# XPlotter G-code Specification

## G-commands

### G0 & G1: Linear Move

#### Usage

G0 Xnnn Ynnn Fnnn

G1 Xnnn Ynnn Fnnn

#### Parameters

Not all parameters need to be used, but at least one has to be used

Xnnn The position to move to on the X axis

Ynnn The position to move to on the Y axis

Fnnn The feedrate per minute of the move between the starting point and ending point

#### Examples

```
G0 X100 Y120.25   ; Move to 100mm on the X axis, and 120.25mm on the Y axis
G0 F2500          ; Set the feedrate to 2500mm/minute
```

### G2 & G3: Controlled Arc Move

#### Usage

G2 Xnnn Ynnn Innn Jnnn Fnnn (Clockwise Arc)

G3 Xnnn Ynnn Innn Jnnn Fnnn (Counter-Clockwise Arc)

#### Parameters

Xnnn The position to move to on the X axis

Ynnn The position to move to on the Y axis

Innn The point in X space from the current X position to maintain a constant distance from

Jnnn The point in Y space from the current Y position to maintain a constant distance from

Fnnn The feedrate per minute of the move between the starting point and ending point

#### Examples

```
G2 X90.6 Y13.8 I5 J10  ; Move in a clockwise arc from the current point to point (X=90.6,
                         Y=13.8), with a center point at (X=current_X+5, Y=current_Y+10)
G3 X90.6 Y13.8 I5 J10  ; Move in a counter-clockwise arc from the current point to point
                         (X=90.6,Y=13.8), with a center point at (X=current_X+5,
                         Y=current_Y+10))
```

## G4: Dwell

Pause the machine for a period of time.

### Parameters

Pnnn Time to wait, in milliseconds

Snnn Time to wait, in seconds

### Example

```
G4 P200  ;   In this case sit still doing nothing for 200 milliseconds. "G4 S2" and "G4 P2000"
             are equivalent.
```

## G20: Set Units to Inches

Units from now on are in inches.

## G21: Set Units to Millimeters

Units from now on are in millimeters. (default)

## G28: Move to Origin (Home)

### Parameters

This command can be used without any additional parameters.

X Flag to go back to the X axis origin

Y Flag to go back to the Y axis origin

### Examples

```
G28     ; Home all axes
G28 X   ; Home the X axis
```

## G90: Set to Absolute Positioning

All coordinates from now on are absolute relative to the origin of the machine. (default)

## G91: Set to Relative Positioning

All coordinates from now on are relative to the last position.

## G92: Set Position

### Parameters

Xnnn new X axis position

Ynnn new Y axis position

### Example

```
G92 X10 Y90  ; Allows programming of absolute zero point, by reseting the current position
               to the values specified. This would set the machine's X coordinate to 10, and
               the Y coordinate to 90. No physical motion will occur.
```

# M-commands

## M0: Disable Screen Touch

When control the machine through USB serial port, this command disable screen touch, so that you don't have to worry about wrong touch on the screen.

## M1: Enable Screen Touch

Enable screen touch, so that you can use touch screen to control the machine again.

## M2: Turn off LCD

Turn off LCD light.

## M3: Set Laser Brightness

Set laser brightness. The protection mechanism makes the laser turn on only when the machine is moving.

**Usage**

M3 Snnn

**Parameters**

Snnn (0~255) 0 means zero brightness, 255 means full brightness

**Examples**

```
M3 S100     ; Set laser brightness to 100
M3 S255     ; Set laser brightness to 255
```

## M4: Laser Focusing

Turn on laser at a relatively low brightness, so that you can adjust laser focusing.

## M5: Laser Off

Turn off laser.

## M10: Vacuum On

Turn on vacuum motor.

## M11: Vacuum Off

Turn off vacuum motor.

### M300: Set Servo Angle

Set pen holder's servo motor angle to change the height of pen holder.

**Usage**

M300 Snnn

**Parameters**

Snnn (0~180) angle of the servo, Unit: Degree

**Examples**

```
M3 S100      ; Set servo angle to 100 degree
M3 S160      ; Set servo angle to 160 degree
```

## Serial Port Parameters

| | |
|---|---|
| **baudrate** | 115200 |
| **parity** | none |
| **data bits** | 8 |
| **stop bits** | 1 |

## Notice!

1. **Every command should end with one byte char \n (Line Feed) or \r (Carriage Return)**
2. **After command received, an "ok" feedback from the machine end with char \n**