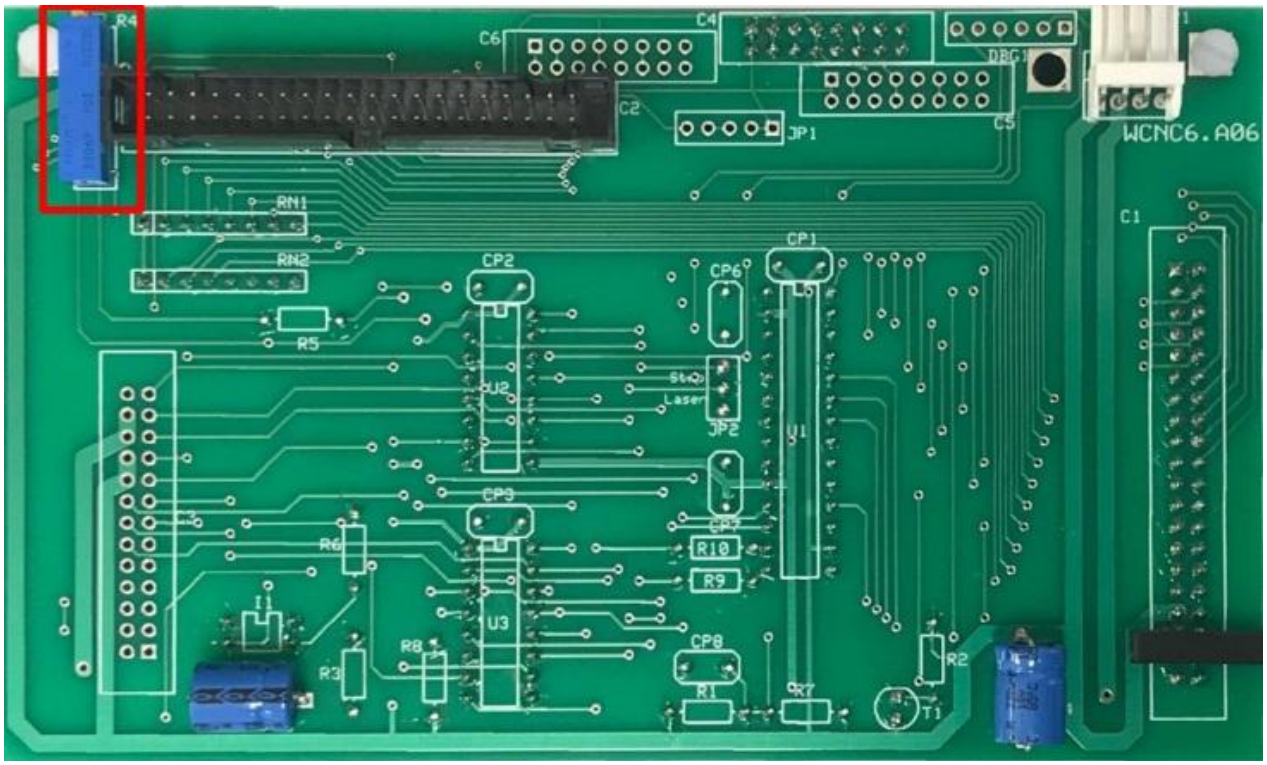
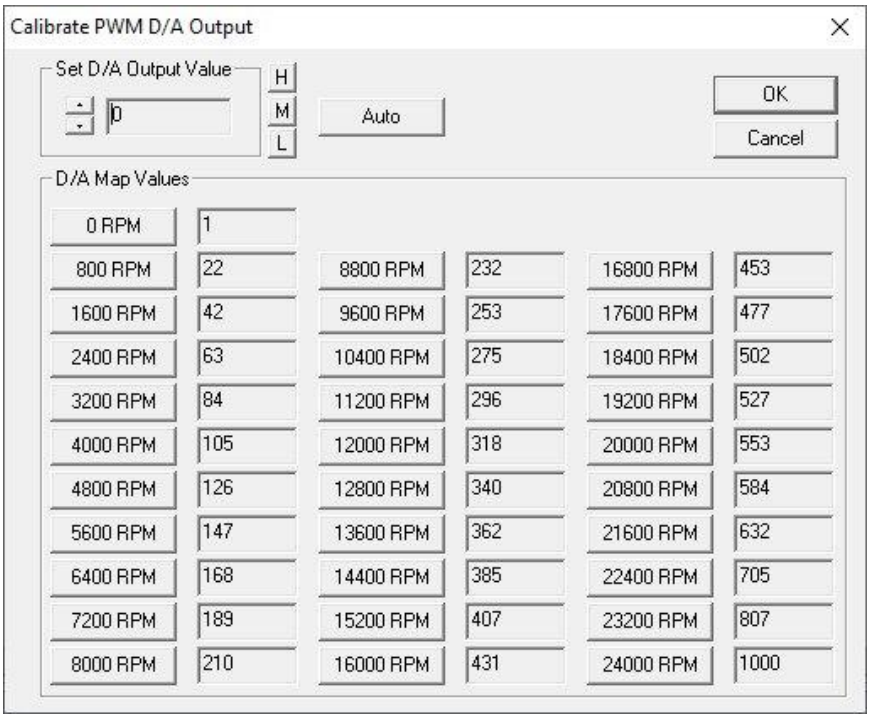
Spindle Speed Control Calibration Instructions

There are two things you must have in order for the D/A spindle speed control to work. First, the correct components must be on your daughterboard. The blue potentiometer (outlined in red below) should be present. Second, the D/A feature must be enabled in the software (there is an additional fee for this option).

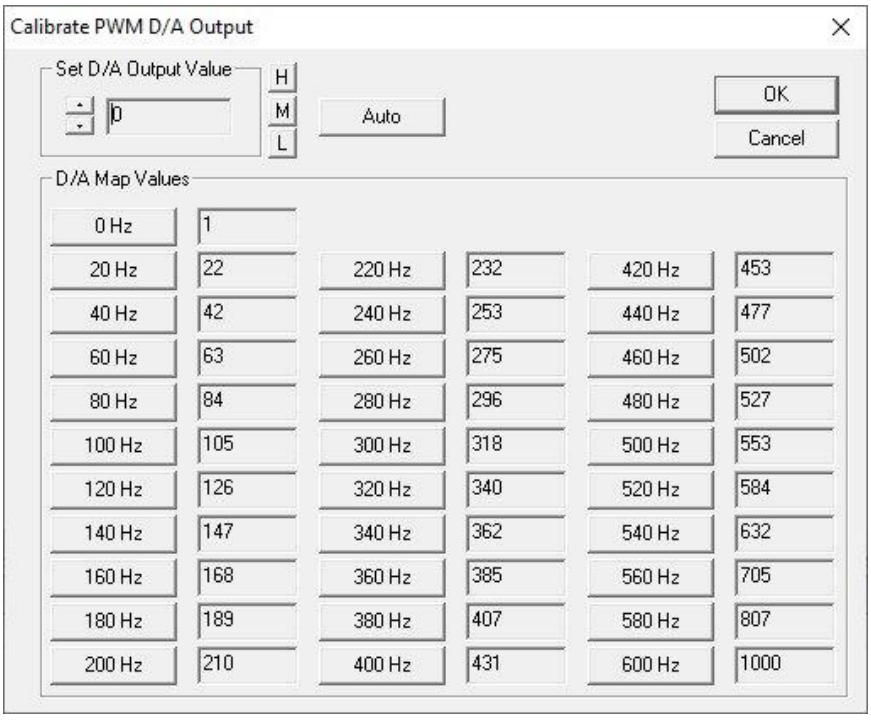


Once the board has been properly modified, and the option has been added to your software, the next step is to calibrate the D/A potentiometer. To do this, follow the steps below:

1. Install your PCI/PCIe card and daughterboard into the PC. Make sure to leave the side of the PC off for access to the daughterboard.
2. Install and configure the WinCNC software. Two WINCNC.INI entries are required for spindle speed control. These are example entries using default values:
   PWMDA=V10
   SPINDLE=T5 R24000
3. Make sure the wiring to the VFD is correct. Power (voltage in) needs to be wired to pin 14 of the CN2/daughterboard, signal (voltage out) to pin 13, and ground to pin 12. If using an external interface board these are the V+, OUT, and GND terminals, respectively.
4. The VFD input voltage should be set on the “PWMDA=” line in WINCNC.INI. Normally, this is 10V but some VFDs optionally use 5V.
5. Open WinCNC, click “Configuration”, and then click “D/A Calibration”. There are two methods of calibration. By default the calibration dialog displays RPM based on the “SPINDLE=R#” in WINCNC.INI, like this:



The calibration can also be done using hertz by adding an 'H#' setting to the "SPINDLE=" line in WINCNC.INI. When configured in this way the calibration dialog will look like this:



6. Use the arrow keys on your keyboard to move the "Set D/A Output Value" up to 1000. Clicking the 'H' button next to the value display automatically sets it to 1000.
7. Now adjust the potentiometer so that the VFD display (RPM or Hz) is at maximum speed. It is important to dial the potentiometer back until the VFD is goes below maximum speed and then increase it slightly until maximum speed is reached. This eliminates dead-band above maximum VFD speed and increases the range and accuracy of speed control.

8. Next, using the arrow keys or the “L” button next to the value display to move the “Set D/A Output Value” to 0 (zero) and confirm that the VFD display (RPM or Hz) is at minimum speed.
9. If absolute maximum or minimum speed can’t be reached it may be necessary to adjust VFD bias settings. Normally, this is not necessary.
10. Now you can click the “Auto” button which will step through each increment of the calibration scale allowing you to adjust the output value before clicking “Next” to save that setting and move on to the next. Make sure to click “Done” at the end.
11. Individual scale values can be changed at any time by adjusting the “Set D/A Output Value” and then clicking the corresponding speed value to save the setting.
12. Make sure to click “OK” at the end to save the software calibration settings.