

Diagnosing and Resolving an Omtech Polar Red Ring Error

Why is my laser throwing an error?

The Ruida controller inside your Omtech Polar is responsible for both controlling the laser, but also protecting it (and you!). If it senses anything off, it will pause the job and signal an error has occurred.

While we are thankful that the machine has these protection features, its also incredibly frustrating that it is happening. On top of that, the best we get from the Polar is a simple red ring. We know something is wrong, but we don't know what. So, what do you do when you get this error?

First we need to diagnose the error, then go about resolving the issue.



How do I know what error I'm having?

The stock Polar comes installed with a Ruida controller. This is the mainboard that handles all the processing inside the machine. When an error is thrown, it stops all operations on the machine, and it pulls the status pin to ground. When that pin is pulled to ground, it connects the red led to ground, and thus we now have a red ring error. The Polar doesn't have the ability to tell you anymore than that in its stock configuration.

The simplest solution to diagnosing a Ruida error is to purchase and install the Ruida Control Panel. This is a plug and play device that among many other things will provide you with a digital read out of the errors. Once the screen tells you the error, you have to go about resolving it yourself. See my write up below on the errors and the potential solutions.

If you don't have the Ruida Control Panel and don't want to fork over the money to get one, you'll be totally fine. I personally don't run the control panel on my machines. At the end of this article, I'll walk you through the manual process.

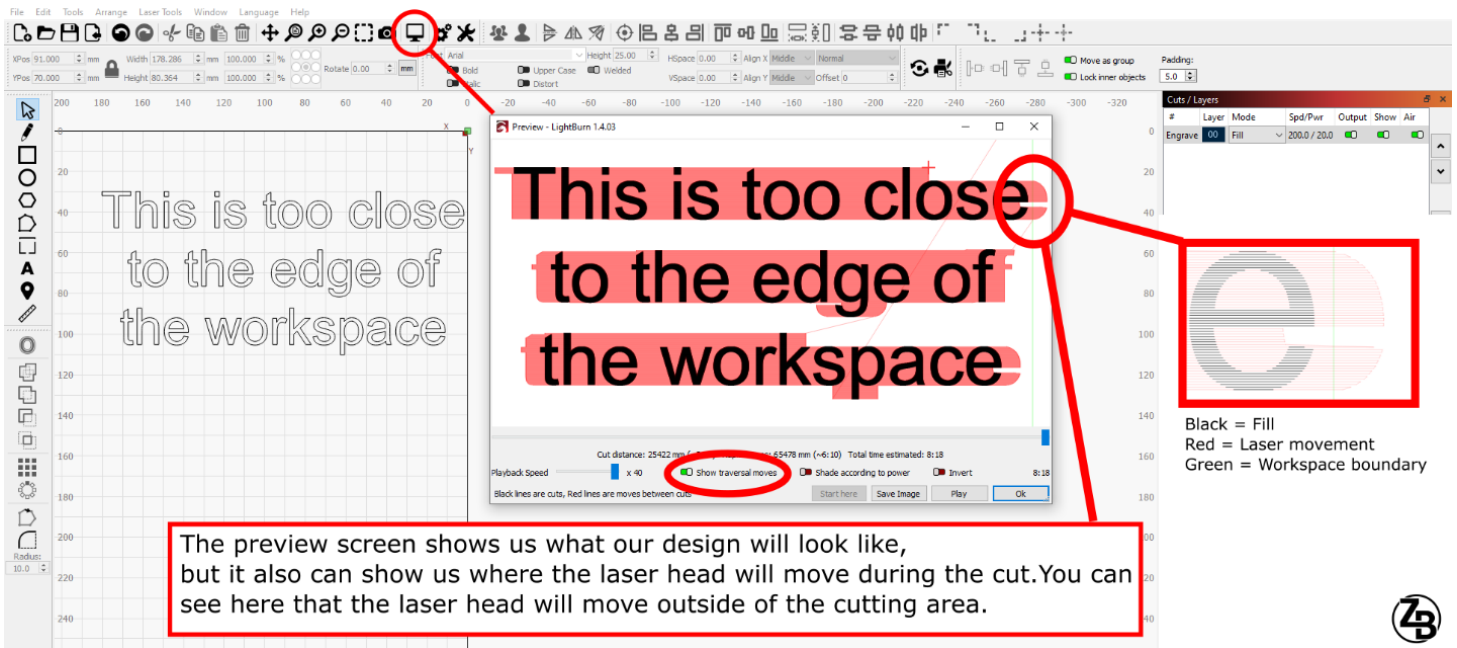
What types of errors exist and how to resolve them?

Thankfully there is a short list of errors that can cause this type of error on a Ruida Controller. Here is a list of the error with a brief explanation of what is causing it:

>Not enough extend space

When performing a fill operation, your laser needs space on each side of your design to effectively perform the fill. If you put your design too close to the edge of your workspace, the laser will determine there isn't enough space to perform the fill (specifically, the extra space it needs to over scan your design). This error exists because the machine wants to protect itself from slamming the laser head into the side rails of the machine.

How to resolve the issue: Make sure your design is not too close to the edge of the work area. A few millimeters is all you need on each side of the design. Trial and error will tell how much room you can get away with.



>Frame Slop Over

The error is thrown when your design is overlapping the edge of your work area. This error exists because the machine wants to protect itself from slamming the laser head into the side rails of the machine.

How to resolve the issue: Make sure your design is not overlapping the edge of the defined workspace.

>Water protect

The Polar has an integrated water cooling system. This system is in place to prevent the tube from overheating. If water protection is enabled and the Ruida controller senses a failure in the water cooling system it will throw an error. The Polar has 3 safety features that could all trigger a water protection failure: the interlock connector, the water flow sensor, and the water temperature sensor.

- Interlock connector: This is the wire loop that gets plugged into the back of the machine. This serves as a safety feature. Think of it like a safety key. Its for you, the user, to be able to remove if you want to prevent the machine from firing.
- Water flow sensor: This sensor is inline with your water system. Its purpose is to check and make sure that water is flowing through the water system. If water is not moving, it means the stagnant water in your laser tube could be building up heat.
- Water temp sensor: This sensor is inline with your water systems. Its purpose is to check the water temperature of the flowing water. If it senses the water temperature is getting too hot it will throw an error.

How to resolve the issue: All 3 sensors must be working in order to pass the water protection check. If any of the 3 sensor (or the wiring in between them) fails, it will throw an error. The machine with or without the control panel doesn't have the ability to tell you which of the 3 sensors is failing. You'll need to manually troubleshoot them.

- Check to make sure your coolant reservoir is at least 3/4 full. If your coolant drops below 3/4 full, there wont be enough coolant to flow through the system causing the water flow sensor to throw an error.
- Check the interlock connector on the back of the machine. You want to make sure it is plugged in and fully seated.



- Use a multimeter to confirm that the water flow and temp sensor are working properly (I'll add more details here in the future)

>Machine protected

The Polar wants to make sure that both itself and YOU are protected while its running. To do this, there are 3 door switches in place to prevent the laser from firing. If the door protection safety feature is enabled in lightburn and the machine senses that any of those 3 switches are open, it will throw an error.

How to resolve the issue: All 3 sensors must be working in order to pass the door protection check. If any of the 3 sensor (or the wiring in between them) fails, it will throw an error. The machine with or without the control panel doesn't have the ability to tell you which of the 3 sensors is failing. You'll need to manually troubleshoot them.

- Check to make sure that the crumb tray switch is pushed in either by your crumb tray or by the sliding toggle. The purpose of this switch is to make sure you don't fire the laser without the crumb tray installed. The crumb tray prevents you from shooting the laser through the bottom pass through.
- Make sure the glass door is closed all the way before you attempt to start your laser job.

How to diagnose the error without the Ruida Control Panel?

If you find yourself with a red ring error and do not have a panel screen for output, follow these steps to determine your error type.

1. In a new lightburn window draw a 10mm x 10mm square and place it roughly in the center of your work area.
2. Set the cut type to "Fill". Set the speed of the to 100 mm/s. Set the power to 5%. (5% power is high enough for testing, but too low for the laser will actually fire. This way you won't have to use up any material for this test. To repeat, the machine will run, but the laser will not fire for this test)
3. Start the job. If the laser successfully runs then you were experiencing the **Not enough extend space** or **Frame Slop Over**. If you still have a red ring, proceed to step 4.
4. Navigate to Edit>Machine Settings> Vendor Settings>Door Protect. Disable this by toggling the setting to red and start your cut. If the job runs successfully, then you can assume this was a **Machine Protect** error. If you still have a red ring, navigate to Edit>Machine Settings> Vendor Settings>Door Protect and enable it to green. Proceed to step 5.
5. Navigate to Edit>Machine Settings> Vendor Settings>Water Protect. Disable this by toggling the setting to red and start your cut. If the job run successfully, then you can assume this was a **Water Protect** error.

At the end of these tests, please make sure you enable both the Water Protect and Machine Protect setting!

