NEXT WAVE CNC

SHARK

LCD Pendant

Owners Manual

Watch Getting Started with your LCD Pendant training video at:
https://www.nextwavecnc.com/webinars

Next Wave CNC warrants your new *Shark LCD Pendant* to be free from defects in material and workmanship for TWO YEARS from the date of purchase. The warranty applies only to the original retail purchaser of the *SHARK LCD Pendant* when purchased from an authorized *Next Wave CNC* distributor. This Warranty covers the parts and labor to correct the defect. It does not cover the cost of shipping the machine and/or parts to *Next Wave CNC* for evaluation or repair.

This warranty does not apply to problems arising from normal wear and tear, misuse, abuse, negligence, accidents, unauthorized repairs, alterations, or lack of maintenance. This warranty is void if the *SHARK LCD Pendant* or any portion of it is modified without prior written permission form *Next Wave CNC*, or if the machine is located or has been outside the country where the machine was purchased.

Please contact *Next Wave CNC* to take advantage of this warranty. If *Next Wave CNC* determines that your *SHARK LCD Pendant* is defective in material or workmanship, *Next Wave CNC* will at its expense and upon proof of purchase send replacement parts to the original retail purchaser necessary to cure the defect. *Next Wave CNC* will repair the *SHARK LCD Pendant* provided it is returned to *Next Wave CNC*, shipping prepaid, with proof or purchase and within warranty period.

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

Version: 07/04/2022

Technical Support

If you need technical assistance with your *SHARK LCD Pendant*, please visit our Support webpage at: *NextWaveCNC.com/support* or email Customer Support at: *Support@NextWaveCNC.com.*

Please include your product model number, date of purchase, and other pertinent information associated with the issue, such as .tap files, *VCarve* files, screen captures, or photos of your setup or the problem.

Support Email: *support@NextWaveCNC.com*
Available: 9am – 5pm Monday – Friday (Eastern Time).

LCD Pendant System Requirements – The LCD is compatible with all current *SHARK* HD and SD series CNC machines as well as past machines that use a control box with a Pendant cable input port. Some (but not all) older machines that lack the Pendant input port can be upgraded by switching to the new style Control Box that has the Pendant input port. For information on upgrading an older *Next Wave CNC* machine contact Customer Service at *Support@NextWaveCNC.com*

NEXT WAVE® CNC

SHARK®
World Class. Made in USA.

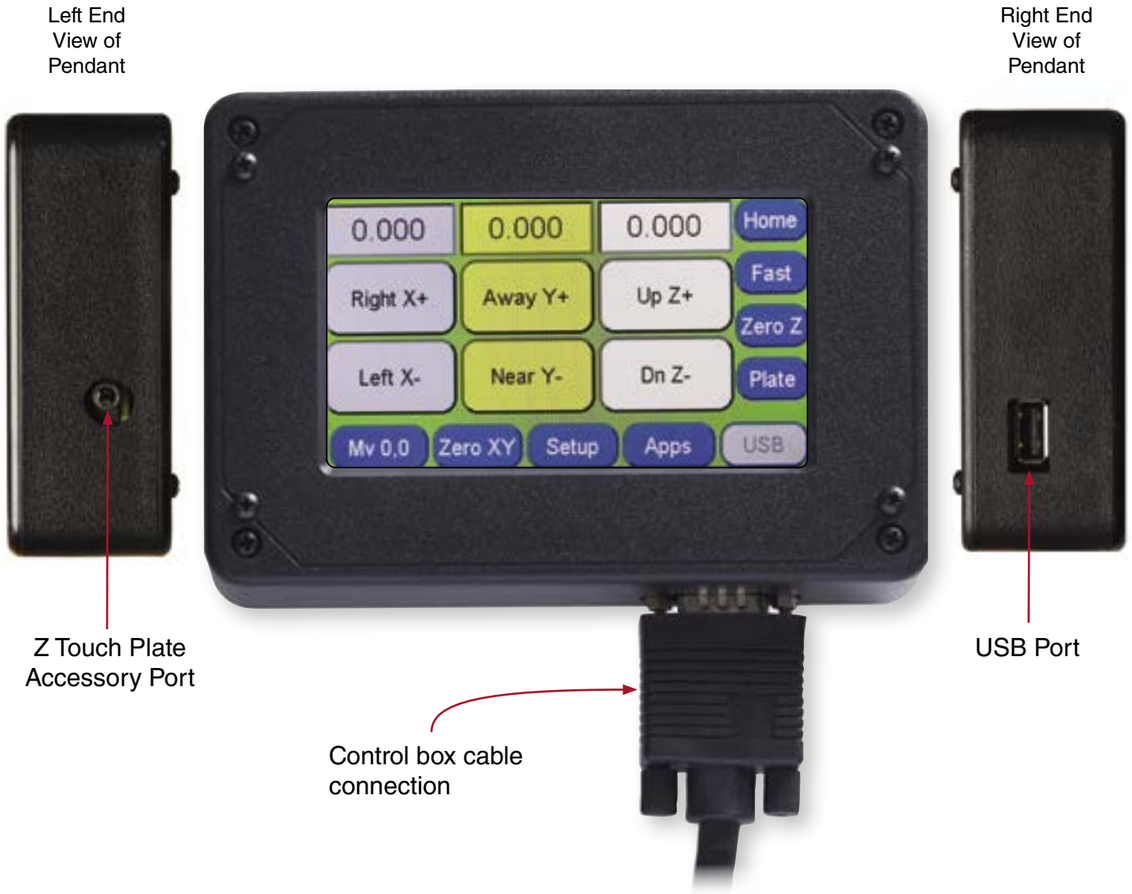
Next Wave CNC, LLC,
600 W. Boundary St., Perrysburg, Ohio 43551
USA
Main Office Phone (419) 318-4822
info@nextwaveCNC.com

CONTENTS

Pendant Overview

The Pendant serves as the primary interface that allows you to operate and control your *SHARK CNC*. The touch screen allows you to control the CNC using your finger, a soft stylus, or a pencil eraser.

You will also find three connectors on the Pendant. The multi-pin connector on the bottom of the Pendant fits the cable from the CNC's control box. Connect this cable first. The optional Z touch plate accessory plugs into the jack on the left side of the Pendant. The touch plate zeros the Z-axis prior to cutting. The USB Type-A port on the right side accepts a USB flash drive containing the TAP/G-code files to cut your project on the CNC.



Warning

DO NOT plug in and turn on the control power until all the motor and Pendant cables have been attached. DO NOT attach or remove the motor or Pendant cables when the control box is powered up as this can damage the electronics and is not covered by the warranty.

Pendant Registration

Before continuing the setup of your *SHARK HD CNC*, register your machine online by navigating your web browser to *NextWaveCNC.com*. Click on the PRODUCT REGISTRATION tab at the top of the screen (see above).

Once you complete the registration, create a customer account and follow the instructions to generate a unique code to unlock your Pendant. You will also receive the code in your email inbox. Use the number keys on the Pendant to enter your Unlock (Access) Code. Press Submit. This unlocks the Pendant.

Your *SHARK CNC* is now unlocked, and ready to use.

Serial Number and Software License Information:
For easy reference and record keeping, enter your *SHARK* Pendant and Controller information below.

LCD Pendant Unlock Code

_____

LCD Pendant Serial Number

_____

Controller Box Serial Number

_____

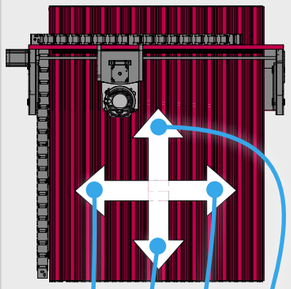
Registering the Pendant

Unlock the Pendant by entering the access code you received upon registration.

After successfully unlocking the Pendant, you're ready to control your *SHARK HD CNC*.

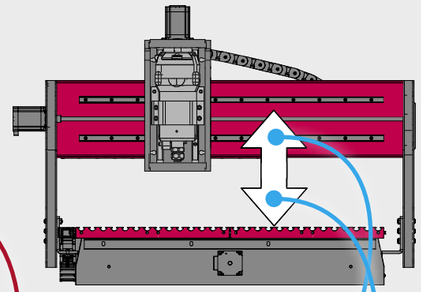
Quick Guide to Basic Pendant Function Keys

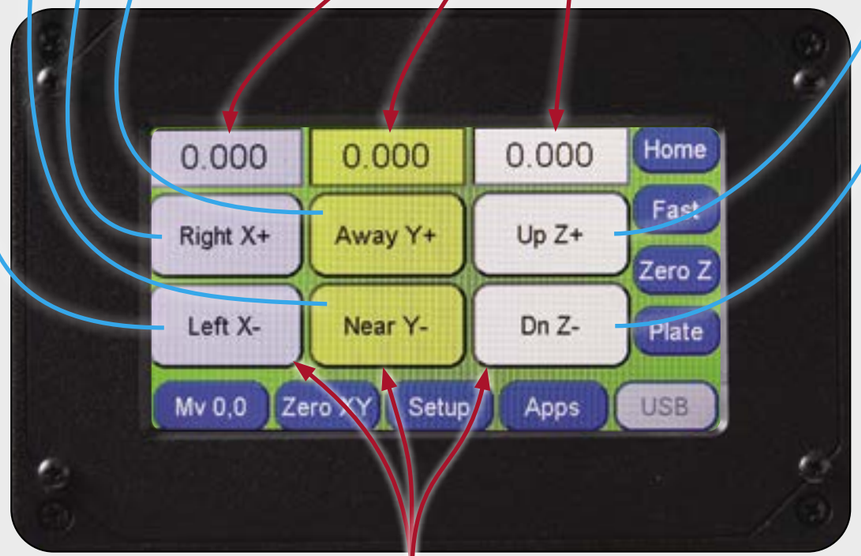
CNC Top View



Axis position fields- These three fields show the current X, Y, and Z location of the router bit. Keep in mind that the location is always relative to where the zero points of the X-, Y-, and Z-axes have been set. Pressing on an Axis position field button opens the Axis edit screen for that axis (see page 13 for more information).

CNC Front View



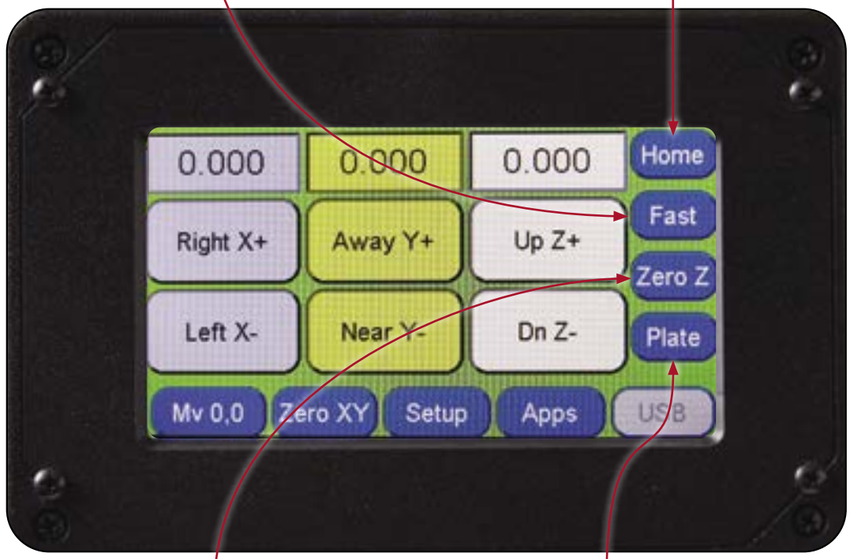


Axis jog buttons – These six buttons control the movement of the router in the specified direction. Use them to jog the router to set a zero point, move it out of the way while securing or removing material, or move it to a convenient spot to change the bit. Change the speed of the movement by toggling the jog speed button.

Main Screen Function Keys

Slow, Med, and Fast Jog speeds – press to toggle between jog speeds. You can use the fast speed to quickly jog the unit into a general position and switch to med or slow for the fine control needed for setting a zero point.

Home - The Home key uses sensors located on the X- and Y- axes to Home (zero) the machine. The Home position serves as an origin for setting up repeating operations **(see page 9)**.



Zero Z – Pressing this key zeros out the Z-axis at its current position. The Z- position field will reset to 000. Use this function to manually set the zero position of the Z- axis.

Plate – The Plate button allows you to use the optional Z-axis touch plate, a handy accessory for quickly setting the zero point for the Z- axis **(see page 11).**

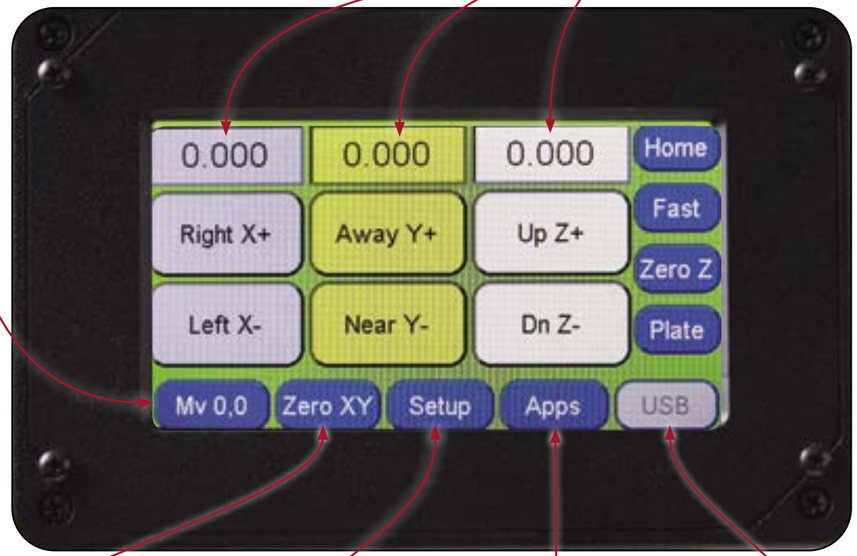
Mv 0,0 – This button automatically jogs the router in one of two ways, depending on how you press the button.

A single tap jogs the router to the X- and Y- axes zero position.

A quick double tap moves the router to the X-, Y- and Z-axes zero position.

The Mv 0,0 key is handy for quickly moving the router back into position to start a cut. In addition, if you are in the process of cutting many parts but need to shut your machine down at the end of the day you can bring the router back to the 0,0,0 point. The next time you start your machine the axes will already be zeroed out to that location and you are ready to pick up where you left off.

Axis Edit Screen Access - press the the Axis Position button to open the corresponding Axis Edit Screen **(see page 13)**

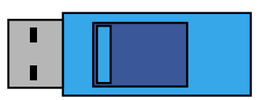


Zero XY– Press this button to zero the X- and Y-axes to the current position of the router. The X- and Y-position fields will reset to 0.000. Use this when positioning the router bit over the datum (XY zero) point on a project.

Setup - Press Setup to access the Setup submenu. The Setup submenu contains options that control how the Pendant functions **(see page 18).**

Apps – Press Apps to view the Apps submenu. It contains special functions for calibrating the operation of the CNC. It's also used with optional accessories **(see page 22)**.

USB – Press this button to select a cutting (.tap) file you transferred from your computer to the USB drive **(see page 15)**.



Home X & Y Axes App

The Home X & Y Axes app calibrates and zeros out the X- and Y- axes to the machine's Home location in the front-left corner of the table for Shark HD5 series machines and the rear-left corner on a Shark SD120 machine.

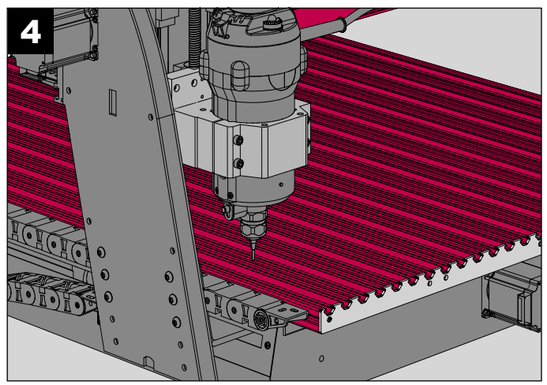
NOTE: The SD100 and SD110 do not have the required sensors, so the Home app does not apply to those machines.

X-Y Home can be calibrated each time you power up your Shark or at any time before you run a project file. Using the Home X- and Y-Axes provides a consistent, repeatable reference point that is particularly useful when using jigs, or when you need to run a cutting file from a precise location.

To access the Homing function press the Home button on the Main Screen (page 7) or open it from the Apps menu (Figure 1). Select Home X-Axis from the list to set its home location (Figure 2). Move the router bit to within 4" of the lower left side before proceeding and press OK (Figure 3). The router will move to the X-axis Home (zero) location (Figure 4) and display the value. Press OK to accept the value (Figure 5) and repeat these steps for the Y- axis.

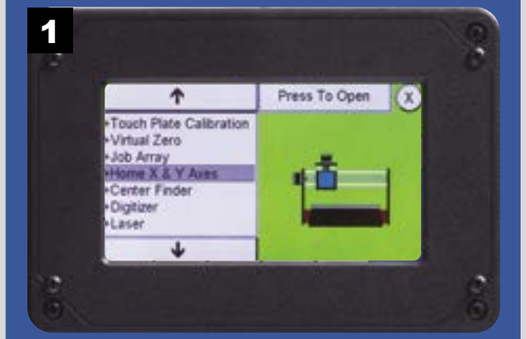
The X- and Y-Offset options on the menu allow you to set the X-Y zero location a precise distance from the machine's Home position (Figures 7,8). This new location can be referred to as "project zero." It gives you the flexibility of using the X- and Y-datum point established when creating a project in *VCarve* at a convenient location on the machine. The combination of Homing and Offsets provides absolute repeatability in job setups.

Press the Mv 0,0 button on the main screen to move the router to the new "project zero" (Offset) location.



When the Homing routine completes, the Z-axis will be centered over the machine's Home location and the Pendant X & Y Position fields will read 0.000 (Figure 5).

Homing X & Y Axes



Access the Home X & Y Axes function by pressing the Home button on the Main screen (page 7) or on the Apps screen (shown above).

Select Home X-axis to calibrate the zero point for the X-axis home position.

Make sure the router bit is within 4" of the lower left corner in the X- and Y-directions.

Home X & Y Axes *continued*

4

The router carriage will begin to move in the X direction until it contacts the limit switch.

5

Press OK to accept the X-axis location. Repeat the process to calibrate the Y-axis.

6

The X and Y Position fields should read 0.000 after calibration.

7

Press Home on the main screen to set the X and Y offset distances from the Home position.

8

Enter a value to set the offset distance of the X-axis from 0,0. Repeat the process to set the Y Offset.

9

The Speed function allows you to set the speed the router moves to the Home position.

Shark Z Zero Touch Plate

The optional Shark Z Zero Touch Plate accessory (see page 35) provides a fast and accurate way to zero the Z-axis. It's a useful upgrade for your Shark CNC router that makes this process easier. Simply place the touch plate on top of the material to be routed before completing the process.

The touch plate assembly includes a ⅜"-thick aluminum disc and a cable assembly. One end of the cable is fitted with an ⅛" plug that fits into the jack on the side of the Pendant. The opposite end of the coiled cable features two leads: an aluminum touch plate, and the other lead has a small magnet that you attach to the router bit. This completes the circuit when the bit touches the plate during the zeroing process.

There are two ways to access the Touch Plate Calibration option: press the Plate key on the Main Screen or press Apps to display a list of options (Figure 1), including Touch Plate Calibration. Select this option, then Press to Open to display three choices. Run Z Calibration performs the operation to zero the Z- axis, a Speed option sets the plunge rate of the Z- axis during calibration, and Plate Thickness stores the thickness of the touch plate . The default values for these work well for most applications. Select Run Z Calibration (Figure 2).

As instructed in Figure 3, Press OK to verify the touch plate is connected properly.

Touch Plate App

1

Press the APPS button on the Main screen to access the option to calibrate the touch plate.

2

The Run Z Calibration option begins the routine to zero the Z- axis using the touch plate.

3

Make sure the magnet is attached to the router bit before pressing OK.

4

Raise the touch plate until it touches the router bit to confirm a proper connection.

Z Zero Touch Plate *continued*

Raise the touch plate to touch the router bit (Figure 4). While the plate is touching the bit, you should see a red screen as shown in Figure 5. Replace the touch plate below the bit and press OK to begin the movement of the router in the Z- axis (Figure 6).

The bit will move downward until it contacts the touch plate (Figure 7) and immediately raise to a safe height. On the next screen (Figure 8), press OK, then remove the touch plate and magnet.

Zeroing X- and Y- Axes

5

Holding the touch plate against the router bit confirms that you can proceed to the next step.

6

Move the touch plate under the bit and press OK to begin router movement.

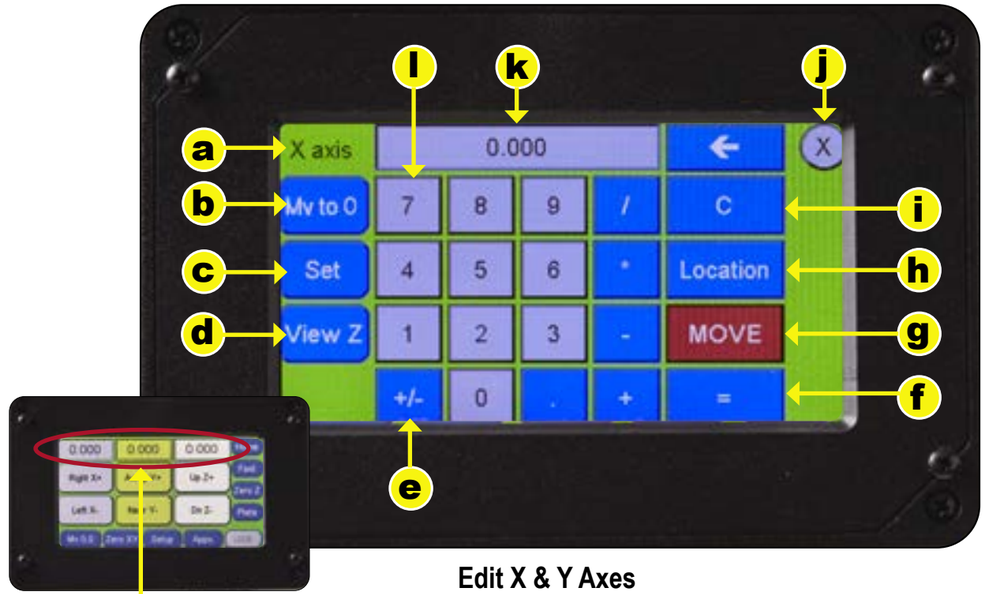
7

The bit lowers until it contacts the touch plate then raises to allow removal of the plate and cables.

8

The calculated Z value is displayed. Press OK to accept these results.

Axis Edit Screens



Edit X & Y Axes

On the main screen of the Pendant, pressing the Position field for the X-, Y-, or Z-axis at the top of the screen allows you to make adjustments to the selected axis. You can also calculate values using the numeric and math function keys.

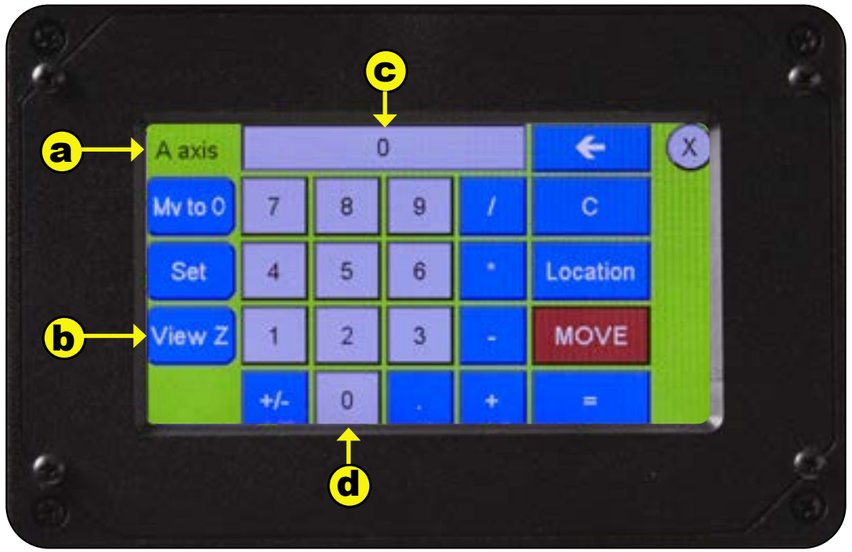
a. **Active Axis:** Displays the axis that is currently open for editing.
b. **Mv to 0:** Moves the axis to its current zero position.
c. **Set:** Sets the new location entered in the Position field. This also changes the value on the Main Screen.
d. **View Z:** Toggles the Edit Screen and Main Control Screen between the Z and A (see below).
e. **+/- button:** Toggles the position field between a positive and negative value.
f. **Function keys:** Similar to those on a typical math calculator.
g. **Move:** Press to move the axis to the location currently showing in the position field.
h. **Location:** Press to recall the current axis location.
i. **C:** Clears (deletes) the information in the position field.
j. **Exit screen:** Press the X symbol to exit the edit screen and return to the main control screen.
k. **Position field:** Displays the current or edited position of the axis. Use the keypad to edit this field.
l. **Number keypad:** Enters a new location in the position field. Can also be used for calculations.

Edit Z Axis

Editing the Z-axis uses the same functions as above except that the Active Axis and View A buttons are also relevant to the A-axis (see next page).

a. **Active Axis:** This value, shown in the upper left corner, toggles between Z- and A-axis with the use of the View A or View Z button.
b. **View A**: Press to toggle the Edit Screen and the Main Control Screen to the A-axis view.

A-Axis Edit Screen



Edit A-Axis

a. Active Axis: This value, shown in the upper left corner, toggles between Z- and A-axis with the use of the View A or View Z button.

b. View Z: Press to toggle the Edit Screen and the Main Control Screen to the Z-axis view.

c. Position field: Displays degrees of rotation.

d. A-axis controls: Use the numeric keypad to set the A-axis degrees of rotation. The value also appears in the Main Control Screen.

Pendant Workflow

Routing projects with your *Shark CNC* consists of a few basic steps, a summary of these steps is listed below and detailed on the following pages:

1. Save toolpaths from the *VCarve* design file to a USB flash drive.
2. Insert the flash drive into the Pendant.
3. Mount the project material to the bed of the CNC.
4 Install a router bit.
5. Zero the X- and Y-axes.
6. Zero the Z-axis.
7. Press the USB button on the Pendant to access the toolpath file.
8. Select the toolpath file.
9. Verify the setup parameters shown on the Pendant screen.
10. Press Start to begin routing your project.

1. SAVE TOOLPATH FILES. After completing the project design and generating the toolpaths in *VCarve*, save the toolpaths to a USB flash drive so you can load the files into the Pendant. To do this, select the toolpaths you wish to save then select the Post Processor that matches your machine. For the *Shark CNC* router select the *Next Wave CNC* (*.tap) post processor (Figure 1). The post processor converts the *VCarve* toolpath selections into instructions for the CNC to rout the project. The code file has a .tap extension and is commonly referred to as a "tap," "G-code," or "cutting file." Finish by pressing the Save Toolpath button and saving the file to a USB flash drive (Figure 1).

2. INSERT USB DRIVE. To enable the Pendant to load the toolpath (.tap) file, switch on the control box and insert the USB drive into the USB port on the side of the Pendant. You'll select the required toolpath file later.

3. MOUNT THE WORKPIECE. To set up the origin of the X-, Y-, and Z-axis on your workpiece, first mark the XY datum (zero) position on your material. (Figure 3). The marked datum point should match the location on the workpiece you used in your *VCarve* design file. In our example, the XY datum point is specified as the center of the material.

Securely clamp the workpiece to the bed of the CNC (Figure 3). Use enough clamps to ensure the workpiece won't shift during the routing process. It's also important to position the clamps so they're not in the way of the toolpaths to be routed into the workpiece. A little careful planning here will go a long way toward ensuring success with your project.

4. INSTALL THE ROUTER BIT. Once the workpiece is secured, properly install the router bit you specified in *VCarve* for the toolpath you'll be using (Figure 4).

5. ZERO THE X- AND Y-AXES. You'll find an overview of the main Pendant screen on pages 6-8. Use the four X and Y buttons (Right X+, Left X-, Away Y+, Near Y-) of the Pendant to jog the router close to the XY datum mark. Notice the values in the Position boxes at the top of the screen change values as you jog the router. Change the jog speed to Slow and position the router bit directly over the datum mark (Figure 5). Press the "Zero XY" button to zero the X- and Y-axes. The values for the X- and Y-axes should read 0.000 in the position boxes.

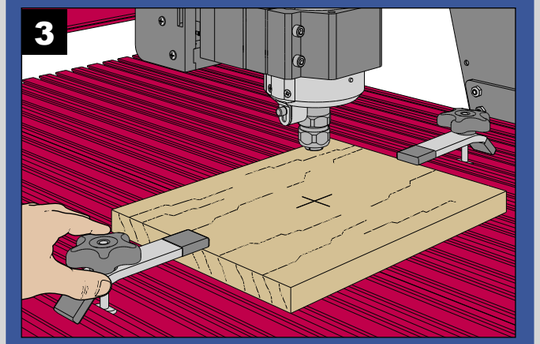
6. ZERO THE Z-AXIS. To zero the Z-axis, lower the bit to within ½" of the top of the workpiece and set the jog speed to Slow. Slide a piece of paper underneath the bit and move it back and forth as you tap the "Dn Z-" button to gradually lower the bit (Figure 6). When the bit "grabs" the paper, stop. Press the "Zero Z" button. The Position value for the Z-axis should read 0.000. Now, all three axes are calibrated.

Raise the router bit approximately ½" to prepare for cutting the project.

NOTE: A fast, easy, and accurate way to zero the Z-axis is with the optional *Z Zero Touch Plate* accessory. See page 11 and learn more at *NextWaveCNC.com*.

CNC Setup

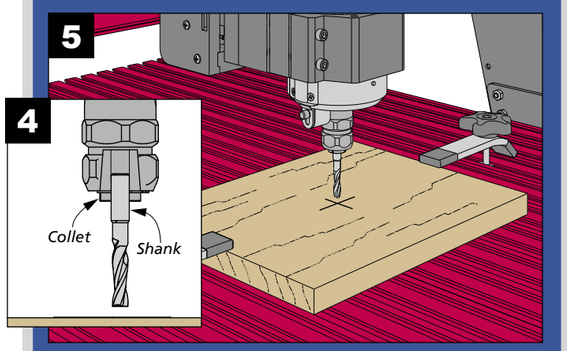
3



Zero the X and Y axis first by jogging the bit until it's positioned over the center of the workpiece.

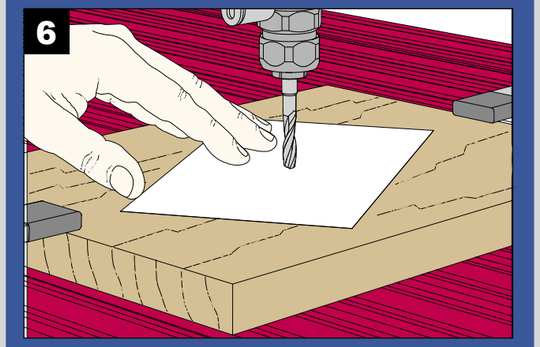
5

4



Insert the bit so that a small amount of smooth shank shows between the collet and the cutting edges, but also make sure the bit isn't bottomed out in the collet.

6



Zero the Z axis by lowering the bit until it just touches a piece of paper on the workpiece.

7. PRESS THE USB BUTTON. With a USB drive inserted into the Pendant, the USB button on the main screen should turn blue. Press the USB button (Figure 7) to open the file selection menu.

8. SELECT THE PROJECT FILE. From the displayed list, select the project .tap file you want to cut (Figure 8).

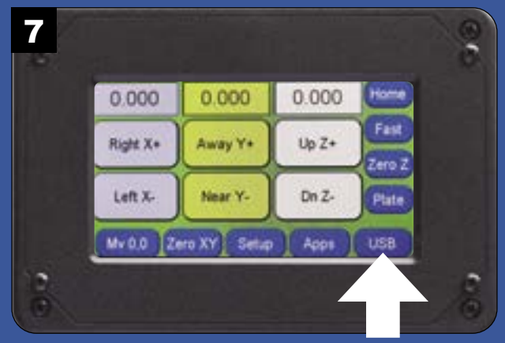
9. VERIFY JOB SETUP. The next screen (Figure 9) shows the parameters for the job including the CNC name, material size, location of the Z origin, and the location of the XY origin. Preview the settings to make sure you've selected the correct .tap file. Also make sure the settings match your *VCarve* file and CNC machine. If everything checks out, press the Next button.

10. PRESS START! Review the safety check lists in your CNC manual, then press the Start button (Figure 10). Your *Shark CNC* will automatically turn on the router and begin cutting the project.

If your project has more than one toolpath file, repeat steps 4 through 10 for the remaining toolpath (.tap) files for the project. When all of the .tap files have been run, remove the project, sand off the rough edges, and apply a finish.

Review, Then Cut

7



After inserting the flash drive into the Pendant, press the "USB" button to select the project file.

8

From the list of available projects, choose the appropriate .tap file you wish to use.

9

Verify all of the set-up information for this job, review the safety checklist, then press the Next button.

10

To begin the CNC operation, press the Start button. If needed, the Stop button shuts down the CNC.

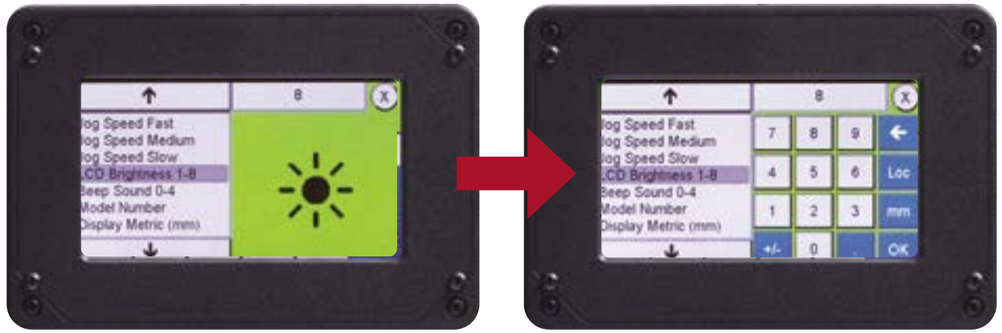
Setup Menu

Setup Menu Screen: Press the Setup button on the Main Control screen to open the Setup screen. The Setup menu contains options for controlling specific Pendant functions. Press a menu item to open the settings screen for that option. To return to the Main Control Screen, press X in the upper right corner.

Jog Speed: Press Jog Speed Fast, Medium, or Slow to display the jog speed settings window. The current jog speed appears in the top right of the

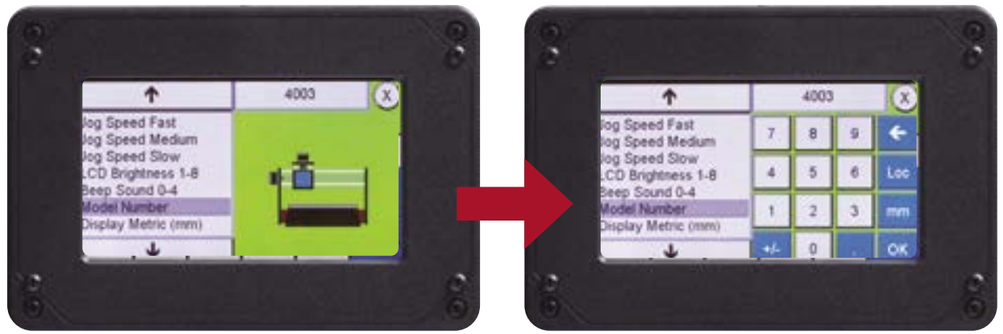
screen. Tapping this field opens a numeric keypad for entering a new value for the Jog Speed. Press OK to save the setting.

COMMON CONTROLS
- Press number field in the upper right to open the numeric keypad
- Use the keypad to enter a new setting
- Press OK on the keypad to save your setting
- Press the X in the upper right to exit Setup and return to the Main Screen.



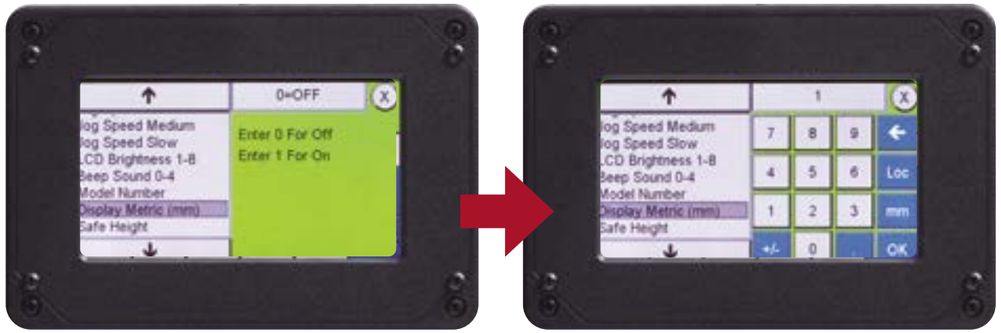
LCD Brightness: Press the number field in the upper right to display the numeric keypad. Use the keypad to adjust the brightness from 1 (dimmest) to 8 (brightest).

Beep Sound: Change the volume of the beeps by selecting Beep Sound 0-4. Enter a value of 0 (silent) to 4 (loudest) using the keypad.

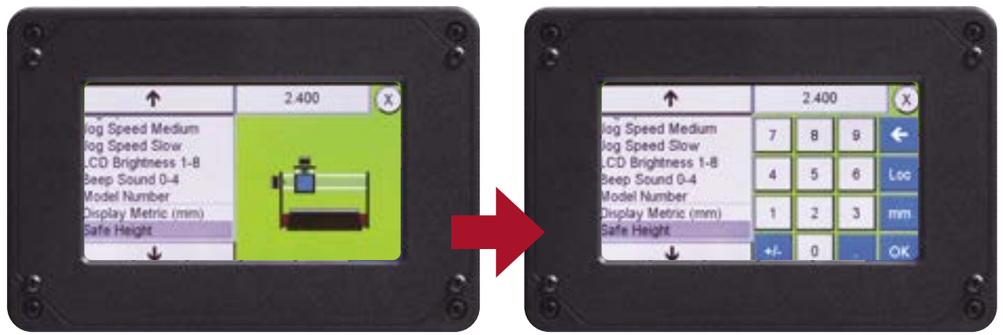


Model Number: This function controls several settings on your *Shark CNC* such as motor rotation and XY machine orientation. Verify the model number for your machine using the chart at right. Verify this setting after performing a firmware update for the Control Box or Pendant.

Machine Type	Model Number
SD100/Barracuda	300
SD110	102
SD120	202
HD500, HD510, HD520	4003
Shark II, HD4, HD4 Ext.	4004



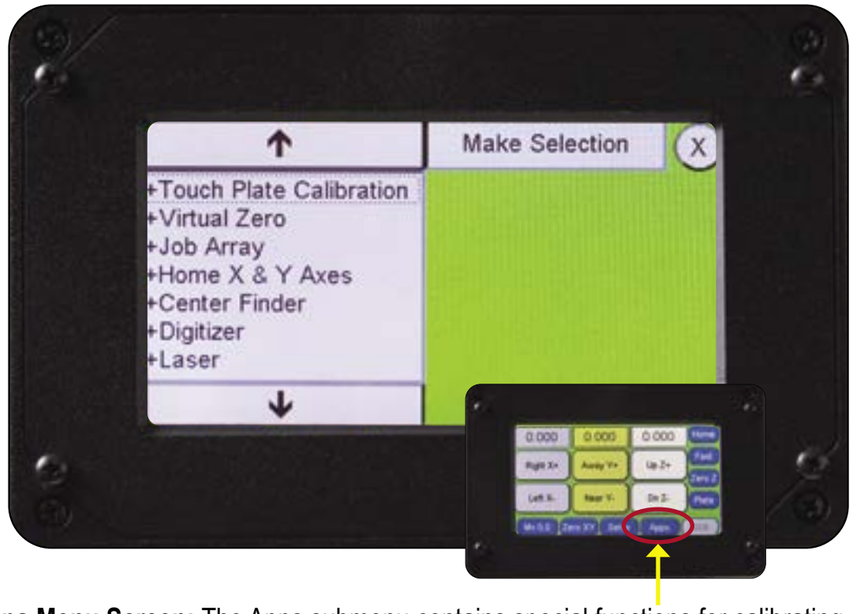
Display Metric: Toggles between millimeter and inch values displayed in the position fields on the main screen. Enter either 1 for metric or 0 for inches.



Safe Height: The Safe Z Height setting controls how far the router bit rises above the Z zero position when you press the Mv0,0 button on the Main screen. This function helps prevent router bit collisions and possible breakage with hold-down clamps or other hardware. You can adjust the Safe Height by pressing the Setup key on the Main Screen. Scroll down the list to “Safe Height” (Figure 1). Adjust the Safe Height by pressing the numerical field at the upper right of the screen. This opens the numerical keypad. Enter the desired value and press OK. Now when you press Mv 0,0 on the Main Screen, the router will move up to this Safe Height and then to the X,Y zero location.

NOTE: To set the safe Z clearance during cutting you need to adjust the Rapid Z Height in your *VCarve* file. You access the Rapid Z Height setting through the Material Setup button located at the top of the Toolpath panel in *VCarve* or *Aspire*.

Apps Menu



Apps Menu Screen: The Apps submenu contains special functions for calibrating and operating your Shark CNC and optional accessories. Select an item from the list of apps and press Make Selection to open the settings screen for that option. Press X to return to the Main Screen.

Touch Plate Calibration: Select this option then Press To Open to initiate a series of steps that quickly and accurately zeros out the Z-axis using the Z Zero Touch Plate accessory (see page 11) available from *Next Wave CNC*.

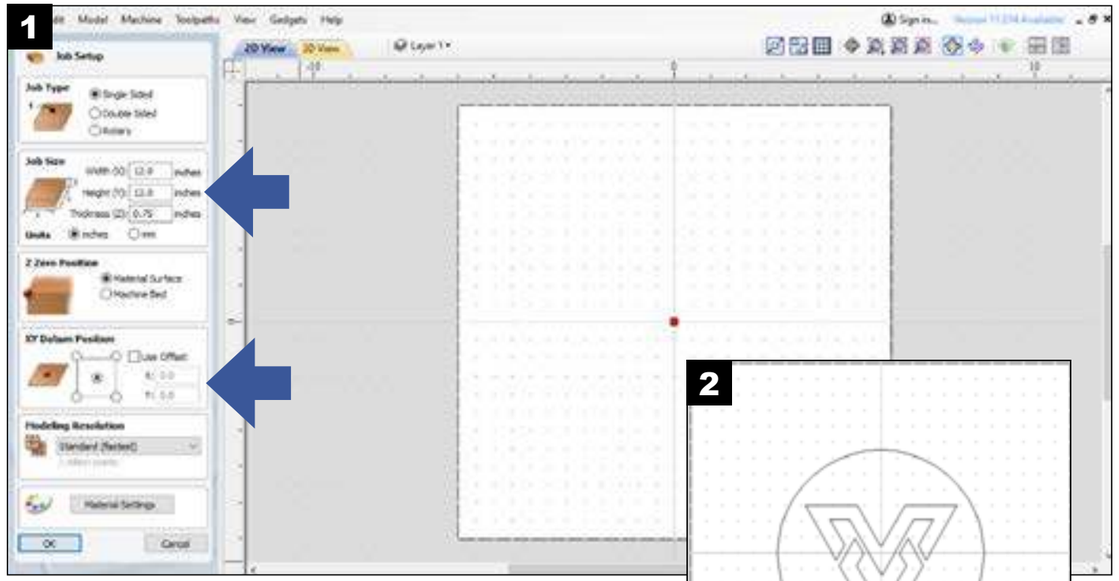
Virtual Zero: Select this app to adjust the .tap cutting file to conform to a slightly warped, curved, or uneven project material or machine table (see next page).

Virtual Zero App

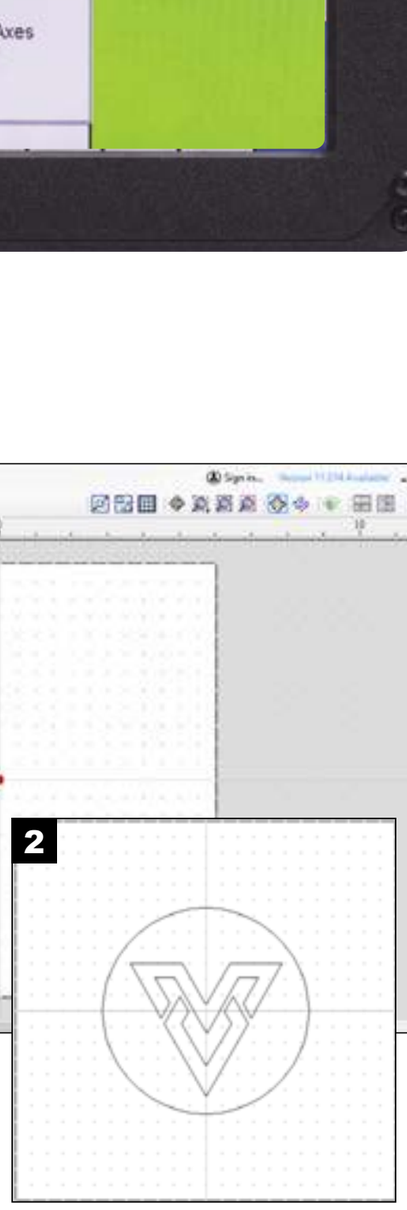
The Virtual Zero app makes adjustments for project material that may not be flat. This app allows you to define five Z zero locations to account for the uneven material: each corner and the center. It maps the uneven surface of the material and makes adjustments to the Z-height values in the .tap file.

The Virtual Zero profile automatically makes the adjustments to every toolpath for the cut file when different router bits are needed to complete the project. The Virtual Zero map remains in the Pendant memory until you reset it or turn off the control box.

Mapping the surface of your material with Virtual Zero requires a number of steps, so, take some time to read through the steps and practice with your machine before setting up to cut your project.

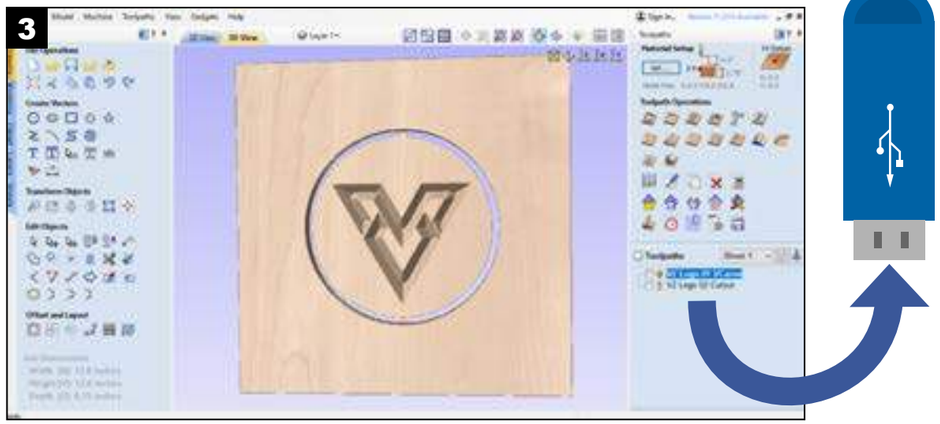


To prepare the design to use the Virtual Zero function, set the Z Zero Position to the Material Surface and the XY Datum Position to the center of your project.



Create your project design as you normally would.

Create and Save the project toolpaths to a USB thumb drive. In this example of the Virtual Zero logo, two toolpaths are saved: one for carving the letter using a 90° V-bit and another toolpath to cut the circle using a straight bit.



Setting Up Virtual Zero

After inserting USB device, use the Apps key and select the Virtual Zero app. In the upper right of the screen touch Press to Open to display the Virtual Zero settings screen.

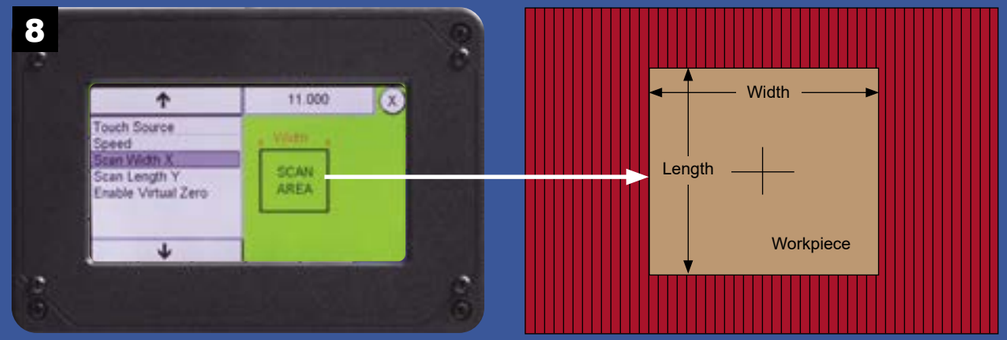
The Touch Source defines the method used to set the Z zero point. Many *Shark CNC* users will use the *Shark Z Zero Touch Plate*. You may also use the optional digital probe accessory.

Press the field in the upper right of the screen to choose either the probe or touch plate using the numeric keypad. Enter 0 to use the probe or 1 to use the touch plate.

The Speed setting controls the Z-axis plunge rate. The default setting of 10 works well for most situations. Change it by pressing the settings field in the upper right and enter a new value using the numeric keypad.

Setting Up Virtual Zero *continued*

8

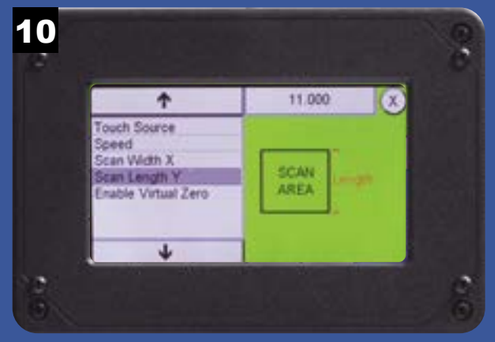


The scan area defines where on the material you will be setting the five Z zero points. You can set this to any size, but it's usually best to limit it to the approximate size of the cutting area. You can also set points that best represent the area that will be carved. Another option is to bypass this step and use the File Specifies width and length derived from the *VCarve* cutting file.

9

After choosing "Scan Width X," enter the width in the upper right hand field using the numeric keypad, then press OK to continue.

10

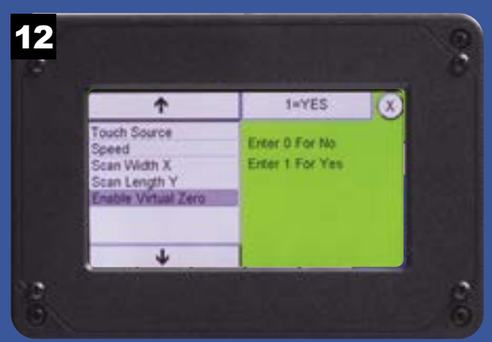


Repeat the process for the "Scan Length Y" option.

11

Enter the value for the Scan Length Y, then press OK to continue.

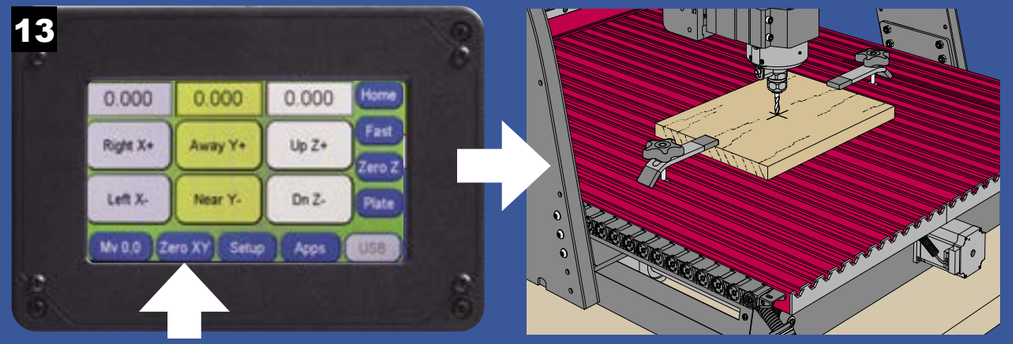
12



Enable Virtual Zero pressing the settings field in the upper right and entering 1 for Yes. Press X to exit this screen and return to the Main Screen.

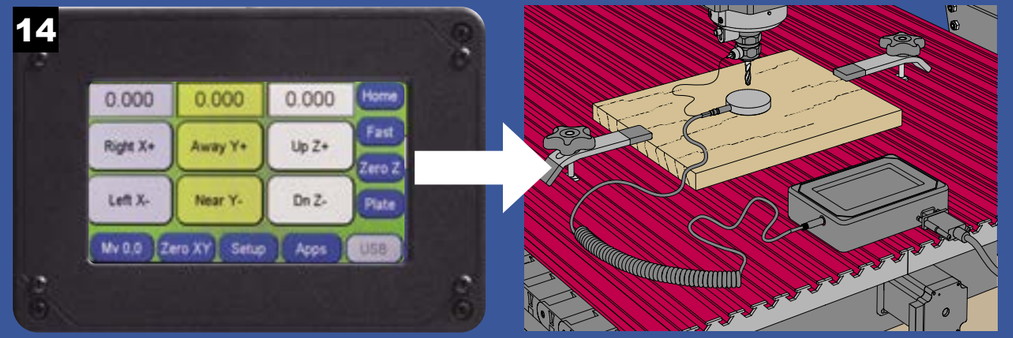
Setting Up Virtual Zero *continued*

13



Mark a center point on the workpiece. Install the appropriate router bit. Move the router bit to the center mark. Press Zero XY to zero the X- and Y-axes to the center of the material.

14



Use the Plate function and Z Zero Touch Plate to zero the Z-axis to the top of the material.

15

Press the USB button to bring up the list of .tap files. Select the toolpath file that you want to cut. In this example we are starting with VZ Logo 01 VCarve.tap.

16

Review the header information screen. If everything looks OK, press the Next button to continue.

Setting Up Virtual Zero *continued*

17

On this screen, you're presented with two options. The first, File Specifies, displays the material size you set up in *VCarve* less 1". This provides half of an inch clearance around the material to assure the scan area stays within the boundary of the material, and to allow some room for clamps.

The second option, Current Region, uses the scan area specified in of the Virtual Zero app. See steps 8 through 10 on page 24.

Both of these options take you to the next steps of capturing the five Z Zero capture points.

18

To define new Virtual Zero coordinates, press Capture New Points. Virtual Zero uses the Z Zero Touch Plate routine to capture the scanned points. Virtual Zero will go through the Z Zero Touch plate routine five times in order to capture the four corners and the center point of the area chosen to scan.

19

With the Z Zero Touch Plate connected to the Pendant, and its magnet attached to the router bit, press OK.

20

Confirm a proper connection between the plate and Pendant by touching the plate to the router bit.

21

When you touch the plate to the router bit, the red confirmation screen appears.

Setting Up Virtual Zero *continued*

22

Ensure the touch plate is positioned below the router bit before continuing. Press OK to confirm that you're ready to capture Virtual Zero points. These are typically the four corners and center of the scan area defined earlier.

23

The Virtual Zero app records and shows how much each point varies from the original Z zero position. After scanning a point you can choose Redo Point or press OK to continue mapping.

24

The router will move in the Z direction until it contacts the touch plate. Repeat the process to define all five points.

25

When the five Virtual Zero points are captured, the screen shows the X and Y values of the scan area and how much each capture point varies from the Z Zero height. Press Next to begin carving your project.

26

A small green V appears in the top right corner of the screen to signify that the file is using Virtual Zero. Press Start to begin carving.

27

As the project file is being processed, the Lines Sent, Transmitted, and Time values are updated. After the first file is done running, press X to return to the main screen.

Setting Up Virtual Zero *continued*

28

Press the USB button to bring up the list of .tap files. Select the next toolpath file for the project. Install the appropriate router bit for this toolpath.

29

Verify the project information and press Next to continue.

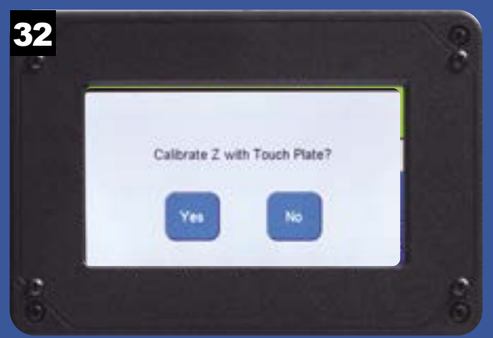
30

Use the same option for the Scan Region as you selected for the first toolpath above (Figure 13).

31

Since you have already captured the five Virtual Zero points for this project, press the Existing Points button on the screen.

32



With a new router bit installed, you will need to recalibrate the bit's Z zero with the touch plate once again.

33

Ensure the touch plate is positioned directly below the router bit and select OK.

Setting Up Virtual Zero *continued*

34

As before, lift the plate to touch the router bit.

35

This screen confirms the touch plate is connected properly.

36

Place the touch plate below the router bit and select OK.

37

Allow the router to move down until it touches the plate.

38

Confirm the value by selecting OK. Remove the touch plate and magnet before proceeding.

39

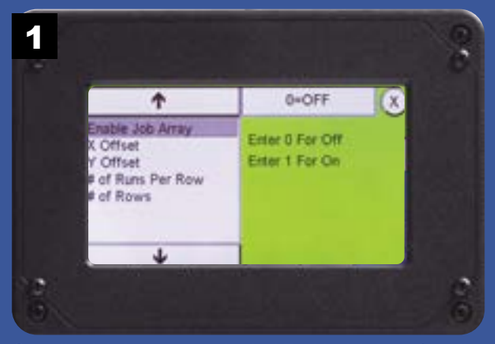
Press Start to begin processing the file. The Virtual Zero map can be used as many times as needed for your project. Remember that the mapping is specific to a particular piece of material, so if you install a new piece of material the mapping must be redone.

Job Array App

The Job Array app allows you to create multiple parts from a single file set up. This gives you flexibility and convenience in setting up projects based on the size of the material or how many parts need to be made. With Job Array there is no need to create a new file in *VCarve* for each part to be cut.

After enabling Job Array (see below), you'll be able to select the cut file for which multiples are to be made. You can specify the how the multiple parts are to be laid out and cut based on the size of the material.

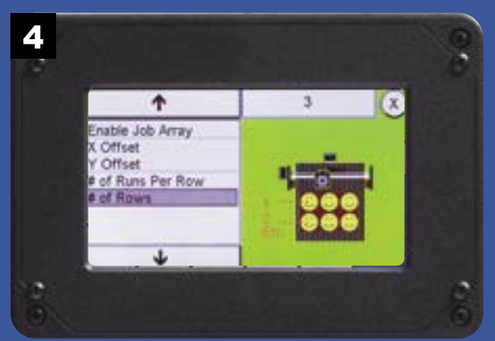
Setting Up Job Array



Open the Job Array app and select Enable Job Array from the list. Press the entry box on the upper right to display a numeric keyboard. Press 0 for Off or 1 to enable Job Array.

The X and Y Offsets sets the distance between the XY datum points for each copy of the part defined in the design file. Enter the distance in the upper right field using the keypad.

Press # of Runs per Row to set the number of copies of the project in the X direction using the numeric keypad.



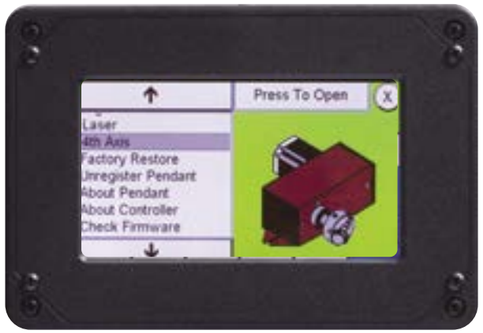
Use the # of Rows function to set how many rows of the project are in the Y direction using the numeric keypad.

Home X & Y Axes: This app calibrates and zeroes out the X- and Y-axes to the machine's home location in the lower left corner of the table (page 15).

Center Finder: This function is used by some older machines but is not a function that applies to newer machines and can be disregarded.

Digitizer: Use this app to map the shape of your project using the Digital Duplicator accessory. You can create a copy of an existing carving or use the scan data with the Virtual Zero app. See the Digitizer Owner's Manual for complete use and operating information.

Laser: Use this app with the laser accessory to create detailed laser-engraved photographic engravings, images, and lettering. See the Laser Owner's Manual for complete use and operating instructions.



4th Axis: This app provides setup options for the various rotary 4th axis accessories available from *Next Wave CNC*. See the 4th Axis Owner's Manual for complete use and operating instructions)

Factory Restore: Use this app to restore the default settings in the Setting and App screens.

Unregister LCD: This option removes the access code from the Pendant.

About Pendant: Use this to display the Pendant serial number and firmware information. This is useful to verify firmware versions or when communicating with technical support personnel.

About Controller: This displays the controller (control box) serial number and firmware information.

Check Firmware: This app runs a quick check and displays a status report on your firmware. Firmware updates are available at *NextWaveCNC.com*.

Maintenance

The Pendant is a durable and trouble-free tool for controlling your *Shark CNC*, but the dust created by the router can sometimes cause problems.

To keep the Pendant operating trouble-free, it's important to keep it clean. To clean the Pendant case and screen, use canned air to blow off dust. Sometimes larger pieces of sawdust can lodge between the LCD screen and the plastic housing. To remove these bits of sawdust, fold a small piece of paper and run it around the perimeter of the screen as shown.

TIP - To reduce problems from dust, mount the pendant on a stand or, if your CNC has an enclosure to contain dust and noise, mount the Pendant on the side of the enclosure. The bottom of the Pendant case features a ¼"-20 thread you can use to mount the Pendant.

Sometimes it is necessary to recalibrate the Pendant screen so that the keys are responsive and work properly. To do this, first turn off the controller. Next, hold your finger on the screen and restart the controller. This activates a series of steps that step you through the process of recalibrating the Pendant LCD screen.

Firmware updates are available at *NextWaveCNC.com/firmware*

Wipe the Pendant screen with a soft cloth and remove sawdust buildup between the case and screen with a folded piece of paper.

Find more maintenance and setup tips and answers at:
https://www.nextwavecnc.com/frequentlyaskedquestions

SHARK®
World Class. Made in USA.

2HP WATER COOLED SPINDLE SYSTEM

- Powerful 2HP motor
- ER11 collet system includes 1/4” & 1/8” collets
- Water pump, hose and connection kit included
- 110V uses standard 20 amp circuit
- 6,000—24,000 rpm (rotations per minute) variable speed Inverter
- Spindle clamp adapts to existing router mounts
- Less than .005 mm runout Superior quiet operation Outer dimensions 80 mm x 180 mm

SKU 20157

NEXT WAVE CNC

SHARK®
World Class. Made in USA.

3HP WATER COOLED SPINDLE SYSTEM

- Powerful 3HP motor
- Digital Speed Control
- ER20 collet system includes 1/4” & 1/2” collets
- Enclosed Cooling System
- In line Flow Indicator

SKU 20160

NEXT WAVE CNC

SHARK®
World Class. Made in USA.

MINI-TOUCH PLATE

- Use the 1” diameter mini touch plate in tight spots, especially useful for Virtual Zero Unlimited
- Solid Aluminum Construction
- 12” patch cord with banana receiver
- Requires standard NWCNC touch plate to work (SKU 20141)

SKU 20146

NEXT WAVE CNC

SHARK®
World Class. Made in USA.

TOUCH PLATE

- Compatible with all Next Wave CNC machines.
- Required for using Virtual Zero Unlimited available on select machines
- Solid Aluminum Construction
- 4 ft Cord (6’ extension cable also available)
- Sets Z axis at exact zero for precision cutting
- Lays flat on the material surface or machine bed

SKU 20141

NEXT WAVE CNC

NEXT WAVE CNC

SHARK®
World Class. Made in USA.

LCD PENDANT
User's Manual
Version: 07/04/2022

800007