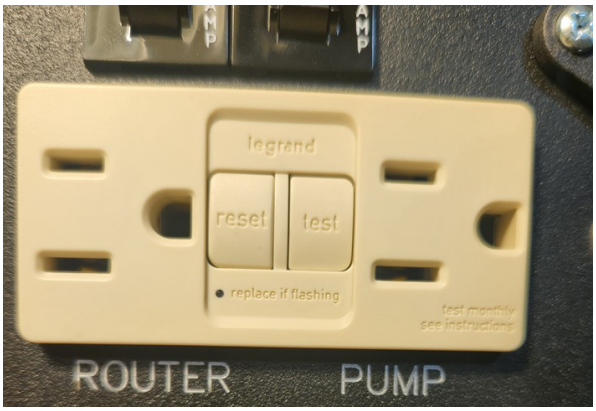
Ground Fault tripping

The SC3 Panel Pro controller is equipped with a ground fault outlet. It will trip and remove power from the router and coolant pump if there is more than approximately 5 milliamps of current difference between the Hot and neutral pins of the GFCI outlet. That is an indication that current is flowing to ground or earth instead of through neutral pin on the GFCI. This is a safety concern and the GFCI removes power.

AvCAM is unaware that this has occurred and continues to move until stopped by the operator.

This paper discusses how to reset the GFCI and resolve the issues that caused it to trip.

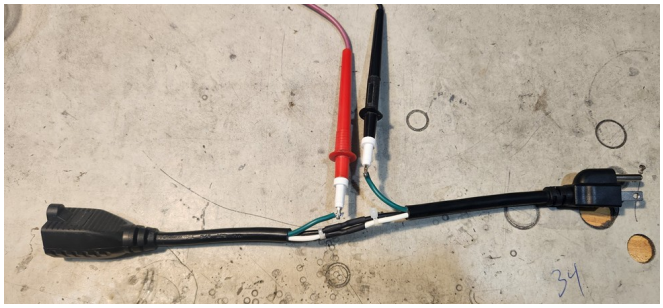


The GFCI is located on the back of the SC3 controller. When tripped the reset button will extend from its normally flush position.

In Normal operation, it should be checked once a month.
To check it:
In auto tool path mode, push the "P" key.
Whatever is plugged in to the outlet should power up.
Push the test button on the GFCI.
The Reset button will pop out and power is removed from the outlet.

How to reset:
In auto tool path mode, push the "P" key if not already on from the previous paragraph.
AvCAM will ask if you want to turn the router on. Respond yes.
The spindle status on the bottom of the AvCAM screen will show "SP:ON"
Now go to the back of the controller and push the reset button on the GFCI.

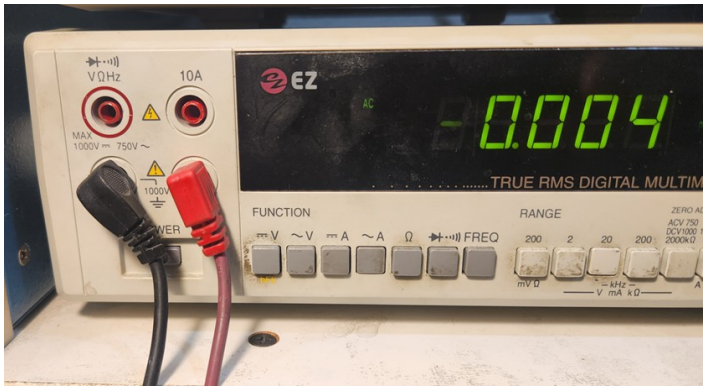
The spindle can be tuned off by pressing the P key again.



Now we have to deal with why it tripped.
Either the router is wet or the coolant pump is bad.
To test the coolant pump you can fabricate a ground current test cable as shown.
plug the coolant pump into the female connector of the test cable.

To test the coolant pump, just submerge it in a pail of water.
Plug the male end of the test cable into an AC source and watch the milliamps on the dvm. It may start out ok, but increase the milliamps after a half hour or so of running. You may also see evidence of oil in the water. This is an indication the seal on the pump has failed and the pump must be replaced. Around 5 milliamps will trip the gfci. https://bullerent.com/product/coolant-pump/

Set up your voltmeter to read ac milliamps.
Either the router or coolant pump can cause the issues.



To test the router:
The router has 2 pin plug. Therefore if it is wet or other reason for leakage, the ground current will be through its frame. The test cable for the coolant pump will not work for the router.

Set it on a non conductive work bench. Plug it in and turn it on. With the DVM set up as above (AC MA) place the red lead on the metal router case, and the black lead on earth/ground. Monitor the milliamps.

The routers can be dried using low heat (150 degrees Fahrenheit) over a couple of hours.
New routers that we send out as well as repaired routers incorporate a splash plate https://bullerent.com/product/kit-milwaukee-splash-plate/ that keeps coolant from splashing up into the router when crossing over clamps.
You can also adjust the valve on the coolant to reduce the flow. Make sure that the coolant is directed on the cutter.

You can replace the router with a new one. https://bullerent.com/product-category/5925-6126parts/

Routers can normally be repaired at least once. This usually involves replacement of the nose bearing, brushes, cleaning, evaluating the Adapter. If the adapter is extensively corroded, it will be replaced. If not it will be reinstalled and the router is tested for leakage, sound and vibration, excessive brush arcing and ground current, runout of the collet bore. Removal of the adapter in the field is not recommended as it can result in excessive runout.

If you need to get a job done, you can plug in the router and pump into a non-ground fault protected circuit.

Be advised this is unsafe

Of course automatic turn on/off is not provided when not plugged into the back of the controller.