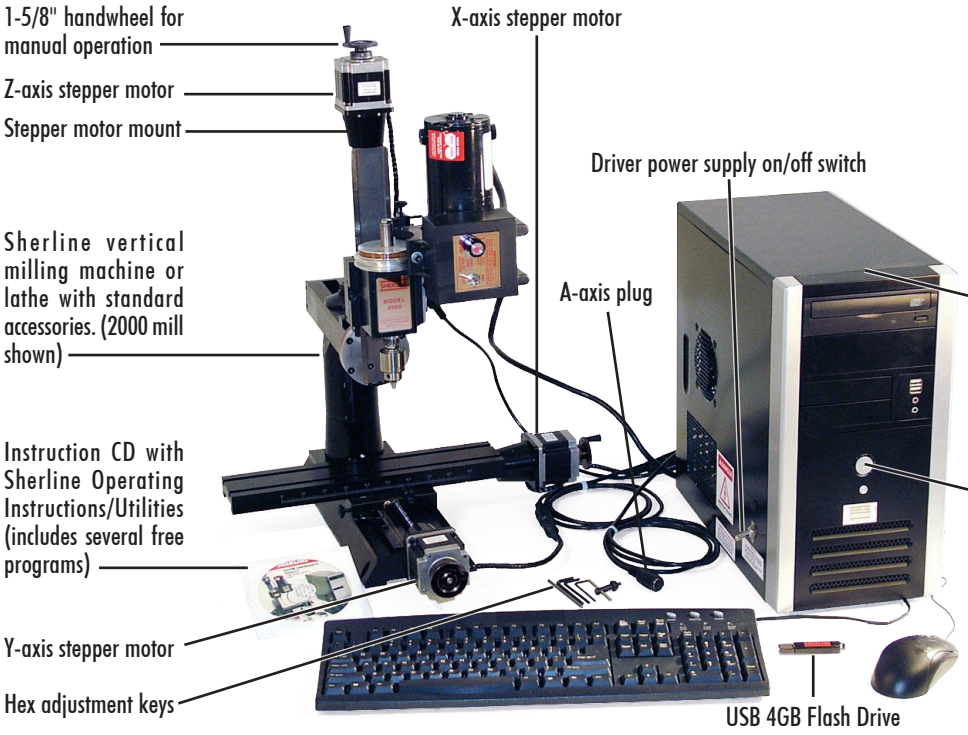
# Sherline CNC package Quickstart Instructions




**WHAT'S INCLUDED:**
Shown here is what comes with a CNC mill package. A lathe package will be similar except that it will have two stepper motors instead of three.
**BOX 1:** machine, accessories, and stepper motors
**BOX 2:** the computer, keyboard, mouse, flash drive, and Instructions CD

Computer with Linux O/S and LinuxCNC software pre-installed, 4 drivers and second power supply installed inside case. Keyboard, mouse, and connecting cables are included.

Computer ON/OFF Power switch (Small silver button below is RESET)

NOTE: Depending upon availability, actual computer supplied with your system may look slightly different than the one shown.

## Assembling Your System

**Mill or Lathe:** Unpack and assemble your machine according to the instructions included in the *Sherline Assembly and Instruction Guide* packed with the mill or lathe.

**CAUTION!**

***Before plugging in your Sherline computer, make sure the 115/230 voltage switch on the computer is set to the proper position for your local voltage. If it must be changed, a second switch on the driver power supply inside the computer must also be changed. See the photo at right for the location of the two switches.***

**Computer:** Unpack the computer and enclosed components. Connect the black X, Y, and Z stepper motor cables leading from the back of the computer to each of the stepper motor connectors. A fourth black cable is unused unless you have purchased an optional CNC rotary table which can be connected here as a 4th (A) axis. Plug the keyboard and mouse cables into their receptacles at the back of the computer (the mouse that ships with your computer may be PS/2 or USB). Plug your monitor into one of the associated video ports (HDMI, Serial, or VGA). **The driver box and the computer are connected via an internal cable.** Insert the female end of the power cord into its receptacle in the computer and plug the male end into a properly grounded wall socket or surge protected power strip. Turn the computer and monitor ON but leave the power switch to the stepper motors in the "OFF" position for now.

### Opening the Instruction Files

If you are not familiar with Linux, you will find the desktop that opens when your computer starts up to be very similar to the Windows® or Mac® desktop. Insert the CD that came with your computer into the CD drive. After inserting the CD, double click on the CD drive icon that will appear on the desktop. Click on the folder labeled "CNC Instructions." Inside the folder are two .pdf versions of the instructions. One is complete and the other labeled "CNCprint" is the shorter workbook version. There are also several manuals on LinuxCNC, a glossary of terms and a guide to G-codes. The instructions can also be found on Sherline's website at **sherline.com/cnc-instructions/** in PDF format.


*Connections on the rear panel of the computer are similar to the above photo.*

### USB Flash Drive Included

A blank 4GB USB flash drive is also included with your package as a backup storage device for your convenience.

**CAUTION—Protect your motors, cables and driver board!**

- **Do not unplug stepper motors using the rectangular white plug that goes into the motor. Disconnect only at the cable plug.**
- **Do not pull on cable wires to disconnect plug—*grip at connector.***
- **Turn handwheels slowly (1 rev/sec) with driver power OFF when manually positioning. For longer travels use Jog Mode.**

# Sherline CNC System Setup

Please read all of the instructions before attempting to use the LinuxCNC program. Machining with CNC is a complicated process, and you will be directed at the appropriate times to run the various features of the program once you have gained the knowledge you need to do so.

### Booting up

Before turning on your computer, make sure the 115/230 voltage switch on the computer is set to the proper voltage. If it must be changed, a second switch inside the computer must also be changed. Also make sure the ON/OFF switch for the stepper motor power supply is in the "OFF" (down) position. Once the LinuxCNC program is running, power to the stepper motors may be turned on.

### Opening the LinuxCNC Program–Login and Password

When starting up, the computer will boot up without asking you to log in. If you log out of the desktop and log back in and get a login screen, enter ***sherline*** for the login (in lowercase letters) and ***sherline*** for the password. After completing the login, double click the [Go] button with your mouse, and the desktop will appear.

To open LinuxCNC, click on the lathe or mill, inch or metric icon for your machine on the desktop. If the icons don't appear there, go to the top menu bar and navigate to ***Applications>CNC>LinuxCNC***. From that menu tree, choose either the inch or metric version for your machine and double click on it. This will open the "Axis GUI" version of LinuxCNC. Although this is slightly different version than the "Mini GUI" opened from the desktop icons you can still use it. Differences are explained in the LinuxCNC manual at ***Applications>CNC***.

### Instruction Files

The instructions for use of your CNC system are pre-loaded in the *Instructions and Utilities* folder on the CD that came with your system. They are in PDF (Acrobat Viewer). PDF documents can be viewed on Windows®, Mac® or Linux operating systems.

### Shutting down the Computer When Done

To properly shut down your computer you should first exit all running programs. Then go to the menu bar at the top of the screen and navigate to ***System>Quit***. After clicking on ***Quit***, you have the choice to ***Log Off*** and leave the computer running or ***Turn off Computer*** which will log you off and shut down the computer. There is also a red power button icon in the upper right corner of the screen that will offer you several shut-down options. Finally, press and hold the power button on the front of the computer to turn off power to the computer.

### Emergency Stops

If you see a physical "crash" is about to occur, the fastest way to stop the stepper motors is to turn the driver board power switch on the side of the computer to ***OFF***. The machine will have to be re-homed and the program restarted, but turning off power to the stepper motors while they are running will not cause damage. Running a slide until it hits a hard stop should not cause any physical damage. Stop the motor as soon as possible by halting the program or by turning the stepper motor power supply switch to ***OFF*** to prevent possible overheating of the stalled motor.

### Transferring G-code Files from another Computer

1. Save your g-code text file to an appropriate media (DVD, CD, USB drive, etc.) in Plain Text (TXT) file format. Program files created in LinuxCNC will automatically be saved with the NGC extension. Either can be read by LinuxCNC. In other programs, limit your file name to eight characters or less in order to be able to transfer it to LinuxCNC.
2. Insert the media containing your file into the appropriate drive or port on your Sherline Linux computer.
3. On the desktop, click on the icon where your source file is located (DVD, USB, etc.) to open a window showing the contents of that media.
4. On the desktop, double click the folder named ***G-Code***.
5. Drag the file from the selected media window and drop it into the G-Code folder window.

### Opening the File in LinuxCNC

1. Open LinuxCNC
2. Click the [AUTO] button along upper menu bar
3. Click the [OPEN] button on lower menu bar
4. Highlight the file by single clicking on it
5. Click the [OPEN] button

### Getting Answers to Your Questions

Please read the instructions all the way through before calling Sherline with questions. Answers to questions relating to Linux or LinuxCNC can be found at **www.linuxcnc.org**. (Follow the links to the mailing list.) Using a ***Google*** search to ask a specific question often yields good results as well. Refer to the *Sherline Assembly and Instruction Guide* booklet that came with your machine for instructions on assembly, setup, adjustment and maintenance of your machine. If you have questions about assembly, missing or broken parts or other items relating to the machine, please call Sherline during business hours (M-F 8-5, Pacific) at 1-800-541-0735 (USA) or email sherline@sherline.com. From outside the USA call 1-760-727-5857.

### Minimum Computer Specifications for Installation

Successful installation of Linux/LinuxCNC v7.xx on your own computer requires at least the following:

- Pentium III class processor or equivalent (800 MHz or faster)
- 512 MB RAM (Sherline uses 1 GB)
- 20 GB hard drive or larger
- DVD drive (verify "Boot from DVD" is enabled before "Boot from HD" in the BIOS setting)
- 25-pin parallel port to connect the external driver box

NOTE: Sherline does not guarantee that the Linux operating system provided on the DVD enclosed with your CNC system or with the 8760 driver box will install on a non-Sherline computer. Sherline does not provide technical support for installation of Linux or LinuxCNC, but help is available on-line through the Linux group at **www.linuxcnc.org** or get subscription information on joining the LinuxCNC users group by emailing LinuxCNC-users@sourceforge.net.

For installations on another computer see **http://wiki.linuxcnc.org/cgi-bin/wiki.pl?Hardware_Requirements** for the latest requirements as specified by LinuxCNC.org. Laptop computers are not recommended for CNC use.

## Safety Fuses

A fuse is included on each axis to protect the driver chips. Their installed locations are noted in Figure 1. Two extra fuses are included in a plastic bag inside the computer case or driver box lid. The fuses have a straight wire coming out of each end. The wires will need to be bent and trimmed as shown in the inset photo below before they can be installed. Additional fuses can be ordered from Sherline as part number 870911.

If a single axis stops working, try replacing its fuse as a first step. The spares are wrapped in plastic and taped inside the computer case or driver box cover lid. The fuses are pressed in and are not soldered. Use a needle nose pliers to grasp the old fuse by the wire near the top and pull straight up. Do not grip it by the green part. Install the new one the same way after bending the wires as shown.

Once installed, determine why the fuse was forced to protect the circuit. In most cases it is because the motor is being worked too hard. Reduce feed rate or depth of cut to keep from blowing more fuses.

If replacing the fuse does not solve the problem, refer to the CNC troubleshooting page at **www.sherline.com/troubleshooting-cnc/**.

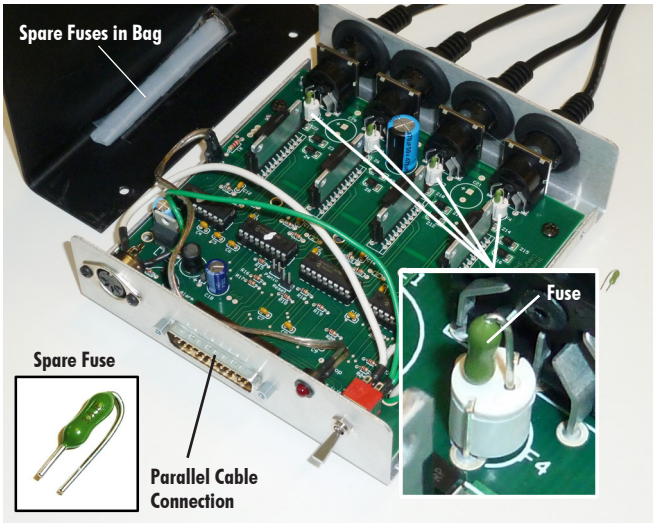



*FIGURE 1—The #8760 driver box is shown with the cover removed and individual axis fuse locations identified. When the driver circuit board is installed inside a computer, the board itself and fuse locations are the same.*