
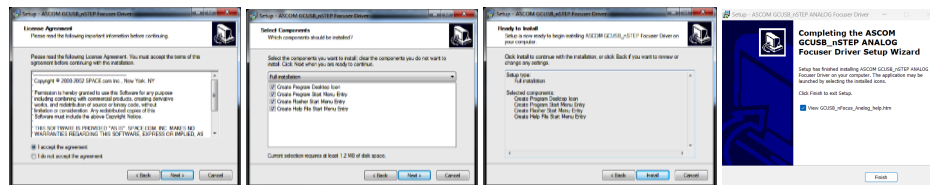
5) Plug the **usb-nSTEP** hardware into a USB port and device drive should install.

6) Select **PORTS (COM & LPT)** in the **Device Manager**. **USB to focus motor controller (COM#)** is displayed, with COM port assigned. You will need to know this COM port to set up the **usb-nSTEP** application.
If desired, you **may** change the COM port assignment by clicking on the USB to focus 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.**
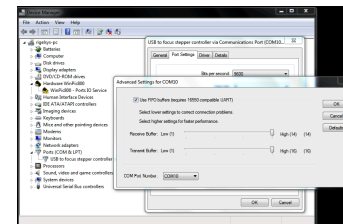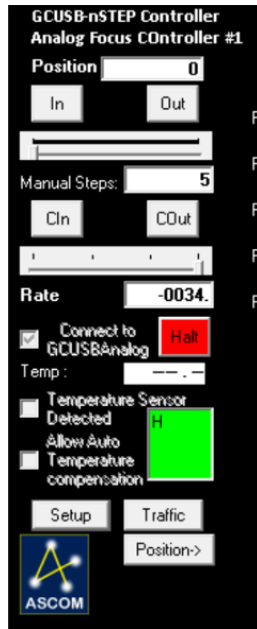

7) Ready to go ☺ Use the shortcut on your desktop to activate the **usb-nSTEP** application.

8) If you are running 2 **usb-nSTEPs** on the same PC download this installer and repeat the steps 3-7 for the 2nd **usb-nSTEP**
http://www.astrogene1000.com/products/Firmware/nstep/GCUSB_NSTEP2/GCUSB_nSTEP2_Setup.exe>

Control Window

GCUSB-nSTEP Controller
Analog Focus COntroller #1
Position 0
In   Out
Manual Steps: 5
CIn   COut
Rate   -0034.
☑ Connect to GCUSBAnalog   Halt
Temp : ---.--
☐ Temperature Sensor Detected
☐ Allow Auto Temperature compensation
Setup   Traffic
Position->
ASCOM

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 steps to do for each press of an In/Out or C

CIn/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 steps

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"

Halt: Press to stop if motor runs away.

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.

Green Square: Park mouse pointer here to operate focus remotely from a Bluetooth/wireless presentation pointer connected to your PC.

Setup

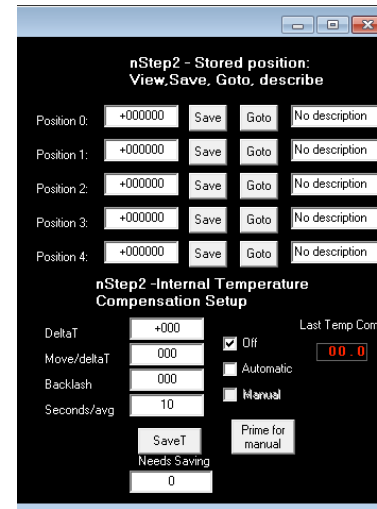Select to display usb-nSTEP setup window.

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

nStep2 - Stored position:
View,Save, Goto, describe

Position 0: +000000 Save Goto No description
Position 1: +000000 Save Goto No description
Position 2: +000000 Save Goto No description
Position 3: +000000 Save Goto No description
Position 4: +000000 Save Goto No description

nStep2 -Internal Temperature Compensation Setup

DeltaT   +000
Move/deltaT   000   ☑ Off   Last Temp Comp
Backlash   000   ☐ Automatic   00.0
Seconds/avg   10   ☐ Manual

SaveT   Prime for manual
Needs Saving
0

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

GCUSB-Stepper Version 5.0.2

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 **Relative 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. **Now Select Absolute Focuser Type** which limits focuser position to between 00000 and **Maximum Position** in ASCOM applications. **Relative: D**oes 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: OBSELETE see PHASE SELECT to reverse direction.

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 in factory to 0. If you desire reverse direction, set to 3**. Can be used for any possible the phase wirings. Allow a person to wire the phases in any order then chose one of 3 normal direction (0,1,2) and 3 reverse settings (3,4,5) 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 steps 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.