

XY plotter specifications

G-codes

M10

Log of opening a COM port in mDraw.

```
<20180926220106.561 TX>
```

```
M10<LF>
```

mDraw sends

Timestamps from COM port
spy&logger SW

```
<20180926220106.561 RX>
```

```
M10 XY 380 310 0.00 0.00 A0 B0 H0 S80 U160 D90<CR><LF>OK<CR><LF>
```

```
<20180926220143.603 TX>
```

End of line

Plotter replies
with two lines

Reply breakdown

```
M10 XY 380 310 0.00 0.00 A0 B0 H0 S80 U160 D90
```

Plot area height
(Y) in mm

Plot area width
(X) in mm

Stepper A (X-axis)
direction

Stepper B (Y-axis)
direction

Plotting speed
(0 – 100%)

Stepper motor directions: 0 = clock wise, 1 = counter clockwise

Directions determine which way motor must be stepped to increase X and Y

```
M10 XY 380 310 0.00 0.00 A0 B0 H0 S80 U160 D90
```

Device type

Undocumented
value

Undocumented
value

Undocumented
value

Pen up value
(0 – 255)

Pen down
value (0 – 255)

M11

Limit switch status query

```
<20180926220233.877 TX>
```

```
M11<LF>
```

mDraw sends

```
<20180926220233.877 RX>
```

```
M11 1 1 1 1<CR><LF>OK<CR><LF>
```

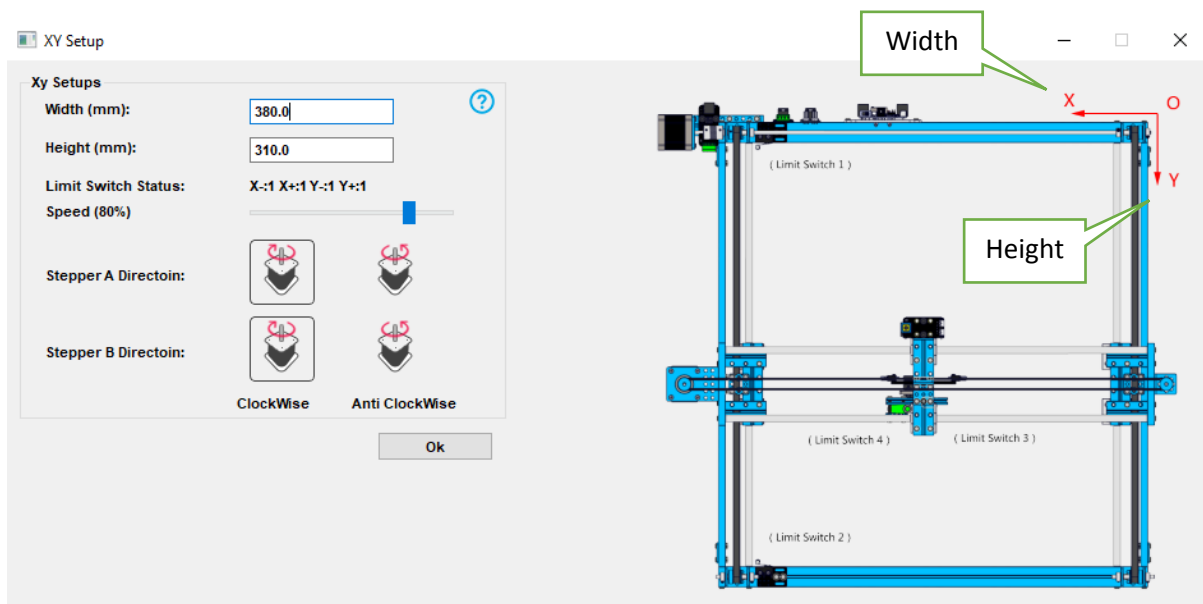
Plotter replies

Limit switches read one (high) when switch is open and zero (low) when closed.

The order of the switch status in the reply is:

```
M11 <L4> <L3> <L2> <L1>
```

L1 → Y+, L2 → Y-, L3 → X+, L4 → X-



M2

Save pen up/down position. The saved values affect the reply to M10.

```
<20180926220143.603 TX>
```

```
M2 U150 D90<LF>
```

mDraw sends

```
<20180926220143.815 RX>
```

```
OK<CR><LF>
```

Plotter replies

M1

Set pen position (control servo). Range 0 - 255. Remember that servo pulse (high) length must be between 1 - 2 ms and pulse frequency is 50 Hz.

<20180926235631.975 TX>

M1 90<LF>

mDraw sends

<20180926235631.975 RX>

OK<CR><LF>

Plotter replies

M5

Save stepper directions, plot area, and plotting speed. The saved values affect the reply to M10

<20180926220235.168 TX>

M5 A0 B0 H310 W380 S80<LF>

mDraw sends

<20180926220235.388 RX>

OK<CR><LF>

Plotter replies

M4

Set laser power. Range 0 - 255 (0 = off, 255 = 100% on). Note that when SCTimer is set to 0% with matchrel the timer still generates very small glitches at the output (about 1 us). The glitches generate EMC disturbance that will affect the performance of the (poorly protected) stepper and IO-boards on the plotter. Use an oscilloscope to verify that when laser is off there are no glitches at the output.

G28

Go to the origin

G1

Go to position. Coordinates are in millimetres. The last parameter tells if coordinates are relative or absolute (A0 = absolute, A1 = relative)

<20180926235632.632 TX>

G1 X85.14 Y117.29 A0<LF>

mDraw sends

<20180926235632.757 RX>

OK<CR><LF>

Plotter replies

LPCXpresso pins

Pins used:

Pin	Port	Description
D6	1_3	Limit SW
D7	0_0	Limit SW
D3	0_9	Limit SW
D2	0_29	Limit SW
D12	0_12	Laser
D4	0_10	Pen
D10	0_27	XMotor
D11	0_28	Xmotor Direction
D8	0_24	YMotor
D9	1_0	YMotor Direction
A0	0_8	SW1
A1	1_6	SW2
A2	1_8	SW3

Note:

Limit switches are grounding switches. They read one when the switch is open (= not at a limit).

LASER PIN IS BY DEFAULT HIGH when the board boots up which powers on the laser at the maximum power. **Drive the laser pin low immediately after your program starts.**