

G - M-Code List and Syntax:

G-Codes do not require attributes unless stated

G1 Linear Move:

Ex:

```
G1 Z1.2      ;Move the Z axis 1.2 in. in the positive direction
```

The G1 command allows for all axes to move synchronously in a contoured linear motion. The parameters supplied will cause a motion in either a relative or absolute fashion depending on the G90/G91 mode.

G2 Circular Move – Clockwise Rotation

Ex:

```
G2 X2 Y-2 I1.5 J-1.5      ; End Point and circle center specified  
                           ; (IJK method)
```

```
G2 X2 Y-2 R1.58114        ; End Point and radius specified
```

The G2 command is used when making circular or elliptical type motion profiles. G2 generates a clockwise rotation and can be determined using the right hand rule from the negative direction of an orthogonal axis.

G3 Circular Move – Counter-Clockwise Rotation

Ex:

```
G3 X2 Y-2 I1.5 J-1.5      ; End Point and circle center specified  
                           ; (IJK method)
```

```
G3 X2 Y-2 R1.58114        ; End Point and radius specified
```

The G3 command is used when making circular or elliptical type motion profiles. G3 generates a counter-clockwise rotation and can be determined using the right hand rule from the negative direction of an orthogonal axis.

G4 Dwell:

Ex:

```
G4 P0.2      ;Dwell for 0.2 seconds
```

The G4 command causes a delay in program execution. The parameter supplied by the user is in seconds and has a maximum resolution of 0.001 seconds.

G9 Exact Stop

Ex:

```
G1 X4.8 Y2.4
```

```
G9
```

The G9 command stops the program from continuing its run until all drives have finished their instructed travel.

G - M-Code List and Syntax:

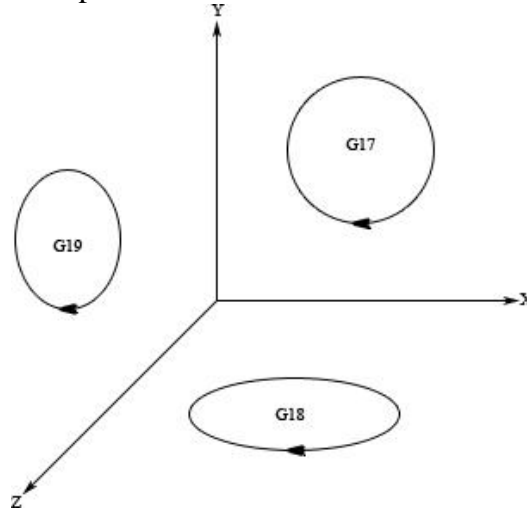
G17/18/19 – Plane Select

G17 – XY Plane

G18 – ZX Plane

G19 – YZ Plane

Used in conjunction with the G2 and G3 commands to select which plane the circular move command takes place.



WARNING: ALWAYS DOUBLE CHECK THE UNITS YOUR PROGRAM AND STAGE ARE OPERATING IN AND BE SURE THAT THEY AGREE; FAILURE TO DO SO CAN CAUSE **SERIOUS DAMAGE** TO THE WORKSTATION, FOCUS HEAD, AND PART.

G90 Absolute Distance Mode:

Movement occurs in relation to the origin

Ex:

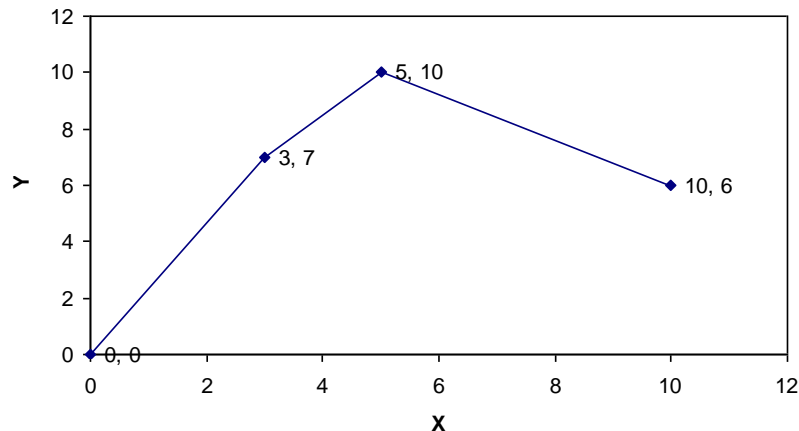
G90

G01 X3.0 Y7.0

G01 X5.0 Y10.0

G01 X10.0 Y6.0

;These commands would generate the following move sequence



G - M-Code List and Syntax:

G91 Incremental Distance Mode:

Movement occurs in relation to current position

Ex:

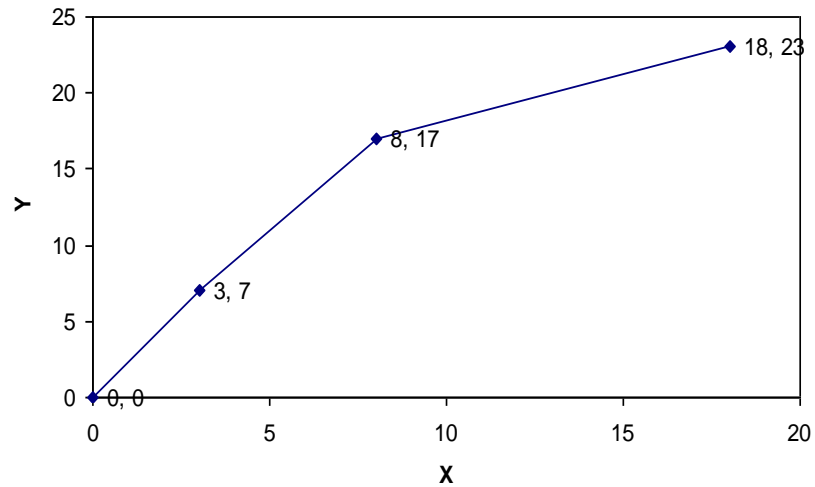
G90

G01 X3.0 Y7.0

G01 X5.0 Y10.0

G01 X10.0 Y6.0

;These commands would generate the following move sequence



G92 Redefine Coordinate System Set:

This command defines a preset position so the user may use absolute coordinates measured from a non-zero position. This command has no effect on relative motion commands.

Ex:

G1 X5 Y5 ; Move to (5,5)

G92 X-1.0 Y-1.0 ; Set (6,6) as Home

G1 X0 Y0 ; Move to (6,6)

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M00 Stop

Allows operator to Jog or otherwise alter system while program is paused
Pressing "Cycle Start" button will resume program sequence

M01 Optional Stop

Checks condition of check box (DeltaMotion interface). Popup message dialog will display and hold (pauses) program execution whenever box is checked. Allows operator to Jog or otherwise alter system while program is paused. Pressing "OK" button will close the popup message dialog and resume program sequence. The popup message can be defined and customized in the file c:\DTMessageList.txt.

Default messages in c:\DTMessageList.txt file:

- 1: Accept or Jog to Acceptable Position
- 2: Accept or Jog to Acceptable Position2

Ex. M01 S1

Select message 1 to display in M01 popup message dialog

G - M-Code List and Syntax:

M09 Status Message Display

M09 allows operator to display a programmable custom status message on the Status Message Display window, with custom background color and flashing enable ON/OFF. The programmable custom status message is loaded from a status message list text file stored at c:\StatusMessageList.txt.

The StatusMessageList.txt contains a list of custom status messages in these formats:

1:Your custom status message1
2:Your custom status message2
3:Your custom status message3
4:Your custom status message4
5:Your custom status message5

Ex. M09 S1 F1 C1

S1 = Load and display Custom Status Message of “Your custom status message1”

F1 = Enable flashing of status message

C1= CloudBlue

(See the color mapping list below of the supported color)

```
C1 = CLOUDBLUE = RGB(128, 184, 223);  
C2 = WHITE = RGB(255, 255, 255);  
C3 = BLACK = RGB(1, 1, 1);  
C4 = DKGRAY = RGB(128, 128, 128);  
C5 = LTGRAY = RGB(192, 192, 192);  
C6 = YELLOW = RGB(255, 255, 0);  
C7 = DKYELLOW = RGB(128, 128, 0);  
C8 = RED = RGB(255, 0, 0);  
C9 = DKRED = RGB(128, 0, 0);  
C10 = BLUE = RGB(0, 0, 255);  
C11 = DKBLUE = RGB(0, 0, 128);  
C12 = LTCYAN = RGB(140, 255, 255);  
C13 = CYAN = RGB(0, 255, 255);  
C14 = DKCYAN = RGB(0, 128, 128);  
C15 = GREEN = RGB(0, 255, 0);  
C16 = DKGREEN = RGB(0, 128, 0);  
C17 = MAGENTA = RGB(255, 0, 255);  
C18 = DKMAGENTA = RGB(128, 0, 128);  
C19 = PURPLE = RGB(102, 51, 153);  
C20 = GRAYBLUE = RGB(104, 122, 151);
```

M13 Set QCW Laser Firing Parameters (Power/Freq/Wave)

Ex:

M13 P45 F10 W100

M13 command allows the user to set the peak power, pulse frequency, and pulse width of the laser.

M16 Gas On

M17 Gas Off

G - M-Code List and Syntax:

M29 Tube Diameter Input

Ex:

M29 S1 D0.28

M29 command allows the operator to change the value of the tube diameter of the part.

M30 Stop Program Execution

M38 Water On

M39 Water Off

M40 Collet Open

M41 Collet Close

M52 Laser Pendant Mode (External Mode Off)

M52 allows operator to put the laser into Pendant Mode for Laser 1 or Laser 2. “L1”

Laser 1 (LW600A) is the default laser and “L2” Laser 2 (LW2AG) is the secondary laser.

If no Laser specifies, the default laser “L1” will be selected.

Ex. M52 L1

Put Laser 1 to Pendant Mode

Ex. M52 L2

Put Laser 2 to Pendant Mode

M53 Laser External Mode (Laser Reference Only)

M53 allows operator to put the laser into External Mode for Welder 1 or Welder 2. “L1”

Welder 1 (LW600A) is the default welder and “L2” Welder 2 (LW2AG) is the secondary

welder. If no Welder specifies, the default laser “L1” will be selected.

Ex. M53 L1

Put Welder 1 to External Mode

Ex. M53 L2

Put Laser 2 to External Mode

M54 Laser On

M55 Laser Off

G - M-Code List and Syntax:

M56 Guide Beam On

M56 allows operator to turn on the Guide Beam on Laser 1 or Laser 2. “L1” Laser 1 (LW600A) is the default laser and “L2” Laser 2 (LW2AG) is the secondary laser. If no Laser specifies, the default laser “L1” will be selected.

Ex. M56 L1

Turn Guide Beam On for Laser 1

Ex. M56 L2

Turn Guide Beam On for Laser 2

M57 Guide Beam Off

M57 allows operator to turn off the Guide Beam on Laser 1 or Laser 2. “L1” Laser 1 (LW600A) is the default laser and “L2” Laser 2 (LW2AG) is the secondary laser. If no Laser specifies, the default laser “L1” will be selected.

Ex. M57 L1

Turn Guide Beam Off for Laser 1

Ex. M57 L2

Turn Guide Beam Off for Laser 2

M60 Branch Shutter 1 Open

M60 allows operator to open the Branch Shutter 1 of Laser 1 or Laser 2. “L1” Laser 1 (LW600A) is the default laser and “L2” Laser 2 (LW2AG) is the secondary laser. If no Laser specifies, the default laser “L1” will be selected.

Ex. M60 L1

Open Branch Shutter 1 On for Laser 1

Ex. M60 L2

Open Branch Shutter 1 On for Laser 2

M61 Branch Shutter 1 Close

M61 allows operator to close the Branch Shutter 1 of Laser 1 or Laser 2. “L1” Laser 1 (LW600A) is the default laser and “L2” Laser 2 (LW2AG) is the secondary laser. If no Laser specifies, the default laser “L1” will be selected.

Ex. M61 L1

Close Branch Shutter 1 On for Laser 1

Ex. M60 L2

Close Branch Shutter 1 On for Laser 2

M98 Universal Wait for M-var to become equal to a specified value