

Sherline/Acorn CNC Control Quick Start Reference

i INFORMATION: Before you do anything, transfer all the files from the USB flash drive to your computer or an external hard drive for a secure backup.

Sherline/Acorn CNC Quick Start Instructions

1. Centroid has a wealth of information on their website. Start by reading [Centroid CNC Software Downloads](#) and follow their instructions.
 2. The license for your software and the “Centroid CNC PC Tuner App” are on the USB drive in the “Software” folder. Use the PC Tuner so you can see if your PC is compatible with the Acorn software. This will save everyone a lot of time and frustration. Here is a link to the instructions for running the App ([Free Centroid CNC PC Tuner has been released. - Centroid Community CNC Support Forum \(centroidcncforum.com\)](#)).
- NOTE:** These instructions are for our complete Acorn Controller (P/N 9400) with our driver box, spindle speed control, external encoder, and limit switches.
3. After you have run the PC tuner and loaded the software, plug the power cord for the 9400 control into a power source.
 4. Plug your E-stop into the top 2-pin connector on the back of the control and push the red knob down to activate the E-stop (see Figure 1).



FIGURE 1

5. Now, plug the Ethernet cable into your PC and into the front of the controller (see Figure 2). There is no need to connect anything else at this time.

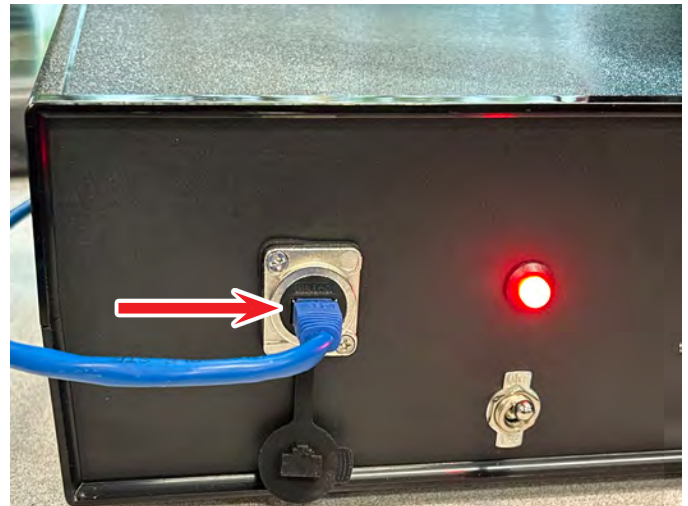


FIGURE 2

6. Turn the Sherline/Acorn CNC Controller power on (see Figure 3).



FIGURE 3—The red LED light will illuminate.

- Click on the CNC12 Mill or the CNC12 Lathe icon to open the controller page software (see Figure 4).

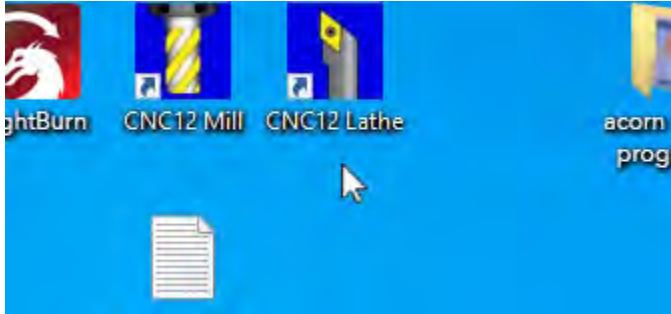


FIGURE 4

- Wait for the control software to establish communication with the Acorn board (see Figure 5), which is inside the Sherline/Acorn CNC Controller. If the software does not connect the first time, click on the Icon again and it will connect.



FIGURE 5

- With the E-stop activated, the control will show "406 Emergency stop detected" (see Figure 6).

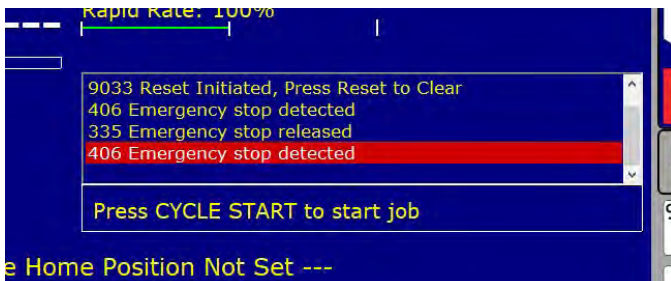


FIGURE 6

- Twist the red knob to release the E-stop and the control will show "335 Emergency stop released" (see Figure 7).

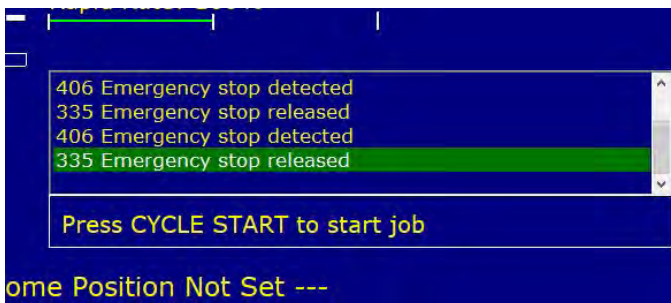


FIGURE 7

- At this time we are just going to load and check all of the settings. Click on Utility F7 (see Figure 8).

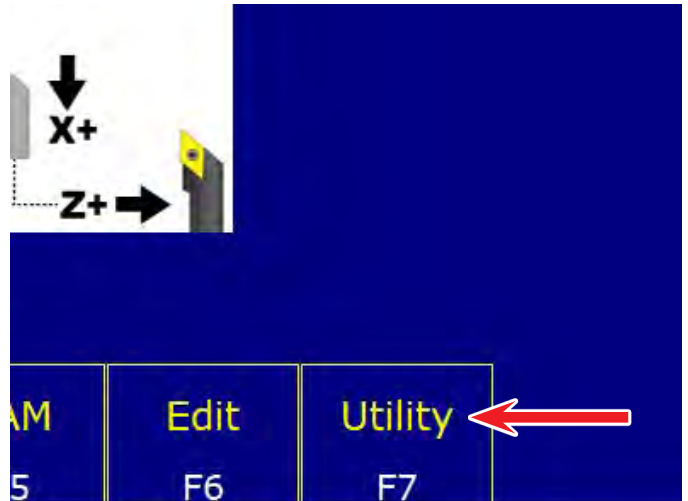


FIGURE 8

- Click on Restore Report F2. Open the File Explorer, USB Flash drive, and Report file. In the report file you will see the report that we made for your control when we tested it. Click on the report file and click on Open (see Figure 9).

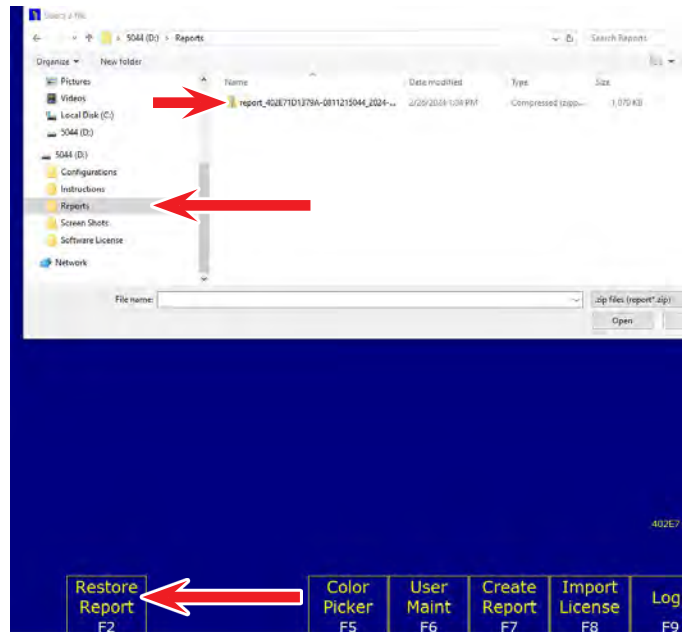


FIGURE 9

- After the report has been loaded into the control you will see an Attention message (see Figure 10).



FIGURE 10

14. First power off the control using the power toggle switch. Then click on Exit CNC12 F9 (see Figure 11).



FIGURE 11

15. This will turn off the CNC 12 software and the control screen. Now, power on the control. Then double-click on the CNC12 icon on the desk top as shown earlier in steps 7 and 8.
16. Now we are going to check the setting in the Acorn Wizard. Click on Utility F7 and then Acorn Wizard F10 (see Figure 12).



FIGURE 12

17. When the Acorn Wizard opens up, click on Axis Drive Type. Choose the standard Axis Drive for your machine (in this case, we are choosing “lathe leadscrew”). Then click on “Load Drive” (see Figure 13).

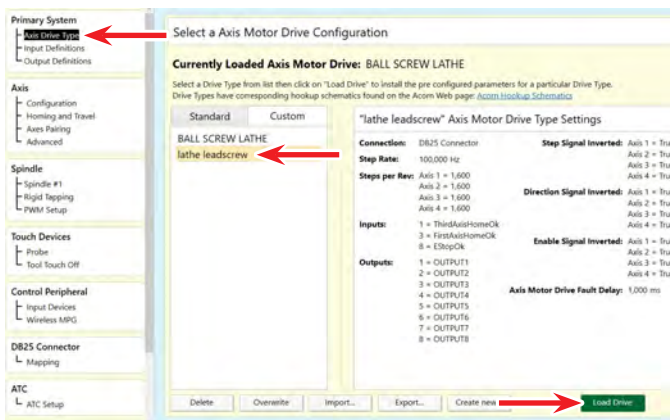


FIGURE 13

18. On the USB flash drive, there is a file “Configurations.” Use file explorer and open the Configuration file. In this file there are screen shots for each of the setting pages. You are going to click on each of the settings pages in the Wizard. Then click on the mating screen shot for that page and check to see if all of the settings are correct. In the picture below we are checking the “Axis Drive Type” and the screen shot for “Axis Drive Type.” You will do this for each setting page. Change any settings that are different (see Figure 14).

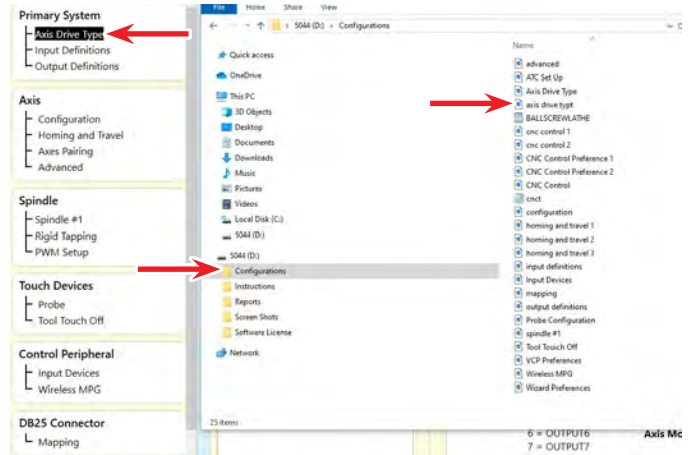
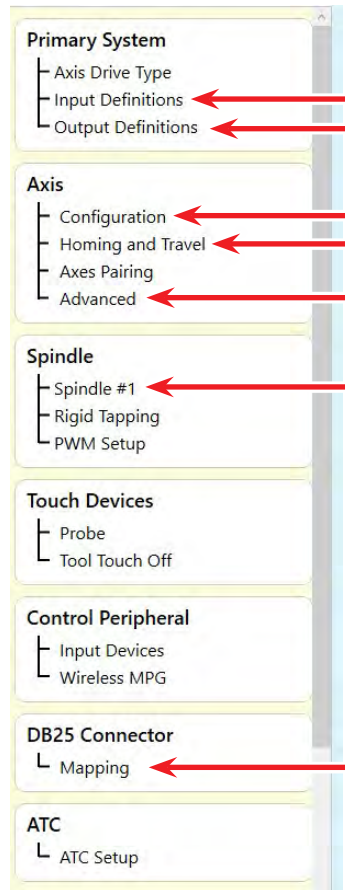


FIGURE 14

19. Several of the settings pages will not be used such as “Rigid Tapping.” The main settings pages that you want to be sure are correct are shown below (see Figure 15).



NOTE: The Max Rate and the Fast Jog Plus Direction on the Configuration page must not exceed (32) for our Sherline stepper motors or the stepper motors will stall.

FIGURE 15—The arrows indicate the main settings you want to make sure are correct.

20. When all of the settings have been checked, click on the “Axis Drive Type page. Then click on “Write Settings to CNC Control Configuration” (see Figure 16).

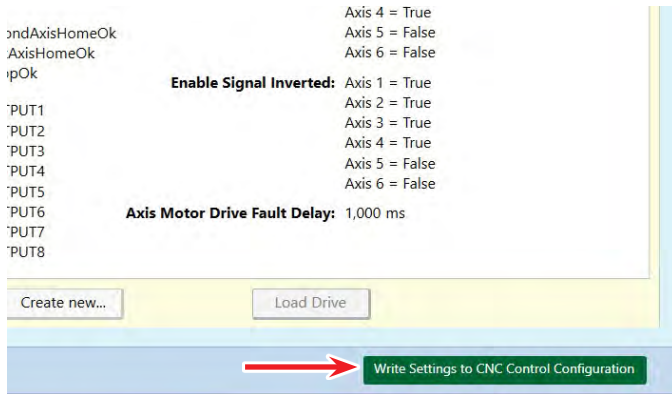


FIGURE 16

21. Click on “Yes” to write these changes to the CNC control configuration (see Figure 17).

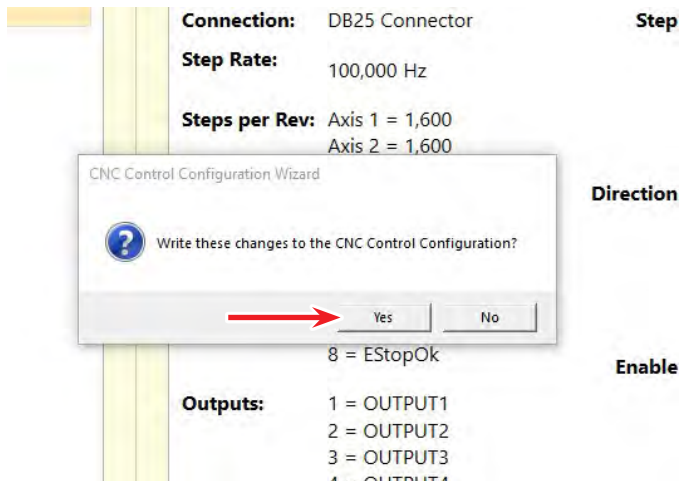


FIGURE 17

22. After the settings have been saved you will need to close the Wizard and restart CNC12. Click “OK” (see Figure 18).

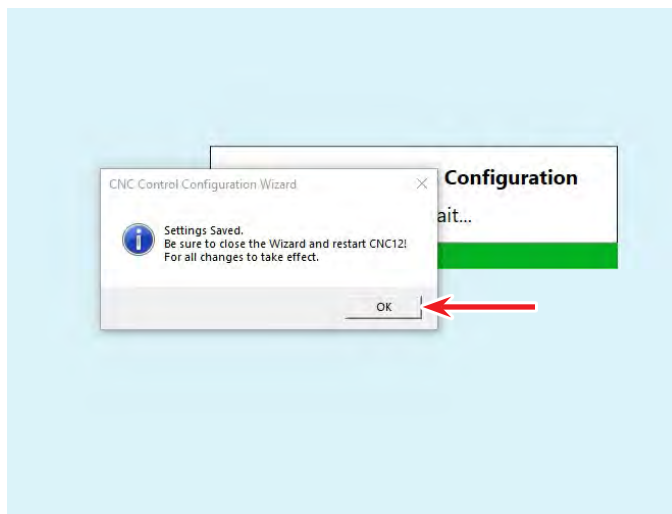


FIGURE 18

23. Close the Wizard. Turn the power off on the controller. Then click on Exit CNC12 F7 (see Figure 19).

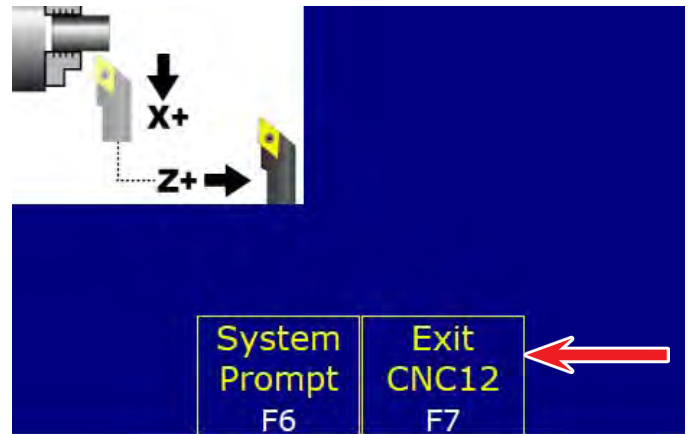


FIGURE 19

CAUTION

You must always power off the controller first. Then exit the CNC 12. Then turn the controller power back on and wait a few seconds. Then double-click on the CNC 12 Icon to start the software again. It must be done in this order.

24. Sometimes you will get the message below. Press any key to exit. Power off the controller. Power on the controller. Wait a few seconds. Double-click on the CNC12 icon again (see Figure 20).

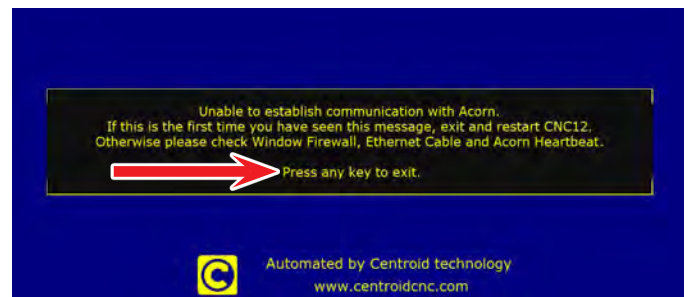


FIGURE 20

25. At this point all of your settings should be correct. We are now going to connect all of the accessories to the controller.

Connecting Accessory Devices to the Acorn Controller

1. Power off the controller and Exit CNC12.
2. Connect the Sherline 4-axis driver box (P/N 8760) to the controller.
 - A. Place the driver box on top of the controller with the power toggle switch (1) side of the driver box to the front of the controller. Plug in the power supply cord (2). Plug in the parallel port cable (3) (see Figure 21).

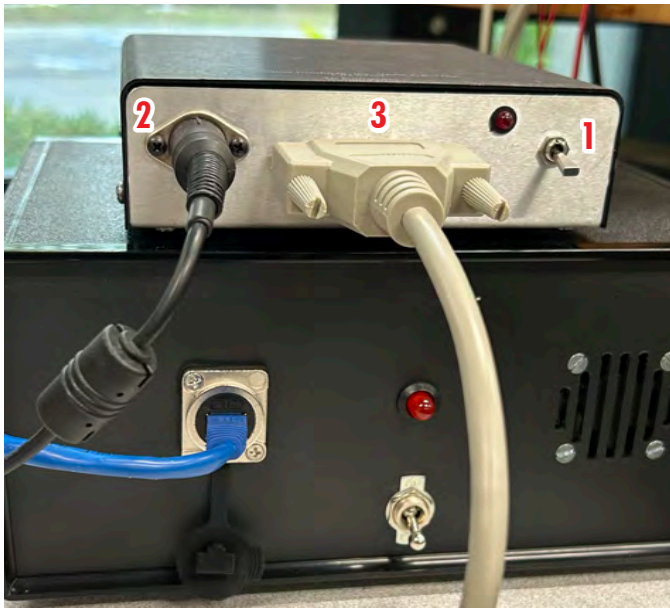


FIGURE 21—(1) Power toggle switch, (2) Power supply cord, (3) Parallel port cable.

- B. Plug the opposite end of the parallel port cable into the top middle DB25 connector on the back of the controller (see Figure 22).

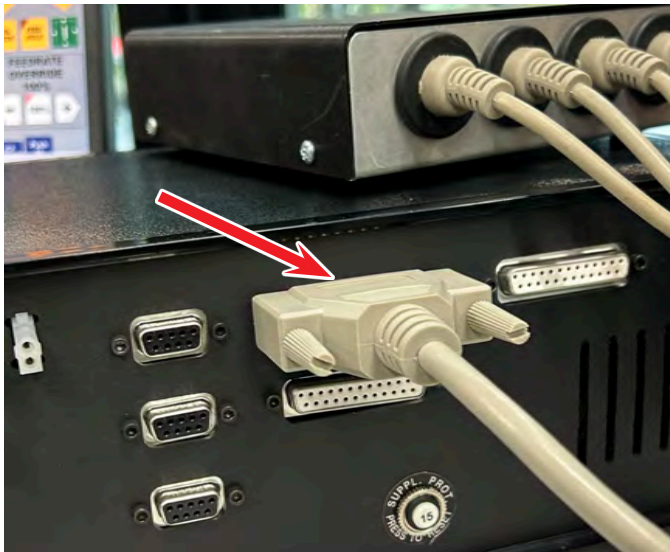


FIGURE 22

- 3. Your E-stop should already be plugged into the top left, 2-pin connector on the back of the controller (see Figure 23).

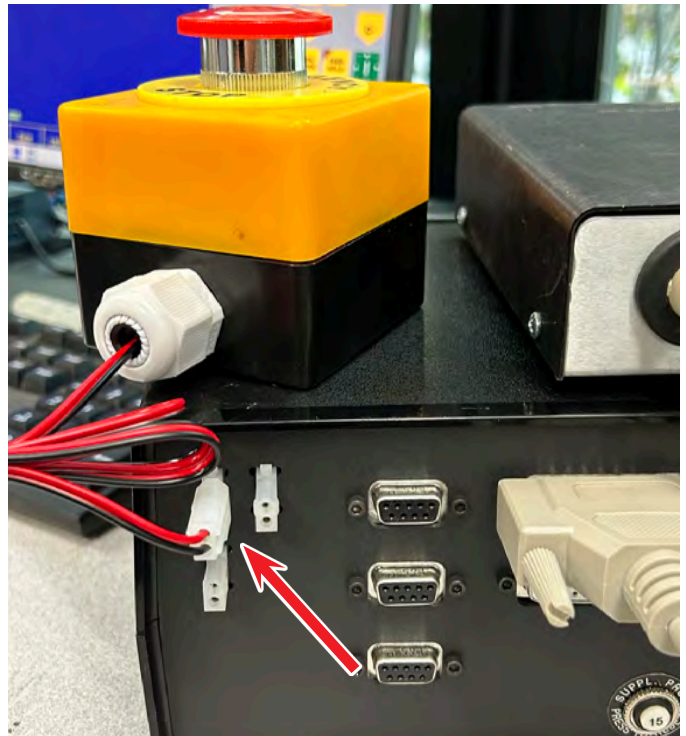


FIGURE 23

4. Spindle Control

- A. If you are doing a retrofit of an existing machine that has our speed control on it, you will need to read the [Wiring the Isolator Board to the Speed Control](#) PDF to install the “1-foot speed control pig tail cable” (P/N 87839) to the speed control. These instructions can be found online and on the USB flash drive in the Instruction folder.
- B. If you are buying a new machine, the 87839 cable will already be installed.
- C. Connect one end of the P/N 87837 “6-foot Connection Cable” to the top right 2 pin connector on the backside of the controller (see Figure 24).



FIGURE 24

Then plug the other end of the cable into the end of P/N 87839 under the speed control housing.

5. External Encoder Connection

- A. Follow the installation instructions for the external encoder. These instructions are online and also on the USB flash drive in the Instruction folder. The file name is [9402 External Encoder inst.pdf](#).
- B. Connect the DB9 connector on the end of the encoder cable to the middle DB9 connector on the backside of the controller (see Figure 25).

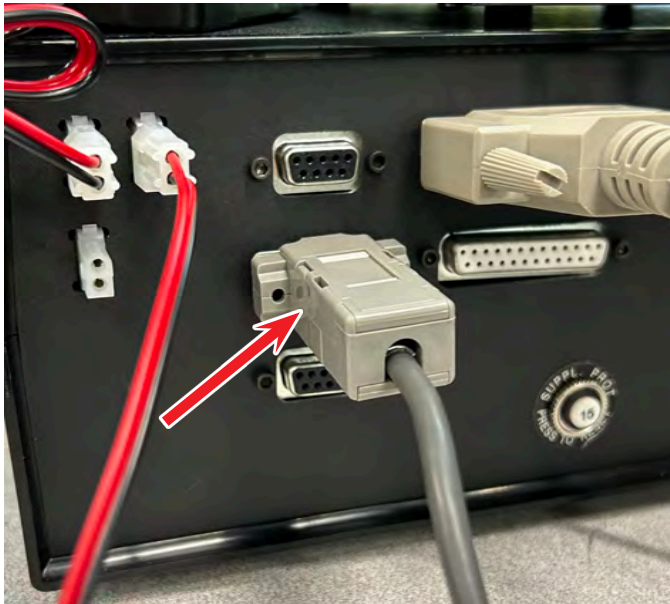


FIGURE 25—The red arrow shows the DB9 Encoder cable connected to the middle DB9 port on the Acorn Controller.

6. Limit Switches

1. Connect the DB9 connector on the end of the P/N 87825 Main Limit Switch Cable to the top DB9 connector on the backside of the controller (see Figure 26)

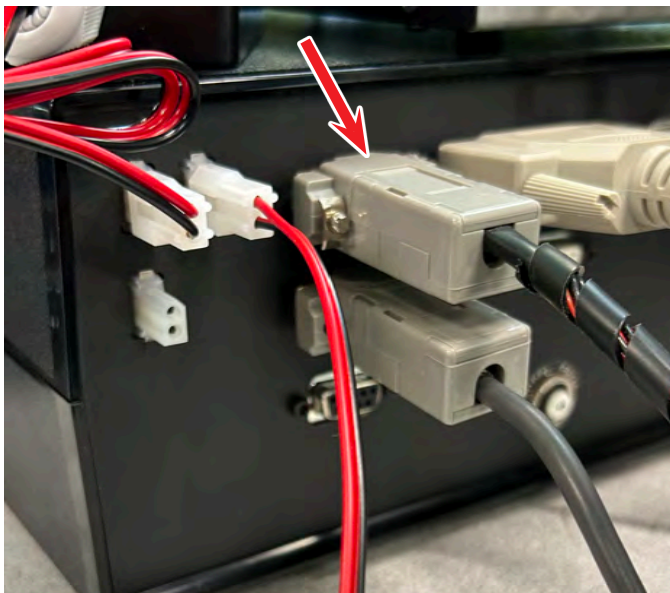


FIGURE 26—The red arrow shows the DB9 Limit Switch cable connected to the top DB9 port on the Acorn Controller.

7. Aux DB9 Connector

- A. This connector is for our Tool Setter Plate P/N 8702 or a Touch Probe.
- B. This is the bottom DB9 connector on the backside of the controller (see Figure 27).
- C. We have our DB9 Aux Cable (P/N 87838) that connects to this connector and has usable wires for connecting aux devices.
- D. For our Tool Setter (P/N 8702), use the black wire and the yellow wire to connect to the tool setter wires (see Figure 28).

NOTE: You may want to purchase an additional P/N 87837 to splice into the P/N 87838 to connect to your Tool Setter or Touch Probe. This will give you a 6-foot cable from the controller to the tool setter.

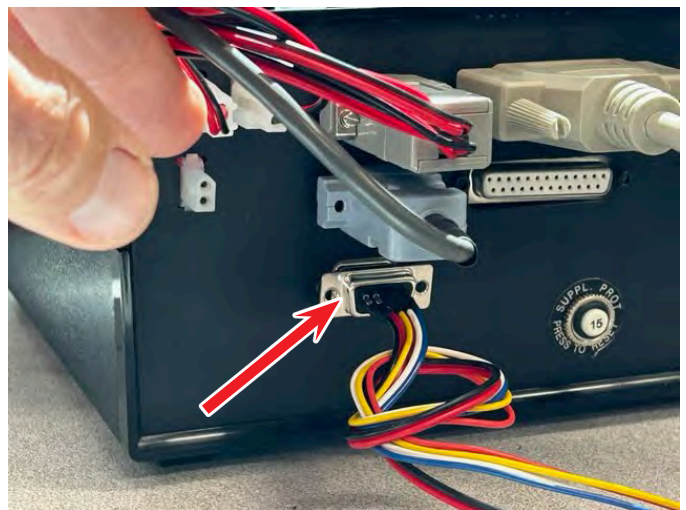


FIGURE 27

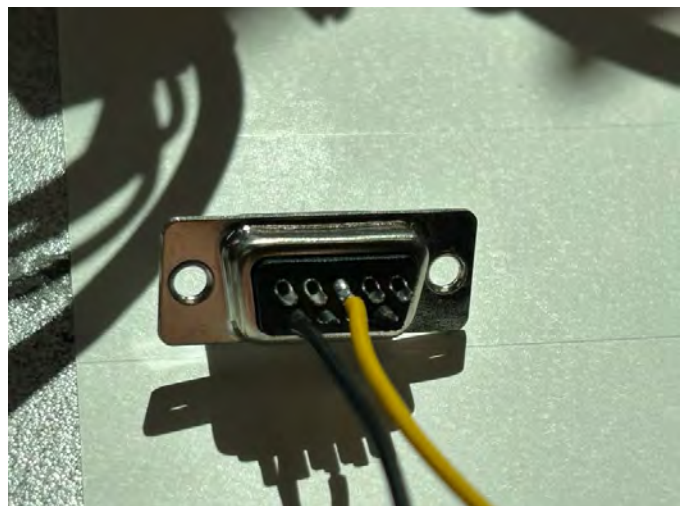


FIGURE 28

E. See Figure 29 for the DB9 connector pin-out schematic.

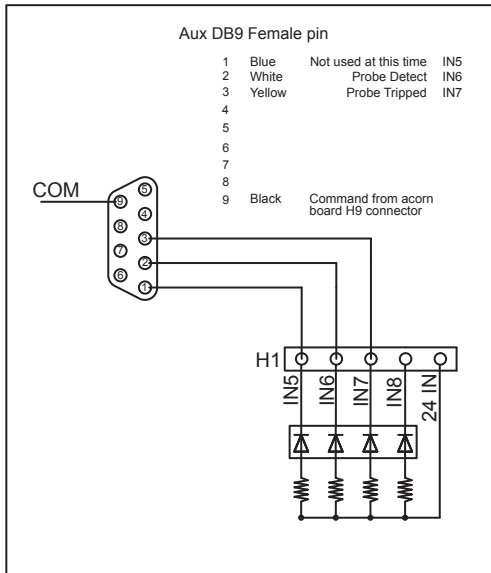


FIGURE 29

F. At the end of these instructions, is an electrical schematic for the 9400 controller and all of the connectors (see Figure 47). These instructions are online and also on the USB flash drive in the Instruction folder. The file name is [acorn_mill_connection_back_panelconfig_DB9_and_DB25.dxf](#).

8. Cable Connections and Routing

A. Connect the end of all of the limit switch cables from P/N 87825 to their respective limit switches.

If you need limit switches or limit switch mounts, go to these links on our website:

- [Limit Switch Assembly product page](#)
- [Limit Switch w/Pigtail product page](#)
- [Lathe Limit Switch Mounting Retrofit Instructions](#)
- [Mill Limit Switch Mounting Retrofit Instructions](#)

B. Connect the ends of the stepper motor cable to their respective stepper motors.

⚠ CAUTION

Whenever you connect or disconnect the stepper motor cables from the stepper motors, **THE POWER** on the 4-Axis Driver Box (P/N 8760) **MUST BE OFF** or you will damage the driver box!

C. Rout and zip-tie all of the cables as shown in the following photos for our mills.

- Z-axis:** Loop the limit switch cable over the stepper motor cable at the stepper motor where the stepper motor cable is zip-tied to the stepper motor. Then zip-tie the limit switch cable to the stepper motor cable (see Figures 30 and 31).

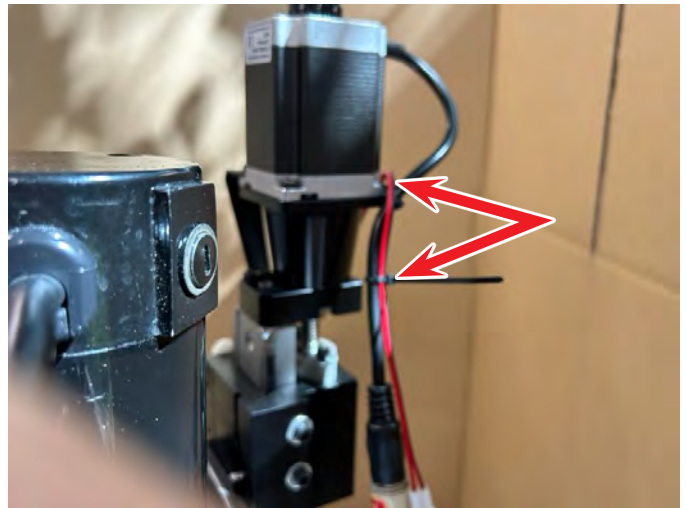


FIGURE 30



FIGURE 31

- Encoder Cable:** Feed the encoder cable behind the spindle pulley and the DC motor (see Figure 32).

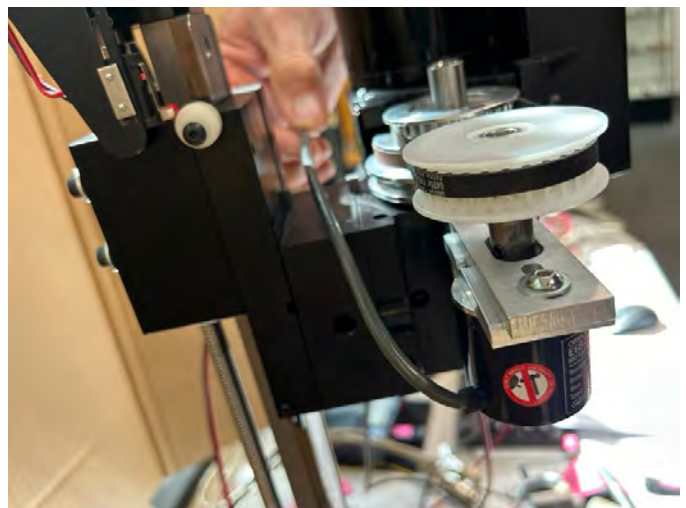


FIGURE 32

- iii. **DC Motor Power Cord:** Loop the power cord up and through the speed control cord that goes to the motor. Then zip-tie the encoder cable and the speed control pig tail (P/N 87839) to the power cord. With the proper amount of slack or tension, you should be able to direct each of these cable away from interference points and at the same time offer strain relief (see Figure 33).

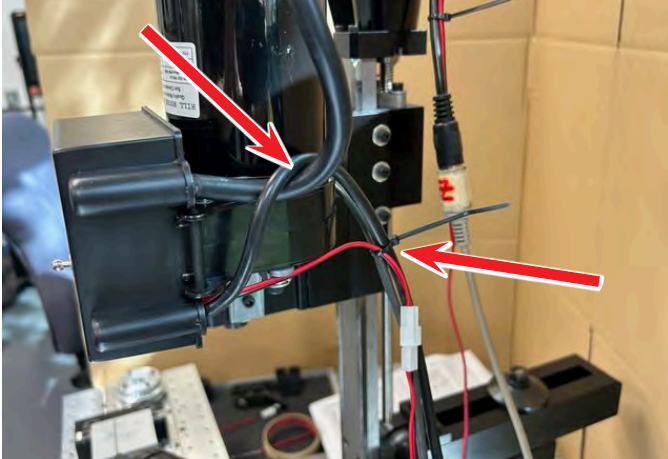


FIGURE 33

- iv. **Securing the Cables:** Zip-tie the speed control/encoder cable bundle to the Z-axis stepper motor/limit switch bundle and rout them to the rear of the machine. This should keep all of these cables away from the work area (see Figure 34).

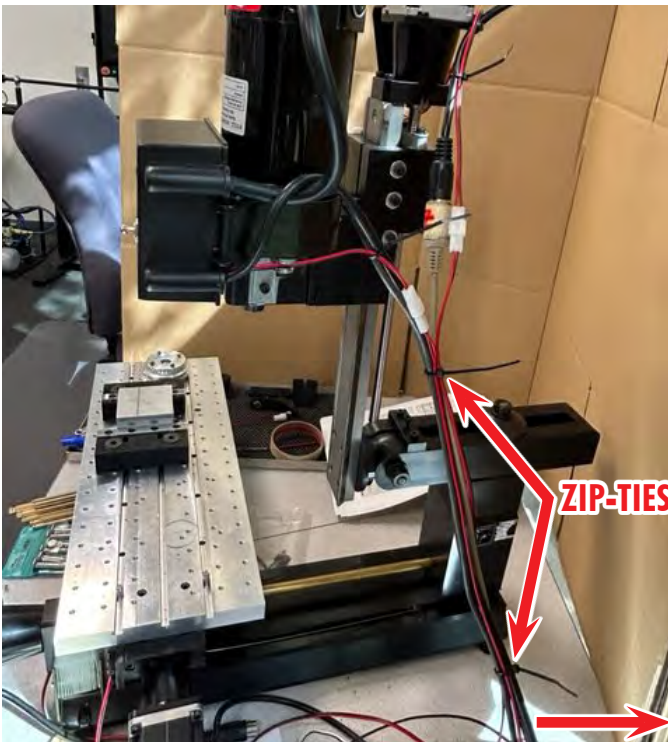


FIGURE 34

- v. For all other axes, zip-tie the limit switch cable to the stepper motor cable and rout them away from the machine.

- vi. Routing the cables for the lathe is very easy. Use the same technique and be sure that the cables have enough slack for each axis to travel the full distance. On the lathe, connect the X-axis driver box cable to the stepper motor that is on the crossslide and connect the Z-axis cable to the stepper motor that is behind the tailstock.

Starting the Acorn Control

1. Always turn on the power to the Acorn controller first, (see Figure 35).



FIGURE 35—When the Sherline/Acorn CNC Controller power is on, the red LED light will illuminate.

2. Next, turn on the power to the 4-axis driver box (see Figure 36).



FIGURE 36—The red LED light will illuminate

3. Click on the CNC12 Mill or the CNC12 Lathe icon to open the controller page software (see Figure 37).

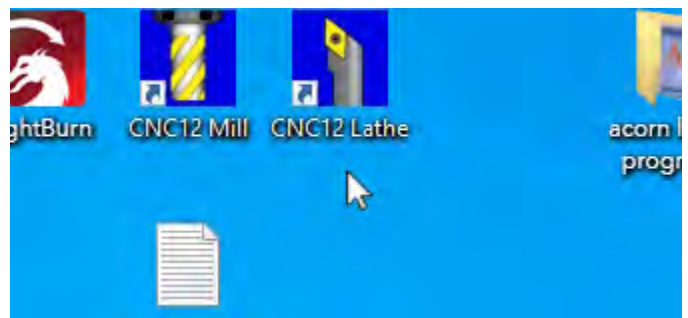


FIGURE 37

4. Wait for the control software to establish communication with the Acorn board, which is inside the Sherline/Acorn CNC Controller (see Figure 38).



FIGURE 38

5. The E-stop button and the “Reset Tripped” on the control screen have the same function.
 - A. If the E-stop button is activated when you open the control software, the alarm message will show “406 Emergency stop detected” (see Figure 39).

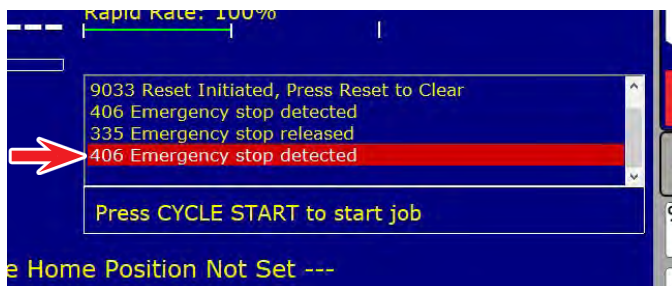


FIGURE 39

- B. Release the E-stop button to deactivate it and the screen will show “335 Emergency stop released” (see Figure 40). The area around the “RESET TRIPPED” will be gray. At this point, you can home your machine (If your machine has limit switches).



FIGURE 40

- C. If the E-stop is not activated when you power on the controller, the “RESET TRIPPED” border on the screen will be white and there will be a “9033

Reset Initiated, Press Reset to Clear” alarm (see Figure 41).

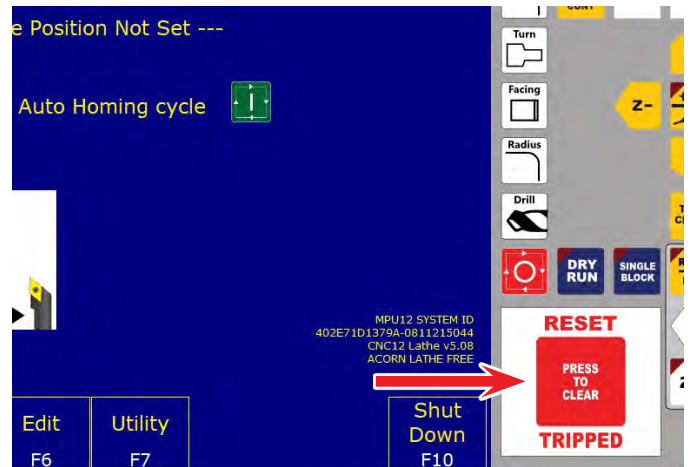


FIGURE 41

- D. Click on “Press to clear” and the boarder will turn to gray and the “4032 Reset Cleared” message will show. Again, you are now ready to home your machine (see Figure 42).

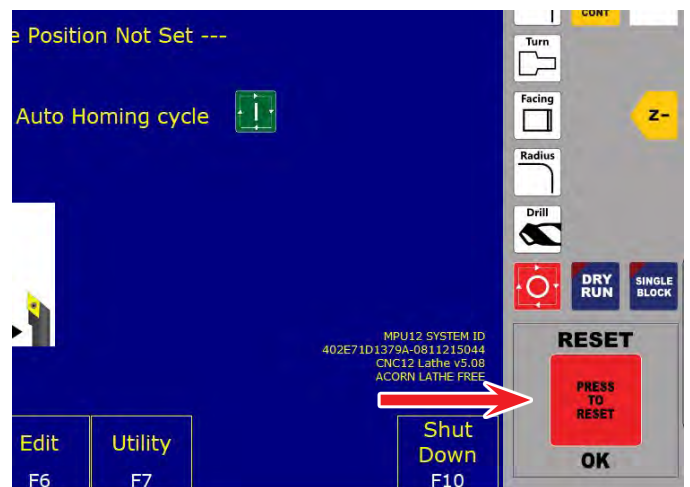


FIGURE 42

6. Homing Your Machine

- A. On the Acorn Wizard, we set the “Homing and Travel” to “Automatic Homing: machine seeks switches to home” and “Wizard to generate Automatic home program” (see Figure 43).



FIGURE 43

B. Because of these settings, the control will request that you “Jog all axes to a clearance point on the machine.” Then “Press Cycle Start to run the Auto Homing cycle” (see Figure 44).

Press the green cycle start button on the right side of the screen, and the homing program will start.

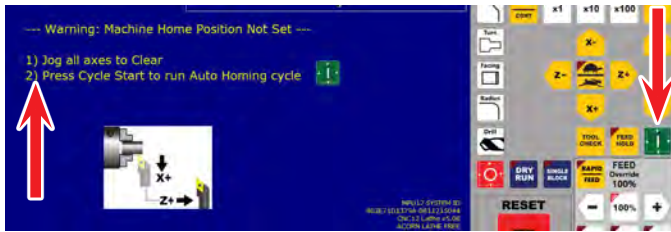


FIGURE 44

- i. On the mills, the axis will home out in the following order (Z, Y, X, and A)
- ii. On the lathe or chucker lathe, the axes will home out in the following order (Z 1st, and the X)

7. Jog Mode

One of the first functions that you will probably use is the Jog mode to move your machine. This is rather self-explanatory (see Figure 45).

1. Increment or Continuous
2. Increment amounts per step (x1, x10, and x100)
3. Slow/Fast (tortoise/hare)
4. Axis jog directions (**NOTE:** This is viewed as the direction that the tool moves. On the mill the tool direction will often be opposite)

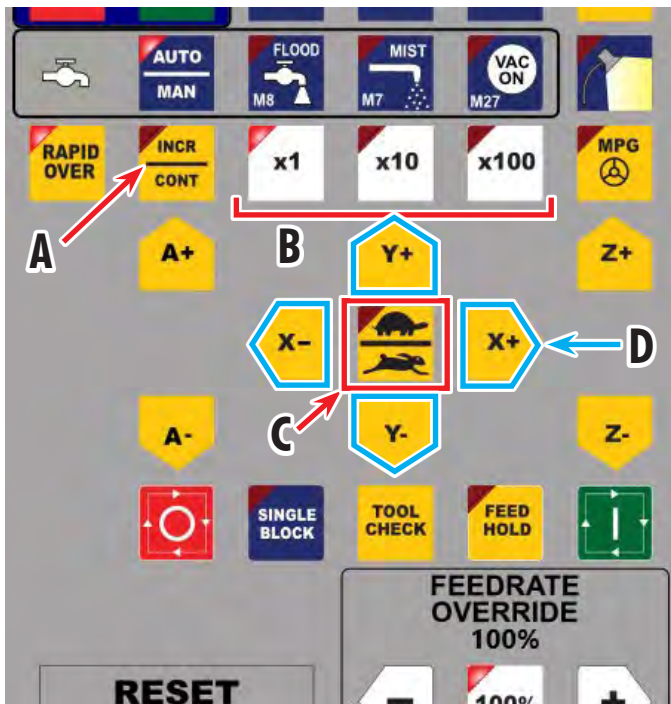


FIGURE 45

Learning How to Use Your Acorn Control

We will leave you here to learn how to use your Sherline/Acorn controller.

1. We strongly suggest that you copy all of the files from the USB flash drive that came with your control to a different computer or hard drive.
2. We have several of our “Sherline-based” instructions on the USB flash drive that came with your Acorn controller (see Figure 46).

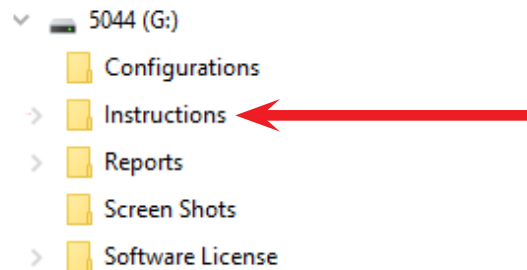


FIGURE 46

3. We have instructions on our website (click the Instructions tab): [Sherline/Acorn CNC Controller - Sherline Products](#).
4. Centroid has a wealth of information on their website: [Acorn CNC controller, Step and Direction 4 axis CNC Control board with ethernet communication,DIY CNC kit \(centroidcnc.com\)](#)
5. Below are links to other Centroid Acorn sites and information.
 - [Free Centroid CNC PC Tuner has been released. -Centroid Community CNC Support Forum](#)
 - [Acorn CNC controller quick start video page](#)
 - [Centroid CNC Software Downloads](#)
 - [Centroid AcornCNC Installation Manual](#)
 - [ALL Acorn Documentation - Centroid Community CNC Support Forum](#)
 - [Automatic Tool Offset Measurement X Z tool offset cycle with Centroid Acorn CNC controller](#)
 - [CENTROID CNC Operator Training: Tool Setup with a Knee Mill](#)

Thank you,
Sherline Products Inc.

