**This is the GCode standard for the 3D20, 3D40 & 3D45 Dremel printers.**

| **Date** | **Update** | **Author** |
| --- | --- | --- |
| August 14, 2020 | Initial Upload | Mike Crowe |
| August 16, 2020 | Added the ability to leave comments | Mike Crowe |
| September 21, 2020 | Adding curl commands | Mike Crowe |
| September 24, 2020 | Added other curl commands, tested on 3D45 | Lorenzo De Luca |
| September 15, 2022 | Added several gcode commands and fixed formatting | Mike Crowe |

All commands start with'~'， end with '\r\n'The printer receives a command, if the command is in agreement with the protocol definition，first reply :'CMD XXX Received.',

second reply Information related to command.The end of "ok";

EXAMPLE of command send/receive structure

User Send ： **M105**

Printer reply： **CMD M105 Received.**

**T0: 25/220 B:25/100**

**ok**

**SIMPLE / SHORT**

M17 // enable stepper motor

M18 // disable stepper motor

M23 // start print

M24 // continue print

M25 // pause print

M26 // abort print

M27 // get print progress

M28 // start send file

M29 // end send file

M104 // set extruder temp

M105 // get temp

M106 // start fan

M107 // stop fan

M108 // set current extruder

M109 // set extruder temp for resume

M112 // stop jog

M114 // get current position

M115 // get machine info

M118 // turbo fan

M119 // get current status

M140 // set platform temp

M141 // Servo Down (3D40)

M142 // Servo Up (3D40)

M146 // set led color

M601 // connect

M602 // disconnect

M610 // set machine name

M611 // set machine extruder

M612 // set machine extruder distance

M650 // get machine extruder distance

G1 // jog

G4 // pause

G28 // homing

G90 // set coordinate as absolute mode

G91 // set coordinate as relative mode

G92 // set coordinate

G161 // Home axes to minimum

G162 // Home axes to maximum

M104 S280 T0 //nozzle

M140 S100

M150 R100 // fan

M152 R100 //turbo fan

G1 E300000 F150 // E

**DETAILED**

#G code

##G1 - Linear motion

Movement to the specified coordinates use current or specified speed.

Parameters：

X: (Code, Optional) X axis coordinate, unit: mm

Y: (Code, Optional) Y axis coordinate, unit: mm

Z: (Code, Optional) Z axis coordinate, unit: mm

E: (Code, Optional) new A/B(Nozzle)coordinate, unit: mm

F: (Code, Optional) speed, unit: mm/min

example: ~G1 X10 Y20 Z30 E1.0 F3000

~G1 Y40

reply ： ok

##G4 - Delay

Allow the device to pause for some time

Parameters： P: time interval， unit: ms

S: time interval， unit: s

example： ~G4 P10000

~G4 S10

reply： ok

##G90 - Use absolute coordinates

Use absolute coordinates

Parameters： None

example ：~G90

reply ： ok

##G91 - Use relative coordinates

Use relative coordinates

Parameters： None

example ：~G91

reply ： ok

##G92 - Set coordinate

Set coordinate for current location

Parameters：

X: (Code, Optional) X axis coordinate, unit: mm

Y: (Code, Optional) Y axis coordinate, unit: mm

Z: (Code, Optional) Z axis coordinate, unit: mm

E: (Code, Optional) new A/B(Nozzle)coordinate, unit: mm

example：

~G92 E0

~G92 X10 Y20 Z5

reply : ok

##G161 - Finding the minimum value

x,y,z axis Finding the minimum value

Parameters：

X: (Code, Optional) X axis move to the minimum coordinate

Y: (Code, Optional) Y axis move to the minimum coordinate

Z: (Code, Optional) Z axis move to the minimum coordinate

example：

~G161 X Y F2000

~G161 Z F600

##G162 - Finding the maximum value

x,y,z axis Finding the maximum value

Parameters：

X: (Code, Optional) X axis move to the maximum coordinate

Y: (Code, Optional) Y axis move to the maximum coordinate

Z: (Code, Optional) Z axis move to the maximum coordinate

example：

~G162 X Y F2000

~G162 Z F600

#M（Query command）

##M105 - Query current temperature

Query current temperature, include Nozzle and build plate.

example： send ：~M105

single nozzle reply ： T0: 25/220 B:25/100

ok

double nozzles reply： T0: 25/220 T1: 25/220 B:25/100

ok

##M114 - Query current coordinate

Query current coordinate for nozzle

example： send： ~M114

reply： X:10 Y:10 Z:10 A:5 B:0

ok

##M119 - Query machine status

Query machine status,include limit switch, motion mode

example： send： ~M119

reply： Endstop: X-max: 0 Y-max: 0 Z-min: 1

MachineStatus: READY

MoveMode: READY

ok

##M112 - Stop

stop running,the buffer be clear

reply： ok

##M116 - Micro switch trigger monitoring

Query whether the micro switch is triggered

example： send： ~M116

reply（0：no triggered； 1：triggered）： ok 0

##M117- Query buffer length

reply： ok 0 to 8

##M118 - Check the fan and wheel state

reply： ok FAN：0/1 COLOR: 0/1(0:Abnormal，1:normal)

ok FAN:1 COLOR:1 FANCIRCLE:0 COLORCIRCLE:212

##M121 - Query whether the machine is moving（G1 can use）

example：

send： ~M121

reply： ok F （F: stop；T：running）

##M122 - Query whether the machine is moving（G162/161 can use）

example： send： ~M121

reply： ok F （F: stop；T：running）

##M905 - Open level sounds

reply： ok

##M906 - Close level sounds

reply： ok

#M code（Buffer execution command）

##M6 - Waiting for the nozzle command

Allow the device to wait for the spray head to heat up to the set temperature

Parameters： T: choose nozzle， T0 or T1

S: (Code, Optional)wait for time， unit: s （default:600s）

example： ～M6 T0

reply ： ok

##M17 - Enable all or specified motor

Enable all or specified motor

Parameters：

X: (Code, Optional) Specify X axis

Y: (Code, Optional) Specify Y axis

Z: (Code, Optional) Specify Z axis

A: (Code, Optional) Specify A axis

B: (Code, Optional) Specify B axis

E: (Code, Optional) Specify A and B axis

default:all axis

example： ~M17

reply ： ok

##M18 - Disable all or specified motor

Disable all or specified motor

Parameters：

X: (Code, Optional) Specify X axis

Y: (Code, Optional) Specify Y axis

Z: (Code, Optional) Specify Z axis

A: (Code, Optional) Specify A axis

B: (Code, Optional) Specify B axis

E: (Code, Optional) Specify A and B axis

default:all axis

example： ~M18

reply ： ok

##M104 - Set nozzle temperature

Set nozzle temperature

Parameters： T: choose nozzle， T0 or T1

S: set temperature， unit:Centigrade

example： ~M104 S220 T0

reply ： ok

##M106 - Start-up fan

Start-up fan。

Parameters： None

example： ~M106

reply： ok

##M107 - Stop fan

Stop fan

Parameters： None

example： ~M107

reply： ok

##M142 T170- Micro switch upper （160-180）

reply： ok

##M141 T200- micro switch down(190-210)

reply： ok

##M148- Play a piece of music

Parameters： S: choose music（1-8)

example： ~M148 S1

reply： ok

##M900- Set LED brightness

Parameters： T: set brightness（0-5)

example： ~M900 T1

reply： ok

##M901- Query version number

example： ~M901

reply： ok v1.1 20150709

**Curl Commands**

**Get Printer Info**

**curl --location --request POST 'http://<printer\_ip>/command' --header 'Content-Type: application/x-www-form-urlencoded' --data-urlencode 'GETPRINTERINFO'**

Example of response

{

"SN": "",

"api\_version": "1.0.2-alpha",

"error\_code": 200,

"ethernet\_connected": 0,

"ethernet\_ip": "",

"firmware\_version": "v3.0\_R02.09.04",

"machine\_type": "DREMEL 3D45 IDEA BUILDER",

"message": "success",

"wifi\_connected": 1,

"wifi\_ip": "<printer\_ip>"

}

**Get Printer Status**

**curl --location --request POST 'http://<printer\_ip>/command' --header 'Content-Type: application/x-www-form-urlencoded' --data-urlencode 'GETPRINTERSTATUS'**

Example of response (in this case printer is in IDLE)

{

"buildPlate\_target\_temperature": 0,

"chamber\_temperature": 28,

"door\_open": 0,

"elaspedtime": 0,

"error\_code": 200,

"extruder\_target\_temperature": 0,

"fanSpeed": 0,

"filament\_type ": "PLA",

"firmware\_version": "v3.0\_R02.09.04",

"jobname": "",

"jobstatus": "",

"layer": 0,

"message": "success",

"networkBuild": 0,

"platform\_temperature": 30,

"progress": 0,

"remaining": 0,

"status": "ready",

"temperature": 32,

"totalTime": 0

}

Additional commands can be sent via curl, such as:

GETJOBSTATUS

NOZZLEHEAT

PLATEHEAT

STOPNOZZLEHEAT

STOPPLATEHEAT

**Curl Commands - Printing**

**Upload Gcode**

**curl --header "Accept=application/json" --form print\_file=@Fan\_Base.gcode**[**http://xxx.xxx.xxx.xxx/print\_file\_uploads**](http://xxx.xxx.xxx.xxx/print_file_uploads)

Parameter1: **@Fan\_Base.gcode**  
This should be a file on your local machine, in your local path, prefixed with “@” (confirmed on Linux).

Parameter2: [**http://<printer\_ip>/print\_file\_uploads**](http://xxx.xxx.xxx.xxx/print_file_uploads)  
This should be the IP of your, and the directory is “print\_file\_uploads”.

**Print Start**

**curl --location --request POST 'http://<printer\_ip>/command' --header 'Content-Type: application/x-www-form-urlencoded' --data-urlencode 'PRINT=<gcode\_file\_name>'**

Response example

{"error\_code":200,"message":"success"}

**Print Pause**

**curl --location --request POST 'http://<printer\_ip>/command' --header 'Content-Type: application/x-www-form-urlencoded' --data-urlencode 'PAUSE=<gcode\_file\_name>'**

Response example

{"error\_code":200,"message":"success"}

**For resume you can send "Print Start” command**

**Print Cancel**

**curl --location --request POST 'http://<printer\_ip>/command' --header 'Content-Type: application/x-www-form-urlencoded' --data-urlencode 'CANCEL=<gcode\_file\_name>'**