

Nighthawk CNC Controller

Using An External Power Supply for Laser Modules



Safety precautions

- Please read this entire guide before starting any work or modification
- Please ensure any relevant PPE equipment is worn or used when operating any CNC machine. This includes safety glasses for using any lasers.
- CNC machines can be dangerous and must be operated with diligence and safety in mind.

By using this guide, you acknowledge and agree that you are taking full responsibility for any damage to property, machinery, person or persons that could potentially occur as a result of using this guide. CNC3D PTY LTD will not be held liable or responsible in any way for the misuse or use of this guide.

**All 240V wiring MUST be done by a licensed electrician.
Failure to do so can cause fire or electric shock!**

**DO NOT ATTEMPT ANY 240V WIRING
WITHOUT AN ELECTRICAL LICENSE**

As laser technology improves, we are finding more and more users asking for higher powered lasers however the electrical power demanded by these units is simply more than the Nighthawk CNC controller can provide.

This guide serves as instructions on how to use an external supply to provide the power to the laser module while still allowing the Nighthawk to control the laser's on/off signals as well as variable power for grayscale engravings.

This modification will involve some low voltage DC wiring including stripping wires and soldering. Please pay close attention to diagrams as any mistake can cause damage to the controller or laser module!

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To complete this modification, you will need the following. Items in red are only required if you are providing your own supply – not the kit

External Power Supply

3 or 4 Core Laser Cable

Red/Black/Yellow Wire

Nighthawk Controller 10-pin Connector

Male/Female 3-Pin Connector

Small Flat-Blade Screwdriver

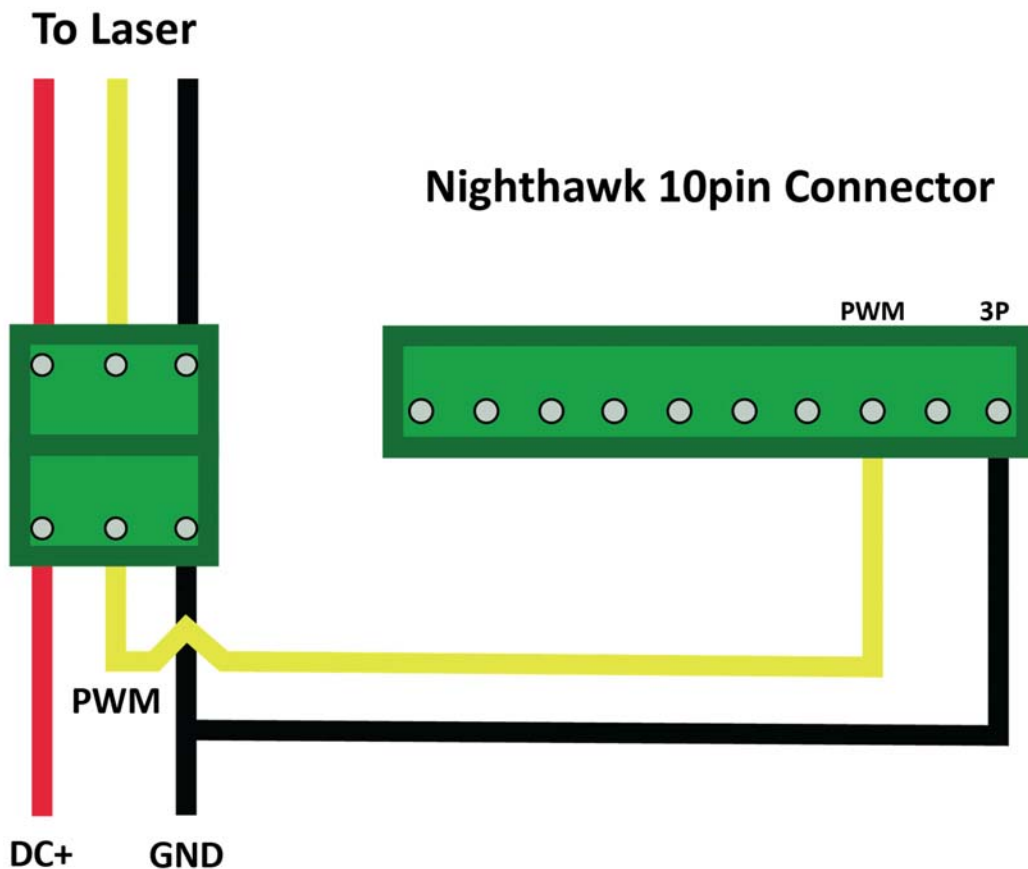
Using your own Power Supply

This step is for users who have provided their own power supply, if you have received the kit from CNC3D then please skip to the next step

To power the laser but also allow the Nighthawk to control it, you will need to provide a path for the DC positive to get to the laser module but at the same time avoiding the Nighthawk's circuitry.

You will also need a path for the PWM control signal to get from the controller to the laser, as well as allowing the DC negative to get to the laser AND the Nighthawk so the PWM has a return path to the controller.

The wiring diagram is as follows:



In this example, the DC+ and GND wires are coming from the power supply and are powering the laser. The yellow PWM wire on the supply side is coming from the PWM pin on the Nighthawk however it needs a return path which is the black wire in the 3P pin. This 3P wire needs to connect to the GND wire. It doesn't matter which side of the 3-Pin connector it goes to but we have found it easier on the supply side rather than the laser side.

Using the CNC3D Kit

As we add high power lasers to our shop, we have pre-made a power supply so that you don't have to mess around with soldering or terminating wires.

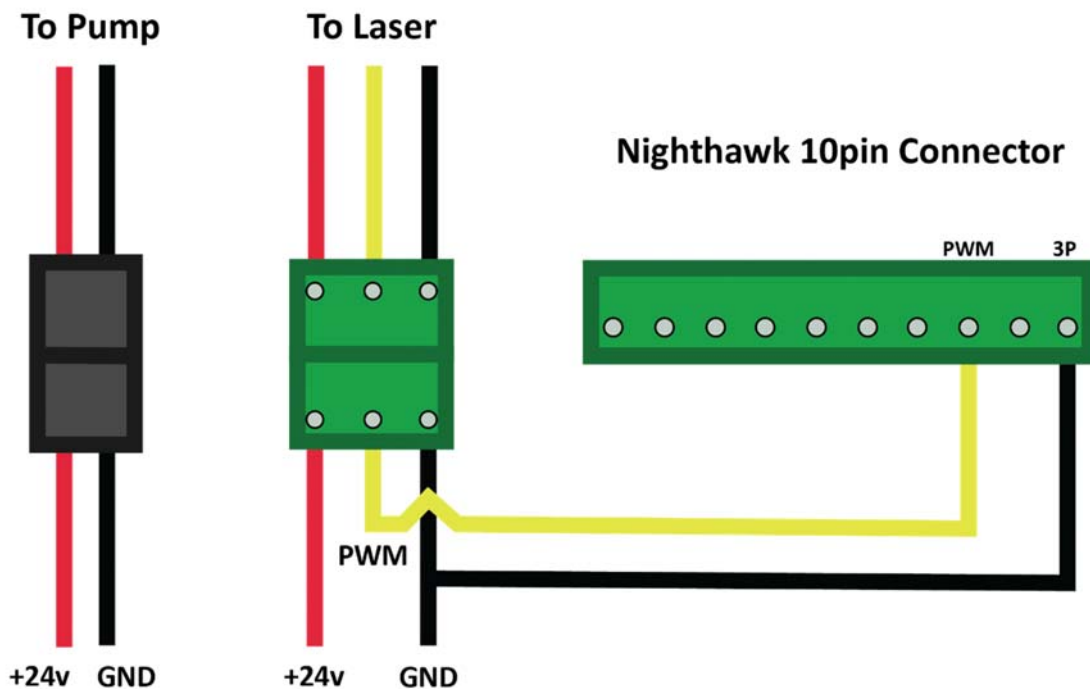
This power supply can run both the laser and the air assist pump at the same time.

If you have received one of our lasers with power supply option, this section will show you how to change your existing setup to make it work with the high-power laser.

To power the laser but also allow the Nighthawk to control it, you will need to provide a path for the 24v to get to the laser module but at the same time avoiding the Nighthawk's 12v circuitry.

You will also need a path for the PWM control signal to get from the controller to the laser, as well as allowing the DC negative to get to the laser AND the Nighthawk so the PWM has a return path to the controller.

The wiring diagram is as follows:

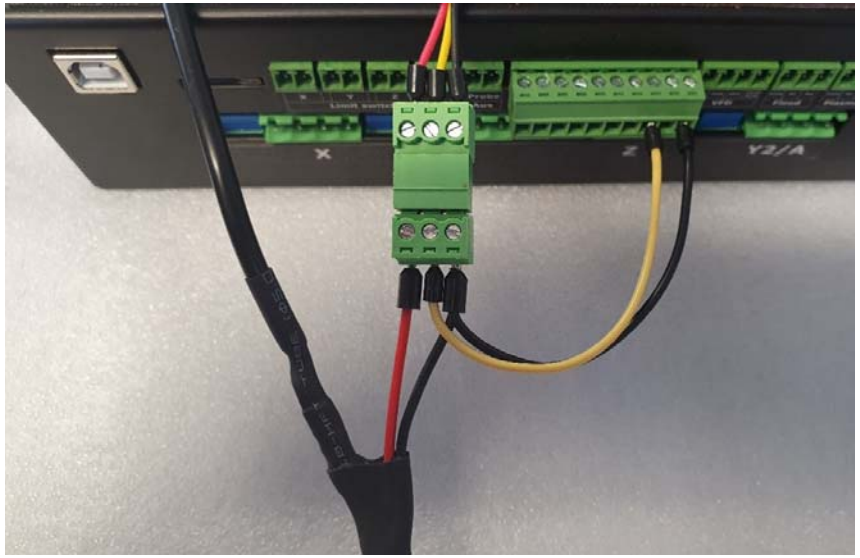


If you have already had a laser set up and running from your Nighthawk, or you have one of our pre-built machines you will need to remove the Red Yellow and White cables from the long 10-pin connector on your controller and instead they will need to be inserted into the green 3-pin connector that came with your kit but be careful to match the colours of the wires!

You can now insert the free ends of the yellow and black wires that came already attached into the PWM and 3P pins on the long 10-pin connector. Refer to the picture above to check those positions.

See below for pictures of the supplied wiring and you can see how it will connect to your laser and Nighthawk.

The thick black wire with the metal plug on the end will power the supplied air pump for air assisted cutting, simply insert it into the plug on the pump power cable.



**Your laser is now set up and ready to go! Happy
lasering!**



**Be aware that you will now be required to turn on the laser
power supply before being able to start a job!**

**If you run into any difficulties with this guide or would like some more
information, reach out to us at [CNC3D.com.au](https://www.cnc3d.com.au)!**