Huanyang VFD Wiring and Cooling System Instructions

110V VFD WATER COOLED 110V SPINDLE

Disclaimer:

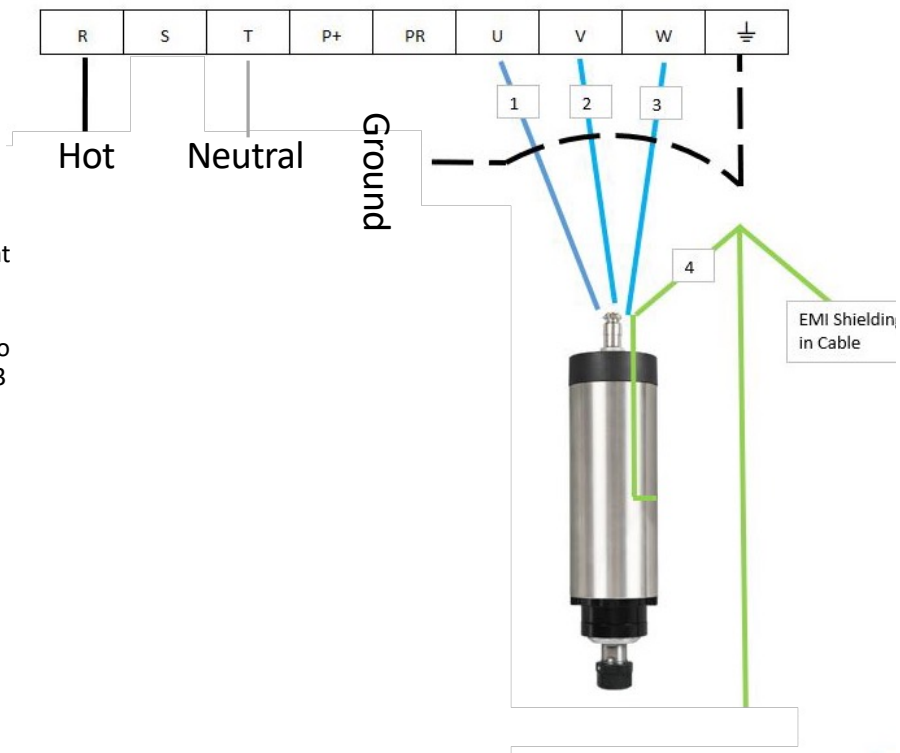
- This is my way to wire the VFD with the spindle and I can’t say it will work with your system or not and I am not responsible for any issues, injuries, or damage arising from this paper.

110V VFD Wiring and Spindle Wiring

1. Wire the 110V 14 gauge cord with Black(Hot) to R and White(Neutral) to T and Green(Ground)E.

2. The spindle wiring should be a double shield cable to help with **Eliminate EMI Issues.**
I purchased my cable from eDealer Direct Automation.

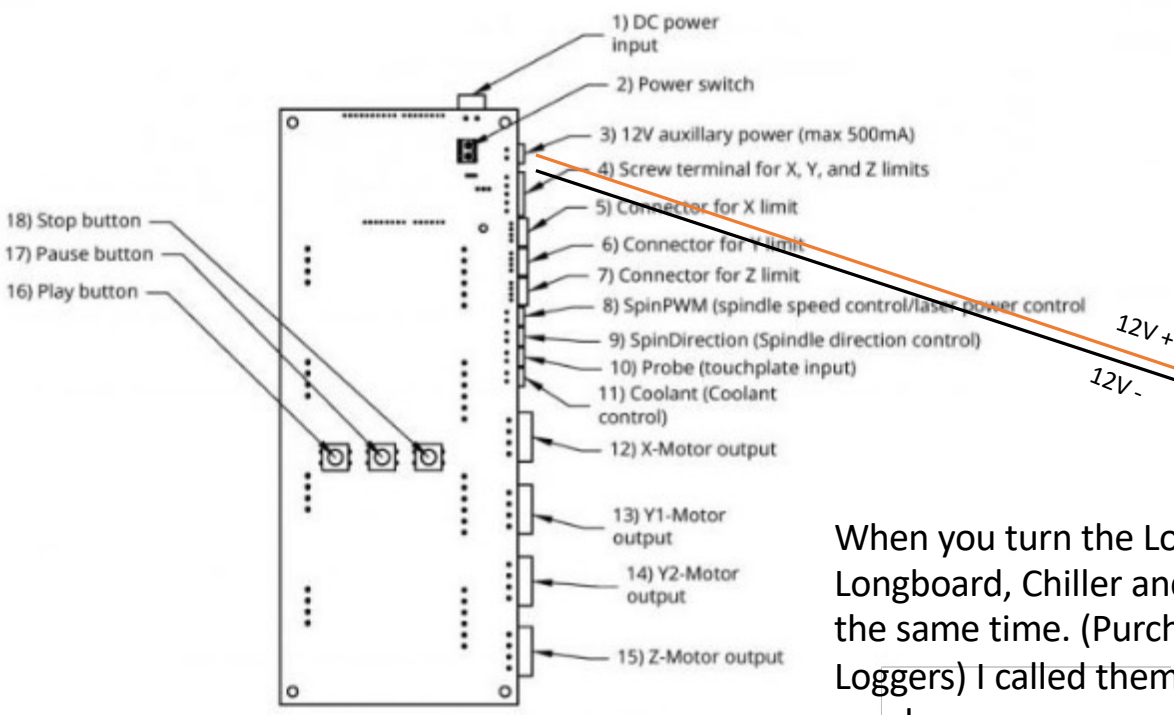
https://www.ebay.com/itm/133273999194?hash=item1f07bfd75a:g:VEIAAOSw4Gliar3N&amdata=enc%3AAQAHAAAA4G31SwvqPy48rO4%2F%2FNCk14sB1Rvl4UL7Lh3YfYQBy5Y9f%2B70EvrrH6cTXXUYIei1EBrS%2FeG8np5eZ3R1akWV205veBrKhoTcBRL9BC5fzAy3ZkHVJhsHEL2rFlRQhkC%2Bi7oAI0J%2B593elBg3jE%2BKBc7uB1jIdc2jGMMO%2Bqbm5w%2F9VxeCZWeQNvyS5UnAYX6n0onR7XlJiviC0q%2Bw1%2Brg4eSIVKSPqeiojRgdgG70j8OmGQT8mmFO559%2FW2d4WySlXLsbb2D3Tg62z9VAg5x1p4VGc18mOkXYYYlHzCuQxdpJ%7Ctkp%3ABk9SR6rN9bK_YQ



I wired 1 to U, 2 to V, 3 to W and the shield of the cable to the ground. I did not use pin 4 on spindle. I also ran a ground wire from VFD to the CNC machine.

Note: I solder an eye connector on all wires for good connections

Longboard with IOT Wiring



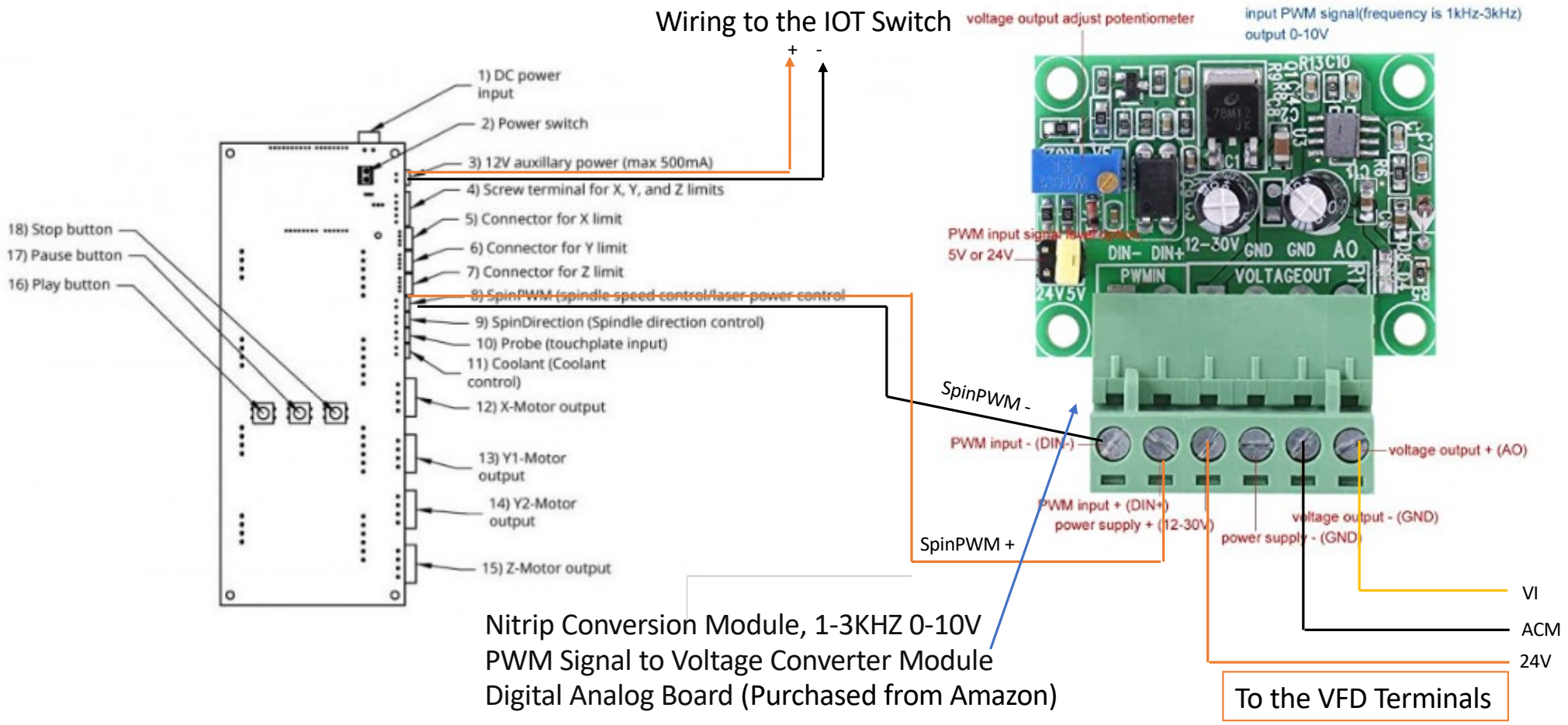
Hook to the 12V Aux power with black to – and red to +

Plug the VFD and Cooling pump to Two normally off outlets

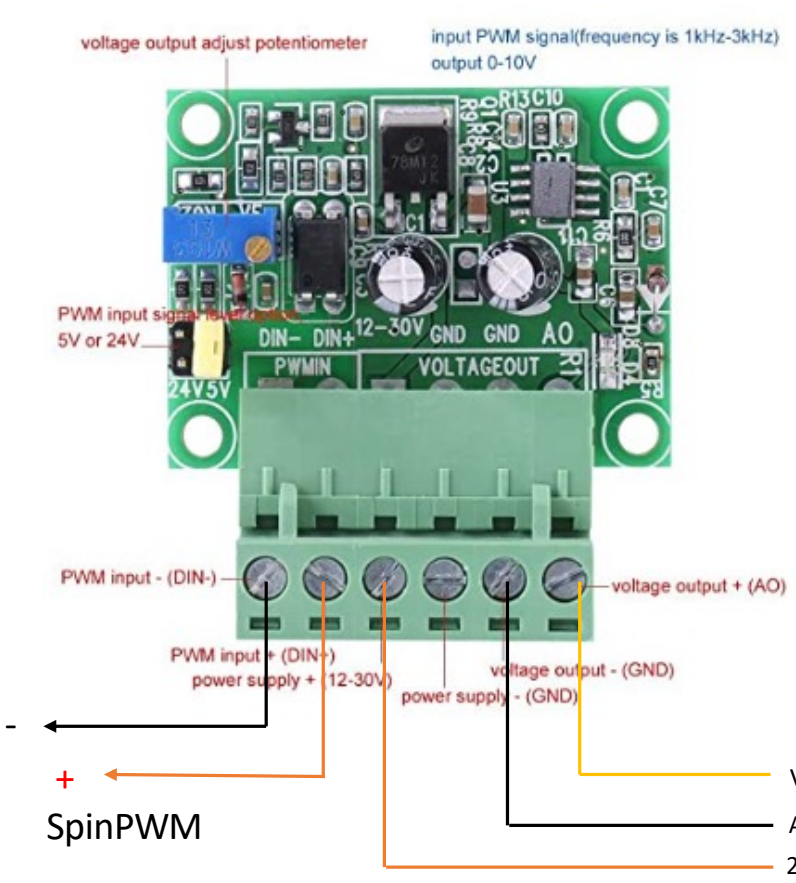
When you turn the Longmill on the Longboard, Chiller and VFD come on at the same time. (Purchased from Digital Loggers) I called them direct to purchase.

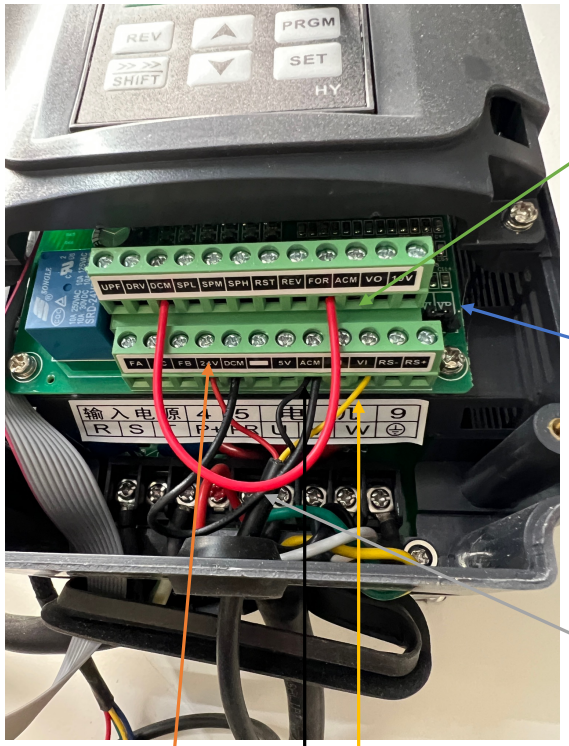
Note:
I talked to the manufacture and the control port is 3.3 to 48VDC and draws .2 ma. The IOT switch can handle 12amp load. What I can tell the VFD draws 7 amps, and my chiller draws .09 amps.

Longboard SpinPWM Wiring



Huanyang VFD Control Circuit Terminals





On the top row of the bar add a jumper from DCM to FOR

Important
Switch the jumper From VR 2-3 to VI 1-2

On the bottom row of the bar add a jumper notation DCM to ACM

Optional Spindle/Laser Switch

- If you have the Laser option, you can add a double-pole toggle switch in line with the SpinPWM positive wire which will allow you to go from spindle to laser. Switch I used.

https://www.lowes.com/pd/Hillman-Zinc-Compatible-with-LED-Toggle-Light-Switch/1000882022

Important:

- When switching to the laser turn Longmill and the IOT switch off, go to Spindle/Laser tab in GSender switch to laser. Then turn only the Longmill to on leaving the IOT switch off and run the laser.
- When done with laser switch GSender to spindle and turn Longmill off and switch back to Spindle and turn on the IOT switch before turning on the power.

VFD Programing

- **Do a factory reset by program PD013 – 8 turn unit off and back on to start the programing.**
- **<u>Set all the codes to the following:</u>**
- **PD000(Parameter Lock) 0 Invalid this allows you to program**

- **PD001 (Source of Run Commands) - 1 (External commands, i.e. Longmill Board)**
  PD002 (Source of Operating Frequency) - 1 (External Terminal)
  PD003 (Main Frequency) - 400 (Motor dependent)
  PD004 (Base Frequency) - 400 (Motor dependent)
  PD005 (Max Operating Frequency) - 400 (Motor dependent)
  PD006 (Intermediate Frequency) - 2.5
  PD007 (Min Frequency) - .2
  PD008 (Max Voltage) - 110 (Motor dependent)
  PD009 (Intermediate Voltage) - 15 (Motor dependent)

Cont.

PD010 (Min Voltage) - 8 (Motor dependent)
PD011 (Frequency Lower Limit) - 120
PD014 (Motor Acceleration Time) - 5 seconds (this becomes important when setting your GCode delay after M3 command
PD015 (Motor Deceleration Time) - 10 seconds
PD041 (Carrier Frequency) - 8 (Motor Dependent)
PD044 (Forward Function tied to the FOR digital input discussed above) - 1 (Forward rotation when VI received Spindle PWM input > 0 volts)
PD70 (Analog Input - VI Input) - 0 ("10 Volt from PWM conversion board")
PD141 (Rated Motor Voltage) - 110
PD142 (Rated Motor Current) - 5
PD143 (Number of Poles) – 4
PD144 (Rated Motor Revolution)- 3000

Important
PD000 (Parameter Lock) 1 (Valid) this allow you to lock the settings

VCarve Post Processor Settings

- If you use Vectric CAD/CAM software you will need to go to Application Data folder under File to add the following to the post-processor so it will control the spindle on, off and speed then when you save your Gcode it will control the spindle when you save you project.

Command output after the header to switch spindle on

begin Spindle ON
"[S]" (spindle speed)
"M3" (starts spindle in clockwise)
"G4 P6" (Pause and seconds)

Command output at the end of the file

begin FOOTER
"M5" (stops spindle)
"G0 [ZH]" (rapid positioning moves)
"G0 [XH] [YH]"
"M2" (turn of spindle)

Spindle Cooling System

Cooling Lines and Drag Chain

- The cooling lines I used is Silicone Tube, 5mm ID, 8mm OD, 16.4’ I purchased from Amazon.
  https://www.amazon.com/gp/product/B01MXLNOZ9/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

- To add the cooling lines in the drag chain I changed to a 18mm x 37mm chain. I purchase three of them from Amazon.
  https://www.amazon.com/gp/product/B07QZR6BW1/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

Chiller for Spindle

- I purchased a **VEVOR 9L Water Chiller CW-3000** to use for cooler system. This unit give you the temp of the water and an alarm to let you know if flow has stopped. The price is around $135.00.
  https://www.ebay.com/itm/114352958461?_trkparms=amclksrc%3DITM%26aid%3D777008%26algo%3DPERSONAL.TOPIC%26ao%3D1%26asc%3D20220705100511%26meid%3D2526bbc71e1a4e708b1d0e67b907be44%26pid%3D101524%26rk%3D1%26rkt%3D1%26itm%3D114352958461%26pmt%3D1%26noa%3D1%26pg%3D2380057%26algv%3DRecentlyViewedItemsV2%26brand%3DVEVOR&_trksid=p2380057.c101524.m146925&_trkparms=pageci%3Ae4d46fd6-c26b-11ed-b596-5233c885da45%7Cparentrq%3Ae04d72141860a49a211c9114ffff8cca%7Ciid%3A1
- I use 50/50 auto antifreeze. The unit holds 2.4 gallons
- You will need 2 each 3/8-in x 1/4-in Barbed Splicer Adapter Fitting and short 3/8” hose and clamps.

Hope this help you install and program your VFD and Spindle