



CNC Shark™ Family Machining, Routing, Engraving Machine

OWNER'S MANUAL



CNC Shark
Pro Plus HD™



CNC Shark
Pro Plus™



CNC Shark
Pro™



CNC Shark™

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12 January 2012

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To Our Customers

Thank you for purchasing a CNC Shark! Your Shark brings the speed and precision of computer-controlled machinery to your shop with the top value CNC system.

This manual tells you more about your CNC Shark system and how to operate and maintain it. Please read the manual carefully. The manual also includes our warranty and important safety information.

This manual has been written with the assumption that the owner is familiar with the basic operation of a computer as well as the basic aspects of techniques for the safe operation of woodworking power tools. Information in this manual is subject to change without notice.

Again, thank you for purchasing a CNC Shark. We are confident you will be pleased with the performance, and its ability to carve and machine a wide variety of signs, doors, and other projects. If you ever have any questions or comments, feel free to contact us at the address below.

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Serial Number and Software License Information

Record your CNC Shark Control Box and Vectric software user name and license codes here for safe keeping. Your software may vary depending on the CNC Shark model purchased.

Control Box Serial Number: _____

VCarve Pro User Name: _____

VCarve Pro License Code: _____

Cut3D User Name: _____

Cut3D License Code: _____

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Warranty

Next Wave Automation warrants to the original retail purchaser of a CNC Shark machine and purchased from an authorized CNC Shark machine distributor that the CNC Shark and any Shark accessories purchased with the CNC Shark machine will be free from defects in material and workmanship for ONE YEAR from the date of purchase. This warranty is for parts and labor to correct the defect, and does not cover the cost of shipping the defective item(s) to Next Wave Automation for repair.

This warranty does not apply to defects arising from normal wear and tear, misuse, abuse, negligence, accidents, unauthorized repair or alteration, or lack of maintenance. This warranty is void if the CNC Shark machine or any portion of the CNC Shark machine is modified without the prior written permission of Next Wave Automation, LLC, or if the CNC Shark machine is located or has been used outside the country of residence of the authorized CNC Shark machine distributor from whom the CNC Shark machine was purchased.

Please contact Next Wave Automation to take advantage of this warranty. If Next Wave Automation determines the CNC Shark machine or CNC Shark accessory is defective in material or workmanship, and not due to normal wear and tear, misuse, abuse, negligence, accidents, unauthorized repair or alteration, or lack of maintenance, then Next Wave Automation will, at its expense and upon proof of purchase, send replacement parts to the original retail purchaser necessary to cure the defect. Next Wave Automation will repair the CNC Shark machine or CNC Shark accessory provided the necessary CNC Shark machine component is returned to Next Wave Automation, shipping prepaid, with proof of purchase and within the warranty period.

Next Wave Automation disclaims any and all other express or implied warranties, including fitness for a particular purpose. Next Wave Automation shall not be liable for death, injuries to persons or property, or incidental, consequential, contingent or special damages arising from the use of the CNC Shark machine.

Safety

The CNC Shark, along with a router or other power tool, is a computer-numerically-controlled (CNC) routing system. As such, it is a powerful system that can reduce your woodworking risks by providing a method of cutting wood and other materials without having to interact with the cutting tool(s) or material during the fabrication process. As with all power tools, your care and attention are required to ensure that you use your CNC Shark safely. Next Wave Automation assumes you will use your CNC Shark safely and follow accepted safety precautions and practices for woodworking and machining.

Emergency Stop

There are 2 ways you can immediately stop your CNC Shark. CNC Shark and CNC Shark Pro users should use a power strip with an on/off switch.

The first is the Emergency Stop button on the Control Panel. The E-Stop button is available regardless of whether you are using the File or the Jog panel.

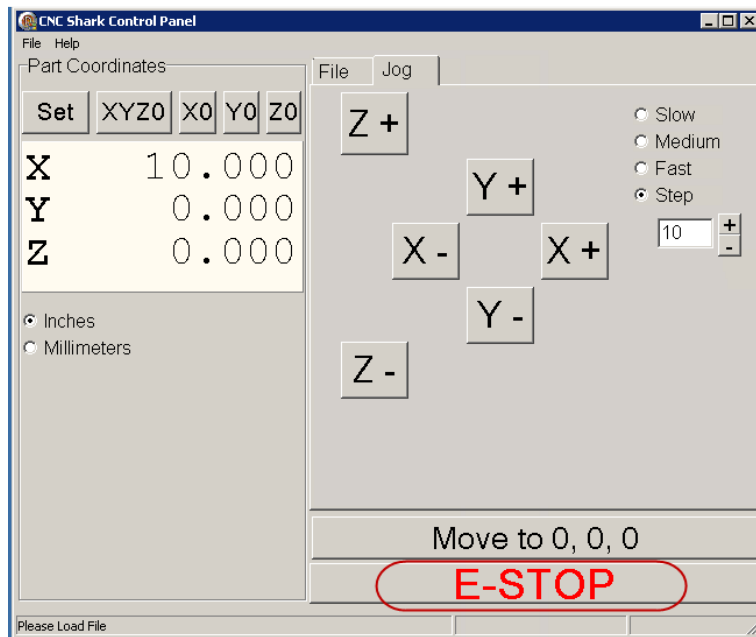


Figure 1 - E-Stop on Shark Control Panel

The second is the E-Stop button on the Control Box of the CNC Shark Pro Plus and CNC Shark Pro Plus HD – or the on/off switch on the power strip recommended for use with the CNC Shark and CNC Shark Pro.

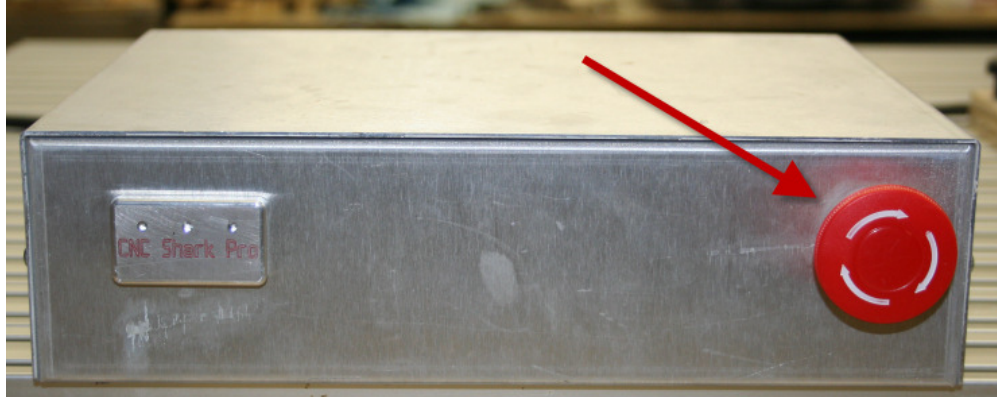


Figure 2 - Emergency Stop Button on Enhanced Control Box

Hitting either will immediately stop the CNC Shark movement. This will also stop the router if it is plugged into the Control Box.

For CNC Shark and Shark Pro users who have plugged the Shark Power Supply and router into a power strip, the power strip's on/off switch serves the same purpose as the E-Stop button on the Shark Enhanced Control Box.



Figure 3 - Power Strip On/Off Switch

CNC Shark Operations Safety Instructions

1. Read and follow all safety and operating instructions before using the CNC Shark. This includes reading the manual(s) for the router that will be mounted on your CNC Shark. Take the time to orient yourself to the Shark and the workflow steps.
2. Take small steps early in use – this will enable you to use the Shark safely and effectively. Practice each step a few times early on without running the router for example. Again, this orientation process will help you to use the Shark safely and effectively.

3. Let the machine and spindle come to a complete stop before touching parts, CNC Shark, or router. Ensure that you have a positive system in place to make sure that power is not applied to the router or the CNC Shark while positioning a work piece, adjusting the position of the tool, changing a bit, or setting up clamps, hold downs, or jigs.
4. Ensure that the material or work piece is firmly secured to the table. This includes accounting for the attachment and hold down of any pieces that will become cutouts or cutoffs during the machining process. Also be sure that all clamps, hold downs, and jigs are not in the path of the cutter – and do not interfere with the movement of the gantry.
5. Always wear eye and ear protection while operating your CNC Shark.
6. Keep miscellaneous equipment off of the CNC Shark table and gantry. This includes areas alongside the table where the gantry travels.



Figure 4 - CNC Shark Gantry and Work Table

7. Never leave the CNC Shark unattended while it is running. A work piece slippage, unexpected cutting error or other unexpected event might occur. This could result in injury as well as damage to the CNC Shark.

8. Never attempt to remove chips, dust or debris from the machine while it is running with your hands or fingers, or by placing a vacuum device into the field of operation – near the cutter.
9. Position the computer keyboard and control box (with E-Stop button) in a place that is easy for you to quickly reach, and out of the path and travel direction of the tool. Chips and debris can travel a good distance, and cutters can break during use.
10. Never attempt to manually adjust the work piece while the CNC Shark and router are running. Do not attempt to manually feed a work piece ‘into’ a running cutter – this is not a router table.
11. Keep the CNC Shark lubricated and clean. Clean the CNC Shark and area after each use. Use a silicon or lithium based spray that doesn’t leave a greasy or waxy residue – for example DuPont Teflon Silicon Lubricant.

CNC Shark Hardware and Project Safety Instructions

Your CNC Shark is comprised of a system – the CNC Shark, the Shark Control Box, a computer, the software that prepares your design project and the software that controls the Shark during operation.

The Shark has 3 stepper motors, a Control Box, and computer connected to it. These are all precision electronic devices and are susceptible to damage from power surges, static discharges, inappropriate power supply, and other unexpected electrical events. It is recommended that the control box and your computer be plugged into a surge protector to minimize the opportunity for damage to occur as a result of a power surge. You may also want to use a dedicated electrical circuit for the CNC Shark. Turning on a shopvac or other power tool on the same leg may cause a momentary change in the power supplied to the CNC Shark. If you know that the power you receive fluctuates significantly, you may also want to use a power conditioner and battery backup device. This will ensure the longest life of your CNC Shark electronic components. A minimal battery backup will enable you to gracefully stop the job in progress at the time of the power loss, thus minimizing the possibility of damage to the CNC Shark, electronics and router.

CNC Shark and CNC Shark Pro users are strongly encouraged to use a power strip with an on/off switch to provide power to the control box and power supply. This provides a second means of an emergency stop if needed.

The CNC Shark machine is not designed to work with fluids. The router is a ‘dry’ router. Do not cut with any misting, cutter lubrication, or wet material as it may cause a fire.

Keep the Control Box vents (all models) and fan (Shark and Shark Pro) clear of dust, dirt, shavings and other material. It is a good practice to periodically lightly vacuum the Control Box while the Control Box is powered off.

Keep your CNC Shark away from any moisture and in a temperature range from 50° to 80° F.

Lightly vacuum the Control Box vents (all models) and fan (Shark and Shark Pro) occasionally to remove any particulate from the electronics. This will help to prevent additional heating inside the box that could result in damage.

Do not expose the system to high humidity – this may cause condensation on the electronics and result in abnormal behavior or even a short in the electronics.

You should not operate your CNC Shark machine during a thunderstorm unless you have an appropriate surge protector in place to prevent circuits from being damaged by excessive line voltage.

Keep static charges from discharging into the motors. If you think this may become an issue, a grounding wire can be added to one bolt head of each of the motors.

It is also strongly recommended that you keep backup copies of all important computer data, files and programs. These should be separate copies – stored on a different device than the computer you are using to create the projects and run them on the CNC Shark.

Overview

General – The CNC Shark Family

Bringing the speed and precision of computer-numerically-controlled machinery to your shop, the CNC Shark family consists of the CNC Shark™, the CNC Shark Pro™, the CNC Shark Pro Plus™, and the CNC Shark Pro Plus HD™. They are designed for routing all types of wood, routing or engraving plastics, etching metal, and even etching or cutting tile, with the appropriate routing bit. The CNC Shark has impressive power, speed, accuracy and ease of use. The CNC Shark family has a quality design and their parts have been manufactured using CNC machines to ensure the highest accuracy. The CNC Sharks are construction of steel, aluminum and high-density polyethylene for a robust, long lasting and high tolerance machine.

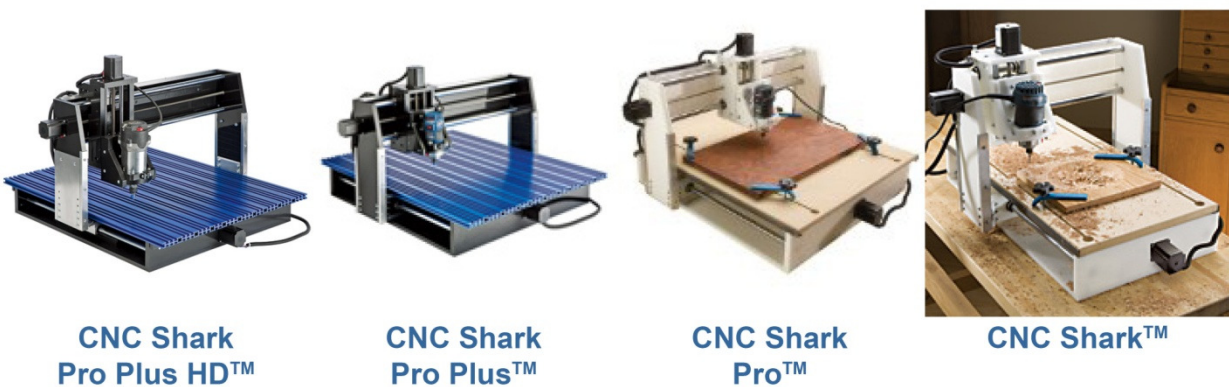


Figure 5 - The CNC Shark Family

The CNC Shark comes with Vectric's VCarve Pro, and can interface with other CNC programs in the industry as well. The differences across the different models are the work piece size capacity, work table structure, x/y/z axis movement speeds, and accuracy of cut. The CNC Shark and CNC Shark Pro have a control box and a separate power supply unit. The Shark Pro Plus and Shark Pro Plus HD use an enhanced control box which has the DC power supply contained within it.

	Overall Machine Dimensions	Work Table Dimensions	Maximum Cutter Travel	Work Table Construction	Maximum Travel Speed
CNC Shark	X: 24" Y: 33.5" Z: 22.5"	15.75" x 31.5"	X: 13" Y: 24" Z: 4.25"	Slotted MDF	120 ipm
CNC Shark Pro	X: 35.75" Y: 36.5" Z: 22.5"	28" x 31.5"	X: 24" Y: 24" Z: 4"	Slotted MDF	120 ipm
CNC Shark Pro Plus	X: 35.75" Y: 36.5" Z: 22.5"	28.5" x 36"	X: 25" Y: 25" Z: 5"	Extended Aluminum T-Slot	200 ipm
CNC Shark Pro Plus HD	X: 36.25" Y: 36.5" Z: 26.75"	28.5" x 36"	X: 25" Y: 25" Z: 7"	Extended Aluminum T-Slot	200 ipm

*inches per
minute

Table 1 - CNC Shark Family Summary

Detailed specifications for each member of the CNC Shark family can be found in the specifications section in the back of this manual.

CNC Shark Control Box

The CNC Shark Control Box stores the project's tap file (instructions) on an SD card and controls the movement of the X, Y, and Z axis. The Control Box is connected to your computer using a USB cable and is plugged into a USB 2.0 capable plug. The Shark Control Panel software is used to communicate to the Control Box. Using this interface, you can jog (position) the gantry and router, load a project (tap) file, and run the project.

The CNC Shark and CNC Shark Pro have a separate Control Box and power supply unit.



Figure 6 - CNC Shark and CNC Shark Pro Control Box and Power Supply



Figure 7 - CNC Shark and CNC Shark Pro Control Box and Power Supply - Opposite Side View

The CNC Shark Pro Plus and CNC Shark Pro Plus HD have an enhanced Control Box with the power supply integrated into a single unit.



Figure 8 - CNC Shark Pro Plus and CNC Shark Pro Plus HD Enhanced Control Box Front Side



Figure 9 - CNC Shark Pro Plus and CNC Shark Pro Plus HD Enhanced Control Box Back Side

CNC Shark Touch Probe

The CNC Shark Touch Probe is an accessory that can be used with any of the CNC Shark machines. The probe attaches to the router, and can trace objects down to 0.001" step resolution. The resulting scan file can be used to replicate objects, shapes and patterns. This process requires Cut3D, Aspire, or similar software to be used with the CNC Shark models. The CNC Shark Touch Probe works well for replicating basic shapes in carvings or reproducing damaged areas on antiques or other irreplaceable items.



Figure 10 - CNC Shark Touch Probe

Workflow

It is important to recognize that unlike other wood working and machining tools, you just don't walk up to the CNC Shark with your material, hit the power button, and start carving or engraving your project. It is easiest to think of the workflow in two distinct components:

1. Create the design and toolpath - using VCarve Pro, create and edit your design, and generate a toolpath file.
2. Machining the part - using the Shark Control Panel – set the X0, Y0, Z0 using the jog command, load the toolpath file to the Shark, and run the project (create your carving).

Create the Design and Toolpath(s)

VCarve Pro is used to create the design of the part you want. You can also edit this design in the future, copy individual components to other VCarve Pro projects, etc. The VCarve Pro project is saved on disk with the file extension '.crv'. This is **not** the file you will load onto the Shark to carve your design. VCarve Pro does not directly control or operate the Shark. This is sometimes referred to as your 'project file' on the forum, and can be opened by VCarve Pro at anytime if you want to make changes.

Once your design is prepared to your satisfaction, you will use VCarve Pro to generate one or more toolpaths. You select the design component, the cutter tool you want to use on the Shark to carve that component, and then generate the toolpath. You can preview the outcome of that toolpath in VCarve Pro. If it is to your satisfaction, you then use VCarve Pro to save that toolpath to a file that will be loaded onto the Shark using the Shark Control Panel software. During this process, you select the CNC Shark post processor – this ensures that the toolpath file will work properly on your Shark – and the resulting file will have a '.tap' file extension. This 'tap' file is the file you will load onto the Shark using the Control Panel software. The tap file contains the G-code instructions that will tell the Shark where to move in X, Y, Z to make the appropriate cuts using the cutter tool selected. [G-code is the common name for the computer numerical control (CNC) language used by the Shark.]

It is important to also note that you can do all of the tasks associated with VCarve Pro on a separate computer – i.e. you may choose to use a computer in your office or home to create your designs and generate the toolpath files and a separate computer in your shop that is connected to the Control Box to load the toolpath files onto the Shark.

Machining the Part

The material to be machined is placed on the Shark work table and properly secured – typically by using clamps. The proper cutter tool is secured in the router. Using the Shark Control Panel, the tool is moved (jogged) to X0, Y0, Z0 – this is typically on the very top of the material, and the lower left corner.

The tap file is loaded onto the SD card in the Control Box using the Control Panel interface. Select the 'Load G-Code' button, and select the appropriate tap file. At this point, all the steps

necessary to run the toolpath have been taken. If you are using the CNC Shark or CNC Shark Pro, turn on the router and then select the 'Run' button on the Control Panel. If you are using the CNC Shark Pro Plus or CNC Shark Pro Plus HD, and have the router plugged into the Control Box, select the 'Run' button, and the Shark starts to machine the part.

Once this toolpath is complete, other toolpaths using different cutter tools can be run. The X0, Y0, Z0 must be set with every tool change. If you want to several copies of the same design, you simply place and secure a new workpiece on the table after the first one is machined, and run the toolpath again. As this toolpath is saved to disk, you can come back at any time and run it again.

Summary of Software and Workflow

The tasks the software that comes with the CNC Shark is summarized in the figure below.

- Vcarve Pro*
 - Layout 2D Design
 - Create 2D and 2.5D Toolpaths
 - Preview Final Part
 - Save the CNC Code
- Cut 3D**
 - Import 3D Model Data
 - Layout 3D Design
 - Create 3D Toolpaths
 - Preview Final Part
 - Save the CNC Code
- CNC Shark Basic Panel
 - Manipulate gantry (jog)
 - Typically used to establish x,y,z zero
 - Load and Run CNC Code
 - *.tap file
 - Scan 3D model using the Digital Touch Probe
 - Optional accessory to the Shark family
 - Software requires an unlock key

* - From the Vectric VCarve Pro Manual

** - Adapted from the Vectric VCarve Pro Manual

Figure 11 - Software Task Summary

A very simplified view of the workflow from a software and file type perspective is shown in the figure below.

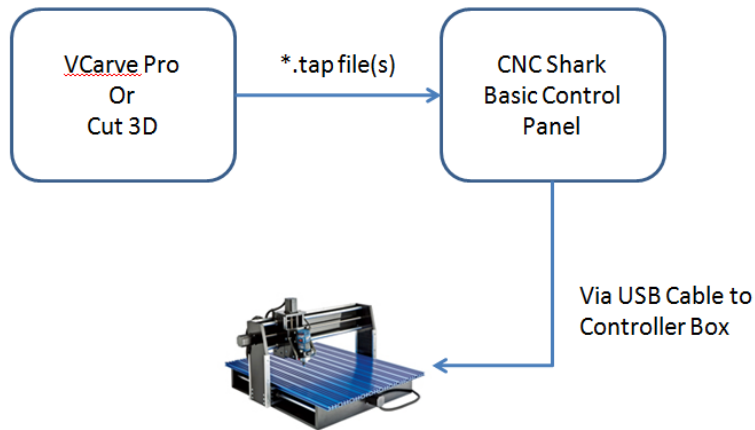


Figure 12 - Simplified View of the Software and File Workflow

Users may have purchased a CNC Shark model that came with Vectric’s Cut3D. Users may also use other software – like VectorArt3D Machinist - to add 3D models to their VCarve Pro project. Cut3D and VectorArt3D Machinist perform 3D tasks (layout, create toolpath) – and then these are brought into VCarve Pro where all of the other components of the design are created (borders, letters, pockets, etc.). Users can also purchase software like Vectric’s PhotoVCarve to incorporate lithographs into their designs. Users will quickly find themselves in a workflow shown in the figure below.

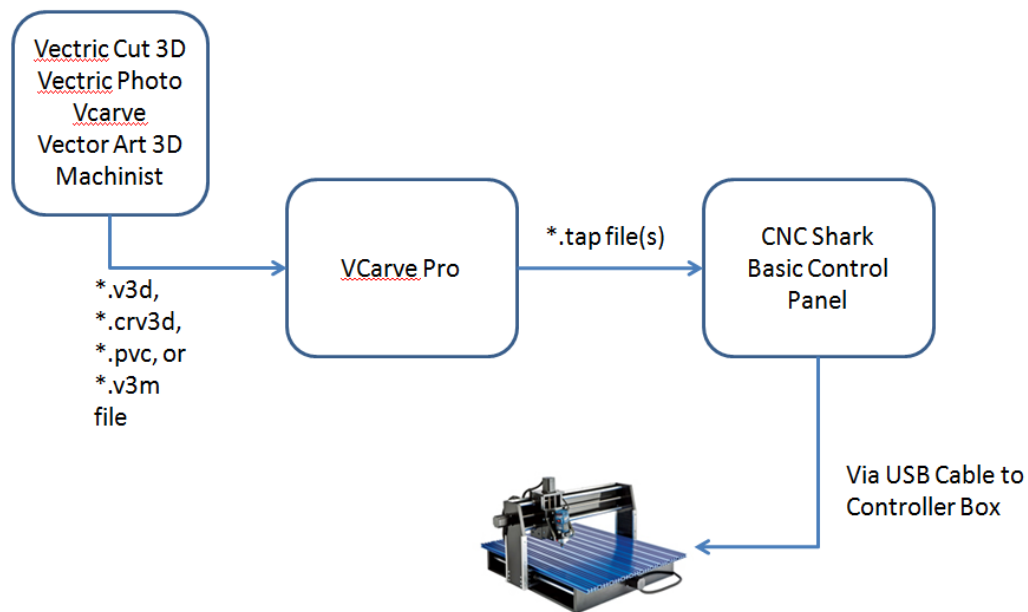


Figure 13 - Common Software and File Workflow

CNC Shark Assembly Instructions

General

The core components of the CNC Shark are the same for each of the family members, and are shown in the figure below.

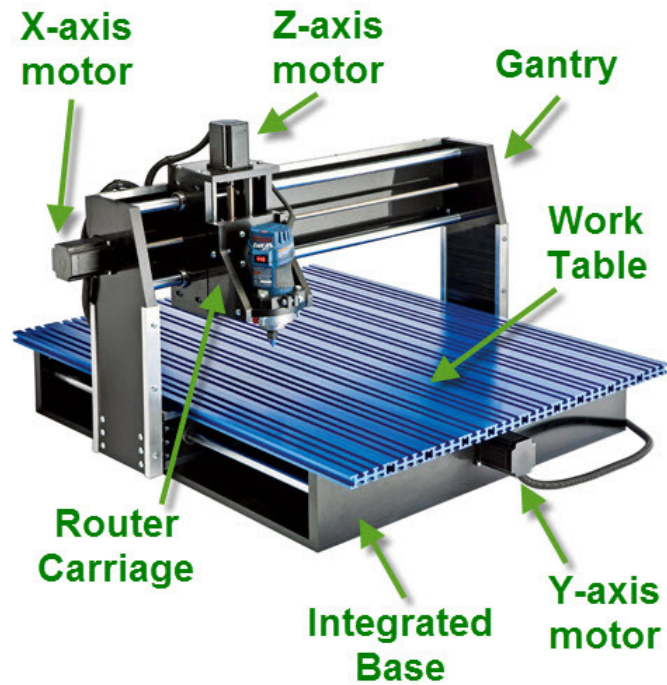


Figure 14 - CNC Shark Core Components

The axes of movement of the CNC Shark are shown in the figure below. Note that the router carriage is facing the 'front' of the machine. The 'front' of the machine for purposes of this manual is defined as the edge of the integrated base unit that has the Y-axis motor bolted to it.

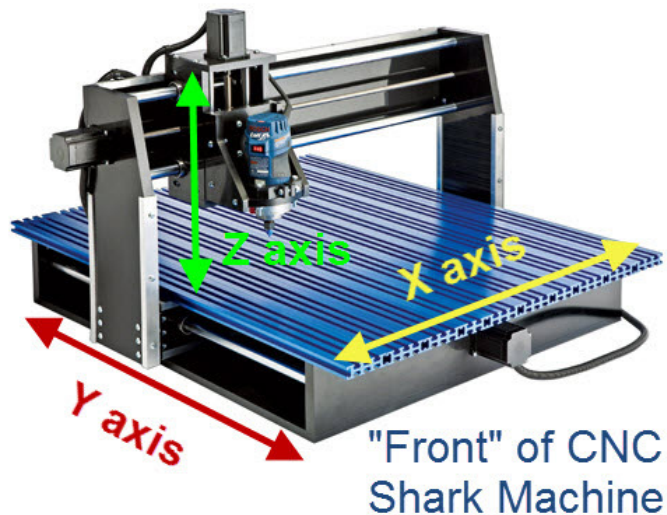


Figure 15 - CNC Shark Movement Axes Orientation

Tools Required

You will need only a T27 bit and a 7/16" box or open wrench. You can choose to use pliers or a crescent wrench in lieu of the 1/2" box or open wrench.

Assembly

1. Unpack the CNC Shark machine and verify that all items are present. The shipping manifest for each of the models can be found in the CNC Shark Family Specifications section at the back of this manual.

Do not use the gantry mounting brackets that are on either side of the Integrated Base, or the gantry support rod(s) to lift or reposition the Integrated Base. Doing so can result in significant damage that can only be repaired by sending the unit back to Next Wave Automation. Lift and reposition the Integrated Base from the base assembly proper.

Do not lift the Integrated Base from the work table surface. Doing so can result in warping of the metal table base, and in all cases can result in mis-alignment of the table surface to the gantry. Lift and reposition the Integrated Base from the base assembly proper.

2. Attach the gantry assembly to the base assembly.

- Take out the 12, 2" carriage bolts, and 12 nylock hex nuts from their shipping bag. If necessary, unscrew all of the nuts from all of the bolts.
- Ensure you remember that the 'front' of the machine is the side of the integrated table that has the Y-axis motor bolted to it.

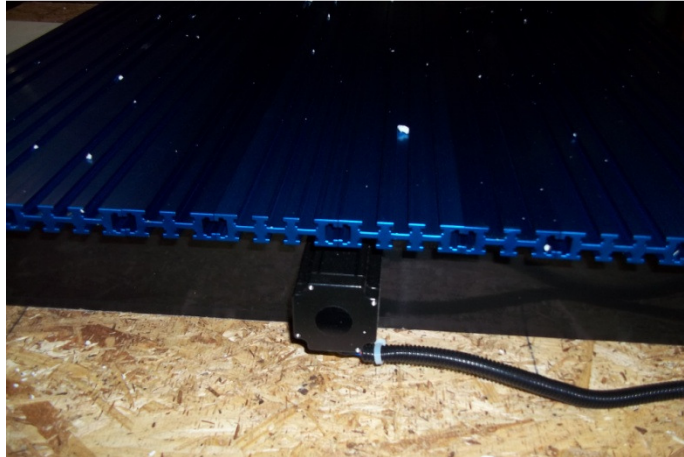


Figure 16 - 'Front' of Machine - Integrated Base Unit with Y-axis Motor

- Identify the gantry mounting brackets on either side of the integrated base unit. They are found on both ends of the Y-axis carriage assembly.



Figure 17 - Gantry Mounting Bracket on the Integrated Base Unit

- Position the gantry assembly across the base assembly. Verify that the router carriage side of the gantry assembly is facing the 'front' of the machine.
- Line up the six pre-drilled bolt holes in each of the two gantry mounting brackets and insert, **but do not fasten**, the 12 bolts through the gantry assembly and gantry mounting bracket. You may find it easier to have an assistant to help during this phase of assembly. You should use the top 6 holes (3 on each 'side' of the individual arm) in the gantry arm where more than 6 holes are pre-drilled in the gantry arm.

- Once all 12 bolts are in place, thread the nuts onto each bolt until they are snug (lightly in place). Do not tighten the nuts firmly until all 12 bolts and nuts are threaded and snug.
- Once all 12 nuts are snug, tighten the nuts firmly, but do not over-tighten. You can over-tighten and strip out the nylock hex nuts. Replace any nylock hex nuts that end up in this condition.

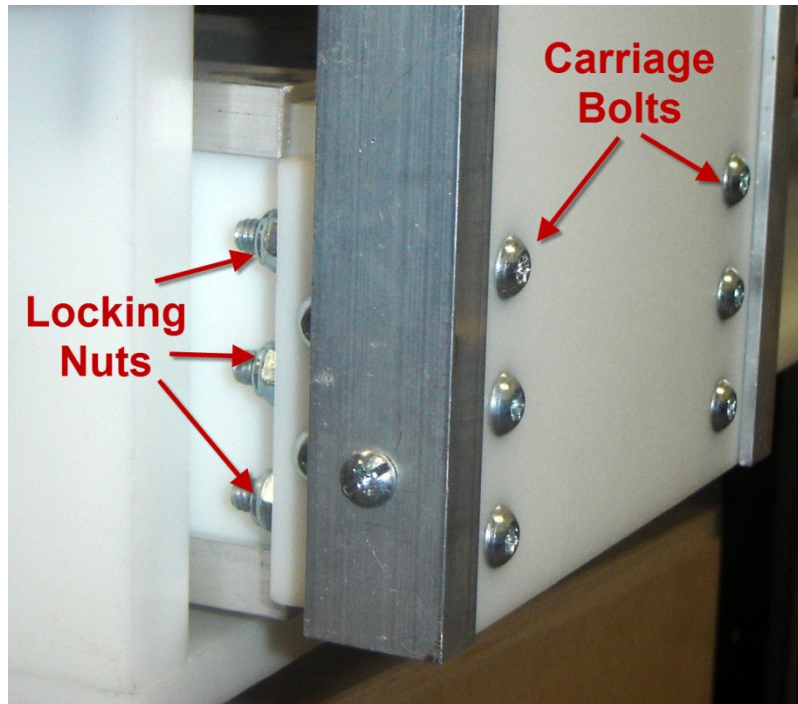


Figure 18 - Gantry Assembly and Y-Axis Carriage Mounting

3. Mount the router to the router carriage.
 - Prepare the router by removing the base. The manual that came with the router will explain how to do this.
 - Locate and identify the router collar. The router collar is a plate mounted to the router carriage with 4 bolts and nylock nuts. There is a fifth bolt and nut on the collar that is used to tighten the collar around the router.
 - Loosen the router collar bolt.
 - Place the router into the router collar. The fit is tight, so twist the router left and right while applying downward pressure on the router. Make sure the route goes down as far as it can.
 - Tighten router collar bolt firmly, but do not over-tighten. You can over-tighten and strip out the nylock hex nut. Replace the nylock hex nut if it ends up in this condition.

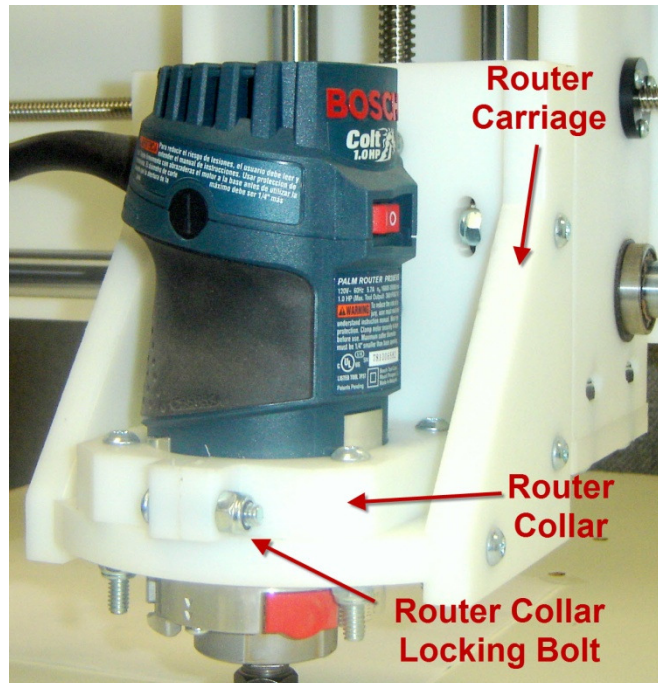


Figure 19 - Router Collar and Locking Bolt

4. Connect the Control Box to the CNC Shark.

WARNING: The axis cable connectors should never be disconnected or re-connected while there is power to the Control Box. Doing so can damage the stepper driver board inside the Control Box.

As there are slight differences between the CNC Shark/Shark Pro and the CNC Shark Pro Plus/Shark Pro Plus HD, the procedure for both is addressed separately.

- CNC Shark and CNC Shark Pro
 - Verify that the Shark Power Supply is unplugged and that no power is being provided to the Control Box
 - There are cables running from each of the stepper motors with male 4-pin connectors. There are shorter lengths of cable for each axis coming from the Control Box with female 4-pin connectors. Each of the connectors is labeled with the corresponding axis letter.

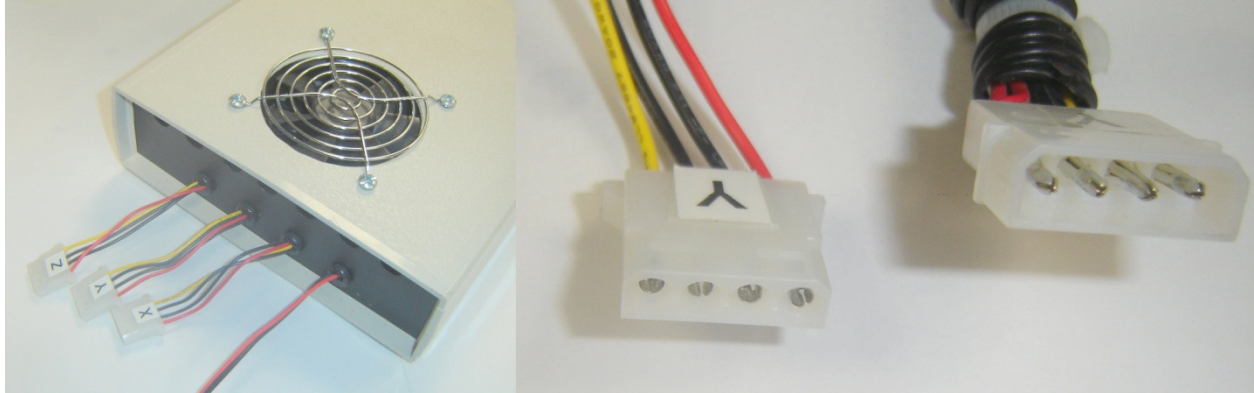


Figure 20 - CNC Shark and Shark Pro Control Box and 4-Pin Cable Connections

- Verify that the X and Z axis drive cables from the stepper motors are connected to the correct cables on the Control Box and are locked with zip ties.
- Connect the Y-axis drive cable to the Y-axis cable from the Control Box, and lock them together with the provided zip tie.
- Install the SD memory card in the Control Box (if not installed). When properly installed, the outside end of the card should be fairly flush with the front of the control box. Once the memory card is installed into the Control Box, there will be no need to remove it.

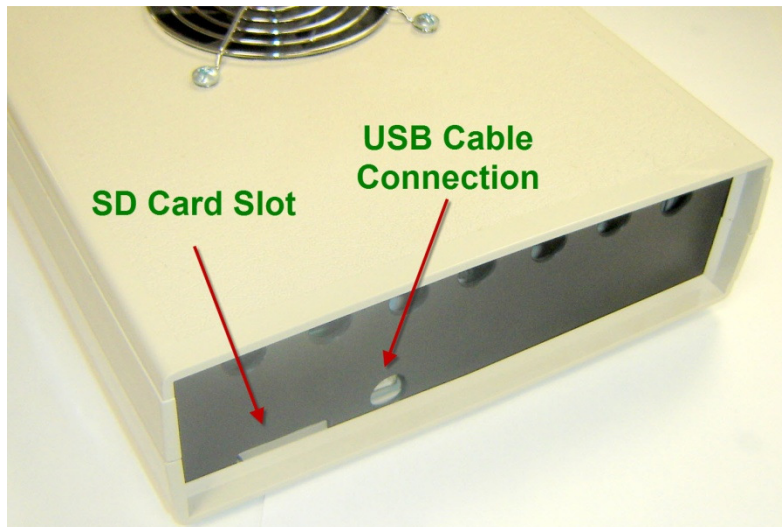


Figure 21 - CNC Shark/Shark Pro Control Box Front View

- Verify that the Control Box to Power Supply wiring, and the power cord to Power Supply wiring is the same as in the figure below.

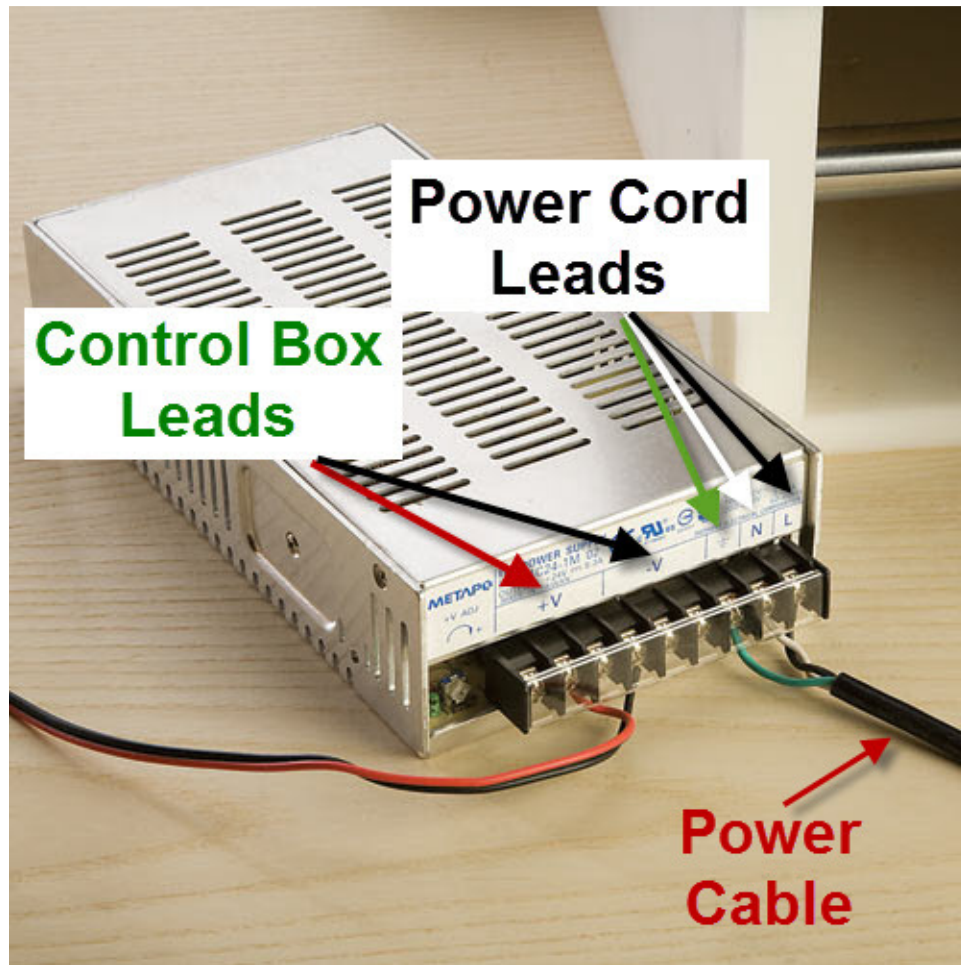


Figure 22 - CNC Shark/Shark Pro Power Supply Cabling

- CNC Shark Pro Plus and CNC Shark Pro Plus HD
 - Verify that the Shark Control Box is unplugged.
 - There are cables running from each of the stepper motors with male 9 pin serial connectors. There are female 9 pin serial connectors on the back side of the Control Box. Each of the connectors is labeled with the corresponding axis letter. There is a fourth serial connector on the control box. That is present for future expansions of the CNC Shark's capabilities.

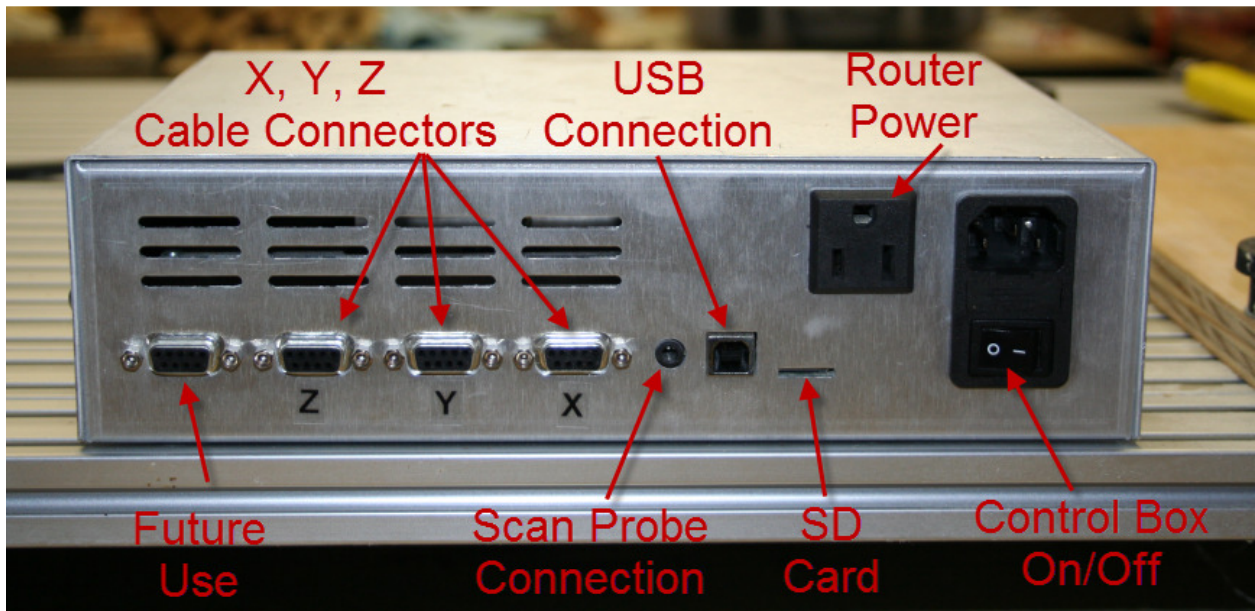


Figure 23 - Enhanced Control Box Back Side



Figure 24 - Serial Cable Connector

- Plug each of the drive cable connectors into the corresponding connector on the Control Box. Tighten the two thumb screws on each connector until they are snug. There is no need to use a screwdriver. Do not over tighten these connections.
- The SD memory card is already installed in the Control Box

5. Apply power to the control box.

As there are slight differences between the CNC Shark/Shark Pro and the CNC Shark Pro Plus/Shark Pro Plus HD, the procedure for both is addressed separately.

- CNC Shark and CNC Shark Pro
 - Re-verify that all three axis drive cables are connected to their respective Control Box leads.
 - Plug the Shark Power Supply into a 120V AC wall outlet, power strip, or surge protector.
 - Verify that the fan on top of the Control Box is operating once the Power Supply is plugged in. If the fan is not running, unplug the Power Supply and contact Next Wave Automation's technical support.
 - You will also hear a slight bumping or clicking noise coming from each of the motors when power is initially supplied. This noise is momentary, and will occur every time power is applied to the Control Box.
- CNC Shark Pro Plus and CNC Shark Pro Plus HD
 - Re-verify that all three axis drive cables are connected to their respective connectors on the Control Box.
 - Plug the power cable into the back of the Control Box
 - Plug the other end of the power cable into a 120V AC wall outlet, power strip, or surge protector.
 - Rotate the E-Stop button 1/4 turn to ensure it is not engaged. If it is engaged, the Control Box will not power on.
 - Turn the on/off switch on the back of the Control Box to the on position.
 - The blue led on the front of the control box should illuminate. You will also hear a slight bumping or clicking noise coming from each of the motors when power is initially supplied. This noise is momentary, and will occur every time power is applied to the Control Box. If the blue light does not illuminate, unplug the Power Supply and check the troubleshooting section of this manual or contact Next Wave Automation's technical support.

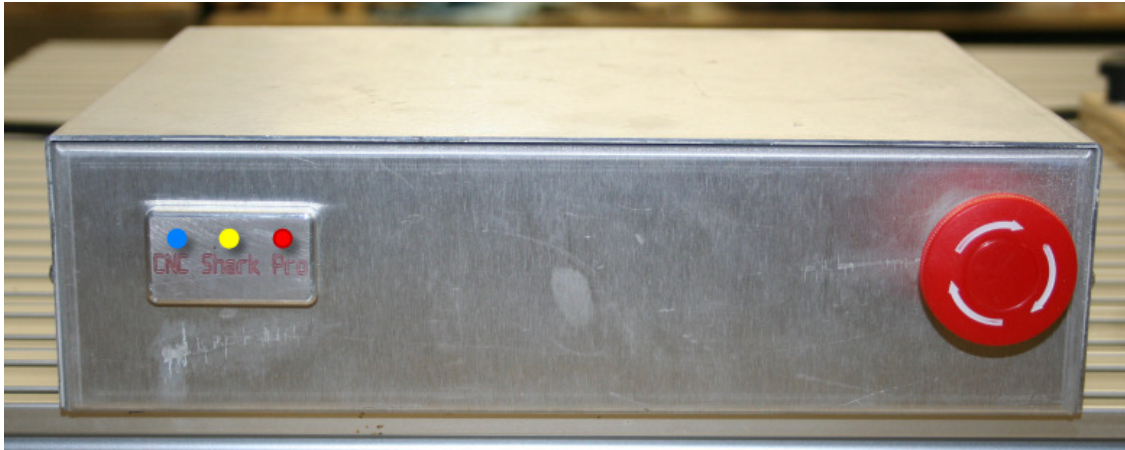


Figure 25 - Enhanced Control Box Front Side

6. The hardware setup is complete. The CNC Shark machine's hardware is now completely setup and is ready for basic operation testing. You must setup the CNC Shark software before you are able to completely test your CNC Shark machine.

Power and Cable Layout

It is recommended that the Power Supply and router used with the CNC Shark and CNC Shark Pro be plugged into a switch power strip (not included with the CNC Shark machine). This provides a second emergency stop capability – by switching off the power strip you stop all machining actions. This is not required with the CNC Shark Pro Plus and Shark Pro Plus HD as the enhanced Control Box has an integrated E-stop button that serves the same purpose as plugging the Shark Power Supply and router into a switched power strip.

The Shark has 3 stepper motors, a Control Box, and computer connected to it. These are all precision electronic devices and are susceptible to damage from power surges, static discharges, inappropriate line power supply, and other unexpected electrical events. It is recommended that you consider purchasing a switched power strip with built in surge protection. The control box and your computer would be plugged into this switched surge protector power strip to minimize the opportunity for damage to occur as a result of a power surge.

You may also want to use a dedicated electrical circuit for the CNC Shark. Turning on a shopvac or other power tool on the same leg may cause a momentary change in the power supplied to the CNC Shark.

If you know that the power you receive fluctuates significantly, you may also want to use a power conditioner and battery backup device. This will ensure the longest life of your CNC Shark electronic components. A minimal battery backup will also:

- Enable the job to continue if there is a momentary off/on power fluctuation, and
- Enable you to gracefully stop the job in progress at the time of the power loss, thus minimizing the possibility of damage to the CNC Shark, electronics and router.

You should arrange the drive motor cables, power cables, and USB cable in a manner that minimizes overlap, even amongst cables of the same purpose. This will reduce any opportunity for signal interference as a result of cables 'laying on top of each other'.

Software Installation

The Shark Control Panel must be installed before you can connect to the Shark Control Box using a USB cable and complete the system setup. This section outlines the steps necessary to complete this installation.

The Shark Control Panel supports use on a Windows XP with Service Pack (SP) 3, Windows Vista and Windows 7. Installing the Shark Control Panel on a Windows XP SP3 or Vista machine has one additional step than an installation on Windows 7.

You can also choose to install the VCarve Pro and other Vectric software products that you may have purchased on the same computer you are going to use with the Shark Control Box, or a separate computer. These software packages come with their own installation instructions. If you have any difficulty installing the Vectric products, please contact Vectric support for resolution.

Getting the Latest Software

Open up your web browser (e.g. Internet Explorer, Chrome, etc.) and go to the website www.CNCShark.com. Click on the 'Downloads' section located on the left side of the page.

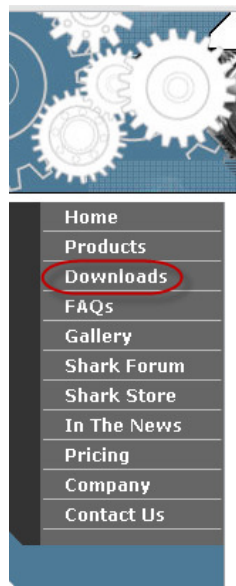


Figure 26 - Web Page Downloads Section

The Downloads page has several sections –

- VCarve, Aspire, Cut3D and PhotoCarve Trial Downloads
- CNCShark Control Program – USB Version XP, Vista and Windows Only

- Microsoft Patches
- CNC Shark Post Processors – USB Version
- CNC Shark Digital Touch Probe Software

Go to the ‘CNCShark Control Program – USB Version XP, Vista and Windows Only’ section. You can always find the latest version of the CNC Shark Control Panel and this manual here on this web page in this section. Download the following files:

- vcredist_x86.exe
- CNCSharkControlPanel-1.5.0.22.exe (or latest version (and name) that is posted)

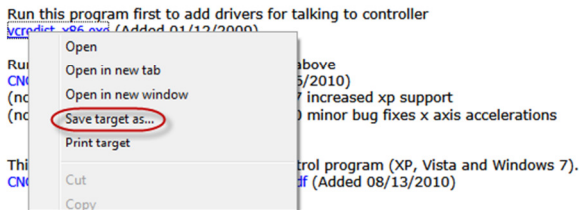
Don't be confused if the file name for the Shark Control Panel on the Documents web page is different than that listed in this manual. A difference in name only indicates to you that a new version of the Shark Control Panel is available to you.

Depending on the web browser you are using, you can either

- Click on the file, and a save file dialogue will open, or
- You can right click on the file and select save as, and a save file dialogue will open.

CNCShark Control Program - USB version XP, Vista and Windows 7 only

This version looks slightly different then the 1.0 version but operates the same.



CNCShark Control Program - USB version XP, Vista and Windows 7 only

This version looks slightly different then the 1.0 version but operates the same.

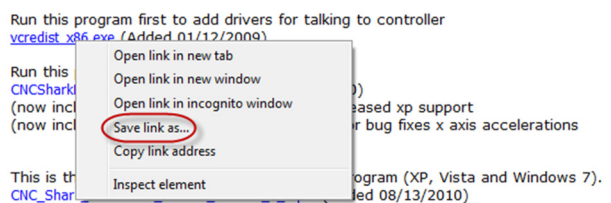


Figure 27 - Right Click Save As - Chrome on Left, IE9 on Right

You will then see a save file dialogue. What is important in this step is that you save the files in a location on your computer that you know. We also recommend you create a new folder and store all of your downloads in this folder. This way you know where all of your “Shark stuff” is on the disk.

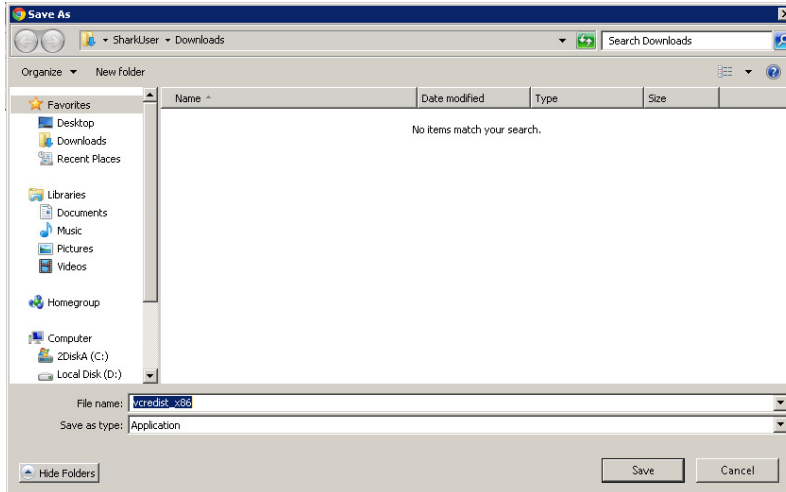


Figure 28 - Save As Dialogue at First Opening

Click on the New Folder button. A new folder will be created. You can use the name of your choice to label the folder.

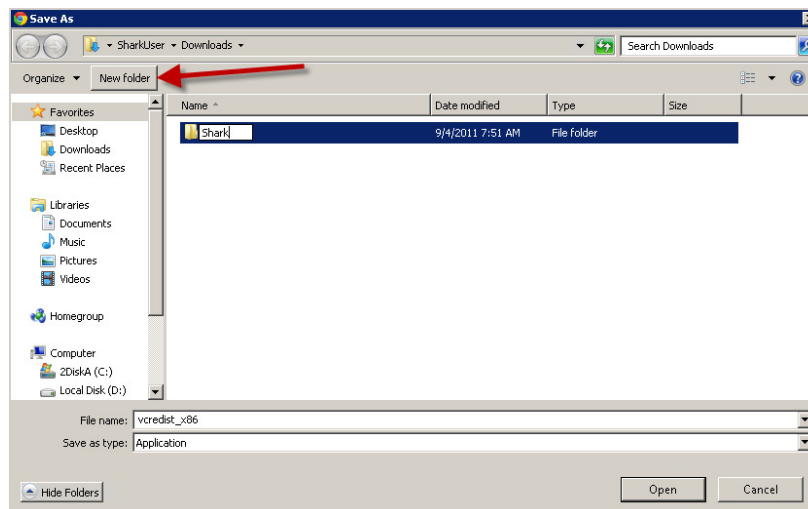


Figure 29 - Creating a New Folder

After double clicking on your new folder, you are now ready to hit the save button. This will result in the file being downloaded from the Downloads page of the web site to the disk on your computer.

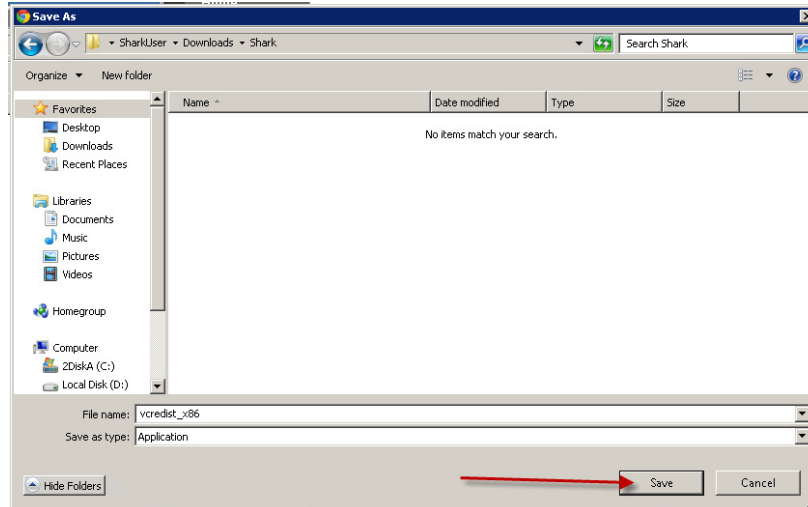


Figure 30 - Saving the File

After the download is complete, you can check to see that the file is on disk by using Windows Explorer to navigate to the folder you used to store the file.

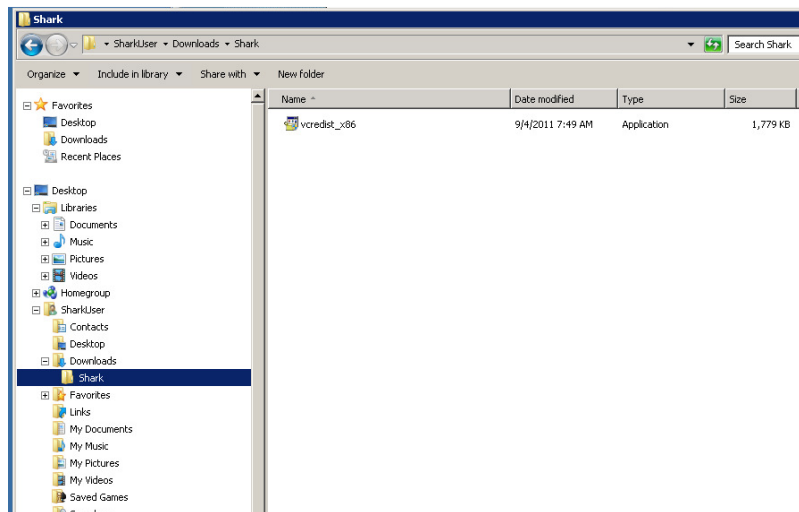


Figure 31 - Downloaded File Viewed in Windows Explorer

You now have downloaded all of the software that you need to successfully install the Shark Control Panel.

Installing the Software

Administrator Privileges

Regardless of the operating system you are using, you must be logged in as an Administrator in order to install the software. You can check to confirm the account you are using is considered an Administrator by going to Start, Control Panel, Users – and selecting your account. It should state this account's role – Administrator, Power User, User. If your account is not an administrator, you will need to either change the permissions for this account, or create a new account with Administrator privileges.

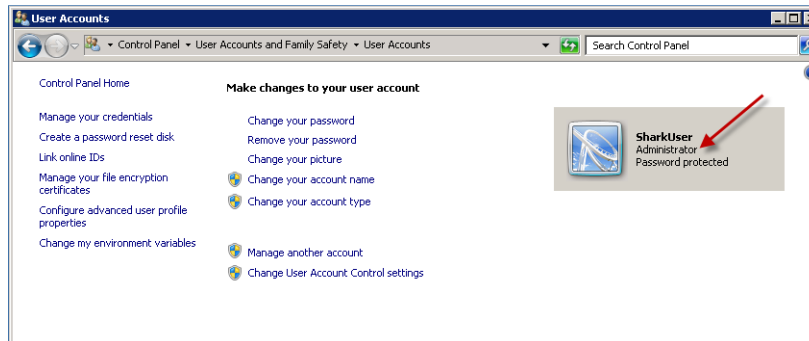


Figure 32 - User Account View

Install vcredist_x86

Now the vcredist_x86.exe file is installed. This is the first file to be installed if you are using Windows 7. This is the second file to be installed if you are using Windows XP SP3 or Windows Vista. Double click on the vcredist_x86.exe file. This will start the installation. On many systems, the first thing that will pop up is a window that asks if you want to allow the following program to make changes to the computer – click yes.



Figure 33 - vcredist_x86 Allow Installation

You will then be presented with the Microsoft Visual C++ 2008 Redistributable Setup panel – click Next.

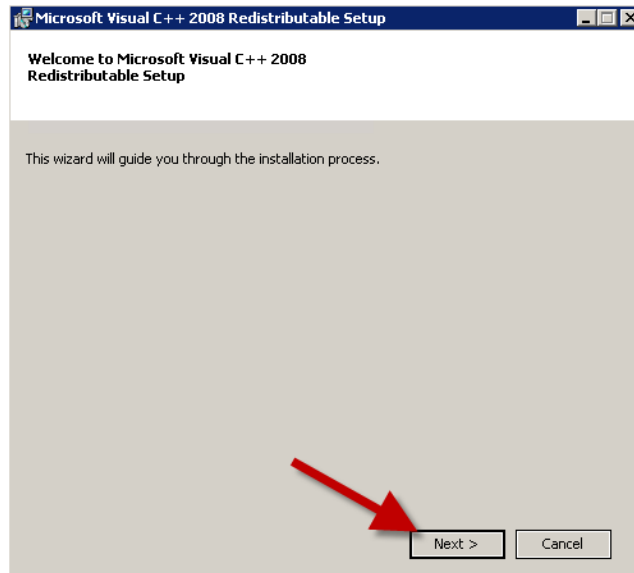


Figure 34 - Microsoft Visual C++2008 Redistributable Setup Panel

Next you will be presented with the License Terms for the Microsoft Visual C++2008 Runtime Libraries. After reviewing these, click on the check box indicating that you have read and accepted these license terms, and then click on install.

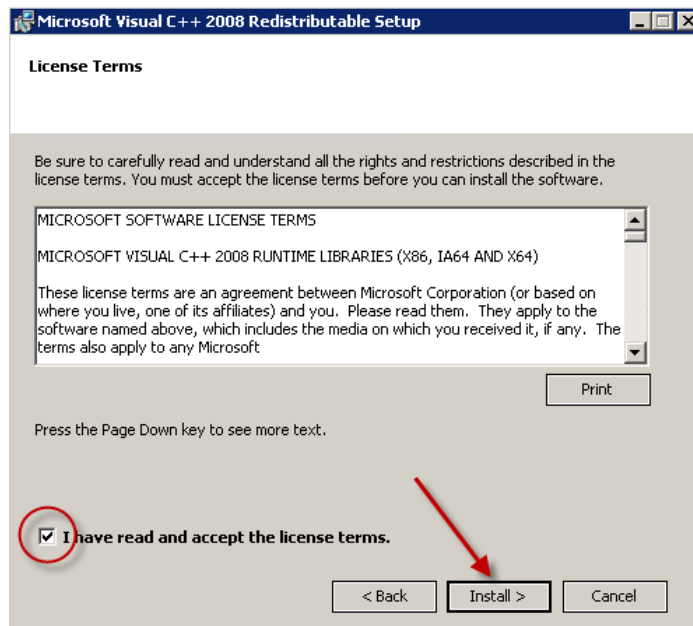


Figure 35 - Microsoft Visual C++2008 Runtime Libraries License Agreement

The installation begins, and a Setup window shows the progress of the installation.

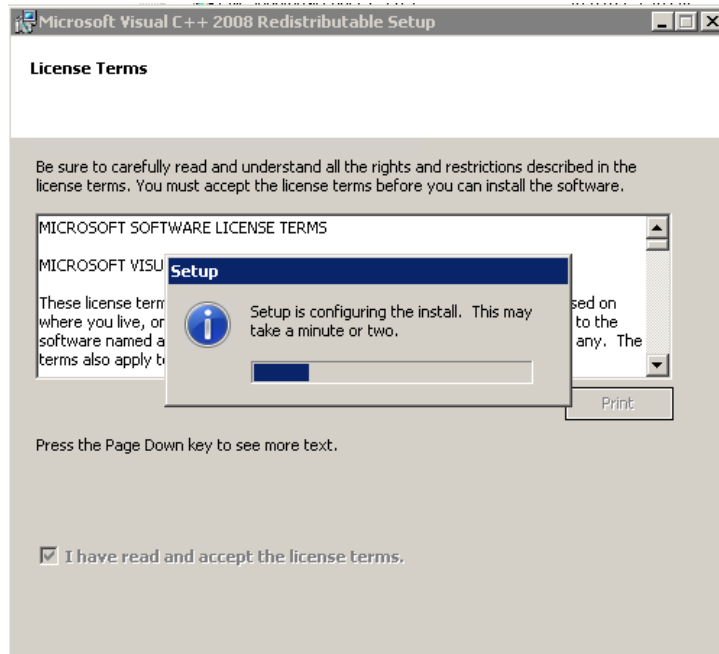


Figure 36 - Microsoft Visual C++2008 Runtime Libraries Installation Running

After the installation is complete, a status window appears to indicate success. Click Finish to close the window.

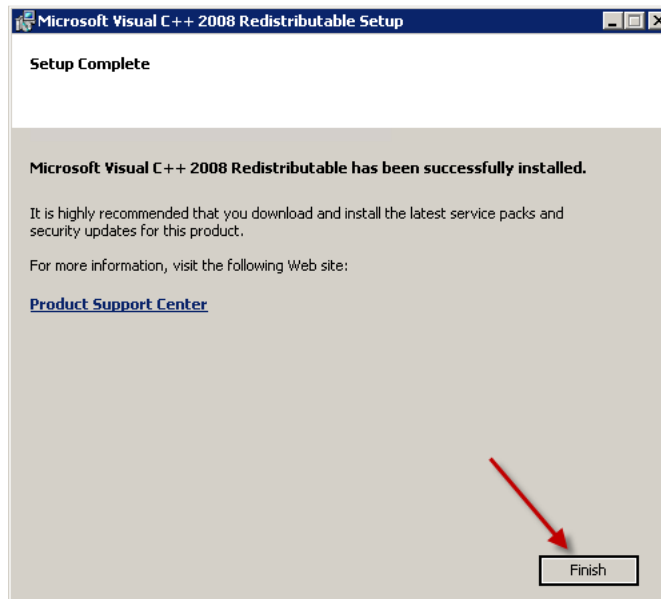


Figure 37 - Microsoft Visual C++2008 Runtime Libraries Installation Complete

Install the Shark Control Panel and USB Driver

The CNC Shark Control Panel and the USB driver are installed using the CNCSharkControlPanel-1.5.0.22.exe file. If at any point in the installation process described below, you make a mistake, you can always repeat the steps. For example, you may not install the USB driver because you inadvertently cleared the check mark and then hit finish at the end of the CNC Shark Control Panel installation. At that point, you can 'start over' and successfully install both components.

Don't be confused if the file name for the Shark Control Panel on the Documents web page is different than that listed in this manual. A difference in name only indicates to you that a new version of the Shark Control Panel is available to you.

If you are using Norton's 360 anti-virus, you should disable the anti-virus auto-protect while installing the Shark Control Panel and USB driver. You can turn it back on after the installation is complete.

Double click on the CNCSharkControlPanel-1.5.0.22.exe. This will start the installation. On many systems, you will immediately see the screen shown in the figure below. Click yes to allow the installation.

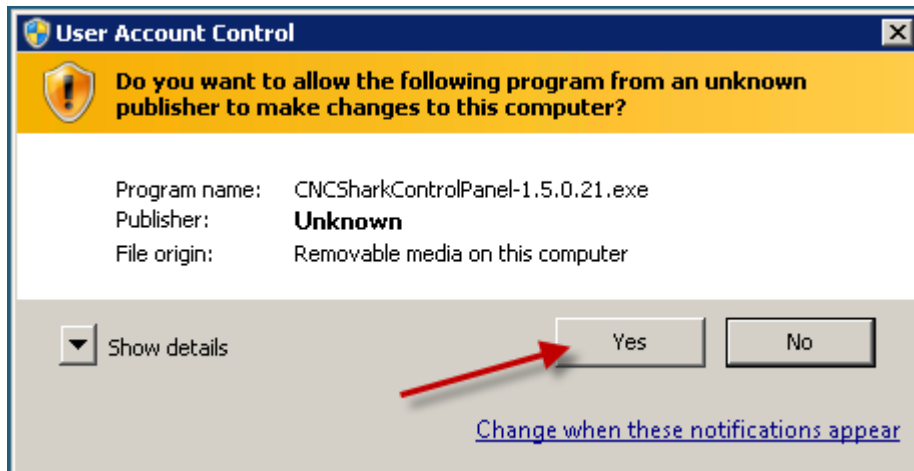


Figure 38 - Shark Control Panel Allow Installation

The CNC Shark Control Panel Setup Wizard will appear – click on Next to start the installation.

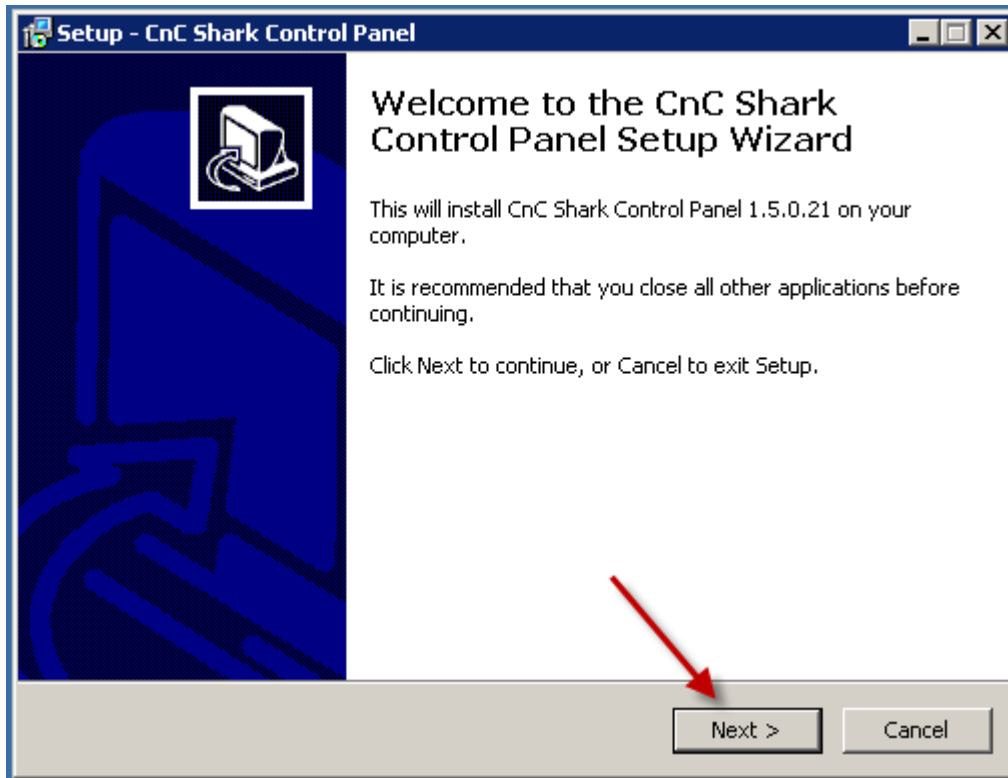


Figure 39 - CNC Shark Control Panel Setup Wizard

You will next see the Setup – CNC Shark Control Panel indicating Ready to Install – click Install.

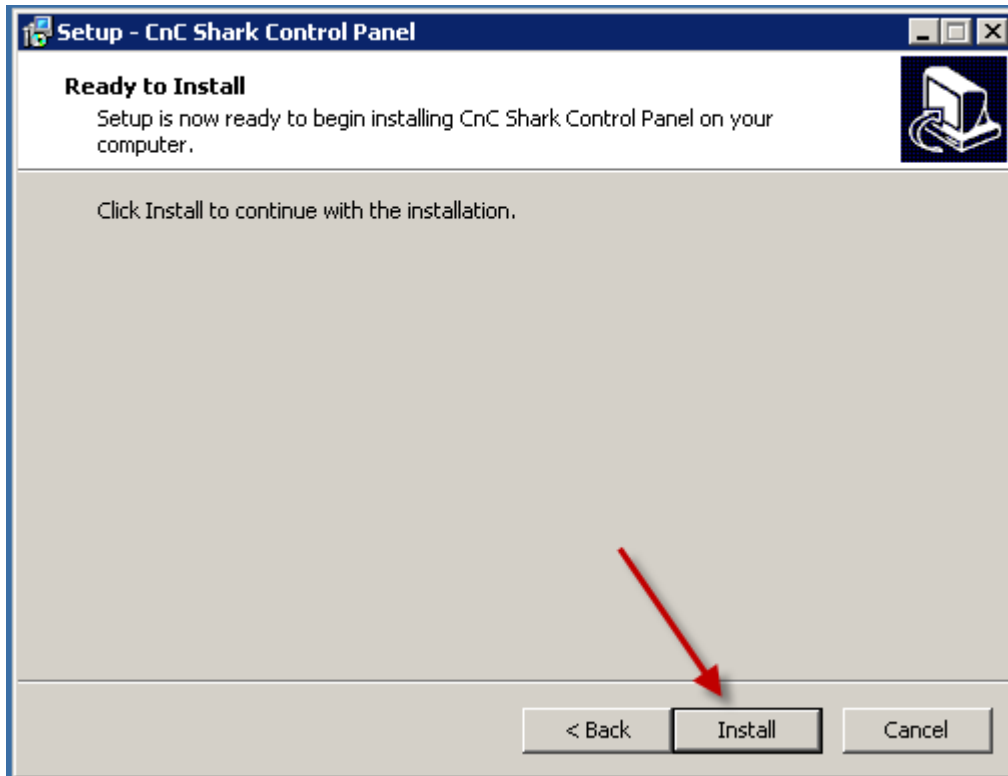


Figure 40 - CNC Shark Control Panel - Ready to Install

The CNC Shark Control Panel Setup panel will show the progress of the installation.

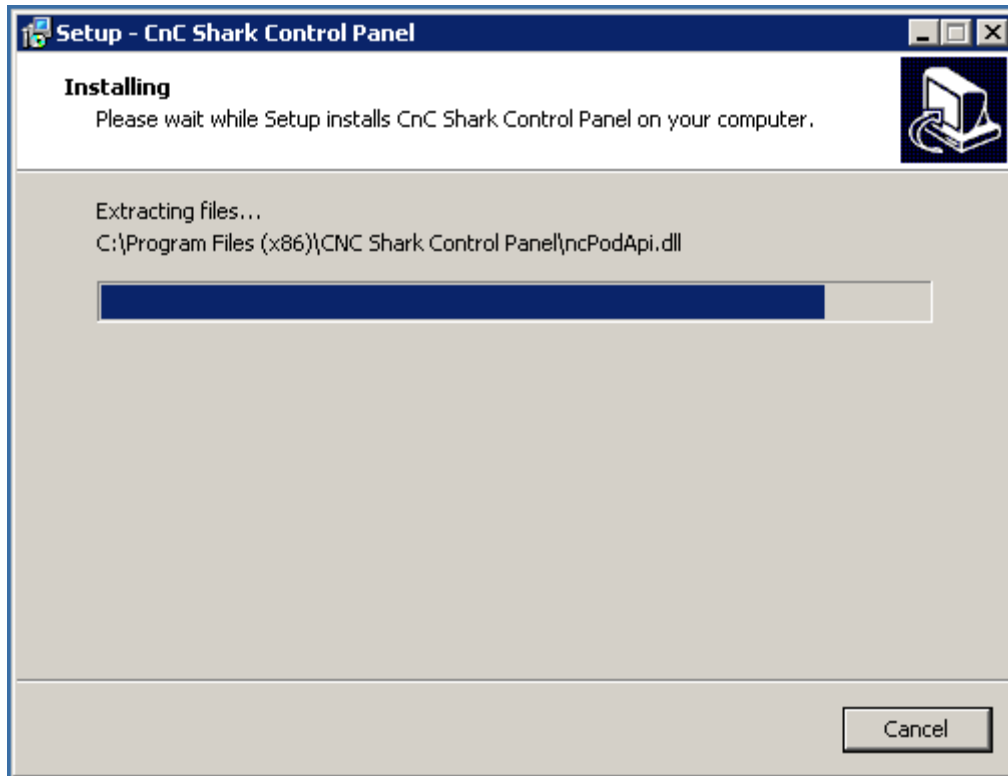


Figure 41 - CNC Shark Control Panel Installation Progress

The CNC Shark Control Panel Setup then indicates that the installation is finished. There is a check box that is already selected to enable the installation of the USB driver after clicking on Finish. Ensure that this box is checked, and click on Finish.

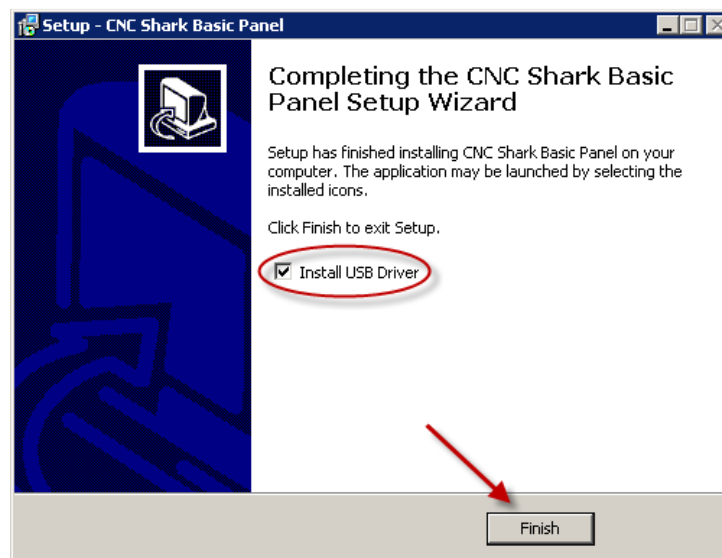


Figure 42 - CNC Shark Control Panel Installation Complete

After clicking on finish, you will be presented with a pop up asking if you want to allow the program from an unknown publisher to make changes to this computer – click on yes.

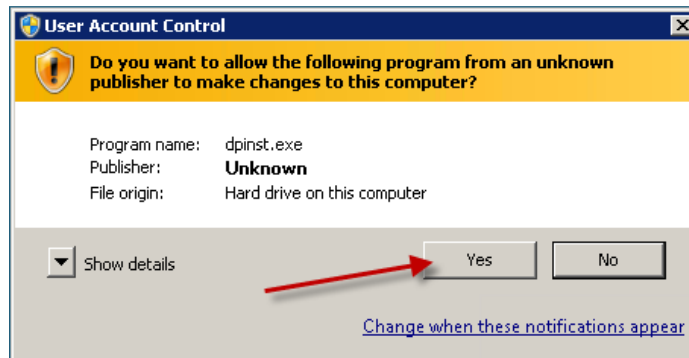


Figure 43 - Shark USB Driver Allow Installation

On Windows Vista and Windows 7 you may not see anything on your screen at this point. But, if you look along the task bar at the bottom of your screen, you'll see an icon flashing. Click on that icon to enable the system to show the panel in the figure above.



Figure 44 - USB Driver Allow Installation in Task Bar

The Device Driver Installation Wizard will appear – click Next.

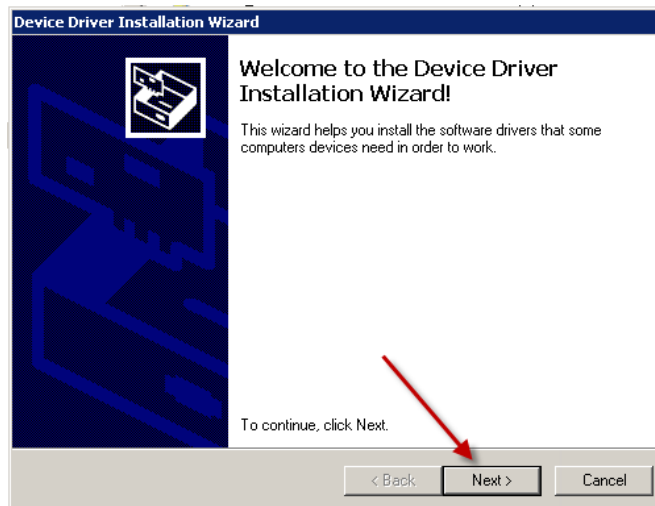


Figure 45 - Device Driver Installation Wizard

The Device Driver Installation Wizard reports success. The USB driver that was installed is shown on the panel. Click on Finish to close the panel.

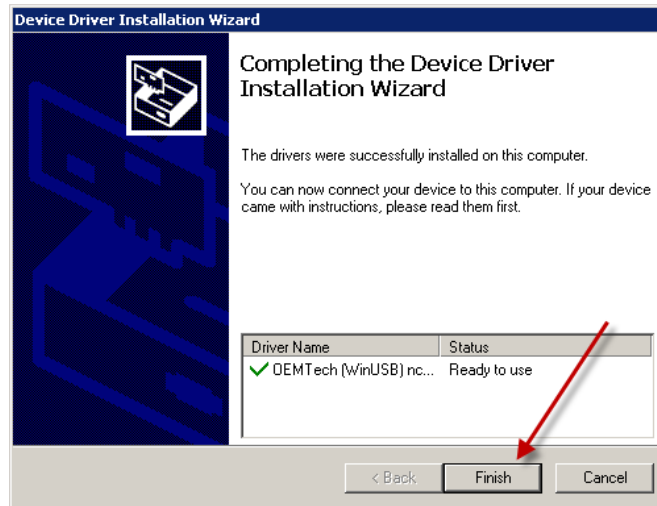


Figure 46 - Device Driver Installation Complete

The CNC Shark Control Panel and USB driver installation is now complete.

If you disabled Norton's 360 anti-virus, you can now enable it.

After Installation

After the installation is complete, you should perform a quick check before connecting the USB cable to the computer and the Shark Control Box.

Click on the Start (programs) button on the lower left of the screen. You may see the CNC Shark Control Panel program listed here.

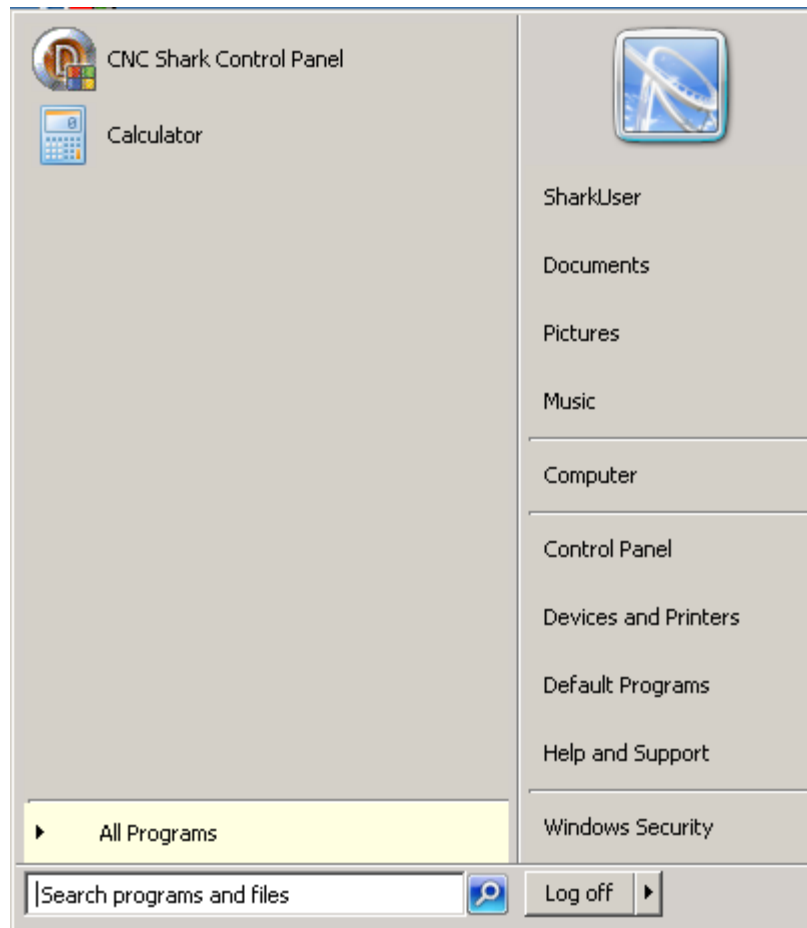


Figure 47 - CNC Shark Control Panel in Program List

Click on All Programs, and you will see the CNC Shark Control Panel program group in the list. Click once on the CNC Shark Control Panel program group and you will see the CNC Shark Control Panel, CNC Shark Firmware Updater, and the Uninstall CNC Shark Control Panel program shortcuts.

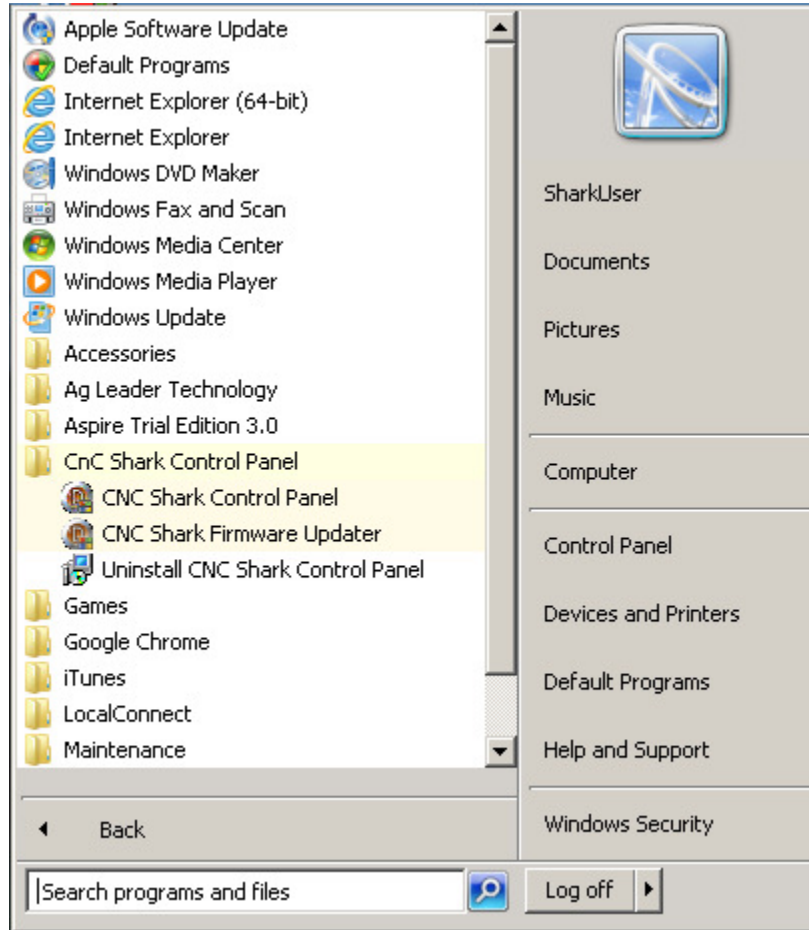


Figure 48 - CNC Shark Control Panel Program Group

If you want to place a shortcut for the CNC Shark Control Panel on your desktop, right click while pointing at the CNC Shark Control Panel shortcut in the Programs menu, and left click on copy.

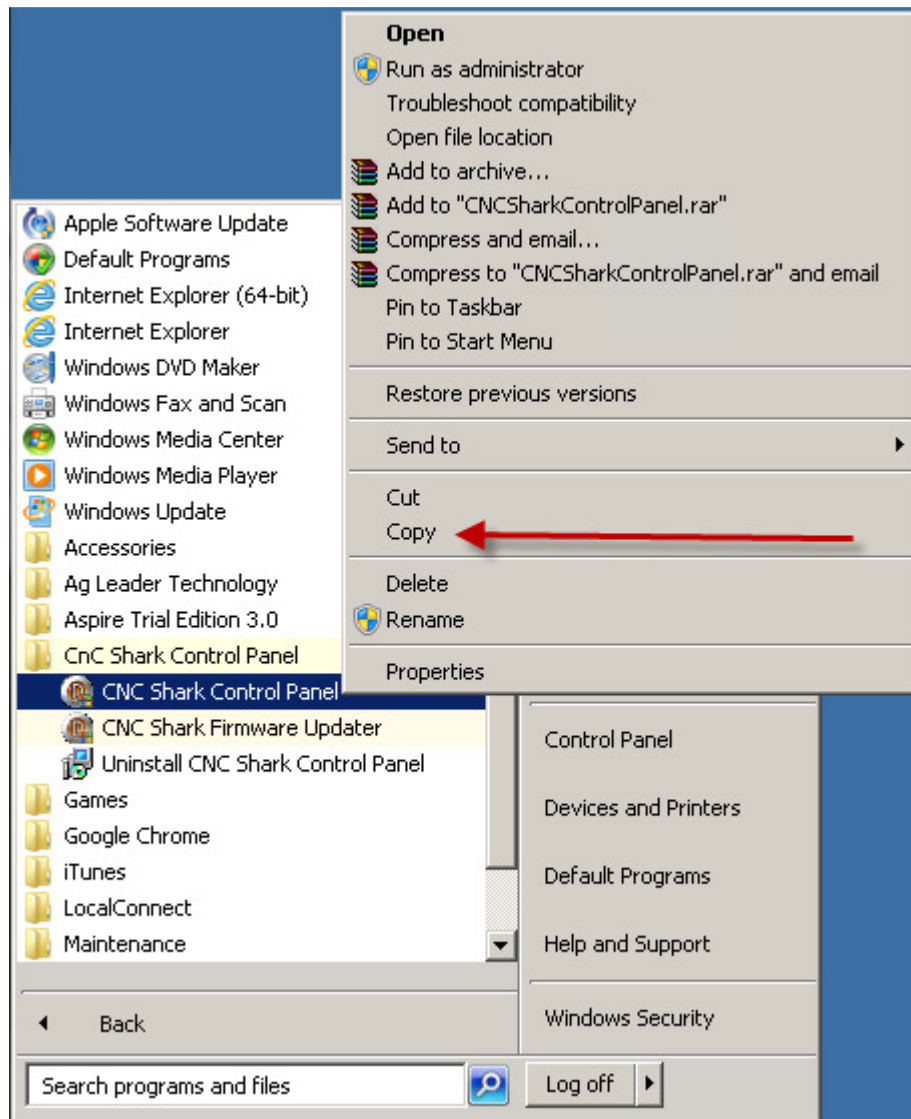


Figure 49 - Copy the CNC Shark Control Panel Shortcut

Left click on the desktop in an open area, and then right click and select paste.

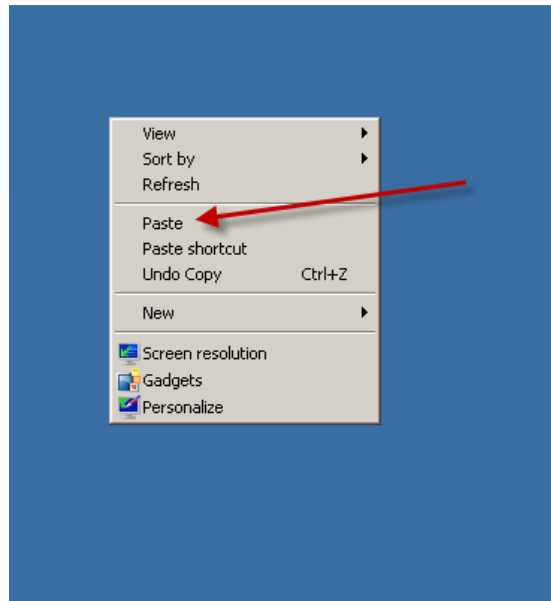


Figure 50 - Paste the CNC Shark Control Panel Shortcut

A shortcut for the CNC Shark Control Panel has been copied to your desktop. You can drag this to any location on your desktop.



Figure 51 - CNC Shark Control Panel Shortcut on the Desktop

There is one last check to perform. During the installation of the CNC Shark Control Panel, a set of test toolpath files were installed in a folder on the computer. The new folder is labeled CNC Shark, and it is placed under the My Documents folder on your computer. The toolpath test files were placed in a folder labeled Samples.

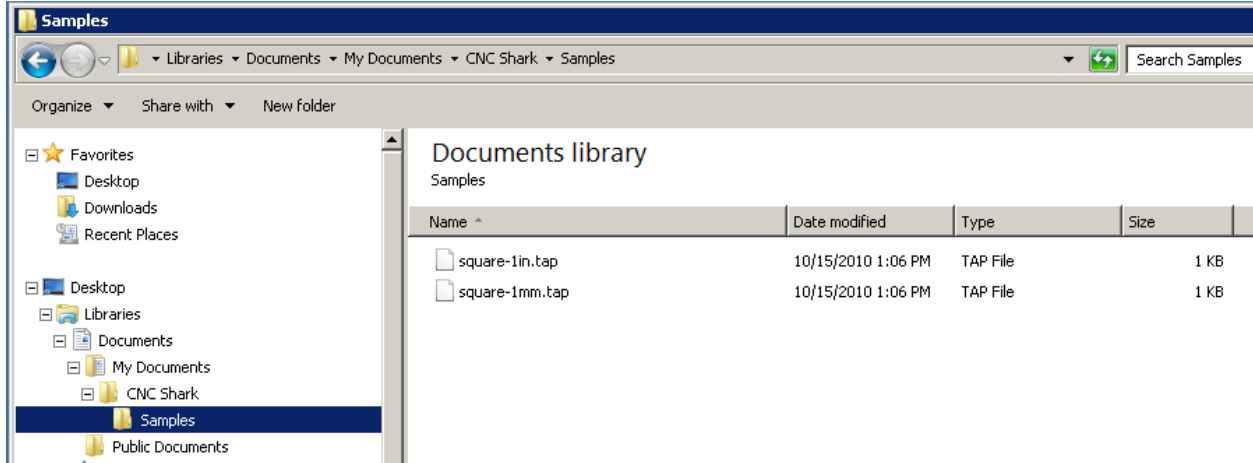


Figure 52- Toolpath Test Files Location – Windows 7

The figure above shows the location and file structure using Windows 7. On Windows XP SP3 and Windows Vista machines, the file structure may appear to be slightly different. In both cases there is a My Documents folder on your computer. The difference is a minor location on disk change that Microsoft made.

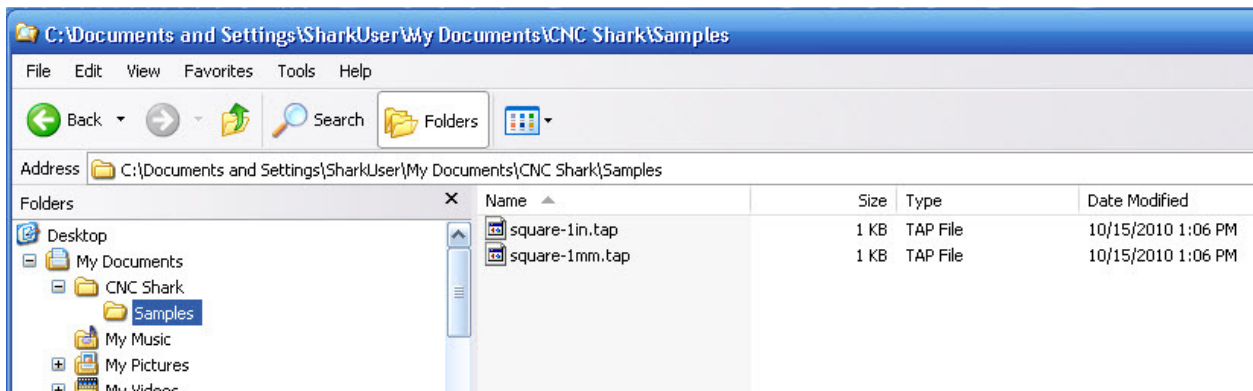


Figure 53 - Toolpath Test Files Location - Windows XP SP3

Computer Settings

You will have the best results using your Shark if you disable the use of a screen saver and in the case of a laptop, configure the Power Options settings to 'Always On'.

To disable the screen saver, first right click anywhere on your desktop, and select properties.

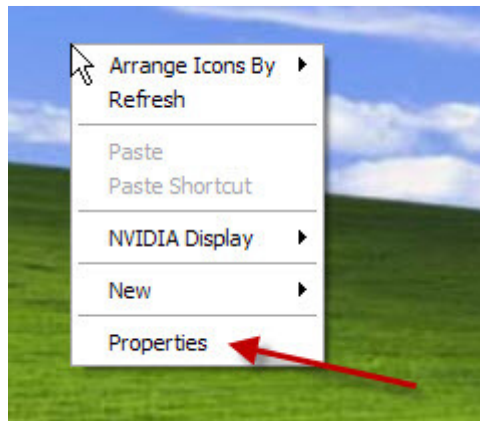


Figure 54 - Right Click on Desktop – Properties

This opens the Display Properties dialogue panel. Left click on the Screen Saver tab. Using the pull down selector under 'Screen Saver', select '(None)'. In some cases your choice may be 'Never'.

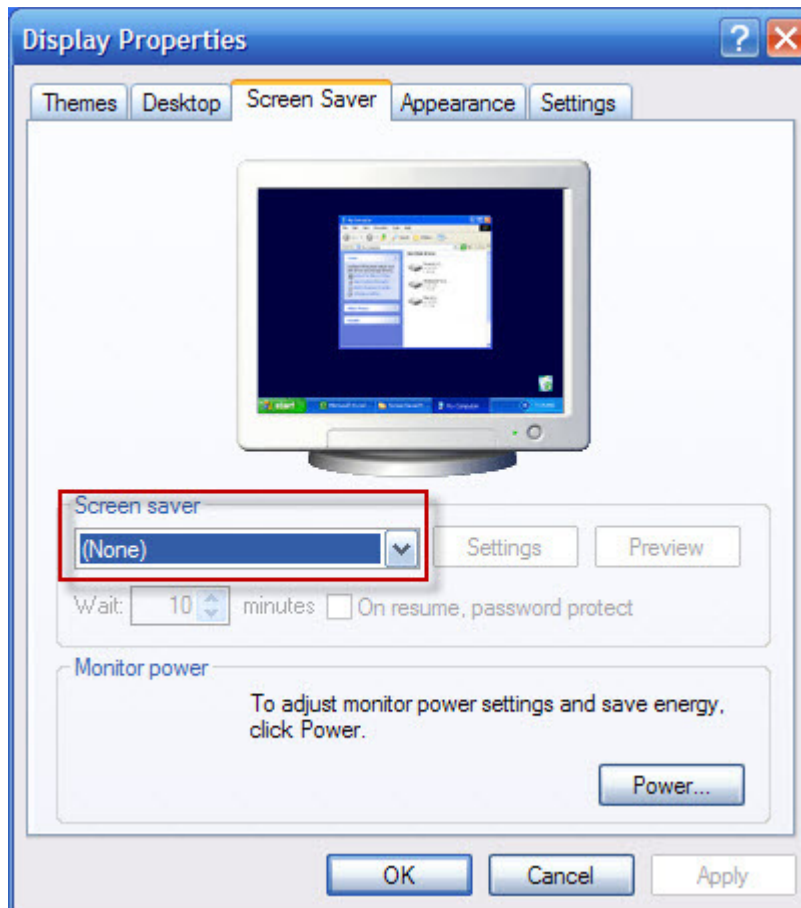


Figure 55 - Display Properties - Screen Saver Settings

Left click on 'OK' to save these settings and close the panel.

If you are using a laptop, you also want to configure the Power Options settings. To open these, left click on Start programs in the lower left corner of your desktop. Along the right side you will see an entry labeled 'Control Panel' – left click on this to open the Control Panel.

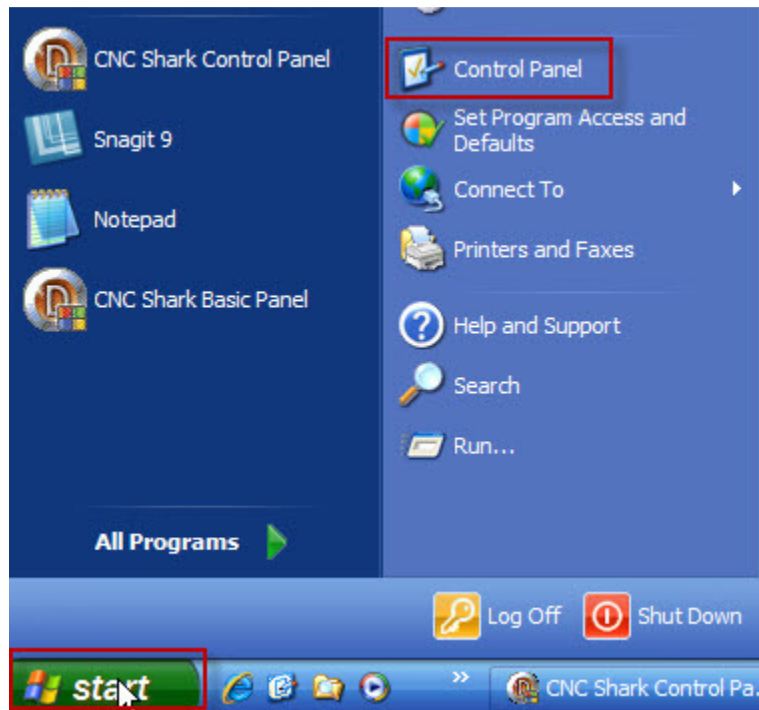


Figure 56 - Opening the Control Panel

In the Control Panel, find the Power Options, and left click on this to open the panel. This may be called Power Management or Power Monitoring in some operating systems.

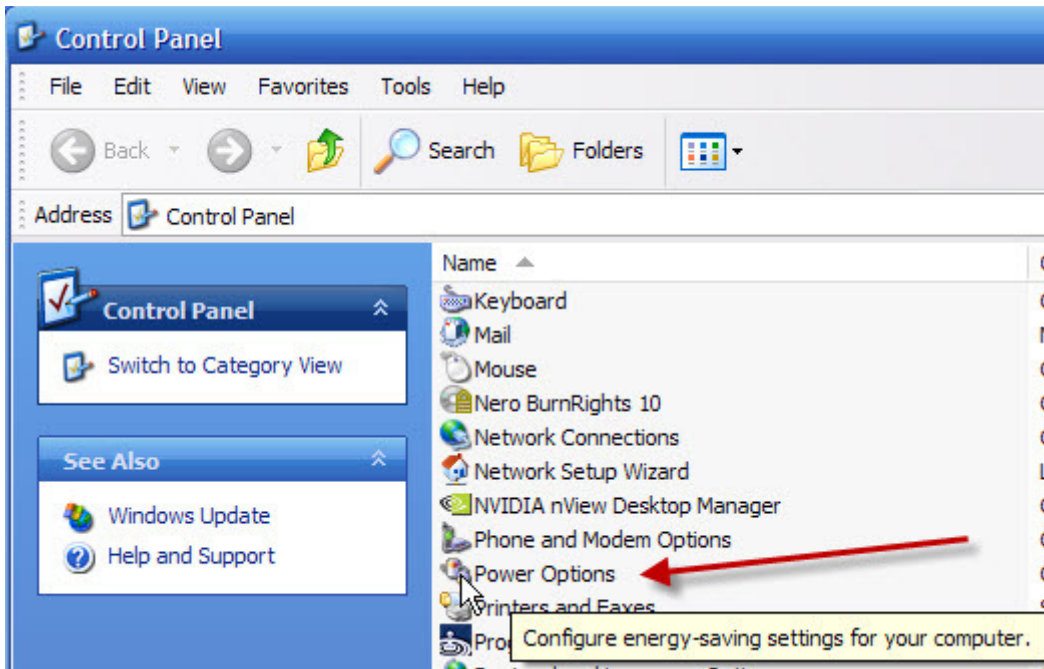


Figure 57 - Power Options (Windows XP)

You want to set every choice to “Always On” or “Never” (off) when plugged in. In some operating systems, the list of components may be longer. Again, set all of them to “Always On” or “Never” (off). Left click on ‘OK’ to apply the settings and close the panel.

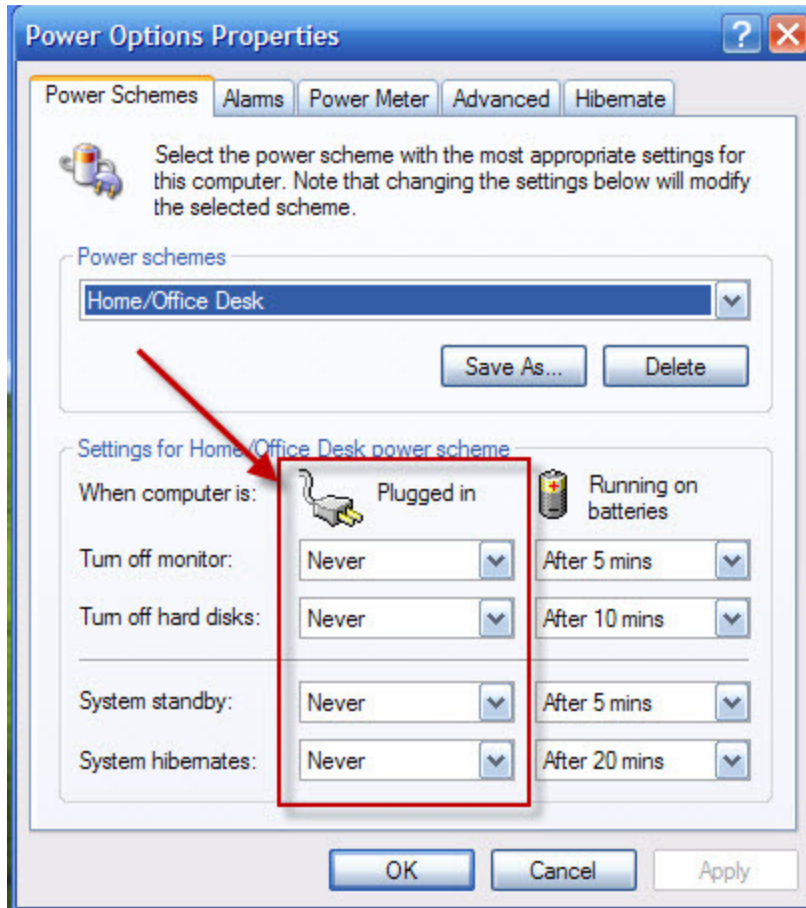


Figure 58 - Power Options Configuration Windows XP

Systems Check

You are now ready to perform a systems check. During the systems check, you will connect the computer to the Shark Control Box using a USB cable, confirm that the Shark Control Panel is able to communicate with the Shark Control Box, jog the gantry, load and run the test toolpath file, and update the firmware.

Computer/Shark Control Box

With the computer turned on, the user logged in, but without first running the CNC Shark Control Panel, and the Shark Control Box turned off, connect the USB cable to the Shark Control Box and the computer.

Once the USB cable is plugged into the computer and the Shark Control Box, turn on the power to the Shark Control Box. You may see a message appear in the lower right corner of the screen in the task bar about finding new hardware.



Figure 59 - Found New Hardware Message

If you do, a Found New Hardware Wizard will open. Select 'No, not at this time' to the choice about connecting to Windows Update to search for the software, and click on Next.



Figure 60 - New Hardware Wizard - Do Not Connect to Windows Update

You are then given a choice on how the Wizard will install the driver. Select 'Install the software automatically' and click on Next.

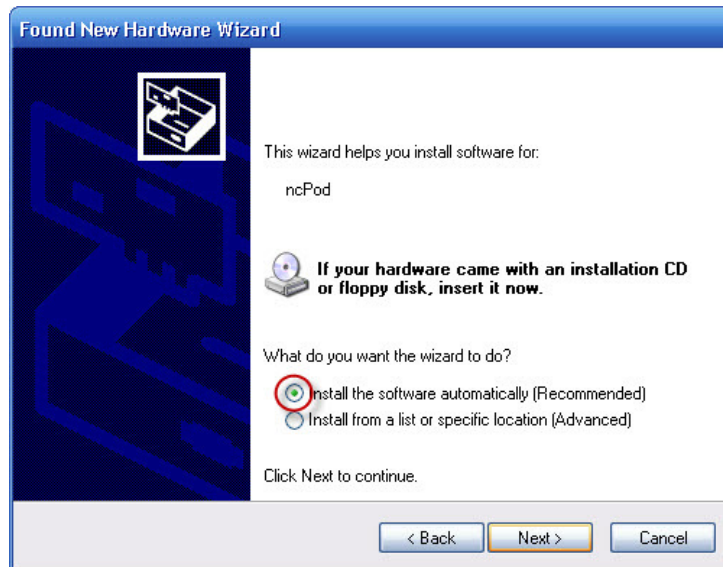


Figure 61 - New Hardware Wizard - Install the software automatically

During the driver installation you will receive a warning dialogue – click on 'Continue Anyway'.

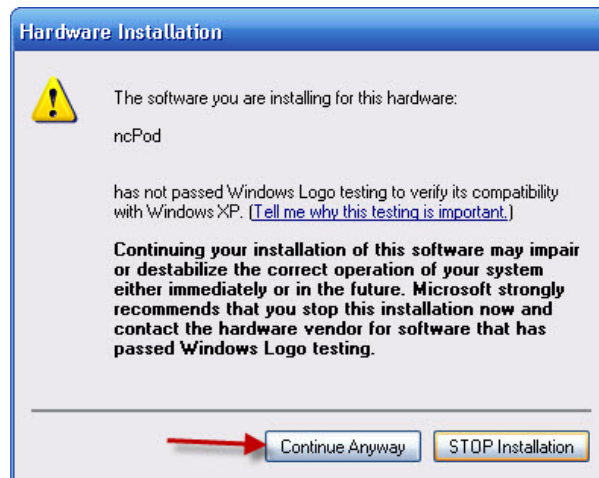


Figure 62 - Hardware Installation Warning - Continue Anyway

The system will report a successful installation of the driver. Click on Finish to close the window.

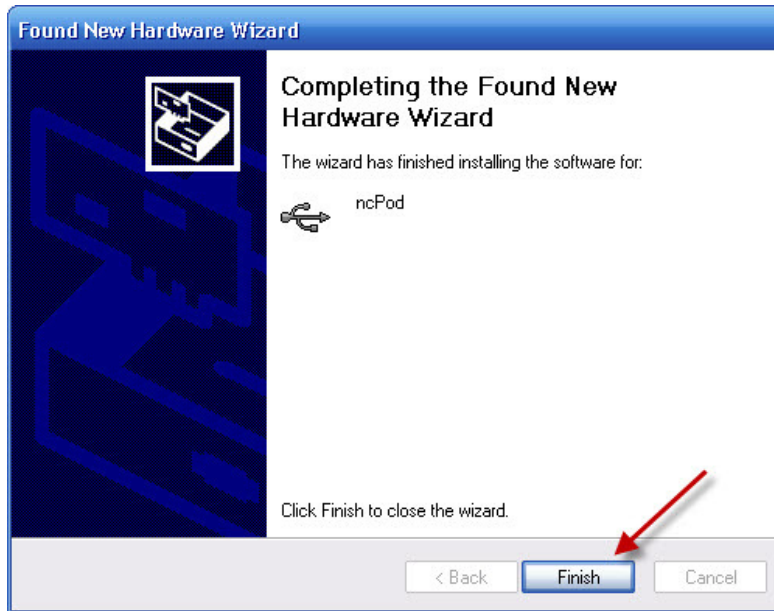


Figure 63 - New Hardware Wizard – Success

After closing this window, a message will appear in the lower right hand corner of the screen in the task bar indicating that the new hardware was successfully installed and it is ready for use.

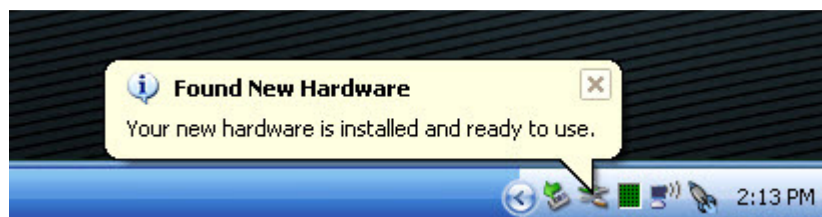


Figure 64 - New Hardware Installed and Ready for Use

You will only see these messages and have to go through these steps once on this computer. Again, you may not have to go through any of these steps – neither case is better or worse.

You'll also notice that once the computer and Shark Control Box are connected via the USB cable and the Shark Control Box power is turned on, the Safely Remove Hardware icon is present in the task bar in the lower right hand corner.



Figure 65 - Safely Remove Hardware Icon - Windows XP SP3

You may need to expose this by clicking on the up arrows in the lower right hand corner on a Windows 7 system.

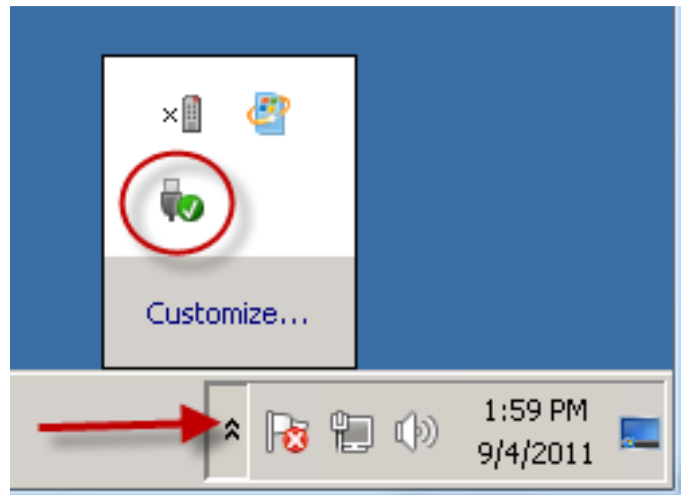


Figure 66 - Safely Remove Hardware Icon - Windows 7

Double clicking on the Safely Remove Hardware icon will open the Safely Remove Hardware panel. Click on Properties to open the ncPod Properties Panel. You can see that the driver is working properly. Click on Ok in the ncPod Properties panel and Close in the Safely Remove Hardware panel to close them.

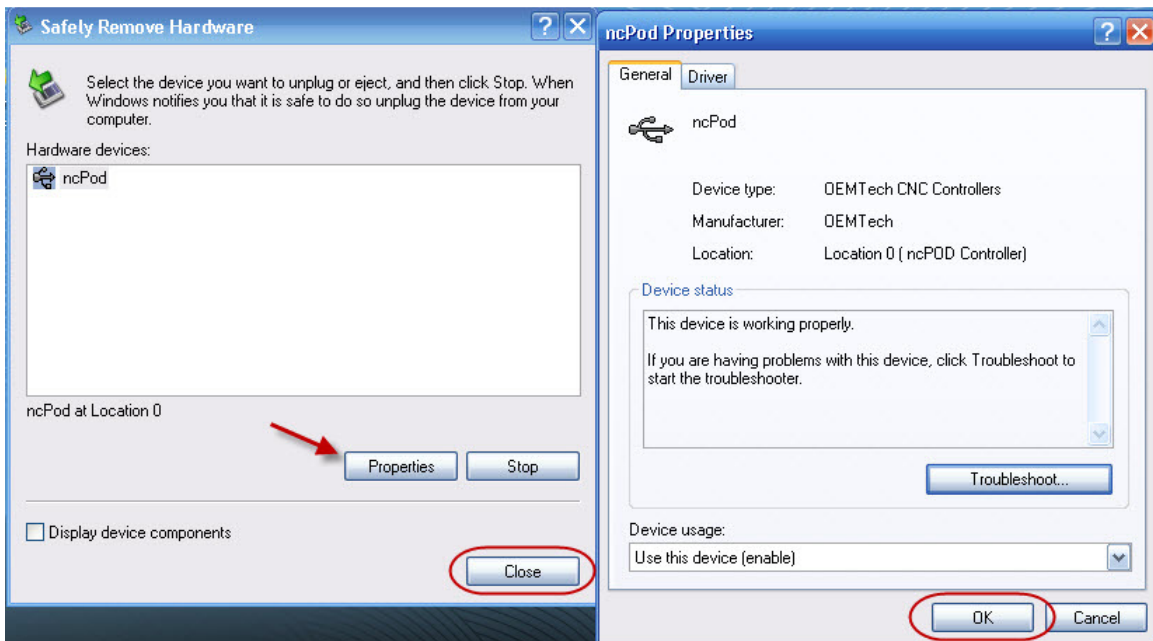


Figure 67 - Safely Remove Hardware and ncPod Properties Panels

Shark Control Panel Checkout and Jog

At this point you have connected the computer to the Shark Control Box via a USB cable, and the Shark Control Box is turned on. Start the CNC Shark Control Panel – from the Start, Programs, CNC Shark Control Panel programs group by clicking on the CNC Shark Control Panel shortcut; or by double clicking on the CNC Shark Control Panel shortcut you created on the desktop.

Connect the Shark Control Box to the computer using the USB cable, and power on the Shark Control Box. Start the CNC Shark Control Panel – from the Start, Programs, CNC Shark Control Panel programs group by clicking on the CNC Shark Control Panel shortcut; or by double clicking on the CNC Shark Control Panel shortcut you created on the desktop.

As the application starts for the first time, you will see a reminder to register the software. Registering the software is discussed below. This reminder will occur every time you open the application until the software is registered. For now, hit the 'No' button to continue.

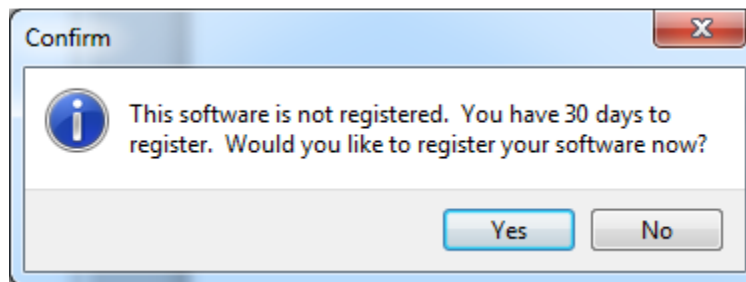


Figure 68 - CNC Shark Control Panel Registration Reminder

The CNC Shark Control Panel displays on the screen.

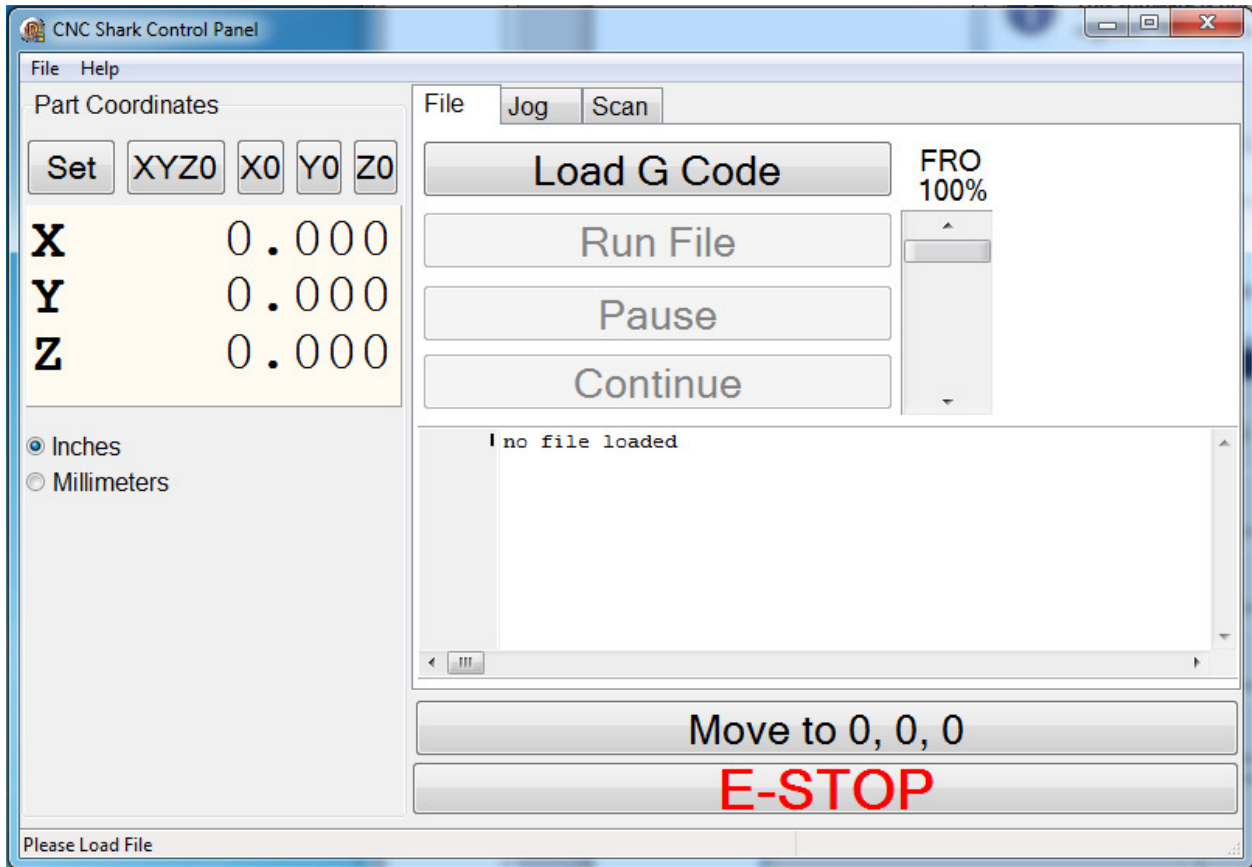


Figure 69 - CNC Shark Control Panel

If the Shark Control Box is not connected and powered on, you will see the message below informing you of the condition. After hitting 'Ok', the Shark Control Panel will close. Connect the Shark Control Box, power it on, and start the Shark Control Panel.

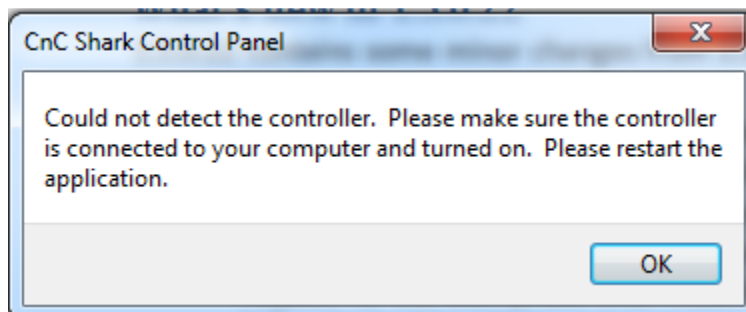


Figure 70 - Control Box Not Connected or Powered On at Start Up of Shark Control Panel

If you turn off the Shark Control Box or disconnect the USB cable after the Shark Control Panel is open, the controls will gray out and become inactive. In the lower left hand corner you'll see a message – Please check CNC Shark power and USB cable. This is indicating that the CNC Shark Control Panel is currently not able to communicate to the Shark Control Box.

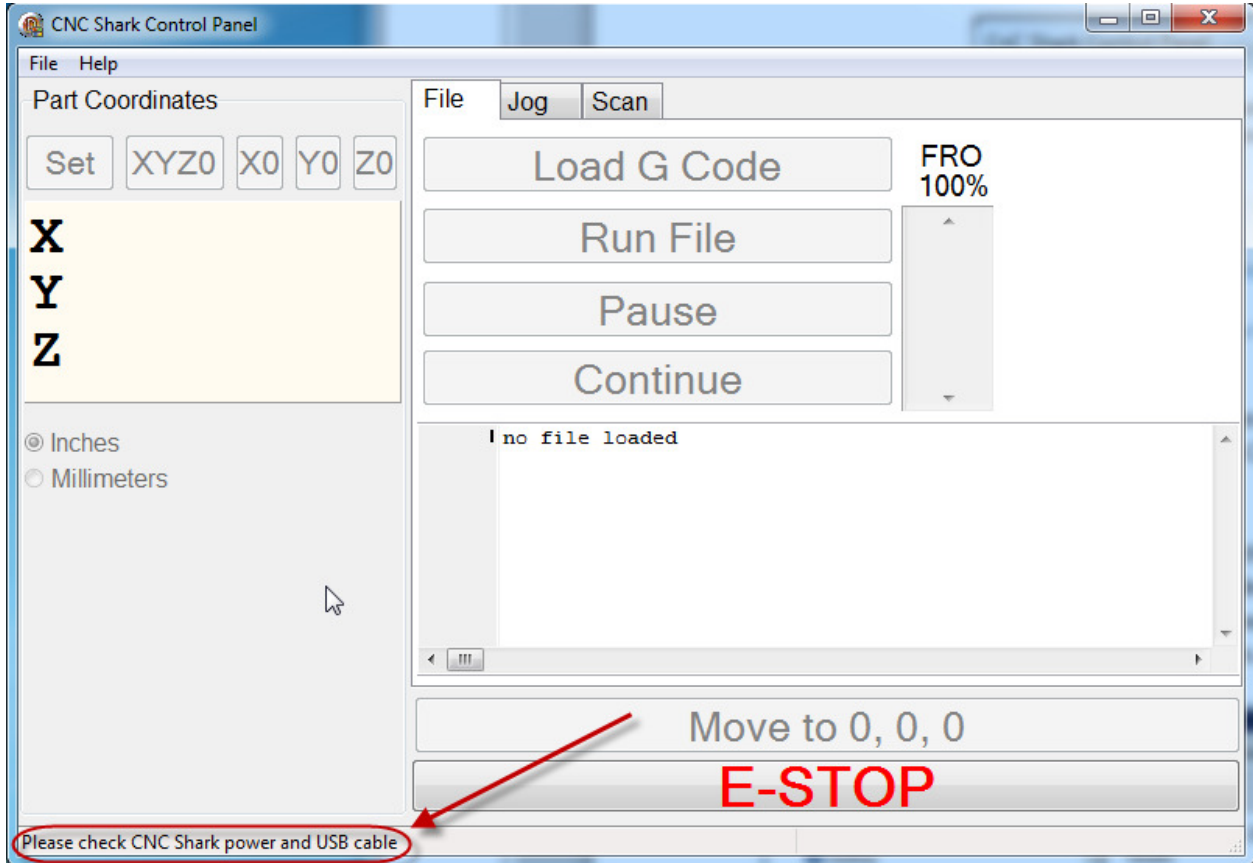


Figure 71 - Shark Control Box Not Connected or Powered On After Opening the Shark Control Panel

The CNC Shark Control Panel displays on the screen.

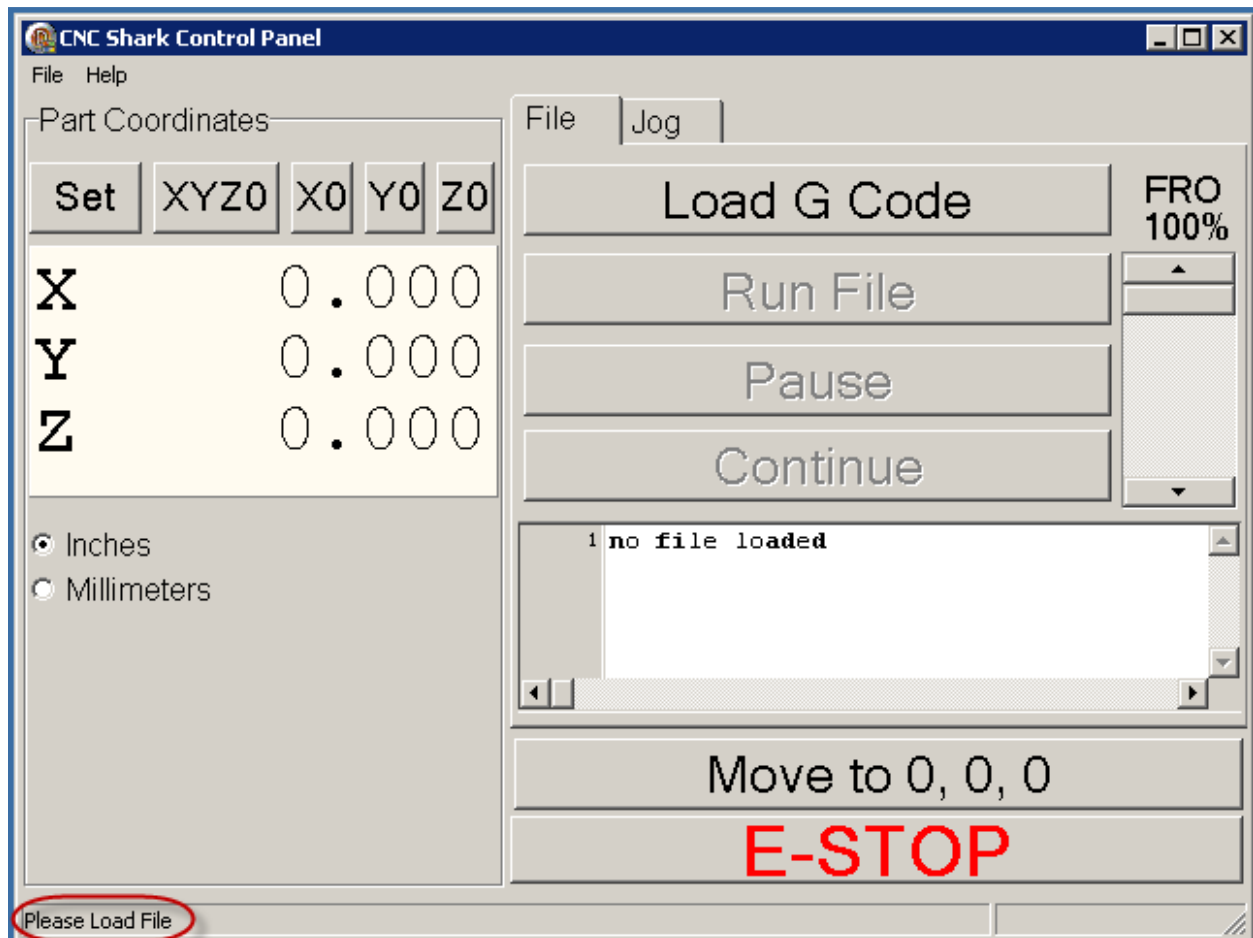


Figure 72 - Shark Control Panel - Connected to the Shark Control Box

Note the message in the lower left corner – 'Please load file'. This indicates that the CNC Shark Control Panel is successfully communicating with the Shark Control Box.

A comprehensive description of each of all of the CNC Shark Control Panel's functions is found in the Shark Control Panel section of this manual. For purposes of completing the systems check, click on the Jog tab. The Jog portion of the CNC Shark Control Panel is now displayed.

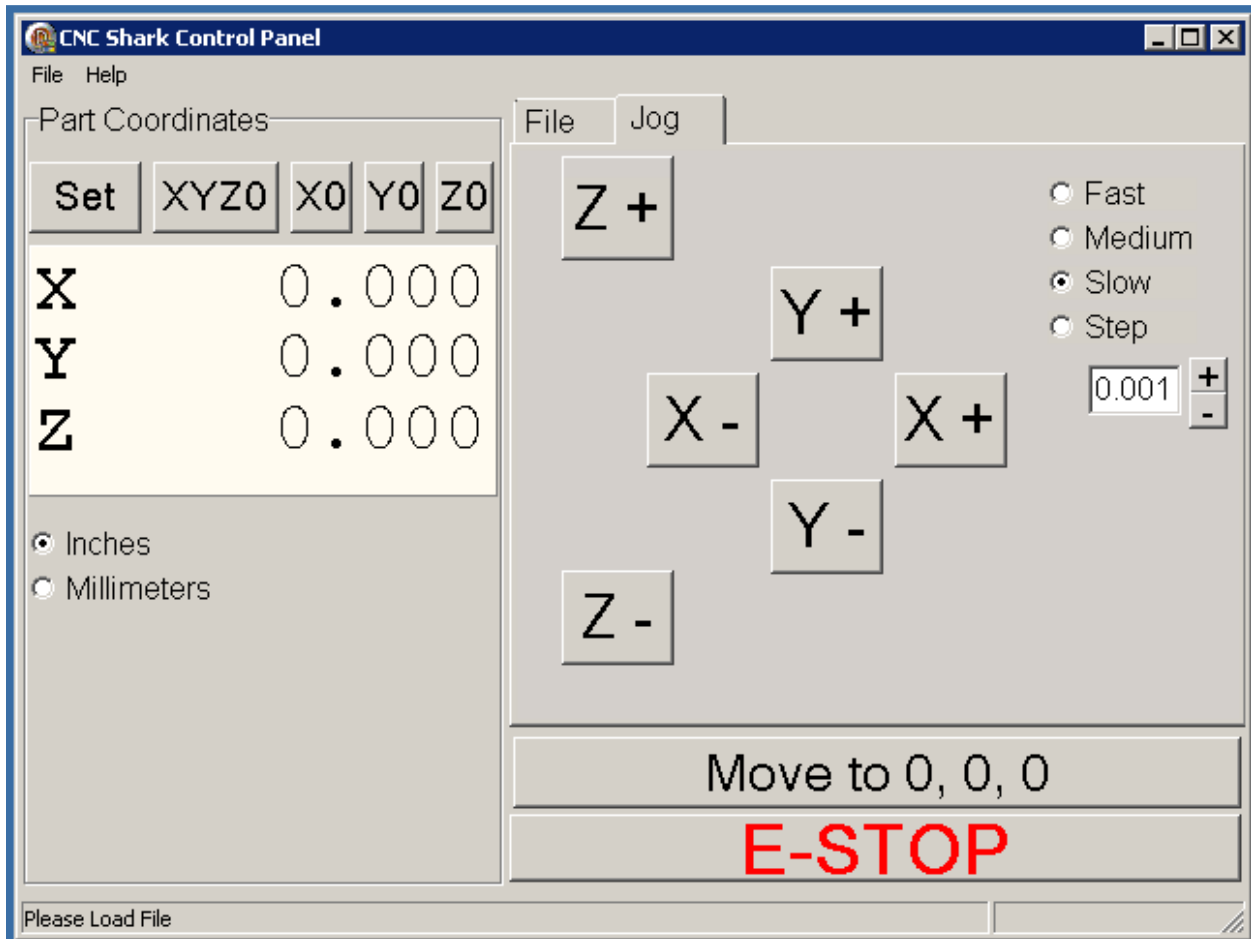


Figure 73 - CNC Shark Control Panel - Jog Panel

Recalling the orientation of the X, Y and Z axis –

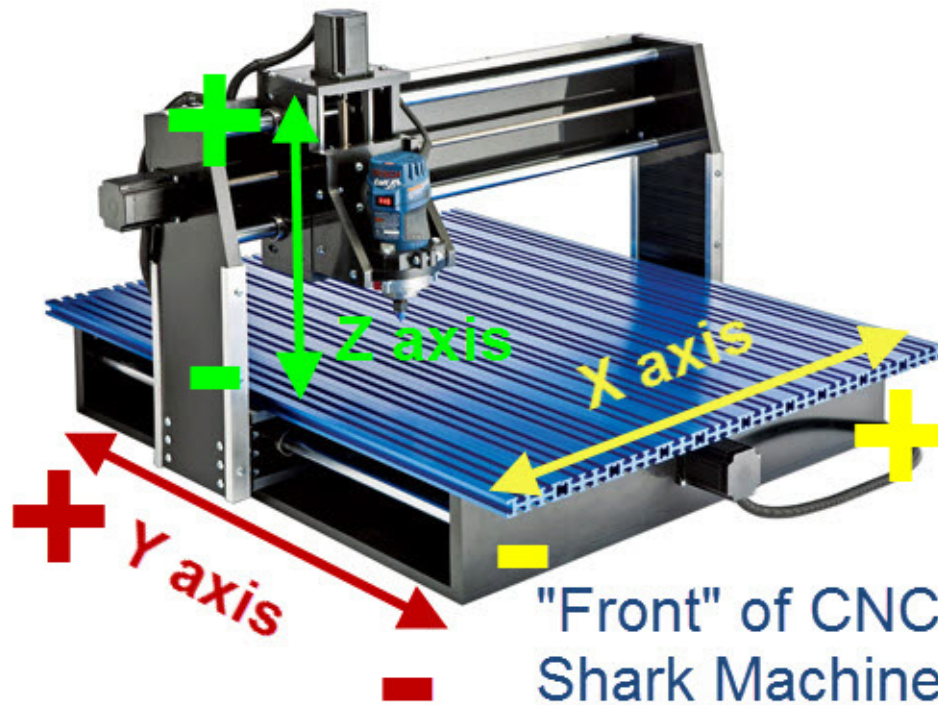


Figure 74 – CNC Shark Axis Orientation

Tap a direction of your choice and familiarize yourself with the movement of the Shark gantry. Confirm that the gantry moves in the desired axis direction based on the button selected. If the Shark is moving along an axis that is different than that selected, check the cabling connection at the Shark Control Box to ensure that the stepper motor cable connection is plugged into the Shark Control Box connector with the same axis label.

Run the Test Toolpath

Jog the gantry to position it about 2" from the left side of the table (X), 2" from the front edge of the table (Y), and 2" above the table (Z). The Jog panel may look something like the figure below. Don't worry if the X, Y and Z numbers don't match – they won't match as the gantry will start out in a slightly different position from Shark to Shark out of the box. There is no need to be exactly precise with this before running the test toolpath – as long as you are within 1" of these physical locations of the gantry, the test toolpath will run fine.

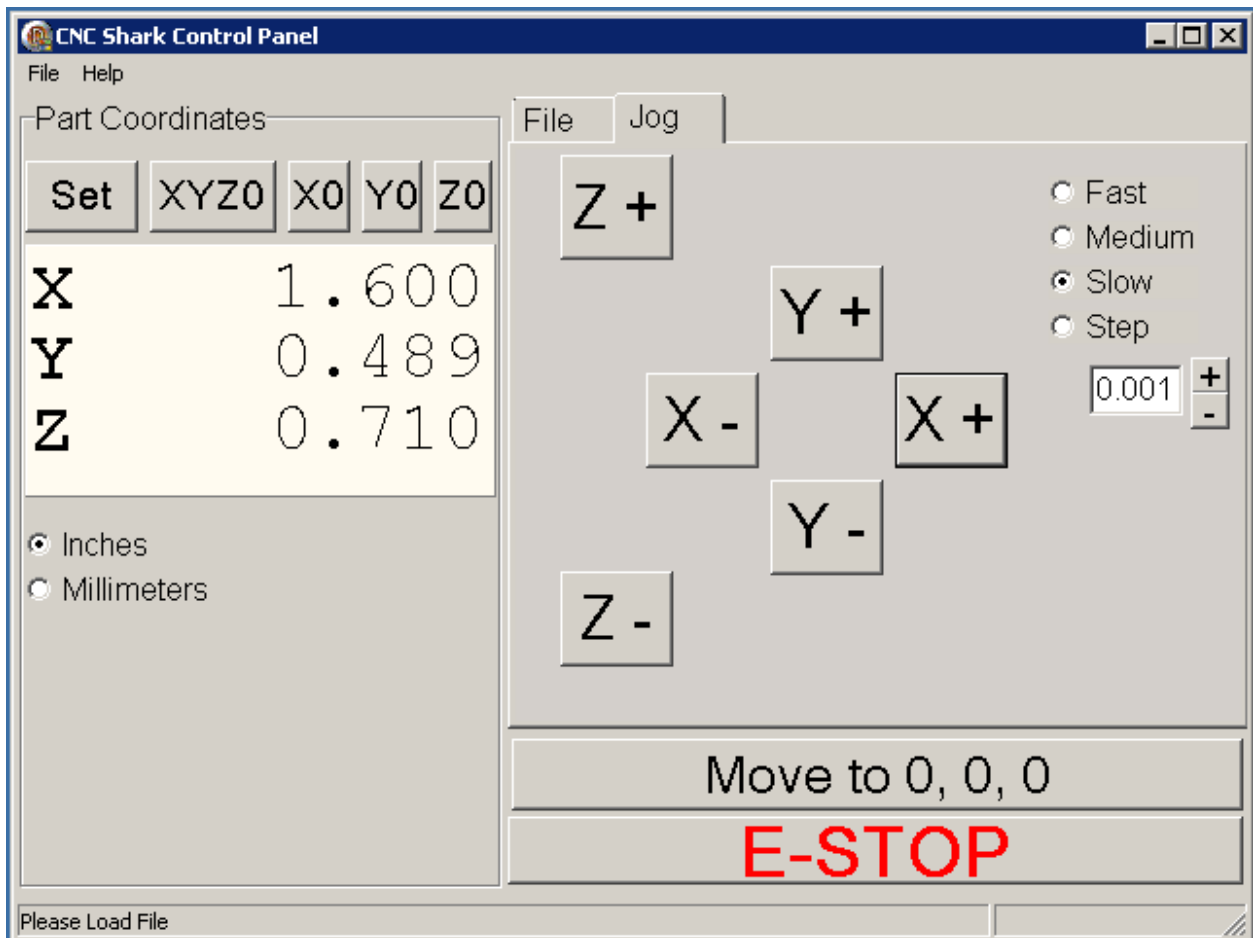


Figure 75 - Jog Panel for Test Toolpath

Click on the XYZ0 button. This will set the X0, Y0 and Z0 to the current position of the gantry.

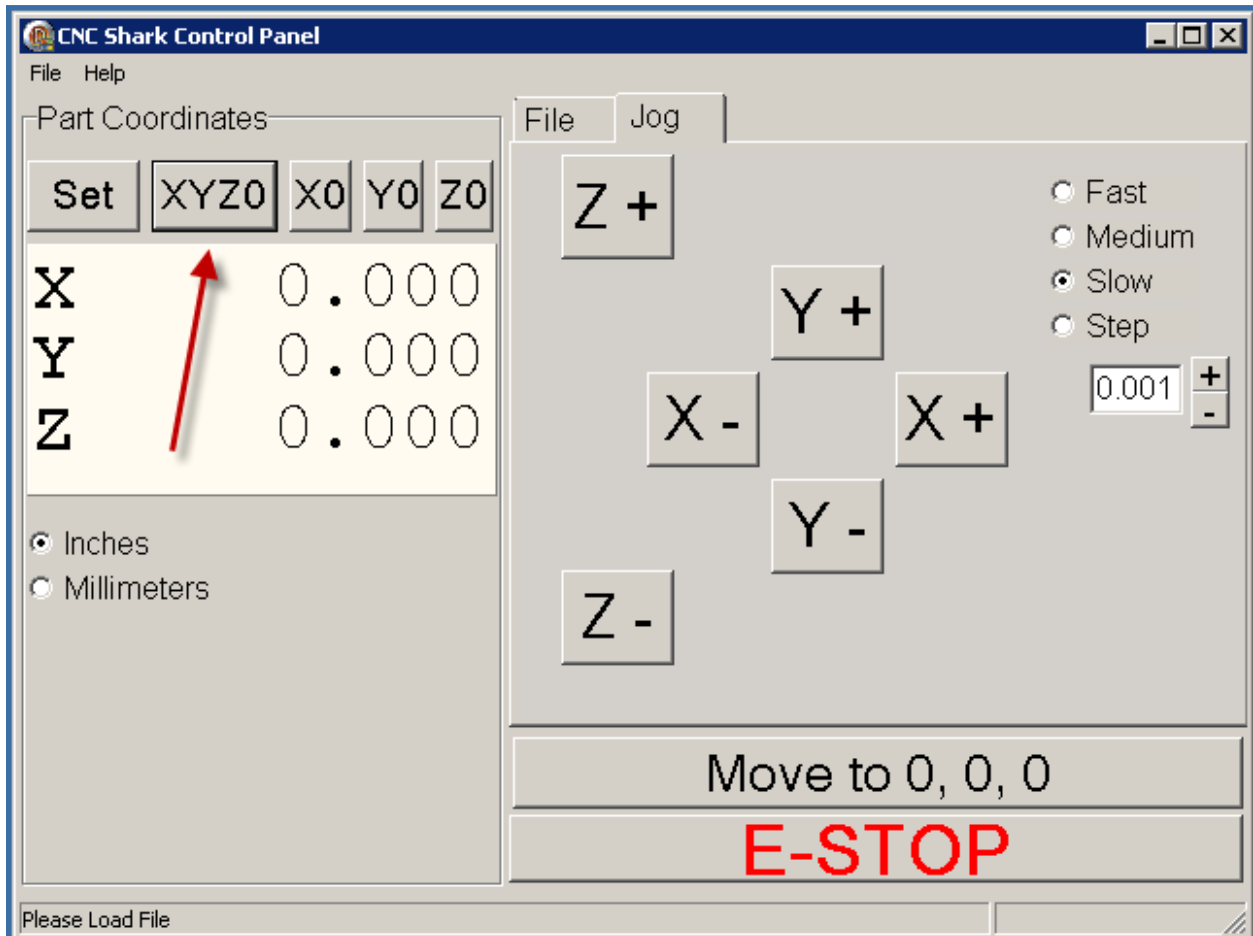


Figure 76 - Set the X0, Y0 and Z0 of the Gantry

Click on the File tab – the commands used to load and run a toolpath are now shown in the CNC Shark Control Panel.

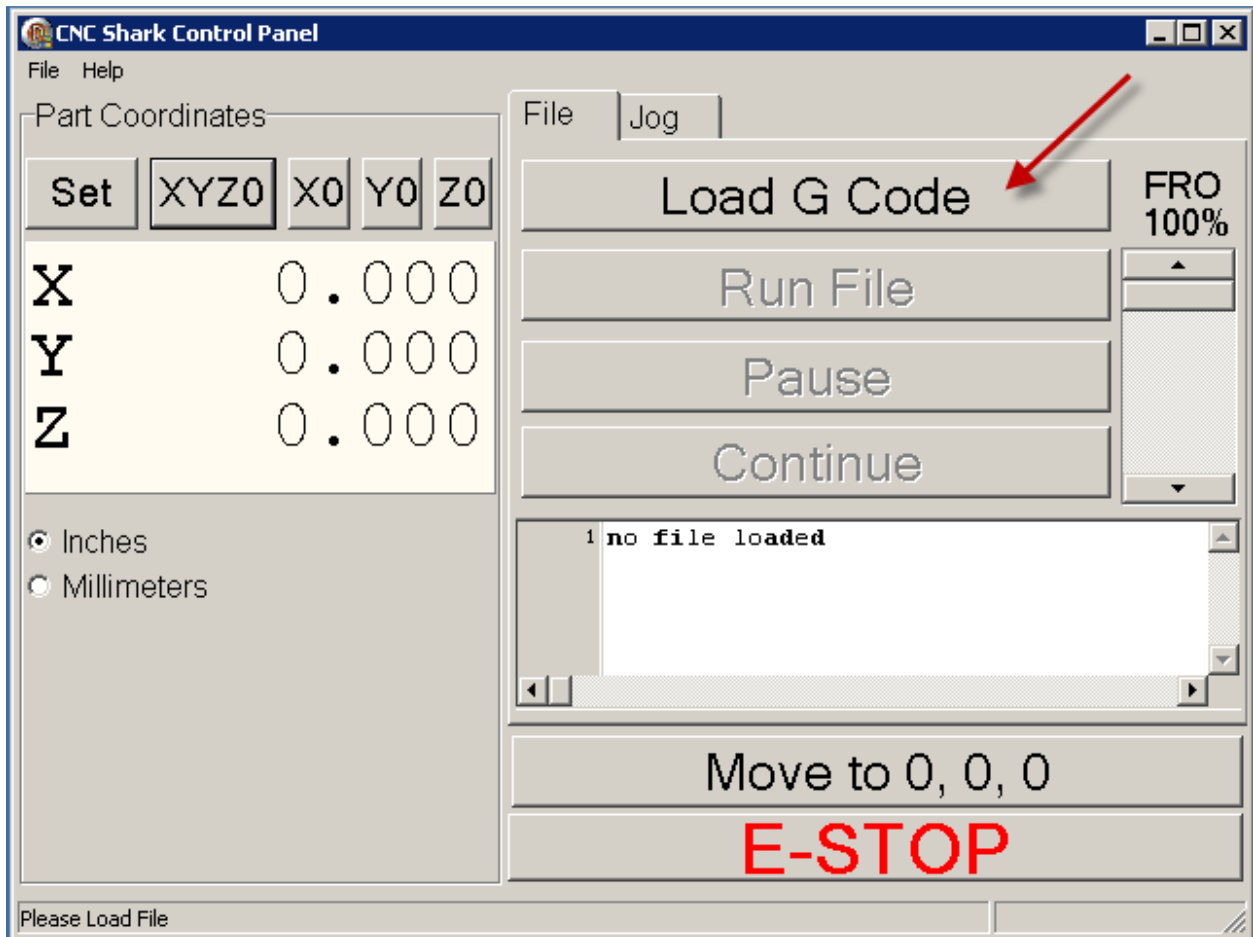


Figure 77 - File Tab, Load G Code

Click on the 'Load G Code' button. An Open dialogue box appears on the screen. Navigate to the CNC Shark folder, Samples folder, and select the square-1in.tap file. Click Open to complete the selection and close the Open dialogue box. You can also double click the file to open it as well.

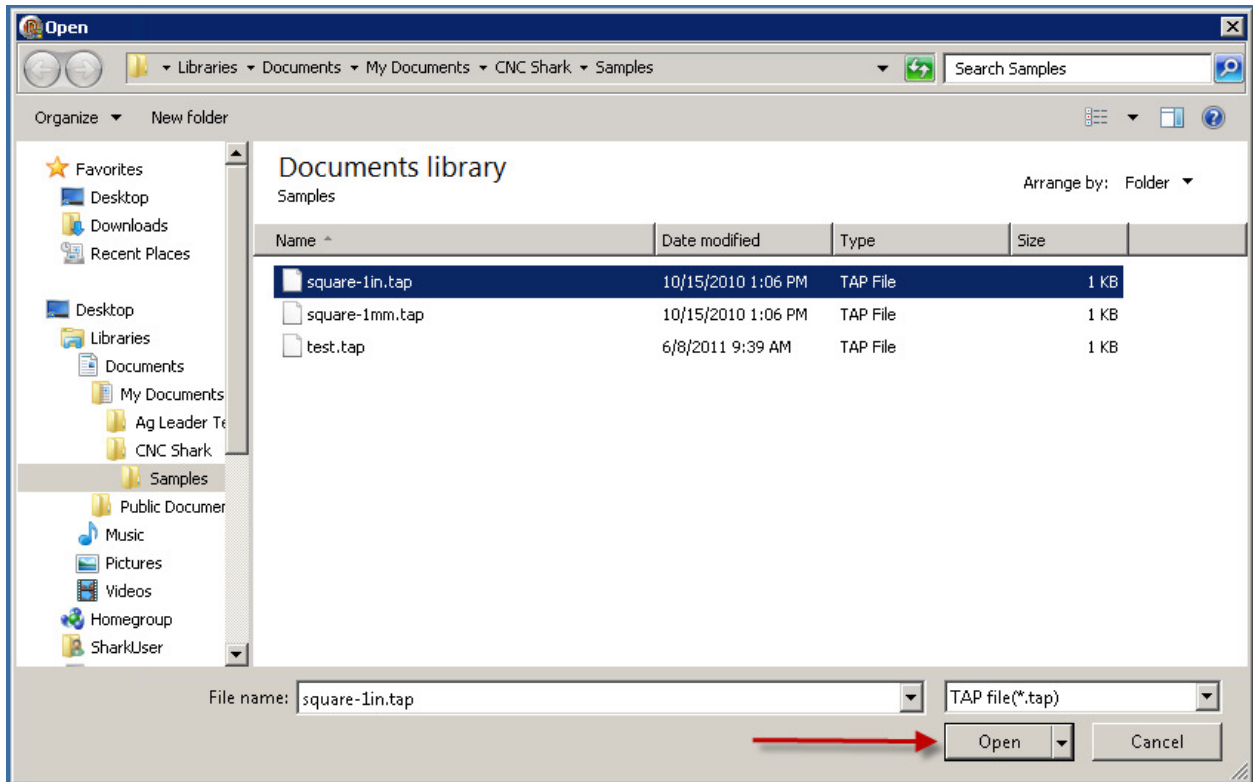


Figure 78 - Toolpath Open Dialogue Box in Windows 7

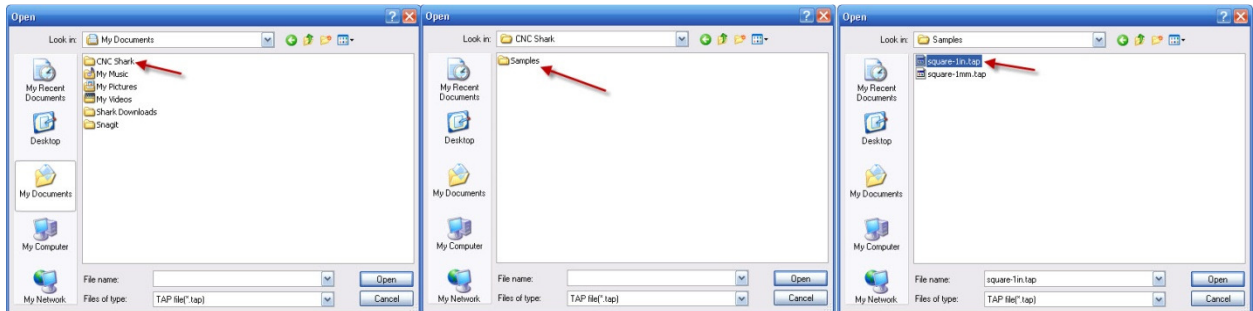


Figure 79 - Toolpath Open Dialogue Box and Sequence of Navigation Steps From Left to Right in Windows XP SP3

At this point, the CNC Shark Control Panel looks as shown in the figure below. This test toolpath will move the gantry down (-) 1 inch in Z, then move along 4 sides of a square, and return the gantry to X0, Y0, and Z0. Note that the 'Run File' button is now enabled (not grayed out), and that the Pause and Continue buttons remained disabled (grayed out).

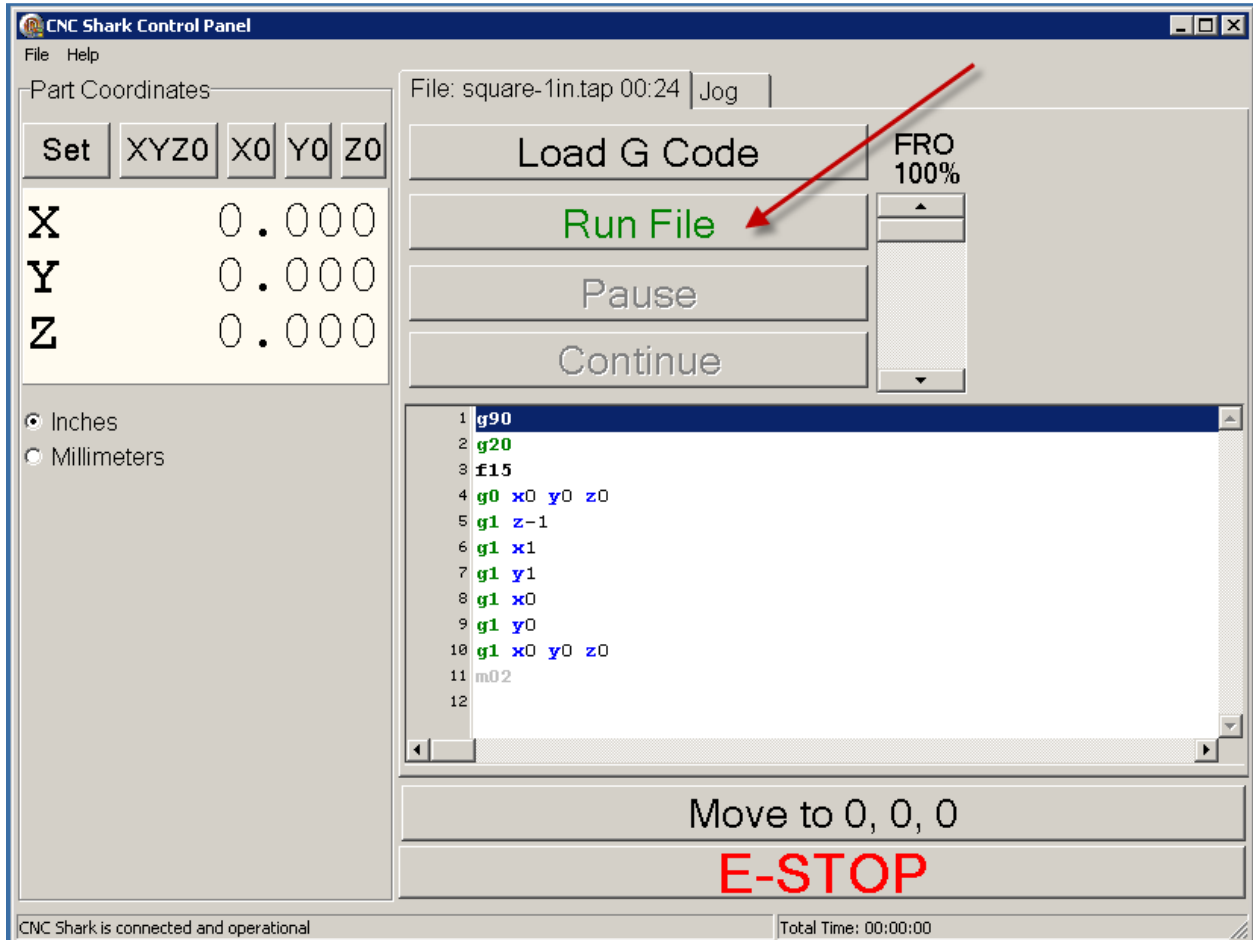


Figure 80 - Toolpath Ready to Run

The router is not needed to be turned on for this test as you can watch it trace the square. You can of course run the router – but ensure that any cutter tool you have mounted is at 2” above the table when you set the Z0.

Remember: You can always select the E-Stop on the CNC Shark Control Panel and stop all movement of the gantry.

Click on the 'Run File' button and the toolpath will be run on the Shark. You will be asked to press the Ok button to begin the program. If you are not ready to run the program, select Cancel.

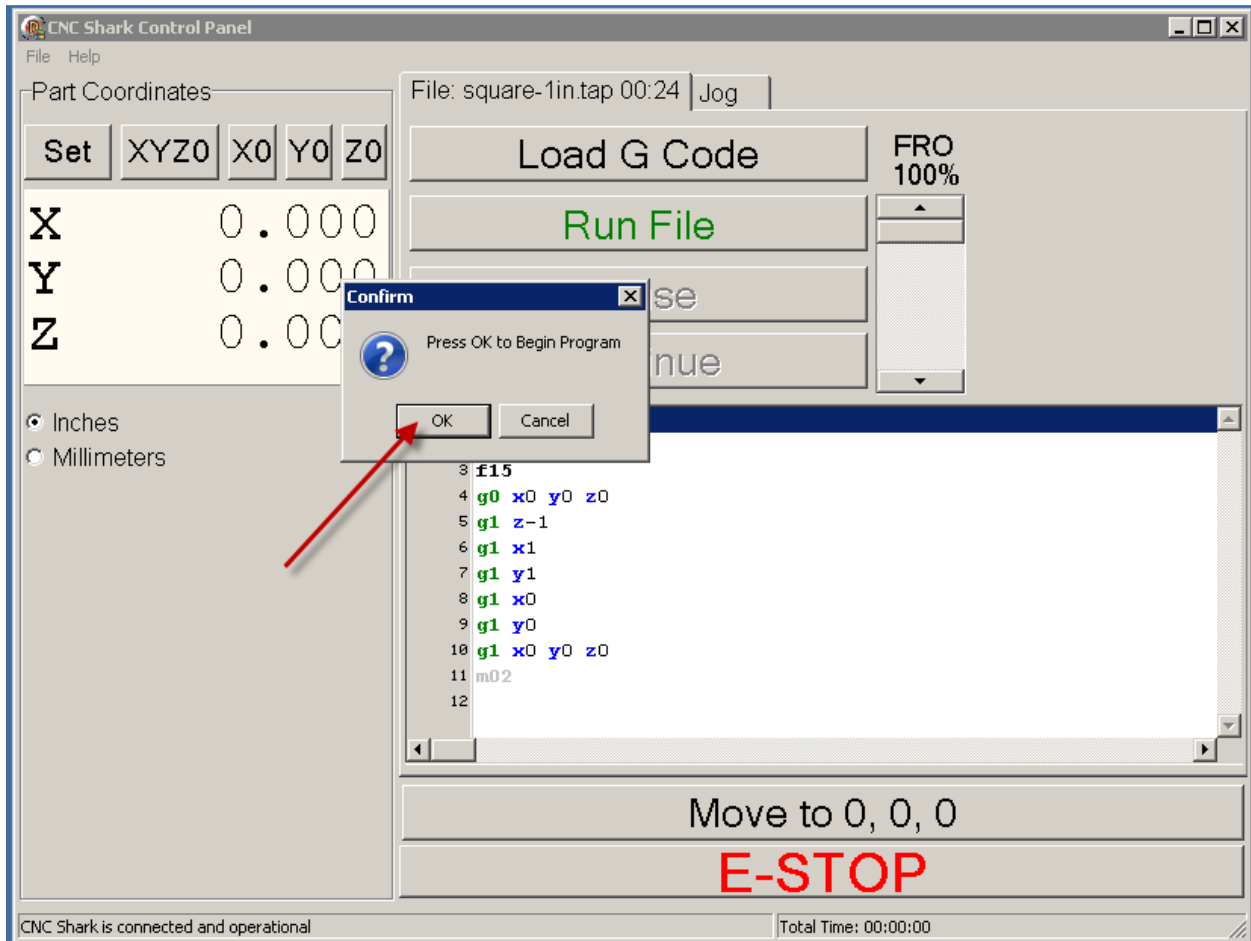


Figure 81 - Run the Program Check

The program is set to a very slow feed rate, so you can watch not only the gantry moving around, but you can see the X, Y and Z locations as reported in the CNC Shark Control Panel. Also note that after hitting the 'Run File' button, only the Pause button is enabled. If you select the Pause button, it becomes disabled and the Continue but is enabled.

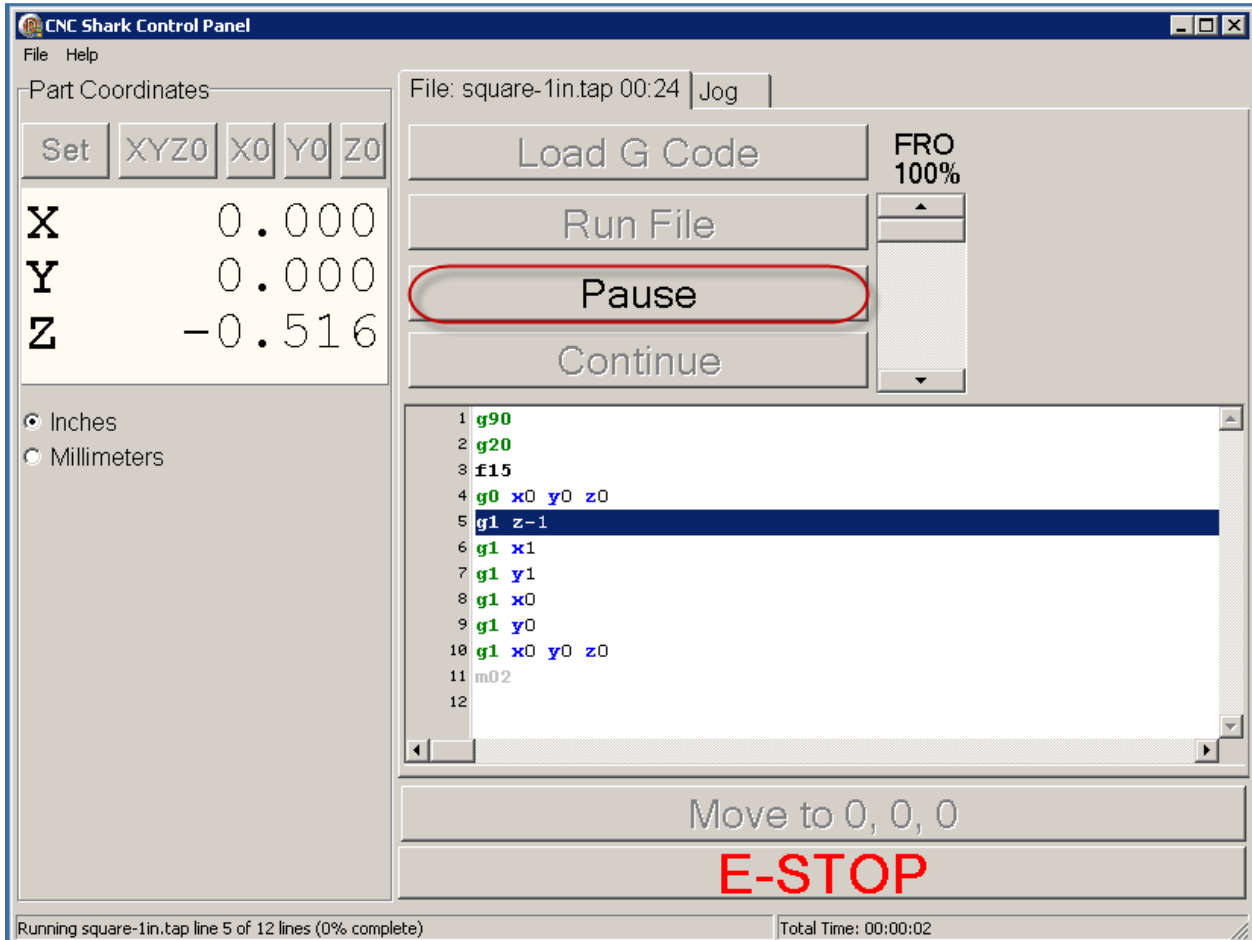


Figure 82 - Pause Button Enabled

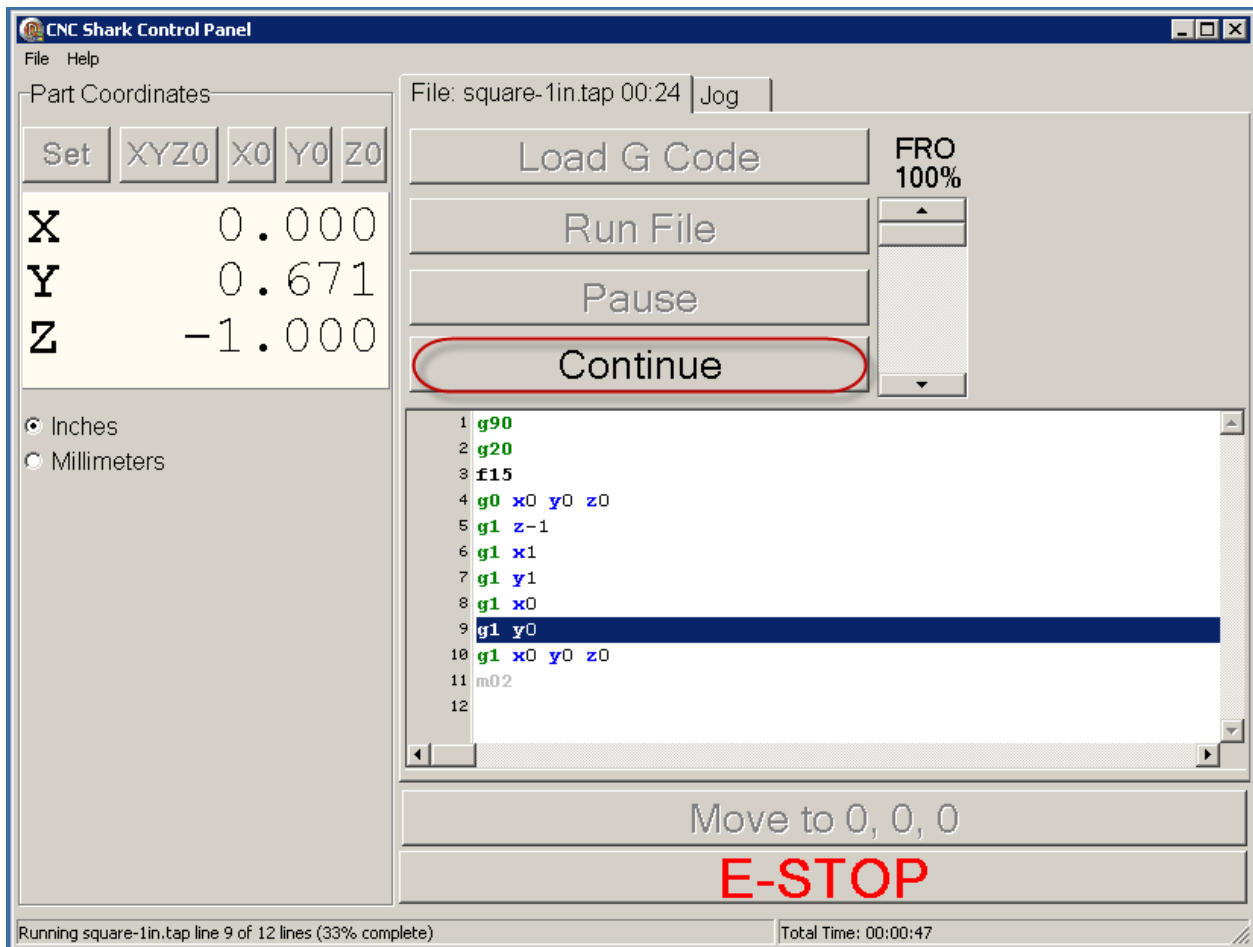


Figure 83 - Continue Button Enabled

When the toolpath is complete, the gantry stops moving, and the 'Load G Code', 'Run File', and 'Move to 0, 0, 0' buttons are once again enabled.

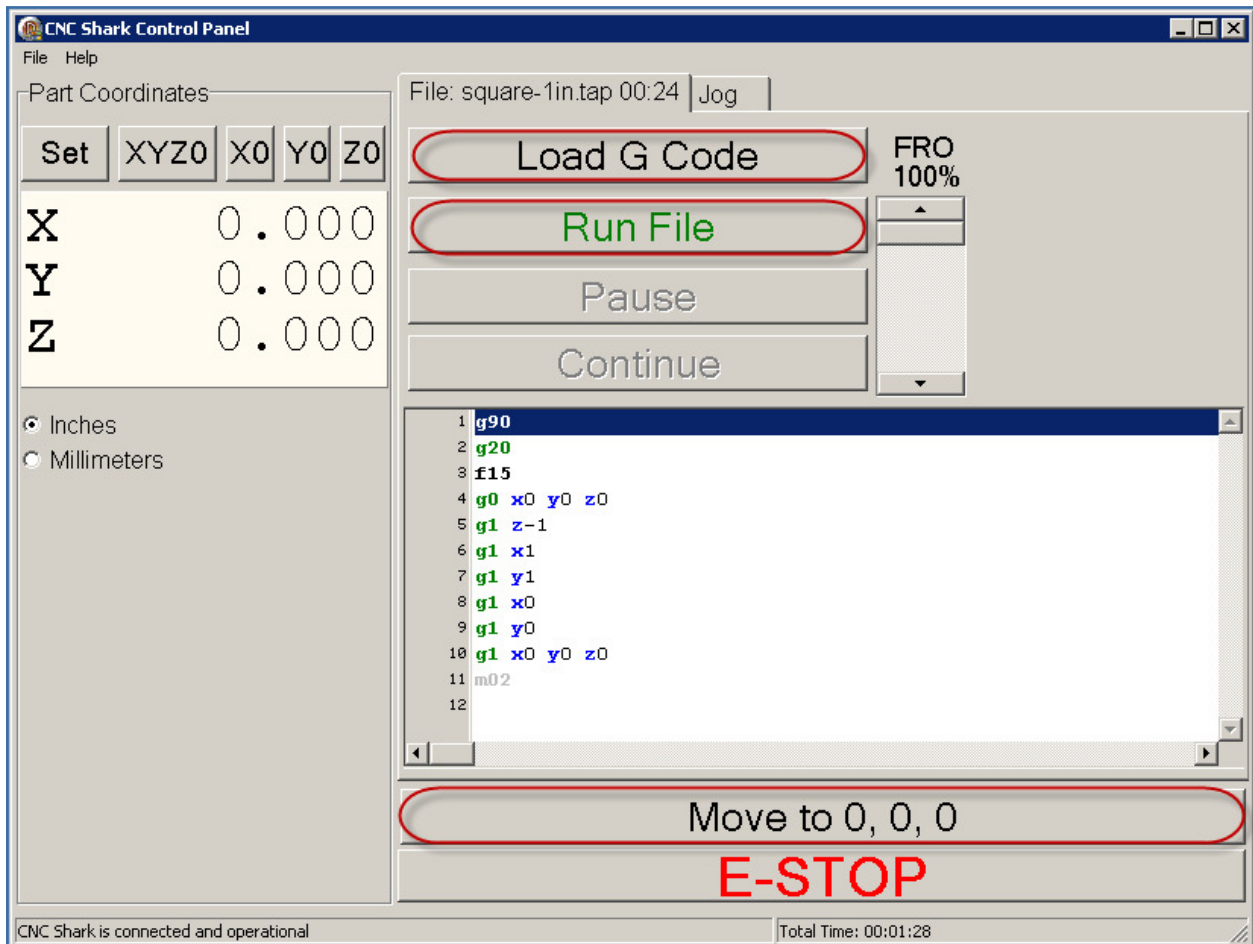


Figure 84 - CNC Shark Control Panel, Toolpath Completed

You can exit the CNC Shark Control Panel. There are two more steps to take to complete the systems check and installation – update the firmware and software registration.

Update the Firmware

Ensure that the CNC Shark Control Panel is closed, but the Shark Control Box is powered on and connected to your computer via the USB cable. Start the CNC Shark Firmware Updater – from the Start, Programs, CNC Shark Control Panel programs group by clicking on the CNC Shark Firmware Updater. The CNC Shark Firmware Updater displays on the screen.

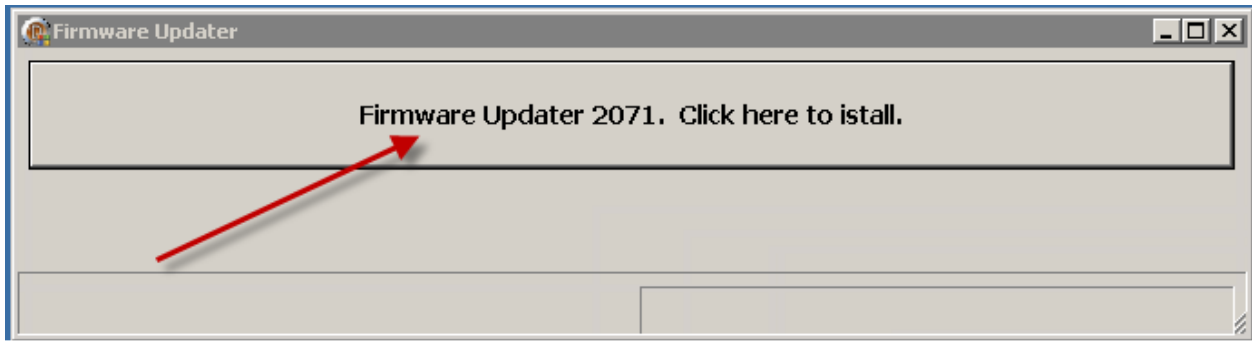


Figure 85 - CNC Shark Firmware Updater

Click on the 'Click here to Start Firmware 2071 Update' button to start the firmware update. The CNC Shark Firmware Updater displays a status bar to indicate the progress of the firmware update.

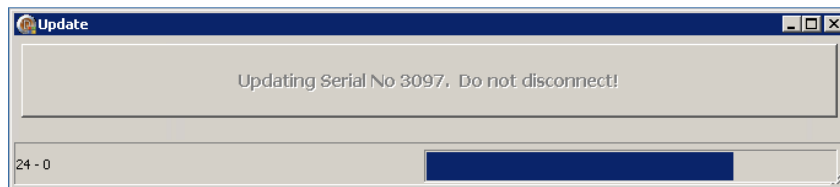


Figure 86 - CNC Shark Firmware Updater - Progress of Update

A new window opens to indicate success. Also note that the status of the firmware update is now present in the lower left corner of the CNC Shark Firmware Updater. Click Ok on the notification window. The notification window and the CNC Shark Firmware Updater will close.

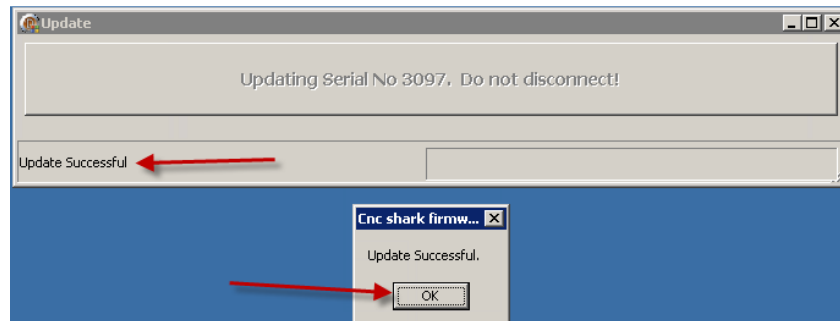


Figure 87 - CNC Shark Firmware Updater – Success

Don't be confused if the file name or version number of the Firmware Updater on the Documents web page is different than that listed in this manual. A difference in name or version number only indicates to you that a new version of the Firmware Updater is available to you.

You have now successfully updated the firmware in your Shark Control Box. There is one last step to complete the systems check and installation – register the software.

CNC Shark Control Panel Registration

Registering the software is a new feature of the CNC Shark Control Panel and Next Wave Automation’s commitment to improving the product and support. The software is fully functional for up to 30 days after installation while registration is pending. This registration process will also be used to enable users quick access to future accessories offered.

There are 3 ways you can register –

- If the computer that is connected to the Shark Control Box via the usb cable is in a network (has access to the internet), you can submit the form from the Control Panel.
- If the computer that is connected to the Shark Control Box via the usb cable is in a network (has access to the internet), you can immediately submit the form from the Control Panel using your default email application
- You can complete the registration form and then save a file to disk, and email the file to registration@nextwaveautomation.com.

In all cases, you will receive an email, at the address you entered while registering, with a Shark Control Panel registration code. That registration code can be used with on any computer/Shark Control Panel system that is connected to the Shark Control Box at the time the registration form was completed and submitted.

There are 2 ways you can open the Registration wizard to register the Shark Control Panel software.

When you start the Shark Control Panel, and it is not registered, a message will appear asking you if you want to Register the Shark Control Panel. Select ‘Yes’ to open the Registration wizard.

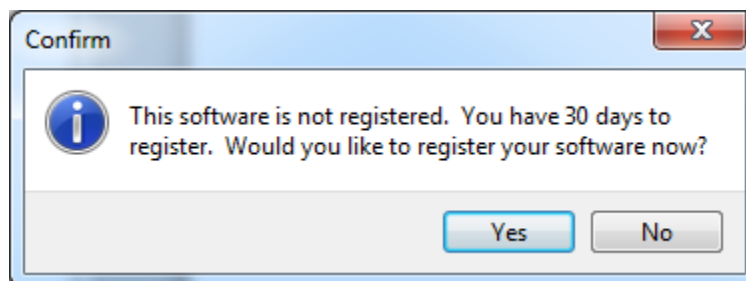


Figure 88 - Control Panel Registration Notice at Start Up

You can also open the Registration wizard from the Shark Control Panel. With the Shark Control Panel open, the Shark Control Box turned on, and a good connection established between the Shark Control Panel and the Shark Control Box (indicated by the ‘Please Load File’

in the lower left corner of the Shark Control Panel) - click on 'Help'. Select 'Register your Next Wave Machine'.

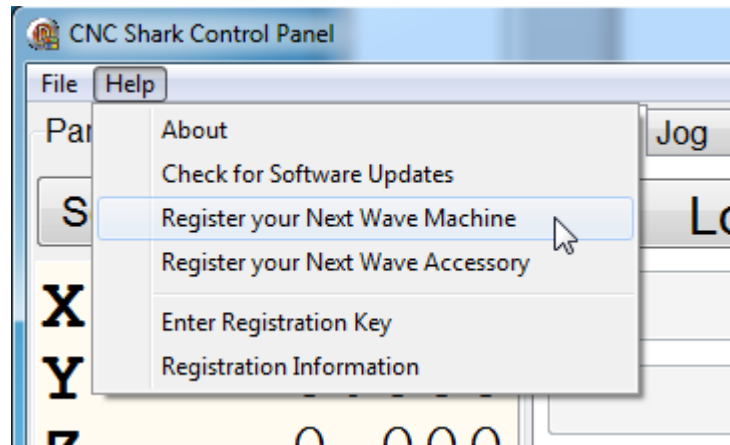


Figure 89 - Register your Next Wave Machine Tool

If the computer is not connected to the Shark Control Box and/or the Shark Control Box does not have power, you will see the message below.

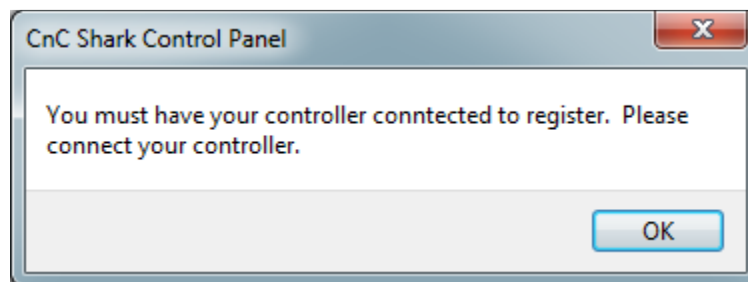


Figure 90 - Not Connected to the Control Box

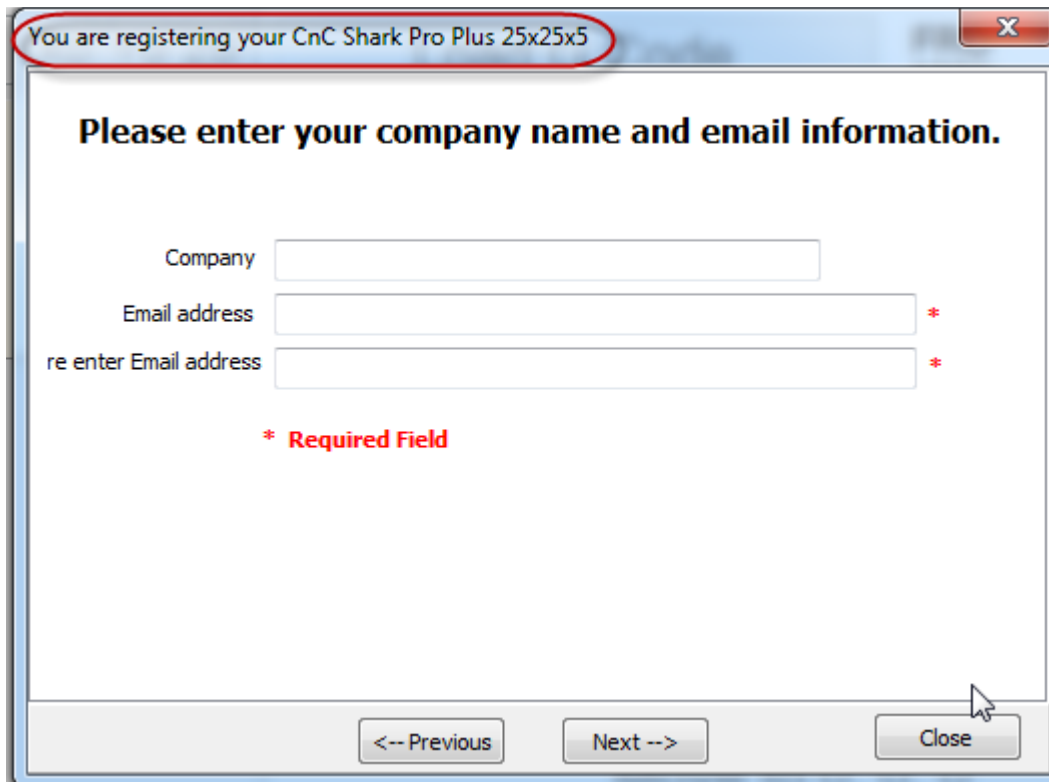
You must connect the Shark Control Box and turn it on. Then repeat the process to open the Registration wizard.

This will open the CNC Shark Product Registration panel. Select the Shark product you want to register.



Figure 91 - Shark Product Registration Selection

When you select 'Next', the Company name and email information panel will open. You must fill in all of the items with a red asterisk. If you don't, when you hit 'Next', an error message will appear prompting you to complete the form and try again. Also note that at this point the panel title bar is indicating the model of the Shark machine you selected to register. Be sure to use the email address that you want to receive the registration key.



The screenshot shows a software window titled "You are registering your CnC Shark Pro Plus 25x25x5". The main content area contains the instruction "Please enter your company name and email information." followed by three input fields: "Company", "Email address", and "re enter Email address". Each of the last two fields has a red asterisk to its right. Below the fields is a legend: "* Required Field". At the bottom of the window are three buttons: "<-- Previous", "Next -->", and "Close".

Figure 92 - Registration Wizard Company Name and Email Address

When you select 'Next' the Owner and Location information panel opens. You must fill in all of the items with a red asterisk. If you don't, when you hit 'Next', an error message will appear prompting you to complete the form and try again.

You are registering your CnC Shark Pro Plus 25x25x5

Please tell us who you are and where you live.

First Name *

Last Name *

Country *

Province

Address *

Address 2

City * State * Zipcode *

* Required Field

<-- Previous Next --> Close

Figure 93 - Registration Owner Name and Address Information

When you select 'Next' you are asked how you want to submit the registration.

- If the computer you are using is connected to the internet, and you want to submit the Registration directly to the Next Wave Automation server, select 'Submit'.
- If the computer you are using is connected to the internet, and you want to email the Registration file, select 'Email Registration to Next Wave'. This will open up your default email application and create an email message. You can add any text you desire and hit 'Send'.
- If the computer you are working on is not connected to the internet, select the 'Save Registration Info to Local File'. This will open up a file save dialogue box. Save the file to a location you will remember. You'll then email that file to register@nextwaveautomation.com as an attachment.



Figure 94 - Registration Submission

You will receive a registration key in the email. To enter this, click on 'Help', then 'Enter Registration Key'.

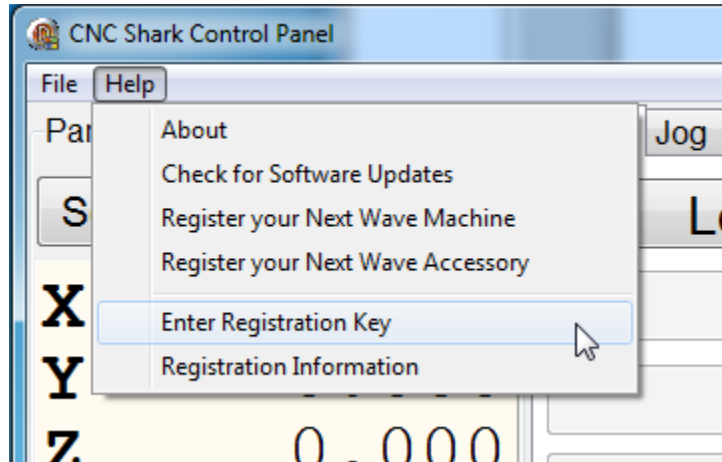


Figure 95 - Enter Registration Key Tool

This will open the Enter Registration Key panel. Enter in the Registration Key you received in the email, and click on the 'Set' button.

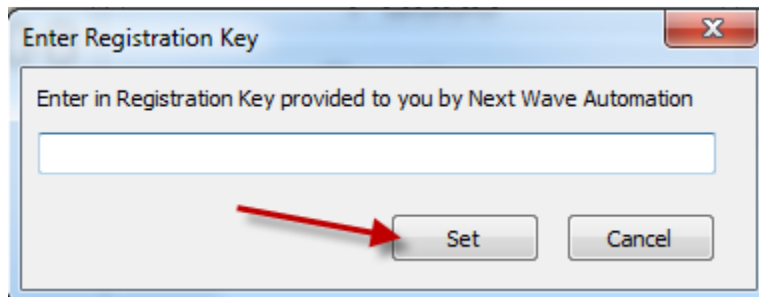


Figure 96 - Enter Registration Key Panel

Your software is now registered for use with your Shark Control Box. This same mechanism is used to register Shark accessories.

You can check to see if the Shark Control Panel is registered in 2 ways.

You can select Help, About – resulting in the display of the About screen. The panel will indicate if the software is registered or not.



Figure 97 - Shark Control Panel About Screen - Software Not Registered



Figure 98 - Shark Control Panel About Screen - Software is Registered

You can also go to Help, and select 'Registration Information'.

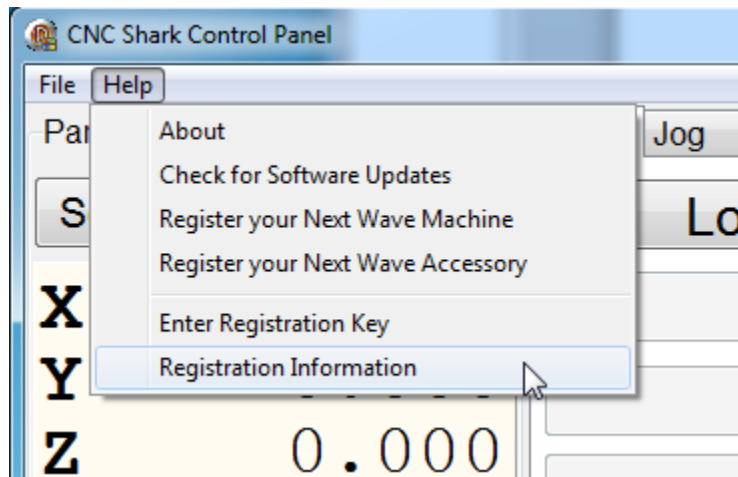


Figure 99 - Registration Information Tool

This will open the Registration Information panel. This displays all registration codes that you have entered.

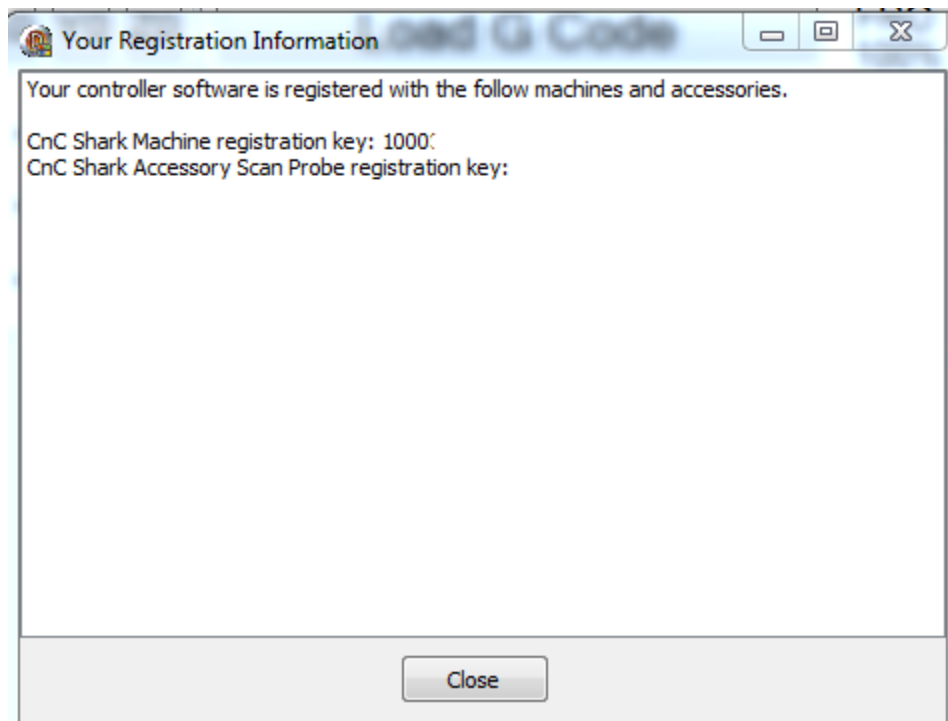


Figure 100 - Registration Information Panel

You may want to perform an initial lubrication of the Shark at this point. See the Maintenance section of this manual for recommendations on how to perform this task.

This also completes the systems check of your new CNC Shark setup – congratulations!

CNC Shark Accessory Registration

Registering the Shark Accessories is a new feature of the CNC Shark Control Panel and Next Wave Automation’s commitment to improving the product and support. The software is fully functional for up to 30 days after installation while registration is pending. This registration process will also be used to enable users quick access to future accessories offered.

There are 3 ways you can register –

- If the computer that is connected to the Shark Control Box via the usb cable is in a network (has access to the internet), you can submit the form from the Control Panel.
- If the computer that is connected to the Shark Control Box via the usb cable is in a network (has access to the internet), you can immediately submit the form from the Control Panel using your default email application
- You can complete the registration form and then save a file to disk, and email the file to registration@nextwaveautomation.com.

In all cases, you will receive an email, at the address you entered while registering, with a Shark Control Panel registration code. That registration code can be used with on any computer/Shark Control Panel system that is connected to the Shark Control Box at the time the registration form was completed and submitted.

Scan probes are now shipped with a serial number identified in the packaging. If you are a current owner of a scan probe, or a new owner and did not receive this information, send an email to registration@nextwaveautomation.com to obtain one. The Control Panel’s Scan function is fully unlocked for 30 days.

To register your Shark Accessory, open the Registration wizard from the Shark Control Panel. With the Shark Control Panel open, the Shark Control Box turned on, and a good connection established between the Shark Control Panel and the Shark Control Box (indicated by the ‘Please Load File’ in the lower left corner of the Shark Control Panel) - click on ‘Help’. Select ‘Register your Next Wave Accessory’.

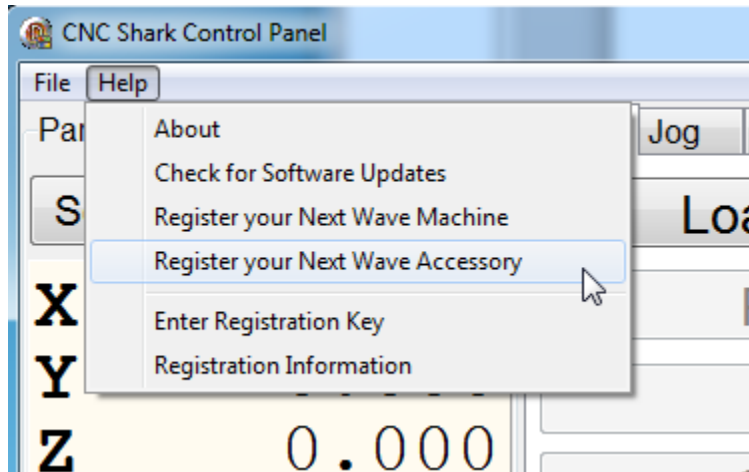


Figure 101 - Register your Next Wave Accessory Tool

If the computer is not connected to the Shark Control Box and/or the Shark Control Box does not have power, you will see the message below.

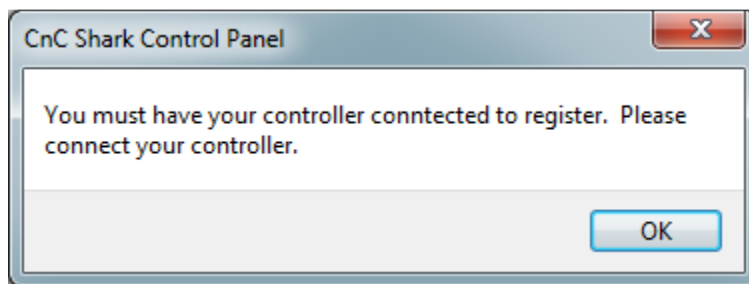


Figure 102 - Not Connected to the Control Box

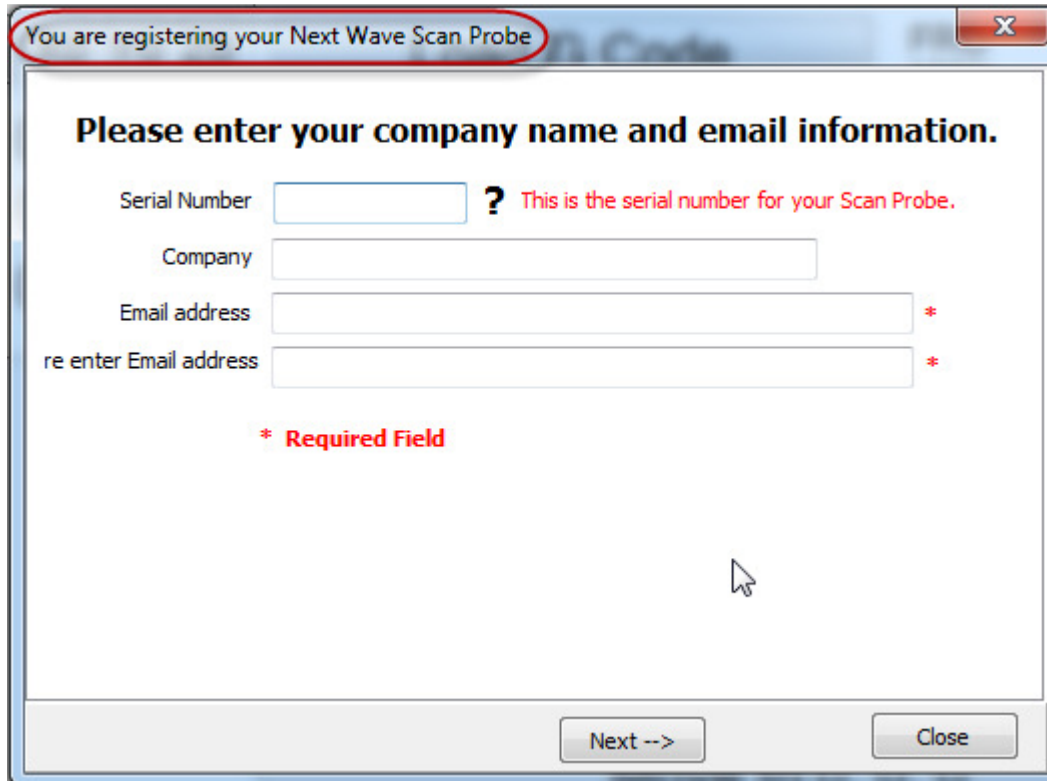
You must connect the Shark Control Box and turn it on. Then repeat the process to open the Registration wizard.

This will open the CNC Shark Registration panel. Select the Shark product you want to register.



Figure 103 - Shark Accessory Registration Selection

When you select 'Next', the accessory serial number, company name and email information panel will open. You must fill in all of the items with a red asterisk. If you don't, when you hit 'Next', an error message will appear prompting you to complete the form and try again. Also note that at this point the panel title bar is indicating the Shark accessory you selected to register. Be sure to use the email address that you want to receive the registration key.



The image shows a registration wizard window titled "You are registering your Next Wave Scan Probe". The main heading is "Please enter your company name and email information." Below this, there are four input fields: "Serial Number" (with a red question mark and the text "This is the serial number for your Scan Probe."), "Company", "Email address", and "re enter Email address". The "Email address" and "re enter Email address" fields have a red asterisk to their right. A legend below the fields states "* Required Field". At the bottom of the window, there are two buttons: "Next -->" and "Close".

Figure 104 - Registration Wizard Accessory Serial Number, Company Name and Email Address

If you enter a serial number that is not valid, a message box will open indicating an incorrect entry. Select 'OK' and re-enter the serial number.

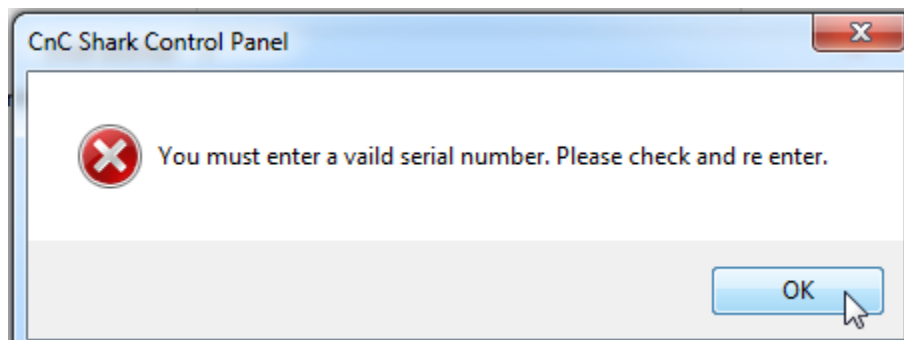
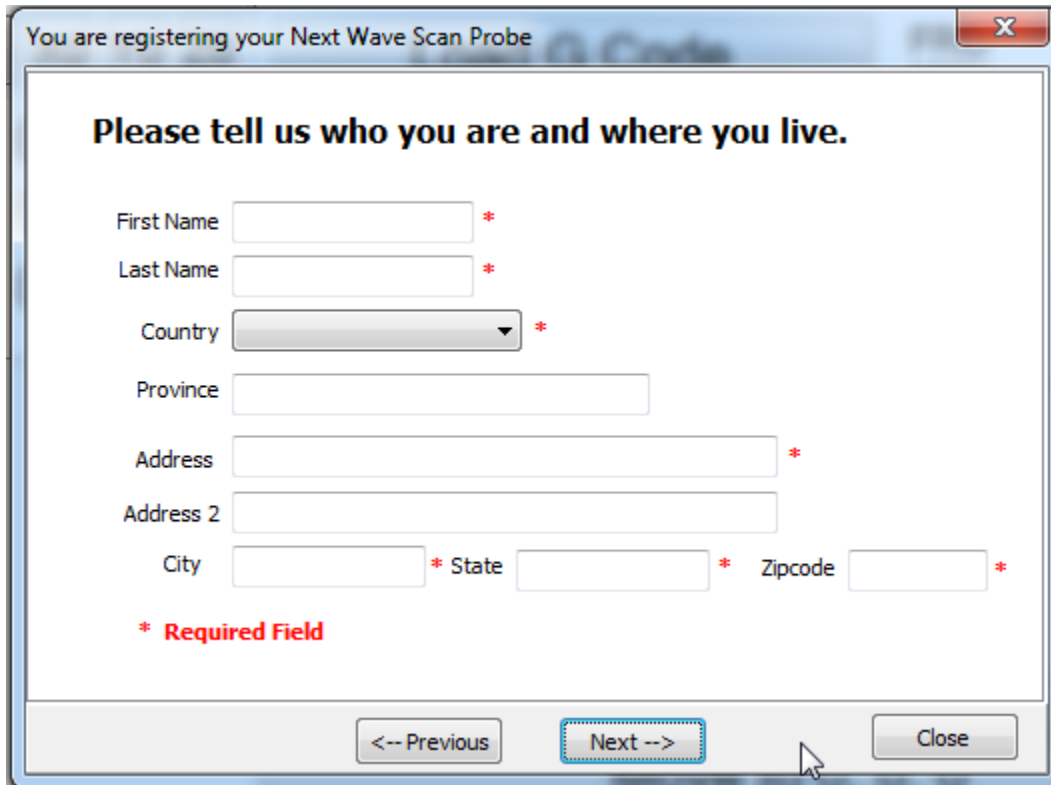


Figure 105 - Invalid Serial Number Entered Message

When you select 'Next' the Owner and Location information panel opens. You must fill in all of the items with a red asterisk. If you don't, when you hit 'Next', an error message will appear prompting you to complete the form and try again.



The image shows a software registration window titled "You are registering your Next Wave Scan Probe". The window contains a form with the heading "Please tell us who you are and where you live." The form fields are: First Name (text input, required), Last Name (text input, required), Country (dropdown menu, required), Province (text input), Address (text input, required), Address 2 (text input), City (text input, required), State (text input, required), and Zipcode (text input, required). A legend below the fields indicates that a red asterisk (*) denotes a "Required Field". At the bottom of the window, there are three buttons: "<-- Previous", "Next -->" (which is highlighted with a blue dashed border), and "Close".

Figure 106 - Registration Owner Name and Address Information

When you select 'Next' you are asked how you want to submit the registration.

- If the computer you are using is connected to the internet, and you want to submit the Registration directly to the Next Wave Automation server, select 'Submit'.
- If the computer you are using is connected to the internet, and you want to email the Registration file, select 'Email Registration to Next Wave'. This will open up your default email application and create an email message. You can add any text you desire and hit 'Send'.
- If the computer you are working on is not connected to the internet, select the 'Save Registration Info to Local File'. This will open up a file save dialogue box. Save the file to a location you will remember. You'll then email that file to register@nextwaveautomation.com as an attachment.

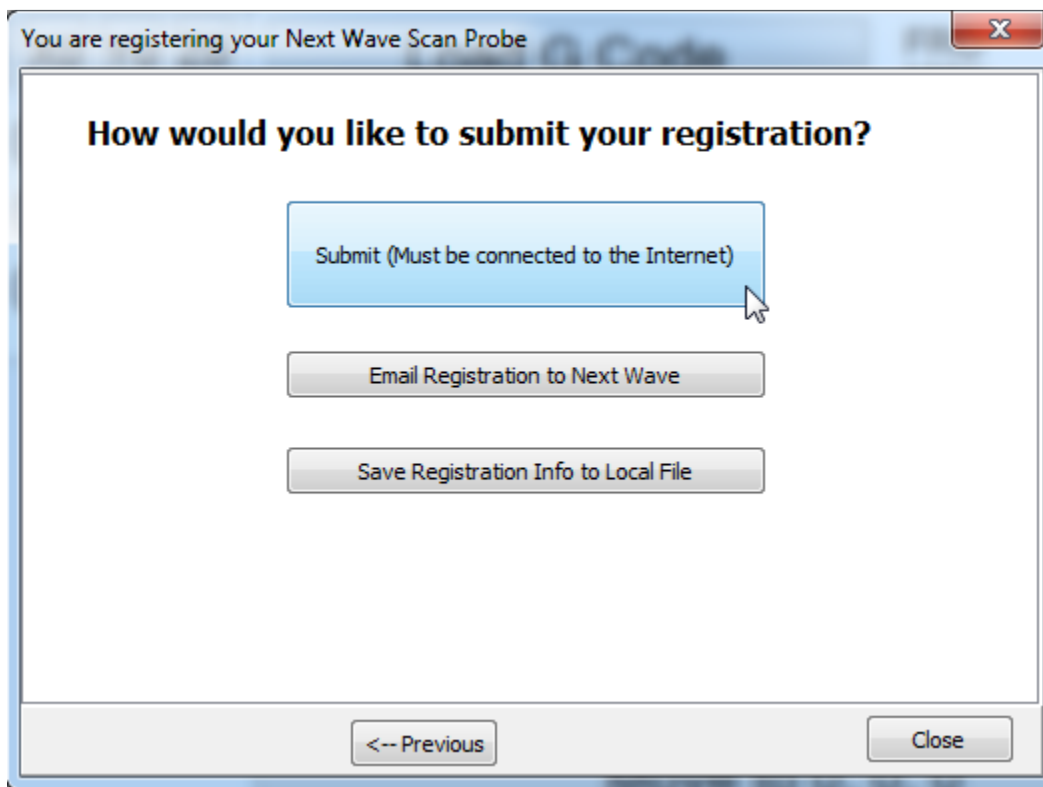


Figure 107 - Registration Submission

You will receive a registration key in the email. To enter this, click on 'Help', then 'Enter Registration Key'.

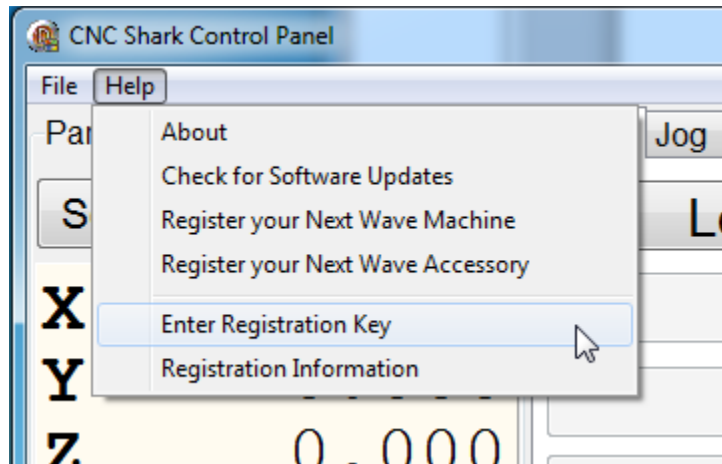


Figure 108 - Enter Registration Key Tool

This will open the Enter Registration Key panel. Enter in the Registration Key you received in the email, and click on the 'Set' button.

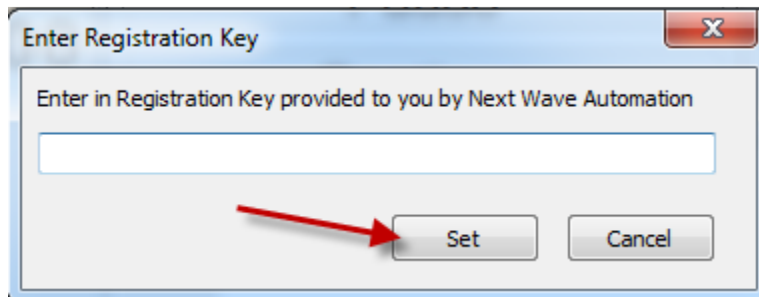


Figure 109 - Enter Registration Key Panel

You must submit a registration request for your Shark machine and each accessory. For example, if you want to register the Shark Control Panel and the Shark Scan Probe, you would perform the registration process twice, selecting 'Register your Next Wave Machine' for one, and 'Register your Next Wave Accessory' for the second submission. In this case, you would receive 2 separate registration numbers to enter and thus complete the registration/licensing process. As new features are added, you would submit a registration for the new feature purchased, receive the registration code via email, and enter that registration code to complete registration of the feature.

Remember that the email address you submit will be the one where the registration code is sent.

You can check to see that the registration code is 'set' by going to Help, and select 'Registration Information'.

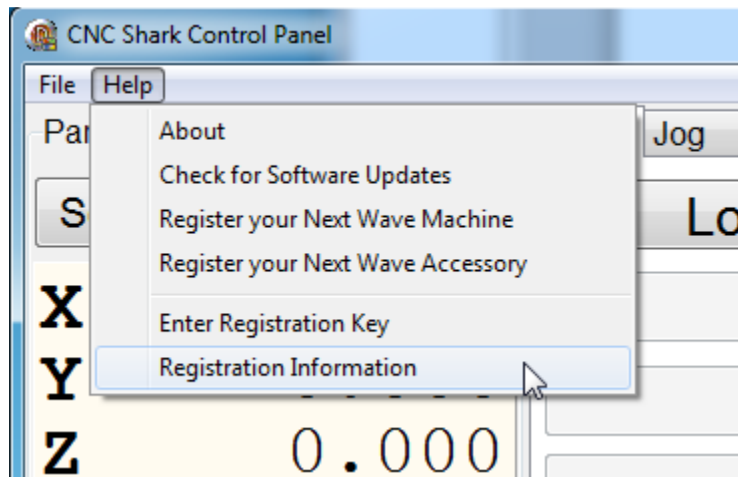


Figure 110 - Registration Information Tool

This will open the Registration Information panel. This displays all registration codes that you have entered.

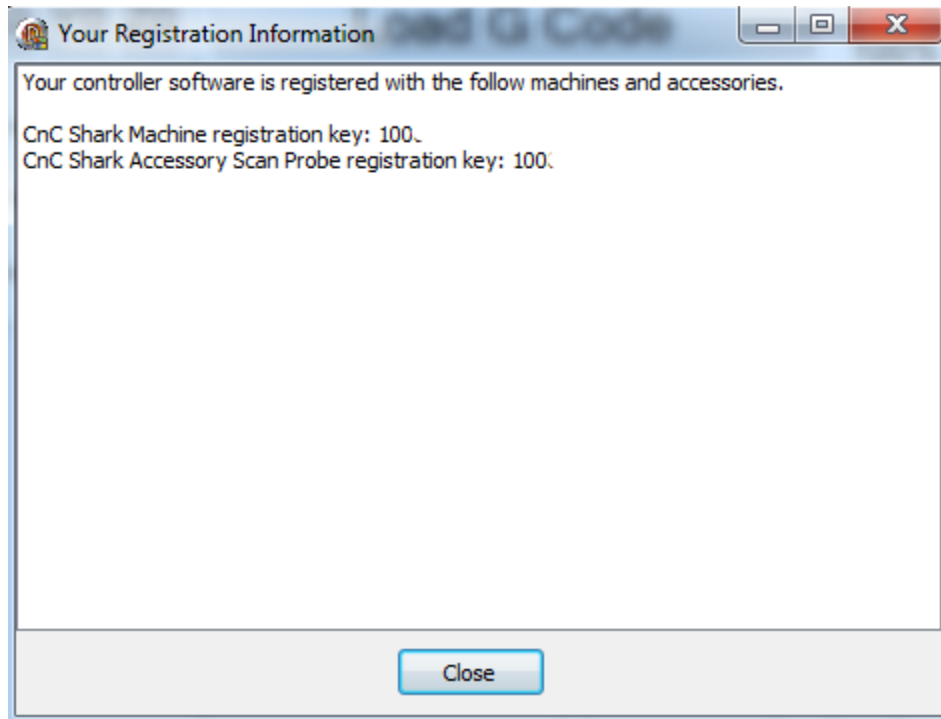


Figure 111 - Registration Information Panel Machine and Scan Probe Accessory Registered

CNC Shark Control Panel

The CNC Shark Control Panel is used to control the CNC Shark. It does this by sending instructions to the Shark Control Box via the USB cable. These instructions include a toolpath, commands to move or jog the gantry, set the cutter tool X, Y and Z zero, running a toolpath (job), pausing the job, continuing the job, and stopping the job.

Control Panel Layout

The CNC Shark Control Panel's layout has 7 distinct areas:

- An E-STOP button along the lower right half of the panel
- A Move to 0, 0, 0 button above the E-STOP button
- A toolbar in the upper left corner.
- A File Controls and Jog Controls panel on the right side of the UI.
 - The File and Jog tabs control which of these two sub-panels are displayed in this area of the UI.
- A Tool Coordinate panel on the left side of the user interface (UI).
- A Control Box Status box in the lower left hand corner
- A Total Time status in the bottom center

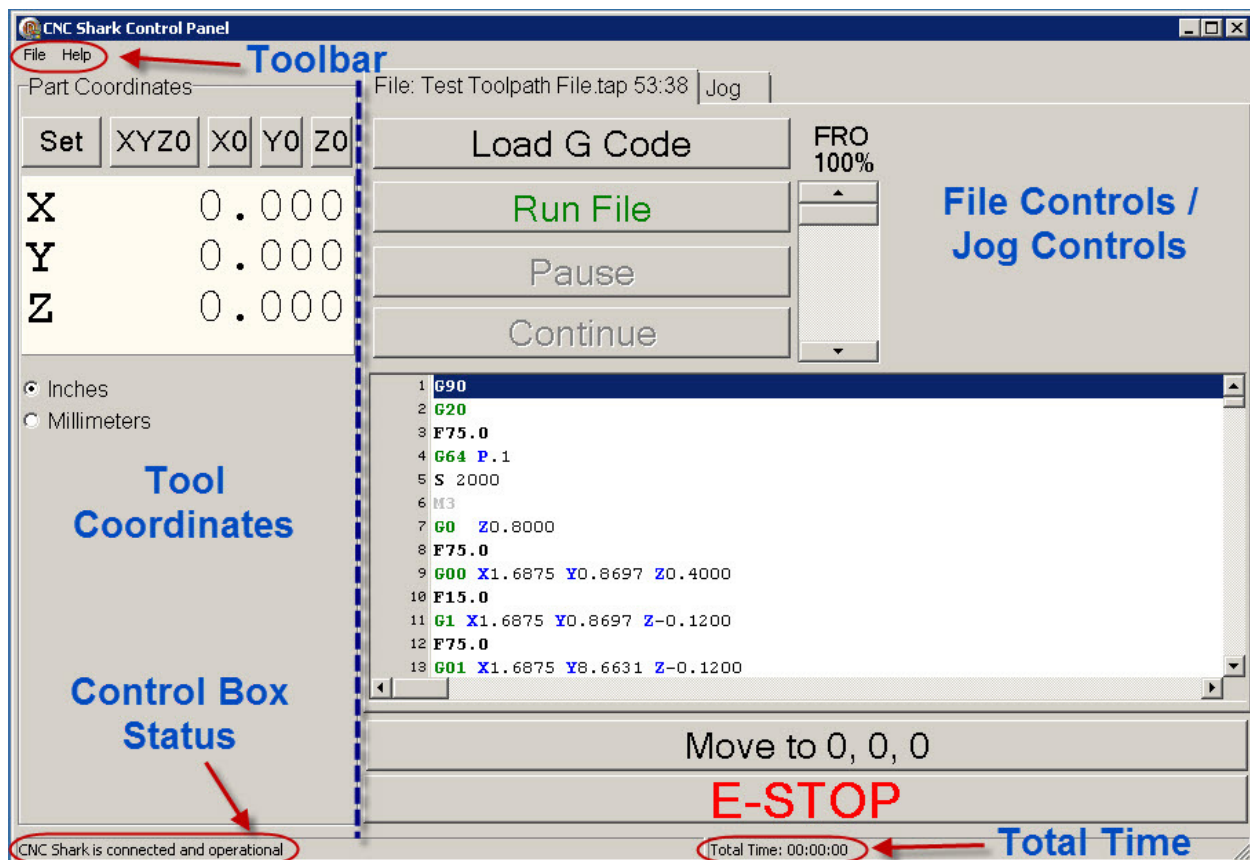


Figure 112 - CNC Shark Control Panel Layout

E-Stop

The E-STOP control (Emergency Stop) is one of 2 methods to shut down any gantry movements. In the case of the CNC Shark Pro Plus and CNC Shark Pro Plus HD where the router is also plugged into the Shark Control Box, clicking the E-STOP will also shut off the router. The E-STOP is always available on the CNC Shark Control Panel, regardless of whether you are using the File Controls or Jog Controls.

EMERGENCY STOP – 2nd Method – The other method you have available to quickly stop the Shark from running is:

- **CNC Shark and Shark Pro – Stopping power by switching off the power strip that the Shark Power Supply and router are plugged into.**
- **CNC Shark Pro Plus and Shark Pro Plus HD – Engaging the red E-STOP button on the enhanced Shark Control Box.**

Whenever you use the E-STOP, you should ensure that you use the Jog Panel to raise the cutter tool Z to a positive value before using the 'Move to 0, 0, 0' control button in the File Control panel to move the cutter tool back to the XYZ0 position. This will ensure that the tool doesn't drag itself over the material or into a clamp while moving back to XYZ0.

Toolbar

The toolbar has two components – File and Help.

From the File tool, you can Load G Code (a toolpath file (*.tap)), set Preferences, and Exit (close) the CNC Shark Control Panel. You can also load the toolpath from the File Controls panel, 'Load G Code' button.

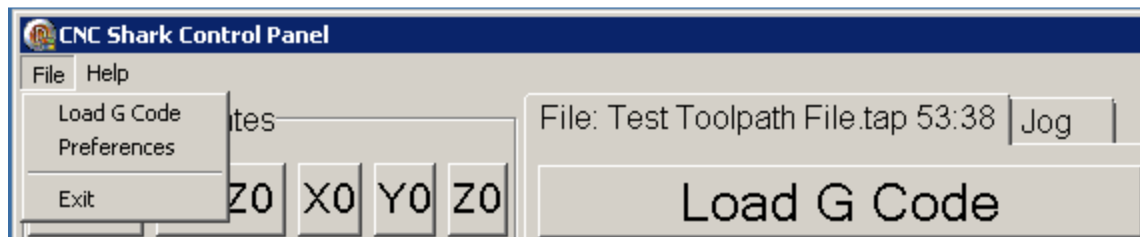


Figure 113 - File Tool Tasks

The Preferences panel enables you to set some parameters in the Control Panel.

- **Default Step Value** – you can set a value that you want the Step function in the Jog panel to start out with first use.
- **Border Check Prompt** – this feature will work with information in the tap file to enable you to choose – by checking the box – to have the software ask you if you'd like to run a border check before running the job. The border check will move the tool around the edge of the material at a safe height, enabling you to visually ensure that any clamps or

jig components in use will not be hit during the job. (Note: This function is not yet available at the time of the publication of this version of the CNC Shark Family Owner's Manual – leave this unchecked.)

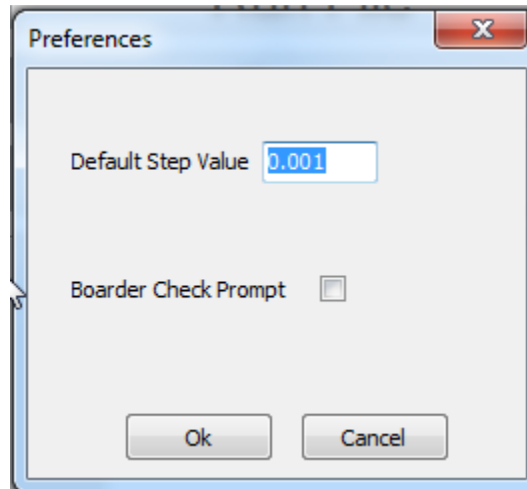


Figure 114 - Preferences Panel

After making any changes to the Preferences, hit 'OK'. These settings will take effect the next time you open the Shark Control Panel. If you want to use these settings immediately, close the Shark Control Panel and re-open it.

The Help tool enables you to check the version of the CNC Shark Control Panel you are using, and to Register your CNC Shark with Next Wave Automation.

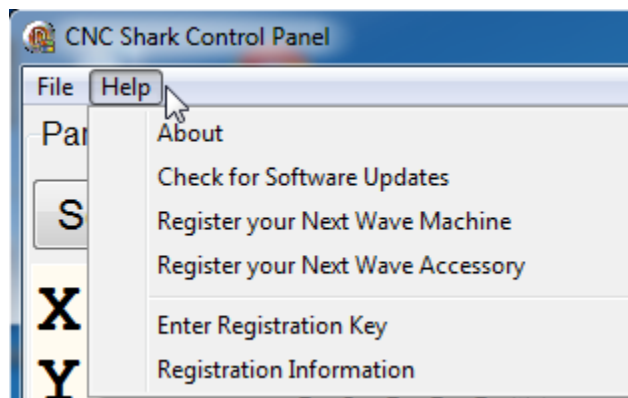


Figure 115 - Help Tool Tasks

When you click on the About button, a window pops up with information about the version of the CNC Shark Control Panel, the identification number and model number of the Shark Control Box you are using, and has URLs that you can click on that will open a web browser to the Next

Wave Automation site, and the Next Wave Automation Store. The window will also indicate if the software has been registered or not.



Figure 116 - CNC Shark Control Panel About Screen - Unregistered



Figure 117 - CNC Shark Control Panel About Screen - Registered

You can select the 'Check for Software Updates' tool to see if a new version of software is available. This requires that the computer is connected to a network (has internet access).

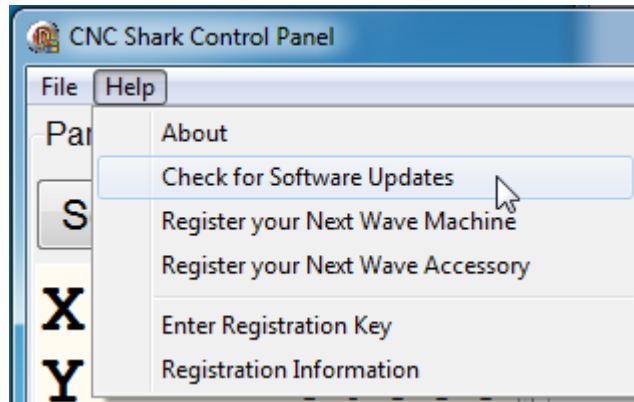


Figure 118 - Check for Software Updates

A message box will appear indicating whether your software is current or not. If it is not current, a link will be provided that you can click on. This will open your default web browser at the Next Wave Automation Downloads page.

The registration tasks – Register your Next Wave Machine, Register your Next Wave Accessory, Enter Registration Key, and Registration Information - are described in a previous section to this manual.

The Check for Software Updates enables you to check while connected to the internet to see if a new version of the Shark Control Panel is available.

Move to 0, 0, 0

This control is used to move the cutter tool to the current X0, Y0, Z0 position. This control is disabled (grayed out) when a toolpath (tap) file is loaded, and when a job is running. The gantry will move in a direct line from where it is currently located to the XYZ0 location.

Be mindful that when you use this command, the gantry will move in a direct line to the XYZ0. If you've stopped the job at a spot where the tool is lower than the top of the material, you may find that the tool is running into the material during this move. In this case, you should use the Jog command to raise the tool to a reasonable distance above the material before using the Move to 0, 0, 0 command. Likewise, you may find that from the current position of the tool, this direct line will run the tool into a clamp or jig component that otherwise would not have been run into while running the job.

Like the E-STOP button, the Move to 0, 0, 0 button is always available, regardless of whether you have the File or the Jog panel open.

File Controls Panel

The File Control Panel is used to control all aspects of loading and running a toolpath. There are 6 controls on the File Control Panel:

- Load G Code – this is used to load the toolpath (tap) file. This control is disabled (grayed out) when a job is running.
- Run File – this is used to start the job. This control is enabled (not grayed out) only when a toolpath (tap) file is loaded. This control is disabled (grayed out) when a job is running.
- Pause – this is used to pause the job execution. This control is enabled (not grayed out) only when a job is running and not paused.
- Continue – this is used to continue job execution when the job has been paused. This control is only enabled (not grayed out) when a job has been Paused.
- FRO – the Feed Rate Override (FRO) slider controls the Shark Control Box's handling of the feed rate that is set in the toolpath (tap) file. For example, if the feed rate in the toolpath is 100 ipm, and you need to slow that down as you are now working with a different material that requires a slower feed rate, you can use the FRO slider to run at 75% - which would result in the toolpath feed rate of 75 imp. This would enable you to use the existing toolpath (tap) file for cutting different material types and densities without going back to VCarve Pro, changing settings, and regenerating a new toolpath (tap) file. You can also adjust the FRO while a job is running.

When you click on the 'Load G Code' button, an Open file dialogue box opens.

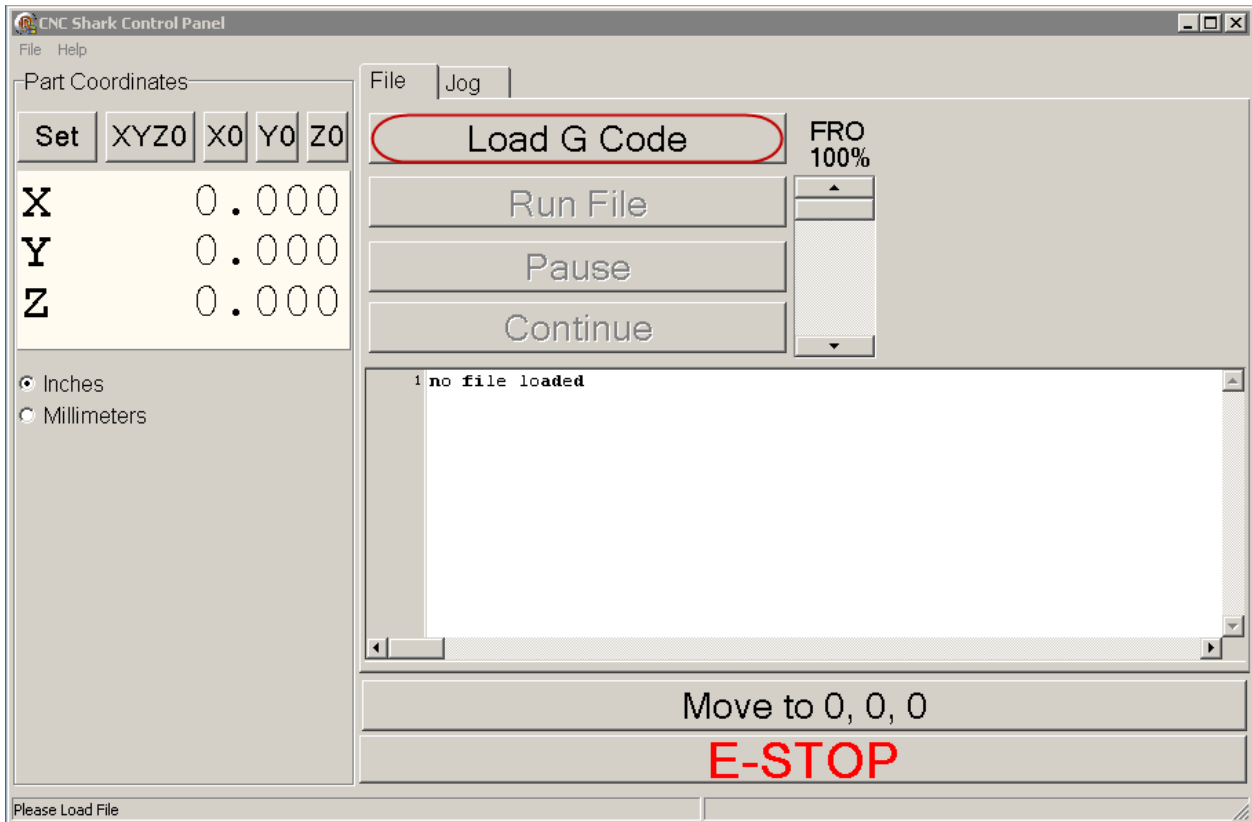


Figure 119 - File Control Panel - Load G Code

Navigate to the location on disk where you saved the toolpath (tap) file. Click on the file, and then click on Open. You can also double click on the tap file and it will open without having to use the Open button.

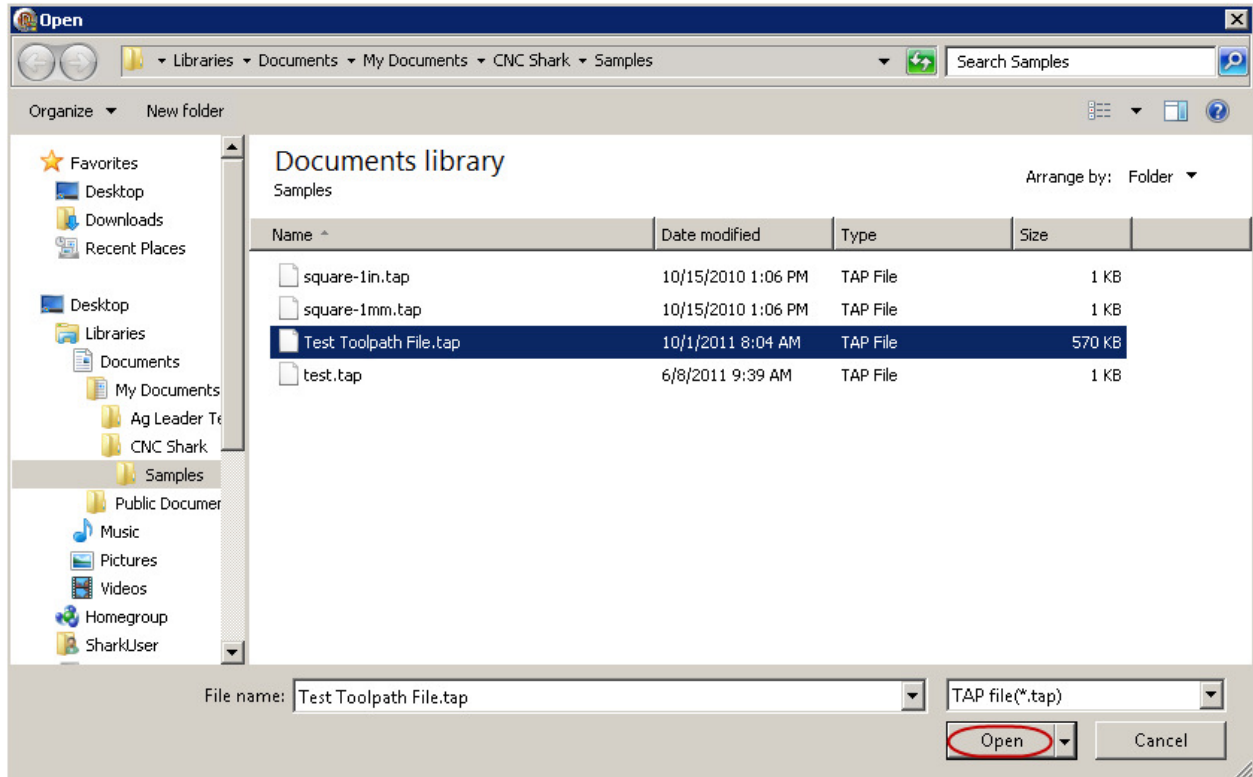


Figure 120 - File Open Dialogue

Note that all of the File control buttons are disabled (grayed out) while the toolpath file is loading. Also note that the Control Panel Status bar is indicating the progress of the toolpath loading.

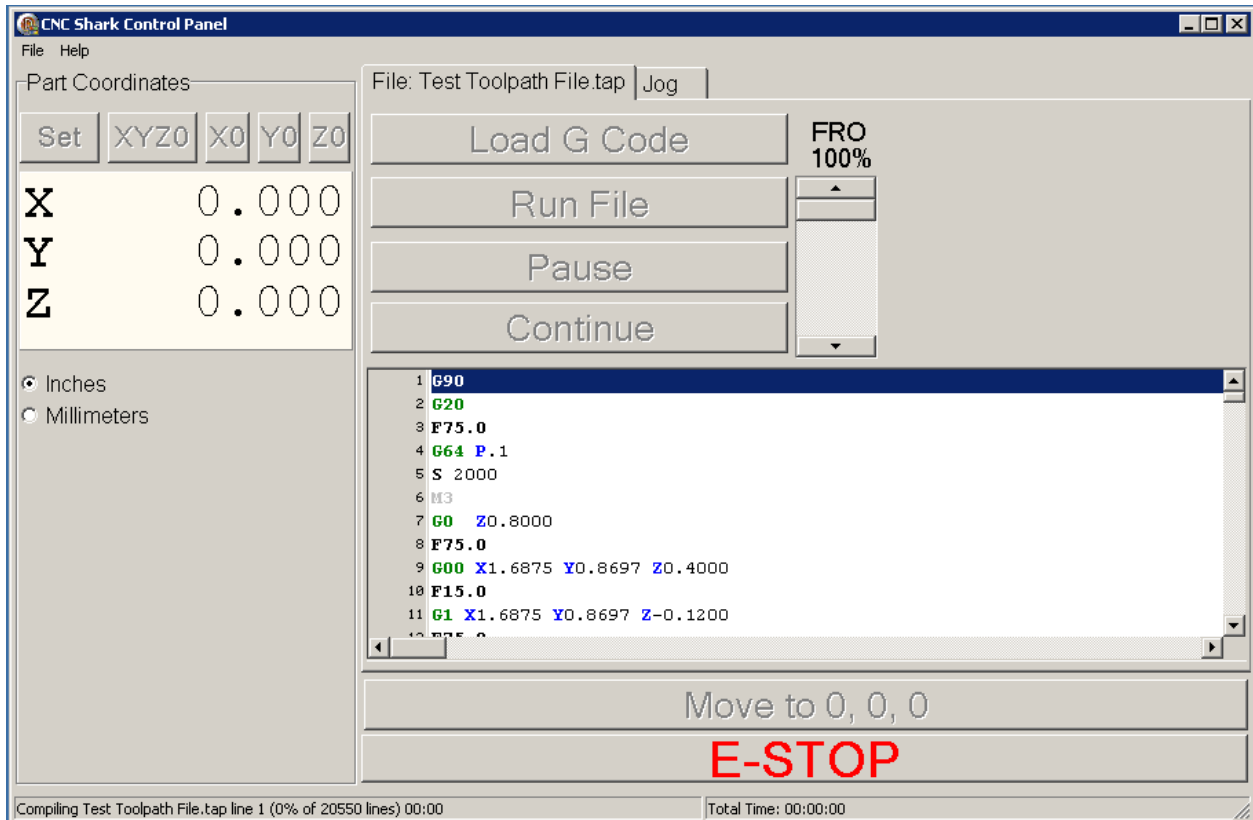


Figure 121 - Toolpath (tap) File Loading

After the toolpath is fully compiled (loaded) onto the Shark Control Box, the Control Panel Status bar states that the “CNC Shark is connected and operational”, and the ‘Run File’ control button is active (not grayed out).

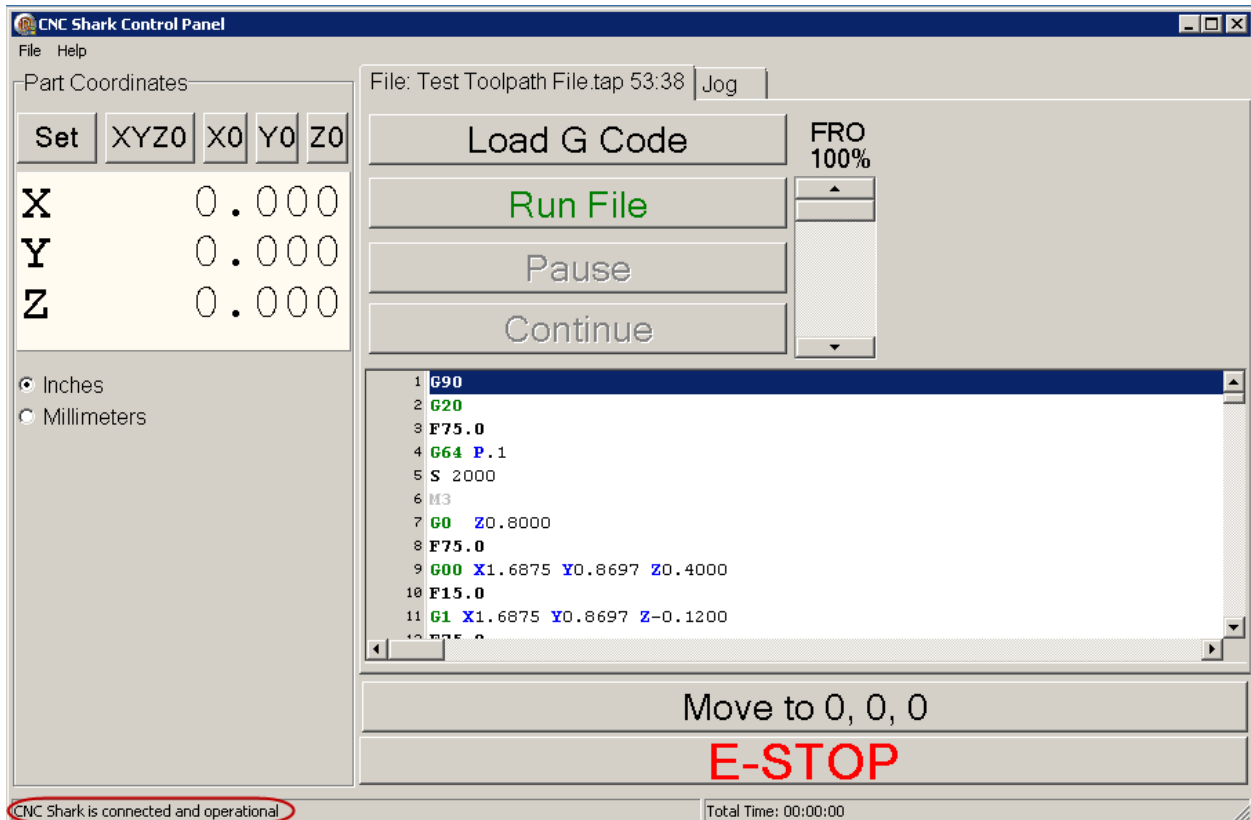


Figure 122 - File Control Panel - Toolpath Compiled and Ready to Run

Before running the toolpath, it is a good idea to position the cutter tool to X0, Y0, Z0. It is not required to do this. The figure below shows the outcome after clicking on the 'Move to 0, 0, 0' control button. The cutter head is positioned at X0, Y0, Z0.

Before using the 'Move to 0, 0, 0' control button in the File Control panel to move the cutter tool back to the XYZ0 position, you should check the anticipated travel path of the gantry and cutter tool. You may want to raise the cutter tool in Z in some situations before using the 'Move to 0, 0, 0' control button. The gantry will move the cutter tool to the XYZ0 position in the most direct, linear route from its current position. Eyeballing the anticipated travel path and making any necessary jogs of the gantry prior to using the 'Move to 0, 0, 0' control will ensure that the tool doesn't drag itself over the material or into a clamp while moving back to XYZ0.

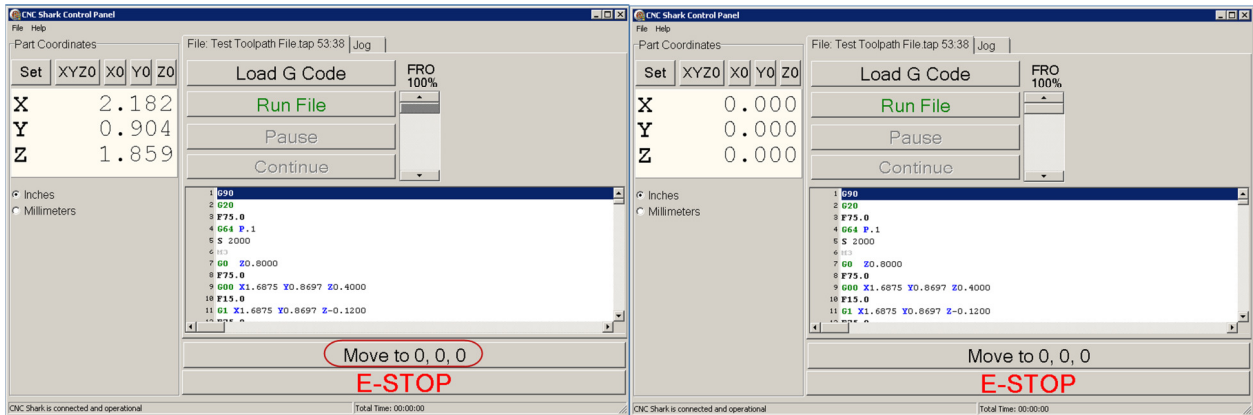


Figure 123 - Using the Move to 0, 0, 0 Control Button to Position To XYZ0

Click on the 'Run File' control button to start the job.

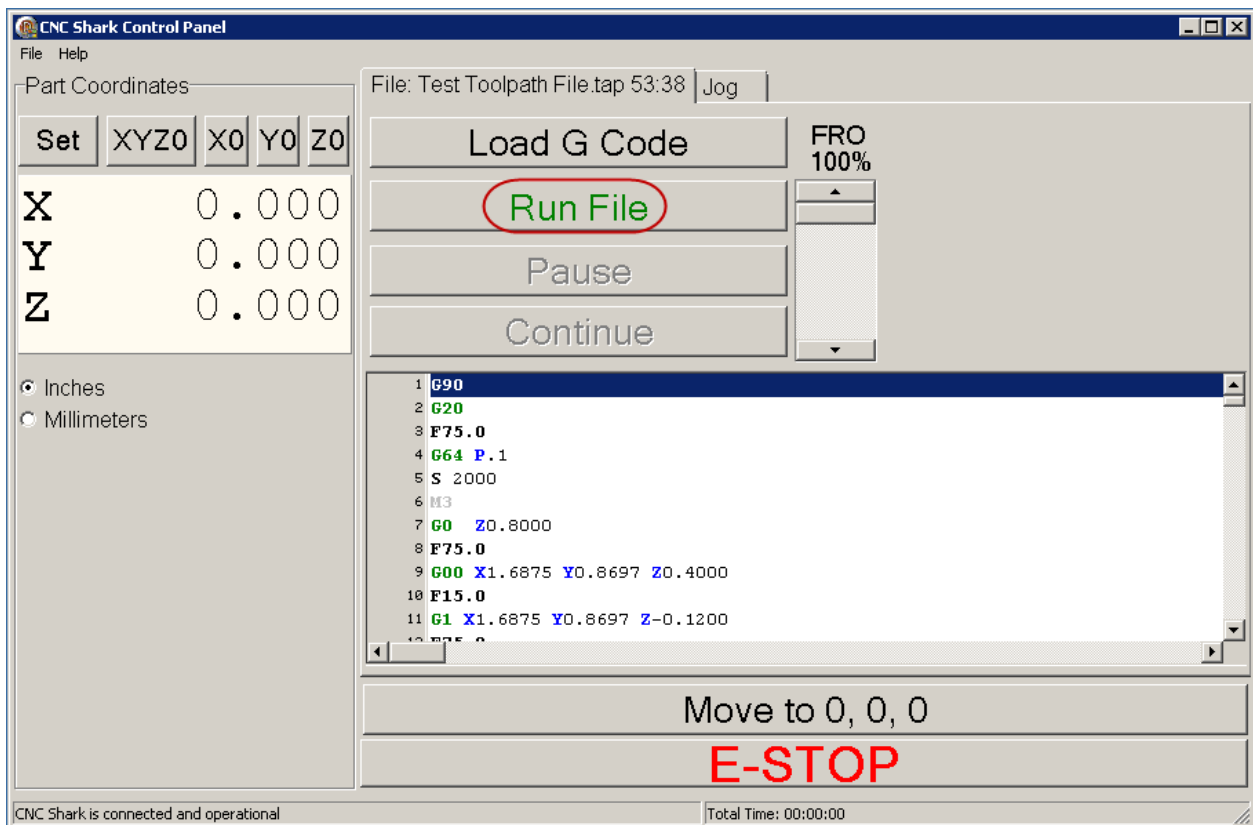


Figure 124 - Run File Control Button

A Confirm box opens to ensure that you want to run this job (and didn't accidentally stroke the 'Run File' button). Select OK to run the job or Cancel to stop the job from running at this point.

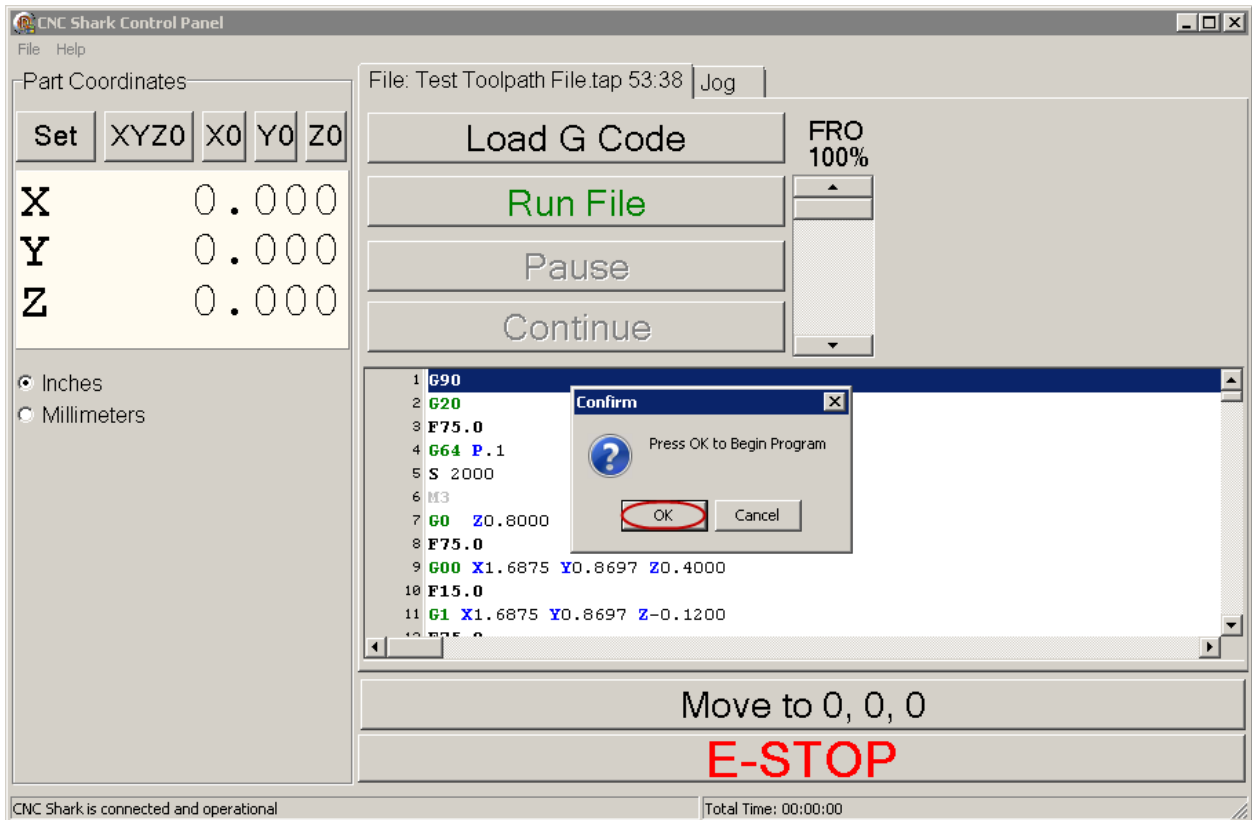


Figure 125 - Confirm Run File

After hitting 'OK', you will notice that the cursor is snapped to the Pause button. This is an aide – if you need to pause the job quickly, the cursor is placed in the right position for you to do this (without 'finding' the cursor and then possibly having to move it over the Pause button).

While the job is running, all of the control buttons but the Pause and FRO are disabled (grayed out). You can adjust the FRO at any time while the job is running. Click on the Pause button to momentarily stop the job from running. The router will continue to run. Note that the Control Box Status is presenting information on the current tap file line and job completion percentage. The Total Time indicator is now calculating the total time the Shark has been running a job this session. Also note that the cutter tool's position relative to XYZ0 is posted in the Part Coordinates panel as the job runs.

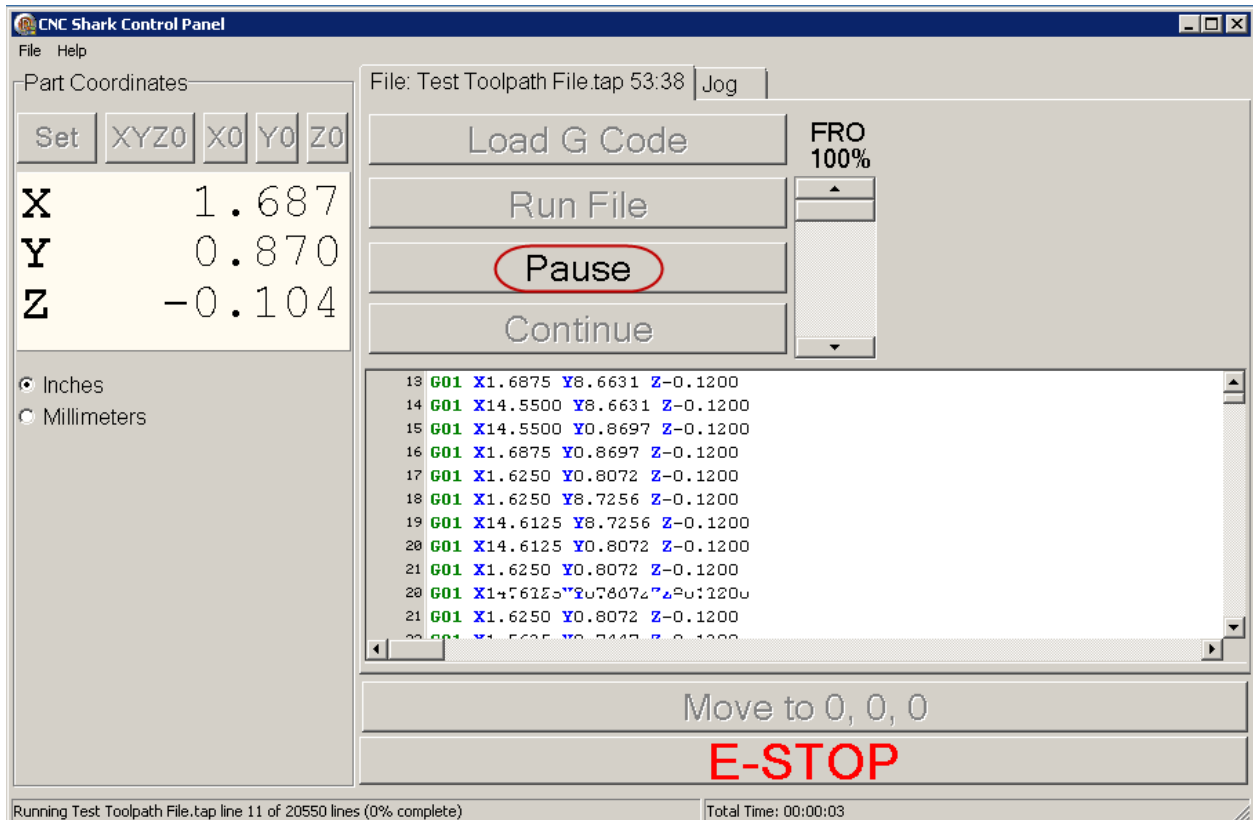


Figure 126 - Pause the Job

When the job is paused, the only File Control Panel buttons enabled (not grayed out) are the Continue and FRO. Click on the Continue button when you are ready to proceed with the job from the point that you paused it.

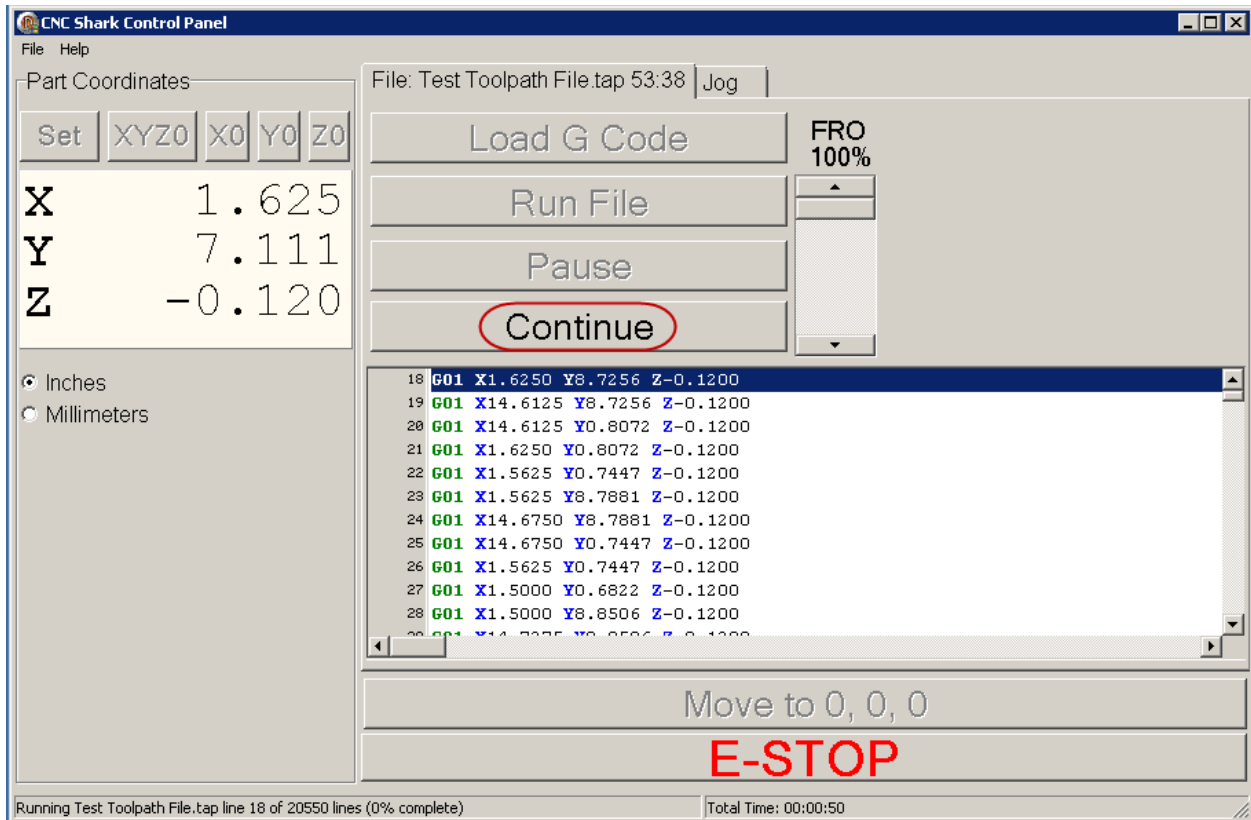


Figure 127 - Continue the Job

When a job is finished, the Shark returns the cutter tool to a position set by the VCarve Pro project, and thus incorporated into the toolpath (tap) file. The default job end position is X0, Y0, Z0.8.

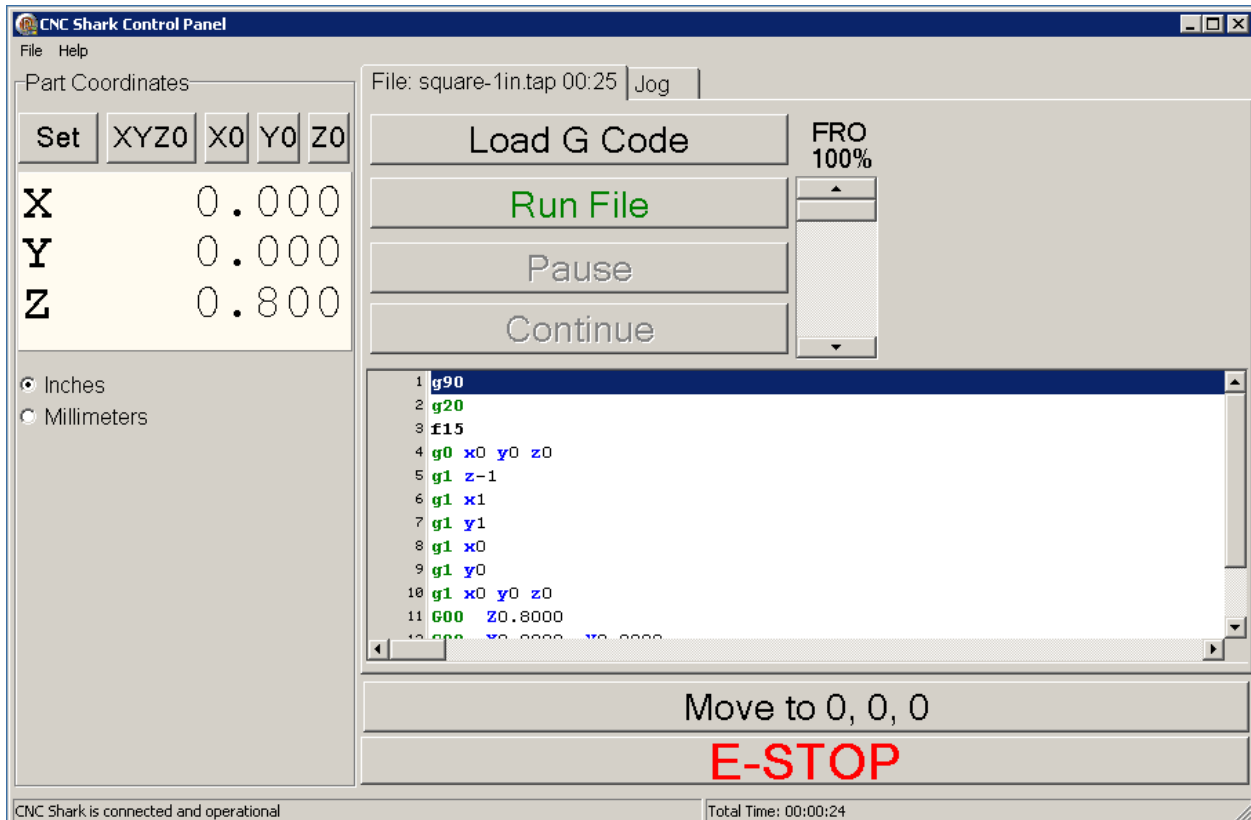


Figure 128 - CNC Shark Control Panel at the End of the Job

At this point, the job is complete. You can place a new piece of material on the table and run the job again, load a new toolpath (tap) file and run it, or close the CNC Shark Control Panel.

Jog Controls Panel

The Jog Control Panel enables you to move – jog - the gantry along any of the 3 axes. You typically use the Jog Controls to move the gantry to:

- Move the cutter tool to the toolpath's X0, Y0, Z0 and set the XYZO.
- Move the gantry to a position on the table to enable material placement and clamping or removal from the table

The Jog Control Panel is opened by clicking on the Jog tab.

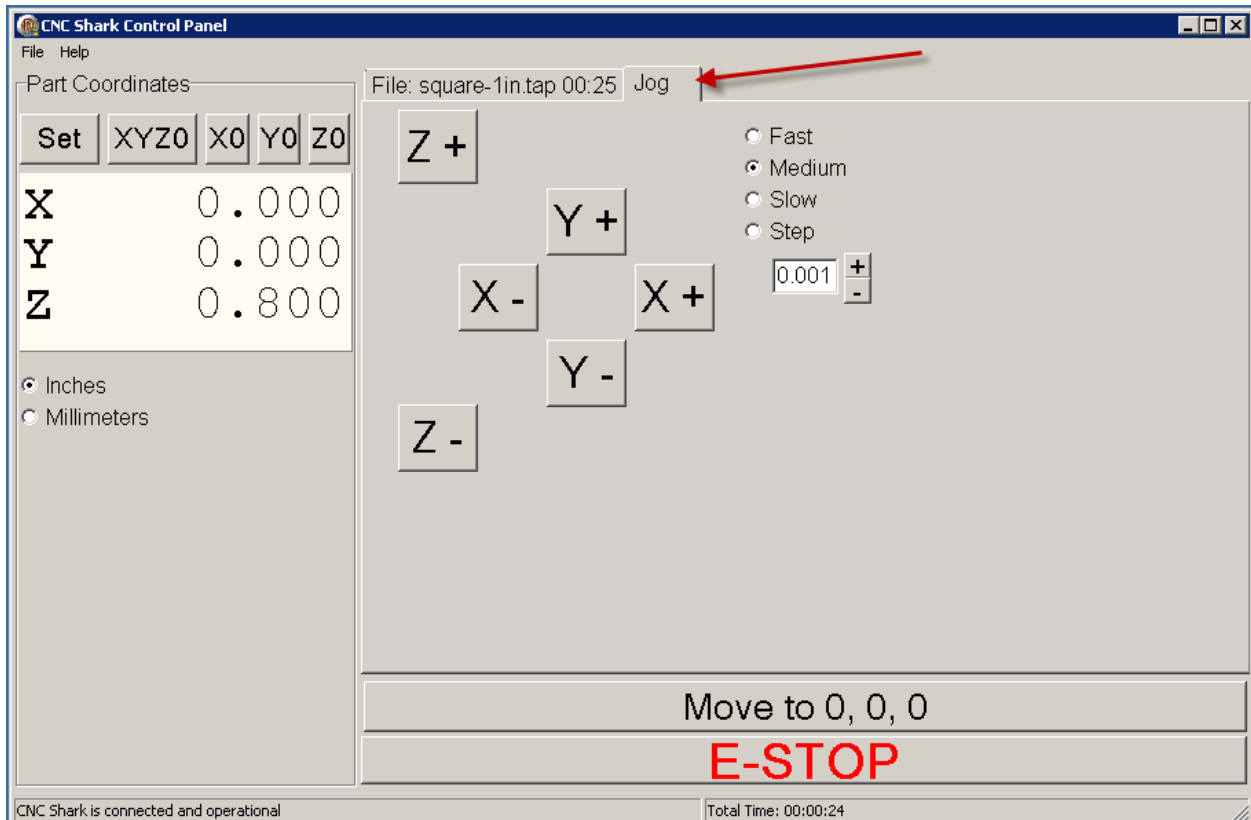


Figure 129 - Jog Control Panel

Clicking on any of the X, Y or Z plus or minus buttons to move the gantry along the desired axis and direction.

The speed of movement is influenced by 2 different sets of controls.

- The jog speed settings along the upper right hand side of the Jog Control Panel – Fast, Medium, and Slow.
- The Feed Rate Override (FRO) slider on the File Control Panel.

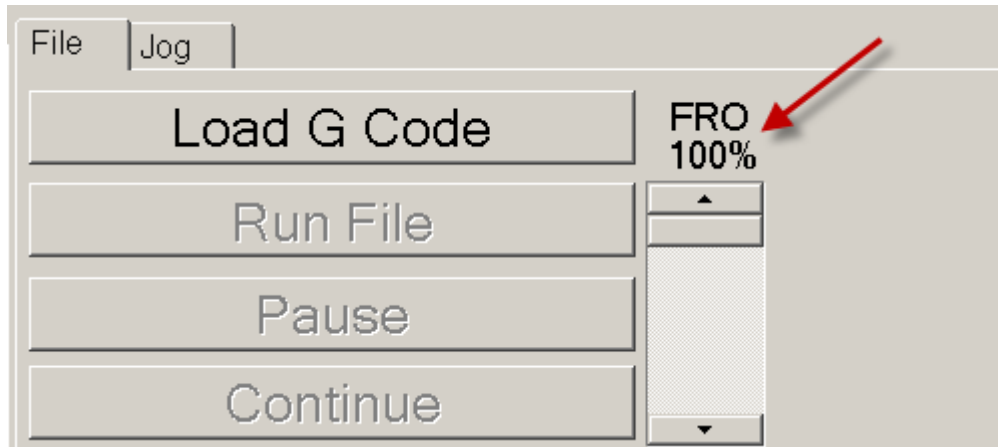


Figure 130 - Feed Rate Override (FRO) Slider

If you need large movements of the gantry to be performed quickly, select Medium or Fast. The amount of gantry movement for each click on the axis button will increase. If you need very small amounts of movement, select Slow. You can further influence the amount of movement for each of these settings by reducing the FRO. Setting the FRO to 100% will enable the largest movement for each of these settings. Reducing the FRO to 50% for example, will reduce the amount of movement at each of these settings by 50%.

To perform very controlled moves of the gantry, select Step, and set the distance in the box immediately underneath the Step control. Use the '+' and '-' buttons to change the step increments.

The step increment size is influenced by the units of measurement currently selected. The upper and lower increment step sizes are shown in the table below.

Units of Measure	Step Range Limit	
	Largest Increment	Smallest Increment
Inches	1	0.001
Millimeters	100	0.1

Figure 131 - Step Increment Size Range

You can use the Step value that is set by using the '+/-' buttons, or you can enter a specific value by clicking on the box to the left of the '+/-' buttons. The value you type in must be within the largest and smallest allowable value (for the units you are using). For example, if you've set the measurement units to inches, you can enter a value of 0.018 and the gantry will move 0.018 inches in the direction you select. In the figure below, the value was manually set to 0.018 and the gantry was moved one step in each axis direction.

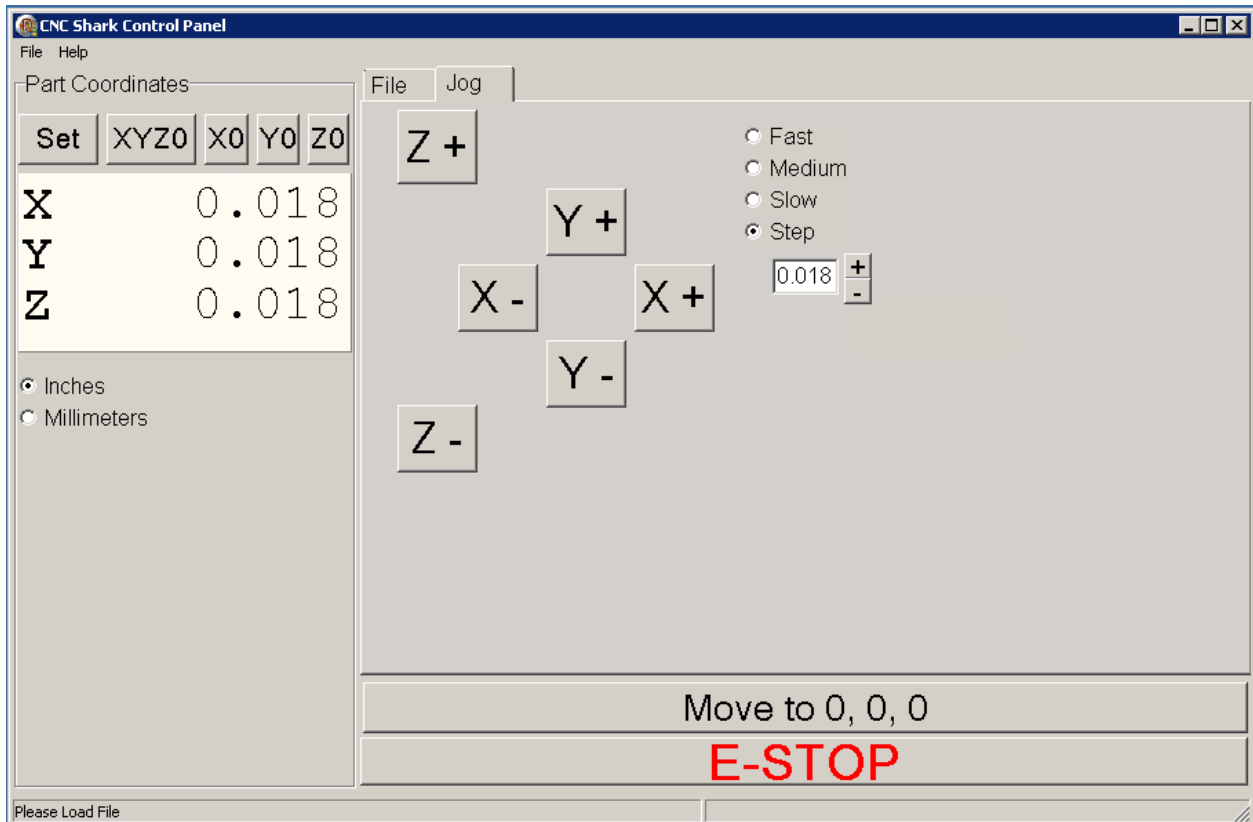


Figure 132 – Step Value Manual Entry and Outcome

As you are able to manually enter a numeric value in the Step function, you can easily enter a value that may result in an undesirable outcome. For example, if you entered 50, and then jogged along any axis, you would exceed the limit of gantry movement. Entering a very small value is also possible, but with no possible undesirable outcome beyond a sore finger.

When you are in Step mode, the only function available while the gantry is executing the Step move is E-STOP. You must wait until the Step move is completed until you can send another Step move to the Shark.

Part Coordinates Panel

The Part Coordinates panel indicates the location of the cutter tool from the Shark Control Box perspective. It is also used to set the axis zero.

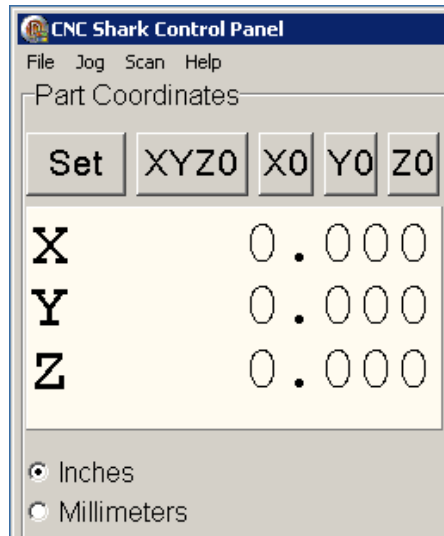


Figure 133 - Part Coordinates Panel

As the gantry moves around, the values for the X, Y and Z axis report their location with regard to the X0, Y0 and Z0.

The units of measure are either Inches or Millimeters. You can change the units of measure at any time, including while the job is running. Again, these values only indicate the position of the cutter tool from the X0, Y0, Z0 that you set. In the figure below, the cutter tool is 1 inch from X0, Y0 and Z0. By clicking on the radial button next to Millimeters, the units of measure are set to millimeters and the Part Coordinates display indicates that the cutter tool is 25.4 millimeters from X0, Y0, and Z0.

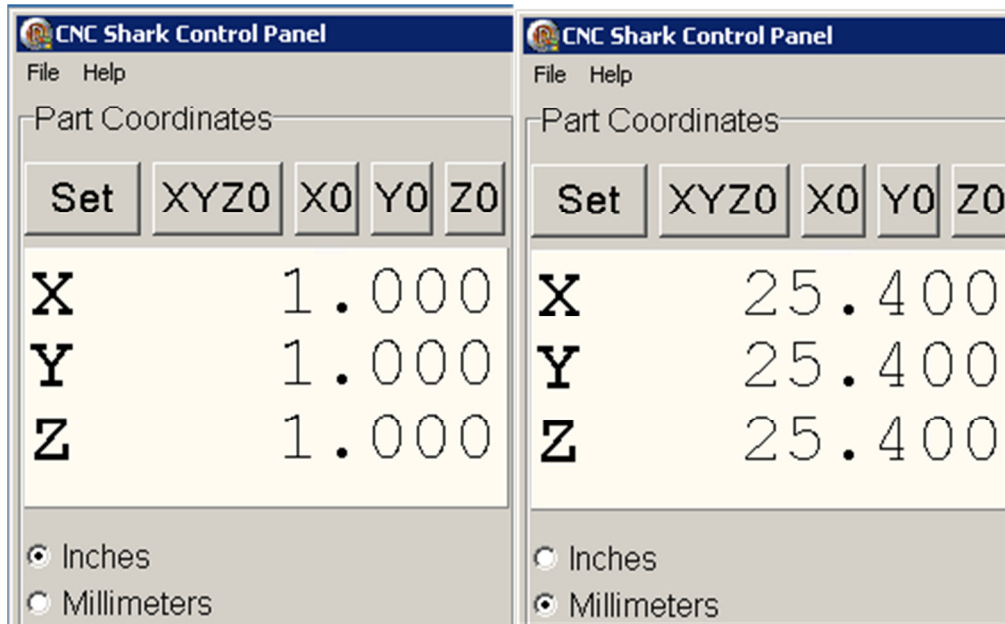


Figure 134 - Part Coordinates Units of Measure

The units of measure setting does not control the settings in the toolpath file (tap file). The units in the tap file are set by the post processor chosen when creating the tap file in VCarve Pro.

As part of the process to machine a part, you will set the X0, Y0, Z0 of the tool with regard to the material before you start the job (Run File). This X0,Y0, Z0 location with regard to the material is defined in the VCarve project. For CNC Shark users, the Z0 is always the top of the material. The default setting for X0 and Y0 in VCarve is the lower left hand corner of the material. You can choose any corner, or the center of the material as well. It is recommended that you use the lower left hand corner for X0 and Y0 as it is the most common, easiest to understand, and easiest to remember.

Whatever location relative to the material you choose to use, you must know what it is for the toolpath you are about to load and run.

You do not need to have the cutter tool positioned at all three axes zero position to set the zero for an individual axis. For example, you may need to reset the Z0 for the next job as the material is a different thickness, and you're using a jig to position the material in the same spot from job to job – and after checking, the X0 and Y0 remain true. Using the Jog panel, you move the cutter tool to the desired position in Z. When it is set in the Z0 location, click on the Z0 button to set the Z0 position in the Part Coordinates panel.

Control Box Status

The Control Box Status indicates the state of the Shark Control Box. There are 5 messages presented in the Status:

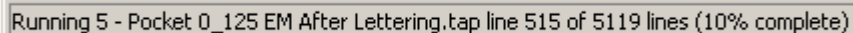
- **Please check CNC Shark power and USB cable** – Indicates no communication with the Shark Control Box. Ensure that the Shark Control Box power is on and the USB cable is plugged into both the computer and the Shark Control Box.
- **Please Load File** - Present upon opening the CNC Shark Control Panel. Indicates good communication with the Shark Control Box and that the Shark Control Box is ready for a toolpath file to be loaded.
- **Compiling line [number] ([number]% of [total number of lines in the tap file]) x:yy [run time]** – Appears after a toolpath (tap file) has been loaded and while the Shark Control Box is compiling the code for use. This message clears when the tap file is compiled. Provides the status of which line in the tap file is currently being compiled, a percentage of the compilation complete based on the total number of lines in the tap file, and the estimated time it will take to run the toolpath up to that point in the compilation.



```
Compiling Test Toolpath File.tap line 7110 (35% of 20550 lines) 25:00
```

Figure 135 - Status Box - Compiling Line Example

- **CNC Shark is connected and operational** – Present after loading a toolpath (tap file) the first time, and every time thereafter in a given session after a toolpath (tap file) has been successfully loaded and is ready for use. Indicates good communication with the Shark Control Box, and that a toolpath is loaded and ready to run.
- **Running line [number] of [total number of lines in the tap file] ([number]% complete)** – Present while job is running. Provides the status of which line in the tap file is being executed, how many total lines of g-code are in the tap file, and a percentage of lines completed.



```
Running 5 - Pocket 0_125 EM After Lettering.tap line 515 of 5119 lines (10% complete)
```

Figure 136 - Status Box - Running Line Example

Total Time Status

The total time status indicates the total amount of time the Shark has spent cutting during the current job. If a new job (G Code) is loaded and then run, the Total Time will reset. If the same job is run a second time, the Total Time will be cumulative. The figure below shows the total time after a job has been completed.

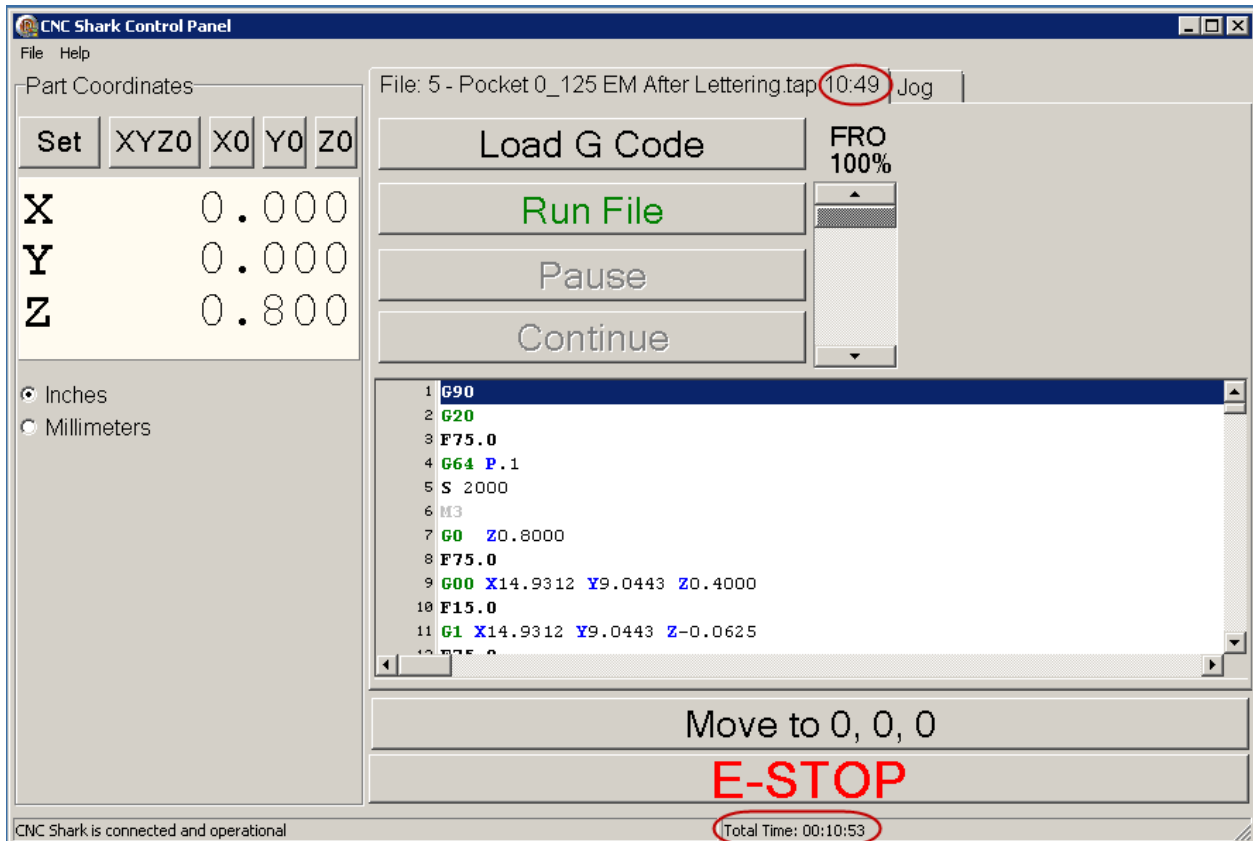


Figure 137 - Total Time Status Example

Keyboard Shortcuts

There are several keyboard shortcuts that you can choose to use.

You can use the Tab key to “thumb through” the control buttons currently displayed – the movement from control button to control button will sequence across the Part Coordinates and File or Jog Control Panels (whichever one is open at the time). The Move to 0, 0, 0 button is included in this Tab function. The Tab key will enable you to activate a control button. Any active button in the Part Coordinates and File Control Panel can be invoked at that point with a carriage return or enter from the keyboard.

If the FRO slider is active (slider bar dark gray), you can use the left or up arrow keys to increase the FRO percentage and the right or down arrow keys to decrease the FRO percentage. You can also use the Page Up and Page Down to move the FRO percentage in 5% increments when the FRO slider is active.

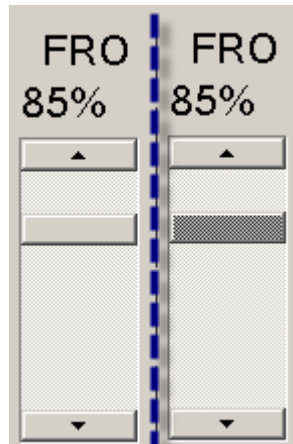


Figure 138 - FRO Slider Inactive on Left and Active on Right

The following keyboard buttons result in Jog Control Panel control button actions when the Jog Control Panel is active:

- Page Up Z+
- Page Down Z-
- Arrow Up Y+
- Arrow Down Y-
- Right Arrow X+
- Left Arrow X-
- '+' Numeric Keypad Increases the Step Increment
- '-' Numeric Keypad Decreases the Step Increment
- Home Key Numeric Keypad Moves up the jog speed list
- End Key Numeric Keypad Moves down the jog speed list
- '5' Numeric Keypad Move to 0, 0, 0



Figure 139 - Home and End Key Function - Jog Speed

CNC Shark Post Processors

Vectric's VCarve Pro and Aspire have the CNC Shark post processors installed. However, Next Wave Automation periodically updates these, and you may want to install the latest CNC Shark post processors. Additionally, Cut 3D and Photo VCarve may not have the CNC Shark post processors installed.

Currently, there are 2 sets of post processor files:

- One set is used with VCarve Pro, Cut 3D and Aspire
- One set is unique and used only with Photo VCarve

The CNC Shark Post Processors provide 3 new functional features starting with the January 2012 version release.

- Ready to use tolerance modes in the form of two different post processors.
- Contains the information needed by VCarve Pro and Aspire to enable sending the tap file from the Vectric application directly to the CNC Shark Control Panel.
- Places key information directly into the tap file about the toolpath(s) selected.

Installing the CNC Shark Post Processors

You can find the latest CNC Shark Post Processors at the Next Wave Automation web site's Download page. You should initially save the post processor file(s) to a location on your disk that you will remember. This is typically in a folder in your /My Documents. Once you have saved it there, copy the downloaded file to the appropriate Vectric application /PostP folder. You should not attempt to copy the post processor directly from the Downloads page to the specific /PostP folder on disk. On many Vista and most Win 7 operating systems, this will result in a failure in the ability for the Vectric application to use the CNC Shark post processor file. In addition, most current anti-virus/internet security applications will block you from attempting to copy directly from the Downloads page to the specific /PostP folder on disk.

64bit Operating System (OS) users should be sure to review the note at the end of this section.

VCarve Pro/Aspire/Cut3D Post Processors and Installation

The following post processors are for use with VCarve Pro (version 3.1 and higher), Aspire (version 2.0 and higher) and Cut3D (only):

CNCShark-USB_NewArcs_inch (Updated 01/08/2012)
CNCShark-USB_NewArcs_mm (Updated 01/08/2012)
CNCShark-USB_3dContour_inch (Updated 01/08/2012)
CNCShark-USB_3dContour_mm (Updated 01/08/2012)

CUT3D

The /PostP folder for Cut3D is located in C:\Program Files\Cut3D\PostP in both WinXP, Vista and Win 7 systems

VCarve Pro v5.5 and Earlier

The /PostP folder for VCarve Pro v5.5 and earlier is located in C:\Program Files\VCarve Pro\V5.5\PostP.

- For versions previous to v5.5, the folder name 'V5.5' will reflect that version. For example, VCarve Pro v5.0 - \V5.0\PostP

Aspire 2.5 and Earlier

The /PostP folder for Aspire v2.5 and earlier is located in C:\Program Files\Aspire\V2.5\PostP

VCarve Pro v6.0 and Later – WinXP Operating System

The /PostP folder for VCarve Pro v6.0 and later is located in C:\Documents and Settings\All Users\Application Data\Vetric\VCarve Pro\V6.0\PostP

- For versions later than v6.0, the folder name 'V6.0' will reflect that version. For example, VCarve Pro v6.5 - \V6.5\PostP

Aspire 3.0 and Later – WinXP Operating System

The /PostP folder for Aspire 3.0 and later is located in C:\Documents and Settings\All Users\Application Data\Vetric\Aspire\V3.0\PostP

- For versions later than v3.0, the folder name 'V3.0' will reflect that version. For example, Aspire v3.5 - \V3.5\PostP

VCarve Pro v6.0 and Later – Vista and Win 7 Operating Systems

The /PostP folder for VCarve Pro v6.0 and later is located in C:\Program Data\Vetric\VCarve Pro\V6.0\PostP

- For versions later than v6.0, the folder name 'V6.0' will reflect that version. For example, VCarve Pro v6.5 - \V6.5\PostP

Aspire 3.0 and Later – Vista and Win 7 Operating Systems

The /PostP folder for Aspire 3.0 and later is located in C:\Program Data\Vetric\Aspire\V3.0\PostP

- For versions later than 3.0, the folder name 'V3.0' will reflect that version. For example, Aspire v3.5 - \V3.5\PostP

Photo VCarve Post Processors and Installation

The following post processors are for use with Photo VCarve (only)

CNC Shark-USB_inch (Updated 11/29/2010)

CNC Shark-USB_mm (Updated 11/29/2010)

The /PostP folder for Photo VCarve is located in C:\Program Files\PhotoVCarve\PostP in both WinXP, Vista and Win 7 systems

64 bit OS (Win XP/Vista/Win7)

For all locations listed above that begin with 'C:\Program Files\...' - on a 64 bit system this will be 'C:\Program Files (x86)\...'

VCarve Pro 6.0 (and newer) and Aspire 3.0 (and newer) Note

The locations listed above refer to default installation settings. Another way you can determine the location of your VCarve Pro 6.0 (and newer) and Aspire 3.0 (and newer) Application Data folder is to select File, Open Application Data Folder. This will open the Application Data folder in a Windows Explorer window.

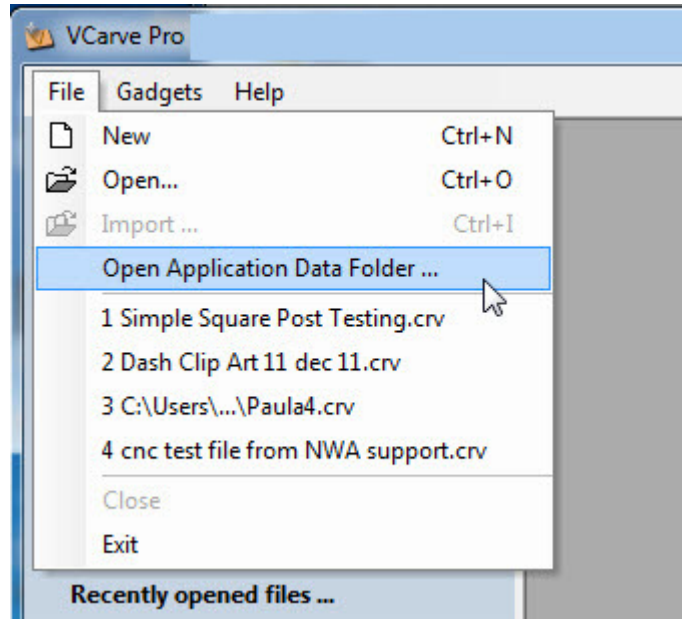


Figure 140 - VCarve Pro Open Application Data Folder

Troubleshooting CNC Shark Post Processor Installation

Can't 'Find' the Folder in Windows Explorer

The typical default setting in Windows Explorer is to hide hidden files, folders and drives.

- In Windows XP, the folder 'C:\Documents and Settings\All Users\Application Data' may be 'hidden'.
- In Windows Vista and Windows 7, the folder 'C:\Program Data' may be hidden.

To change this setting, select Tools, Folder Options from the Windows Explorer toolbar.

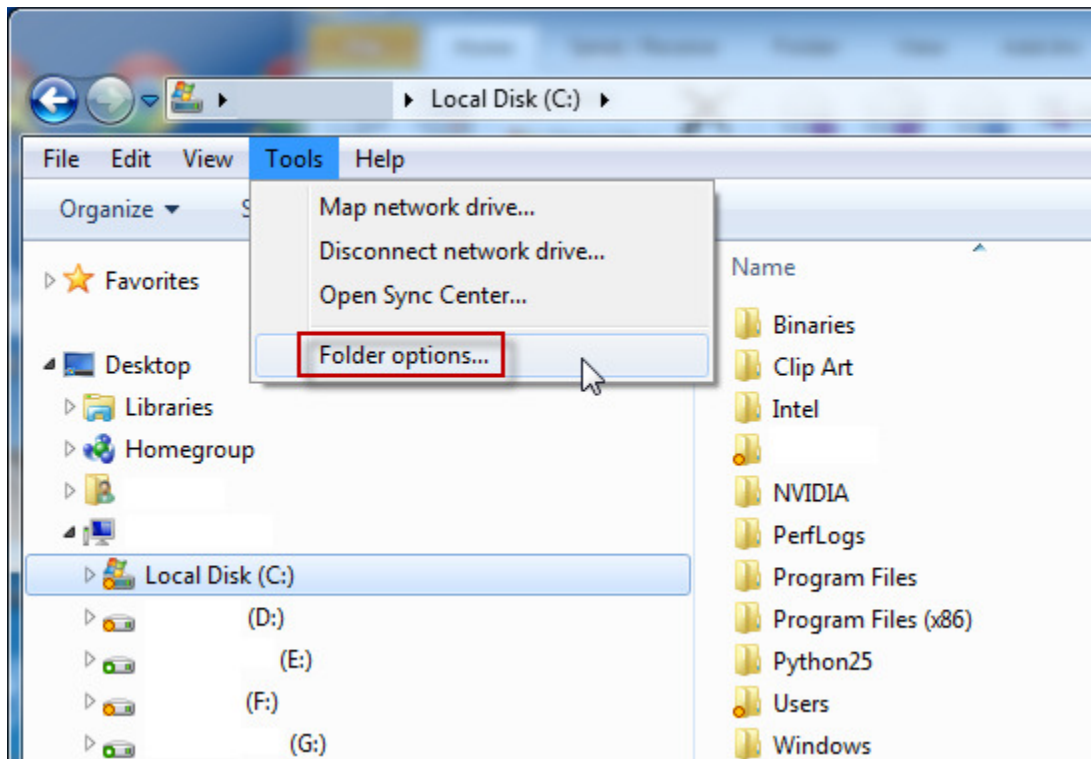


Figure 141 - Windows Explorer Folder Options

In the Folder Options, select the View tab. You may have to click on 'Hidden files and folders' to expand the tree. Click on the 'Show hidden files, folders, and drives' to activate the selection. Then hit 'Apply' and then 'OK' to close the panel.

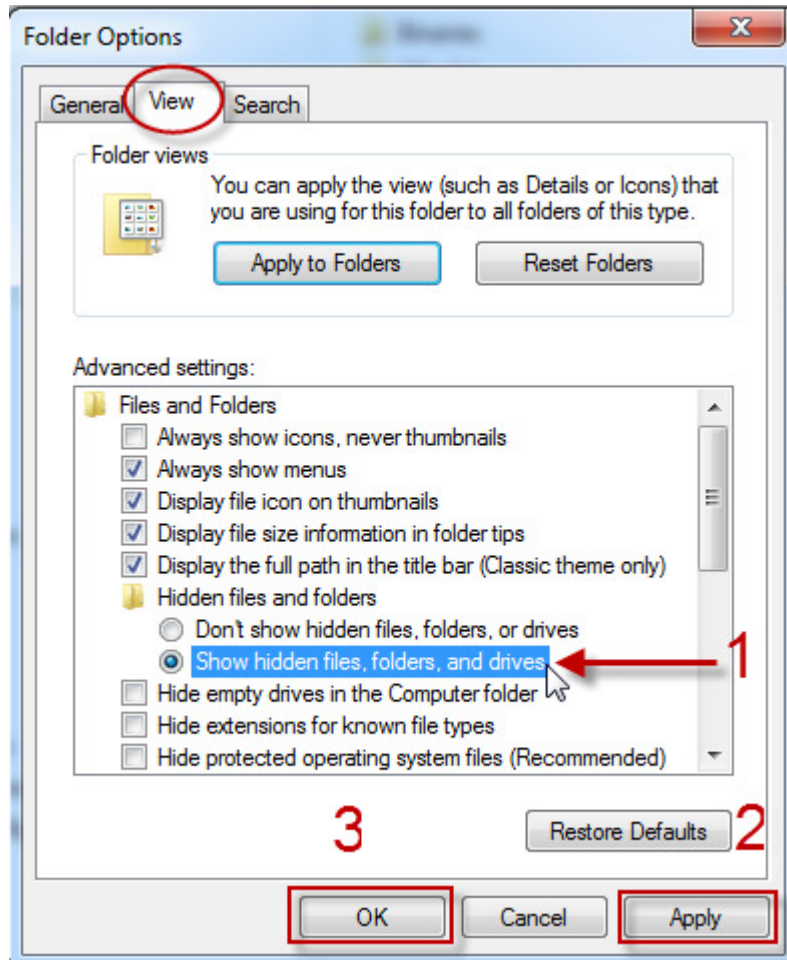


Figure 142 - Folder Options Panel

After doing this, all folders are now visible in Windows Explorer.

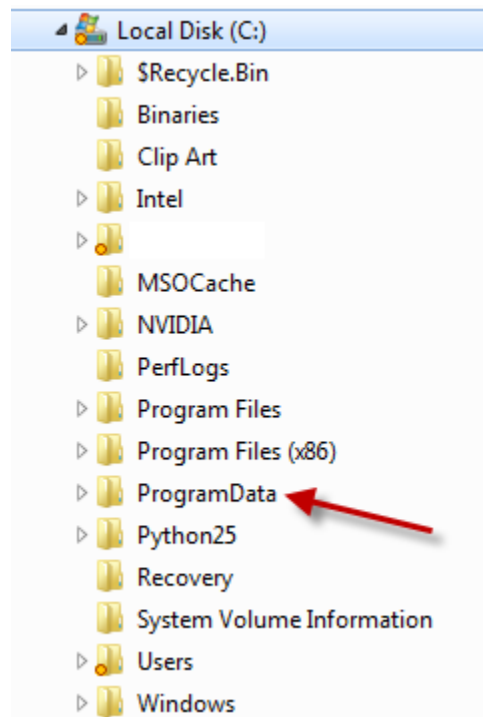


Figure 143 - C:\Program Data Folder Visible

Copied the Post Processors, but Can't 'See Them' in VCarve Pro/Aspire

Your OS can be pretty sensitive to files that are downloaded from the web. This is particularly true with Window 7.

While you may be able to download the post processor(s) from the Next Wave Automation web site directly to the appropriate /PostP folder, it will definitely result in not being able to 'see' the downloaded post processor file in the post processor file list in the Vectric application as this file is blocked from use by the OS.

Even if you download the files to a known location on your computer, and then copy them from that location to the appropriate /PostP folder, the operating system may block its use by the Vectric application.

If you are in this state, open Windows Explorer, find the post processor in the appropriate folder, right click on the post processor file, and select 'Properties'. From the 'General' tab, click on the 'Unblock' button, then hit 'Apply', and lastly 'OK' to close this panel. Open the Vectric application and you should now 'see' the post processor in the post processor list.

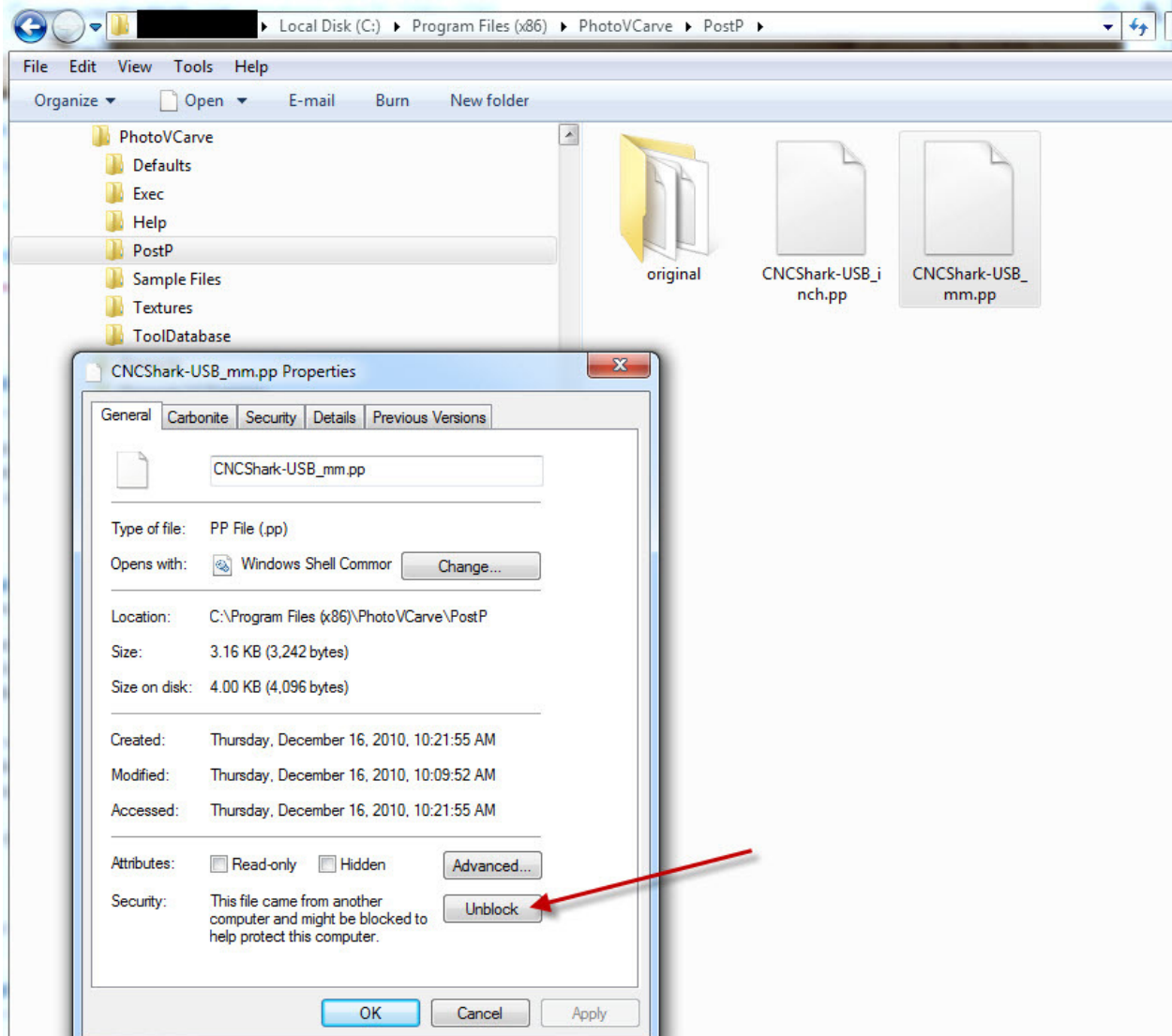


Figure 144 - File Properties, Unblock

Tailored Post Processors

There are now 2 post processors available for use with no modification, each having an inch and millimeter mode:

- CNCShark-USB_3dContour_
- CNCShark-USB_NewArcs_

The difference between the 2 is the Set Path Control Mode G64 Px.x (Continuous Mode Best Possible Speed with Motion Blending Tolerance) setting. The 'Contour' inches post processor uses G64 P0.1 (2.54 mm), and the 'NewArcs' inches uses G64 P0.01 (0.254 mm). Previous versions of the CNC Shark Post Processor inches used G64 P0.1.

The G64 Px.x is a way to fine tune the Shark system “for best compromise between speed and accuracy. The Px.x tolerance means that the actual path will be no more than Px.x away from the programmed endpoint. The velocity will be reduced if needed to maintain the path within the tolerance. In continuous mode, sharp corners of the path may be rounded slightly so that the feed rate may be kept up (but by no more than the tolerance).”¹

You can edit this setting in either post processor file using Notepad or any text editor. A smaller tolerance will result in a more accurate cut to the design. Using a smaller tolerance can also dramatically increase the machining time. A smaller tolerance may be required or desired if you need sharp inside corners for example. For projects involving 3D elements, a larger tolerance will often produce excellent results, as well as resulting in a reasonable machining time.

You also influence the outcome with the feed rate of the tool you are using. You will get a slightly different outcome for a profile toolpath for example with the same end mill when using a feed rate of 100 ipm and then a second time using a feed rate of 60 ipm.

For toolpaths involving pockets, corners and lettering, using the CNCShark-USB_NewArcs_ post processor is recommended as a starting point. For toolpaths involving 3D components, or where a faster machining still provides results that meet your requirements, the CNCShark-USB_3dContour_ post processor is recommended as a starting point.

¹ *Common Machining Center*, LinuxCNC.org, URL: linuxcnc.org/docs/html/gcode.html

You can always manually edit the G64 Px.x tolerance value to fine tune the Shark system to meet your requirements. Users should keep in mind that this is just one of several factors that influence the overall 'accuracy' of the outcome. Router TIR, tool settings, table setup, etc – all contribute to this.

```
"([TOOLS_USED])"  
"([TOOLNAME])"  
"(|-----)"  
"(| Toolpath:- '[TOOLPATH_NAME]' )"  
"(|-----)"  
"G90"  
"G20"  
"[FC]"  
"G64 P.1"  
"S 2000"  
"M3"  
"G0 [ZH]"  
  
+-----+  
+  Commands output for rapid moves  +  
+-----+  
  
begin RAPID_MOVE  
  
"[FC]"  
"G00[X][Y][Z]"
```

Figure 145 - G64 Px.x Line to Edit in Post Processor

Enabling Use of Output Direct to Machine in VCarve Pro and Aspire

The CNC Shark Post Processors contain the command line necessary to enable use of the 'Output direct to machine' option in VCarve Pro and Aspire.

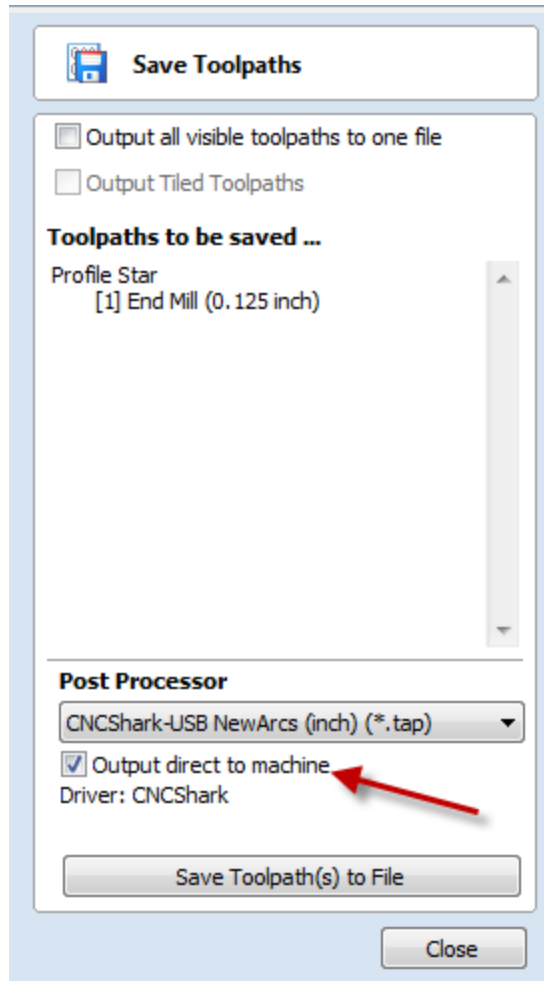


Figure 146 - Save Toolpaths, Output direct to machine

When used with the CNC Shark Control Panel v1.5.0.22 installed on the same computer as VCarve Pro or Aspire, and connected to a Shark Control Box, you can choose to send the tap file directly to the Shark Control Panel from VCarve Pro or Aspire.

One additional file must be placed in the appropriate /PostP folder – CNCShark_run.ini. This file should be placed in the same folder as the post processors (described above).

The post processor contains the command 'DIRECT_OUTPUT'. This enables the process to open the CNC Shark Control Panel and load the tap file when that option is checked in the VCarve Pro or Aspire 'Save Toolpaths' panel.

```
POST_NAME = "CNCShark-USB 3D Contour (mm) (*.tap)"  
FILE_EXTENSION = ".tap"  
UNITS = "MM"  
DIRECT_OUTPUT = "CNCShark|CNCShark_run.ini"  
SUBSTITUTE = "{ }"
```




Figure 147 - DIRECT_OUTPUT Command Line in the Shark Post Processor

The 'Output direct to machine' option in the VCarve Pro or Aspire 'Save Toolpaths' panel will only be active when a post processor that contains this command line is selected for use.

Remember, the CNCShark_run.ini file must be in the same folder as the CNC Shark post processor you are using for 'Output direct to machine'. You are able to select this option even if this file is not properly installed. In that case, the process will fail and you will receive a message indicating the failure.

Using this work flow is straight forward and easy. First, ensure that the CNC Shark Control Panel is closed (not running on the computer). From VCarve Pro or Aspire, in the 'Save Toolpaths' panel, select the desired CNC Shark Post Processor v1.5, and enable the 'Output direct to machine' by clicking on the box. When you click on 'Save Toolpath(s) to File' with 'Output direct to machine' selected, you will still be prompted to name and save the tap file to disk. After writing the file to disk, the CNC Shark Control Panel will be started and the tap file will be loaded.

The CNC Shark Control Panel cannot be open (running) when you start this process. Be sure to check and ensure that the CNC Shark Control Panel is closed.

You will very quickly see the CNC Shark Control Panel 'splash' screen appear. The CNC Shark Control Panel will display after the tap file has been loaded. This is very different than the behavior when you start the CNC Shark Control Panel directly, and then load the tap file. In that case, the CNC Shark Control Panel appears immediately after the splash screen. The time it takes for the CNC Shark Control Panel to appear when using 'Output direct to machine' will be as long or short as the time it takes to 'Load G Code' directly from the CNC Shark Control Panel. Be patient when using this method with large tap files. If you see the splash screen, you know

that the CNC Shark Control Panel has been successfully opened and the tap file is being loaded. When that is complete, the CNC Shark Control Panel will be visible and ready for use.



Figure 148 - CNC Shark Control Panel Splash Screen Displayed During Output Direct to Machine Startup

You must close the CNC Shark Control Panel after a job is finished before using the direct output method to run a different tap file. Once the tap file is loaded, you can run that job as many times as desired – i.e. you do not have to close the CNC Shark Control Panel and resend the same tap file to CNC Shark Control Panel from VCarve Pro or Aspire between runs of the same job. You could also choose to use the 'Load G Code' function from the CNC Shark Control Panel to load a different tap file (without closing and re-opening the CNC Shark Control Panel first).

Troubleshooting Output Direct to Machine

The 'Output Direct to Machine' is 'Grayed Out'

If the post processor selected in the 'Save Toolpaths' panel in VCarve Pro or Aspire is grayed out, this means that the CNC Shark post processor selected does not support this. Select a CNC Shark post processor that does support the use of this option.

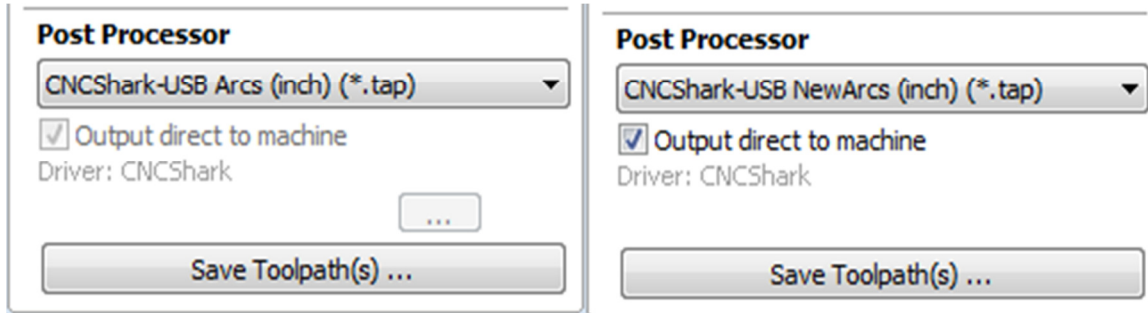


Figure 149 - Output Direct to Machine Not Available (L) and Available (R)

VCarve Pro or Aspire Failure Message

If the CNCShark_run.ini file is not present in the same folder on disk as the CNC Shark post processor you are using, the direct output process will fail, the CNC Shark Control Panel will not open, and VCarve Pro and Aspire will report this with a message box.

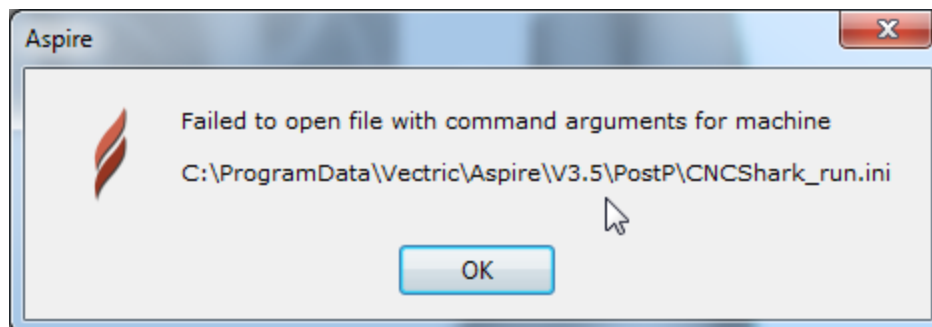


Figure 150 - VCarve Pro/Aspire Failure Message

Place a copy of the CNCShark_run.ini file in the same folder as the CNC Shark post processors to clear this failure.

CNC Shark Control Panel Fail to Detect Message

If the CNC Shark Control Panel is open (running) when you use the direct output process from VCarve Pro or Aspire, the process will fail. A CNC Shark Control Panel message indicating a failure to detect the controller will appear.

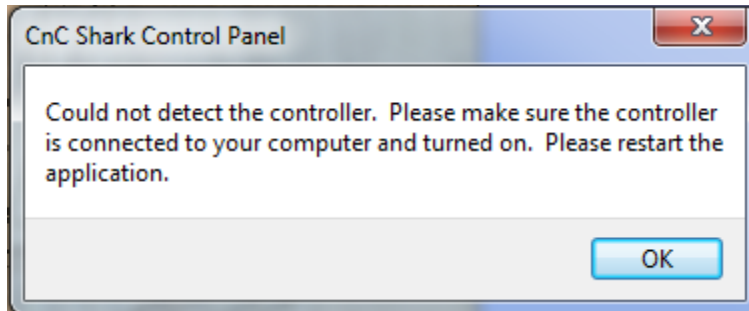


Figure 151 - CNC Shark Control Panel Could Not Detect the Controller Message

Close the CNC Shark Control Panel that is open (running), and try the direct output method from VCarve Pro or Aspire again.

Tap File Header

The CNC Shark Post Processors create and store information about the toolpath generated by VCarve Pro and Aspire in the header of the tap file. This information will help users to know with authority specific aspects of using this tap file – like the tool (cutter/bit) the toolpath is intended to use, the size of the material, the toolpath origin, etc – when viewing the tap file after it is loaded in the CNC Shark Control Panel, or by using a text editor application like Notepad.

The header contains the following information:

1. Tap file name (name assigned to the file when it was written to disk from VCarve Pro or Aspire)
2. Date the tap file was created
3. Material size (X, Y and Z)
4. Z Origin for Material (Material Surface or Table Surface)
5. XY Origin for Material (Bottom Left Corner, Bottom Right Corner, Top Left Corner, or Top Right Corner)
6. XY Origin Position (typically 0, 0 unless the 'Use Origin Offset' in the 'Job Setup' tool in VCarve Pro or Aspire is used)
7. Home Position
8. Safe Z Height/Rapid Clearance Gap
9. Project Notes (from VCarve Pro or Aspire Project (Edit, Notes))
10. Toolpath(s) used (from your VCarve Pro or Aspire project)
11. Tool used by the tapfile

```
1 | ( Star Project Profiles )
2 | ( File created: Wednesday, January 04, 2012 - 10:53 AM)
3 | ( for CNC Shark from Vectric )
4 | ( Material Size)
5 | ( X= 10.000, Y= 10.000, Z= 1.000)
6 | ( Z Origin for Material = Material Surface)
7 | ( XY Origin for Material = Bottom Left Corner)
8 | ( XY Origin Position = X:0.000, Y:0.000)
9 | ( Home Position)
10 | ( X = X0.0000 Y = Y0.0000 Z = Z0.8000)
11 | ( Safe Z = 0.200)
12 | (1. Quick test project to support CNC Shark Post Processor v1.5 documentation.)
13 | (2. This project is using inches.)
14 | (3. A third entry to enhance clarity in the screen grab and documentation.)
15 | (Toolpaths used in this file:)
16 | (Profile Star)
17 | (Profile Star Inside)
18 | (Tool used in this file: )
19 | (End Mill {0.125 inch} PB)
```

Figure 152 - Header Information in Tap File as Viewed from the CNC Shark Control Panel

The tap file name is the name you assigned the tap file when you saved it from VCarve Pro or Aspire.

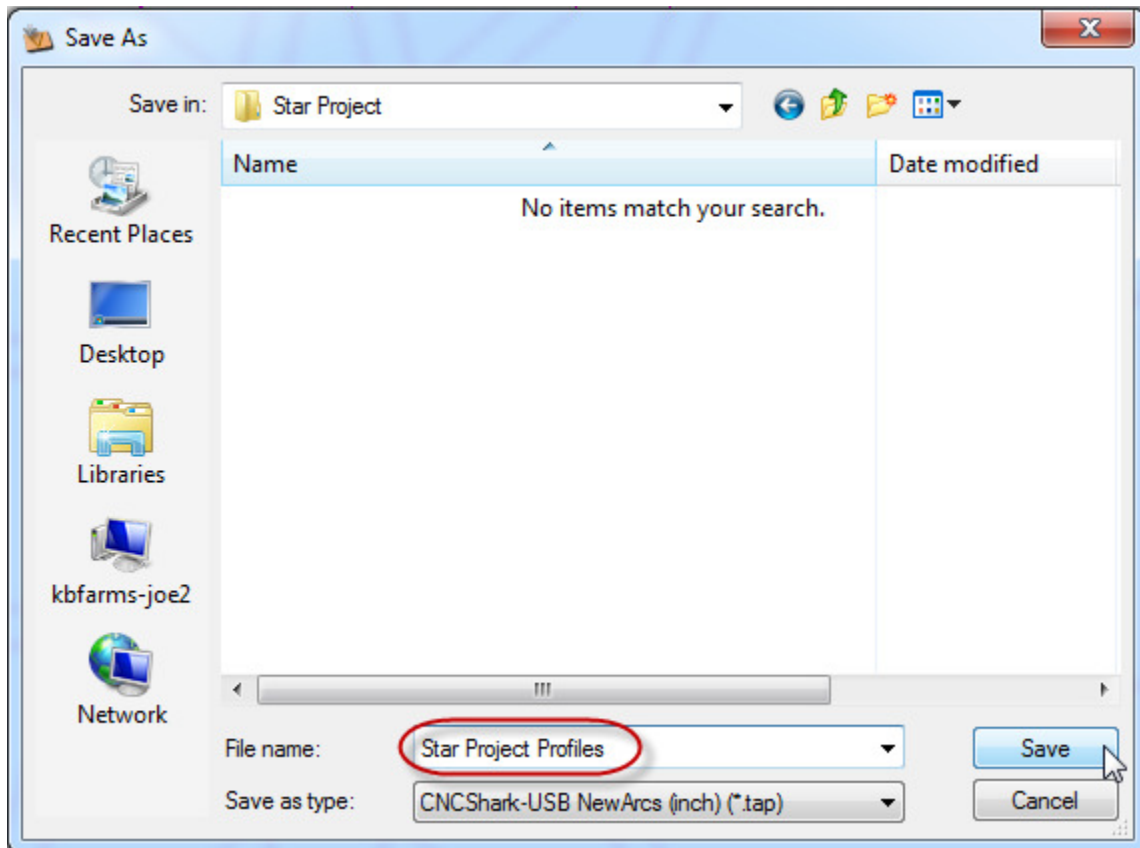


Figure 153 - Tap File Name Creation Dialogue Panel (VCarve Pro or Aspire)

The Material Size, Z Origin for Material, XY Origin for Material, and the XY Origin Position are from the settings used in the 'Job Setup' panel. From VCarve Pro or Aspire, select Edit, Job Size and Position, to open this tool.

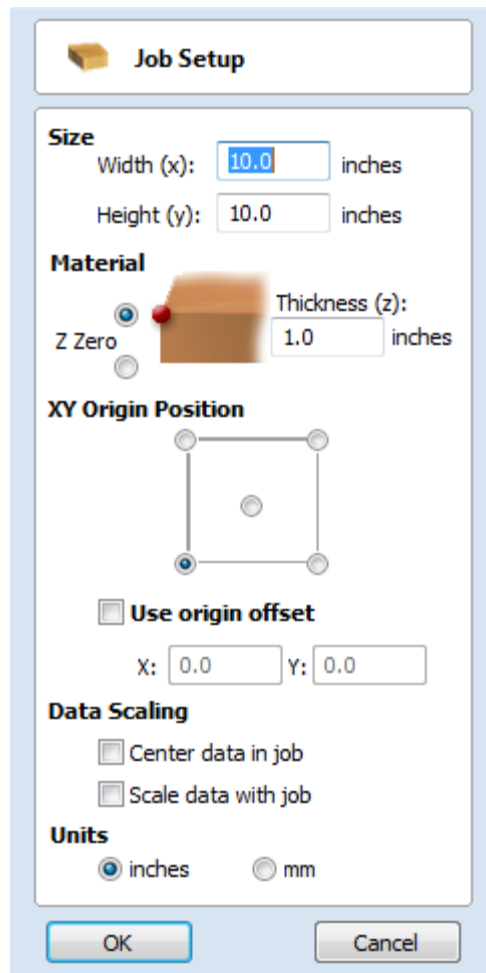


Figure 154 - Job Setup Panel in VCarve Pro and Aspire

The Home Position and Safe Z Height / Rapid Clearance Gap are from the settings used in the 'Material Setup' panel. From VCarve Pro or Aspire, open the Toolpath Tab, and select the Setup the Material and Rapid Gaps tool button to open this tool.

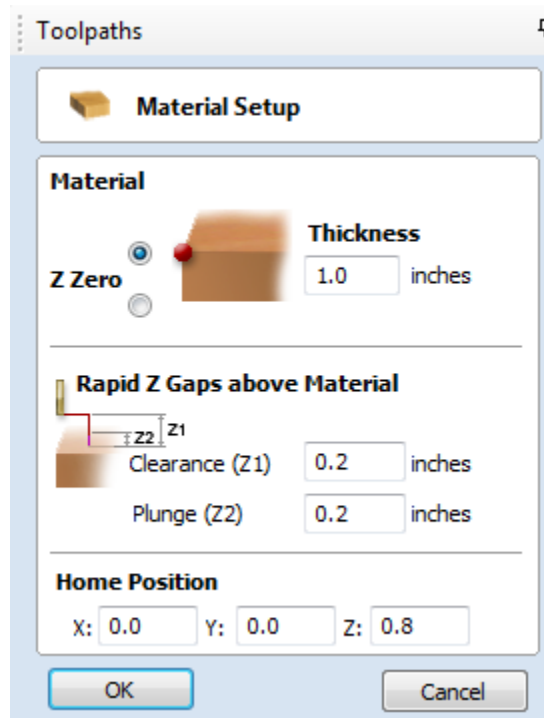


Figure 155 - Material Setup Panel in VCarve Pro and Aspire

The Project Notes are from the 'Notes' tool. To open From VCarve Pro or Aspire, select 'Edit', 'Notes'.

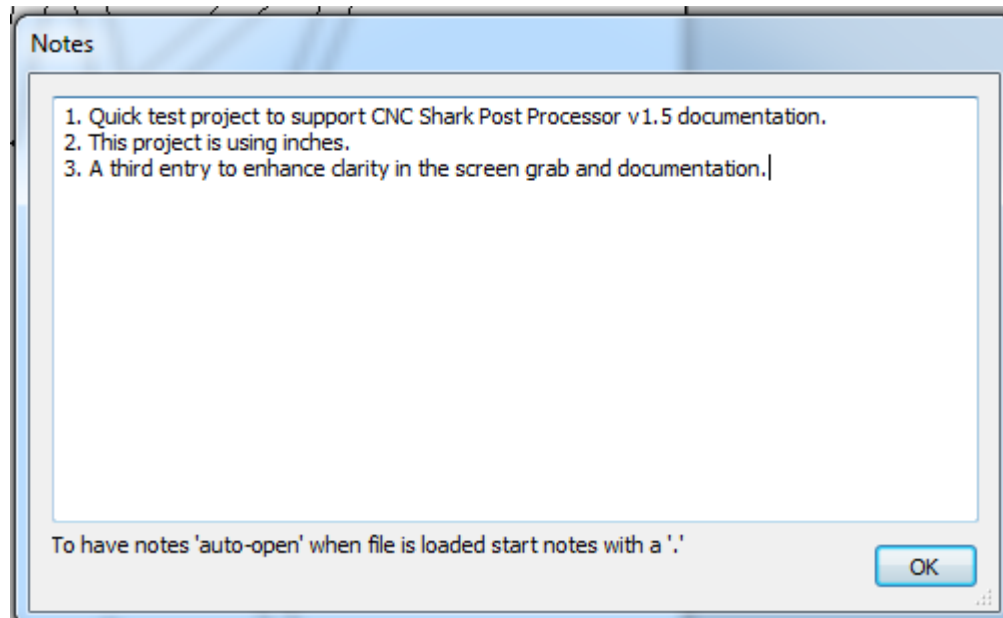


Figure 156 - Notes Tool in VCarve Pro and Aspire

The toolpaths are the VCarve Pro or Aspire project toolpaths that were selected when creating the tap file.

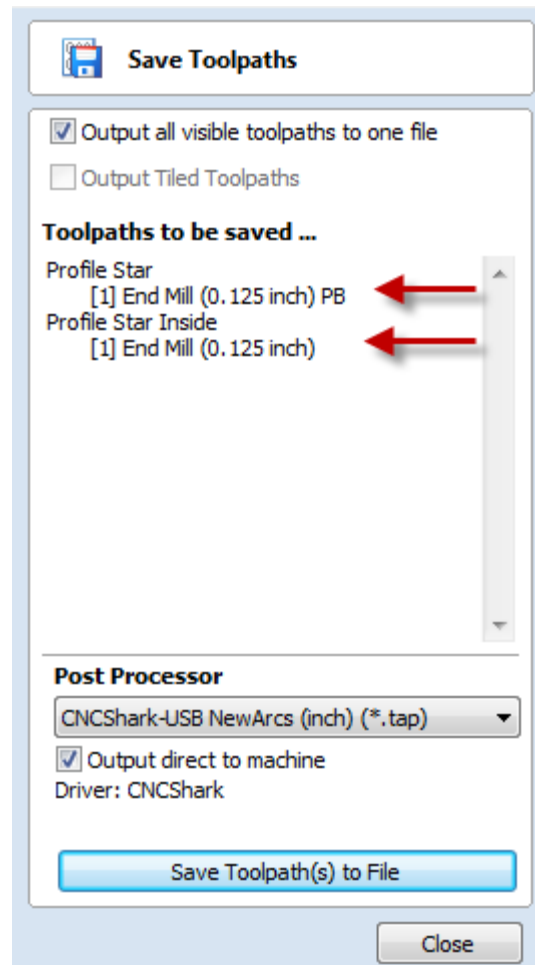


Figure 157 - Toolpaths to be Saved in VCarve Pro or Aspire

The tool of course is from the toolpath setup itself. The name of the tool in the tap file header is the same as that set in the VCarve Pro or Aspire Tool Database.

Maintenance

Routine

Besides keeping the machine generally clean – it's a good idea to remove all dust and debris after a job – the primary maintenance task is to lubricate the lead screws (spiral rods) and support rods. While any lubricant will work, a silicon or lithium based spray that doesn't leave a greasy or waxy residue – DuPont Teflon Silicon Lubricant is an example - is recommended. This can be found at any hardware or 'big box' store. Apply the lubricant, jog the gantry the length of the axis and back again. Holding a cloth or rag against the lead screw, repeat the jogging motion. This removes any excess lubricant and cuts down on the opportunity for dust and debris to build up by clinging to the lubricant. Repeat these steps with the guide rails.

Control Box Fuses

The Enhanced Control Box has two fuses.

One is located in a small drawer under the AC power cord connector. A spare fuse is supplied and in the drawer. Turn off the Shark Control Box, remove the AC power cord, and using a small flat tip screwdriver, slide the box away from the chassis. Inspect and replace the fuse if necessary. This fuse is 8 amp for units delivered to Canada, and 10 amp everywhere else.



Figure 158 - Shark Control Box Power Cord Fuse

The second fuse is located on the electronics board inside the enclosure. Turn off the Shark Control Box, remove the AC power cord, and remove the screws that hold the enclosure cover on. The fuse is a 7.5 amp blade type fuse that can be purchased at any electronics store.

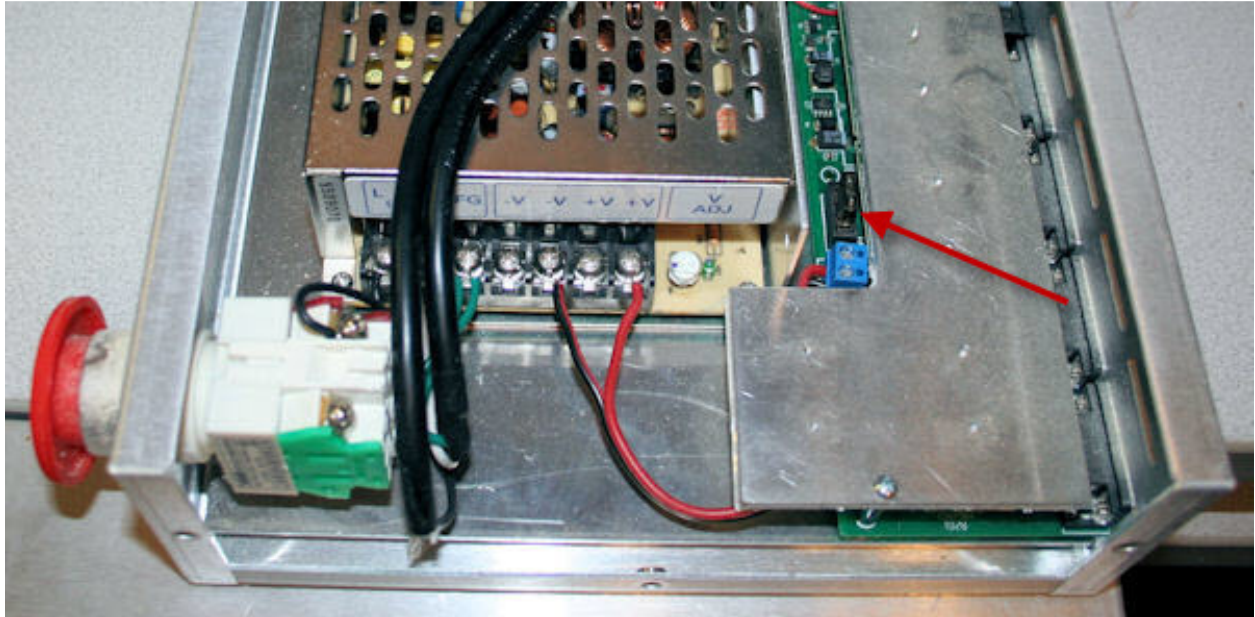


Figure 159 - Blade Fuse on Electronics Board

Repair Parts and Upgrades

Repair parts for the Shark are available online in the Next Wave Automation Store at the Next Wave Automation web site – www.nextwaveautomation.com.

Questions about upgrades and other modifications can be made directly to Next Wave Automation via email or phone.

Information Resources

Rockler Woodworking and Hardware

www.rockler.com, support@rockler.com, (800) 260-9663

Distributor of the CNC Sharks. The website has general product information and pricing for the Sharks, and downloadable Shark documentation. Rockler Tech Support is the first point of contact for any product questions or issues. Also sponsors of the CNC Shark Talk forum – www.cncsharktalk.com.

Next Wave Automation

www.nextwaveautomation.com or www.cncshark.com

Manufacturer of the CNC Sharks. The website has software and documentation downloads as well as other general product information.

Vetric

www.vetric.com

Producers of the **VCarve Pro** software package. The Vetric website has product information, FAQs, on-line tutorials, and an excellent user forum. Keep in mind that Vetric supports Vetric software, not the CNC Shark; although there are some Shark-specific threads in their Forum.

Vector Art 3D

www.vectorart3d.com

Vendors of CNC-ready, **VCarve Pro** compatible three-dimensional clip-art models. Use their powerful FREE software to create toolpaths of the models, which can then be imported into **VCarve Pro**. Purchase models individually or in collections; a huge number of models is available. They also provide custom modeling services for customers requiring specific parts created from their own artwork.

CNC Zone

www.cnczone.com

All kinds of CNC information. Includes a “Woodworking Machines” forum with some Shark-specific threads and many other interesting discussions – including how to build your own CNC routing system (or why it might be a better idea to just buy one).

Router Forums

www.routerforums.com

A discussion board site; check out their “CNC Routing” router category for both general and Shark-specific threads.

CNC Information

www.cncinformation.com

A general CNC information website that includes a forum, articles, a free e-learning course about CNC and a free G-code Quick Guide.

Woodshred

www.woodshred.com

A general woodworking information website that includes some interesting articles about adapting and customizing the Sharks.

VectorClip3D

www.vectorclip3d.com

Vendors of CNC-ready, **VCarve Pro** compatible three-dimensional clip-art models.

Tooling Suppliers

This is not a comprehensive list.

Rockler	www.rockler.com
PreciseBits	www.precisebits.com
Onsrud	www.onsrud.com
VTC	www.vanguardtool.com
MLCS	www.mlcswoodworking.com
American Carbide	www.american-carbide.com
2L Inc	www.2linc.com
Bits & Bits	www.bitsbits.net
Amana Tool	www.amanatool.com
Centurion Tools	www.centuriontools.com
Toolstoday Router Bits	www.toolstoday.com

CNC Shark Family Specifications

CNC Shark

General

- Overall Machine Dimensions: X: 24" Y: 33.5" Z: 22.5"
- Work Table Dimensions: 15.75" x 31.5"
- Maximum Cutter Travel: X: 13" Y: 24" Z: 4.25"
- Bearings: 12 precision linear bearing guides (4 on each axis) that maximize rigidity
- High power hybrid 1.8 degree stepper motors rated at 269 oz/in
- USB interface with on controller memory storage
- 24V power supply to provide full power to the stepper motors
- Precision lead screws with anti-backlash on all axis
- Work table – slotted MDF
- Rockler item number 39200

Rates and Accuracy

- Step Resolution: Full step of 0.0005 inch; at 1/8 step 0.0000625 inch
- Reproduction accuracy depends on the precision of the setup and alignment – but is in the same range or better.
- High Speed Positioning (jogging) Rate: 120 ipm

Shipping Manifest

The CNC Shark (39200) purchased from Rockler ships with the following items in a single box:

- Base Assembly
- Gantry Assembly
- Control Box
- Power Supply (120V AC in/24V DC out)
- Slotted MDF Table Top
- 12 Gantry Mounting Bolts (2" T27 star drive 1/4" – 20 tpi)
- 12 Gantry Mounting Nylock Nuts (hex, 1/4" – 20 tpi)
- 1 zip-tie
- USB A-B cable
- CNC Shark Family Owner's Manual
- Vectric VCarve Pro software (CD)
- SD Card
- V-Groove Router Bit (1/2" diameter, 90°, Rockler SKU 90869)
- 2 Hold Down Clamps (Rockler SKU 21912)

CNC Shark Pro

General

- Overall Machine Dimensions: X: 35.75" Y: 36.5" Z: 22.5"
- Work Table Dimensions: 28" x 31.5"

- Maximum Cutter Travel: X: 24" Y: 24" Z: 4"
- Bearings: 12 precision linear bearing guides (4 on each axis) that maximize rigidity
- High power hybrid 1.8 degree stepper motors rated at 269 oz/in
- USB interface with on controller memory storage
- 24V power supply to provide full power to the stepper motors
- Precision lead screws with anti-backlash on all axis
- Work table – slotted MDF
- Rockler item number 36900

Rates and Accuracy

- Step Resolution: Less than 0.001 of an inch
- Reproduction accuracy depends on the precision of the setup and alignment – but is in the same range or better.
- High Speed Positioning (jogging) Rate: 120 ipm

Shipping Manifest

The CNC Shark Pro (36900) purchased from Rockler ships with the following items in a single box:

- Base Assembly
- Gantry Assembly
- Control Box
- Power Supply (120V AC in/24V DC out)
- Slotted MDF Table Top
- 12 Gantry Mounting Bolts (2" T27 star drive 1/4" – 20 tpi)
- 12 Gantry Mounting Nylock Nuts (hex, 1/4" – 20 tpi)
- 1 zip-tie
- USB A-B cable
- CNC Shark Family Owner's Manual
- Vectric VCarve Pro software (CD)
- SD Card
- V-Groove Router Bit (1/2" diameter, 90°, Rockler SKU 90869)
- 2 Hold Down Clamps (Rockler SKU 21912)

CNC Shark Pro Plus

General

- Overall Machine Dimensions: X: 35.75" Y: 36.5" Z: 22.5"
- Work Table Dimensions: 28.5" x 36"
- Maximum Cutter Travel: X: 25" Y: 25" Z: 5"
- Bearings: 12 precision linear bearing guides (4 on each axis) that maximize rigidity
- High power hybrid 1.8 degree stepper motors rated at 269 oz/in

- Integrated Control Box with USB interface, on controller memory storage, 24V power supply to provide full power to the stepper motors, integrated E-Stop button, and on/off software control of router
- Precision lead screws with anti-backlash on all axis
- Work table – extended aluminum t-slot
- Rockler item number 39500

Rates and Accuracy

- Step Resolution: Control to 0.000125 of an inch
- Reproduction accuracy depends on the precision of the setup and alignment – but is in the same range or better.
- High Speed Positioning (jogging) Rate: 120 ipm

Shipping Manifest

The CNC Shark Pro Plus (39500) purchased from Rockler ships with the following items in two boxes:

- Base Assembly with slotted aluminum t-track work table (single box)
- Gantry Assembly
- Enhanced Control Box with built in 24V DC power supply and SD card (already mounted)
- 115V AC power cord (for Control Box)
- 12 Gantry Mounting Bolts (2" T27 star drive 1/4" – 20 tpi)
- 12 Gantry Mounting Nylock Nuts (hex, 1/4" – 20 tpi)
- USB A-B cable
- CNC Shark Family Owner's Manual
- Vectric VCarve Pro software (CD)
- Vectric Cut3D software (CD)
- Vectric VectorArt 3D Sampler Pack (CD)
- V-Groove Router Bit (1/2" diameter, 90°, Rockler SKU 90869)
- 2 Hold Down Clamps (Rockler SKU 21912)

CNC Shark Pro Plus HD

General

- Overall Machine Dimensions: X: 36.25" Y: 36.5" Z: 26.75"
- Work Table Dimensions: 28.5" x 36"
- Maximum Cutter Travel: X: 25" Y: 25" Z: 5"
- Reinforced to handle up to 2.5 hp router or spindle.
- X and Y axis have supported linear guides.
- Z travel up to 7 inches max (2 inches more the regular plus).
- Stronger Drive system then Plus systems.
- Integrated Control Box with USB interface, on controller memory storage, 24V power supply to provide full power to the stepper motors, integrated E-Stop button, and on/off software control of router

- Precision lead screws with anti-backlash on all axis
- Work table – extended aluminum t-slot
- Rockler item number 49504

Rates and Accuracy

- Step Resolution: Control to 0.000125 of an inch
- Reproduction accuracy depends on the precision of the setup and alignment – but is in the same range or better.
- High Speed Positioning (jogging) Rate: 200 ipm

Shipping Manifest

The CNC Shark Pro Plus (<value>) purchased from Rockler ships with the following items in two boxes:

- Base Assembly with slotted aluminum t-track work table (single box)
- Gantry Assembly
- Enhanced Control Box with built in 24V DC power supply and SD card (already mounted)
- 115V AC power cord (for Control Box)
- 12 Gantry Mounting Bolts (2" T27 star drive 1/4" – 20 tpi)
- 12 Gantry Mounting Nylock Nuts (hex, 1/4" – 20 tpi)
- USB A-B cable
- CNC Shark Family Owner's Manual
- Vectric VCarve Pro software (CD)
- Vectric Cut3D software (CD)
- Vectric VectorArt 3D Sampler Pack (CD)
- V-Groove Router Bit (1/2" diameter, 90°, Rockler SKU 90869)
- 2 Hold Down Clamps (Rockler SKU 21912)

Computer Requirements

The VCarve Pro software from Vectric is more computationally and graphically (video card) intensive than the CNC Shark Control Panel software. The current minimum system requirements for running both VCarve Pro and the CNC Shark Control Panel on the same computer are:

- 2 GHz Pentium 4
- 60 Mb Disk Space
- 2 Gb RAM
- 1024x768 graphics display
- DVD ROM drive
- USB 2.0
- Operating system: Windows XP with SP3, Windows Vista, or Windows 7

VCarve Pro will run faster with a better processor and more memory than listed in the minimum system requirements. While loading a tap file to the Control Box may be slightly faster in the same case, the operating speed of the CNC Shark machine is not affected by the 'power' of the computer used to connect to the Control Box.

Other operating systems, for example iOS (Apple) and Linux, are not currently supported.

The computer used to connect to the Control Box must have a USB 2.0 port. If a USB hub is used between the PC and the Control Box, it must be a 'powered' USB 2.0 hub. The Control Box will not work with a computer connected with a USB 1.0 or 1.1 port, or a USB hub that is not powered.

There is no requirement to run VCarve Pro on the same computer as you use in the shop to connect to the Shark Control Box.