LaserCut

September 2, 2017

1 Laser Cutting Tests

1.1 Test Setup

2 Code:

In [19]:
```
import GCode
import GRBL
import numpy as np
from uuid import uuid4
import os
import sys

sys.path.append("..")
from utils import picture
```

In [20]:
```
cnc = GRBL.GRBL(port="/dev/cnc_3018")
cnc.laser_mode = 1

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

def init(feed = 100):
    program = GCode.GCode()
    program.G21() # Metric Units
    program.G90() # Relative positioning.
    program.G92(X=0, Y=0, Z=0) # Zero on where we put the workpiece
    program.G1(F=feed)
    return program

def end():
    program = GCode.GCode()
    program.M5()
    return program
```

```
ok
Laser Mode: 1.0
```

```
In [16]: def laser_on(pwm=1):
             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 F10") # Laser On

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

In [17]: def pulse(pulse_duration=100):
             prog = GCode.GCode()
             prog.M5()
             prog.G91()
             prog.G0(X=0)
             prog.M3(S=255)
             prog.G1(X=0)
             prog.G4(U=pulse_duration)
             prog.G0(X=0)
             prog.G90()
             prog.M5()
             return prog

In [21]: cnc.run(init()+pulse(100)+end())

Out[21]: 1.4474668502807617

In [6]: cnc.run(init()+pulse(500)+end())

Out[6]: 1.2418253421783447

In [7]: cnc.run(init()+pulse(1000)+end())

Out[7]: 1.2426557540893555

In [22]: test_run = GCode.GCode()
         # TODO: Get z-axis probe.
         test_run+=init(feed=200)
         for i in range(3, 10):
             Xs = np.linspace(0,10,i)
             for X in Xs:
                 test_run.G0(X=np.round(X, 4))
                 test_run+=pulse(1)

In [23]: test_run

Out[23]: <GCode>[cmds=424]

In [24]: gcode_file = "LaserCut.gcode"
```

In [25]:
```
test_run.save(gcode_file)

del test_run
test_run = GCode.GCode()

test_run.load(gcode_file)
```

In [26]:
```
test_run.buffer[0:5]
```

Out[26]:
```
['G21', 'G90', 'G92 X0 Y0 Z0', 'G1 F200', 'G0 X0.0']
```

In [27]:
```
from time import sleep
```

In [28]:
```
while 1:
    try:
        cnc.run(test_run)
        while 1:
            print(cnc.status)
            sleep(5)
    except KeyboardInterrupt as error:
        print("Feed Hold")
        cnc.cmd("!")
        while 1:
            try:
                cnc.reset()
                break;
            except:
                pass
        print("^C")
        break
    except:
        raise
```

```
<Idle|MPos:10.000,0.000,0.000|Bf:15,127|FS:0,0|WCO:0.000,0.000,0.000>
<Idle|MPos:10.000,0.000,0.000|Bf:15,127|FS:0,0|Ov:100,100,100>
<Idle|MPos:10.000,0.000,0.000|Bf:15,127|FS:0,0>
<Idle|MPos:10.000,0.000,0.000|Bf:15,127|FS:0,0>
<Idle|MPos:10.000,0.000,0.000|Bf:15,127|FS:0,0>
<Idle|MPos:10.000,0.000,0.000|Bf:15,127|FS:0,0>
<Idle|MPos:10.000,0.000,0.000|Bf:15,127|FS:0,0>
<Idle|MPos:10.000,0.000,0.000|Bf:15,127|FS:0,0>
<Idle|MPos:10.000,0.000,0.000|Bf:15,127|FS:0,0>
<Idle|MPos:10.000,0.000,0.000|Bf:15,127|FS:0,0>
<Idle|MPos:10.000,0.000,0.000|Bf:15,127|FS:0,0|WCO:0.000,0.000,0.000>
Feed Hold
^C
```