



Users Reference Guide

**WARDCO R1
CONTROLLER**

1 Overview

1.1 Contents

R1 Motion Control unit
Hand held pendant
Pendant stand and clamp
Power cord
USB 3.0 cable
Wireless USB plug for pendant
2 fuses
Memory stick with Software and manuals

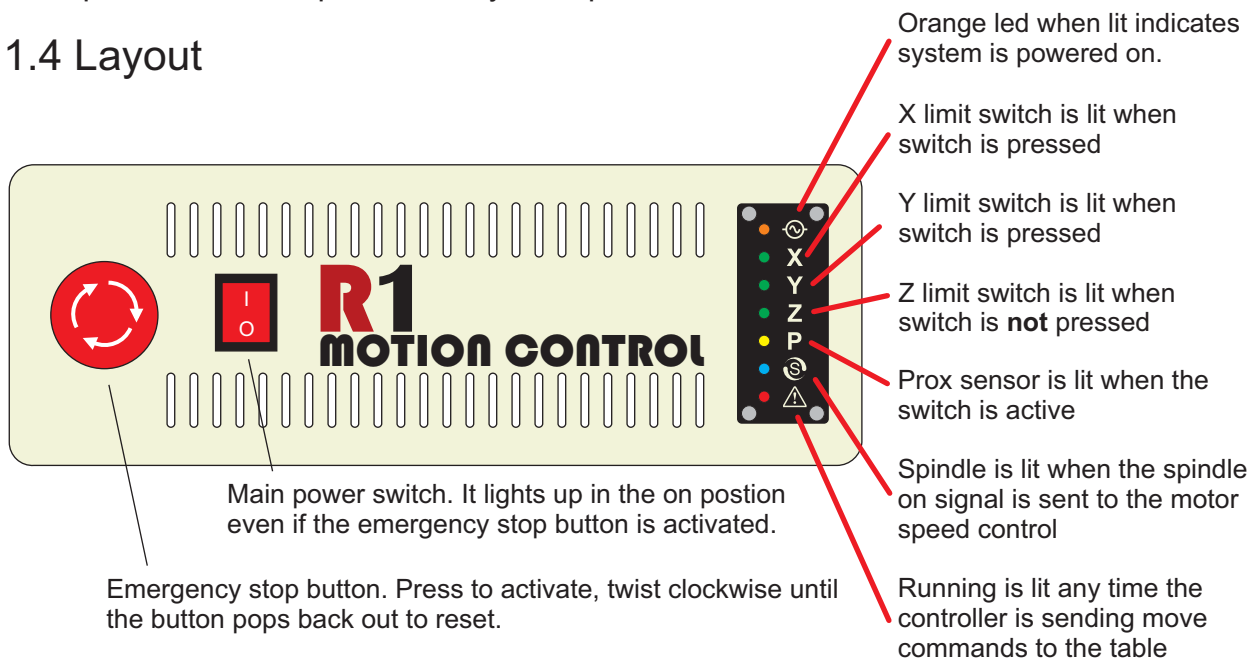
1.2 Power Requirements

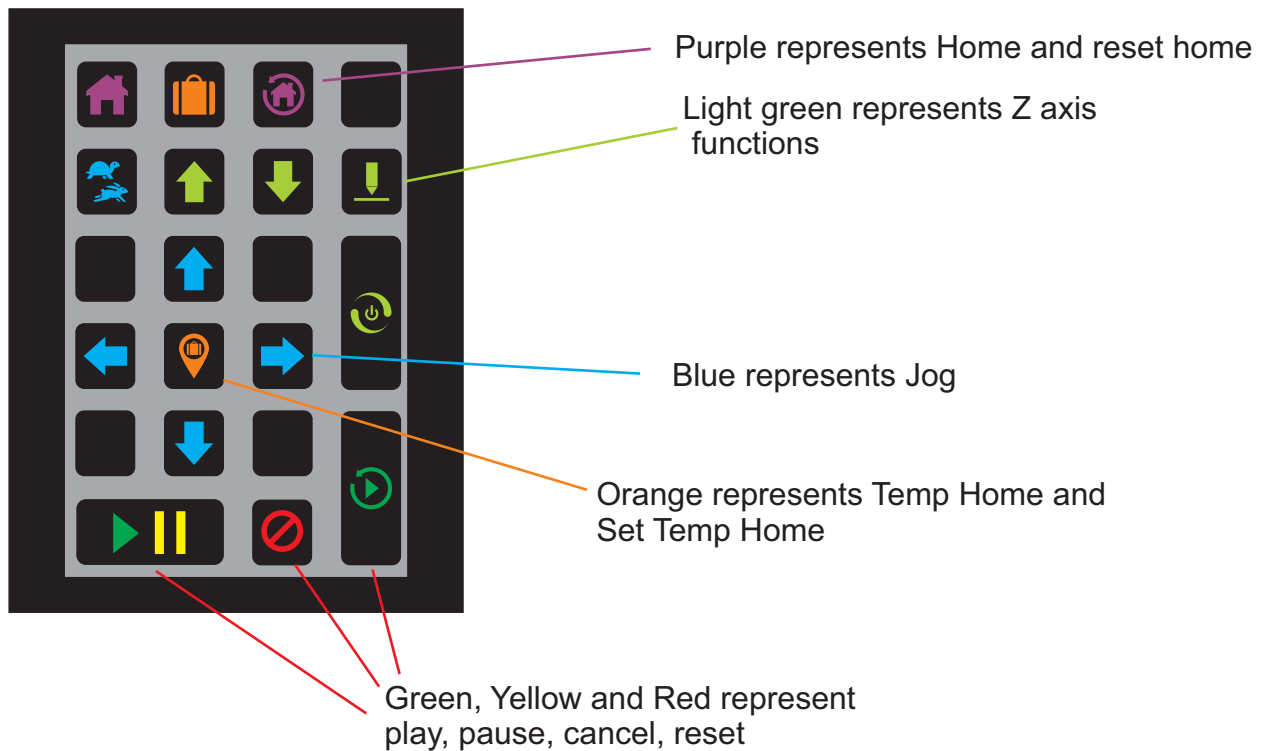
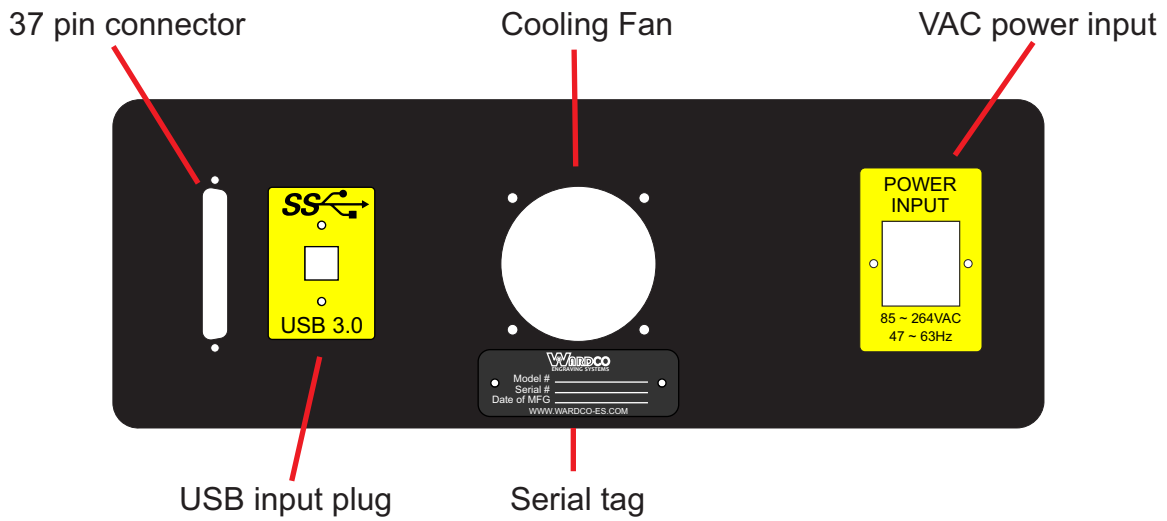
Input power: 85 - 264 VAC 47 - 63 Hz

1.3 Computer Requirements

Windows 10*, 8.1 or Windows 7, 64-bit
Intel Core i3/5/7 or AMD Athlon 64
2 GB RAM
2.5 GB hard disk space
USB port for R1 Controller: USB 3.0 only (designated by SS before the USB symbol and the inside of the plug is blue)
USB port for wireless pendant: Any USB port will do.

1.4 Layout





The pendant is only functional when the Engraving Device Interface or EDI Screen is active.

Home and Reset Home Functions



Move to permanent X,Y, home



Mechanical home machine to permanent home position

Temp Home and Set Temp Home Functions



Set Temp Home (requires double press)



Move to Temp Home

Spindle Functions



Turns spindle motor on and off



Lowers spindle



Raises spindle



Cutter set

X and Y Jog Functions



Fast or slow jog



Jog up toward top of table



Jog down toward bottom of table



Jog left



Jog right

Play, Pause, Cancel, Reset Functions



Either starts or pauses a job



Cancels a paused job



Resets job to allow for replay (requires double press)

2 Setup

2.1 Connections

Plug in 37 pin cable from engraving table.
Connect the USB cable from the controller to a USB 3.0 plug on your computer.
Plug wireless USB pendant plug into any available USB port on your computer.
Plug power cord into 110-220 volt outlet.

2.2 Pairing with a table

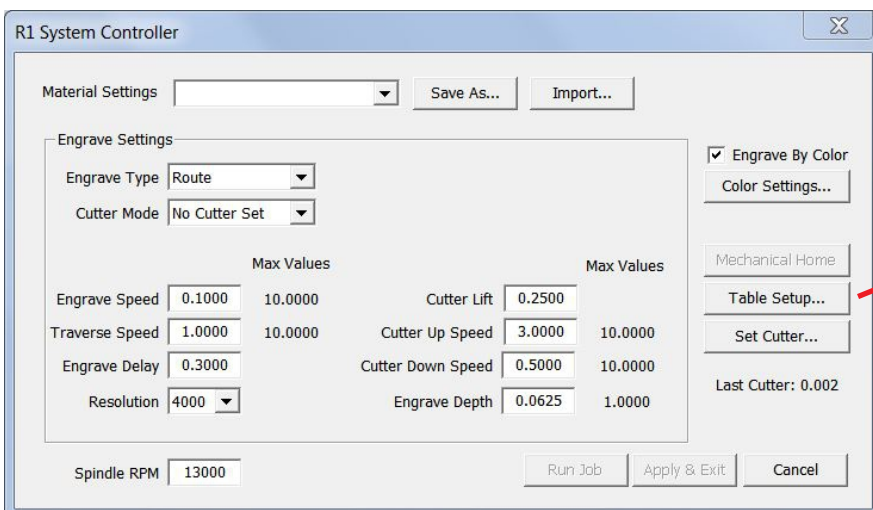
The main power switch lights up when in the on position. The power led light should be lit. If not check the emergency stop button by twisting it clockwise.

Open Carpathia Graphix Interface software on your computer. (See Carpathia manual for software installation instructions.)

Press the F1 key - This opens the “Choose Controller” dialogue. If you have multiple controllers connected to your computer this is where you select the one you want. If you only have 1 controller you can select the primary controller box and this will prevent you from seeing this selection box when you are sending jobs to the EDI.



Click the “Settings” button to open the R1 Controller dialogue.



Click the “Table Setup...” button to open the settings dialogue.

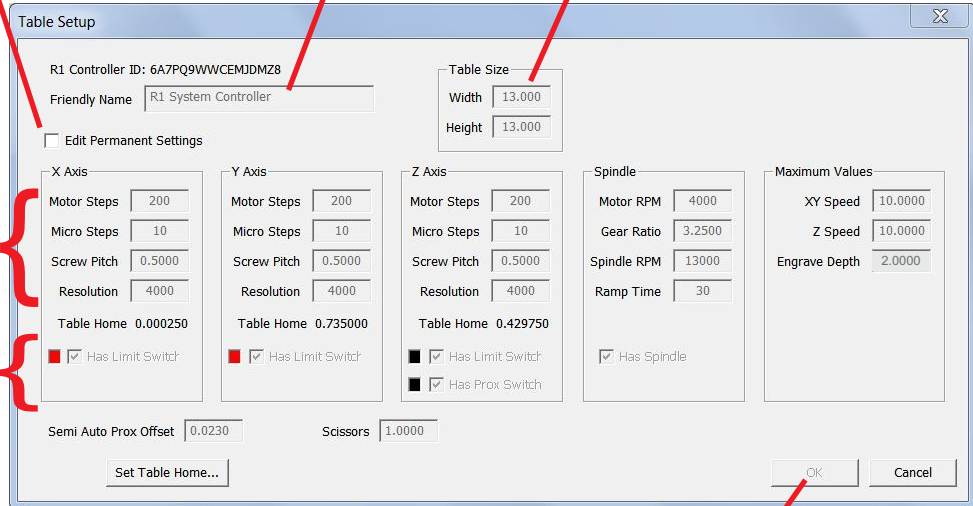
The table setup dialogue is where all of the information about your specific engraving machine is entered.

To get started click the “Edit Permanent Settings” button.

You can assign any name you like to this machine or leave it as the R1 System Controller.

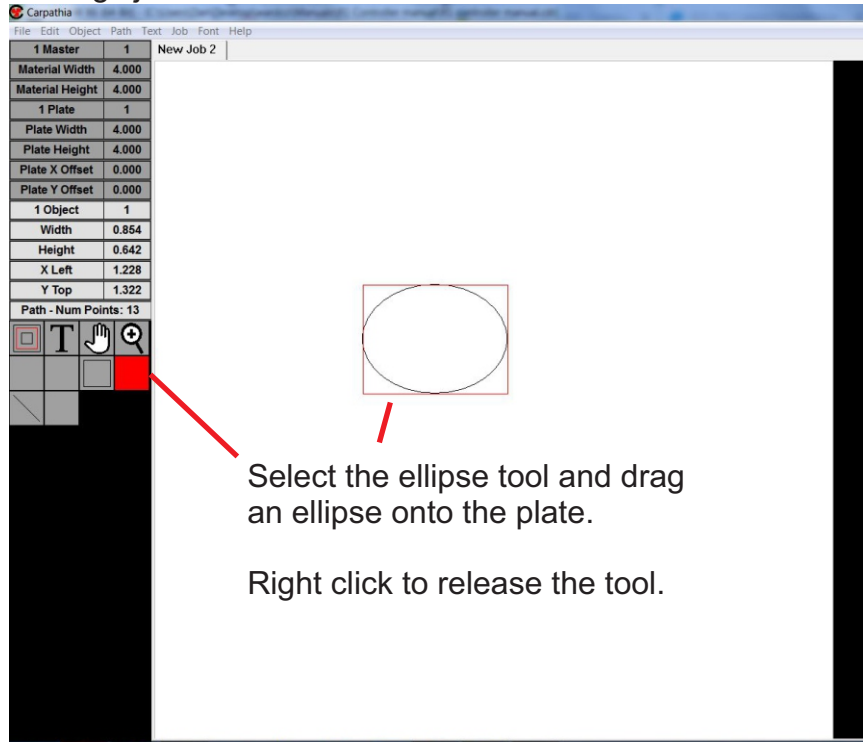
Enter your table size here.

These values are the same for any standard Xenetech table.

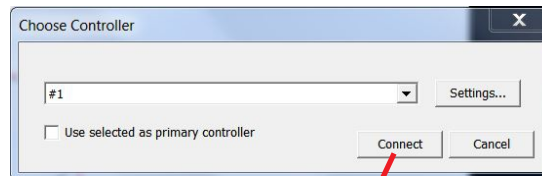


Click the “OK” button to save these settings.

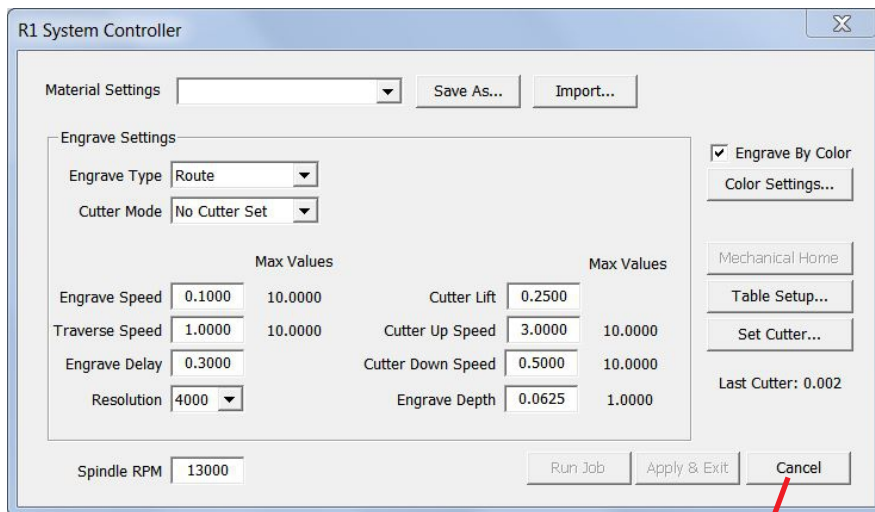
Close back out to Carpathia software. Select “File” then “New”. Don’t worry about any of the master material settings just click “OK”.




Press the F1 key on your keyboard to send this job to the Engraving Device Interface or EDI.

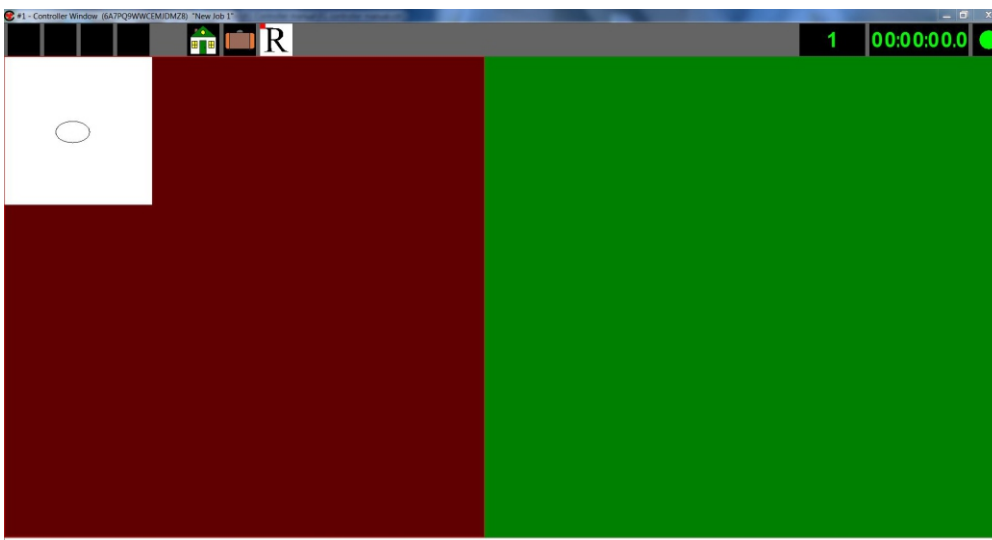





If you have not selected a primary controller then this dialogue will open every time you send a job to the EDI. Click the “Connect” button.

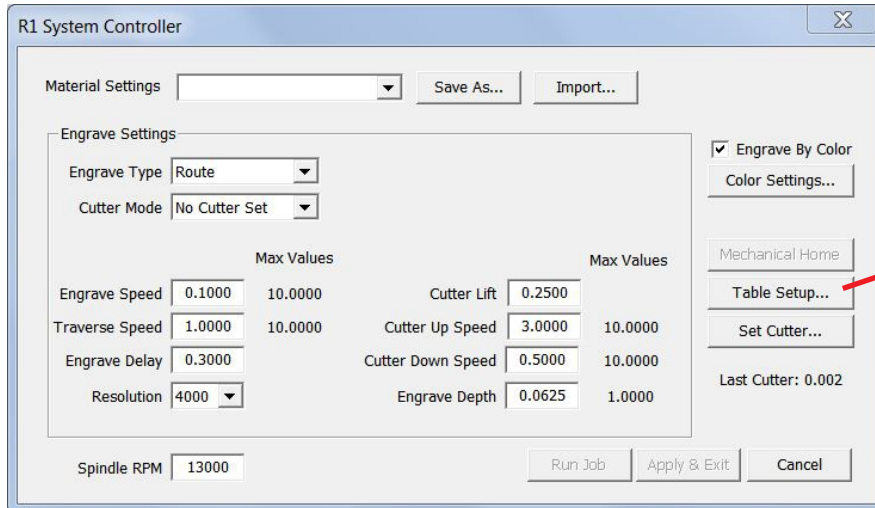


Cancel out of the settings dialogue.

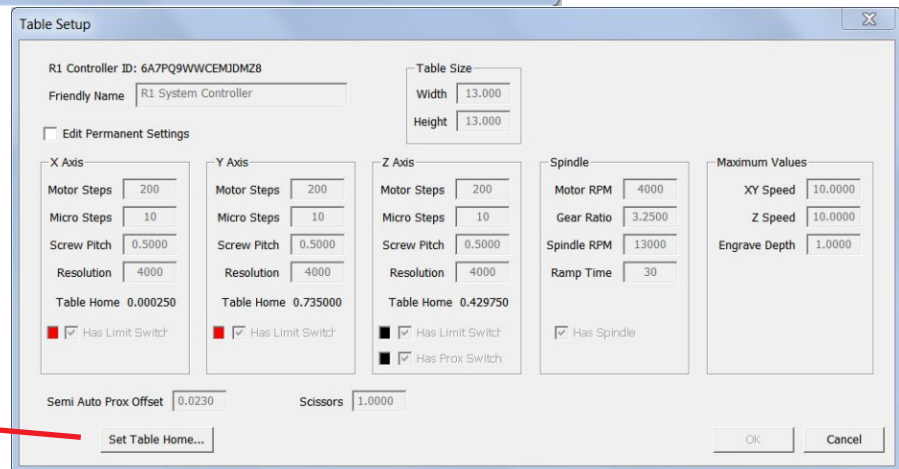
With the EDI now open and no other windows open within it, the pendant is functional. Jog the head out to the top left corner of the table. Use the  button to slow the X,Y, travel speed providing more accuracy.



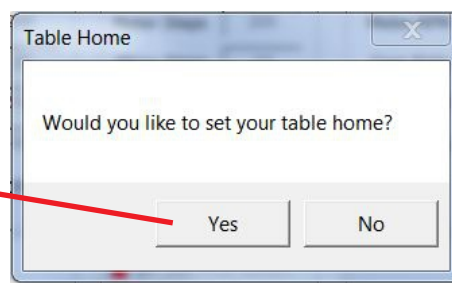
Lower the Z axis using the  button. Any time you are raising or lowering the Z axis be mindful of the spindle belt. It can bind when moving more than a 1/2". To prevent that turn on the spindle motor.  Once you are about a 1/4" above the table you can turn off the spindle motor.  Carefully line up the cutter, diamond, etc. to the top left corner of the table. Once you have it ready press the F1 key.



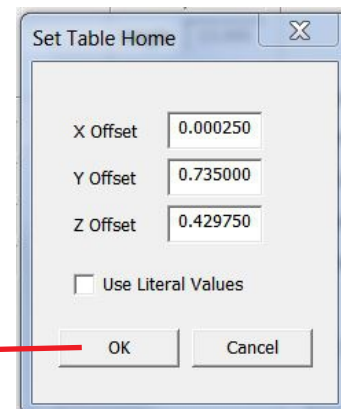
Click the "Table Setup..." button



Click the "Set Table Home" button



Click the "Yes" button



Click the "OK" button

The system will now mechanical home and save the home position. The head of the machine will always rest at the limit switches to stay out of the way but will only engrave from the home position you set.

3 Engraving Device Interface or EDI

3.1 Overview

Carpathia software is used for many applications other than rotary engraving so it is not aware of the application. When you press F1, select a controller, the EDI opens and it is aware that it is controlling a rotary engraving machine because the EDI is in constant communication with the controller. When the EDI connects to a controller that has just been powered on it commands the controller to perform a mechanical home. This allows the EDI to know the exact position of the engraving head. As long as the controller is powered up the motors remain locked so even if you then close the EDI and open it again later the EDI does not command a mechanical home.

The EDI must be open for the pendant to function. This is because the EDI is what the pendant uses to command the controller. At the time this was written the EDI must not only be open but it must be the active or top screen for the pendant to work. Soon the EDI can be minimized or behind other application screens and still work with the pendant. When you open the settings dialogues in the EDI the pendant function is turned off.

You can not close the EDI while a job is running. If you turn off the controller or unplug the USB cable and communication is lost the EDI will close. If a settings dialogue is open the EDI will close once the dialogue is closed.

Since the EDI is rotary specific it only accepts vector information. For example if you try to send over text that has no outline and a solid fill rather than a serpentine fill it will not show up in the EDI. Bitmaps will also not send over. All lines in the EDI are shown as “thin line” or “wire frame”. This allows you to see exactly what path the machine is going to follow.

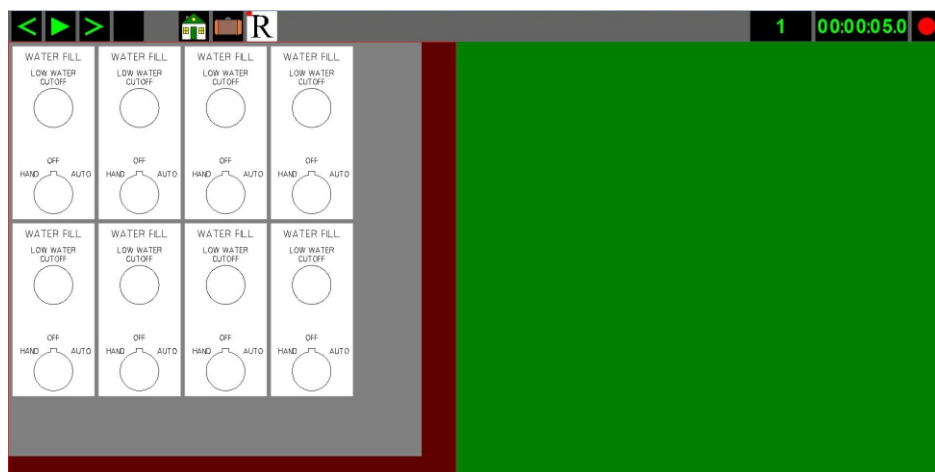
3.2 Layout

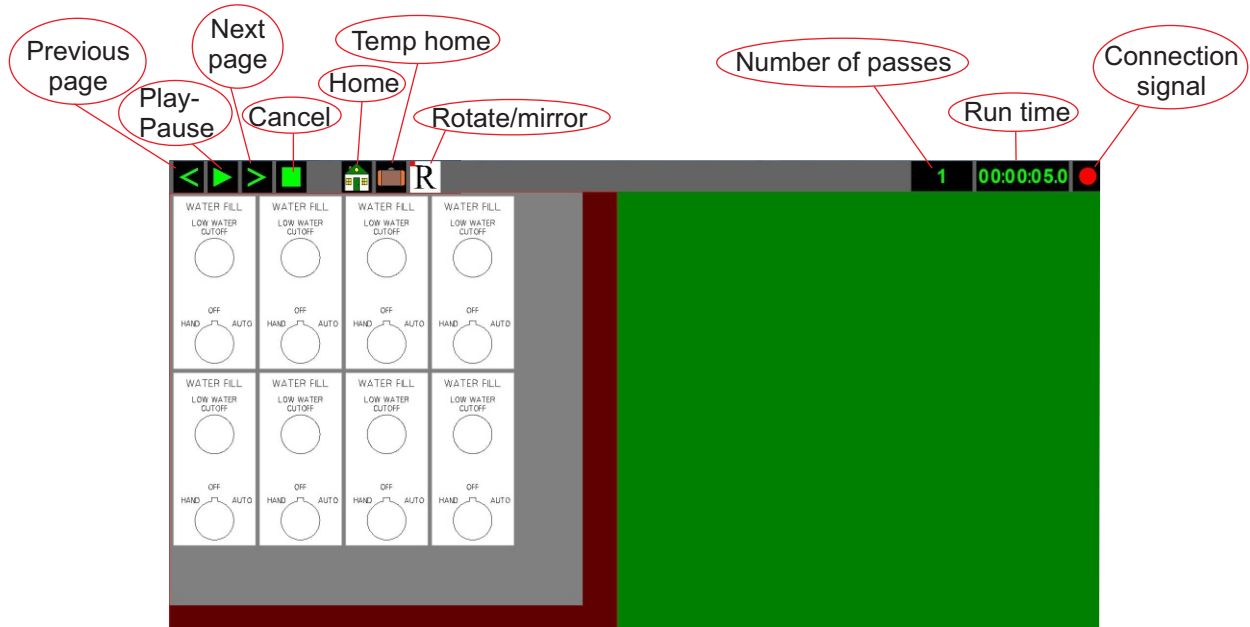
The white areas represent plates.

The grey areas represent the material.

The red area represents the table.

The green area is out of bounds.





Previous page/Next page - Any time there are multiple master plates or a job is broken into different operations by using engrave by color these arrows appear and allow you to scroll through the pages. If you have grid cutout turned on the EDI will automatically separate it from the rest of the job.

Play/Pause - After you select the “Apply & Exit” button the play symbol will appear. Once the job is started the pause button will appear.

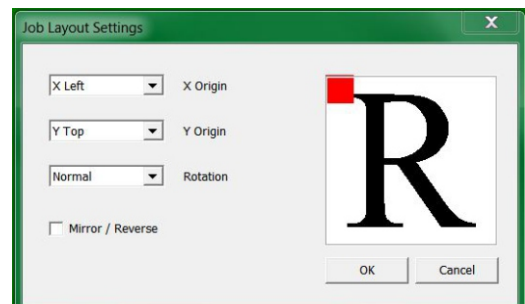
Cancel - The cancel button only appears when a job is paused. You have the option of either pressing the play button to resume the job or the cancel button to clear the job completely.

Home - Any time the head of the machine is not in the home position you can press this button to have the system return to home. This is not a mechanical home so you can use this to get the head out of the way but not lose a temp home position.

Temp Home - Any time to left click on the temp home button it moves the head to the temp home position. You can right click the temp home button and either manually type in values or set a temp home where the head is currently resting.

Rotate/mirror - Clicking on the button opens the “Job Layout Settings” dialogue. You can select the point of rotation and/or reference, as well as rotation and mirror/reverse.

Note - be mindful of where your plate is in reference to the red table in the EDI. We do not protect you from moving an object off of the table.



Number of passes - Any number you use here will cause the job to not stop but repeat that number of times. This will go away when the multiple pass with depth control is implemented.

Run Time - The run time only counts when the job is running. It does not count during pauses.

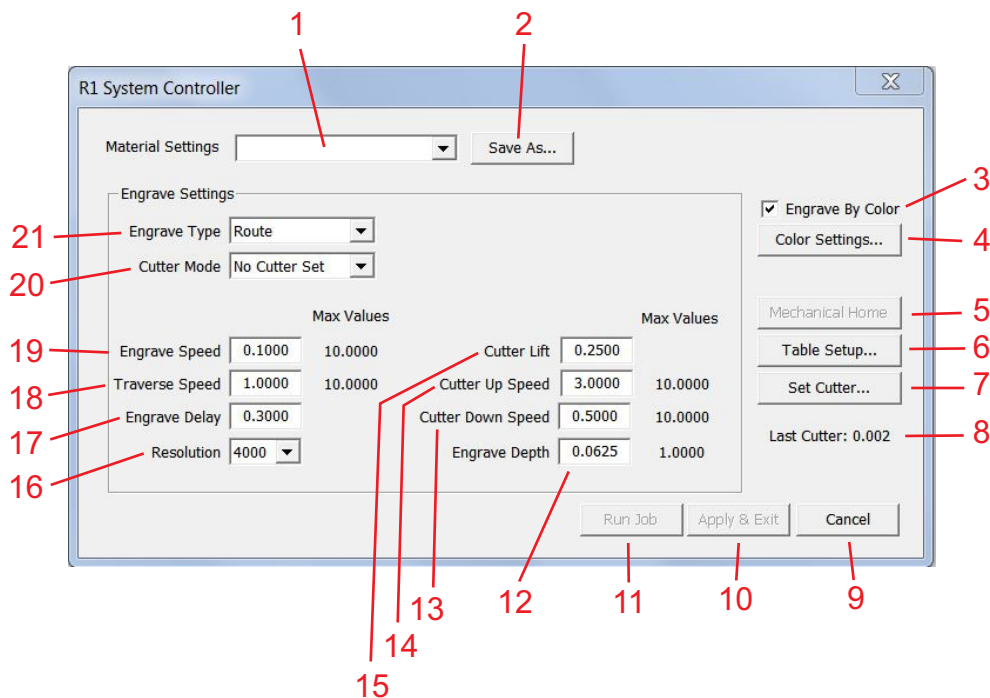
Connection indicator - When this light is flashing red/green there is a connection with the controller.

4 Settings Dialogues

4.1 Job Settings Dialogue

When the EDI opens the job settings dialogue opens automatically.

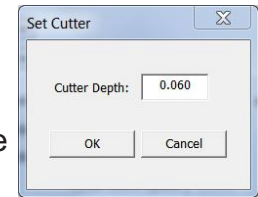
The job settings dialogue is where all values are entered for engraving a job.



1. Contains a drop down list of all the profiles you have saved.
2. Save the current values as a profile.
3. Select to turn on engrave by color. A separate page will be created for each color.
4. Click to open the color settings dialogue. For now the only option is to turn off a color.
5. Click to have machine find all limit switches. This also clears out a temp home.

6. Click to open the Table Setup dialogue. (see next section)

7. This feature allows you to set a cutter depth without having to use the micrometer. Loosen the cutter and lift it up in the spindle. Set the depth you require in the "Set Cutter" dialogue and click "OK". The spindle will lower until the nosecone touches the material then lift by the depth you entered. Gently slide the cutter down until it touches the material then tighten.



8. Shows the last value you used for a cutter set.

9. Closes the job settings dialogue without saving any of the changes you have made.

10. Closes the job settings dialogue and saves the changes made.

11. Starts running the job.

12. If you are not using a nosecone this sets the depth of engraving, if you are using a nosecone this value is used to apply more spring pressure.

13. Represented in inches per second with 10ips being the fastest. This for now controls the plunge speed. Plunge speed will be added later.

14. Represented in inches per second with 10ips being the fastest. In most cases cutter up speed should be set fast for efficiency.

15. Determines how far up the cutter is lifted between characters. Too low and the cutter can drag during traverse moves, too high and the job time will be very long.

16. On a large format machine run time can be decreased by lowering the resolution. It should be left at 4000 on most engraving systems.

17. How long the cutter has to clean out after plunging into the material. Units are in seconds.

18. Set the speed the head will move when not engraving.

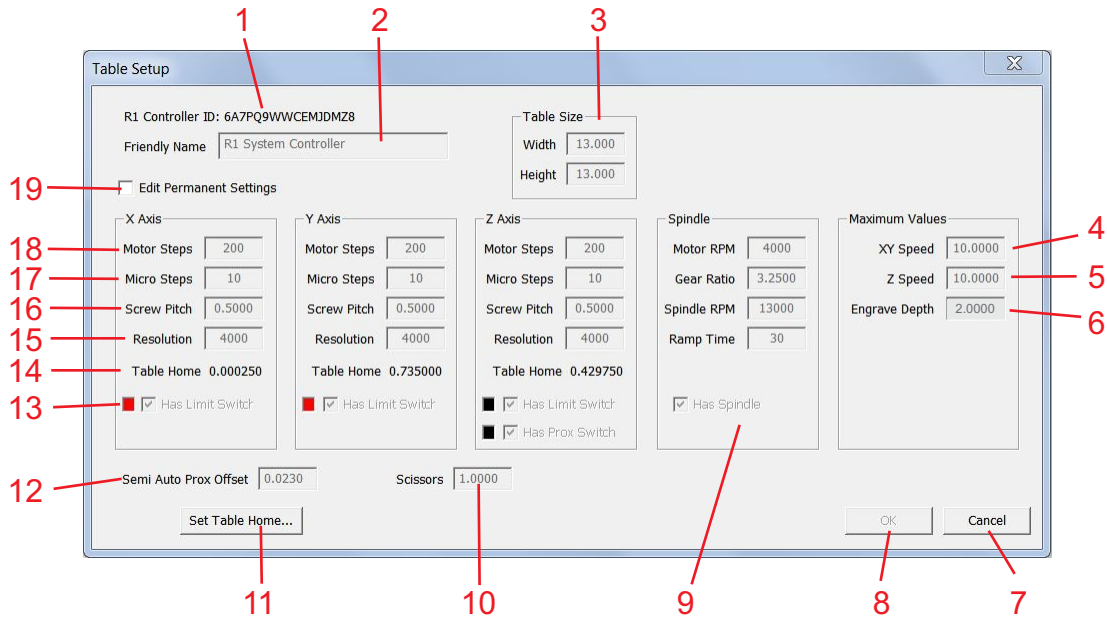
19. Set the speed the bit will move through the material from .0001 to 10 max

20. Select "full auto", "no cutter set", or "manual cutter set"

21. Select rout or drag. If you are dragging there is no reason for the spindle motor to run.

4.2 Table Settings Dialogue

The table setup dialogue is where all of the information about your specific engraving machine is entered.



1. Each mother board has a unique ID.
2. You can give your controller any name you like.
3. This allows the controller to know its x and y limitations.
4. Depending on the age condition and quality of your machine there should be a max speed allowed. Speed is shown in inches per second with a max speed of 15ips. Most engraving machines need to be set between 5ips and 10ips.
5. Depending on the age condition and quality of your machine there should be a max speed allowed. Speed is shown in inches per second with a max speed of 15ips. Most engraving machines need to be set between 5ips and 10ips.
6. The physical travel of the Z axis on your system is entered here for the controller to know its limitations.
7. Closes the “Table Settings Dialogue” without saving any of the changes made.
8. Closes the “Table Settings Dialogue” and saves changes.
9. The “Spindle Settings” section is only for spindles controlled through the R1 Controller. If your spindle is controlled through an independent speed control like Xenotech and Vision tables then this is irrelevant.

10. When a job is running if you press the pause button the controller must continue to the next vector point before stopping. If you are milling a large object and need to pause at the beginning of a long straight segment it can take quite a while for the system to pause. This value allows you make sure there are no line lengths longer than the value you enter. If you set the scissor value too low it can slow the speed of the controller.

11. This process is used when initially setting up a system as explained earlier in the manual. If you are operating in no limit switch mode it will be used each time the controller power is cycled.

12. When a nosecone touches a surface there is a slight offset before the proximity sensor is triggered. This value allows the controller to properly offset that amount when using the auto cutter set feature. The easiest way to set this is to input a value of say .003" then check with a feeler gauge to adjust.

13. If your system does not have limit switches or if a limit switch fails and you need to continue operating the system can be run in no limit switch mode by turning off even just one of the limit switches.






14. These values indicate how far away each limit switch is from the home position you selected.

15 - 18. These are all of the values that make sure the controller moves the proper distance for each motor step. The values shown in this dialogue are correct for any standard Xenetech table.

19. Check this box to allow for changes to the table settings.

5 Operating the R1 Controller






5.1 Manual Cutter Set

When a job is set to Manual Cutter Set, first press the  Play/Pause button. With spindle switch on the MSC set to Auto the spindle will come on, the X and Y will move to the start of the first character. The system is now waiting for you to set the cutter depth. To do this lower the spindle  until the cutter is about 1/4 inch above the material. (The purpose of this is to have the spindle motor running while making large movements down with the spindle so the spindle belt does not bind.) Now turn off the spindle,  and lower the spindle until the cutter is at the desired depth. Press the cutter set button  the Z will lift then press play  to start the job.




Note:

When setting a cutter to the material it is best to have the cutter lifted into the spindle, then once the spindle is close to the material loosen the cutter knob and gently lower the cutter to the material thus assuring that it is perfectly zeroed.

5.2 Setting a Temp Home

To set a temporary home position, first jog the X and Y using the jog arrows  until you are in the general vicinity of the desired temp home. For the most precise setting lower the spindle  (be sure to turn on the spindle motor  to prevent the spindle belt from binding if you will be lowering more than about 1/2 an inch.) Lower your cutter to just above the location you need to set the temp home. For fine X and Y adjustments select the slow jog mode.  Once you have located the desired temp home position press the Temp Home Set button  twice. The machine will turn on the spindle motor, lift the spindle then make a short back and forth motion to indicate that the new temp home has been set.

Note:

If your temp home leaves the head of the machine in the way for any reason you can press the Home button  and the system will move back to the permanent X,Y location. You can start a job with the machine resting in the permanent home position and it will use the temp home as the origin for the job. At any time you can confirm the temp home position by pressing the temp home button,  and the system will move to the temp home. To clear a temp home press the mechanical home button,  and the system will go through the homing process finding all limit switches, then rest in the permanent home position.

5.3 No limit switch mode

If your machine does not have limit switches or if a limit switch is broken the controller can operate in “No Limit Switch Mode”. First go to the “Table Settings Dialogue” and turn off even just one limit switch, then click “OK”. In this mode the controller will not attempt a mechanical home. When the power on the controller has been cycled the home position is lost. Before powering up the controller move the cutter down to the top left corner of the table. Power the controller and open the EDI. The set table home dialogue will appear. The X and Y values can stay 0 if you prefer or you can enter how far back from the 0 position you would like the system to rest by typing in a positive value in inches. For the Z axis you need to enter the value for how far up in inches the z can physically move. Most systems will have at least an inch from the table so you are safe with that value.

