Using the Rotary Attachment (Roller or Chuck Style) with “Easy Button”

Quick-Start to install the rotary device.

1) Home the laser machine by pushing the [Reset] button.
2) Lower the worktable so that the rotary device will set inside the work area without colliding with the focal head.
3) Move the gantry to the middle of the work table.
4) Press the [Origin] button on the operator pad.
5) Place the rotary attachment inside the work area with the drive wheels (or chuck) on the right-hand side. Try to make the axis of the rotary device straight with the gantry.
6) Notice that the rotary motor connector receptacle should be visible on the right-hand side of the work area. Notice that the rotary device has a motor cable with matching round connector plug. Plug the 4-pin cable into the rotary motor connector. Screw the connector into the receptacle to ensure it will not pull loose.
7) Notice the “Easy Button” on the front of the laser machine. This button switches off the worktable Y-Axis and turns on the rotary Y-axis. Press the “Easy Button” to be latched/toggled to the inward position.
8) Note: When the worktable Y-axis is disengaged, the gantry can easily be moved by hand in the front and back directions.
9) Start the laser software, RDWorks V8.
10) Look at the right side of the software and open the "User" tab.
11) Click on the "Read" button to update all parameters from the laser machine controller.
12) Open the last settings section labeled as "Other" and scroll down to the variables for the Rotary Attachment in the “Rotating” section. Notice that the values that are currently found at “Enable Rotating”, “Circle Pulse”, and “Circle Diameter”. The "Enable Rotating" configures the laser machine to use the normal worktable (No) or the rotary attachment (Yes).

    If you have not already set up the parameters for the rotary device, then you will need to calculate the Circle Pulse and Circle Diameter. Also note that not all functions of the laser are perfectly adapted in the switch from flat worktable to rotary device. In the “Processing” section, you may want to adjust the “Cut Idle Speed” value down to “30”. A lower “Cut Idle Acceleration” (value of approximately 200) would also lend to smoother performances. Speed and Acceleration values that are too high will cause the product to bounce out of the four-wheel cradle. For rotary settings, the "circle diameter" tells the software about the cylinder product or the rotary that you are using. Remember to [Read], change values, then [Write] these values to the controller.

    Option A - If the rotary attachment is roller-wheel style, the "circle diameter" indicates the outside diameter of the O-ring driver wheels. The diameter of the product is not important. The circle diameter is always the diameter of the O-ring. The circle diameter for the O-ring driver wheel is approximately 67mm. This may be different based on the usage, stretch, or normal wear and tear on your rotary device.

    Option B - If the rotary attachment is the chuck style, then the "circle diameter" indicates the outside diameter of the product at the engraving location. This measurement is made in millimeters. The "circle pulse” indicates how many micro-steps the controller needs to create in order to rotate the circle at exactly one revolution.

If the rotary attachment is roller-wheel style, then the O-ring wheel will turn one full rotation. If the rotary attachment is chuck style, then the cylinder product (chuck) will turn one full rotation. The "circle pulse" P can be calculated according to the following method. We must consider the motor commanded steps per revolution and reduction gearing.

The total number of Micro-steps is found by multiplying the “natural steps” by the “Step divisions”.

Stepper motor natural steps = 200 Step division = 16

Micro-steps M = 200 * 16 = 3200

The total Pulse steps for a full rotation of the wheel (or Chuck) can be found by

Motor drive gear teeth d = 18 Driven gear teeth D = 70

P = M*D/d P = 3200 * 70/18 = 12,444.44.

Other factories make the rotary with different gear ratios. The calculation changes only a little...

P = 6400 * 45/25 = 11,520 OR P = 1600 * 70/18 = 6,222.222

Change the values of the “Circle Pulse” and “Circle Diameter” to match the physical properties of your rotary device.

13) Set the “Enable Rotating” to “Yes”.
14) Press the [Write] button to set the laser machine to use rotary mode. The laser should be ready to use the rotary attachment. Remember to design your project such that the Y-axis will be rotating your product. Most all of your projects will need to rotate the design 90 degrees clockwise.

Reminders:

- Do NOT plug/unplug the motor connector while the rotary button is engaged.
- Make sure to level the product surface (powder coated cup) so that it will be in focus.
- Move the gantry over the product surface (powder coated cup) so that the laser engraves on the top-most arc of the surface.
- Use masking tape to eliminate scale from the surface during engrave.
- Use a weight inside the cup to “push” down the cup onto the rollers and prevent slipping.

Things to consider:

Problem: My images are being engraved upside-down (or backwards).

Answer-1: You need to rewire the Y-axis motor wires. Swap the A- and the A+ motor wires.

Answer-2: The rotary device is normally inserted into the machine with the motor on the right side of the work table. You can insert the rotary device with the motor on the left side.

Problem: The product is moving too fast and skips out of position and sometimes it can even jump around.

Answer-1: Press the "Speed" button on the Operator Panel to reduce the jogging speed.

Answer-2: You will need to adjust the User Configuration variables for the values of "Cut Idle Speed" or “Cut Idle Acceleration”.

Answer-3: You may need to adjust the Y-axis "Vendor Settings" configuration to smooth the performance. The default "Vendor Settings" password should be "rd8888".

Problem: My engrave design comes out with horizontal lines. (Gaps)

Answer-1: The stepper motor amperage is too high or too low. Turn OFF the laser machine. Change the DIP switch settings to the lowest value. Turn laser machine ON. Run a test project. If the project still has lines, change the DIP switch settings to the next amperage value. Run the next engraving test. Most rotary devices use motors that work nicely near 1.3 amps.

Answer-2: Your "Interval" value for the scan mode may be too high or too thick. Change the scan mode "Interval" to 0.0847 mm (or DPI of 300). Download the project again. Run the laser project to test if the problem is solved.

Problem: My projects result as oblong/stretched.

Answer: Need to adjust the "Circle Pulse" or "Circle Diameter". Remember to "Write" the settings to the laser machine controller and then try your project again.

Problem: While using the roller-wheel style attachment, the engrave project has gaps or squished in only a small section of the project. Other parts of the project appear to be correct.

Answer: The product may be slipping.

Problem: Will changing the “User” values effect both RDWorks and LightBurn?

Answer: Yes. The parameters are saved into the laser machine as the configuration. These new parameter values should be used by any interface software.

Getting back to the worktable mode from using the rotary device.

1) The laser machine is “ON”
2) The gantry Y-axis motor should be free to push toward the back of the work area.
3) Notice the “Easy Button” on the front of the laser machine. This button switches ON the worktable Y-Axis and turns OFF the rotary Y-axis. Press the “Easy Button” to be latched/toggled to the outward position.

Note: When the worktable Y-axis is engaged, the gantry cannot be moved by hand.

4) Notice that the rotary motor cable is plugged into the rotary motor receptacle. Unscrew and unplug the 4-pin cable from the rotary motor connector.
5) Remove the rotary attachment from the laser machine.
6) Start the laser software, RDWorks V8.
7) Look at the right side of the software and open the "User" tab.
8) Click on the "Read" button to update all parameters from the laser machine controller.
9) Open the last settings section labeled as "Other" and scroll down to the variables for the Rotary Attachment in the “Rotating” section. The "Enable Rotating" configures the laser machine to use the normal worktable (No) or the rotary attachment (Yes).
10) Set the “Enable Rotating” to “No”.
    a. If you have modified the “Idle Speed” or “Idle Acceleration”, restore those values to be appropriate for the worktable (“Idle Speed” = 100, “Idle Acceleration” = 1100).
11) Press the [Write] button to set the updated parameters. The laser machine should be ready to use normal worktable mode.
12) Home the laser machine by pushing the [Reset] button.

Problem: I am back to engraving flat part. My projects result as oblong/stretched.

Answer: The laser controller may be configured to use the rotary device. Open the User settings section labeled as "Other" and scroll down to the variables for the Rotary Attachment in the “Rotating” section. The "Enable Rotating" parameter configures the laser machine to use the normal worktable (No) or the rotary attachment (Yes). Select the proper value of “No”. Press the [Write] button to set the laser machine to use worktable mode. The laser should be ready to use the normal worktable.

Problem: I am back to engraving flat parts. My speeds are really slow.

Answer: The laser controller may still have parameters configured to be slow. In the “Processing” section, you may want to adjust the “Cut Idle Speed” value to “110”. The “Cut Idle Acceleration” would also perform smoother at value of “1100”. Speed and Acceleration values that are too slow will waste time. Values that are too high could cause the axis to skip or lose track of position.