Nighthawk CNC Controller

Communication Setup

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To use your Nighthawk CNC Controller, you will need to have a way of communicating with it from a PC so you can give it GCODE files as well as commands like movement and of course, running your jobs!

There are multiple options that you can use to connect to your Nighthawk CNC Controller – USB, WiFi, and Bluetooth.

USB (Not Recommended)

Your first instinct may be to use USB however this is the **least reliable way** to control and run your machine and it is heavily discouraged! While it's running the spindle will create lots of Electromagnetic Interference (EMI) and electrical noise which can cause the USB connection to drop out resulting in random job stoppages or irregular machine behaviour. We only recommend using the included USB cable for setting up wireless communications, then unplugging the cable and storing it in a drawer.

WiFi (Best Option)

The best possible way to run your QB2 is via WiFi and connecting the machine to an existing WiFi network such as a house or factory network.

The next preferable option is WiFi – Direct Access Point Mode which allows you to connect directly to the Nighthawk instead of connecting the Nighthawk to an existing network. This will be the best option if there is no network in the area where your QB2 is located or if you are using a mesh network/WiFi range extenders as the Nighthawk cannot connect to these networks. This works the same as connecting to a network, but the drawback is that the computer running the machine will not have access to the internet while running the machine.

Bluetooth (Backup Option)

The third option is connecting to the Nighthawk via Bluetooth from a compatible PC or Laptop (not a smartphone!)
Bluetooth works the same as USB without the physical cable so it will eliminate the risk of EMI and unpredictable machine behaviour.

WiFi (Connect to Existing Network)

Connecting your Nighthawk to an existing wireless network is the best and most reliable way to communicate with and control your Nighthawk controller. Keep in mind that your Nighthawk DOES NOT need internet access, it only needs access to the network so that computers and devices on the same network can communicate with it.

Note: There are some network configurations that the Nighthawk will not work with or will have limited connectivity.

- WiFi routers are often capable of putting out signals in both the 5.8GHz and 2.4GHz frequency bands. **Your Nighthawk is only capable of interacting with and connecting to the 2.4GHz band.** If you are unsure which frequency band your network is you will need to contact the person who set it up for you as our support team often cannot help with this.

- Mesh networks are common in large properties where a single router isn't powerful enough to provide wireless signals to the entire property. The Nighthawk sometimes has issues reliably connecting to these networks however we are aware of this issue and are working on solutions.

- WiFi range extenders are common in large properties where a single router isn't powerful enough to provide wireless signals to the entire property. The Nighthawk sometimes has issues reliably connecting to these networks however we are aware of this issue and are working on solutions.

To get started with this process you will need to have a Windows PC located near the machine so you can connect to it with a USB cable.

Plug in your USB cable, turn on your PC, turn on the Nighthawk and open CNC3D Commander.

Note: If your Nighthawk is not installed automatically or detected by your PC, refer to the USB setup section of this guide.

Select COM in the first drop-down menu. In the second drop-down menu select the correct COM port, it should be the one that has CH340 in the description.

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Once connected, you will need to clear the Alarm by clicking the E-stop button and then "Unlock" so the Alarm box changes to green, then click on the Connections/ESP32 tab to access the wireless settings.

In the drop-down box you will need to select WiFi – Connect to Existing Network and the relevant options will highlight in the bottom of the window in the WiFi (Station) section.
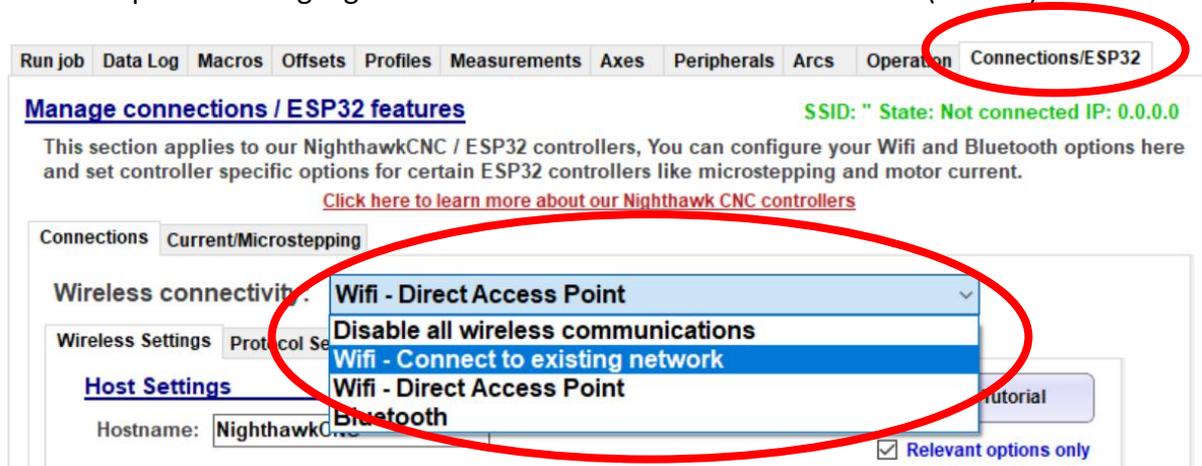
With the correct options highlighted, click on the "Show WiFi List" button to bring up the list of available WiFi networks that your Nighthawk can see.

Pro Tip: Your network will usually be the one with the best signal, but not always!

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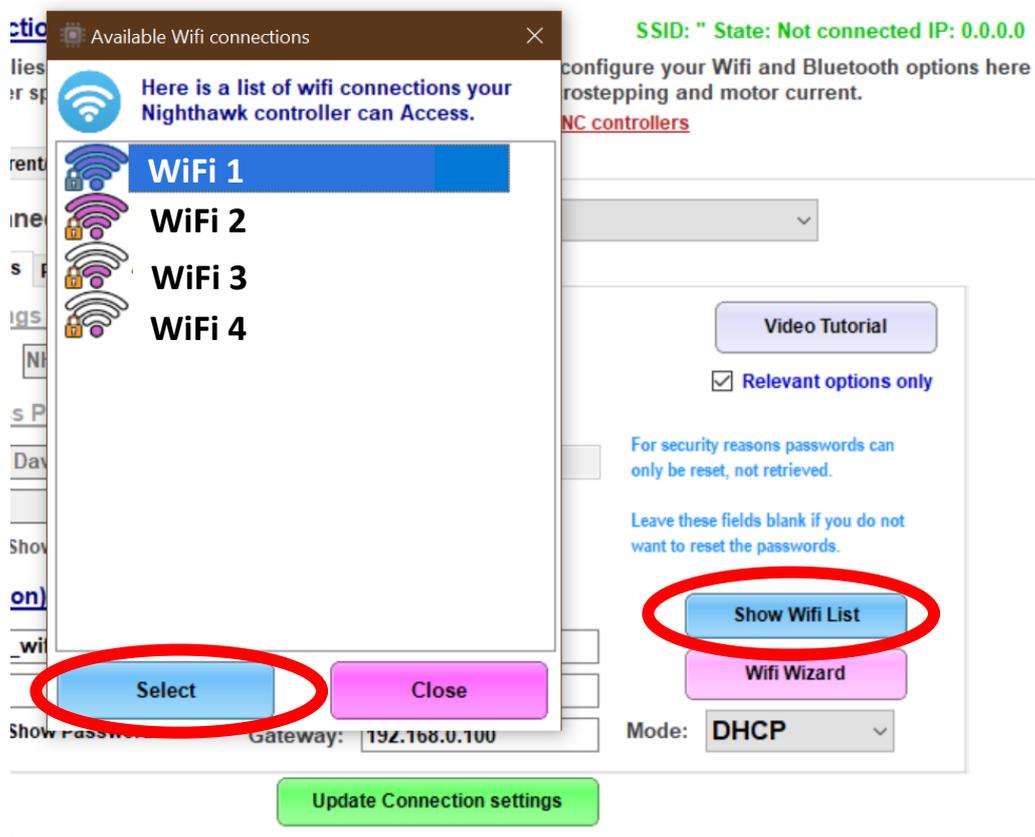
Note: You may need to refresh the list by closing the window and clicking the WiFi list button again

Highlight your network name, then click Select. This will put the network name you selected into the SSID box; you will then need to enter in your WiFi password. For now, you can leave the other boxes with numbers in them alone, and do not update settings just yet.

The next step is to click the WiFi Wizard button. This will automatically grab some details about your network from your computer and put them into the IP Address, Subnet and Gateway boxes. To do this your computer MUST be connected to the same network that you are setting up on your Nighthawk controller.

The next box allows you to set the Nighthawk controller's IP Address. For most users the default of 155 is perfect. If you do not need to assign a particular number here, you can leave it at 155.

Click OK to update the numbers and look for the popup to confirm it has been completed and click "OK".
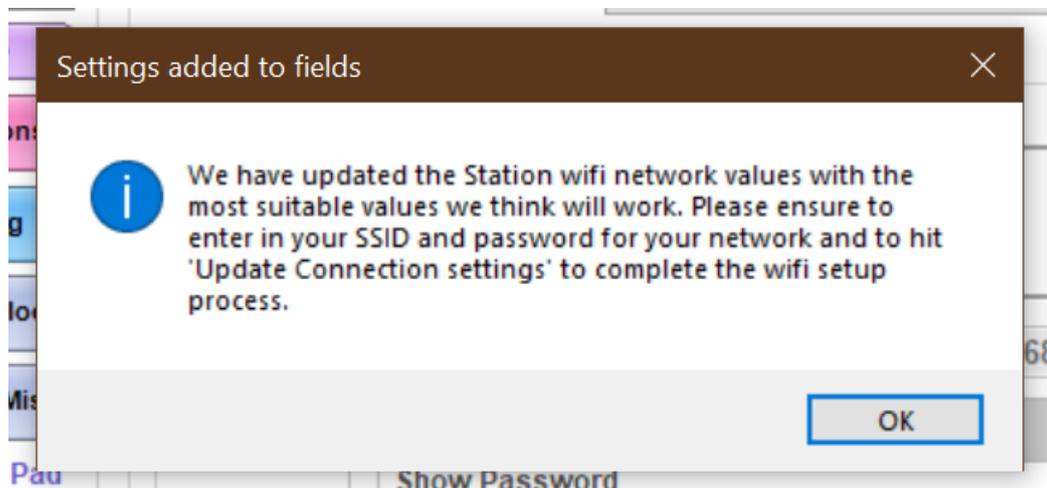
If you did not get a popup box telling you the settings have been updated, check to see if your machine is in an Alarm state in the bottom left corner of the Commander window next to the E-Stop. If you are in Alarm state you will need to clear it by clicking the E-stop button, then "Unlock" and re-do the process to update your settings.

You will see the numbers in IP Address, Subnet and Gateway may have changed to best suit your network, and the Mode box will read STATIC.

Pro Tip: Keep a note of the number in the IP Address box. All 4 number sets and . are vital!

You can now click "Update Connection Settings" and look for the popup box confirming the settings have been updated.
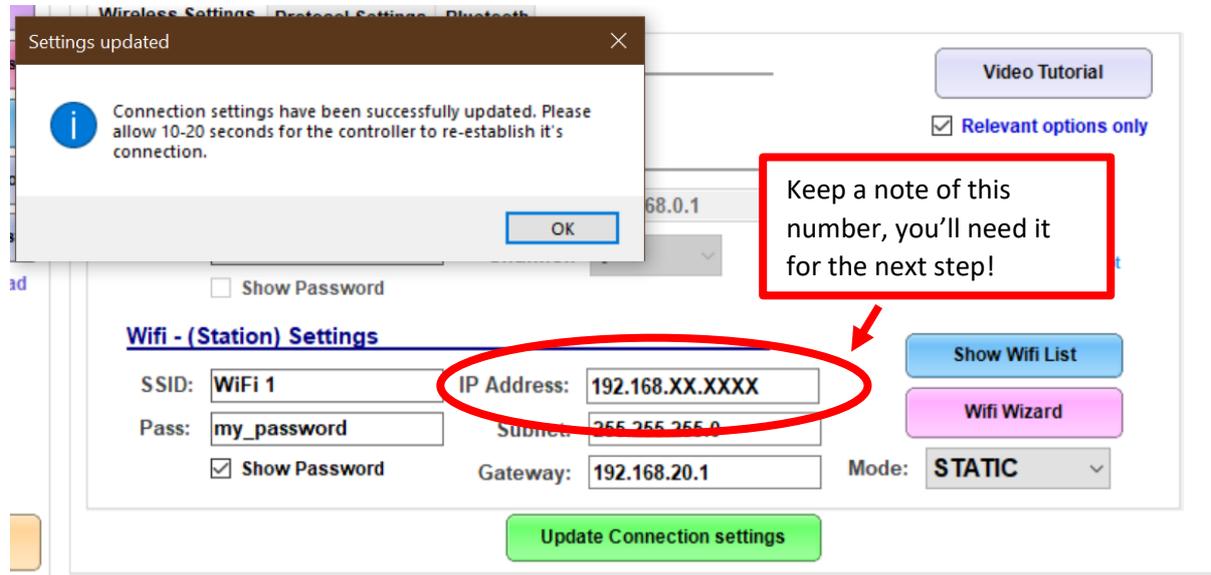
You should now click "Disconnect", turn off your Nighthawk controller, wait 10-20 seconds, and then turn it back on.

After powering the controller back on, you can click "Connect" to re-establish a connection via the USB cable after selecting the correct COM port and switch over to the Connections/ESP32 tab. If your connection was successful, you will see green text at the top right of the tab.
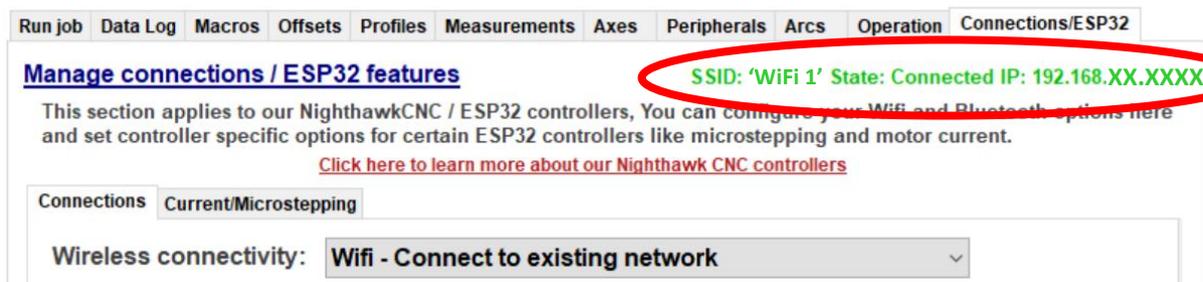
You can now click "Disconnect" at the top left of Commander, then change that first drop-down box to IP, and then type in the IP Address that was specified in the previous step and click "Connect".

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If everything was successful, Commander will light up and you will have full control of your machine. You will also see "Connected.. NighthawkCNC 2.2" in the coloured bar above the "Disconnect" button. You can ignore the description in the brackets eg: 4 Axis.

You can now unplug the USB cable from both the PC and the Nighthawk and continue to control your machine via your WiFi connection.

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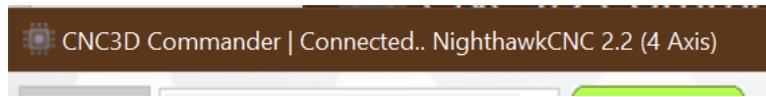
WiFi (Direct Access Point)

This connection method is only recommended if the one above does not work. We recommend trying the WiFi (Connect to Existing Network) option first.

If you do not have access to an existing wireless network, or your existing network setup is incompatible with your controller, you can connect directly to your Nighthawk using its own built-in WiFi signal.

Note: The PC used to run the Nighthawk will not have internet access while connected to your machine if using the Direct Access Point method.

If you're using Easel or another web-based design suite to create your toolpaths, you will need to ensure you have downloaded your GCODE file or job file **BEFORE** connecting to your controller as you will not be able to do so while connected to your Nighthawk.

To get started with this process you will need to have a Windows PC located near the machine so you can connect to it with a USB cable.

Plug in your USB cable, turn on your PC, turn on the Nighthawk and open CNC3D Commander.

Note: If your Nighthawk is not installed automatically or detected by your PC, refer to the USB setup section of this guide.

Select COM in the first drop-down menu. In the second drop-down menu select the correct COM port, it should be the one that has CH340 in the description.

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Once connected, you will need to clear the Alarm by clicking the E-stop button and then "Unlock" so the Alarm box changes to green, then click on the Connections/ESP32 tab to access the wireless settings.

In the first drop-down box you will need to select WiFi – Direct Access Point and the relevant options will highlight in the middle of the window in the WiFi (Access Point) section.
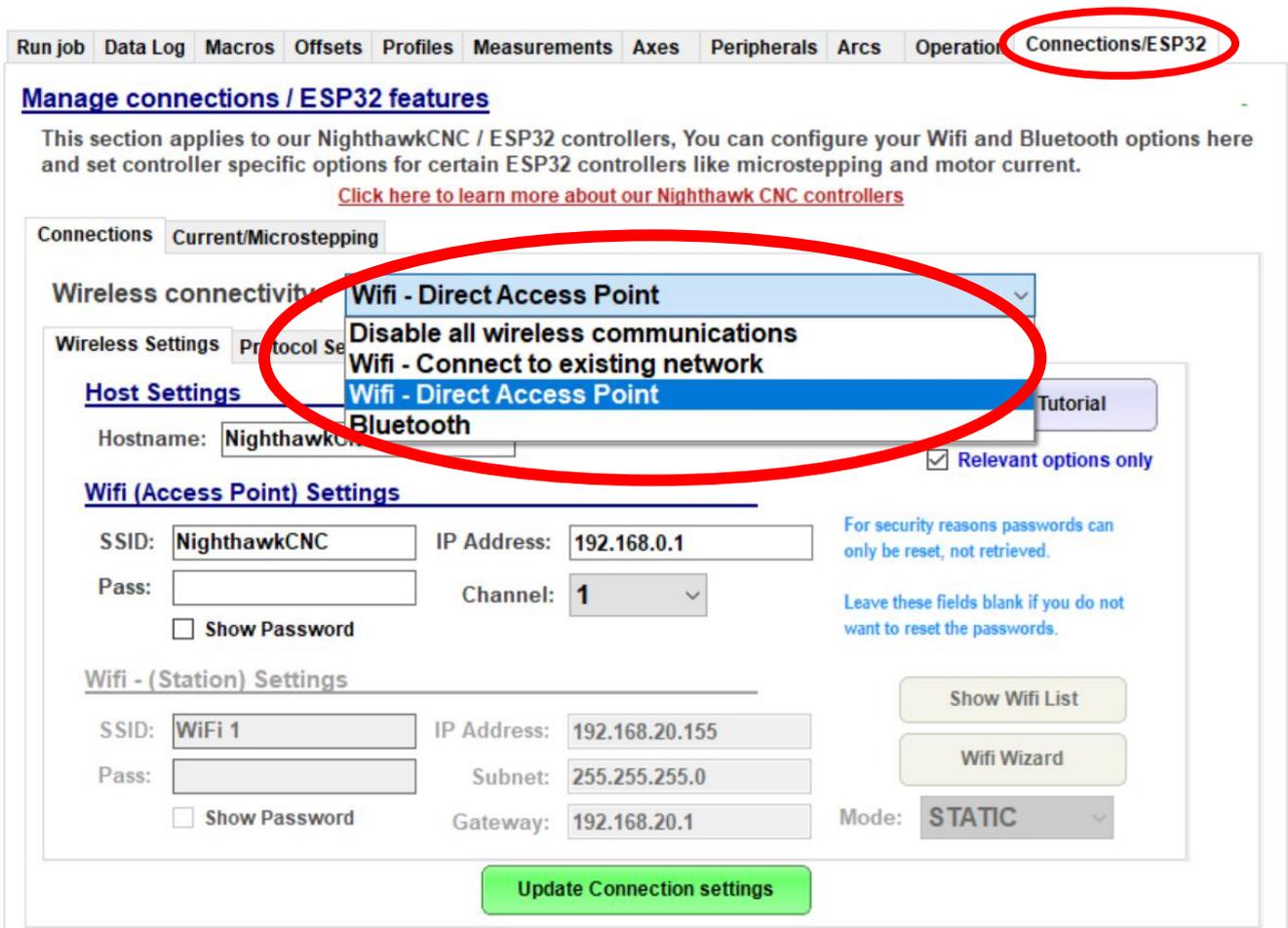
The SSID, IP Address and Channel boxes should match the ones in the image above, these are the defaults and will work just fine. The Hostname box should be the same as the SSID, which is **NighthawkCNC** by default.

The Pass box is blank, though the default password has already been set on the controller. You do not need to put anything in the Pass box unless you want to change the default password.

If you do want to change the password from the default you can enter your desired password into the box.

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If all your settings are correct, you can now click "Update Connection Settings" and look for the popup box confirming the settings have been updated and click "OK".

If you did not get a popup box telling you the settings have been updated, check to see if your machine is in an Alarm state in the bottom left corner of the Commander window next to the E-Stop. If you are in Alarm state you will need to clear it by clicking the E-stop button, then "Unlock" and re-do the process to update your settings.

You should now click "Disconnect", turn off your Nighthawk controller, wait 10-20 seconds, and then turn it back on.

After powering your Nighthawk back on, you will need to connect your PC to the Nighthawk's wireless signal. You will need to do this from your PC's WiFi selection settings, not in our Commander software.

Please Note: PCs will vary due to the different versions of Windows operating system that are available. Because of this yours might look a little different to the pictures below. If you are unsure on how to navigate the next step on your particular PC you may need to get help from your PC retailer's technical support as this is specific to your computer and is not a part of CNC3D Commander software.

Look for the WiFi signal in the bottom-right corner of your computer screen. Open the menu to see the available wireless networks and look for the NighthawkCNC network.
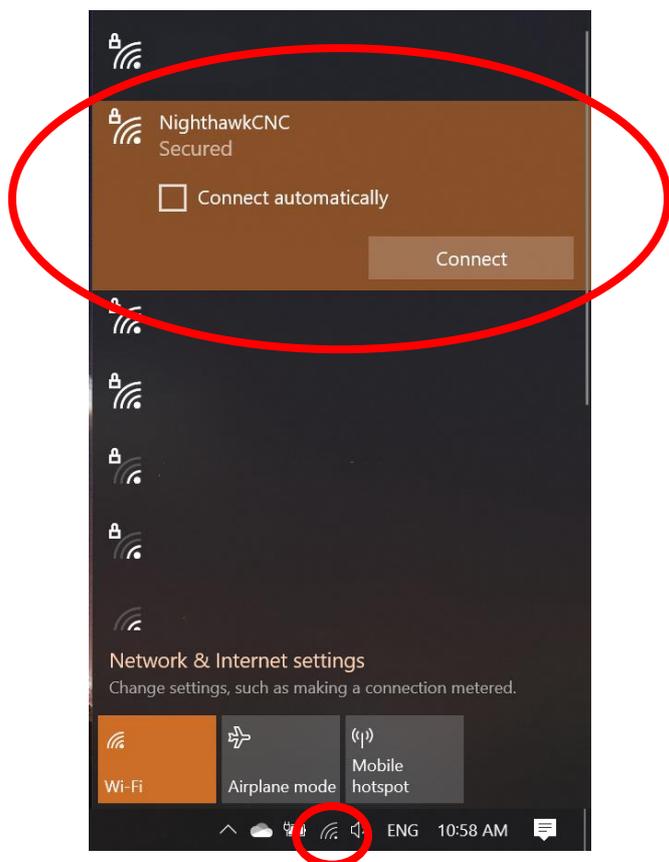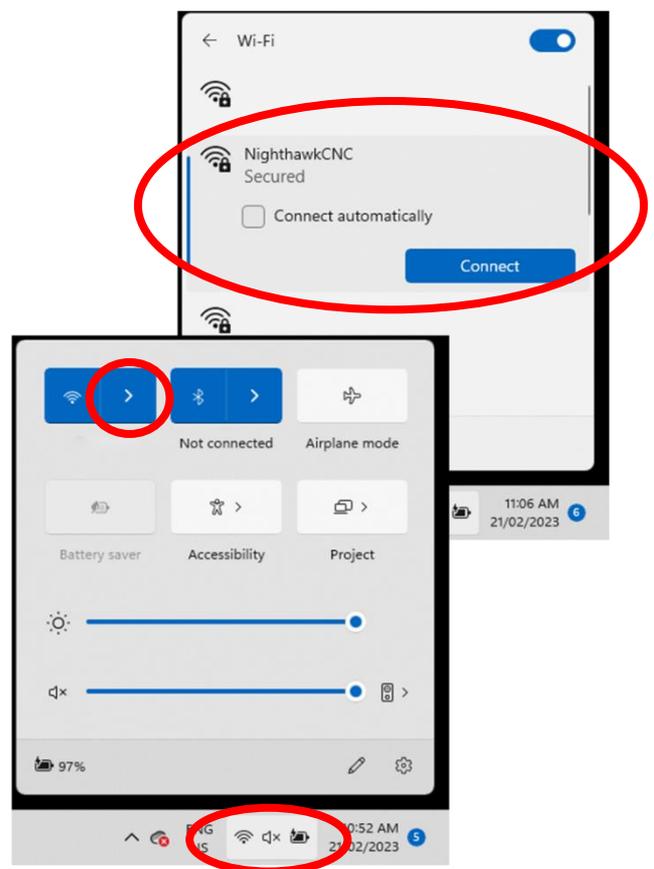
Windows 10	Windows 11

After selecting the NighthawkCNC network in the list, click 'Connect' and enter the password.

If you did not specify a password in the previous step, your default password will be 12345678 with no spaces between the numbers or any other characters.

Your PC may take a minute or so to connect to the Nighthawk as it is verifying the connection. Once your PC is connected you will see "No Internet, secured" or "Connected Without Internet" written below the "NighthawkCNC" WiFi name.

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You can now switch back to our Commander software.

In the top-left corner of Commander you will need to change the first drop-down box to "IP" and the second box will need to read **192.168.0.1** you do not need to enter the :23. Click 'Connect' and Commander will add the :23 to the end of the IP address and connect to your Nighthawk.

If everything was successful, Commander will light up and you will have full control of your machine. You will also see "Connected.. NighthawkCNC 2.2" in the coloured bar above the "Disconnect" button. You can ignore the description in the brackets eg: 4 Axis.
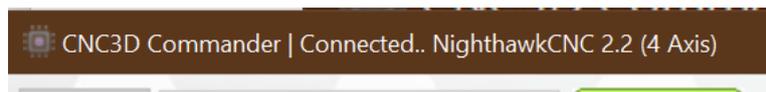
You can now unplug the USB cable from both the PC and the Nighthawk and continue to control your machine via your WiFi connection.

Note: When the connection to your Nighthawk drops by either turning off the machine, moving your PC out of range or by using the Emergency Stop button, you may need to go through the steps above to reconnect to your NighthawkCNC WiFi Network before attempting to connect to your Nighthawk in Commander.

Bluetooth

This connection method is only recommended if neither of the WiFi options work for you. We recommend trying the WiFi (Connect to Existing Network) option first.

Bluetooth connections work the same as a USB connection without the drawbacks of having a physical wire plugged into the Nighthawk, so it is impervious to EMI interruption.

Bluetooth and USB connections work by sending every line of code to the Nighthawk one-by-one so if anything interrupts that connection you run the risk of your machine stopping mid-job or uncontrolled machine movement. This can be something as simple as your computer going to sleep or a laptop losing power so if you are certain you must use a Bluetooth connection to control your machine make sure you have disabled all power saving options in your PC and are plugged into power if using a laptop.

Contact your PC retailer's technical support if you need assistance with disabling these features.

Please Note: Bluetooth will only work with a Windows laptop or desktop computer with Bluetooth capabilities, it is not intended for use with a smartphone or iPad.

Most modern laptop computers will have a Bluetooth adapter built into the computer, however if not you can use a plug-in Bluetooth adapter which are readily available from most electronics retailers.

To get started with this process you will need to have a Windows PC located near the machine so you can connect to it with a USB cable.

Plug in your USB cable, turn on your PC, turn on the Nighthawk and open CNC3D Commander.

Note: If your Nighthawk is not installed automatically or detected by your PC, refer to the USB setup section of this guide.

Select COM in the first drop-down menu. In the second drop-down menu select the correct COM port, it should be the one that has CH340 in the description.

Once connected, you will need to clear the Alarm by clicking the E-stop button and then "Unlock" so the Alarm box changes to green, then click on the Connections/ESP32 tab to access the wireless settings.

In the first drop-down box you will need to select Bluetooth and Commander will switch over to the Bluetooth settings tab.
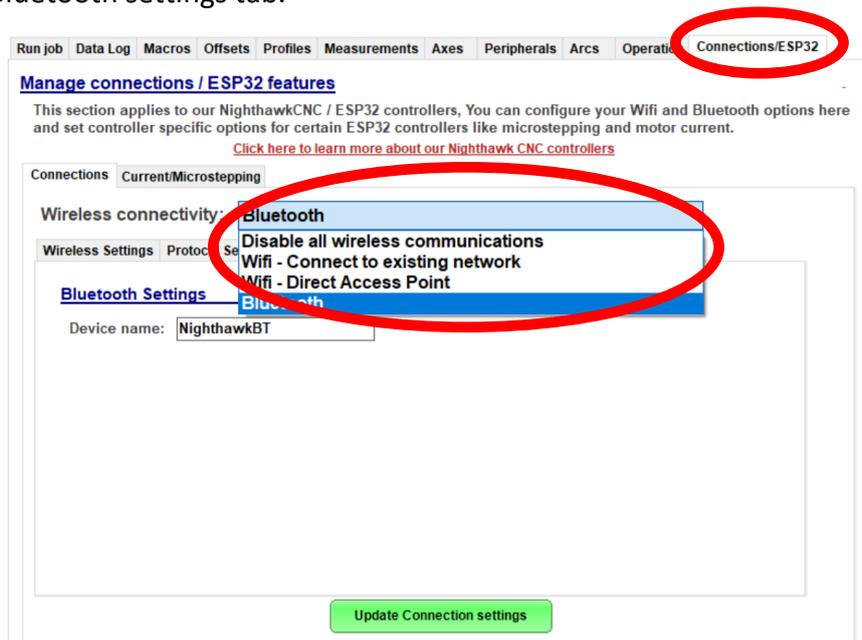
From here you can set the Device Name, however leaving it as the default **NighthawkBT** is perfectly fine.

This will be all the settings you need to change in Commander so you can now click "Update Connection Settings" and look for the popup box confirming the settings have been updated and click "OK".

If you did not get a popup box telling you the settings have been updated, check to see if your machine is in an Alarm state in the bottom left corner of the Commander window next to the E-Stop. If you are in Alarm state you will need to clear it by clicking the E-stop button, then "Unlock" and re-do the process above to update your settings.
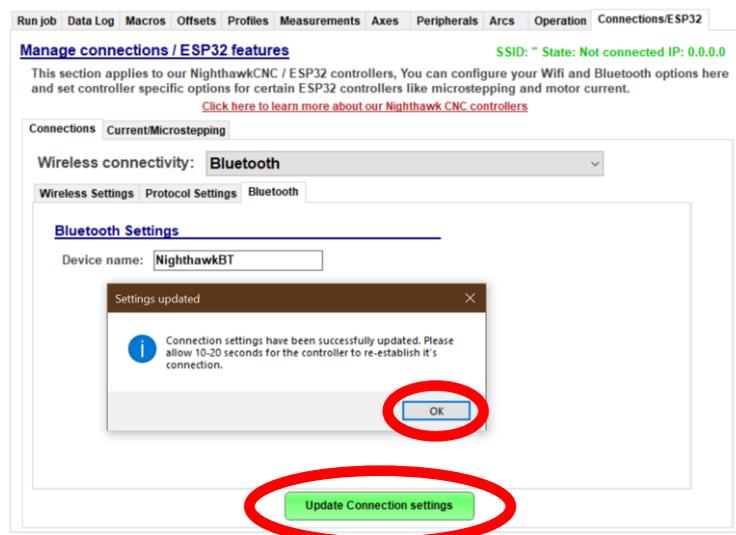
You should now click "Disconnect", turn off your Nighthawk controller, wait 10-20 seconds, and then turn it back on.

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After powering your Nighthawk back on, you will need to connect your PC to the Nighthawk's Bluetooth signal. You will need to do this from your PC's Bluetooth selection settings, not in our Commander software.

Please Note: PCs will vary due to the different versions of Windows operating system that are available. Because of this yours might look a little different to the pictures below. If you are unsure on how to navigate the next step on your particular PC you may need to get help from your PC retailer's technical support as this is specific to your computer and is not a part of CNC3D Commander software.

Look for the Bluetooth symbol in the bottom-right corner of your computer screen. You may need to click the ^ to see it. Open the menu and select 'Add a Bluetooth Device' and another window will open. Click 'Add Bluetooth or Other Device' then 'Bluetooth'.

It will then search for available Bluetooth devices and should find the **NighthawkBT** device. If you changed the device name in the previous step then you should see that name show up now. Click on it and it will attempt to connect. Once it shows as 'Paired' you have successfully connected, and it will show up in your 'Other Devices' section of the window.

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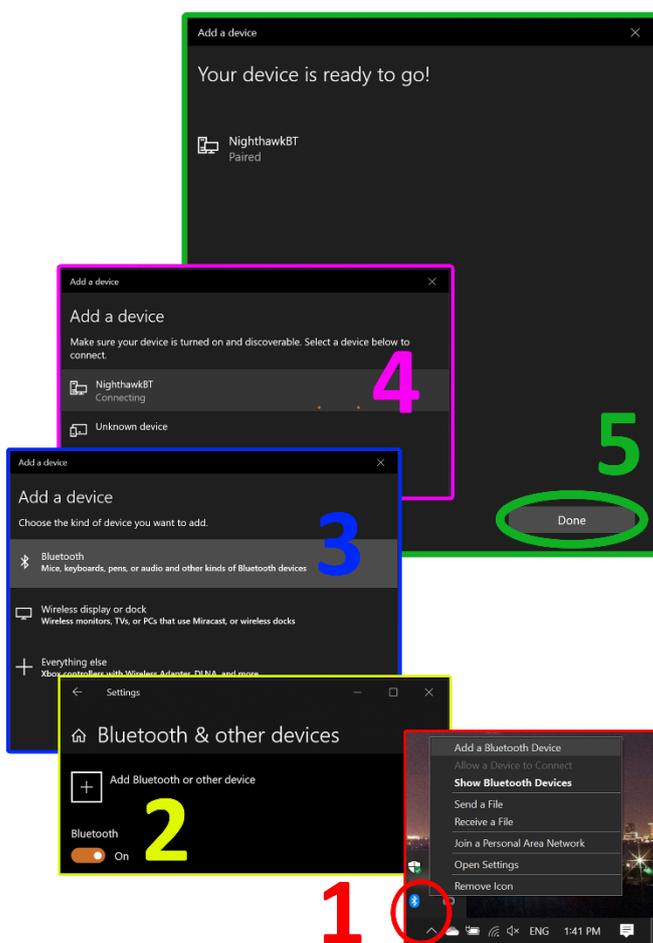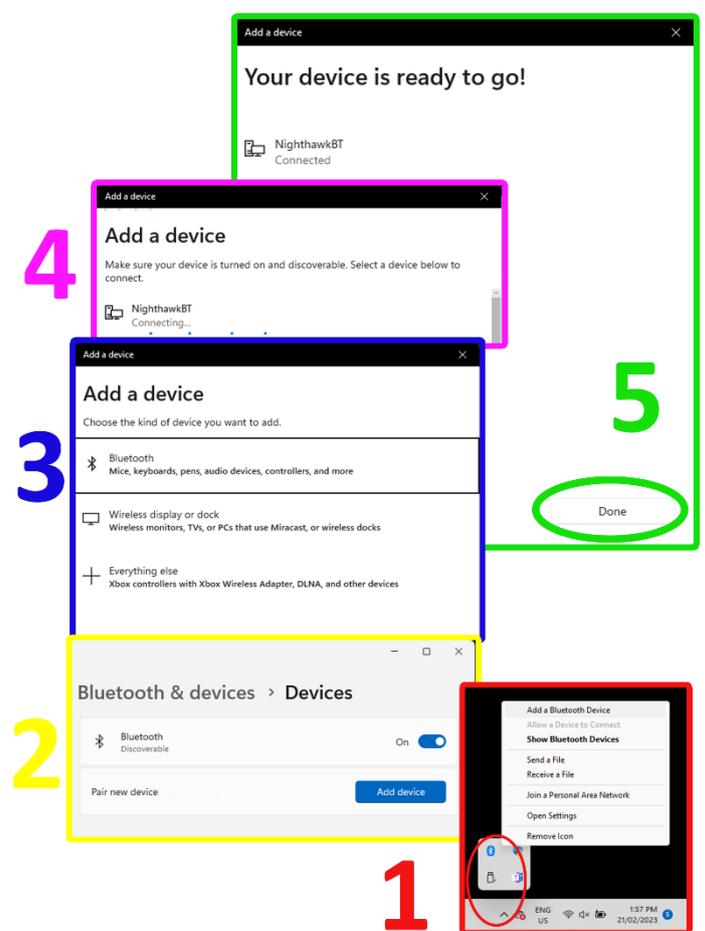
It may be necessary for you to wait a minute or two while your computer installs the device after the first time connecting. After the installation is complete you can switch back over to Commander.

Select COM in the first drop-down menu. In the second drop-down menu you should now see the option for 'Standard Serial over Bluetooth link'. There will be two different COM numbers associated with both links.
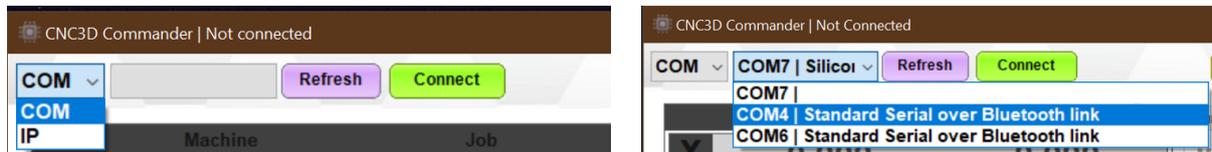
Unfortunately it is not currently possible for Commander to tell you which is the correct COM port to select as your computer doesn't differentiate between them. One of them will work and the other will not, though often it's the lower number that is the correct one.

Choose one of the available Bluetooth link COM ports and click 'Connect'. If Commander stops responding for a few seconds then it is likely the wrong one and you can click 'Disconnect'.

Select the other Bluetooth link and click 'Connect'.

If everything was successful, Commander will light up and you will have full control of your machine. You will also see "Connected.. NighthawkCNC 2.2" in the coloured bar above the "Disconnect" button. You can ignore the description in the brackets eg: 4 Axis.
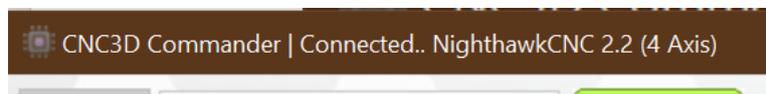
You can now unplug the USB cable from both the PC and the Nighthawk and continue to control your machine via your Bluetooth connection.

Note: If the connection to your Nighthawk drops by either turning off the machine, moving your PC out of range or by using the Emergency Stop button, you may need to go through the steps above to reconnect to your NighthawkBT Bluetooth connection before attempting to connect to your Nighthawk in Commander.

USB

This connection method is only recommended if NONE of the wireless options work for you. We recommend trying the WiFi (Connect to Existing Network) option first.

USB is the last resort when choosing how to run your machine. We recommend USB for initial setup **ONLY** and **NEVER** for running jobs. Spindles, routers, or plasma torches will create lots of Electromagnetic Interference (EMI) and electrical noise which can cause the USB connection to drop out resulting in random job stoppages or uncontrolled machine behaviour.

If you have no other choice but to use USB, for example in a secure area where wireless devices are not permitted, then you must use a high-quality USB cable that has magnetic ferrules attached to it, as well as disabling certain features of your PC.

USB connections work by sending every line of code to the Nighthawk one-by-one so if anything interrupts that connection you run the risk of your machine stopping mid-job or uncontrolled machine movement. This can be something as simple as your computer going to sleep, a laptop losing power or even just turning on the cutting tool. So, if you are certain you must use a USB connection to run your machine make sure you have disabled all power saving options in your PC and are plugged into power if using a laptop.

Contact your PC retailer's technical support if you need assistance with disabling these features as they are specific to your PC and not part of our Commander program.

To get started with this process you will need to have a Windows PC located near the machine so you can connect to it with a USB cable.

Plug in your USB cable, turn on your PC, turn on the Nighthawk and open CNC3D Commander.

Select COM in the first drop-down menu. In the second drop-down menu select the correct COM port, it should be the one that has CH340 in the description.
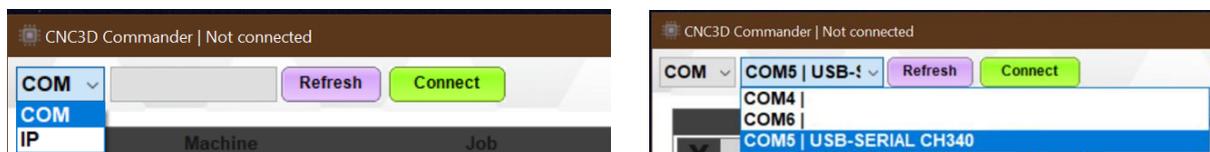
If you do not have any COM ports, or no COM ports with the CH340 description then it's likely that you do not have the correct CH340 driver installed. You will need to download the driver by clicking the link below or typing it into a browser window from your computer.

https://libraries.sharpsoft.com.au/nighthawk/ch340.zip

You will also need to turn off your Nighthawk and unplug the USB cable from your computer.

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When the download is complete, navigate to your downloads folder and look for the **ch340.zip** file. You will need to 'unzip' this folder before you can use the contents. It's as easy as right-clicking on the file and selecting the 'Extract All' option. The next window will ask you to specify a location for the files to be saved. Take a note of the location and click 'Extract'. When the extraction process finishes it should open the location of the extracted files.
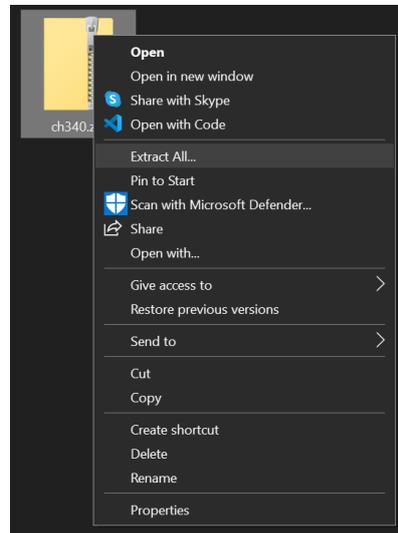
Open the 'CH340' folder, look for the 'Setup.exe' file and open it.

If you get a security popup asking if you would like to allow this program to run or make changes to your device, make sure you click 'Yes' or the program will not run.

When the program opens it will already have some information pre-loaded. All you need to do it click 'Install'. If successful you will get a message saying "The drive is successfully pre-installed in advance".

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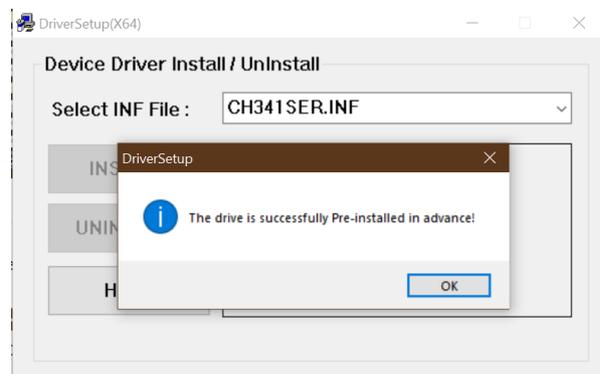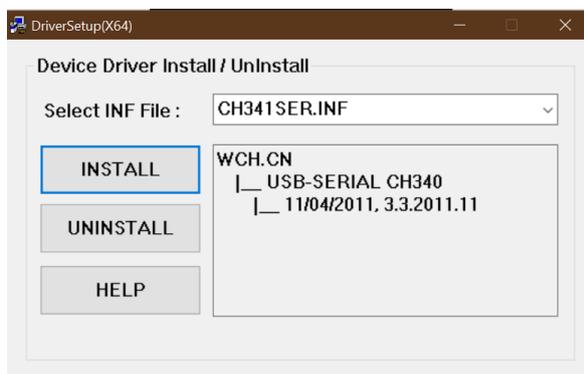
If you get a message box saying "Drive Install Failure" you simply need to click 'Uninstall' to uninstall any older drivers that are interfering with the installation, then click 'Install' once it has finished uninstalling.

Now that your CH340 driver is installed, you can turn on your Nighthawk, plug the USB cable back into your computer and switch back to our Commander software.

Select COM in the first drop-down menu. In the second drop-down menu select the correct COM port, you should now see one that is labelled CH340. Click 'Connect'.

If everything was successful, Commander will light up and you will have full control of your machine. You will also see "Connected.. NighthawkCNC 2.2" in the coloured bar above the "Disconnect" button. You can ignore the description in the brackets eg: 4 Axis.