



IMPORTANT! READ THIS SETUP THOROUGHLY BEFORE RUNNING THE MACHINE. HAVE A LICENSED ELECTRICIAN PERFORM ALL ELECTRICAL CONNECTIONS BASED ON YOUR LOCAL CODES.

This document provides information on how-to setup the LC Series CNC Routers. More detailed documentation is on the Techno CD-ROM. All manuals should be read and understood for proper operation of the machine. These setup instructions contain additional reference documentation keep all information together.

LC SERIES SETUP INSTRUCTIONS

- i. Minimum System Requirements
- I. UNPACKING THE MACHINE
- II. PCI INTERFACE CARD
- III. WIRING THE AC SPINDLE INVERTER
- IV. TECHNO CNC G-CODE INTERFACE
- V. INSTALL TECHNO CNC INTERFACE
- VI. SCALE FACTOR SETUP
- VII. TOUCHPAD SETTINGS
- VIII. E-STOP START STOP BOX
- IX. USING THE VACUUM TABLE



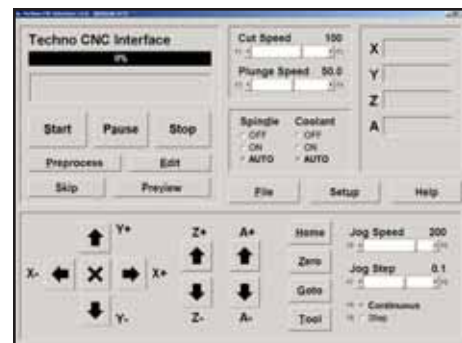
APPENDICES

- A. COLLETING GUIDELINES
- B. MACHINE MAINTENANCE
- C. ADDITIONAL RESOURCES

i. Minimum System Requirements

- PC with 800Mhz Pentium 3 Processor, 2 GB Memory, 256 Ram, CD-ROM
- Windows 98, ME, 2000, XP or Vista*
- Two Available PCI Slots


*If Vista PC Operating System of choice, Techno Technical Support will provide required instructions to accommodate software compatibility.



I. UNPACKING AND MACHINE IDENTIFICATIONS

All Techno machines are shipped assembled and secured to a wooden pallet. If your machine was shipped disassembled in any way please refer to the Reassembly Instructions provided with your machine.

STEP 1: Unpack all items that shipped with your machine. Check the items against the packing slip to be sure nothing was left out. Notify Techno immediately if you are missing any pieces of your shipment.

 Please note the four forklift tubes on the front and rear of the machine. Also note the four removable forklift guides (not on all models) on the underside of the machine. The forklift tubes and guides will provide the most stability when lifting the machine and will not damage the frame.

STEP 2: Forklift your machine up from the floor, remove the wooden pallet. Locate your machines four leveling feet.

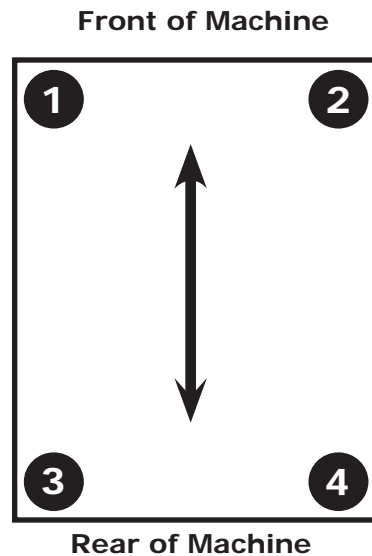
STEP 3: Carefully screw the four leveling feet into the bottom of each machine leg. Using a level beam, Techno recommends that you level the machine in the following fashion (refer to DIAGRAM 1 for a visual):

- Begin leveling the machine width wise, start at the front left leg and level it with the front right leg. Repeat to the rear legs lengthwise, start with the front left leg and proceed to the rear left leg. Then level width wise from the left front leg to the right front leg.
- Repeat on the right and rear sides of the machine until the machine is level.

STEP 4: Remove all four forklift guides (not on all models) from the underside of the machine. They are held onto the frame by three screws each. Your machine will not operate if these remain on the frame.

STEP 5: Power up your computer (if your ordered a Techno computer) and perform the manufacturer's basic user setup.

DIAGRAM 1: *Top View of Machine*




PICTURE 1: *One of Four Forklift Guides*



PICTURE 2: *Four Leveling Feet*




II. INSTALLING SERVO PCI INTERFACE CARD

 Refer to computer manufacturer's manual for the accessibility and location of the PCI Slots. Install the PCI Interface Card before the software.

WARNING: Ground yourself during installation.

STEP 1: Turn off and unplug power to your computer. Remove the computers side cover and locate a vacant PCI slot.

STEP 2: Remove the vacant PCI slot's cover plate, and the PCI Interface Card from its protective anti-static packaging.

 The PCI Interface Card connectors mate with the PC Motherboard in only one way.

STEP 3: Gently but firmly insert the PCI Interface Card into the vacant PCI slot. Secure with screw (if applicable), and close the computers side cover.


STEP 4: Attach the SCSII Cable connector to the newly installed PCI Interface Card.

PICTURE 3: PCI Interface Card & SCSII Cable



III. WIRING THE AC SPINDLE MOTOR INVERTER

The following instructions pertain to those machines equipped with an AC Spindle. This is NOT used with Porter Cable or other 120VAC Spindles. It is strongly recommended that all 220 and 440 VAC connections be connected through a power disconnect switch for use with either CNC Spindle and/or vacuum pump setups. This switch is required for safety and to meet National Electrical Codes.

 Before powering up your machine you will need to have a LICENSED ELECTRICIAN properly connect the wiring from your machine to the AC Spindle Motor Inverter. Please note that your AC Spindle Motor Inverter may look slightly different from the one pictured in this setup. Size will vary according to the Horsepower of your spindle, however all instructions are the same. Review the manufacturer's inverter manual before proceeding.


PICTURE 4: Power Disconnect Switch




WARNING: ALL WIRING AND ELECTRICAL SETUP MUST BE COMPLETED BY A LICENSED ELECTRICIAN. FAILURE TO DO SO MAY CAUSE DAMAGE TO YOUR MACHINE.

STEP 1: Open the front cover by loosening the cover screw. Remove the cover plate and set screws aside.

STEP 2: Connect the inverter power wires to the appropriate terminals within the Inverter Box.

 *Review the manufacturer's inverter manual for more details on single and three phase wiring.*

STEP 3: Replace the metal cover plate and lock the front cover screw. Connect all power to your machine and proceed with the software installation.

 *Be sure to connect power to your machine, your spindle, and your PC.*

PICTURE 5: AC Spindle Motor Inverter




PICTURE 6: 3-Phase Inverter Wiring



Continued on the next page...


IV. INSTALLING THE TECHNO CNC INTERFACE

 When you reconnect power, turn your computer on and when Windows starts up it will detect "new hardware."

STEP 1: Follow the Window's prompts. When asked to "search" for a suitable driver, insert the Techno CD.

STEP 2: When asked for "optional search locations" choose your computer's CD drive.

STEP 3: Click on **Setup Techno CNC Interface**.

 **KEEP THE TECHNO CD IN A SAFE PLACE, IT CONTAINS ADDITIONAL DOCUMENTATION (PDF FILES).**


V. SCALE FACTOR INTERFACE SETUP

STEP 1: Start the Techno CNC Interface.


STEP 2: From the Main Menu click on the Setup Button, then Systems.

 The Setup>System screen will appear.

STEP 3: Input the numbers printed on the Scale Factor Sticker located on the front leg of the machine.

 See the circled section in SCREEN CAPTURE 3. Make sure to type the numbers exactly how they appear on the sticker including any negative values. (I.e. -20320)

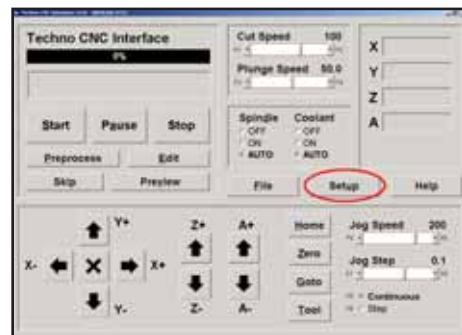
STEP 4: Click the OK Button in the Setup>System screen to save the changes made. Return to the Techno Interface Main Menu.

 If the values are not written on the front leg of your TECHNO CNC ROUTER then the interface default values should apply.

SCREEN CAPTURE 1: Installation Screen



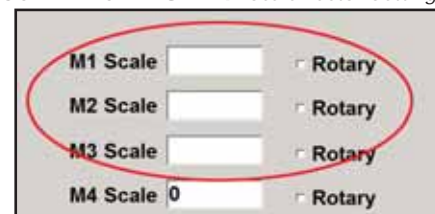
SCREEN CAPTURE 2: Main Menu



SCREEN CAPTURE 3: Systems Menu




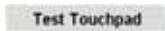
SCREEN CAPTURE 4: Scale Factor Settings




VI. TOUCHPAD INTERFACE SETTINGS

The following setup will require you to load an actual cutting tool into the spindle and touch it to the touchpad. See Appendix A-Proper Collecting Guidelines for instructions on how to load a tool properly.

 *The settings for the Touchpad need to be tested and/or configured in the Techno CNC Interface prior to using the machine.*


STEP 1: From the main menu click *Setup> Advanced>Touchpad & Remote*, click the  Button. The message "Pick up the touchpad and touch it to the tip of the tool in the spindle..." should then appear. Follow the on screen prompts.


 *If the "test passed" screen appears, click "ok", the test has indicated that the Touchpad is functioning properly. Exit the setup menu and return to the main menu.*

If the test failed (nothing happened), you need to click where indicated "click here". The "test cancelled" screen should appear, click "ok." Repeat the touchpad test again. If it fails once more, turn off power, check all connections and call Technical Support for further assistance.

VII. E-STOP START/STOP BOX INTERFACE SETTINGS

The green button is the START button, hit this button to resume the machine program after having hit the black PAUSE button. The PAUSE button temporarily stops the machine. **PUSH THE EMERGENCY STOP (E-STOP) BUTTON WHENEVER YOU NEED TO STOP THE MACHINE IMMEDIATELY.** To reset the Start/Stop Box E-stop, twist the E-Stop button clockwise. The machine will not work if the E-Stop is still pushed in.

 *The settings for the E-Stop Start/Stop Box need to be entered and/or configured in the Techno CNC Interface prior to using the machine.*

STEP 1: From the Main Menu, go to *Setup> Advanced>Touchpad & Remote*. Click on the  Button. Follow the on screen prompts.

SCREEN CAPTURE 5: *Touchpad & Remote*




PICTURE 7: *Touchpad to Tip of Tool in Spindle*



PICTURE 8: *Mounted Start/Stop Box*

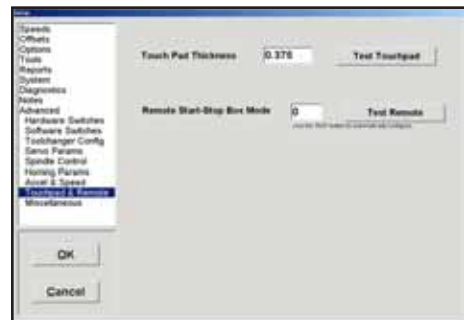


STEP 2: Press the Start button on your remote E-Stop Start/Stop Box when prompted. Press the Pause button on your remote Start Stop Box when prompted.

 *If the test passes, you should get the message: "Remote test passed."*

If the test fails, repeat. If test fails again, turn power off, check all connections and call Techno Tech Support for further assistance.

SCREEN CAPTURE 5: *Touchpad & Remote*



VIII. USING THE VACUUM TABLE SETUP


The following setup will be the same for all Pumps and Blowers. It is strongly recommended that all 220 and 440 VAC connections be connected through a power disconnect switch for use with either CNC spindle and/or vacuum pump setups. This switch is required for safety and to meet National Electrical Codes.

WARNING: A LICENSED ELECTRICIAN MUST PERFORM THE FOLLOWING INSTALLATION! REFER TO THE MANUFACTURERS DOCUMENTATION PROVIDED WITH THE PUMP/BLOWER BEFORE PROCEEDING WITH THIS SETUP. FAILURE TO DO SO CAN RESULT IN DAMAGE TO THE PUMP/BLOWER.

PICTURE 9: *Power Disconnect Switch*



SETTING UP THE VACUUM PUMP/BLOWER

 *Shipped with your Pump/Blower will be a closed Motor Starter Box. Although the Vacuum Pump/Blower Motor has been wired and tested in the factory prior to shipping, a licensed electrician will have to connect wires to the inside of the Motor Starter Box.*

PICTURE 10: *3-Phase Wired Pump*



3-Phase Pump Wiring

STEP 1: Disconnect ALL power sources. Unscrew the Motor Starter Box Cover and remove.

STEP 2: Remove the appropriate knockout hole from the outside of the Motor Starter Box according to where you desire the cables to enter the box.

STEP 3: Insert the AC Power (220 or 440VAC) cable through the knockout hole and connect it to L1, L2, and L3 as specified in the manufacturer's manual.

STEP 4: Replace the Motor Starter Box cover and continue with the setup.

Single-Phase Pump Wiring

STEP 1: Disconnect ALL power sources. Unscrew the Motor Inverter Box Cover and remove.

STEP 2: Remove the appropriate knockout hole from the outside of the Motor Inverter Box according to where you desire the cables to enter the box.

STEP 3: Insert the AC Power (220 or 440VAC) cable through the knockout hole and connect it to R/L1, S/L2, and T/L3 as specified in the manufacturer's manual.

STEP 4: Replace the Motor Inverter Box cover and continue with the setup.

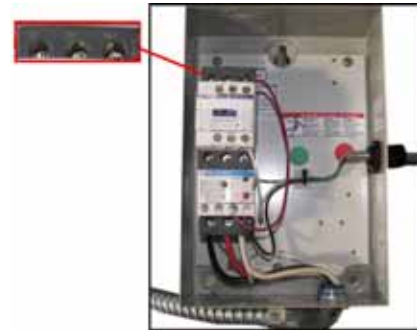
STEP 5: Connect the Pump/Blower power. Check the rotation of the pump.

WARNING: THE DIRECTION OF ROTATION IS CRITICAL IF THE ROTATION (ARROW ON CASING OF PUMP/BLOWER) IS INCORRECT, SWITCH 2 PHASES. IF YOU RUN THE PUMP CONTINUOUSLY IN THE WRONG DIRECTION THE VANES WILL BE DAMAGED!

STEP 6: Connect the machine end of the vacuum signal connector, behind the front control panel of the Servo Controller Box to the motor starter's mating connector.

Continued on the next page...

PICTURE 11: 3-Phase Motor Starter Box



PICTURE 12: Single-Phase Wired Pump



PICTURE 13: Single-Phase Motor Inverter Box



PICTURE 14: Machine Signal Connector



STEP 7: Next connect one end of the Vacuum Hose to the manifold fitting and snake the hose out through the bottom of the machine.

STEP 8: Connect the other end of the vacuum hose to the Vacuum Pump/Blower filter. Engage power and test run the Pump/Blower.

 **KEEP VACUUM PUMPS RUNNING, ROUTINELY GREASE THE PUMPS ONCE A YEAR.**


PICTURE 15: *Manifold-Vacuum Hose Conn.*



PICTURE 16: *Filter-Vacuum Hose Conn.*



USING THE VACUUM HOLD-DOWN

 *The Techno Vacuum Table is very effective in "holding down" parts to be routed. For this method to work well, simple procedures need to be followed.*

STEP 1: Define the area where your work piece will be positioned on the vacuum table.

STEP 2: Using the red rubber plugs, fill-in ALL the vacuum grid holed outside your defined work area, leaving the holes inside that area untouched.

STEP 3: Using the black foam rubber gasketing, section (wall-off) your work area from the rest of the table. This will create an area of concentrated vacuum, which will generate the greatest amount of vacuum "hold-down".


PICTURE 17: *Rubber Plug in Vac Table*




PICTURE 18: *Foam Gasketing in Vac Table*



Continued on the next page...

 Holes and channels outside your work area but not activated by the vacuum valve do not need to be plugged. **DO NOT STRETCH** the gasket material while inserting it into the gasket slots. This will produce tears in the gasket material causing leaks leading to the loss of vacuum and secure pieces that fly off the table surface. When joining two separate pieces of gasket material, make sure to push them together so the two pieces form a tight seal.

STEP 4: Turn ON (valve vertical) the valves that pertain to your work area and turn OFF (valve horizontal) the ones outside of that area. This concentrates all the vacuum "hold-down" capacity to your defined work area. Each valve controls two rows of vacuum table extrusions.

 Use Techno's line of fixturing accessories (cam clamps, clamp bars, toggle clamps, t-nuts and more) to secure odd-shaped items.

WARNING: Proper care should be taken to make sure that objects held down with the vacuum table are secure. There is a danger that objects can become loose and could be thrown by the action of the cutting tool. Proper safety precautions against flying debris must be taken. Safety glasses must be worn at all times of operation.

PICTURE 19: Vacuum Table Control Valves



PICTURE 20: Vacuum Table Fixturing



"DON'T LET THIS HAPPEN TO YOUR MACHINE!"

PREVENT FIRE HAZARDS by using the proper feeds, speeds, and tooling while operating your Techno machine. For example, setting feeds and speeds too low and/or using dull tool bits creates friction at the material. The friction generates heat which can result in a fire that can be drawn through the vacuum table without you knowing it. Be very careful when cutting composite material, especially wood composites like MDF and Particleboard.



APPENDIX A - COLLETING GUIDELINES

COLLETING GUIDELINES
WRONG!



This picture shows an improper assembly. Notice the gap and angle of the collet in relation to the nut. The collet is not flush to the end of the collet nut. Correct this assembly before using.

DO NOT PUSH THE COLLET INTO THE SPINDLE AT ANY TIME!

Only the proper assembly should be screwed onto the spindle.



RIGHT!



The picture above is how your collet nut assembly should look: the end of the collet is flush with the bottom surface of the collet nut. You will hear and feel a "SNAP" as the collet properly goes into the collet nut. Once it is assembled, then "SCREW" the nut onto the threaded spindle end.

FOR TOOLCHANGE AND FIXED COLLET SPINDLES:

ONLY USE TOOLHOLDERS, COLLET NUTS AND TOOLS THAT ARE BALANCED TO MEET OR EXCEED THE MAX RATED SPEED OF THE SPINDLE.



THE SPINDLE WILL BE DAMAGED IF UNBALANCED EQUIPMENT IS USED! ALL AUTOMATIC TOOL CHANGE SPINDLES REQUIRE FILTERED DRY AIR. THIS MIGHT REQUIRE THE ADDITION OF A WATER REMOVAL SYSTEM TO YOUR AIR COMPRESSOR. SUPPLYING WATER SATURATED AIR TO THE ATC SPINDLE WILL RESULT IN DAMAGE THAT IS NOT COVERED BY THE WARRANTY.

**APPENDIX B - LUBRICATION SPECS.
 LUBRICATION SPECS. FOR LC / LCP / LCX SERIES MACHINES**

Y-Axis (Long Axis) – THK Products

Grease: Lithium-based grease (JIS NO. 2) or Urea-based Grease (JIS No. 2), such as AFB Grease (THK), Alvania Grease No. 2 (Shell), Daphne Eponex Grease No. 2 (Idemitsu Kosan) or equivalent.

Oil: Sliding surface oil or turbine oil (ISOVG32-68), such as Super Multi 32 to 68 (Idemitsu Kosan), Vactra No. 2S (Mobile), DT Oil (Mobile), Tonner Oil (Showa Shell or equivalent).

TABLE 1 - THK

	BALLSCREW	RAIL	CARRIAGE
GREASE	√	√	√
OIL	√	√	
Note: On some items you can use either the grease or oil.			

X and Z-Axes – ISEL Products

Grease: Alvania-1, -2, -3 (Shell) for light, med. and heavy-duty apps, respectively.

Oil: Renolin CLP 100 (Part No. 299020).

TABLE 2 - ISEL

	BALLSCREW	RAIL	CARRIAGE
GREASE	√		√
OIL		√	√
Note: On some items you can use either the grease or oil.			

APPENDIX B - LUBRICATION SPECS cont.
LC/LCP/LCX SERIES LUBRICATION MAINTENANCE

For regular work loads, machine maintenance is required at least once a month. The machine should also be lubricated once it is received.

WARNING: Before inserting any object into the machine, press the E-Stop Button. DO NOT use WD-40 or silicon spray on the machine, it may damage the drive components.

Use the Grease and Oil Recommendations listed on the previous page, paying close attentions to what grease and/or oil must be used. It is different for the three axes.

LONG AXIS (Y) - THK BALL SCREW

1. Clean the ball screw with a dry rag removing old grease and debris that may have collected.
2. Apply grease (See Table 1) on the ball screw and run the machine back and forth several times to spread the grease out. By applying the grease and running the axis back and forth, small particles that may have collected in the ball nut may be flushed out. Repeat Steps 1 and 2 again. **(PICTURE 1)**

THK CARRIAGES AND RAILS:

THK specifications indicate a small amount of grease needs to be applied to the rails after 4 months of use. PICTURE X indicated the location of a grease fitting. There are 4 bearing carriages total, 2 on each side. **(PICTURE 2)**

GANTRY (X AND Z AXES) - BALL SCREWS AND RAILS

1. Remove black end caps at the top and bottom of Z-axis and both ends of (X-axis) Gantry, there are 4 spots per axis. See alternate lubrication instructions (1B, 2B) for nylon wipes below. **(PICTURE 3)**
2. Jog the axis to end of travel or until lube point is visible. Using the a grease gun, insert a small amount of grease (see TABLE 2). This lube point greases both the bearing and ball screw simultaneously. Run the machine back and forth 1/2 dozen times. **(PICTURE 3A)**

If you can not reach the lube points then you can apply grease and oil (see TABLE 2) through the nylon wipes.

- 1B. Apply oil to an acid brush. Spread apart the rubber guards and brush oil onto the rails. When applying oil to the rail behind the ball screw, it may be necessary to bend the acid brush to reach the rails. **(PICTURE 4)**
- 2B. Apply grease to a second acid brush or your finger and apply grease to the ball screw.

PICTURE 1: Ball Screw Grease Fitting



PICTURE 2: THK Rails & Carriage Grease Fittings



PICTURE 3: Gantry Grease Fittings



PICTURE 3A: Z-Axis Grease Fittings



PICTURE 4: Rail Behind Ball Screw Fitting



APPENDIX C - ADDITIONAL RESOURCES

CUSTOMER SUPPORT WEBSITE

<http://support.technocnc.com/>

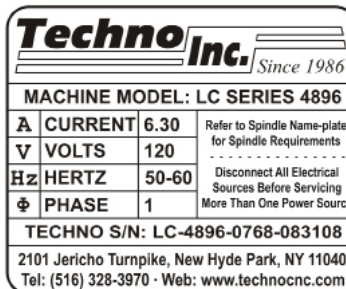
*Visit this site for software updates and the Tech-Support Wizard.
 This Wizard is password protected for our customers.*

Username: technocnc

Password: multiaxis

MACHINE SERIAL NUMBERS

There are two machine serial number labels on your machine. The larger label is located on your control box and contains the Serial Number with Machine Voltage Information. The second smaller label contains the machine serial number identical to the larger label and is located on the front base of the machine under the table top extrusion. Examples of both are pictured to the right. Record the serial number and have readily available when contacting Techno.



TO REORDER VACUUM SUPPLIES:
 Call Techno Today at: 516-328-3970

<u>ITEM</u>	<u>PART NUMBER</u>
Rubber Plugs	H91X30-PL006-001
Foam Rubber Gasketing	HX4892-W0002



TO ORDER CNC TOOLING ROUTER BITS:

Ray Jakas, Tooling Sales Manager
 516-328-3970 ext. 163

tooling@technocnc.com · www.technocnc.com/tooling/