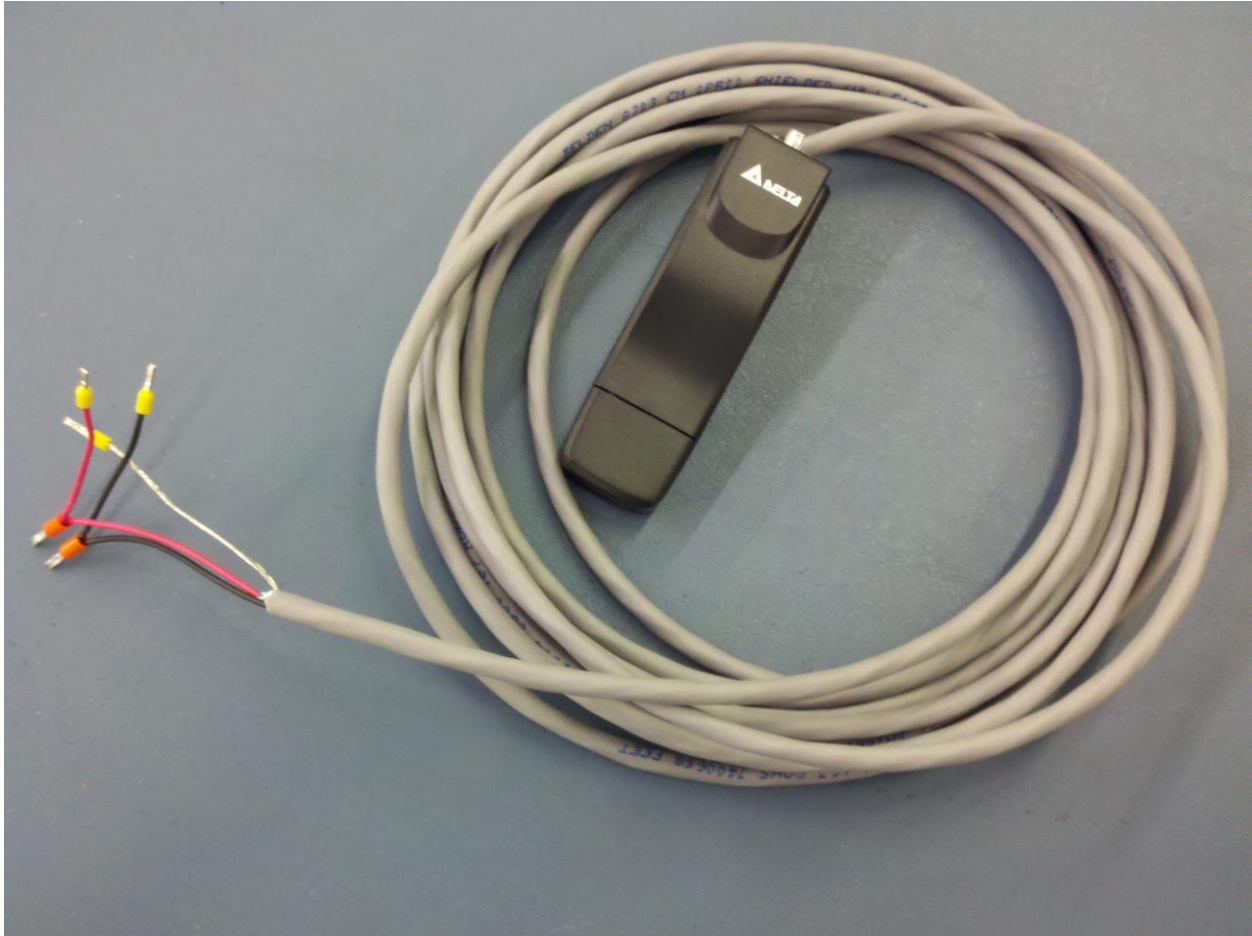# Installing the Spindle RPM Controller (Yaskawa VFDs)



The Spindle RPM Controller board allows you to change the spindle RPM from within the ShopBot Control Software (Sb3.5.5 or higher)   The RPM Controller is wired into variable frequency drive (VFD) models (V1000 and V74X) and connected to the computer through USB. The device is controlled with Sb3.5x through a virtual tool: **T**ools, Spindle **R**PM Control [TR].

**ShopBot Tools, Inc**
3333B Industrial Dr
Durham, NC 27704
919-680-4800 or 888-680-4466
www.shopbottools.com

## Parts Required

Delta Spindle RPM Controller                                      10251
Data Cable w/ filter                                              001019
Cable RPM Delta Jumper (Optional, required for 2nd spindle)       10256
ShopBot Control Software CD SB3.5.5 or higher

| | |
|---|---|
| ⚠️ | **WARNING**<br>**ELECTRIC SHOCK CAN KILL**<br>**Use extreme caution when working near live electrical circuits. Dangerous voltages exist inside the variable frequency drive (VFD) that can cause serious injury or death.**<br><br>**Use extreme caution and good judgment at all times.** |

# Installation Instructions (single spindle setup)

**Before starting any of the procedures below, make sure that all power has been disconnected going into the ShopBot control box and the VFD.**

## 1. Open the VFD.

On the front face (face plate) of the VFD remove the soft rubber covers that hide the (4) screws. Remove the screws.  Carefully open the face plate and disconnect the face plate's data cable from the main body of the VFD and set the face plate aside.
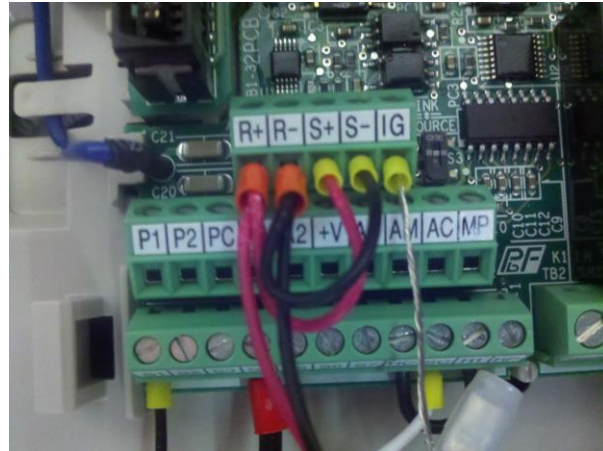
## 2. Connect the wiring from the Spindle RPM Controller to the VFD Terminal Blocks (single spindle setup).

With the face plate of the VFD removed, locate the terminal blocks on the right side of the VFD.  Follow the images below and connect the (5) loose ends of the wires from the Spindle RPM Controller in the VFD model that you own (V1000 and V74X)

The Spindle RPM Controller comes pre-wired from ShopBot. The wires will be connected to corresponding terminals in the VFD.
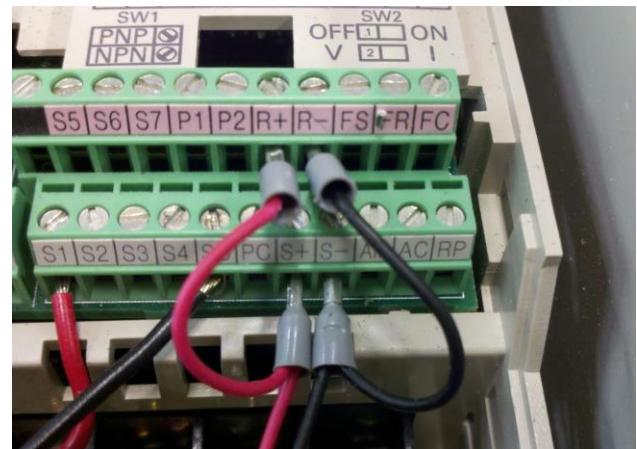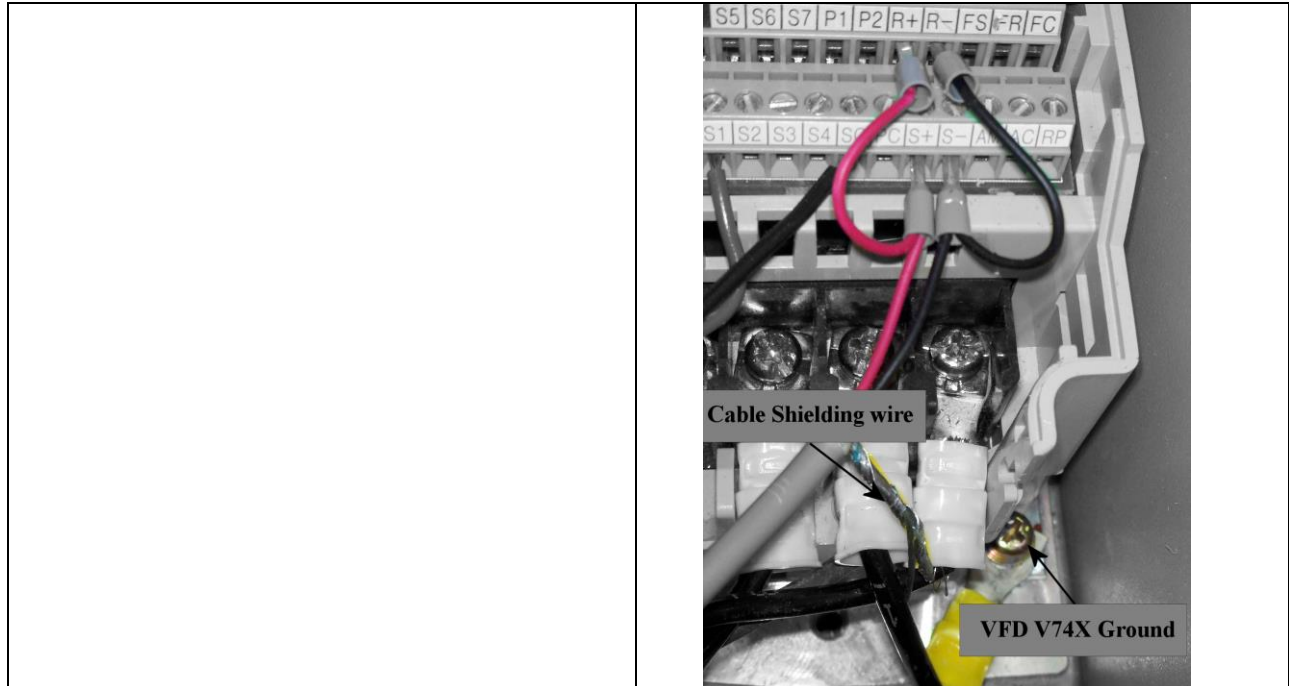
| VFD V1000 | VFD V74X |
|---|---|
| S+ (Red), R+ (Red), S- (Black), and R- (Black). The Bare wire is the cable shielding and should be wired into IG | R+ (Red), S+ (Red), R- (Black), and S- (Black). The Bare wire is the cable shielding and should be wired to the Grounding screw in lower right of the VFD V74X interior. |
|  |  |

Cable Shielding wire

VFD V74X Ground

## 2a. Connect the wiring from the Spindle RPM Controller to the VFD Terminal Blocks (two spindle setup).

If you have a second spindle/VFD setup refer to the **Dual Spindle configurations (two spindle setup)** at the end of this document before proceeding to the next step.

## 3. Connect the USB cable to the Spindle RPM Controller.

The Data cable connects the Spindle RPM Controller to the computer's USB port.

**Do not connect the USB to the computer until instructed to do so.**



Run the Gray data cable through the grommet in the bottom of the VFD and connect the cable to the spindle controller. Reattach the face plate of the VFD. **Do not forget** to plug in the data cable of the face plate and tighten screws.

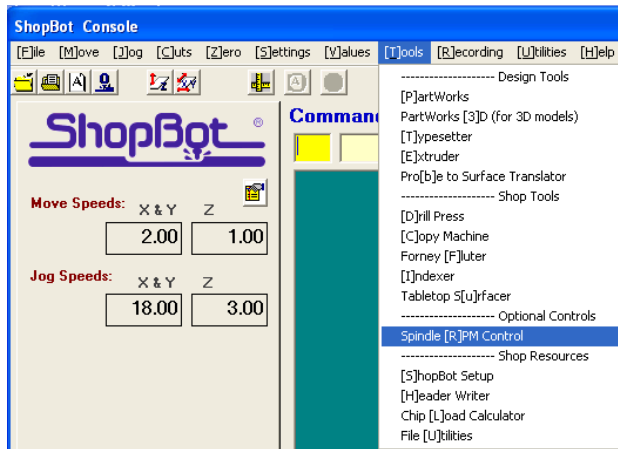## 4. Install the Driver for the device NOW.

If SB3.5.5 or higher control software is already installed continue to step 5. If not, insert the ShopBot Control Software CD into the CD drive or download the most recent version from http://www.shopbottools.com/mSupport/controlsoftware.htm. It should automatically start and install the control software; it's OK to install over the current version. At the end of the control software installation, you will be offered the option of installing the drivers for the ShopBot Version 20x Controller Cards. This is the same driver needed to run the Spindle RPM Controller. Make sure the "Install ShopBot Version 20x Controller Drivers" box is checked and click "Finish" to start the automatic driver installation process.



## 5. Connect the USB cable to the computer.

After the drivers are installed, plug the free end of the USB device into the computer. Windows will report, "Found new hardware" and then a Windows message reporting the spindle control was successfully installed.

# Using the RPM control software.

Start the ShopBot control software then go to Tools, Spindle RPM Control [TR].

When the Spindle RPM Control opens, it will display the current RPM.   To change the RPM, click in the display window, then enter a new RPM and hit Enter on the keyboard.   To change the RPM from within a part file (version 3.5.5 or higher) use the [TR] command and the new RPM. (Example:  TR, 12000 will change the rpm to 12,000).

# Dual Spindle configurations (two spindle setup)

| | |
|---|---|
| ⚠️ | **WARNING**<br>**ELECTRIC SHOCK CAN KILL**<br>**Use extreme caution when working near live electrical circuits. Dangerous voltages exist inside the variable frequency drive (VFD) that can cause serious injury or death.**<br><br>**Use extreme caution and good judgment at all times.** |

# V1000 VFD Models

## Installing the Jumpers for the Spindle #1 / Master V1000 VFD

Disconnect power and open the VFD face plate on #1/Master VFD as instructed in **Step 1**.

Locate the **S2 switch**. Make sure switch is **off** (left position).

Wire in the VFD jumper cable from VFD #1 to VFD #2. (The jumper for VFD #1 will be shared with wires going to the RPM controller).

Remove the red and black wire from S+, S- and bare ground wire IG and remove ferrules from the red and black.

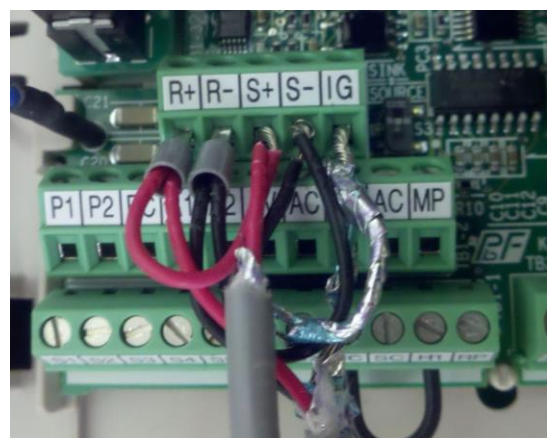Twist the end of the jumper cable (end without the ferrules) to red, black and ground (IG).

Insert the twisted wires in to the terminal bar

**Red to S+**, **Black to S-**, and **Ground to IG**
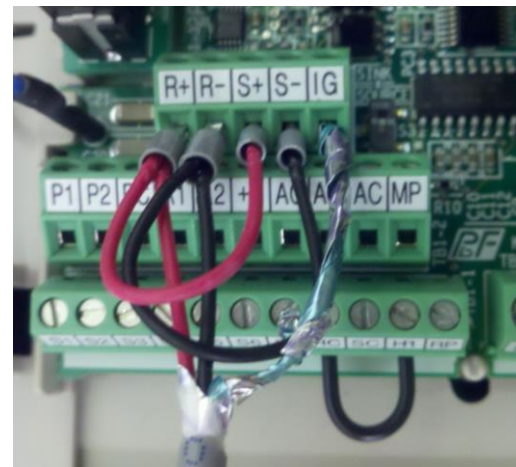
Reattach the VFD face plate.

Review **VFD Programming** below.

Cycle power off then back on to set programming.

# Installing the RPM controller for Spindle #2 / Slave in the V1000 VFD

- Disconnect power and open the VFD face plate on #2/Slave VFD as instructed in **Step 1**.

- Locate the SW2 switch. Make sure switch is **ON** (right position).

- Wire in the VFD jumper cable from VFD #1 to VFD #2 using the ferruled ends of the jumper.

- **Red to R+ and S +**

- **Black to R-  and S-**

- **Ground to IG**

- Reattach the VFD face plate.

- Review **VFD Programming** below.

- Parameter H5-01 will be set to the Setting Increment of 2.
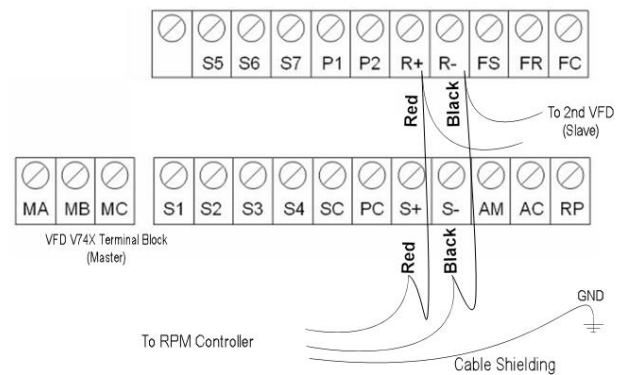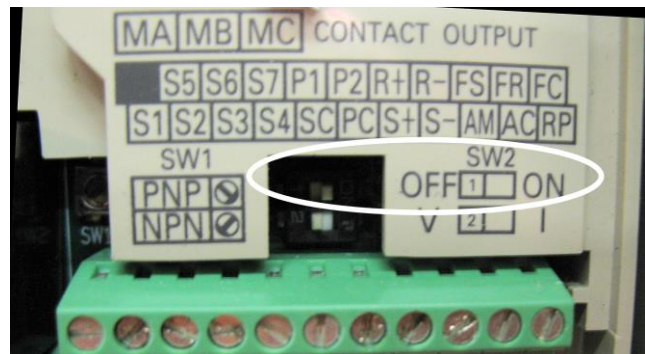
- Cycle power off then back on to set programming.

Once complete, return to Step 3: Connect the USB cable to the Spindle RPM Controller.

# V74X VFD Models

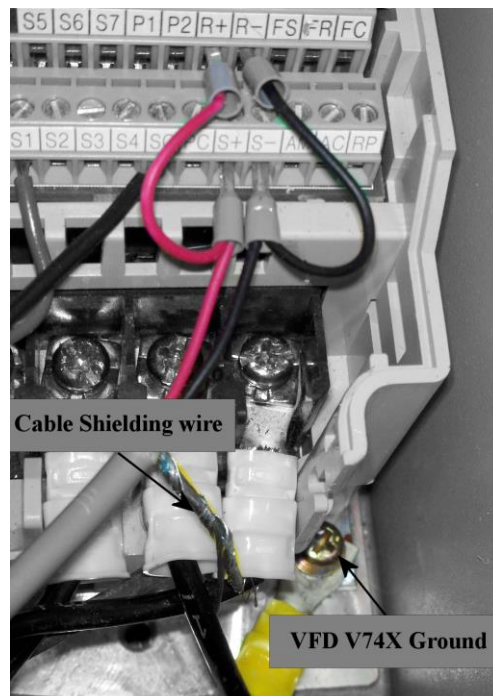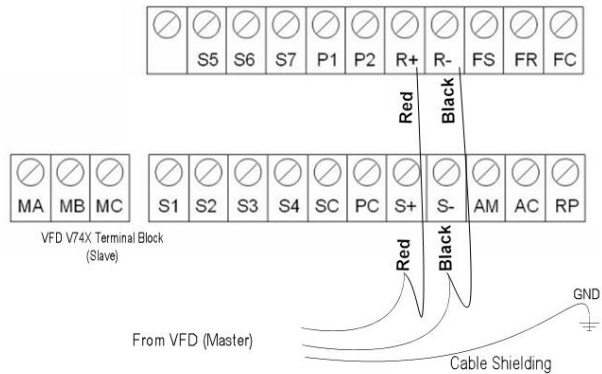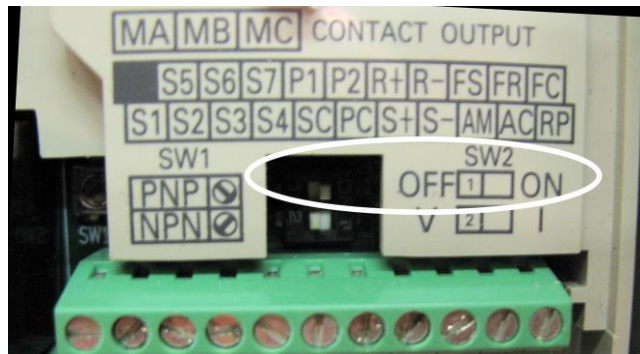## Installing RPM controller for Spindle #1 / Master in the V74X VFD

- Disconnect power and open the VFD face plate on #1/Master VFD as instructed in **Step 1**.

- Locate the SW2 switch (White switch circled in picture). Make sure switch is **ON** (right position).

- Wire in the VFD jumper cable from VFD #1 to VFD #2 using the diagram (right). (The jumper wires in VFD #1 will be shared with wires going to the RPM controller).

- Remove red and black wires from S+ and S-.

- Cut ferrule and strip wire insulation from the red and black wire.

- Match red and black wire to jumper and twist matching colors.

- Reinsert red twisted wire into S+ and black wires into S-.

- Attach the cable shielding to the grounding screw on the frame (as below).

- Reattach the VFD face plate.

- Review **VFD Programming** below. Parameter 153 will be set to the Setting Increment of 1.

- Cycle power off then back on to set programming.



Once complete, return to Step 3: Connect the USB cable to the Spindle RPM Controller.

# Installing RPM controller for Spindle #2 / Slave in the V74X VFD

- Disconnect power and open the VFD face plate on #2/Slave VFD as instructed in **Step 1**.

- Locate the SW2 switch (White switch circled in picture on right). Make sure switch is **ON** (right position).

- Wire in the VFD jumper cable from VFD #1 to VFD #2 using the diagram above.

- Reattach the VFD face plate.

- Review **VFD Programming** below. Parameter 153 will be set to the Setting Increment of 2.

- Cycle power off then back on to set programming.

Once complete, return to Step 3: Connect the USB cable to the Spindle RPM Controller.

---

# VFD Programming

-----STOP---- STOP----STOP---- STOP---- STOP---- STOP---- STOP---- STOP-----

**Your VFD has been programmed from ShopBot for a single spindle setup. If you informed us of the addition of a second spindle/VFD then it should have been programmed for the 2nd spindle. This section is here for diagnostic purposes only. Please test your current setup before attempting this programming.**

-----STOP---- STOP----STOP---- STOP---- STOP---- STOP---- STOP---- STOP-----

## V1000 Programming

- Press the down arrow until **PAR** is displayed, and press **Enter.**

- Use the up arrow to display **H**, then use the right arrow to change to H5-01 and press **Enter.**

- Pressing **Enter** once more will display the setting of **H5-01**. Change this setting to 02 for a second spindle (pre-programmed ShopBot default is 01).

- After making the setting change pressing **Enter** will return to the **H4-05**

- Press **ESC** until a small **u** is displayed with the set RPM.

## V74X Programming

- Press the **DSLP** (display) button on the VFD keypad to scroll through the modes until **PRGM** (program mode) is illuminated. This will display a parameter number.

- Use the **Up or Down Arrow** keys to change to the parameter number 153.

- Press **Data Enter** again to show the Setting Increment.

- Using the **Up or Down Arrow** keys to change the Setting Increment to **2** for a second spindle (pre-programmed ShopBot default is 1).

- Press **Data Enter** again to accept the Setting Increment.

- Press the **DSLP** button on the VFD keypad to scroll through the illuminated modes until **FREF** (frequency reference) is selected.

- Turn off the power to the VFD and spindle. It is necessary to cycle the power off for this setting to register.

- The VFD is now set up for spindle control for the connected spindle.