



1013 IntelliCarve

Owner's Manual



Oliver Machinery

M-1013 7/2011

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Warranty

Oliver makes every effort possible to assure that its equipment meets the highest possible standards of quality and durability. All products sold by Oliver are warranted to the original customer to be free from defects for a period of 2 (two) years on all parts, excluding electronics and motors, which are warranted for 1 year. Oliver's obligation under this warranty shall be exclusively limited to repairing or replacing (at Oliver's option) products which are determined by Oliver to be defective upon delivery F.O.B. (return freight paid by customer) to Oliver, and on inspection by Oliver. This warranty does not apply to defects due, directly or indirectly, to misuse, abuse, negligence, accidents, unauthorized repairs, alterations, lack of maintenance, acts of nature, or items that would normally be consumed or require replacement due to normal wear. In no event shall Oliver be liable for death, personal or property injury, or damages arising from the use of its products.

Warning

Read this manual thoroughly before operating the machine. Oliver Machinery disclaims any liability for machines that have been altered or abused. Oliver Machinery reserves the right to effect at any time, without prior notice, those alterations to parts, fittings, and accessory equipment which they may deem necessary for any reason whatsoever.

For More Information

Oliver Machinery is always adding new Industrial Woodworking products to the line. For complete, up-to-date product information, check with your local Oliver Machinery distributor, or visit www.olivermachinery.net

WARNING

Read this manual completely and observe all warning labels on the machine. Oliver Machinery has made every attempt to provide a safe, reliable, easy-to-use piece of machinery. Safety, however, is ultimately the responsibility of the individual machine operator. As with any piece of machinery, the operator must exercise caution, patience, and common sense to safely run the machine. Before operating this product, become familiar with the safety rules in the following sections.

This machine is designed for acrylic and wood carving only. This unit cannot be modified and used for any application other than for which it is designed. Any modification may result in a serious injury and will void all warranties. Please read and understand all warnings and operating instructions. Basic safety precautions should be followed to avoid the risk of personal injury when operating the machine.

1. Do not block the Emergency Stop Button.
2. To reduce the risk of electric shock, do not operate the machine with wet hands.
3. Do not wear gloves when operating the machine.
4. Before turning the power on, make sure the surroundings are clear of obstacles.
5. When you turn the power on, the axis return to the Home Point coordinates automatically.
6. Avoid the risk of danger; not play or run in the work area.
7. Do not touch the spindle or cutting tools with bare hands before the machine is completely stopped.
8. Pay attention to the warning labels. Replace the warning labels if they become illegible or are missing.
9. Always power off the machine when you finish your work.
10. Please install and remove the bit as instructed.
11. Ensure the power is off before installing a new cutting tool.
12. Please install the software and the unit as instructed.
13. To avoid the risk of danger, make certain that the object you are carving is properly secured.
14. Do not remove any debris that cover the axis while the unit is operating.
15. Always ensure that the size of the workpiece is proper for IntelliCarve.
16. To ensure safety, all maintenance should be made by a knowledgeable technician.
17. To ensure safety, be sure to properly ground any extension cord that is used.
18. To ensure safety, do not tamper with the safety cover, limit switch or any other accessories.
19. To avoid electrical shock, do not touch transformers, motors and control box when the power is on.
20. Unplug the power before replacing any fuse. Be sure to use the recommended fuse.
21. Be sure to turn off the machine when the power source is unstable.
22. Be sure to keep a record before changing any settings of the machine.
23. Place the unit in a sturdy place and dry area.
24. Avoid extremely high temperatures.

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Overview

Software

i-Picture is free software for the intelliCarve series that can automatically output NC code from image files such as jpg, png, gif or bmp files. Oliver Machinery will continue to review the software and will provide new releases when available at no charge to the original owner.

intelliCarve

With the output NC code from i-Picture, the intelliCarve is a very unique engraving machine that allows the user to transfer digital images or photographs onto a material such as wood, corian, acrylic or plastic.

What makes the intelliCarve so unique?

1. Easy

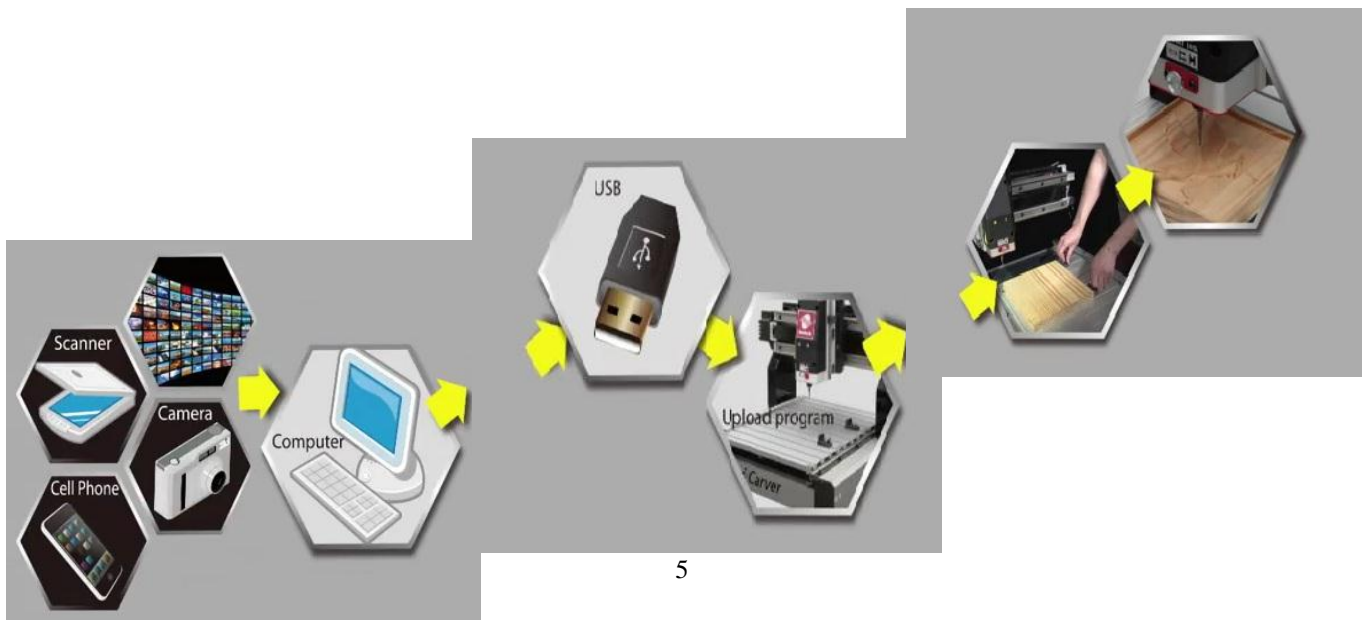
intelliCarve users only need plug the USB into the intelliCarve, then select a file for carving and push a few buttons to complete the carving. Knowledge of CAD/CAM software is not necessary.

2. Light

i-Picture comes free with the intelliCarve and does not need a high level computer system to operate such as what is usually needed for CAD/CAM software. And iCarver is only 62lbs!

3. Versatile

Easily make highly detailed lithophanes from digital photographs or carve 3D relief carvings from the included library of 3D gray scale images.



Technical Features

Easy picture engraving by i-Picture's intuitive picture to g-code convertor

File transferred to intelliCarve via USB flash drive

Pause function during carving

Repeatable origin

Adjustable jog speed in manual mode

Adjustable carving speed

Metric/Imperial system available

Supports manual carving without program

Maximum engraving area simulation

Supports file category tree structure

Spindle and stepper motors overload protection

Support images in bmp/jpg/gif/png format

Percentage display for carving time completion

Auto parameters optimization

Reliable BLDC (brushless, DC) spindle motor

Wood/plastic engraving

Dust impact free drive structure

Light aluminum ght structure

Specifications

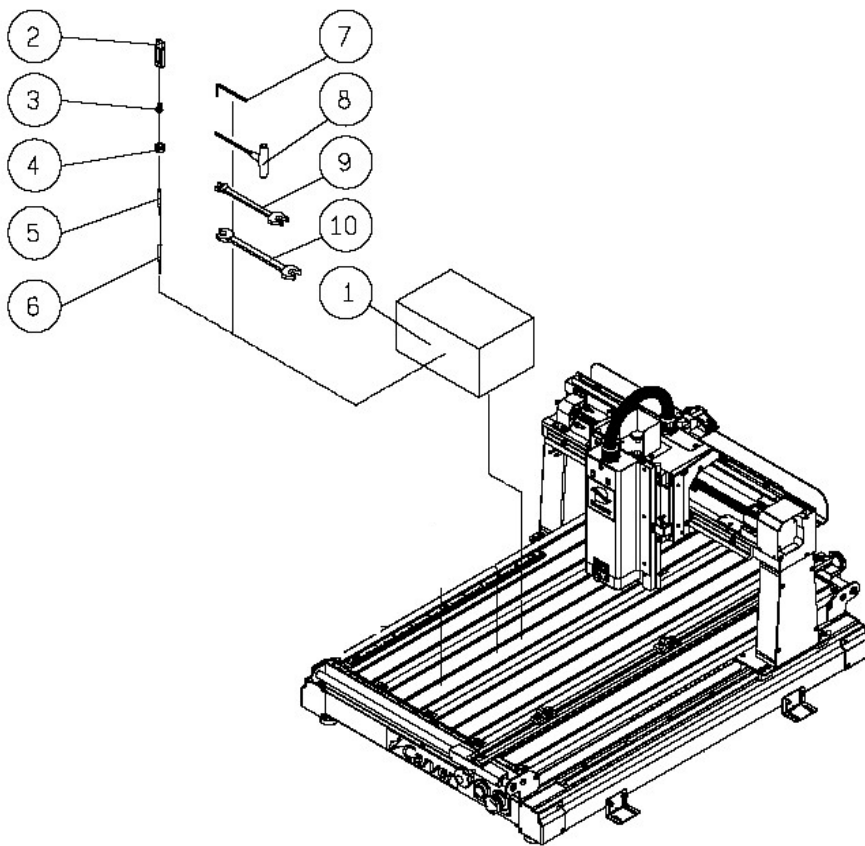
1013 intelliCarve		
Item	Description	Spec
1	Travel	
1.1	X axis	331mm(13")
1.2	Y axis	457mm(18")
1.3	Z axis	76mm(3")
2	Tool	
2.1	shank OD	¼"
2.1	cutter	conical R1/32" (0.8mm) / end mill D1/8" (3.2mm)
2.2	Cut depth	Max 25.4mm(1")
3	Spindle	
3.1	speed	15000rpm
3.2	motor	150w DC brushless
4	Transmission	
4.1	X/Z lead screw diameter	16mm(0.63")
4.2	X/Z rail material	IGUS WX-01-10
4.3	Y axis	Rack & pinion
6	Feed Speed	
6.1	speed	3M/min(118in/min)
6.2	position accuracy	0.1mm (0.004")
6.2	reposition accuracy	±0.1mm (0.004")
7	Step motor	
7.1	Max torque	17.3 kg-cm(15lb-in)
7.2	step angle	1.8 °
7.3	voltage(Max.)	24V/Phase
7.4	current(Max.)	2.8 A/Phase
8	Sensor	
8.1	no of sensors(X/Y/Z)	2/2/2
9	Control Interface	
9.1	LCD	(46x30)mm
9.4	keypad	10 keys
9.6	interface	USB Port x 1

Unpacking Your intelliCarve

Please unpack your intelliCarve with care. If you discover the machine has been damaged, please report the damage to the freight carrier.

Standard Packaging

1. Tool Box
2. USB flash drive
 - I-picture software
 - 3D sample pictures
3. 1/4" collet
4. Collet nut
5. Conical bit, 0.8mm Radius
6. End mill bit, 3.2mm Diameter
7. 4mm T wrench
8. 5mm Hex wrench
9. Double wrench 11*13mm
10. Double wrench 14*17mm



Getting to Know Your IntelliCarve

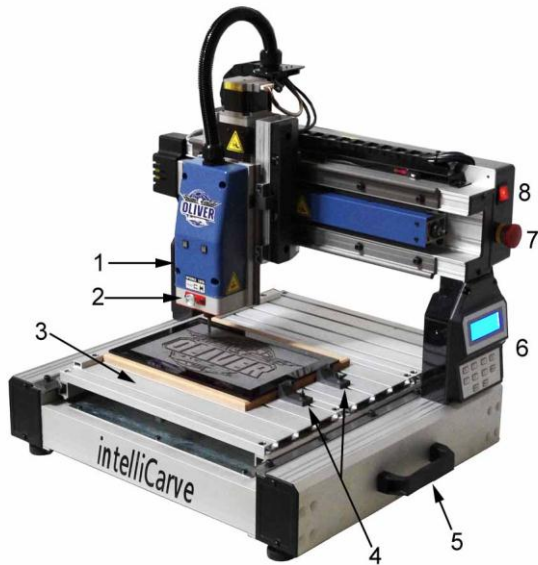


Fig. 2

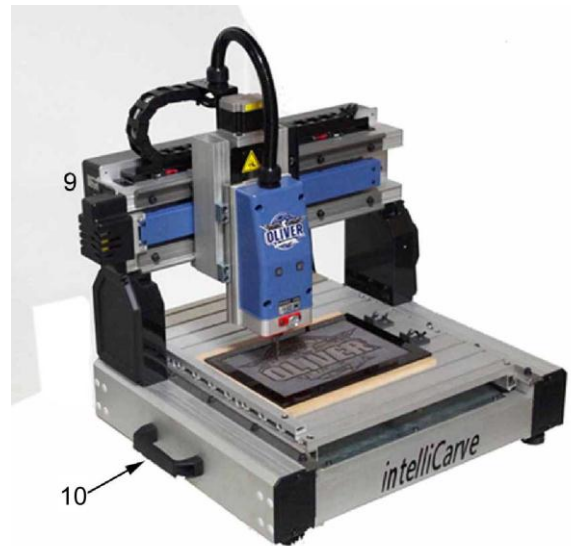


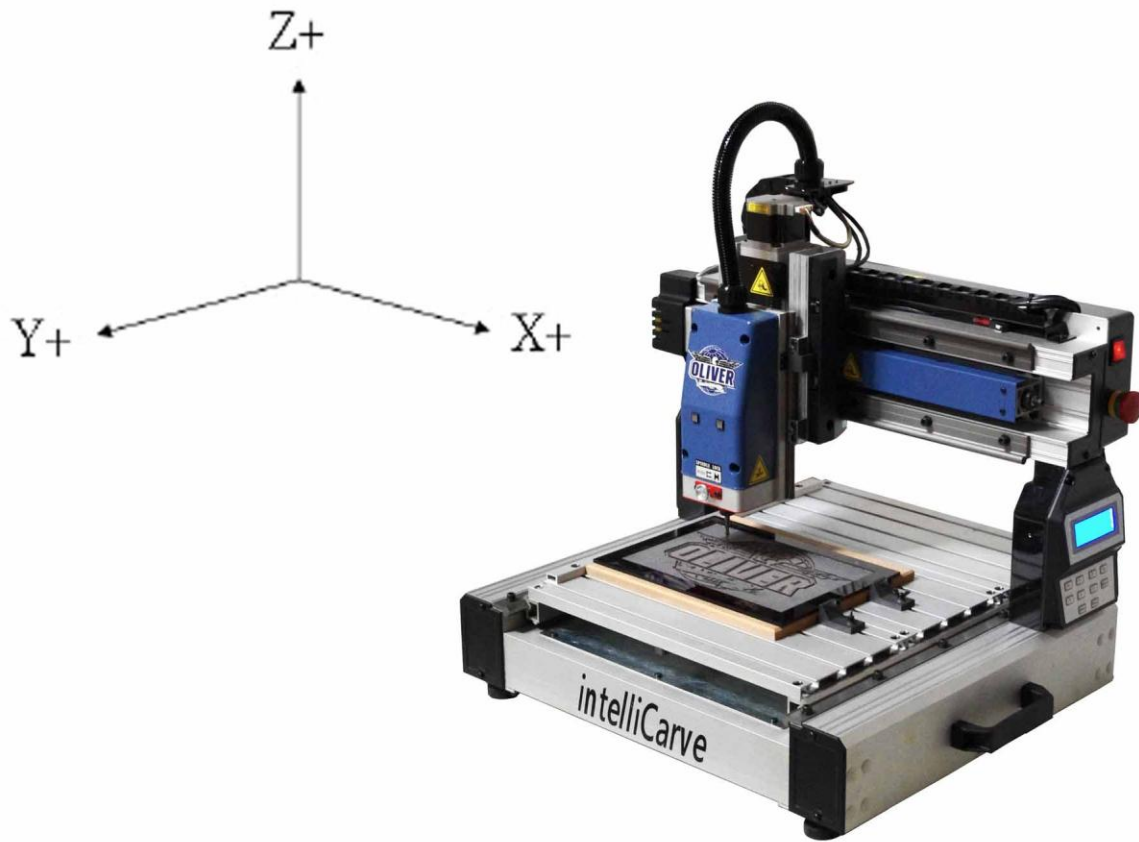
Fig. 3

The Components (see Fig. 2-3)

- | | |
|-------------------------------|------------------------|
| 1. Spindle motor | 7. Emergency stop |
| 2. Spindle lock | 8. Power switch |
| 3. Table | 9. USB port |
| 4. Work piece hold downs | 10. Lift handle (left) |
| 5. Lift handle (right) | |
| 6. LCD display and controller | |

The Axis System

The axis movements are defined according to the operator's position (facing the front spindle).



Keypad Functions

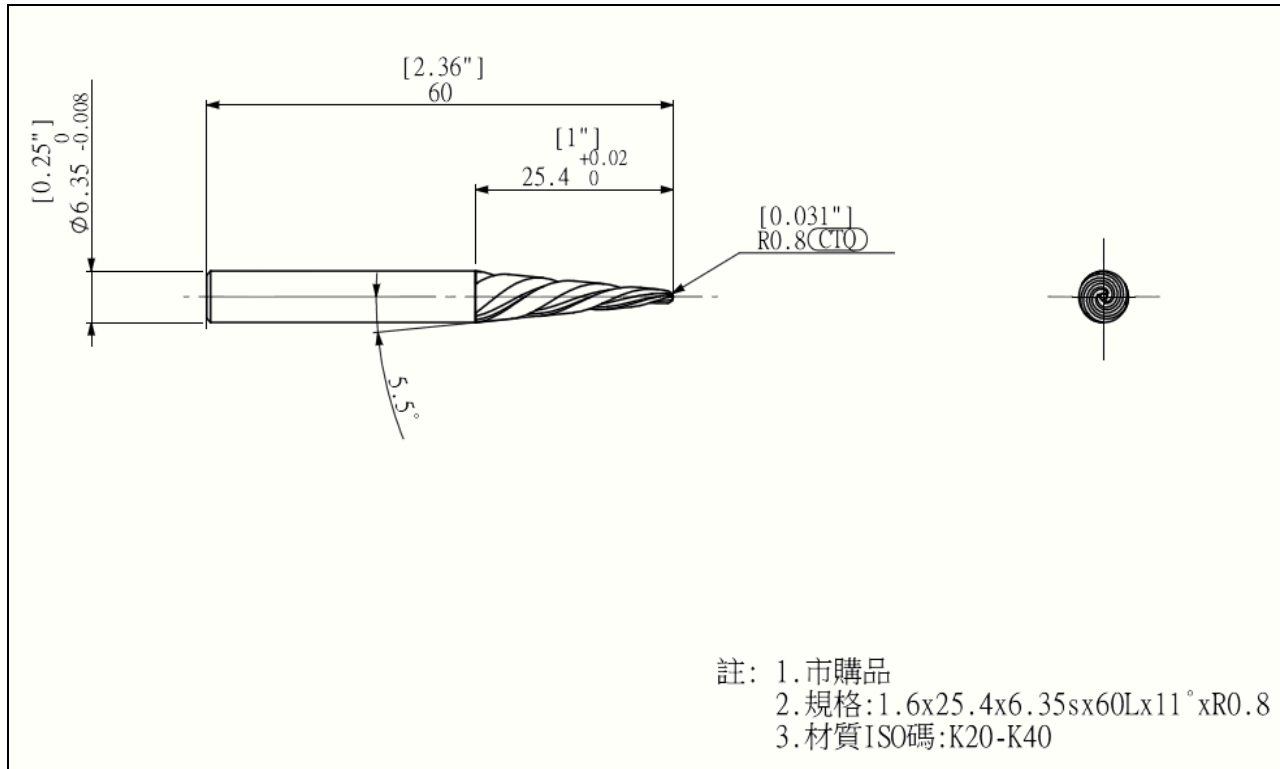
1. + X: spindle head moves right
2. - X: spindle head moves left.
3. +Z: spindle head moves up.
4. - Z: spindle head moves down.
5. +Y: table moves toward operator.
6. - Y: table moves away from operator.

Installing the Cutting Tool

	1	Press pin slightly.
	2	Rotate spindle while pressing the pin in order to engage the lock.
	3	Loosen the nut with an open end wrench turning clockwise.
	4	Release the bit.
	5	To install a new bit, place the collet into the nut. Then put the bit into the nut and collet. Screw the assembly onto the spindle.
	6	Lock the bit with an open end wrench turning counterclockwise.

Cutting Tools

Conical Bit

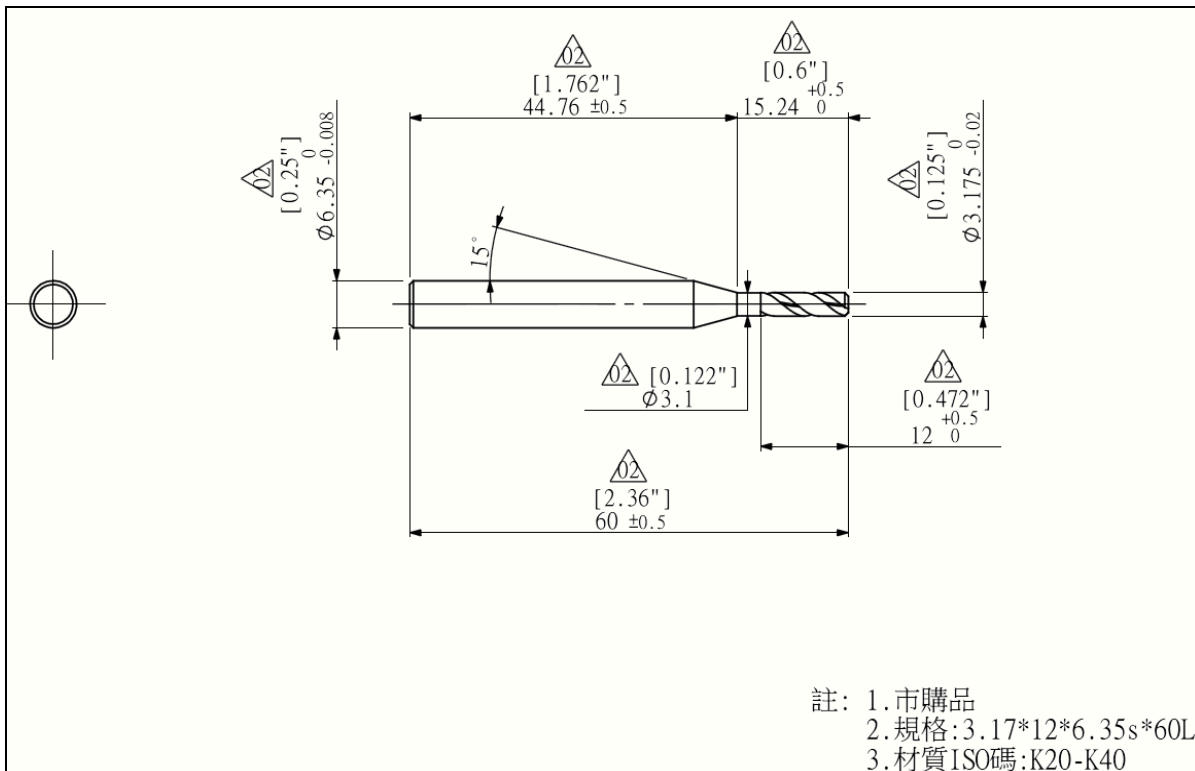


Tool Model No. 381044-000

- Material: Carbide
- Flute: 2
- Flute length: 1" / Cut depth: Max 1"
- Shank diameter: 1/4"
- Overall length: 2.36"
- Cutting edge radius: 0.8mm
- Various types of woods.
- Recommended max depth of cut per cycle: 1/2" for Pine; 3/8" for Oak

Cutting Tools (cont.)

End Mill Bit



Tool model No. 381020-000

- Material: Carbide
- Flute: 2
- Flute length: 0.47"/ Cut depth: Max 0.45"
- Shank diameter: 1/4"
- End mill diameter: 3.175mm
- Overall length: 2.36"
- Various types of woods.
- Max depth of cut per cycle: 1/8" for Pine; 1/8" for Oak

Installing i-Picture Software

(Recommended Operating System – Windows XP, Vista or 7)

When you purchase the intelliCarve, it comes with i-Picture software. i-Picture converts your image files (gif, png, bmp & jpg) to a .gee file in order for intelliCarve to perform. To begin using i-Picture software it first must be loaded into your personal computer. Locate the thumb drive from the toolbox and insert it into the USB port of your personal computer. Locate the executable file labeled i-Picture_v1.2.exe and click to begin installation. Follow the prompts to complete the installation.

Using i-Picture

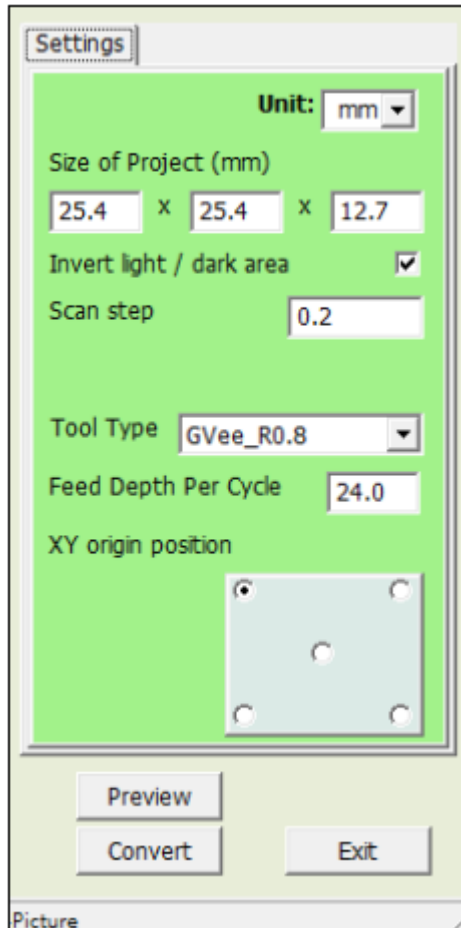
1. Opening a File

Start i-Picture. Under the **File** tab, click **Open Image File**, to upload your image file. Allowable formats for pixel files are gif, png, bmp, and jpg files. To open a G code file, click **Open G Code** under the **File** tab. Allowable formats for G Code files are nc, txt, and dat files (see Advanced Operation Section).



Using i-Picture (cont.)

2. Settings



Unit: [mm] or [inch] measurement

Size of Project is the carving size that you wish to appear on your workpiece. The boxes represent X/Y/Z = width/length/depth of cut. When you input a number in X, Y will be set automatically according to the ratio of your image. Similarly, when you input a number in Y, X will be set automatically. The maximum allowable dimensions are X=13”(330.2mm), or Y=18”(457.2mm) and Z=3”(76.2mm). The intel-licarve will not operate with values greater than these.

Warning: Make sure your work piece is thicker than the dimension you set for the Z-axis otherwise machine damage will occur. Use a sacrificial board if cutting through your work piece is required.

Invert light / dark area is to invert concave and convex. When a grayscale image is uploaded, I-Picture defines the darker area as the deeper depth of cut, whereas the lighter area as the shallower depth of cut. Invert will reverse this which is handy for working with lithophanes.

Scan step is the distance the Y axis moves on every carving along the X axis. The lower number the **Scan step** is, the more detailed your image will be but the longer it will take to produce. Default is 0.2 (mm).

Tool Type:

- GVee_0.5: conical cutter [Metric]. Cutting Edge Radius: 0.5mm. Type-A1 Tool model no: 380959-000.
- GVee_0.8: conical cutter [Metric]. Cutting Edge Radius: 0.8mm. Type-A2 Tool Model no: 380993-000.
- GVee_1/50”: conical cutter [English]. Cutting Edge Radius: 1/50”. Type-A3 Tool Model No: 381018-000
- GVee_1/32”: conical cutter [English]. Cutting Edge Radius: 1/32”. Type-A4 Tool Model No: 381044-000.
- Endmill_3.2: end mill [Metric System]. Flat diameter: 3.2mm. Type-B1 Tool Model No: 380961-000.
- Endmill_D_1/8”: end mill [English]. Flat diameter: 1/8”. Type-B2 Tool Model No: 381020-000.

Feed Depth per Cycle is the depth of cut (Z axis) per cycle. The default is set to be 24mm, but it is adjustable. For example: when Z is 10mm and **Feed Depth per Cycle** is 24mm, the cutter will carve the workpiece in a single pass. Conversely, when Z is 10mm and **Feed Depth per Cycle** is 5mm, the cutter will carve the workpiece twice (2 passes) in order to meet Z depth (per cycle= 5mm; two cycles = 10mm).

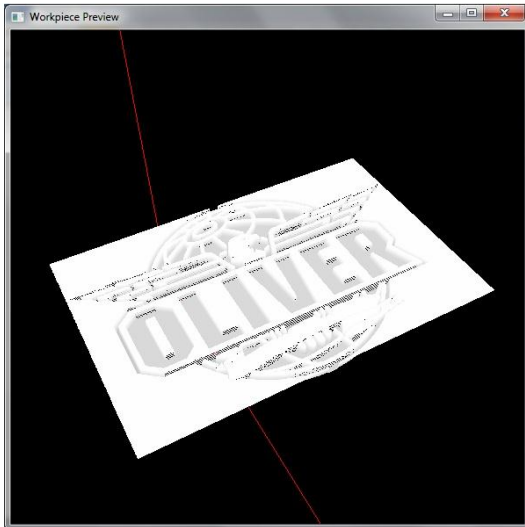
Settings (cont.)

XY Origin Position represents your picture and how it will be oriented on your work piece. (However this will ultimately be determined when you set the spindle to your preferred starting point on the work piece, but this will be discussed later in section 7.)

If using a single piece of material for one carving it may be advantageous to start in the center as this is an easy point to find on your material. However, if carving several objects on one piece of material it might make sense to start in one of the corners in order to 'nest' the projects.

- a. Center
- b. Upper Left
- c. Upper Right
- d. Lower Left
- e. Lower Right

Preview allows you to preview your project before saving:



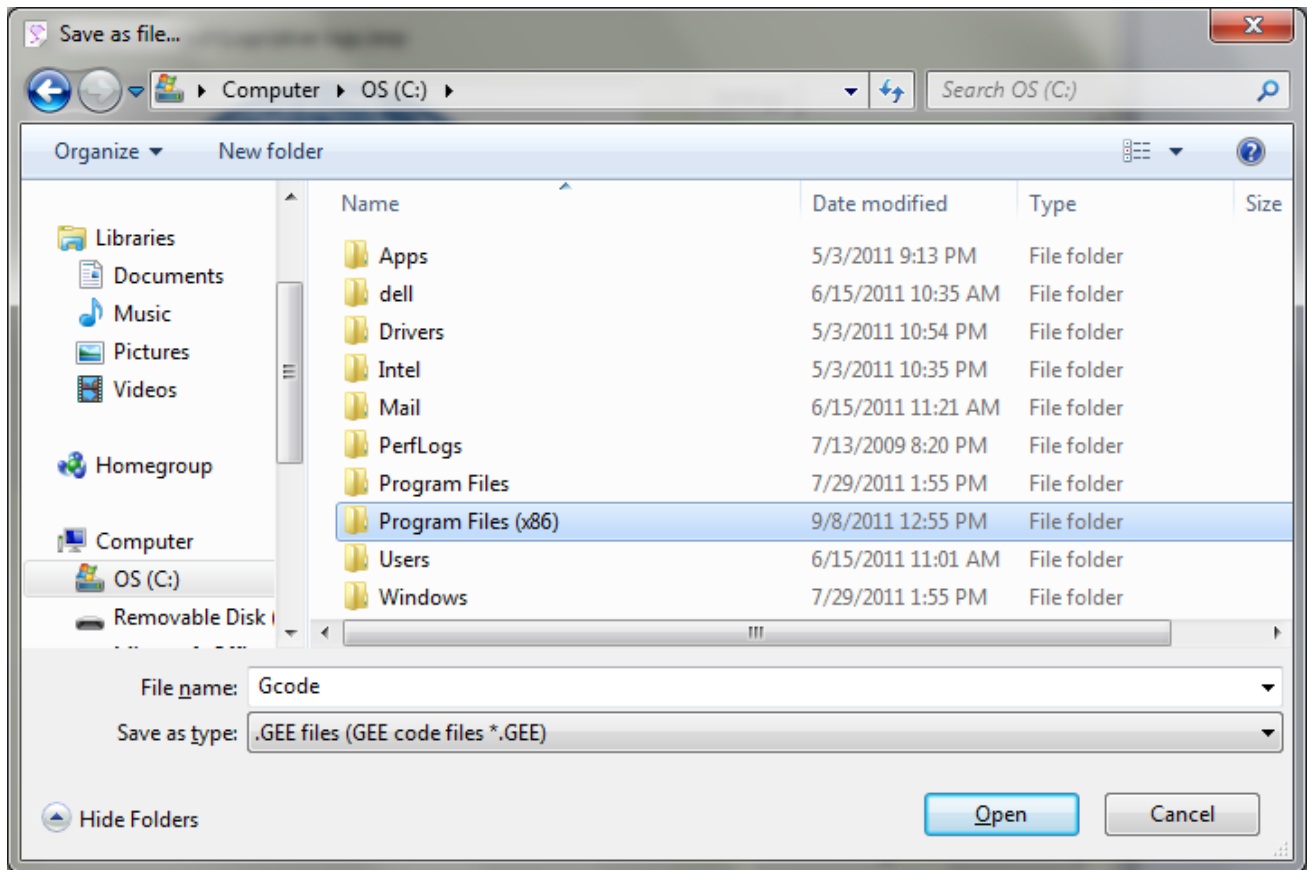
Preview

Using i-Picture (cont.)

3. Converting a file

Once your settings have been entered it is time to convert the image to a .gee code file.

Click **Convert** to save the file in [.gee] format. A screen will pop up saying 'It will take a few minutes, please Wait' and in a few moments you will see a blue progress bar begin. When finished the following screen will appear prompting you to save the file:



Here you can change the File name and save the file in a location of your choosing on your computer. When you wish to actually carve the file, simply copy the file from the location it was saved to the flash drive and insert it in the USB port of the intelliCarve.

Getting Ready to Carve

Powering Up the IntelliCarve

****Ensure carving bit is secure in machine before proceeding****

1. Insert the flash drive into the USB slot. (see picture 'A')
2. Rotate emergency stop button clockwise to release. (see picture 'B')
3. Turn rocker switch to on position. (see picture 'B')



Picture A

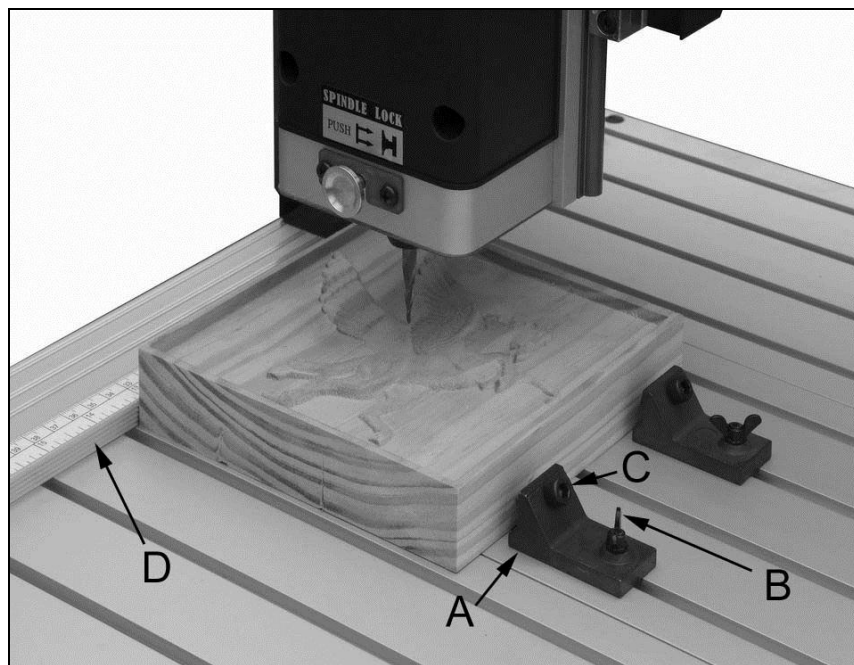


Picture B

Setting Up To Carve (cont.)

Setting the work piece on the table

The left fence with the ruler represents the Y-axis. Make sure that the Y dimension of your carving is within the minimum and maximum dimension on the ruler. It is important for the work piece to be held securely in position on the work table. Two hold-downs are supplied with the machine to accomplish this. First place the work piece against the fence (D) as shown in the picture below. Slide the hold down (A) up to the work piece leaving approximately 1/16"-1/8" between the base of the hold down and the work piece. Lock the hold down into position with the wing nut (B). Finally, turn the cap screw (C) clockwise until the work piece is held firmly in position. Repeat the procedure for the second hold down.




Setting Up To Carve (cont.)

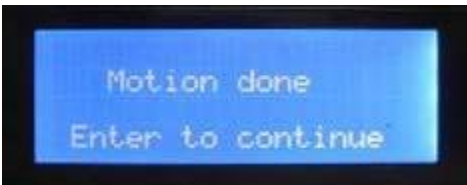
Using the control panel


1. When you first turn the machine on you will notice the control panel display will read:



Pressing  on the keypad will automatically start the spindle toward its home point (X=0, Y=0, Z=0).


2. After the spindle reaches its home point, the display will read:



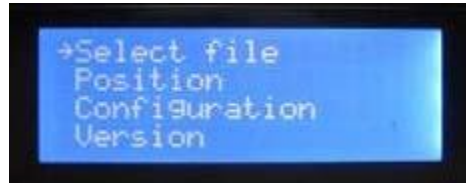
Press  to continue.


3. The next three screens will prompt you to check:

- Is the 'cutting tool' is secure?
- Is the 'workpiece' secure?
- Is the flash drive in the 'USB' port?

Press  after confirming each of these.


4. The next screen to appear is the main operating screen as seen below. Use the arrow button on the controller to set the cursor to 'Select file' as shown:



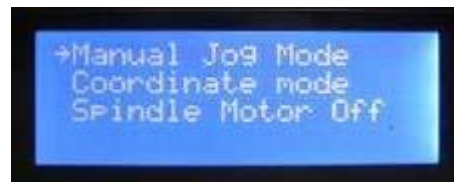
Press  to continue.

5. Use the arrow buttons to scroll up or down to the desired file as indicated by the cursor (this is the file you converted from i-Picture and copied to the flash drive). In this case the file is called 'GCODE.GEE' as shown:



Press  to continue.

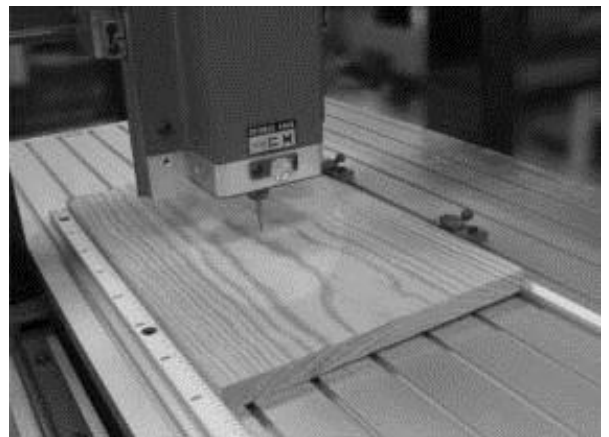
6. Select 'Manual Jog Mode' as show:




Press  to continue.

Using the control panel (cont.)



7. Once in 'Manual Jog Mode' it is time to move the spindle to the 'Origin Point'. This is the point that corresponds with the selected 'XY origin position' chosen in i-Picture. In this example we will use the 'center' position as the origin point. Again, make sure that the Y dimension of your carving is between the minimum and maximum of the ruler on the fence. Use the X,Y and Z plus and minus keys to move the spindle to the center of your work piece. Note that for the Z axis, move the spindle so that the tip of the cutting tool just touches the work piece surface.



Press  to continue

8. Once the spindle is in position move the cursor using the arrow buttons on the keypad to 'Enter to set ORG' as shown:



Press  to set the carving origin point and  again to continue.



Using the control panel (cont.)

9. The screen will now show the X,Y,Z origin points confirmation set to zero:

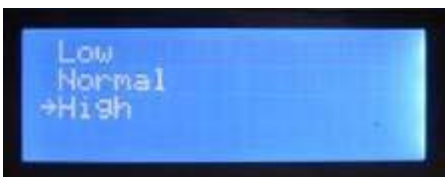


10. Press the 'BACK' key on the keypad and the following screen will appear:



If you wish to see the spindle travel around the outside border of your carving, move the cursor to 'Border' and press.  This is helpful if there is concern of the spindle bumping into something. If you wish to continue, move the cursor to 'Process' and press 

12. The following screen will appear asking you to choose the carving speed. Note: The lower the speed the higher quality the carving will be but the longer it will take. Use the up or down arrows to choose.



Press  to begin carving!

Tips

1. When working with thin materials or cutting through your work piece it becomes necessary to place your project on a sacrificial board to prevent damage to the machine. Double sided tape such as white carpet tape is helpful to secure the pieces together.

2. a) When working with lithophanes keep in mind that your end product will be a mirror image of your photograph. You may wish to reverse your photograph before uploading it to i-Picture. This can be done with photo editing software.

(b) It might be handy clicking the Invert box in i-Picture. This will reverse the depth of cut for the dark and light colors allowing for proper shading of your lithophane.

(c) Black and white photos or photos that have been converted to grayscale give better results.



Advanced Operations

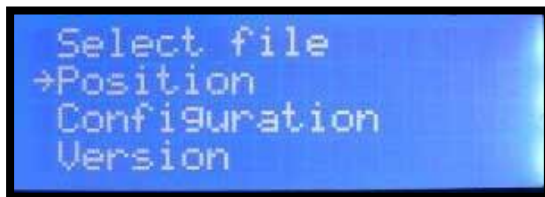
CAD/CAM software

The 1013 intelliCarve will accept G-code from aftermarket CAD/CAM software programs such as V-Carve Pro or ArtCam. Check with your supplier for the post processor file required for your software to run the intelliCarve. There may be some limits to the projects you can produce due to nature of the Y-axis travel. Possibly, intricate work where fitting with another part is required may be a problem. Oliver Machinery is not responsible for work done using after market CAD/CAM software.

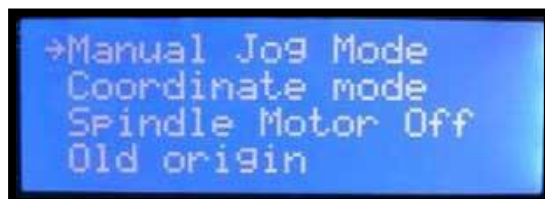
Origin repeat

If you wish to run the same project again, rather than manually jogging the spindle to the origin point, it is possible to start from the previous origin point:

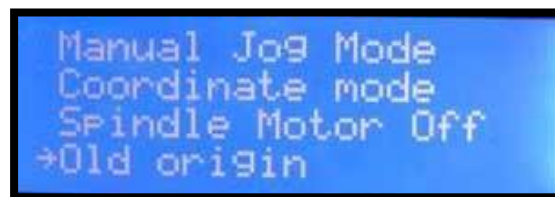
Step 1. After engraving complete, select “Position” and press “enter”.



Step 2. If home point was set in last engraving, “Old origin” will prompt up.



Step 3. Select “ Old origin” to set engraving origin.



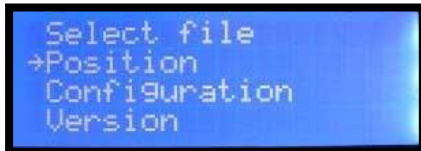
Step 4. Press  and proceed as usual.

Advanced Operations (cont.)

Positioning by coordinate input

User can move spindle to certain position by coordinate input:

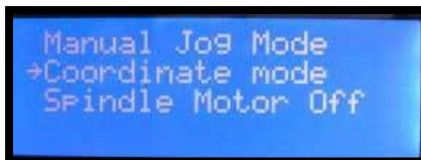
Step 1. Select "Position" and press 




```
Select file
→Position
Configuration
Version
```

Step 2. Select "coordinate mode" and press





```
Manual Jog Mode
→Coordinate mode
Spindle Motor Off
```

Step 3. Select X and press 



```
→X: 0.0mm
Y:- 0.0mm
Z:- 0.0mm
Move and Set ORG
```

Step 4. Cursor turns to block flash for adjustment status



```
█X: 0.0mm
Y:- 0.0mm
Z:- 0.0mm
Move and Set ORG
```

Step 5. Press up or down key to input coordinate reading, for this example, X axis reading is 103.6.



```
█X: 103.6mm
Y:- 0.0mm
Z:- 0.0mm
Move and Set ORG
```

Step 6. Press "Back" key to leave adjustment status



```
→X: 103.6mm
Y:- 0.0mm
Z:- 0.0mm
Move and Set ORG
```

Step 7. Select "Move and Set ORG"



```
X: 103.6mm
Y:- 0.0mm
Z:- 0.0mm
→Move and Set ORG
```


Step 8. Press "Enter" to move spindle to (103.6,0,0)

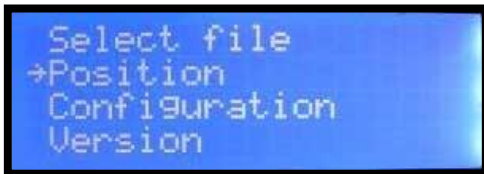
Advanced Operations (cont.)


Turn on/off spindle in manual jog mode

The default setting is 'Spindle Motor Off'

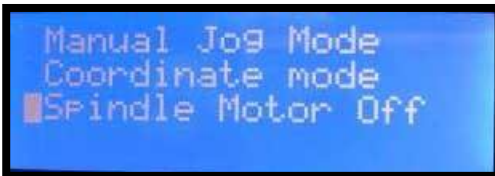
Example : Turn Spindle Motor On

Step 1. Select "Position" and press 



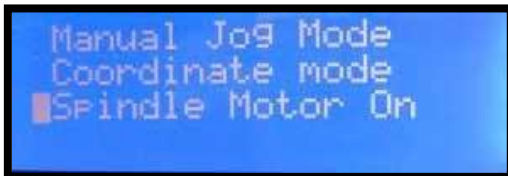
Step 2. Select "Spindle Motor Off" then press 

Cursor turns to block flash for adjustment status



Step 3. Press up or down key to change status, for this example, press down key to turn on spindle motor

***Caution: watch safety issues when spindle motor is turned on**



Step 4. Press "Back" key to leave adjustment status

Step 5. Follow the same procedure to turn off spindle motor

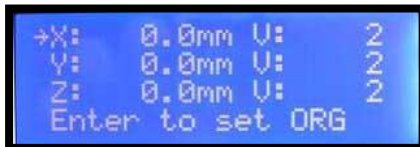
Advanced Operations (cont.)

Imperial / Metric Unit Change

The iCarver default unit is Metric scale in mm, unit can be switched to Imperial in inches.

Example: Change Unit from Metric (mm) to Imperial (inches)

Step 1. Default is metric unit display:




```
→X: 0.0mm U: 2
Y: 0.0mm U: 2
Z: 0.0mm U: 2
Enter to set ORG
```

Step 2. Select “Configuration” on main manual and press 



```
Select file
Position
→Configuration
Version
```

Step 3. Select “Unit: mm” and press 



```
→Unit:mm
M3 Code:open
Update
```

Step 4. Press  and cursor turns to block flash which means it is ready



```
█Unit:mm
M3 Code:open
Update
```


to edit. Press the up or down key to change the setting from mm to inches.

Step 5. Press “Down” key on keypad to change to Imperial unit, “Unit : mm” will change to “Unit : in”.



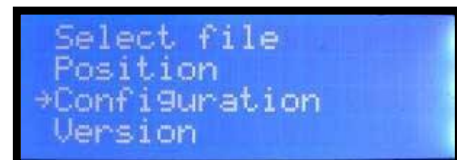
```
→Unit:in
M3 Code:open
Update
```

Step 6. Press “Back” key on keypad, to restore cursor from block flash to “→”.



```
→X: 0.00in U: 2
Y: 0.00in U: 2
Z: 0.00in U: 2
Enter to set ORG
```

Step 7. Press “Back” key on keypad to return to the main screen



```
Select file
Position
→Configuration
Version
```

The display now is in Imperial inches Unit change is completed. The system will keep this setting after power off. User can follow the same procedure to set metric unit to mm.

Troubleshooting

Operating the unit:

Item	Problem	Check up	Solution	Note
1	The unit is not functioning after the power cord is plugged in.	a. Ensure the power switch is turned on.	Turn the power switch to “—” status.	
		b. Ensure the power switch LED lights Red.	Red light indicates normal. LED does not come on, indicating malfunction.	Contact your local dealer or distributor if this does not help.
		c. Set off the EMERGENCY STOP Button.	Press the red button and turn it clockwise in order to set it off.	For your safety, set the button on when not in use. Set the button off in order to carve.
		d. Press the Start Button (Green color).	The unit will set the 3 axes to their home coordinates automatically.	Go to [e] if this does not work.
		e. Ensure the 3 axes are in their correct positions.	If not, see <u>X/Y/Z components</u> .	
		f. The axes do not stay in their travel areas.	Locate the axes to their travel areas manually. Use the tools that come with the unit to adjust the lead screws.	Adjust X & Y axes with T & Hex wrench; and/or rotate the screw on Z axis.
		g. Restart the Start Button.	The unit will set the 3 axes to their home coordinates automatically.	Contact your local dealer or distributor if this does not help.
2	The display shows signal, but the unit does not function.	Check the display shows ■■■■■■■■	If the display shows ■■■■■■, reset the EMERGENCY STOP Button and release it after 10 seconds. Then, turn on the Start Button.	Contact your local dealer or distributor if this does not help.

Troubleshooting

Operating the unit:

Item	Problem	Check up	Solution	Note
3	Front LEDs light on.	Ensure USB Flash drive is inserted.	Reinsert the drive into USB port.	Front LEDs light red, indicating USB is unable to be read. Contact your local dealer or distributor if this does not help.
4	Control Panel does not function.	Ensure the power is turned on.	Contact your local dealer or distributor.	
5	Restarted the unit, but the Control Panel still does not work.	Ensure Control Panel wire is connected.	Connect the wire.	Contact your local dealer or distributor if this does not help.
6	Choose "Select File" on the Control Panel, and the front LEDs light red.	Ensure USB Flash drive is inserted.	Reinsert the drive into USB port.	LEDs light red, indicating USB is unable to be read. Contact your local dealer or distributor if this does not help.
7	Select "Position" on the Control Panel, but the axes move improperly.	The axes move awkwardly.	Clean the lead screw & rail in which the axis moves awkwardly.	Contact your local dealer or distributor if this does not help.
		The axes do not function.	Contact your local dealer or distributor if this does not help.	

Troubleshooting

During operation:

Item	Problem	Check up	Solution	Note
1	Select "Enter" to carve, but axes do not function.	Ensure axes make a small shift.		
		Time counts down shows on the display.		
		Turn off Emergency Button to stop carving the project.		
		Turn off the power switch in the rear of the unit.		
		Take apart the front cover where the axes locate.	Use the T wrench to fix the axes.	
		Check if the motor wire is loose.	Ensure terminal pin is tight.	
		Secure the cover back to the place. Then turn on the power switch. Select "Enter" to carve.		Contact your local dealer or distributor if this does not help.
2	Abnormal noise or vibration occurs while axes are operating.	Turn on Emergency Stop button.		
		Turn off the power switch.		
		Unsecure the nut on the bit.	Use wrenches to reinstall the bit.	
		Unload the ER-11 chuck		
		Clean the bit, chuck and nut.	Use compressed air to clean sawdust.	
		Reinstall the bit.	To lock the bit, push it up. Then, secure the nut.	Contact your local dealer or distributor if this does not help.

Troubleshooting

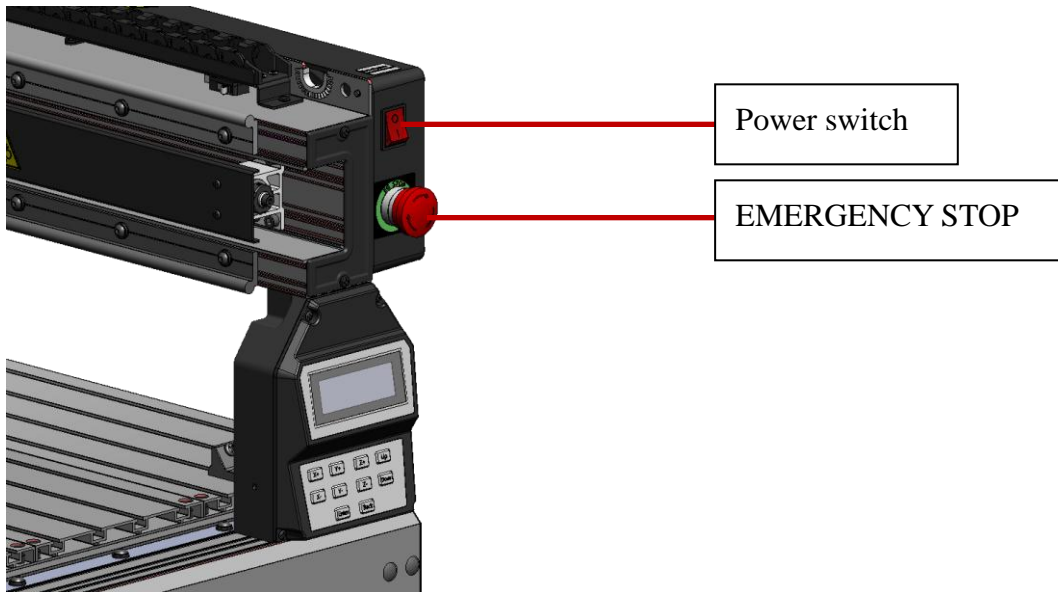
During operation:

Item	Problem	Check up	Solution	Note
3	Bit breaks while carving.	Turn on Emergency Stop button.		
		Turn off the power switch.		
		Unsecure the nut on the bit	Use wrenches to re-install the bit.	
		Unload the ER-11 chuck		
		Install a new bit.	To lock the bit, push up the bit .Then, secure the nut.	The causes of Bit breaks: 1. Cutting depth is overloaded. 2. The hardness of the material is too high. 3. Bit becomes dull.
	Restart carving your workpiece.			
4	The outcome does not match your computer file.	Ensure you install the right size of the bit for your project.		
5	Blurriness on your workpiece.	Your workpiece is composite wood.	Use brush to clean the surface of your workpiece.	
6	Lines or curves on your workpiece.	Check the software setting and the bit.	Clean the rails and lead screws.	Contact your local dealer or distributor if this does not help.

Troubleshooting (cont.)

A) Situation: Power is on, but the unit does not function.

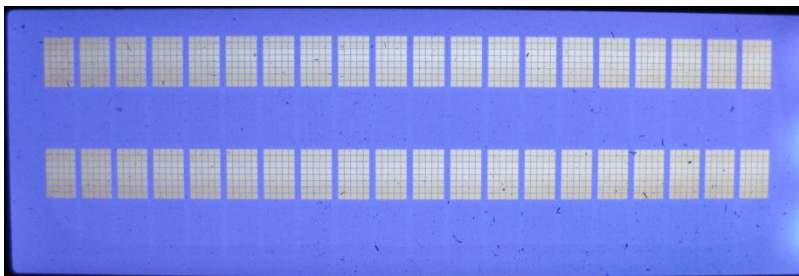
Solution: Press the Emergency Stop and turn it clockwise in order to release it.



B) Situation: Power turned on, but display screen blanks out.

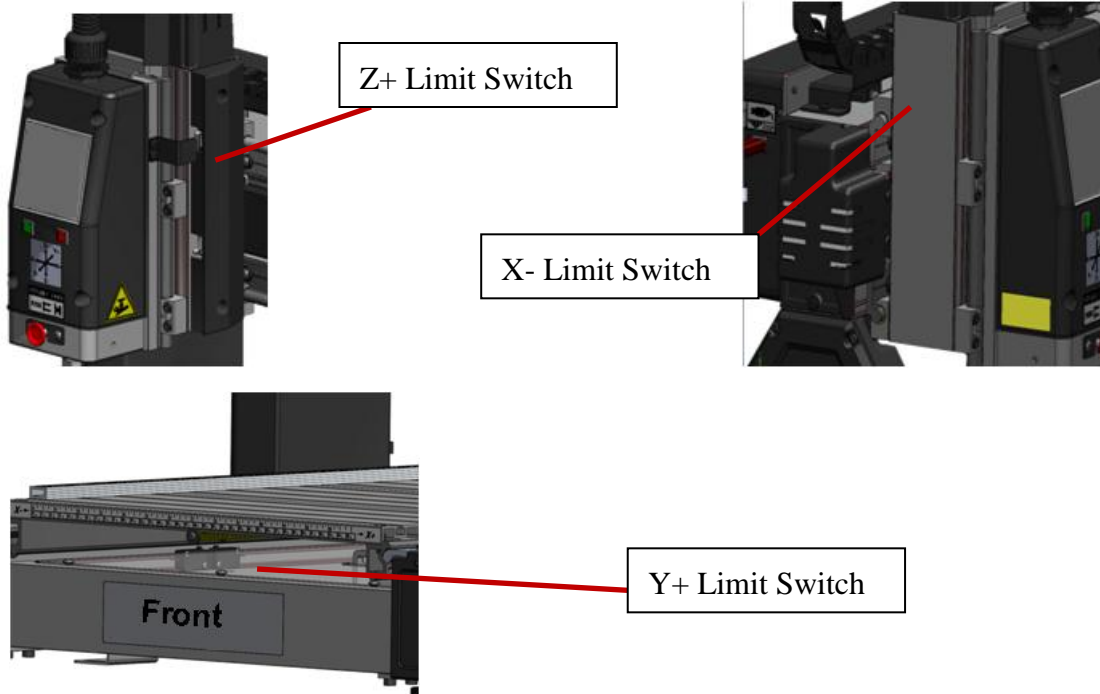
Solution #1: Turn off the power and unplug the USB. Restart the power, then plug in the USB into the port.

Solution #2: Display screen is capable of presenting 48 files. Keep your files within 48 or reduce root folders on the USB.



Display Screen blank

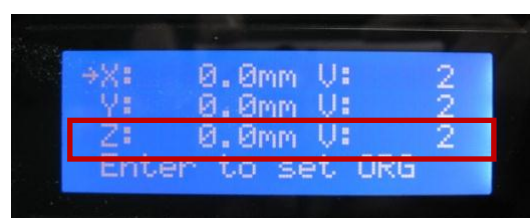
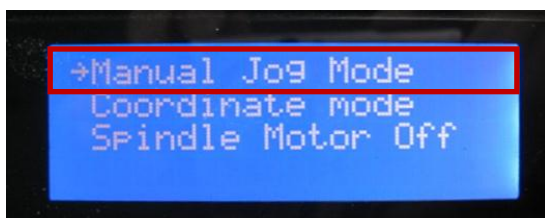
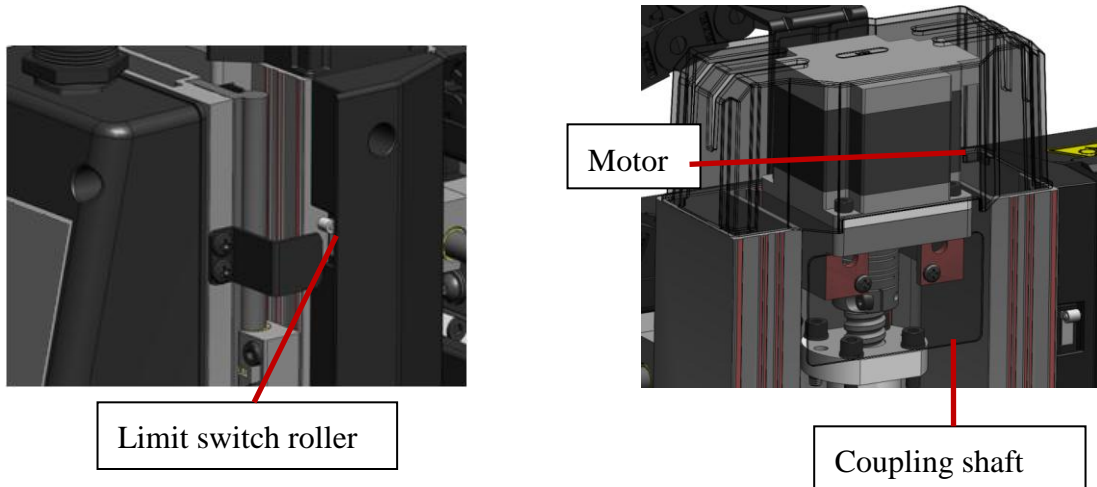
C) Display screen shows “Welcome - Enter to Continue”. After pressing “Enter”, the axes return home improperly.



Situation #1: Z axis does not return to home point.

Solution:

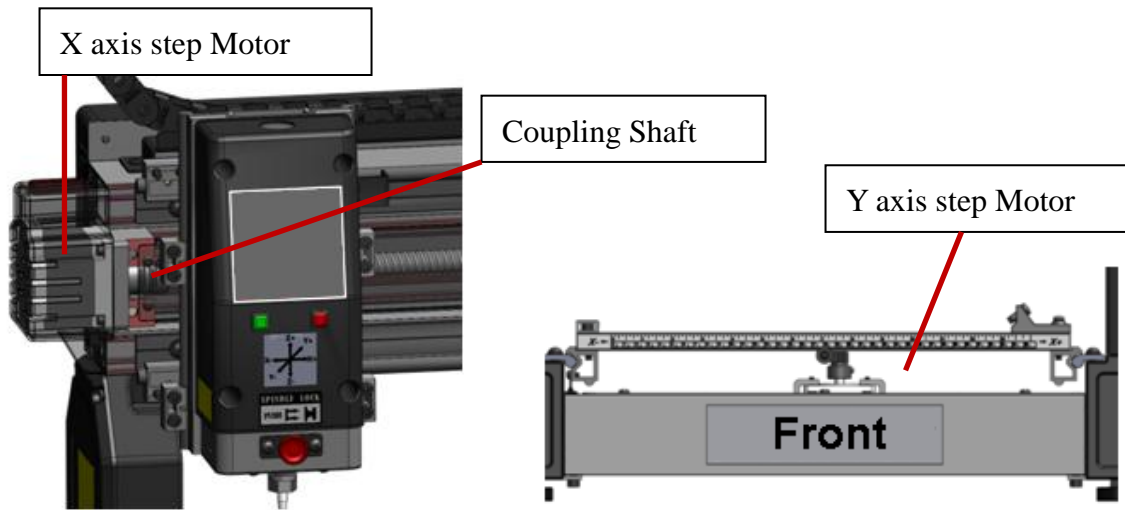
- Make Z axis return home by touching Z+ limit switch roller with a tool. Then, restart the machine.
- Ensure the motor functions and coupling shaft rotates.
- Go to [Manual Jog Mode] and press Z+ and Z- to move Z axis.



Situation #2: X or Y axis does not return to home point.

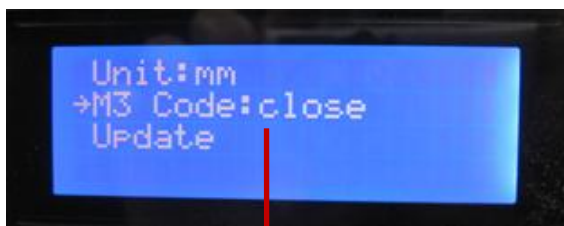
Solution:

- Before checking X/Y axis, ensure [C. situation #1] is fully inspected.
- Make the spindle return home by touching X- limit switch with a tool. Then, restart the machine. Go to [Manual Jog Mode] and press X+ and X- to move X axis. Ensure the motor functions and coupling shaft rotates.
- Follow the said procedures to examine Y+ limit switch.

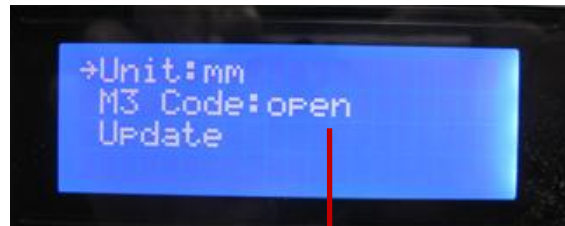


D) Situation: File loaded and 3 axes operating, but spindle motor does not function.

Solution: Go to [Configure \ M3 code] and select [M3 Code: open].



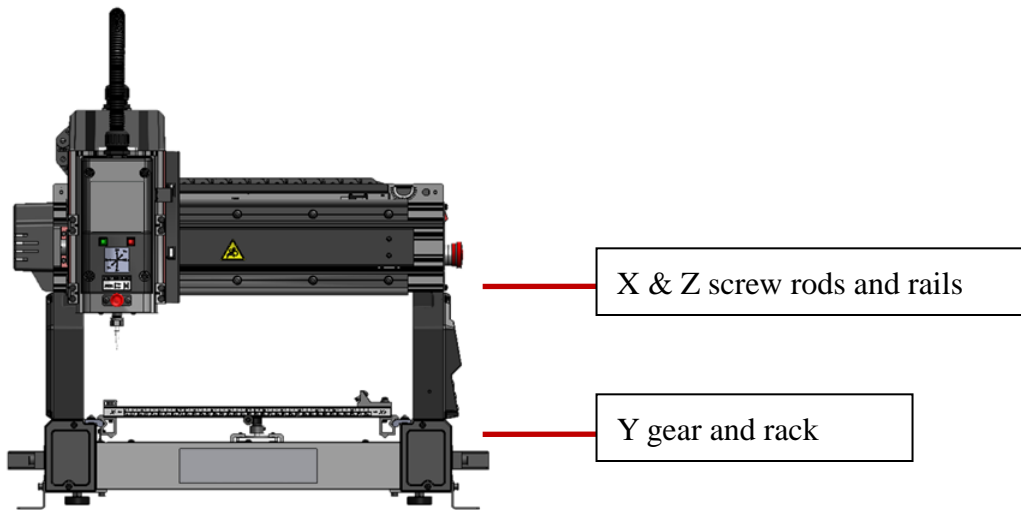
M3 Code close: Spindle Motor turned off



M3 Code open: Spindle Motor turned on

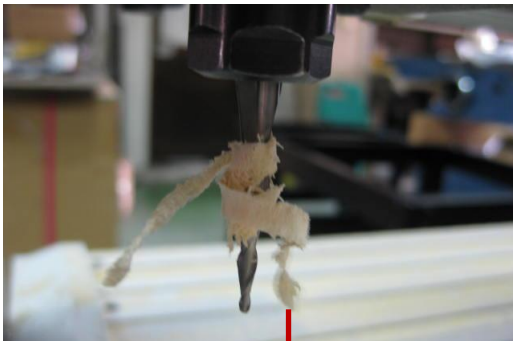
E) Situation: High pitch sounds from axes.

Solution: Clean X & Z screw rods and rails with thinner/lighter lubricant that is equivalent to ISO-32 or lighter than SAE-20. Grease Y axis gear and rack with thicker/heavy lubricants. Clean up excessive oil from gear and rack with clean cloth. DO NOT APPLY DRY CLEAN LUBRICAN.



F) Situation: wood chips accumulate on the cutter.

Solution: ensure wood fiber texture is paralleled to Y Axis.



When wood texture is paralleled to X axis, wood chips would accumulate on the cutter.



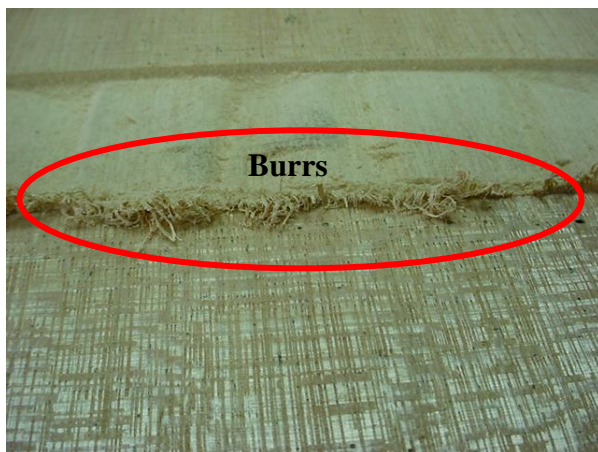
Wood texture paralleled to X Axis



Please place wood piece with its texture paralleled to Y Axis

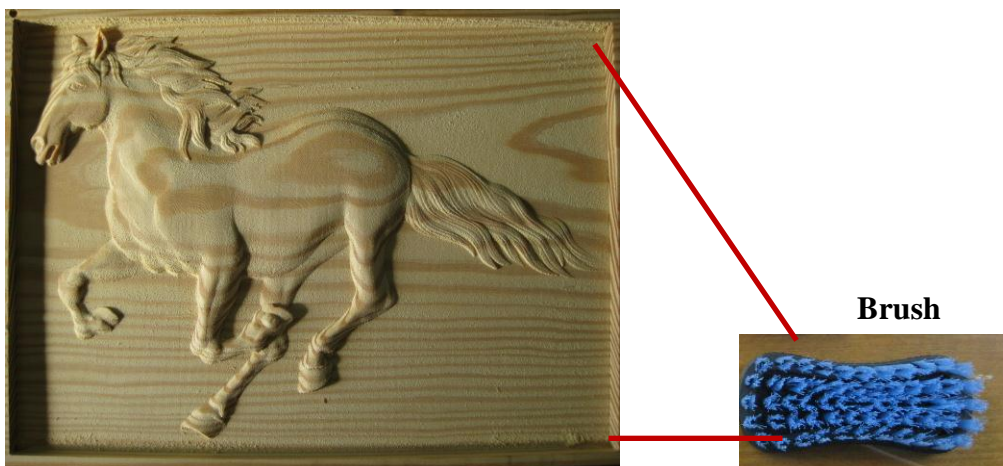
G) Situation: Burrs appear on your project.

Solution: Replace the bit. It might be dull or broken.



H) Situation: Burrs on the edge

Solution: Use brush to clean the surface/burr.



I) Error Codes

- **LIMIT SWITCH ERROR (Error 1):**
Causes: X, Y, or Z axis over travels and hits limit switch or its wire is disconnected.
Solution: Turn off the power and restart the machine. Then, the axes should function.
- **SPINDLE MOTOR OVERHEAT (Error 12):**
Causes: Spindle motor shuts down automatically when overheating.
Solution: Turn off the power. Then restart the power after 5 minutes.
- **ELECTRICAL ERROR 13 (Error 13):**
Causes: Spindle motor shuts down automatically when disturbances from other sources occurred.
Solution: Ensure power supply is earth grounded. Avoid sharing same loop with other equipments.
- **ELECTRICAL ERROR 21 (Error 21):**
Causes: Wire disconnection between HMI (Human-Machine Interface, refer to the screen and buttons)

and PCB (Printed Circuit Board).

Solution: Turn off the power and ensure wires are well connected among PCB, HMI and LCD. Restart the machine and it should function.

· **USB ERROR (Error 23):**

Causes: Misconnected USB or defective USB.

Solution: Unplug the USB and restart the machine. Re-plug in the USB. Or replace the USB.

· **ELECTRICAL ERROR 24 (Error 24):**

Causes: HMI cannot detect PCB connection.

Solution: Turn off the power and ensure wires are well connected among PCB, HMI and LCD. Restart the machine and it should function.

· **ELECTRICAL ERROR 26 (Error 26):**

Causes: PCB cannot detect HMI connection.

Solution: Turn off the power and ensure wires are well connected among PCB, HMI and LCD. Restart the machine and it should function.

** Please contact your local dealer or distributor for further assistance if the problem persists. **

1013 Parts List

Index	Part No.	Description	Specification	QTY	Old P/N
0	923360-000	Tool Box		1	923184-000
8	000103-102	CAP Screw	M6*1.0P*10	2	HA020404
20	230322-000	Nut for Bits	S45C	1	
85	006001-022	Flat Washer	6.3*13*1t	2	HE010300
109	172936-000	Machine Positioning Plate	Galvanized	2	
124	041306-002	Polybag	190*130(Open)*0.15t	1	HR051500
125	660179-000	Brush	125*54*40	1	
126	040203-000	Open Wrench (double sided)	11*13	1	HQ020800
127	040205-000	Open Wrench (double sided)	14*17	1	HQ021100
128	040401-000	Screwdriver	1號*75	1	
129	660175-000	Tool Box	Plastic(Clear)175(L)*110(W)*95(H)	1	
1	029402-101	Hex. Screw w/Spring and Flat Washer	M6*1.0P*16/6.1*12.3/6.3*13*1.0t	26	
2	310247-909	Z Axis Rail (Left)	6061	1	FH010063
3	310253-909	Z Axis Rail (Right)	6061	1	FH010069
4	310270-909	Z Axis Nut Bracket	6463	1	FH010103
5	310269-909	Z Axis Positioning Plate	6463	1	FH010102
7	922494-000	Block	WJ200UM-01-10	8	
8	000103-102	CAP Screw	M6*1.0P*10	46	HA020404
9	006501-100	Serrate Washer	4.3*8.5(BW-4)	7	HE040600
10	000302-702	Hex. Head Screw	M4*0.7P*8	31	HA040403
11	000102-103	CAP Screw	M5*0.8P*10	5	
12	923358-000	Spindle Assembly	15000rpm 150W/110V/60Hz	1	
.1	923238-000	Bit Spindle Assembly	15000rpm 150W/110V/60Hz	1	
.1.1	922883-000	Brushless Motor and Spindle Assembly		1	
	499010-000	DC Brushless Motor	TECO	1	
	360930-901	Spindle	SCM435	1	
.1.2	490770-000	Spindle Drive	(110V)	1	
.2	490761-000	Power Supply	NES-150(110V)	1	
13	923029-000	Bit Chuck Assembly		1	
.1	047101-212	ER Chuck	ER11(Ø6.5)	1	
.2	381044-000	Conical Bit	Carbide(1.6x25.4x6.35sx60Lx11°xR0.8)	1	
.3	381020-000	End Mill Bit	Carbide(3.17*12*6.35s*60L)	1	
14	000103-106	CAP Screw	M6*1.0P*16	18	HA020408
15	173124-902	Z Axis Block	SPCC	1	FH010121
16	000303-703	Round Head Screw	M5*0.8P*10	26	HA040604
17	033708-000	Ball Bearing	6002-2NKE	1	
18	172752-902	Plate	SPHC	1	

19	000804-101	Hex. Socket Screw	M5*0.8P*8	6	HA090303
21	310207-909	Block	6463	1	
22	280182-000	Compress Spring	SUP6	1	
23	172744-902	Pin Plate	SPHC	1	
24	360931-908	Pin	S45C	1	
25	250862-000	Spindle Cover		1	FH010122
26	490777-000	LED Light (Green)		1	
27	490778-000	LED Light (Red)		1	
28	945445-000	Name Plate Assembly	Oliver-110V	1	
29	000101-103	CAP Screw	M4*0.7P*12	12	
30	499015-000	Step Motor		3	
31	310265-909	X Axis Motor Bracket	6463	2	FH010097
32	002602-102	CAP Lock Screw	M6*1.0P*20	4	HA310410
33	173170-904	Z Axis Guard Plate	SPHC	1	
34	677026-000	Coupler		2	
35	923423-000	X Axis Shaft Assembly		1	923155-000
35.2	361041-000	X Axis Shaft	Screw Pitch 10mm	1	360993-916
35.3	000102-103	CAP Screw	M5*0.8P*10	1	HA020304
36	031004-000	Thrust Bearing	51201(Nachi)	4	FH010055
37	310266-909	Bracket	6463	2	FH010098
38	002602-101	CAP Lock Screw	M6*1.0P*12	8	
39	008913-100	Nut	MR12*1.0P	2	
40	000102-106	CAP Screw	M5*0.8P*20	24	HA020310
41	006302-100	Spring Washer	5.1*9.3	8	HE020800
42	006001-009	Flat Washer	5.2*10*1t	8	HE011100
43	310268-909	X Axis Bracket	6463	1	FH010101
44	250883-615	Z Axis Motor Guard		1	
45	001101-702	Round Head Self-Tapping Screw	M3*1.06P*15	4	
46	490594-000	Limited Switch		4	
47	250861-615	Gliding Bracket Cover		1	FH010118
48	923264-000	Connecting Wire Assembly	CSA/UL-110V	1	
49	173123-904	Rack	SPHC	1	FH010120
50	310271-909	Nut Bracket	6463	1	FH010104
51	173122-902	X Axis Block	SPCC	1	FH010119
52	173121-000	X Axis Guard	SPHC	1	FH010114
53	310246-909	X Axis Rail	6061	2	FH010040
54	250869-615	X Axis		1	
55	000301-204	Round Head Screw	M3*0.5P*15	8	HA040207
56	310264-909	Bar	6463	1	FH010096
57	000401-704	Flat Head Screw	M4*0.7P*10	4	
58	923172-000	X Axis Link Assembly	L-513mm (19-links)	1	

59	173120-904	X Axis Link Bracket	SPHC	1	FH010113
60	021704-000	Sleeve	AMB-3 65mm	1	
61	310272-909	Cooler Panel	6463	1	FH010105
62	330051-000	Hex. Bolt	M3*0.5P-10L	8	FJ010607
63	310331-909	Control Panel Cooler Plate		1	
64	000301-206	Round Head Screw	M3*0.5P*10	8	
65	950536-000	Control Panel Assembly		1	
.1	490760-000	Control Panel		1	
.2	490763-000	IC Board		1	
.3	490762-000	Monitor	WH2004A	1	
66	000301-201	Round Head Screw	M3*0.5P*6	10	
67	300063-000	Drive Board Cooler Panel		1	
68	000101-101	CAP Screw	M4*0.7P*8	2	000101-107
69	923426-000	Z Axis Shaft Assembly	巨庭	1	923158-000
69.2	361042-000	Z Axis Shaft	Screw Pitch 5mm	1	360994-916
69.3	000102-103	CAP Screw	M5*0.8P*10	1	HA020304
70	250858-615	Electrical Box Assembly		1	FH010115
71	000303-702	Round Head Screw	M5*0.8P*8	12	
72	490785-000	Fan	DC 24V 2.04W	1	490779-000
73	250895-615	Fan Cover	ABS	1	
74	001201-909	Point Cutting Self-Tapping Screw	M4*1.59P*25	4	
75	250144-615	Winder Base		2	PH010023
76	001203-902	Point Cutting Self-Tapping Screw	M5*1.59P*10L	4	
77	453013-018	Wiring	SJT 18AWG*3C*2000mm	1	
78	021375-000	Strain Relief	MGB16-10B	1	
79	490673-000	On/Off Switch		1	FJ010142
80	490672-000	Emergency Switch	Red	1	FJ010197
81	923286-000	Warning Light Wiring Assembly	DC 24V-LED-Φ10	1	
82	250857-615	Cap		1	FH010111
83	090248-008	Bracket		2	090248-308
84	006303-100	Spring Washer	6.1*12.3	12	HE020900
85	006001-022	Flat Washer	6.3*13*1t	12	HE010300
86	001202-602	Point Cutting Self-Tapping Screw	M3*1.06P*6	4	
87	001106-601	Round Head Self-Tapping Screw	M2*0.63P*6L	4	
88	923343-000	Controller Cover Assembly		1	
89	250859-615	Cover (Left)		1	FH010116
90	021103-100	Cable Clip	ACC-3-B	2	021112-000
91	000103-101	CAP Screw	M6*1.0P*8	2	HA020403
92	310262-909	Positioning Rod	6463	1	FH010091

93	008603-100	Square Nut	M6*1.0P	2	
94	310261-909	Table Rack	6463	2	FH010091
95	173119-902	Y Axis Block	SPCC	2	FH010109
96	310260-909	Table	6463	3	FH010090
97	021107-100	Strain Relief	ACC-1.5-B	1	
98	310263-909	Rack	6061	3	FH010094
99	006001-004	Flat Washer	4.3*14*1.8t	2	
100	021101-100	Strain Relief	ACC-2-B	1	
101	000805-103	Hex. Socket Screw	M4*0.7P*12	6	
102	923027-000	Positioning Bracket Assembly		2	
.1	130275-903	Bracket		1	
.2	173010-902	Nut	SPHC	1	
.3	000303-112	Round Head Screw	M5*0.8P*18	1	
.4	006302-100	Spring Washer	5.1*9.3	1	HE020800
.5	000304-107	Round Head Screw	M6*1.0P*16	1	HA040708
103	130277-000	Gear		1	FH010095
104	001904-104	SET Lock Screw	M4*0.7P*8	2	
105	310258-909	Y Axis Motor Bracket	6463	1	FH010088
106	173236-000	Plate		1	
107	000104-708	CAP Screw	M8*1.25P*25	4	
108	250123-615	Handle		2	PG920008
110	042506-000	Lock Seal	HP-13G*	16	FH010126
111	250855-615	Cover (Left)		2	FH010106
112	250856-615	Cover (Right)		2	FH010107
113	310254-909	Side Rod (Left)	6463	1	FH010084
114	310255-909	Side Rod (Right)	6463	1	FH010085
115	310310-909	Y Axis Rail	6061	2	
116	008006-100	Hex. Nut		4	
117	230049-000	Packing Screw	S20C+NBR	4	TH0902
118	490768-000	Limited Switch		2	
119	310257-909	Rod (Front)	6463	1	FH010087
120	310256-909	Rod (Middle)	6463	1	FH010086
121	310273-909	Rod (Rear)	6463	1	
122	021803-000	Lock Ring	NB-1925	2	

