Index

Kora Pro 3D PC PRINTER

Turn the power to your 3D printer on
....

The Model details will be displayed on the screen for a few seconds before ....
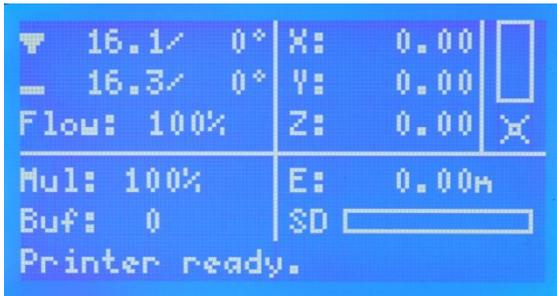
The Home Screen appears ....
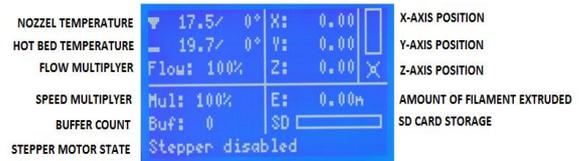
From the Home Screen, turn the Jog Wheel (Silver Knob below LCD Screen) one click, in either direction and the Usage History Screen will appear. Turn another click and it will return to the Home Screen.
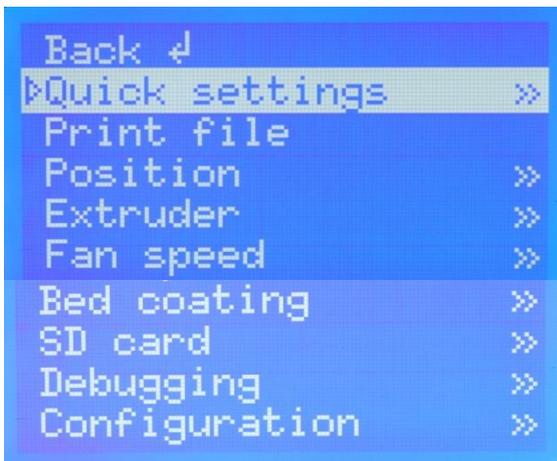
From the Home Screen press the Jog Wheel briefly to bring up these 9 options (over 2 screen parts) .... Turn the Jog Wheel to scroll between the two screens

```
Back ↵
▷Quick settings        »
 Print file
 Position              »
 Extruder              »
 Fan speed             »
```
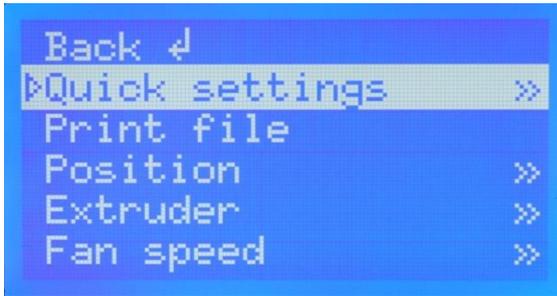
Enter the Quick Setting menu by pressing the Jog Wheel to select ....

```
Back ↵
▷Home all
 Z babystep.: 0.00mm
 Speed mul.:100%
 Flow mul. :100%
 Lights:On
 Change filament
 Preheat PLA
 Preheat ABS
 Cooldown
 Set to origin
 Disable stepper
 ATX power on/off
```

These 12 options will now be available ....
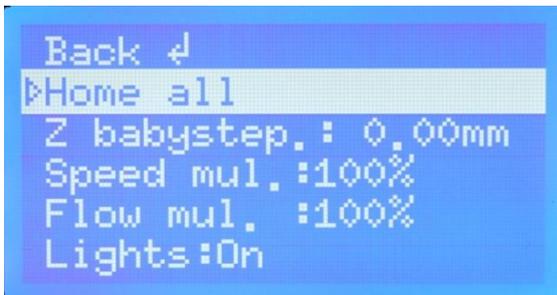
Select Home all and the Printer will Home all of its axis'. This means the stepper motors engage and move the Printers Main Block to the back right corner. First it 'Homes' X then Y and finally home the printers Hot Bed.

```
Back ↵
▷Home all
 Z babystep.: 0.00mm
 Speed mul.:100%
 Flow mul. :100%
 Lights:On
```
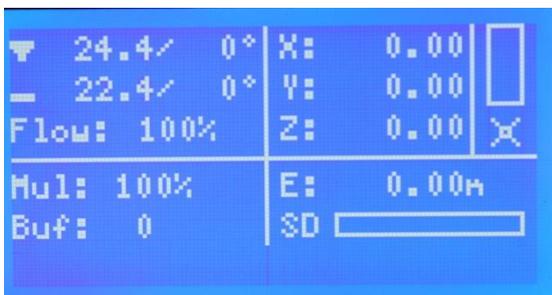
If you select Back the Home Screen will now look as pictured. You will notice X,Y and Z Axis Positions are now at zero.

```
▼ 24.4/  0°│X:   0.00│
─ 22.4/  0°│Y:   0.00│
Flow: 100% │Z:   0.00│✕
Mul: 100%  │E:   0.00m
Buf:  0    │SD ▭
```

Note: As the stepper motors are now engaged it is not possible to move the Main Block manually.

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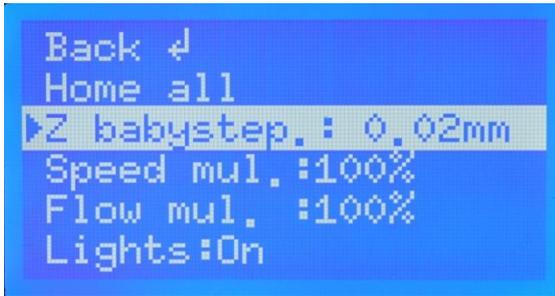
Returning to the Quick settings Menu.

Z babystep allows you to make minute 'live' alterations to the Hot Bed height (Z-axis). Simply select and set using the Jog Wheel.
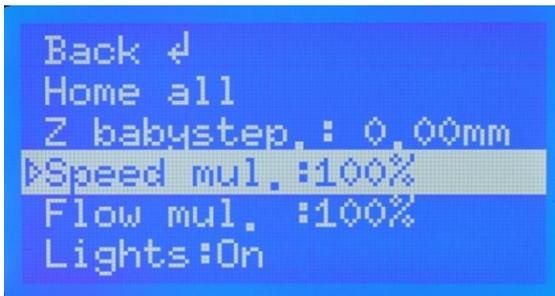
The Speed multiplier (mul.) alters the previously set speed of the Print (previously set during the models 'slicing' procedure)

Simply select the Speed multiplier option and set using the Jog Wheel.
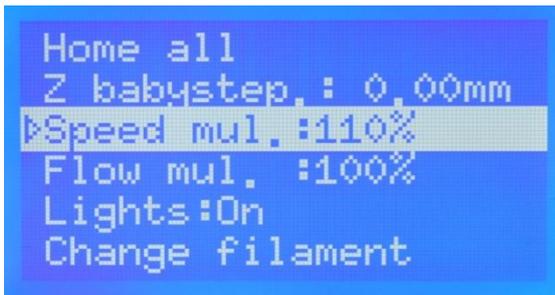
Once the required value is set select again to enter.

The Speed multiplier has been set to 110% of the original speed in the example shown.
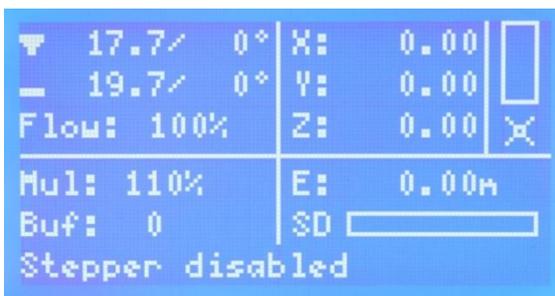
If you return to the Main Menu you will notice Mul: will show the new speed selected.

Note: It is possible to alter this setting at any point before or during a print.

```
Back ↵
Home all
Z babystep.: 0.00mm
Speed mul.:100%
▷Flow mul. :100%
Lights:On
```

```
Back ↵
Home all
Z babystep.: 0.00mm
Speed mul.:100%
▷Flow mul. :110%
Lights:On
```

```
▼  17.5/   0° X:    0.00
─  19.7/   0° Y:    0.00
Flow: 110%   Z:    0.00  ✕
Mul: 100%    E:    0.00m
Buf:   0     SD ▭▭▭▭▭▭
Stepper disabled
```
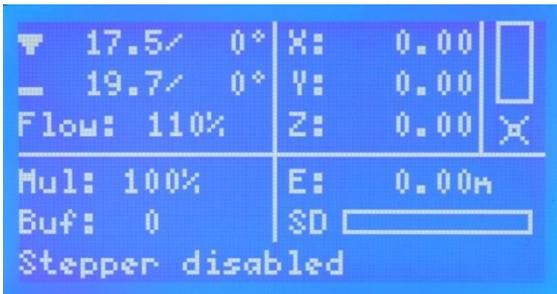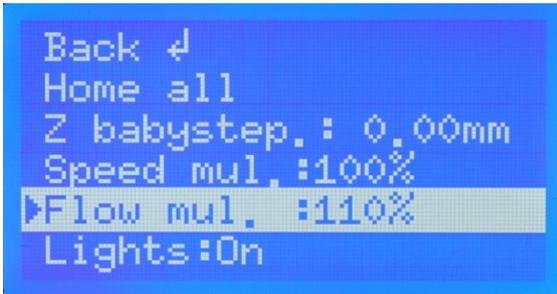
Flow multiplier (mul.) works in a similar way to Speed multiplier but instead of adjusting the speed of the whole machine, Flow multiplier only varies the flow rate of plastic being extruded from the Nozzle.

Simply select the Flow multiplier. option and set using the Jog Wheel.

Once the required value has found select again to enter.

The Flow multiplier has been set to 110% in the example shown.

If you return to the Main Menu you will notice Flow: will show the new speed selected.

Note: It is possible to alter this setting at any point before or during a print.

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```
Back ↵
Home all
Z babystep.: 0.00mm
Speed mul.:100%
Flow mul. :100%
▷Lights:On
```

By selecting the Lights option the internal Machine Lighting can be turned on....

```
Back ↵
Home all
Z babystep.: 0.00mm
Speed mul.:100%
Flow mul. :100%
▷Lights:Off
```

...or off.

```
 Lights:On
▷Change filament
 Preheat PLA
 Preheat ABS
 Cooldown
 Set to origin
```
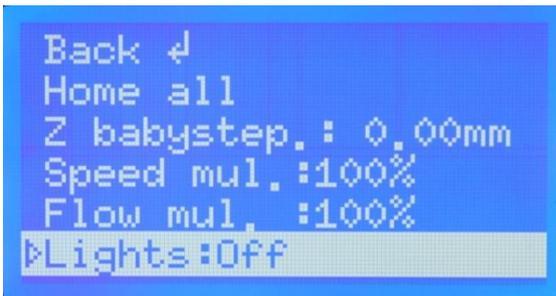
Changing the filament can be done manually or by selecting the Change Filament option shown here.

BUT before either method can be used the hot end must be at printing temperature. This allows the filament to be extracted in one piece from the hot end without breaking and leaving excess filament.

```
Change filament
Rotate to move
filament up/down
Click when done
```
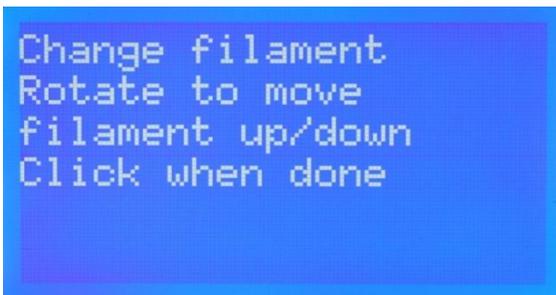
As soon as the Change filament option is selected the filament extruder will extract the filament.

To reload filament, manually feed the filament thru the filament feeder into the receiving nipple, then turn the Jog Wheel clockwise until filament extrudes from the hot end nozzle.

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```
Change filament
▷Preheat PLA
 Preheat ABS
 Cooldown
 Set to origin
 Disable stepper
```

Preheat PLA when selected will prepare the printer to print with PLA.

Simultaneously heating the Hot Bed (to 50°C) and Hot End (to 220°C)
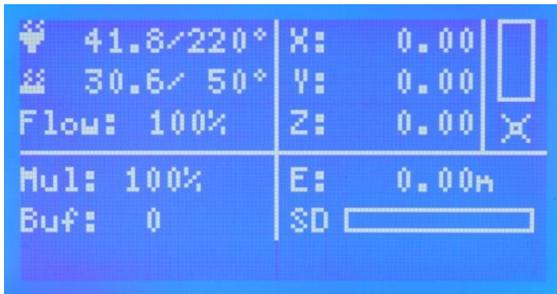
```
  41.8/220° X:    0.00
  30.6/ 50° Y:    0.00
Flow: 100%  Z:    0.00
Mul: 100%   E:    0.00m
Buf:  0     SD
```

This is displayed on the Home Page shown here.

Left = Current Temp./ Right = Target Temp.

```
 Change filament
 Preheat PLA
▷Preheat ABS
 Cooldown
 Set to origin
 Disable stepper
```

Preheat ABS when selected will prepare the printer to print with ABS.

Simultaneously heating the Hot Bed (to 80°C) and Hot End (to 250°C)
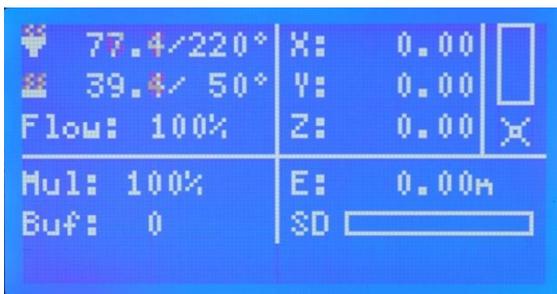
```
  77.4/220° X:    0.00
  39.4/ 50° Y:    0.00
Flow: 100%  Z:    0.00
Mul: 100%   E:    0.00m
Buf:  0     SD
```

This is displayed on the Home Page shown here.

Left= Current Temp./ Right = Target Temp.

```
Change filament
Preheat PLA
Preheat ABS
▷Cooldown
Set to origin
Disable stepper
```

```
▼  95.3/   0°│X:     0.00│
_  45.3/   0°│Y:     0.00│
Flow: 100%    │Z:     0.00│✕
Mul: 100%    │E:     0.00m
Buf:  0      │SD
Stepper disabled
```

```
Preheat PLA
Preheat ABS
Cooldown
▷Set to origin
Disable stepper
ATX power on/off
```

```
▼  36.4/   0°│X:     0.00│
_  32.1/   0°│Y:     0.00│
Flow: 100%    │Z:     0.00│✕
Mul: 100%    │E:     0.00m
Buf:  0      │SD
Stepper disabled
```

Cooldown can be selected when you require all the heaters (Hot Bed and Hot Ends) to be turned off.

This can be done individually (see 'Extruder' sub menu page 13) but this function does it with just one single selection.
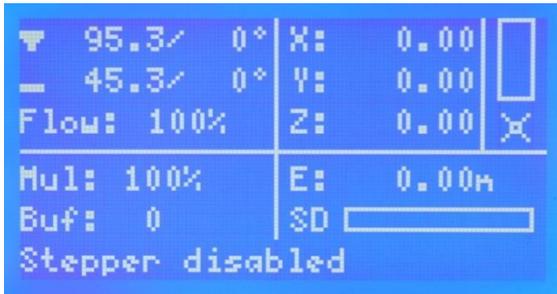
Notice the target temperature on the Home Screen is now 0°C for both Hot Bed and Hot End.

NOTE: When a print is completed this will be done automatically.

CAUTION. The Hot Ends and Hot Bed will remain hot for several minutes after switching off or after 'Cooldown' is selected

```
Preheat PLA
Preheat ABS
Cooldown
Set to origin
▷Disable stepper
 ATX power on/off
```
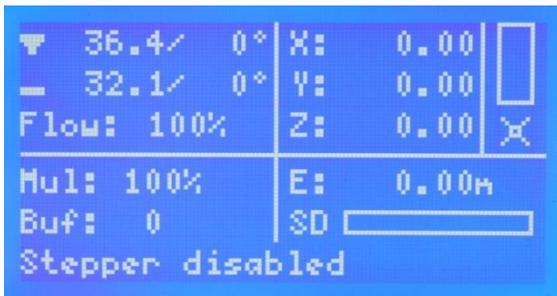
Selecting Disable stepper de-energises (unlocks) all the stepper motors (X,Y and Z) allowing for manual machine mechanism movement. This is particularly useful when manually levelling the printers Hot Bed.

```
▼  27.8/   0°│X:    0.00│
─  28.4/   0°│Y:    0.00│
Flow: 100%   │Z:    0.00│✕
Mul: 100%    │E:    0.00m
Buf:  0      │SD ☐        ☐
Stepper disabled
```
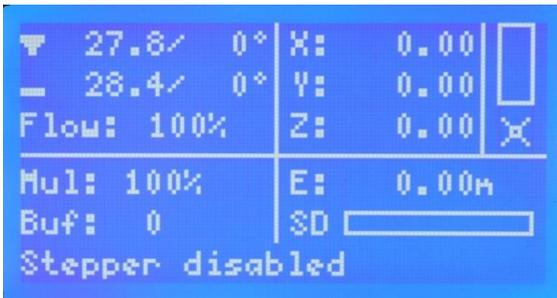
On the Home Screen this action is shown as displayed.

```
Preheat PLA
Preheat ABS
Cooldown
Set to origin
Disable stepper
▷ATX power on/off
```
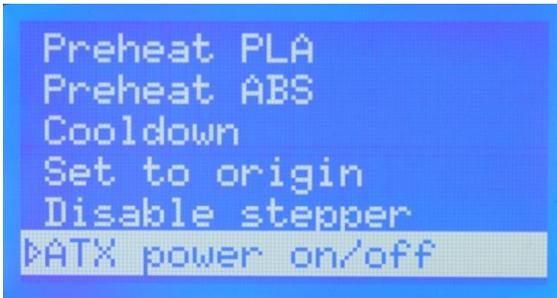
ATX power on/off is disabled and not required.

```
Back ↵
Quick settings        »
▷Print file
Position              »
Extruder              »
Fan speed             »
```
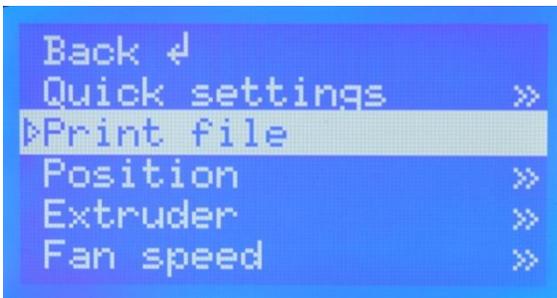
Print file, once selected, will give you access to the .gco / .gcode files on the SD Card inserted in the SD Card slot.

Select the desired file using the Jog Wheel and the following will happen:

```
▷Back ↵
bedlevedRHb.gco
ADDNo1.gco
zswitchmid4.gco
ADDNo1025.gco
```

1. X-axis travels Home
2. Y-Axis travels Home
3. Z-Axis travels Home
4. Hot Bed heats to preset temp.
5. Hot End heats to preset temp.

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The Position option relates to the position of the X,Y and Z axis.
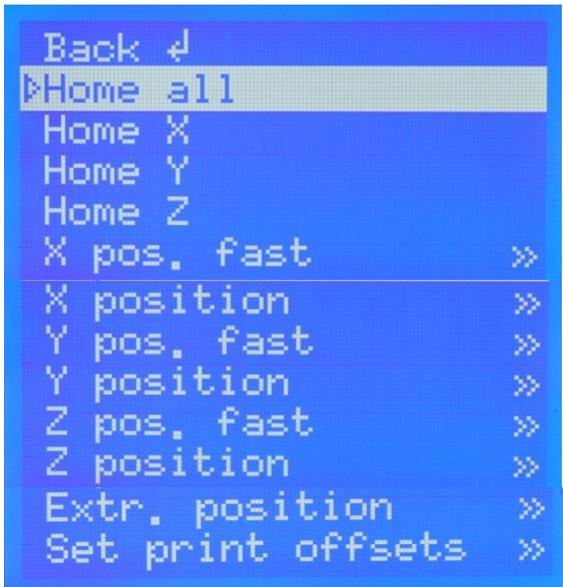
Once selected the following menu of 12 options will be available.

Home all, as described before in Print file, will firstly Home the X-Axis, then Y and finally the Z-Axis.

Once finished the Main Block will be in the back right corner and the Hot Bed will just be touching the tip of the nozzle.
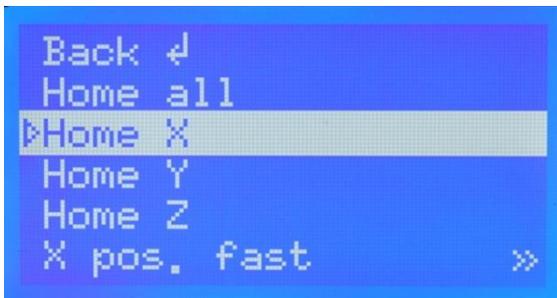
NOTE: All the stepper motors will now be energised preventing any manual movement of the machine mechanism.

Select Home X will only energise and Home the X-axis. This means it is still possible to manually adjust the other two axis
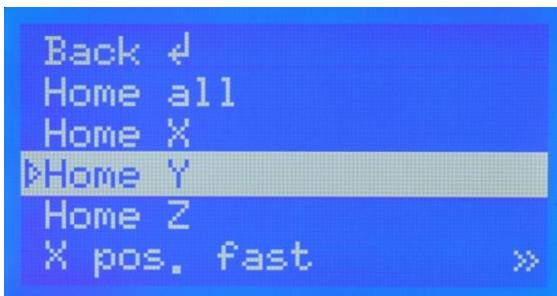
...similarly with Home Y only the Y-axis stepper motor will be energised.

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```
 Back ↵
 Home all
 Home X
 Home Y
▷Home Z
 X pos. fast              »
```
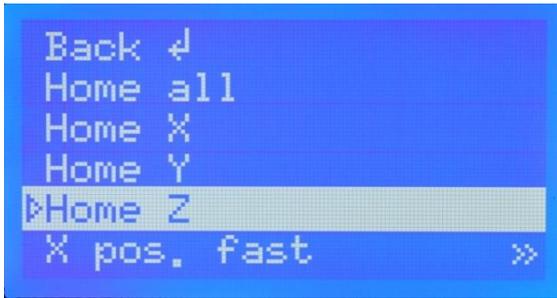
By selecting Home Z the Hot Bed will raise to its print ready position. This means both the X and Y Axis can be moved by hand which allows for accurate manual Bed Levelling.

```
▷X pos. fast             »
 X position              »
 Y pos. fast             »
 Y position              »
 Z pos. fast             »
 Z position              »
```
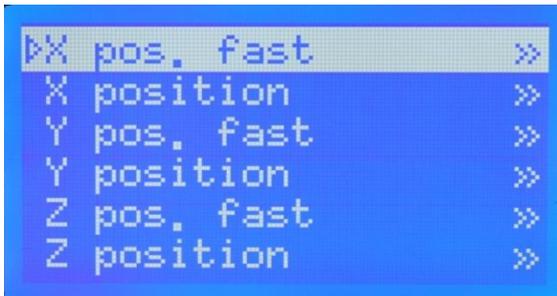
These six options from the position menu all work in a similar manner.

By selecting X pos. fast, for example..

```
X:    0.00 mm
Min endstop:Off
Max endstop:N/A
```

..this screen will appear.

```
X:    5.00 mm
Min endstop:Off
Max endstop:N/A
```

By turning the Jog Wheel the X-axis will move in increments of 1mm.

```
X:    0.05 mm □□
Min endstop:Off
Max endstop:N/A
```
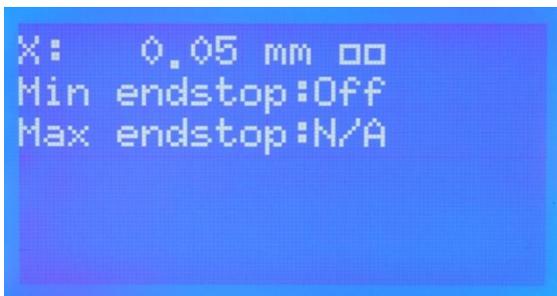
Selecting X position and then turning the Jog Wheel will move the X-axis in increments of 0.01mm.

This operation is similar for all axis.

In this menu, by turning the Jog Wheel the Extruder gear will move the filament in increments of 1mm.

Note. In order for this process to be

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```
Y pos. fast        »
Y position         »
Z pos. fast        »
Z position         »
▷Extr. position    »
Set print offsets  »
```

```
E:    0.00 mm
1 click = 1 mm
 E: 21.7/  0°C⇒  0%
     95.3 m printed
```

```
Y pos. fast        »
Y position         »
Z pos. fast        »
Z position         »
Extr. position     »
▷Set print offsets »
```

```
Back ↵
▷Set X offset:    0mm
 Set Y offset:    0mm
 Set Z offset: 0.00mm
```

Selecting the Extruder option will bring up this screen.....
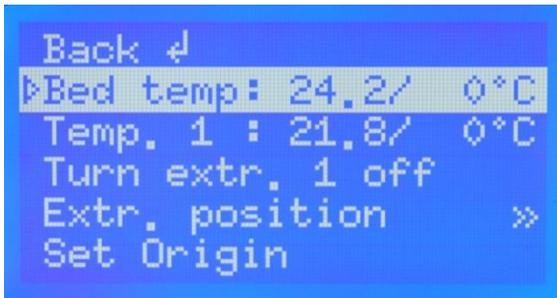
The Bed temp. allows you to set the target temperature for the Hot Bed. This can be at any time before, during or after a print.
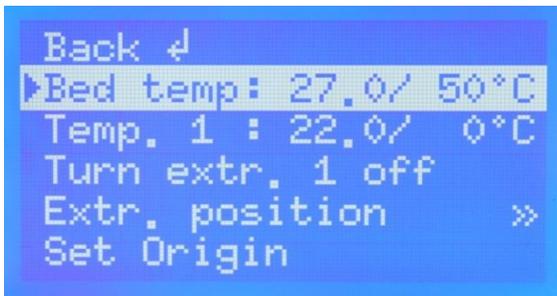
The Bed temp. here has been set to a target temperature 50°C.
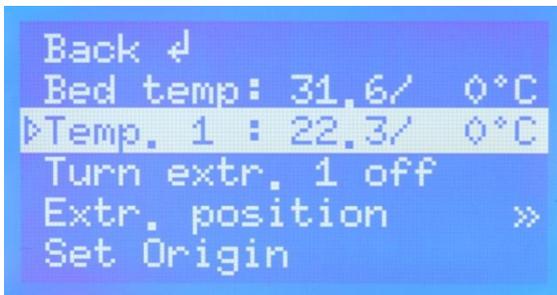
Temp. 1 allows you to set the target temperature of the Hot End for Extruder 1. As with the Hot Bed this can be adjusted at any time before, during or after printing.
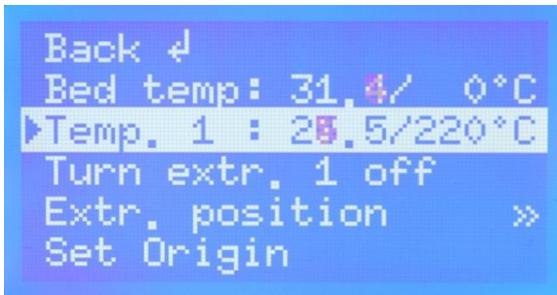
Here, the target temperature for the Hot End Extruder has been set to 220°C.
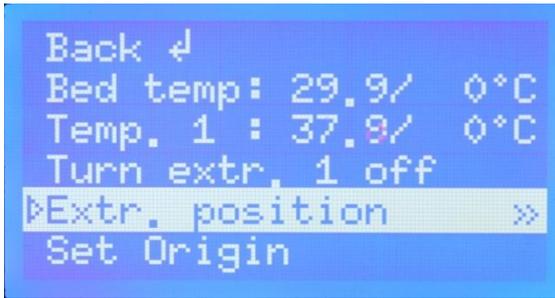
In this menu, by turning the Jog Wheel the Extruder gear will move the filament in increments of 1mm.

Note. In order for this process to be active, the Hot End must be at or heated up to full operating temperature (set according to the filament material installed - eg. PLA = 220 $^{\circ}$C.
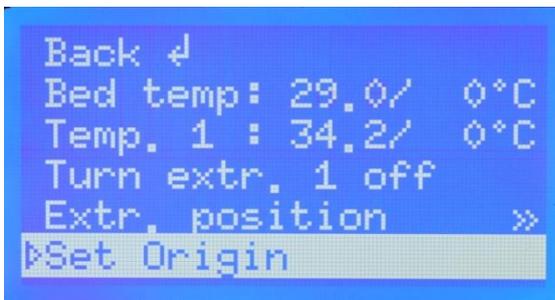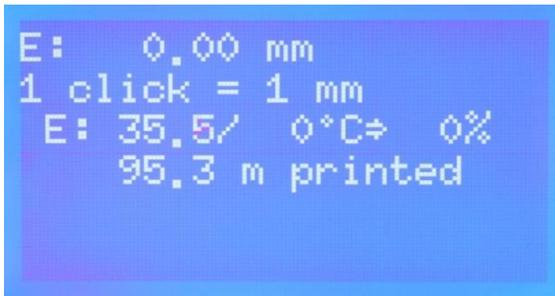
This menu is for advanced users only.

As soon as power is supplied to your 3D Printer the fan that cools the finned section of the Hot End will activate and constantly run at 100%.

The Fan speed option here controls the speed of the filament cooling fan or 'PLA Fan'.
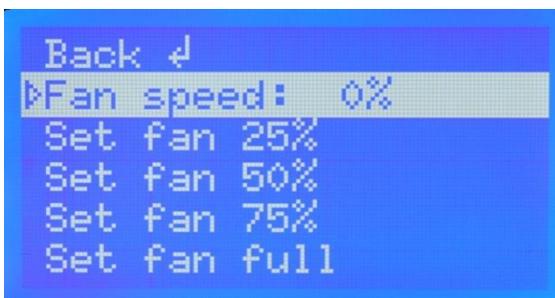
This first option allows you to set a bespoke speed using the Jog Wheel. Be aware, the fan may not function correctly if set below 25%

...here it has been set to 10% for this illustration

Other options of 25%, 50%, 75% and Full speed are available.

```
Back ↵
▶Fan speed: 10%
 Turn fan Off
 Set fan 25%
 Set fan 50%
 Set fan 75%
```

```
 Set fan 25%
 Set fan 50%
 Set fan 75%
 Set fan full
▶Ignore M106 cmd □
```

```
 Extruder          »
 Fan speed         »
▶Bed coating       »
 SD card           »
 Debugging         »
 Configuration     »
```

```
 Back ↵
▶No coating
 BuildTak
 Kapton
 Blue paper tape
 Green PET tape
 Glue stick
 Custom:   0.00mm
```

...this will then be displayed.

If you then return to the screen shown you will notice the Custom has been changed to 0.40mm. This

```
 Back ↵
 No coating
▷BuildTak
 Kapton
 Blue paper tape
 Green PET tape
```

```
Bed coating set to
BuildTak
```

```
 BuildTak
 Kapton
 Blue paper tape
 Green PET tape
 Glue stick
▷Custom:   0.40mm
```

```
 Extruder          »
 Fan speed         »
 Bed coating       »
▷SD card           »
 Debugging         »
 Configuration     »
```

```
 Back ↵
▷Print file
 Delete file
```

```
▷Back ↵
 bedlevedRHb.gco
 ADDNo1.gco
 zswitchmid4.gco
 ADDNo1025.gco
```

```
▷Back ↵
 Echo    :Off
 Info    :On
 Errors  :On
 Dry run :On
 EndStop :Off
```

```
 Extruder       »
 Fan speed      »
 Bed coating    »
 SD card        »
▷Debugging      »
 Configuration  »
```
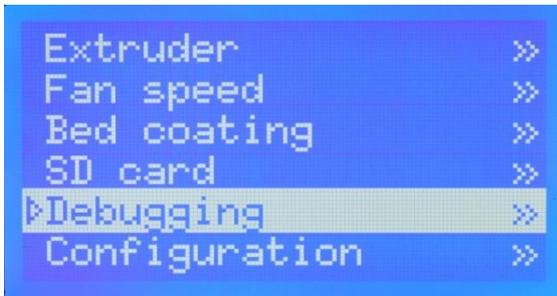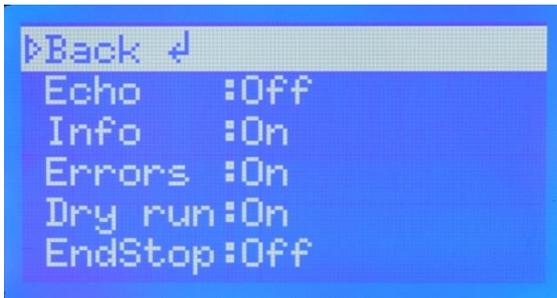
'Debugging' is for Advanced Users only

```
 Back ↵
▷General        »
 Language       »
 Acceleration   »
 Feedrate       »
 Extruder       »
 Heating bed    »
 Store to EEPROM
 Load f. EEPROM
```
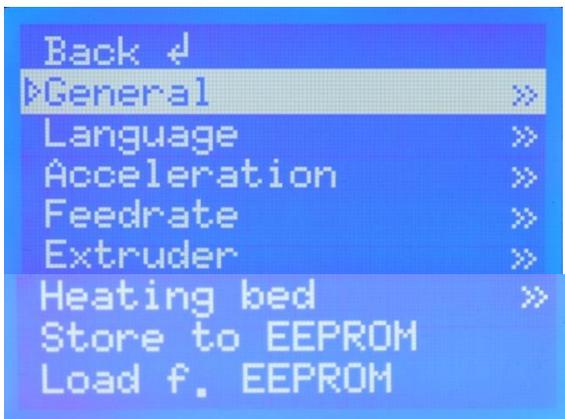
Selecting General will reveal the menu below.

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```
Extruder          »
Fan speed         »
Bed coating       »
SD card           »
Debugging         »
▷Configuration    »
```

The Configuration option, once selected will bring up ....

```
Back ↵
▷Baudrate:250000
Stepper inactive  »
Max. inactive     »
Autolevel: Off
```
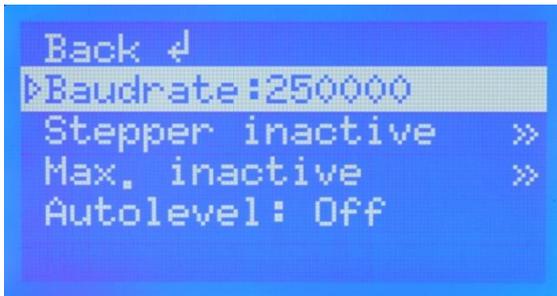
.... this menu.

Baudrate should already be set at 250000 as shown and should not normally be altered.

```
Back ↵
Baudrate:250000
▷Stepper inactive  »
Max. inactive      »
Autolevel: Off
```
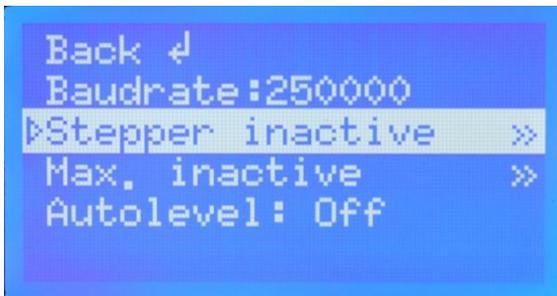
The Stepper inactive option allows you to set the time period for the stepper motors to de-energise when not in use.

The default setting is set to 6 minutes as shown here. This can be altered using the Jog Wheel.

```
Dis. after:    6
[min] 0=Off
```

Max. inactive is similar to Stepper inactive but turns everything off. Hot End, Hot Bed, PLA Fans etc. but the lights and main cooling fans stay on.

The default is set to 10 minutes, as shown.

```
Back ↵
Baudrate:250000
Stepper inactive  »
▷Max. inactive     »
Autolevel: Off
```
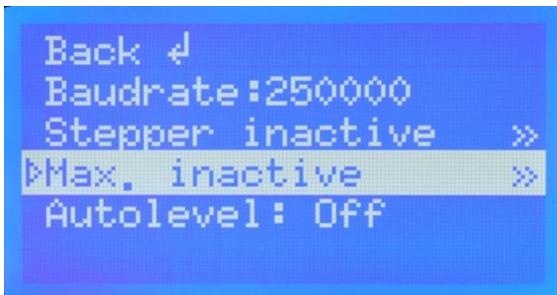
Both Stepper and Max inactive can be edited, but to keep the settings required after switching the printer off you must Store to EEPROM. (See page 25)

LCD Screen Function and User Tips Guide

```
Dis. after:  10
[min] 0=Off
```

```
Back ↵
Baudrate:250000
Stepper inactive     »
Max. inactive        »
▷Autolevel: Off
```
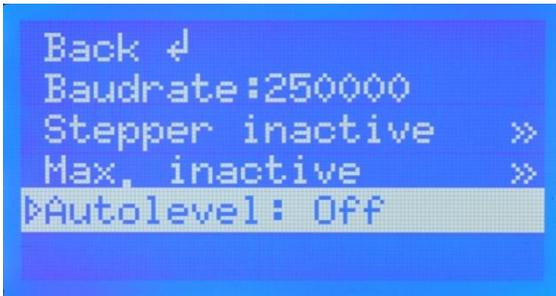
This Autolevel serves no function in the standard machine configuration

..... off or on.

```
Back ↵
Baudrate:250000
Stepper inactive     »
Max. inactive        »
▷Autolevel: On
```
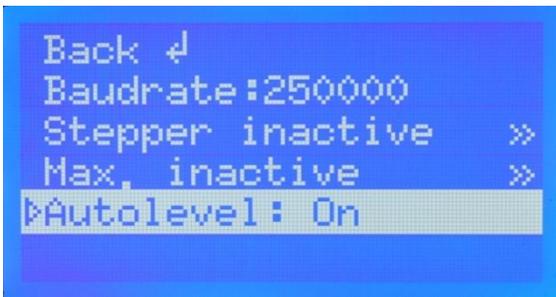
Select the Language option...

```
Back ↵
General              »
▷Language            »
Acceleration         »
Feedrate             »
Extruder             »
```

```
Back ↵
▷English
```
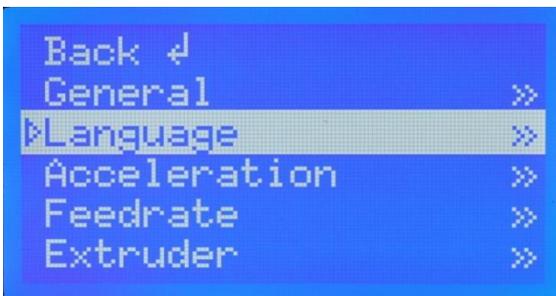
.... here, English is available. Alternative languages will be listed and selectable, where appropriate.

KORA

```
Back ↵
General              ≫
Language             ≫
▷Acceleration        ≫
Feedrate             ≫
Extruder             ≫
```

```
Print Z:    100
Move X :   1000
Move Y :   1000
Move Z :    100
Jerk   :   20.0
▷Z-Jerk :    0.3
```

```
Print Z:    100
Move X :   1000
Move Y :   1000
Move Z :    100
▷Jerk   :   20.0
Z-Jerk :     0.3
```

```
▷Back ↵
Print X:   1000
Print Y:   1000
Print Z:    100
Move X :   1000
Move Y :   1000
Move Z :    100
Jerk   :   20.0
Z-Jerk :    0.3
```
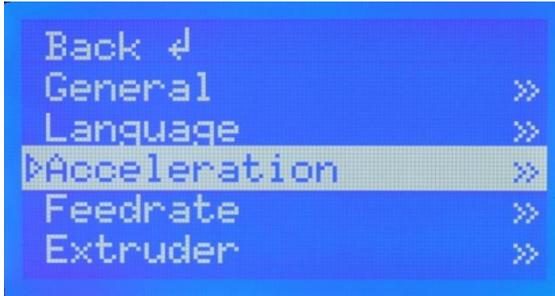
The remaining screen settings and others are for 'Advanced Users Only' and should not normally be entered unless *fully* understood by the user - with the exception of 'Store to EEPROM' on page 25
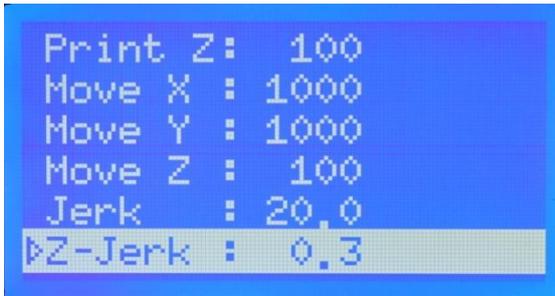
Refer to :
www.repetier.com/#documantation and http://www.reprap.org and associated forums for further in depth documentation regarding these options
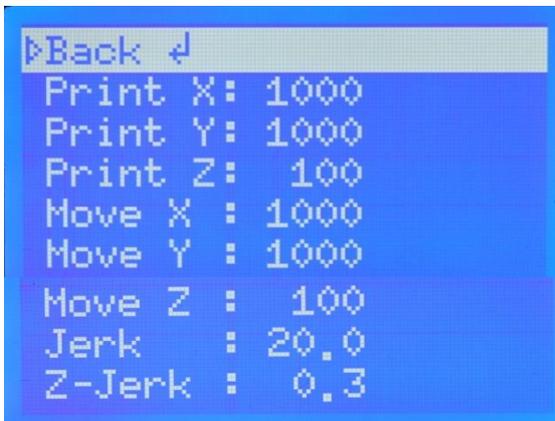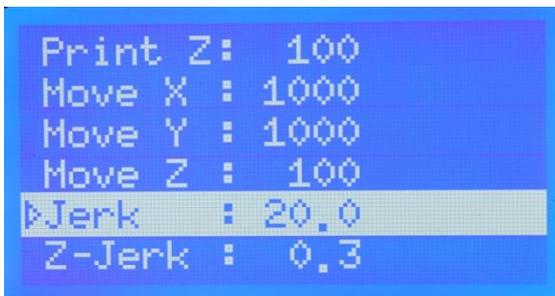
```
 Back ↵
 General              »
 Language             »
 Acceleration         »
▷Feedrate             »
 Extruder             »
```

```
 Back ↵
▷Max X:    200
 Max Y:    200
 Max Z:     20
 Home X:    40
 Home Y:    40
 Home Z:    20
```

```
 Back ↵
 General              »
 Language             »
 Acceleration         »
 Feedrate             »
▷Extruder             »
```

```
▷Back ↵
 Steps/MM:400.0
 Start FR:    20
 Max FR:    50
 Accel: 5000
 Stab.Time:    1
 PID D:   45.57
```

```
 Wait retr.: 0 mm
 Wait temp.   150°C
 Control:PID
 PID P:    8.86
 PID I:    0.43
```

KORA

```
 Back ↵
▷Steps/MM:400.0
 Start FR:    20
 Max FR:    50
 Accel: 5000
 Stab.Time:    1
```

```
 Back ↵
 Steps/MM:400.0
▷Start FR:    20
 Max FR:    50
 Accel: 5000
 Stab.Time:    1
```

```
 Back ↵
 Steps/MM:400.0
 Start FR:    20
▷Max FR:    50
 Accel: 5000
 Stab.Time:    1
```

```
 Back ↵
 Steps/MM:400.0
 Start FR:    20
 Max FR:    50
▷Accel: 5000
 Stab.Time:    1
```

```
 Back ↵
 Steps/MM:400.0
 Start FR:    20
 Max FR:    50
 Accel: 5000
▷Stab.Time:    1
```

LCD Screen Function and User Tips Guide

```
▷Wait retr.: 0 mm
 Wait temp.  150°C
 Control:PID
 PID P:    8.86
 PID I:    0.43
 PID D:   45.57
```

```
 Wait retr.: 0 mm
▷Wait temp.  150°C
 Control:PID
 PID P:    8.86
 PID I:    0.43
 PID D:   45.57
```

```
 Wait retr.: 0 mm
 Wait temp.  150°C
▷Control:PID
 PID P:    8.86
 PID I:    0.43
 PID D:   45.57
```

```
 Wait retr.: 0 mm
 Wait temp.  150°C
 Control:PID
▷PID P:    8.86
 PID I:    0.43
 PID D:   45.57
```

```
 Wait retr.: 0 mm
 Wait temp.  150°C
 Control:PID
 PID P:    8.86
▷PID I:    0.43
 PID D:   45.57
```

```
Wait retr.: 0 mm
Wait temp.  150°C
Control:PID
PID P:    8.86
PID I:    0.43
▷PID D:   45.57
```

```
PID P:    8.86
PID I:    0.43
PID D:   45.57
▷Drive Min: 40
 Drive Max:255
 PID Max:255
```

```
PID P:    8.86
PID I:    0.43
PID D:   45.57
 Drive Min: 40
▷Drive Max:255
 PID Max:255
```

```
PID P:    8.86
PID I:    0.43
PID D:   45.57
 Drive Min: 40
 Drive Max:255
▷PID Max:255
```

```
 Acceleration      »
 Feedrate          »
 Extruder          »
▷Heating bed       »
 Store to EEPROM
 Load f. EEPROM
```

LCD Screen Function and User Tips Guide
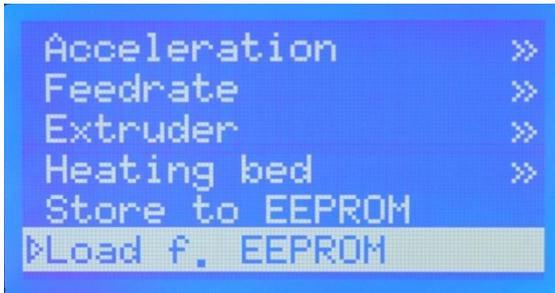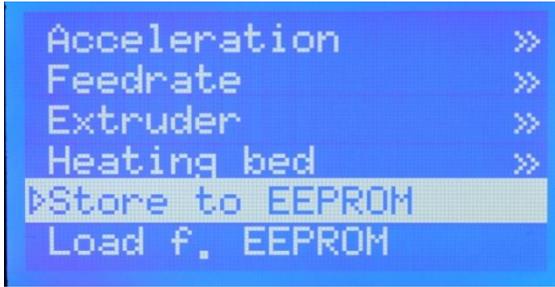
Any settings adjustments made in the menus above will be lost after the machine is switched off unless this 'Store to EEPROM' option is selected *after* any settings have been altered. In this case, all new settings will be saved

The 'Load f. EEPROM' option is not normally used

PID tuning refers to a proportional-integral-derivative control algorithm used in hot ends and heated beds.

PID needs to have a P, I and D value defined to control the nozzle temperature. If the temperature ramps up quickly and slows as it approaches the target

temperature, or if it swings by a few degrees either side of the target temperature, then the values are incorrect.

To run PID Autotune in Repetier and other firmware, run the following gcode with the nozzle cold:

```
M303 E0 S220 C8
```

This will heat the first nozzle (E0), and cycle around the target temperature 8 times (C8) at the given temperature (S200) and return values for P I and D. An example from http://www.soliwiki.com/PID_tuning is:

```
bias: 92 d: 92 min: 196.56 max: 203.75
Ku: 32.59 Tu: 54.92
Clasic PID
Kp: 19.56
Ki: 0.71
Kd: 134.26
PID Autotune finished ! Place the Kp, Ki and Kd constants in
the configuration.h
```

Turn on Printer and connect to PC or Mac via Repetier Software. Navigate to the 'Manual Control' tab
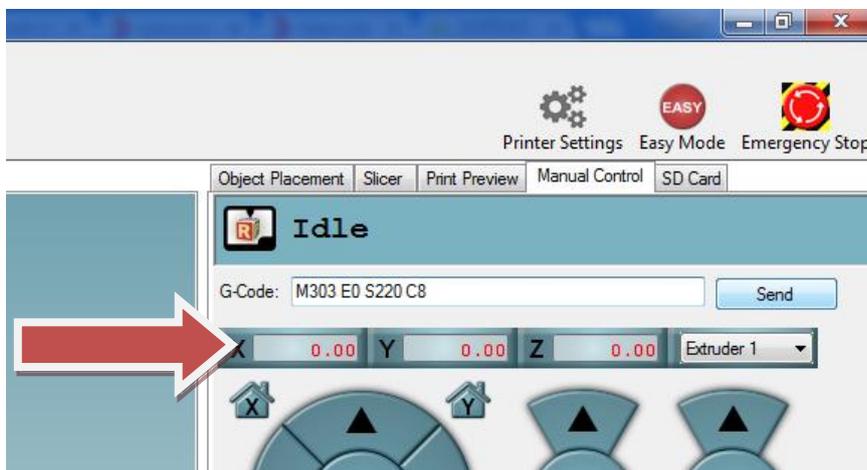
Enter M303 E0 S220 C8 in the G Code box and press the 'Send' button
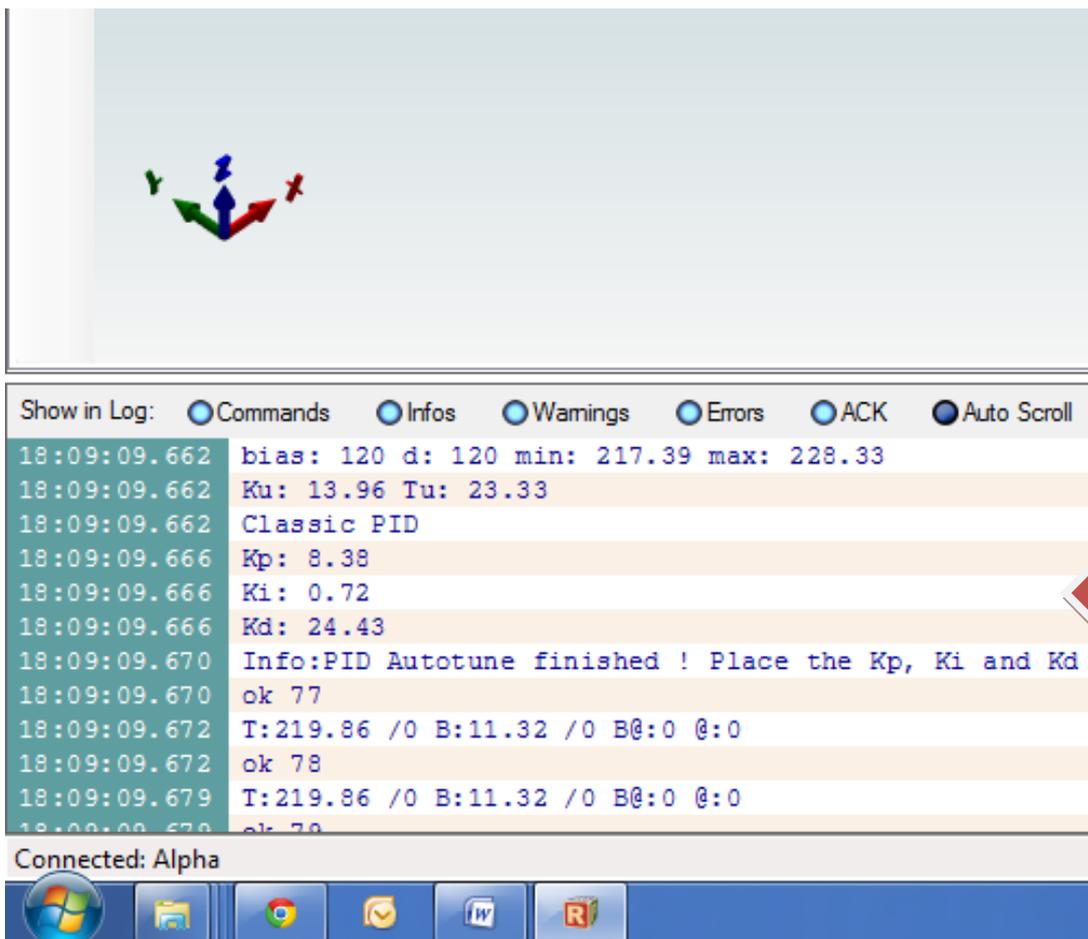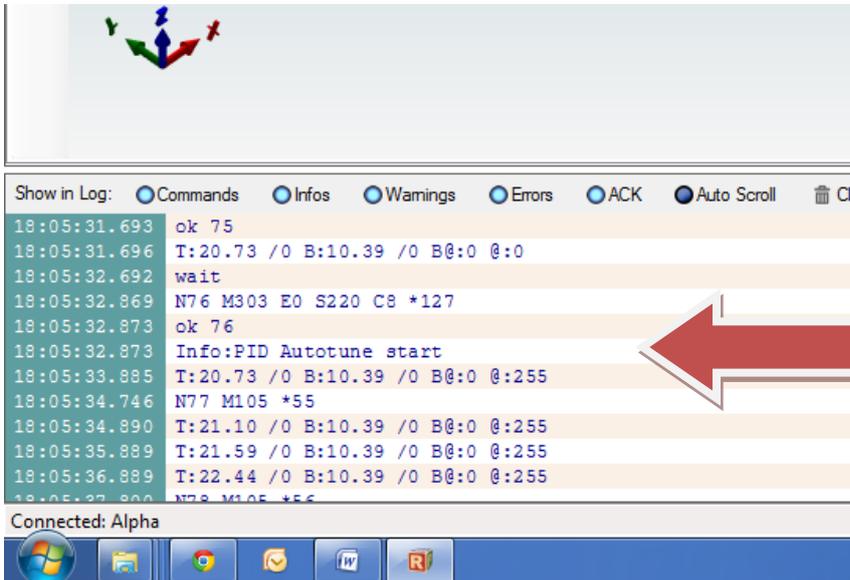
Take note of the (K)P, (K)I and (K)D numbers after the statement 'PID Autotune finished!' is seen in the log
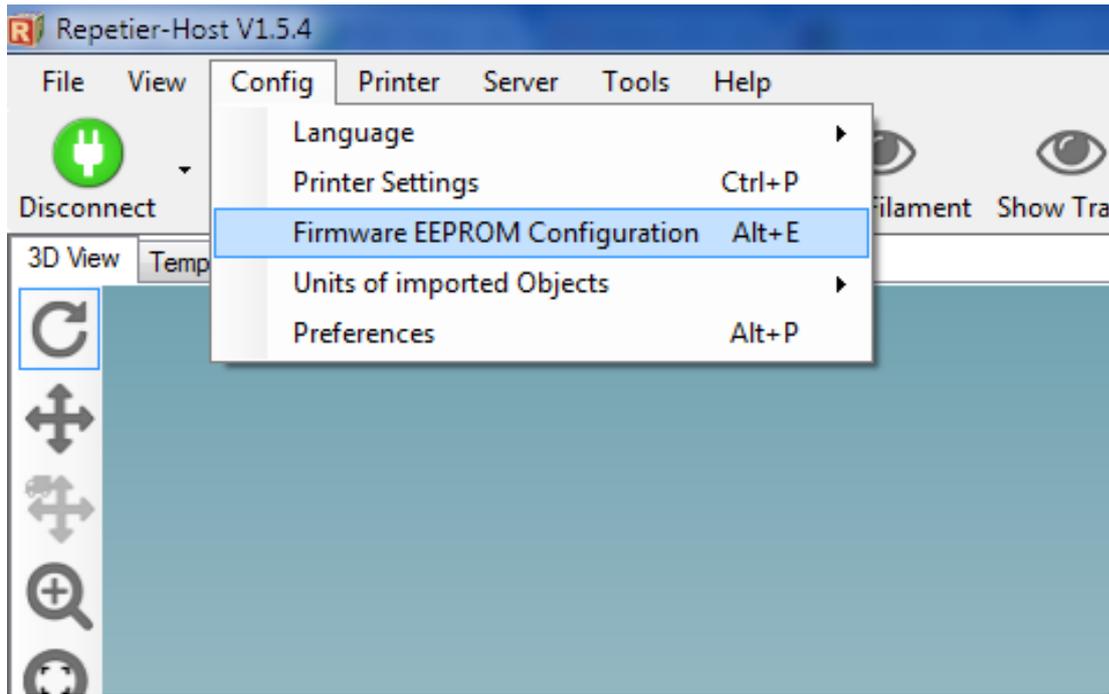
Select the Alt+E above

KORA
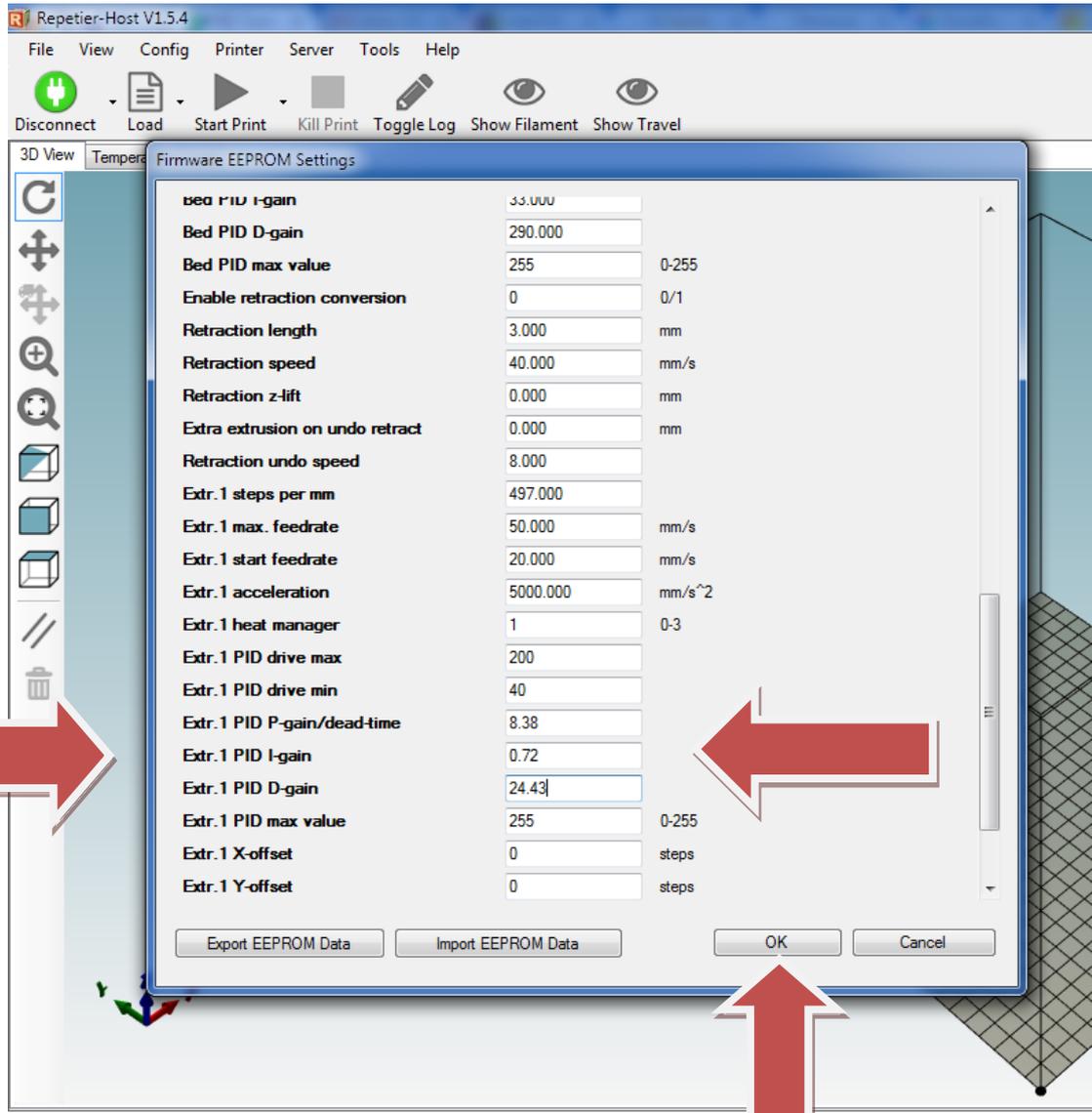
Enter the P, I and D settings in the Extr. 1 Boxes above, then press the OK button

KORA
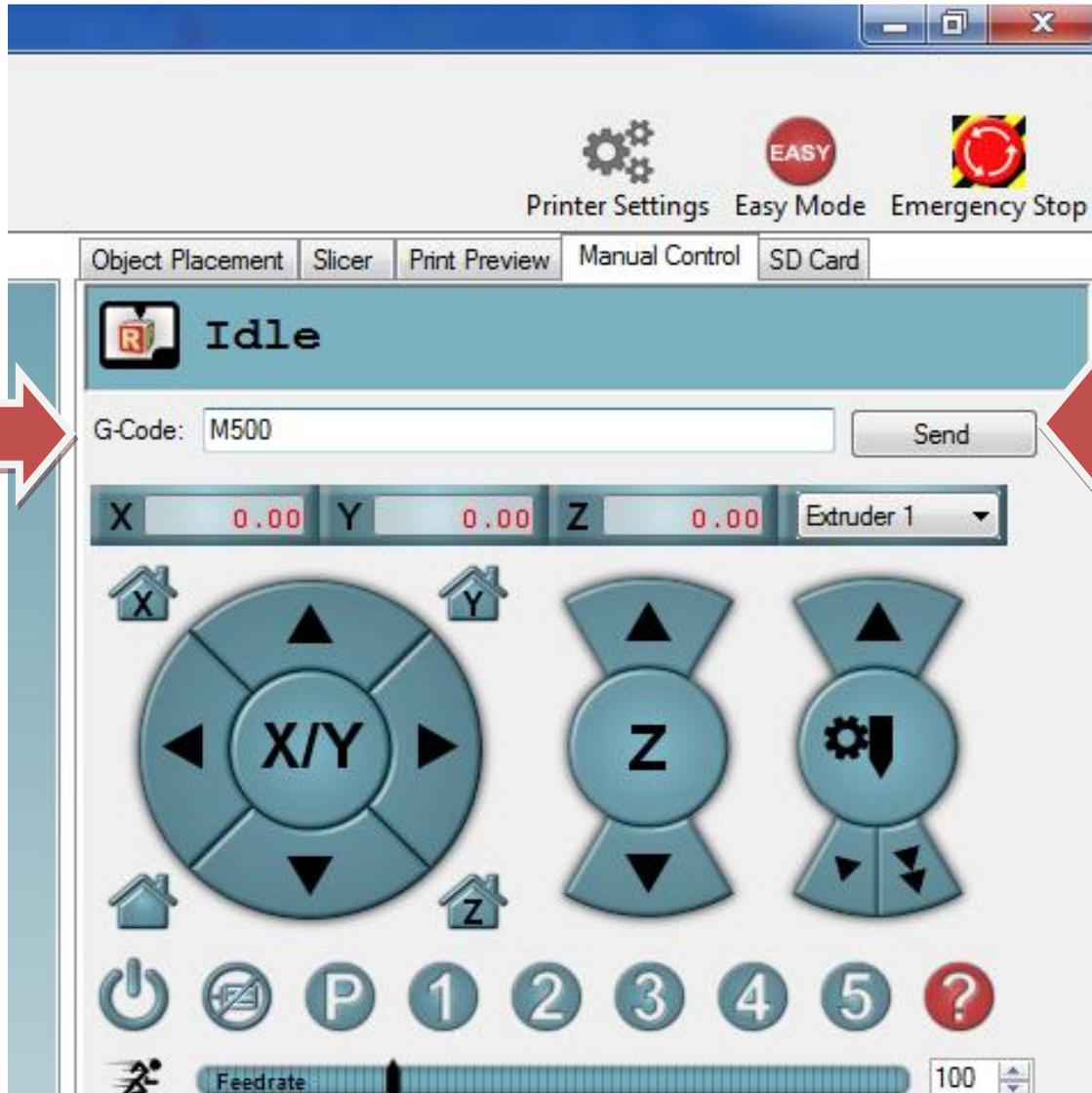
Enter M500 in the G Code line and press 'Send' button

PID Auto Tune is now Complete

KORA

LEVELING THE PRINT BED

It cannot be stressed enough that levelling the printer bed correctly is essential to achieve good adhesion between the printer bed and the first layer of all your 3D prints. Only **VERY LIGHT** contact is required between the tip of the nozzle and the printer bed, ideally **NO** "gap" should be present. However, a sheet of standard 80 gram printer paper can be used to gauge when the nozzle is very close to the printer bed during adjustment, by feeling friction on the paper as the nozzle starts to squeeze the paper against the printer bed.

Although so called 'automatic printer bed levelling' could be easily installed on this machine, however, manual printer bed levelling has been installed on this machine. This is much more consistently accurate and after a little practice, proves a far better levelling method than any 'automatic' alternatives.

It is good practise to level the Printer Bed after loading the filament with the Nozzle and Heated Bed at printing temperature, before each print. This allows for the Nozzle to be clear of hardened filament - allowing accurate judgement of light contact between and Printer Bed.

 It also allows, once bed levelling is complete, to proceed straight to printing without the risk of the interfering with the levelled bed.

Experience in this procedure will be gained quickly, through practise.

There are several ways to ensure that the bed is level and ready to print.

Note: Before attempting to level the printer bed using method **a.** or **b.** below, manually rotate the Bed Lead Screw clockwise until the Nozzle lightly touches the printer bed At this position the lowest LED on the Hot End PCB should be illuminated. If it is not, turn all the thumb screws (x4, located at each corner of the headed print bed) one full turn anticlockwise (to lower printer bed) and repeat test from '**Note:**' (above). Continue this procedure until the lowest LED on the hot end PCB illuminates when the nozzle is just touching the bed.

KORA

a)   MANUAL METHOD (preferred method)

1. Using Control Panel, press Jog Wheel once and scroll down to '***Position***' on the printers LCD screen, press Jog Wheel. Scroll down to '***Home Z***' and select by pressing Jog Wheel, the printing bed will raise towards the Nozzle then stop in a locked position.

2. When it reaches the top, using the Mechanism Support Rods manually move the main Hot End holder block to all four corners of the printer bed - at each corner use the Thumb Screw below that particular corner of the Printer Bed to adjust the printer bed up and down so that it **lightly** touches the brass tip of the Nozzle in all positions.

3. When complete recheck all four corners again and finally check the middle of the Printer bed.

4. You have 6 minutes to complete the above process after selecting '***Home Z***', after this time the Z motor will time out and unlock - thus preventing accurate Printer Bed levelling - if this happens simply repeat from step **1** above.

b)   USING SD CARD (alternative 'Semi-Automatic Levelling')

1. Insert SD card (if already inserted remove and re-insert). On the file list shown on the Control Panel LCD display scroll down and select the file named '***midi_levelling.gco***' . The printer will home all axes, then automatically move the Hot End holder block to far right hand corner slowly raising the Printer Bed towards the Nozzle.
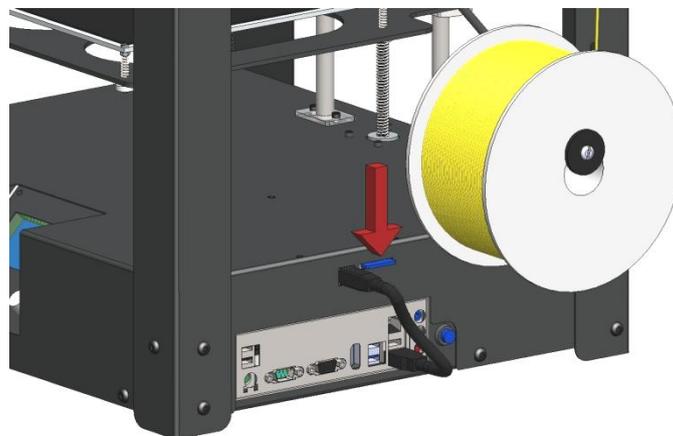
2. When the bed stops rising check that the Nozzle is **lightly** touching the Printer Bed surface. This is adjustable using the Thumb Screw under the far right hand corner of the bed. You have 10 seconds after the bed has stopped rising to make this adjustment correctly. After 10 seconds the bed will slightly lower and the Nozzle will move to the far left hand corner to repeat the process.

3. The process will be repeated for the remaining corners, allowing for adjustment each time.

4. The Nozzle will then move to the centre for 5 seconds to check the adjustment.

5. The Control Panel will then display '***One Quick Check!***' and will repeat everything from 2 above but this time only pausing for 5 seconds (To allow final fine tuning).

6. The Nozzle will return to its home position (rear right hand corner).

7. You can repeat the process as often as you like, until completely satisfied that the Nozzle is lightly touching the Printer Bed in all positions. To do this start again at step *1.* above.