

Installing the Spindle Control Board (Delta VFD-B)



The Spindle Control Board allows the user to change the RPM of the spindle from ShopBot's control software. The Spindle Control Board is wired into the variable frequency drive (VFD) Delta model VFD-B and connects to the computer through USB. The device is controlled with SB3 (ShopBot Control software) through a virtual tool; Tools, Spindle RPM Control [TR]. The Spindle Control Board can control up to two spindles on two of the same model VFD; the VFDs should not be mounted farther than 3 feet (305mm) from each other. A jumper cable (SB#10256) is needed to connect the two VFDs. The Spindle Control Board is compatible only with ShopBot alpha and V4G boards using SB control software v3.5.6 or greater.

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WARNING

ELECTRIC SHOCK CAN KILL

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.

Use extreme caution and good judgment at all times.

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What's included?

Included Items:

Spindle Control Board (circuit board)

USB Cable w/ filter

Adhesive stand-offs

(Optional) Delta Jumper Cable for 2 spindle control (10256)

Installing the Spindle Control Board in the Delta VFD-B

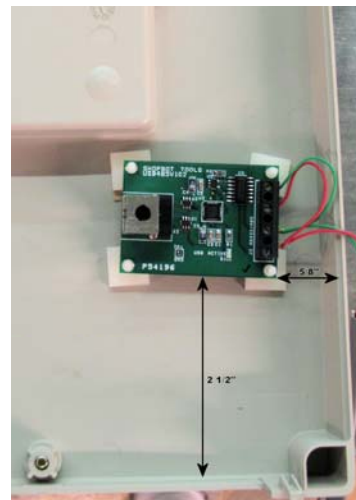
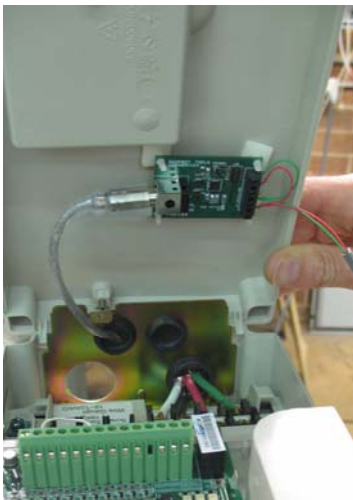
Opening the VFD

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



Remove the Keypad by grabbing the tabs inside the access points and pulling outward. Loosen the screw at the bottom of the front face (face plate) of the VFD. Depress the tabs on both sides of the face plate and tilt outward (the bottom edge is tabbed). Carefully open the face plate from the main body of the VFD and set the face plate aside.

Mounting the Board

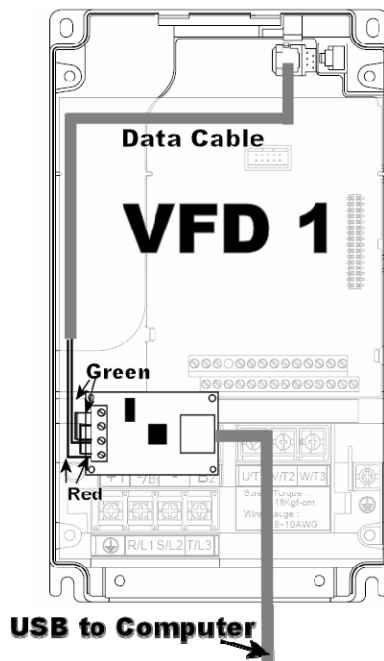


Mount the spindle control board on the underside of the face plate in the lower right corner. Measured from the inside of the face plate, the approximate location for the spindle control board is 2 1/2 in (63.5mm) from the bottom edge and 5/8 in (16mm) from the right side edge. Once the board is in position, remove the backing for the pads and stick the spindle control board in place.

Connecting the Spindle Control Board

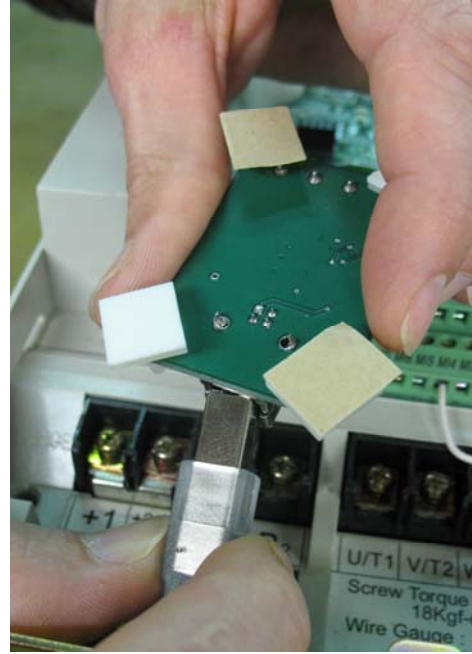
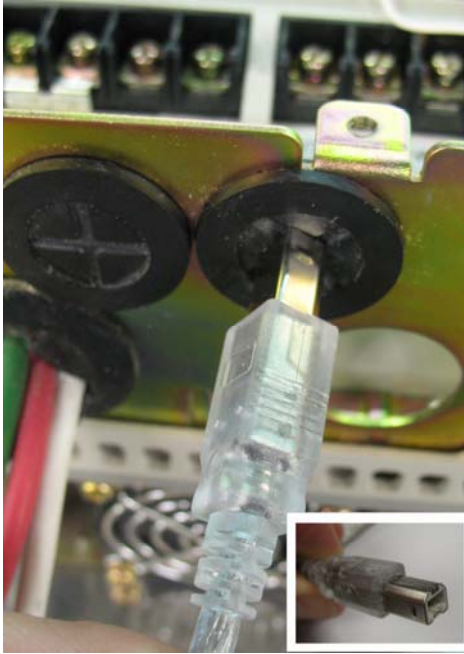


The flat grey data cable from the spindle control board will be plugged into a black data socket in the upper right corner of the VFD's controller board. Make sure that the data line is fully seated in the black socket rather than in the dummy socket to its right. Route the data line so that it does not bind and is not pinched when the cover is reinstalled. Replace the cover and keypad, and tighten the screw on face plate. Cable tie strain relief for the USB cable to the other cables coming out of the VFD.



This is simple wiring diagram for a single spindle setup. The RPM controller should have been pre-wired from ShopBot. This diagram assumes that the RPM controller has been installed as instructed above.

Running the USB cable



With the face plate of the VFD removed, locate the rubber grommet on the right side of the VFD and close to the face of the VFD. Cut a tiny slit into the grommet and insert the 6-sided end of the USB cable in the VFD. Plug the USB cable into the spindle control board. **Do not connect the other end of the USB to the computer at this time.**

If this is a single spindle setup, replace the cover and keypad, then tighten the screw on the face plate. [Go to Programming the VFD for ShopBot Control.](#)

If this is a two-spindle setup, continue on to next page without replacing cover.

Two Spindle Configuration: Connecting to the second VFD



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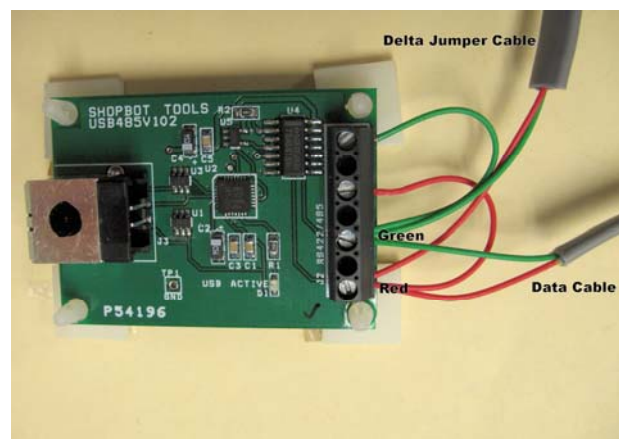
Use extreme caution and good judgment at all times.

Before starting any of the procedures below make sure that all power going to the ShopBot control box and the VFDs is disconnected.

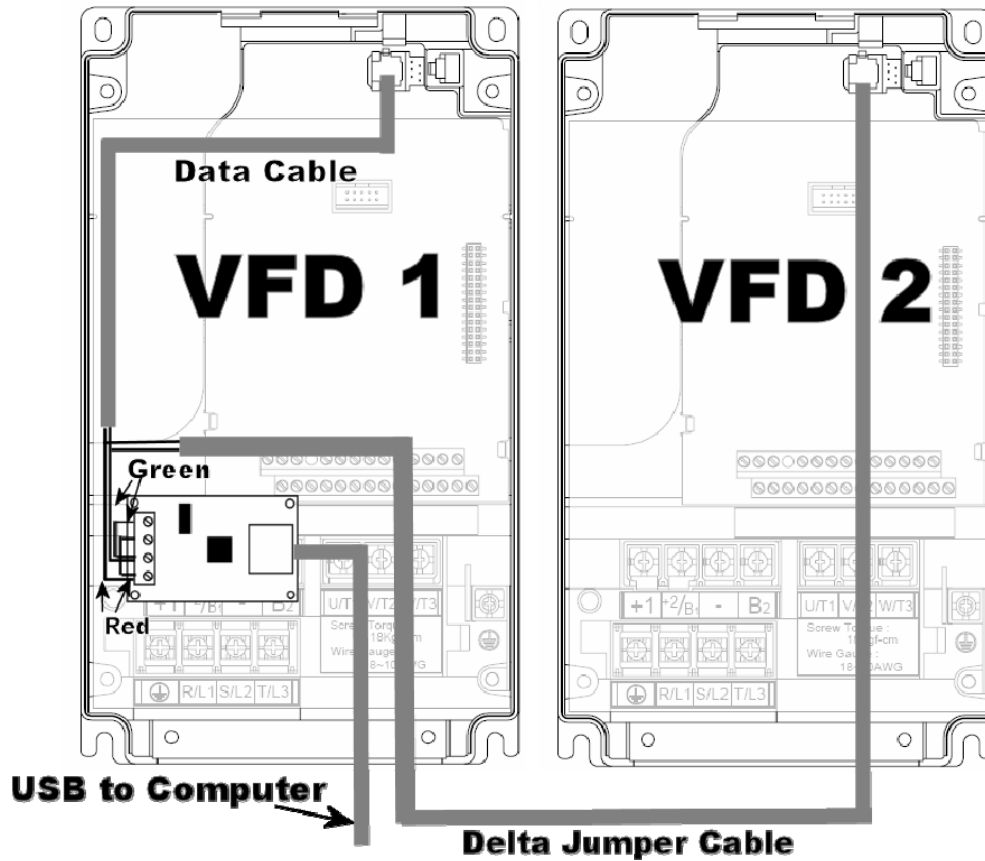
Install and connect the board in the first VFD as instructed previously. For the two spindle setup, there will be a second data cable (Delta Jumper Cable #10256) to connect the two VFDs.

In VFD#1

- Open the VFD face plate on the first VFD if necessary.
- Locate the spindle control board.
- Connect the Delta Jumper Cable (#10256) to the existing wiring on the spindle control board as shown in the wiring diagram on the next page.
- Route the Delta Jumper Cable to the outside of the VFD through the rubber grommet that the USB Cable is in.
- Cable tie the Delta Jumper Cable to the USB cable for strain relief.
- Replace cover, keypad, and tighten the screw on face plate.



Dual VFD Wiring Diagram



In VFD#2

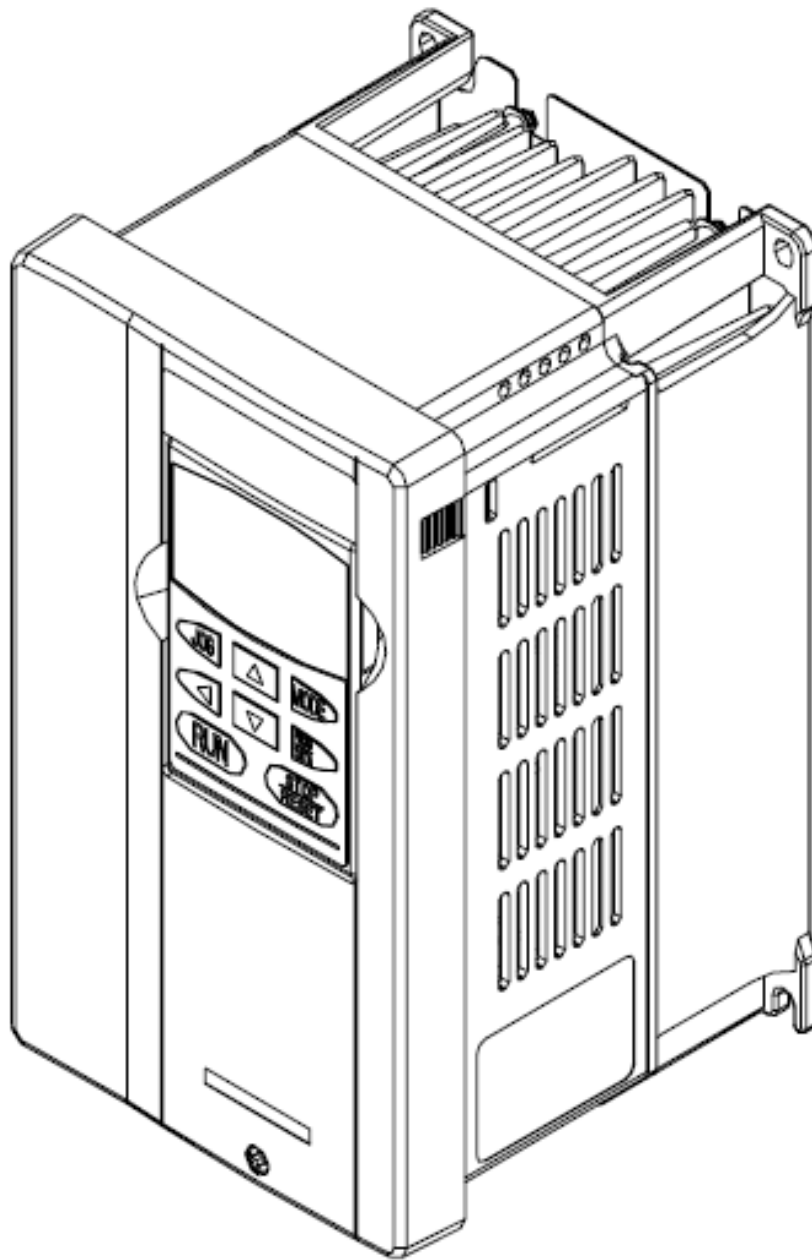
- Open the face plate on the second VFD.
- Cut a tiny slit in the grommet and insert the loose end of Delta Jumper Cable in the VFD.
- Plug the cable into the black data socket in the upper right corner of the VFD controller board.
- Replace cover, keypad, and tighten the screw on face plate.



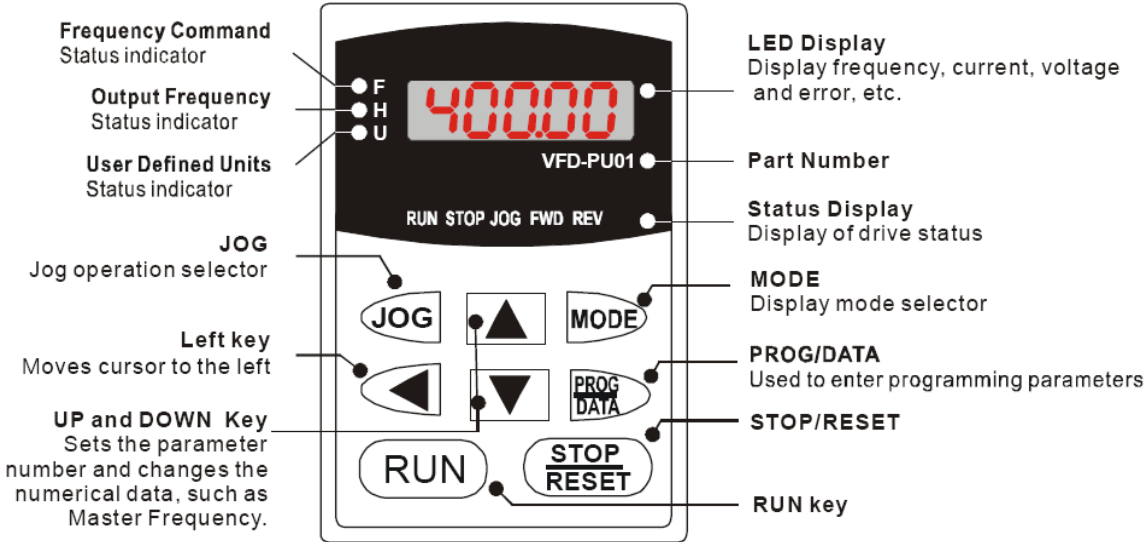
Programming the VFD for ShopBot control

The VFD must be programmed in order for the computer to communicate with the spindle. Consult the parameters that were included with the spindle for your specific Spindle configuration.

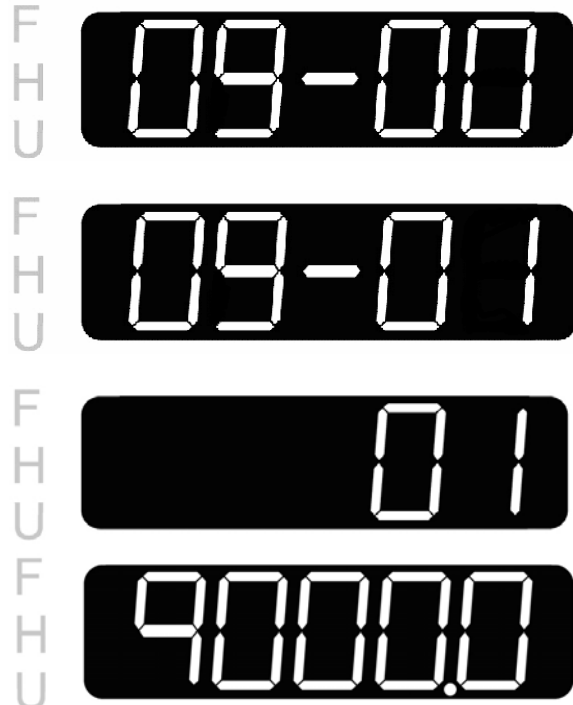
If a second spindle (spindle #2) is to be used, program VFD#1 first, then VFD#2. . The only difference is that program **09-01** will have Parameter **01** for VFD#1 and **02** for VFD#2. The VFD must be shut off and back on for the new settings to take effect.



Setting VFD#1



- Turn the ShopBot Control Box and spindle power **ON**.
- FOR ShopBot alpha only: Press the **RESET** button on the left side of the Control Box or on remote pendant. This action will turn the **VFD ON**.
- Press the **PROG/DATA** button on the VFD keypad to initiate program mode. This will display the program group number.
- Using the **Up or Down Arrow** keys to change the group number (09-00).
- Press **PROG/DATA** again to show the program number.
- Use the **Up or Down Arrow** keys to change the program number (09-01).
- Press **PROG/DATA** again to show the program parameters.
- Use the **Up or Down Arrow** keys to change the program parameters.
- After setting a program parameter to the correct value, press **PROG/DATA** again to return the program number. For single spindle 01 (Second spindle 02).
- To change another program, repeat the above sequence.
- To return to the selection mode, press **MODE**



Press MODE until the "U" is lit to display the RPM setting for the spindle
The VFD is now set up for spindle control for the connected spindle(s).

Setting VFD#2, if applicable

- Press the **PROG/DATA** button on the VFD#2 keypad to initiate program mode. This will display the program group number.
- Using the **Up or Down Arrow** keys to change the group number (09-00).
- Press **PROG/DATA** again to show the program number.
- Use the **Up or Down Arrow** keys to change the program number (09-01).
- Press **PROG/DATA** again to show the program parameters.
- Use the **Up or Down Arrow** keys to change the program parameters.
- After setting a program parameter to the correct value, press **PROG/DATA** again to return the program number. For VFD#2, set to 02).
- To change another program, repeat the above sequence.
- To return to the selection mode, press **MODE**

Press MODE until the "U" is lit to display the RPM setting for the spindle
The VFD is now set up for spindle control for the connected spindle(s).

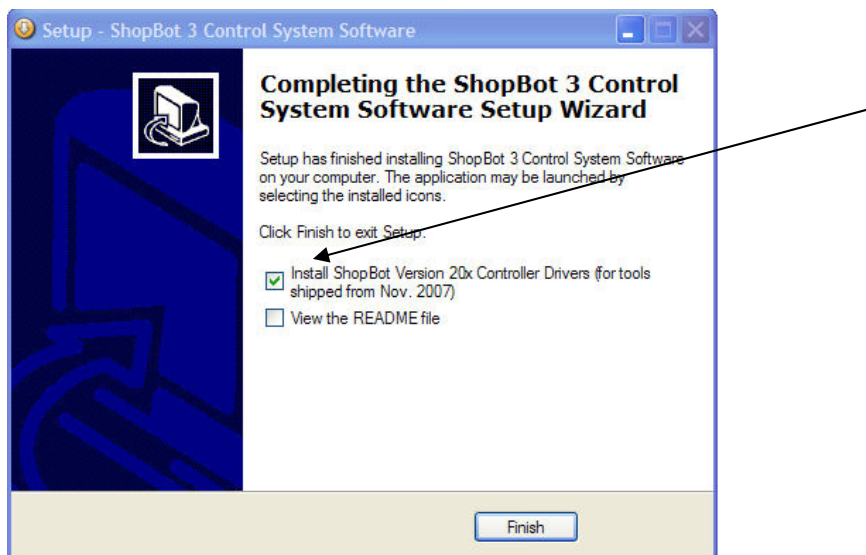
Connecting the USB cable from the Spindle Control Board to the Computer

Before connecting the USB cable from the spindle control board to the computer, check to see if the folder **SB Controller** which contains the drivers for the board is present. The default location is C:\Program Files\ShopBot\SB Controller. If this folder is present, plug in the USB and continue to **Starting the RPM control software** below. If the folder is not present install SB Control Software version 3.5.6 (or higher).

Installing Version Sb3.5.6 or later Software

The USB driver software for ShopBot will be installed at the end of the installation of the ShopBot Control Software. After the Control Software has been loaded, the option of installing the drivers for ShopBot Version 20x Controller Cards will be offered. If the ShopBot was received anytime after November 1, 2007, install these drivers. It will not hurt anything to install them if this is an older tool, or if they are already installed.

Make sure the 'Install ShopBot Version 20x Controller Drivers' box is CHECKED and click 'Finish' to start the automatic driver installation process.



A message indicating that the Drivers are being installed, and soon after, that the installation is complete.

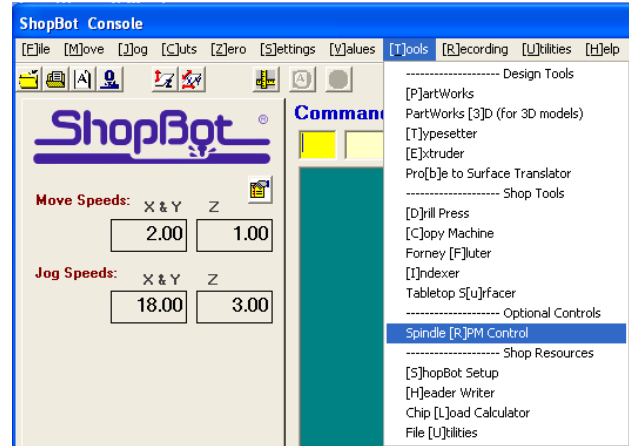
Plug in the USB cables from the ShopBot and Spindle Control Board and turn the Control Box on. If this is a PRSalpha ShopBot, hit the RESET button as well.

* This Installation Program can also be started by going to folder:
C:\Program Files\ShopBot\ShopBot 3\Drivers\ShopBotControllerV201
And double clicking on the program "DriverLoader.exe"

**If the USB was plugged in before installing the drivers, unplug the USB cables and plug them back in after the install.

Setting the Spindle RPM in the ShopBot Control Software

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

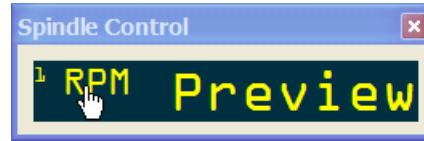


If you are using the ShopBot control software on a computer not connected to a ShopBot, the Spindle Control window will display "Preview".



The Spindle Control Window

Click the word "RPM" in the spindle control window to bring up a fill in sheet.



The fill in sheet will have several parameters that can be defined within this sheet.

RPM: Defines current RPM value the spindle is set to. If in preview mode (preview) will be here.

Port Number: Defines the com port that the Spindle Control Board is connected to. This will happen automatically.

On the Fly Increment: Defines the amount the RPM increases or decreases when holding the shift key and (+) or (-).

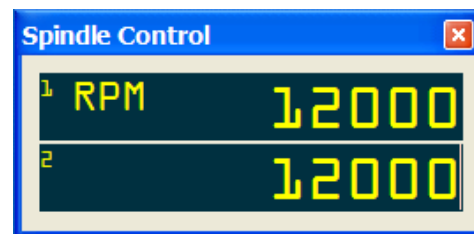
Start when SB3 Starts: Default is 0; the spindle control window only opens when prompted [TR]. If set to 1; Opens and closes the spindle control window with the ShopBot control software.

 A screenshot of the parameter fill-in sheet for the Spindle Control window. It has a yellow background and a table with two columns: 'Parameter Name' and 'Value'.

Parameter Name	Value
RPM	12000
Port Number	3
On the Fly Increment	100
Start when SB3 Starts	0
VFD 1	Yaskawa V74X
VFD 2	None
	None
	Yaskawa V74X
	Delta VFD-B

 An 'OK' button is located at the bottom right of the form.

VFD 1 and 2: Defines what type VFD spindles 1 and 2 are connected to. Running two different VFDs is not recommended. Selecting a VFD model under VFD 2 will open a second spindle control window.



To change the RPM,

- Click in the display window, enter a new RPM and hit Enter on the keyboard. **OR**
- Open the fill in sheet as above.

To change the RPM from within a part file

- Use the [TR] command and the new RPM. (Example: TR,12000,1 will change the rpm for spindle#1 to 12,000.).
To change the RPM for spindle #2 (TR,12000,2).

To change the RPM when a part file is being run

- Hold the Shift key and press the + or – keys on the keyboard. By default the + will increase the RPM by 100 and the – will decrease the RPM by 100.



Outputting Spindle RPM within Design Software

Locate the area in which the feeds and speeds are set for that particular tool within tool database of the design software. Define the RPM value for that tool and apply or save. This RPM information will be specific to this particular tool.

Create desired toolpaths. When toolpaths are ready to be saved, output the toolpaths with a ShopBot post that ends with "w/speed". This will call up the RPM information for the tool used as well as start the (TR) file inside the SB control software.

If calling up the RPM for spindle #2, save the toolpath using the posts for "Head 2 w/ speed".

