

Power Consumption Tests_24V

August 29, 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
```

```

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.

```

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_pwm))
    results.append(result)

```

```

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,laser_pwm))
    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, multiline)
    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!

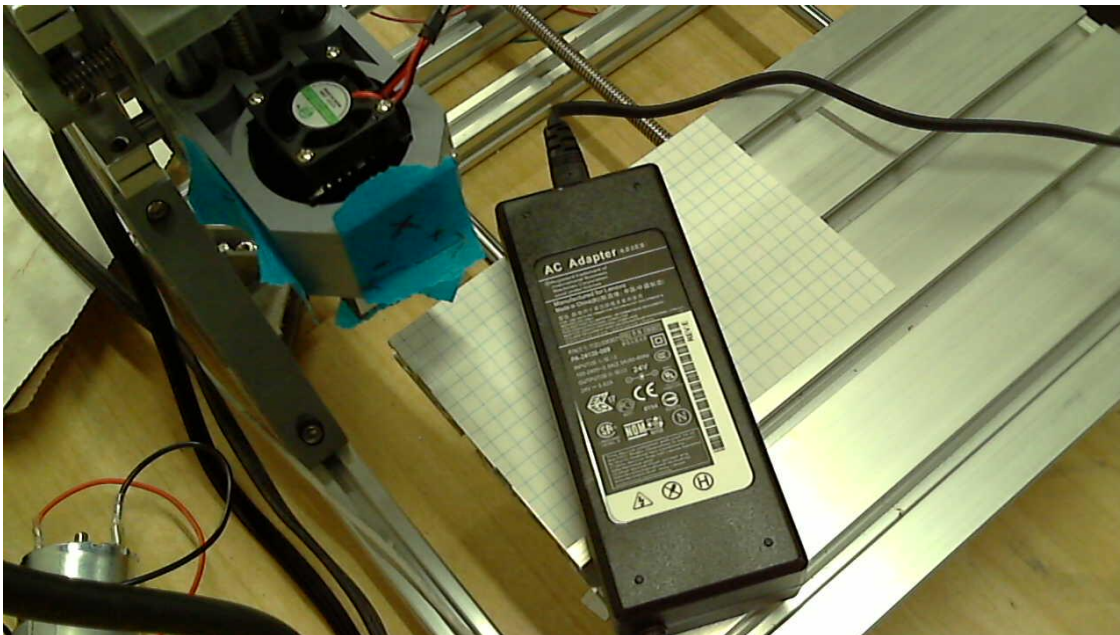
This is the issue that people are running to online and that I ran into earlier when testing the laser.

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...

In []: