Power_Consumption_Tests_24V

September 2, 2017

1 Power Consumption Tests

1.1 Object

- Figure out power consumption @ 24V

2 Code:

```
In [1]: import GCode
        import GRBL
        cnc = GRBL.GRBL(port="/dev/cnc_3018")

        print("Laser Mode: {}".format(cnc.laser_mode))

        from enum import IntEnum
        class Tool(IntEnum):
            SPINDLE = 0
            LASER = 1

        from enum import IntEnum
        class LaserPower(IntEnum):
            CONSTANT = 0
            DYNAMIC = 1

        LaserPower.CONSTANT

        def init(power = LaserPower(0), feed = 200, laser = 25):
            program = GCode.GCode()
            program.G21() # Metric Units
            program.G91() # Absolute positioning.
            program.G1(F=feed) #
            if power==LaserPower.CONSTANT:
                program.M3(S=laser) # Laser settings
            else:
                program.M4(S=laser) # Laser settings
            return program
```

```python
def end():
    program = GCode.GCode()
    program.M5() # Laser settings.
    return program

def square(size=20):
    program = GCode.GCode()
    program.G1(X=size)
    program.G1(Y=size)
    program.G1(X=-size)
    program.G1(Y=-size)
    return program
```

```
Laser Mode: None
```

2.1 Test Setup

Power Supply: - CicuitSpecialists CSI3010SW
    Position the paper & other things.

```python
In [2]: import numpy as np
        import matplotlib.pyplot as plt

In [4]: def laser_on(pwm):
            if int(pwm) != np.uint8(pwm):
                raise(Exception("UINT8! {}".format(pwm)))
            # Set minimal power setting to focus and position laser
            cnc.cmd("M3 S{:03d}".format(np.uint8(pwm)))
            cnc.cmd("G1 X0 F10") # Laser On

        def laser_off():
            cnc.cmd("M5") # Laser off

In [5]: voltage = 24
        # TODO:
        # import powersupply
        # powersupply.voltage(24)

        current = list()
        results = list()
        for laser_pwm in [0, 10, 25, 50, 100, 150, 200, 255]:
            result = dict()
            result["laser_pwm"] = laser_pwm
            result["voltage"] = voltage
            laser_on(laser_pwm)
            result["current"] = input("{}V. PWM: {}. Current Output (A):".format(voltage,laser_p
            results.append(result)
```

2

```
        laser_off()
        results

24V. PWM: 0. Current Output (A):.24
24V. PWM: 10. Current Output (A):.37
24V. PWM: 25. Current Output (A):.50
24V. PWM: 50. Current Output (A):.69
24V. PWM: 100. Current Output (A):.80
24V. PWM: 150. Current Output (A):


        ---------------------------------------------------------------------------

        UnicodeDecodeError                        Traceback (most recent call last)

        <ipython-input-5-c58405f812a4> in <module>()
         10      result["laser_pwm"] = laser_pwm
         11      result["voltage"] = voltage
    ---> 12      laser_on(laser_pwm)
         13      result["current"] = input("{}V. PWM: {}. Current Output (A):".format(voltage,las
         14      results.append(result)


        <ipython-input-4-b171da4ffaac> in laser_on(pwm)
          4      # Set minimal power setting to focus and position laser
          5      cnc.cmd("M3 S{:03d}".format(np.uint8(pwm)))
    ----> 6      cnc.cmd("G1 X0 F10") # Laser On
          7
          8 def laser_off():


        ~/python_cnc3018/python_rs274/GRBL/__init__.py in cmd(self, command_line, resp, multilin
         48          self.write(command_line)
         49          if resp:
    ---> 50              return self.read(multiline=multiline)
         51          return None
         52


        ~/python_cnc3018/python_rs274/GRBL/__init__.py in read(self, multiline, timeout)
         36          if multiline:
         37              responses = self.serial.readlines()
    ---> 38              responses = [response.decode().strip() for response in responses]
         39              return responses
         40          else:
```

```
        ~/python_cnc3018/python_rs274/GRBL/__init__.py in <listcomp>(.0)
          36          if multiline:
          37              responses = self.serial.readlines()
    ---> 38              responses = [response.decode().strip() for response in responses]
          39              return responses
          40          else:


        UnicodeDecodeError: 'utf-8' codec can't decode byte 0xa1 in position 1279: invalid start
```
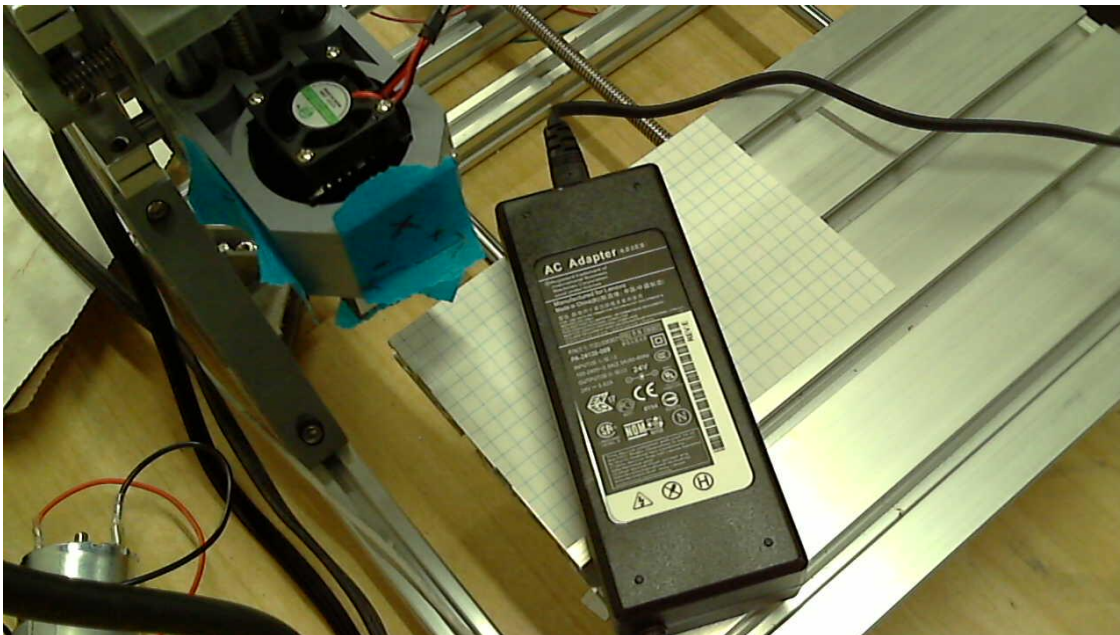
3 Reset!

This is the issue that people are running to online and that I ran into earlier when testing the laser.

Above a certain laser power @ 24V the whole controller resets. This happened at 24V PWM=100. It registered 0.8A for a few seconds then reset.

The device was provided with a 24V Laptop power supply:

```
In [7]: from utils import picture

In [10]: picture()
```


The laser control board has a 12V in and a TTL port. But only the 12V cord is provided. The "Woodpecker 2.6" control board has a IRF540NS power MOSFET.

12V to the "TTL" doesn't let out any magic smoke.

Hooking the "Laser" connector to TTL and 12V to 12V draws a lot of current and melts power cables. But doesn't let any smoke out.

3.1 Run device at 12V for now...