DrawingTests

August 29, 2017

1 Drawing Tests

1.1 Object

- Play around with drawing things.

2 Code:

```
In [1]: import GCode
        import GRBL
        import numpy as np
        from utils import picture
        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 = 1):
            program = GCode.GCode()
            program.G20() # 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=0.25):
        program = GCode.GCode()
        program.G1(X=size)
        program.G1(Y=-size)
        program.G1(X=-size)
        program.G1(Y=size)
        return program

Laser Mode: 1.0
```

2.1 Test Setup

Power Supply: - CicuitSpecialists CSI3010SW @ 12V - PostIt Note Grid notes. .25" grid. Position the paper & other things.

```
In [2]: 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 [17]: init()

Out[17]: <GCode>[cmds=4]

In [8]: cnc.run()

Out[8]: 0.414473295211792

In [9]: laser_on(1) # Position the axis by hand

In [16]: cnc.cmd("G0 F10 X0 Y0")

Out[16]: ['ok', 'error:9']

In [ ]: picture()
```

```
In [15]: laser_off()

In [ ]: laser_on(1)

In [14]: cnc.reset()

In [ ]: square(0.25)

In [ ]: tests_x = 10
        tests_y = 7

In [ ]: cnc.run(init(laser=0.1)+square(0.25))

In [ ]: np.linspace(0, 255, tests_x)

In [ ]: np.linspace(50, 1, tests_y)

In [ ]: def jogx(x=10):
            program = GCode.GCode()
            program.G0(X=x)
            cnc.run(program)
        def jogy(y=10):
            program = GCode.GCode()
            program.G0(Y=y)
            cnc.run(program)
        def jogz(z=10):
            program = GCode.GCode()
            program.G0(Z=z)
            cnc.run(program)

In [ ]: jogx(-1)

In [ ]: laser_on(1)

In [ ]: square_size = 0.25
```

3 Test Setup

```
In [ ]: cnc.cmd("$G")[1]

In [ ]: cnc.cmd("$#")[1]

In [ ]: cnc.cmd("$$")

In [ ]: cnc.cmd("$I")

In [ ]: picture()
```

```
In [ ]: for feed in np.linspace(50, 1, tests_y):
            for pwm in np.linspace(0, 255, tests_x):
                i = init(laser=np.uint8(pwm), feed=np.round(feed))
                s = square(square_size)
                laser_on(1)
                cnc.run(i+s)
                jogx(0.25)
            jogx(-1*2*tests_x*square_size)
            jogy(-square_size*2)

In [ ]: cnc.cmd("!")

In [ ]: laser_on(1)

In [ ]: cnc.reset()

In [ ]: laser_off()

In [ ]:
```