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FAQ

Temperature Problem

Temperature shows 0/0

1. Power cycle the printer

2. Connect printer to computer through USB on the side (exhaust cutout)

3. On the computer, use software like Pronterface to connect to the printer and see if the temperature is reading correctly.

4. If it fails to connect to the printer, opens up the Device Manager to check if there is a COM port showing when the printer is connected.

5. If no COM port is created, it indicates the main board could be faulty, please contact customer service for further assistance.

Temperature shows -15/0

1. Check vertical FFC (Flexible Flat Cable or Ribbon Cable):

    a. Unplug the 30-pin FFC (vertical) connected to the base;

    b. Do a visual check on the cable and female connectors on the base and see if there's any oxidation on either side;

    c. Check for deform / burnt on the female connectors (cable seating incorrectly could lead to excessive heat, hence causing connector to deform);

    d. Do a visual check on the FFC for defect / scratch / damage.

    e. If b (cable), d exist, replace the FFC with the spares;

    f. If b (female connector), c exists, connect customer service for further assistance.

2. Check horizontal FFC:

    a. Remove the plastic cover on the right of the extruder;

    b. Do a visual check on the cable and female connectors on the base and see if there's any oxidation on either side;

    c. Check for deform / burnt on the female connectors (cable seating incorrectly could lead to excessive heat, hence causing connector to deform);

    d. Do a visual check on the FFC for defect / scratch / damage.

    e. If b (cable), d exist, replace the FFC with the spares;

    f. If b (female connector), c exists, connect customer service for further assistance.

Temperature shows Random Number

1. Make sure the printer is completely cooled down;

2. If the problem is with the hotend, unplug the horizontal FFC and notify for changes on temperature

    a. If the temperature changes to -15, it indicates a thermistor problem, replace hotend thermistor;

    b. If the temperature doesn't change, unplug the vertical FFC and notify changes;

        i. If the temperature changes to -15, check for problems on vertical FFC and breakout boards (see Temperature shows -15/0);

        ii. If the temperature doesn't change, it indicates a main board problem, replace the mainboard or use E2 thermal instead (requires flashing firmware, see Appendix 2). .

3. If the problem is with the bed:

a. Power off the printer, disconnect the AC power cord and USB cable (if applied);

b. Turn the printer sideway, be careful not to damage the X stepper motor connector (if flipped that side);

c. Unscrew the 6 screws holding the bottom panel;

d. Unplug the bottom fan connected to the main board before removing the bottom panel;

e. Unplug the bed thermal cable (see Appendix 1);

    i. Connect printer to power and turn on the printer (be careful not to touch any electronics inside the housing);

    ii. If the temperature DOES NOT change, replace the main board or use E2 thermal instead (requires flashing firmware, see Appendix 2);

    iii. If the temperature changes, it indicates the problem is with the heating pad thermistor, replace the heating pad.

Temperature suddenly shows 0/0 on hotend and bed

1. Power cycle the printer

2. If the temperatures still showing 0/0, connect printer to computer

3. If temperature shows 0 on the computer also, it could be a main board problem, replace the main board.

4. If the temperatures are correctly shown on the computer, it could be a tft control board problem, replace the tft control board.

Hotend temperature fluctuate while printing

1. Run PID autotune (see Appendix 5)

Thermal Runaway triggered while parts cooling fan kicks in

1. Run PID autotune (see Appendix 5)

Hotend Problem

Mintemp/Maxtemp Error

1. Check the thermistor, make sure it's connected securely:

    a. If it's not, reseat the connector;

2. Wiggle the thermistor cable to see whether the temperature fluctuate:

    a. If the temperature fluctuates while the cable is connected securely, go to step 3;

3. Take off the silicone sleeve (if applied), do a visual check on the thermistor cable to check for defect:

    a. The thermistor could be defective / damaged, replace the thermistor.

4. Check the FFC (see Temperature shows -15/0)

5. If the connection is secure, and there's no problem on the FFC / connectors, the next steps requires removing the bottom panel (turn off and disconnect AC power):

    a. Remove the bottom panel and swap the cable connecting to E1 thermal and Bed thermal (check Appendix 1 for reference);

    b. Connect AC power and turn on machine (be careful not to touch electronics inside the housing);

    c. Look at the temperature:

        i. if the bed (which is hotend now) looks normal, while the hotend (now is the bed) still having problem, it indicates the problem is on the mainboard E1 thermal, there's 2 options:

            1. Replace the mainboard;

            2. Use E2 thermal instead, and it requires making small changes in firmware source code and reflash, (check Appendix 2 - How to flash firmware)

  ii. If the temperature looks normal on the hotend (now the bed) and abnormal on bed (now is the hotend), it indicates the problem lies somewhere in the connection from the thermistor to mainboard, please contact customer service for further assistance.

6. If all the above checks out, carefully remove the thermistor from the hotend, and connect it directly to the main board;

 a. If the temperature shows room temperature, thermistor is fine and the problems is in the connections;

 b. If the temperature shows -15 or random number, it indicates a defective thermistor, replace the thermistor.

Thermal Runaway / Heating Failed

1. Make sure AC is connected and power is on (screen will turn on when USB is connected)

2. Do a power cycle and try again (mainboard may freeze from previous error)

3. Heat up the hotend from the touch screen manually

 a. If it heats up normally, it could be a result of step 2.

 b. If it still failed, please do the following:

  i. After pressed heat, look through the exhaust cutout on the side and check if there's a red LED turns on

   1. If no red LED turns on, it could be a problem on the mainboard, please contact customer service for further assistance.

  ii. Apply heat to the heater block and check for temperature changes on screen,

   1. if temperature doesn't change, check for problem on thermistor

   2. If temperature changes, go to next step (requires a multimeter)

  iii. Remove the extruder plastic cover

  iv. Check for continuity on the heater cartridge pin (see Appendix 3 - Breakout Board Printout)

   1. If there's no continuity, it indicates either the connector is not connected securely or the heater cartridge is defective

   2. If there's continuity, check the voltage to make sure it's 24V.

    a. If the voltage is not 24V (or close), do a PSU checking (see Printer Not Powering On)

    b. If the voltage and continuity checks out fine, check the resistance of the heater cartridge, it should be around 9Ohms.

Heated Bed Problem

Not heating

1. Power off the printer and disconnect the AC power cord and USB;

2. Turn the printer sideway, be careful not to damage the X stepper motor connector (if flipped that side);

3. Unscrew the 6 screws holding the bottom panel;

4. Unplug the bottom fan connected to the main board before removing the bottom panel;

5. Connect power and power on the printer (be careful not to touch any electronics in the housing);

6. While the printer still on turned sideway, heat up the bed from touch screen;

7. With a multimeter set to DC mode, check the Heatbed connector on main board for 24V, if no power, it means the mosfet to the port could be dead, replace main board;

8. If 24V measured in step 7, check for LED on SSR (Solid State Relay), if it doesn't turn on, it indicates a defective SSR, replace SSR;

9. If step 7 and 8 checks out fine, check for resistance on heated bed with multimeter, the resistance for 220V is around 96.8Ohms and 110V is around 24.2Ohms, if the resistance is off or cannot measured, it indicates the heating pad is defective, replace the heating pad.

Thermal Runaway ID bed / Mintemp bed

1. Usually caused by heating pad thermistor;

2. Move the bed by hand and notify for temperature changes;

    a. If temperature changes while moving, try tug the cable back into the case;

3. Replace heating pad.

My prints are not sticking to the bed

1. Re-level the bed, make sure all 4 corners are around 0.1mm away from the nozzle (a piece of A4 paper thickness)

2. Make sure to heat up the bed and nozzle before adjustment

3. The print bed sticks better with temperature around 10C higher than the bed temperature suggested by the manufacturer.

4. You may clean the surface gently with water when it's completely cooled down to room temperature. Never clean it with any cleaning products.

Printer halted. Kill

1. Check for problem in FFC connections (see Hotend Problem - Mintemp / Maxtemp Error)

2. Make sure all endstops functioning correctly (see Appendix 4 - Endstops Test)

Stepper Motor Not Working or Shaking

1. Check for problem in FFC connections (see Mintemp Error / Heating Failed (Hotend))

2. Remove the bottom panel and expose the main board (see Hotend Problem -> Mintemp/Maxtemp Error step 5)

3. Swap the stepper driver on the axis having problem with one that's working properly

4. Connect power, move the faulty axis from the touch screen manually (will not move to negative before homing)

    a. If it's working properly, it indicates a faulty stepper driver, please contact customer service for further assistance

    b. If it's still not working

        i.   Swap the faulty axis stepper motor with a known working axis

        ii. Run step 4 again

            1. If problem still exist, it indicates the problem is in the connection, check FFC if it's either X or Extruder stepper motor

            2. If it works properly, it indicates it's a faulty stepper motor, replace the stepper motor.

Printer Not Powering On

1. Make sure the printer version matches your country's voltage;

2. Swap the fuse next to the power button inside the socket;

3. If replacing the fuse doesn't work:

    a. Open up the bottom panel (disconnect power);

    b. When the printer is on the side, connect AC power (while power button is off);

    c. Be careful not touching any electronics in the housing, flip the power button;

    d. Check for LED light on PSU (Power Supply Unit);

        i.   If no LED lights up;

            1. With a multimeter switched to AC mode, measure the input voltage across L and N terminals (**Warning! you're working with main voltage and can cause electric shock, make sure you understand what you're doing, do not proceed if you're not feeling comfortable**);

2. If there's no voltage coming in, it could mean either the fuse is blown, replace the fuse.

    ii. If LED lights up, but very dim:

        1. If Input is correct, check the power output on the PSU, switch to DC mode and measure voltage across +V and -V (either two are fine).

        2. If there's no output or the voltage is way off from 24V, replace the PSU.

Z banding

Sidewinder X1

1. Adjust the eccentric nuts on all carriages, make sure it's snug against the aluminum extrusions.

2. Tighten X and Y belts.

3. Use a caliper, measure the both the top and bottom inside width of the XZ gantry, make sure they're within 0.2mm in differences.

    a. To adjust the width of the XZ gantry, loosen the screws on the bottom holding the XZ gantry to the base, while pulling the aluminum outwards if top bottom is narrower (push inward if wider), tighten the screws.

4. Move the X axis (2060 aluminum extrusion) to the top by pulling the top belt (or from the touch screen manually), make sure the distance between the X axis and top beam are equal on both sides.

    a. You may need to loosen the pulley on lead screws and unplug the Z stepper motor to adjust the height of the carriage.

5. If all the above had been done and Z banding still exists, remove both lead screws from the printer, row them on a flat surface to look for banding in lead screws. If they're bent, replace the lead screws.

Genius

1. Tighten X and Y belts.

2. Loosen the 4 screws holding the X axis 2060 aluminum extrusion to the injection molded plastic carriages on both sides.

3. Slide the X axis (aluminum extrusion) left and right, there should be little room for movement, to make sure the screws are loose enough.

4. Tighten the 4 screws holding the X axis (aluminum extrusion).

5. Move the X axis (2060 aluminum extrusion) to the top by pulling the top belt (or from the touch screen manually), make sure the distance between the X axis and top beam are equal on both sides.

    a. You may need to loosen the pulley on lead screws and unplug the Z stepper motor to adjust the height of the carriage.

6. If Z banding still exists, remove both lead screws from the printer, row them on a flat surface to look for banding in lead screws. If they're bent, replace the bent lead screws.

Carriage smashing into endstops / print bed

1. Run Endstop test and replace the faulty endstop.

Extruder / Hotend Problem

Extruder not extruding

1. Make sure the hotend temperature is 170C+ and idle (extruder will not work if hotend is below 170C);

2. Is the large gear rotating while extruding manually?

    a. Yes.

        i. Is it turning counter-clockwise?

            1. Yes.

a. Check if the extruder lever is broken. If so, contact customer service for further assistance.

b. Try hand feeding the filament through to check for clogging.

c. Adjust the tension on the extruder lever.

2. No.

a. Have you recently re-flash the firmware?

i. Yes. - Check your code

ii. No. Try swapping the extruder stepper driver with another known working axis to determine whether the stepper is good or bad.

b. No.

i. Check FFCs.

ii. Check stepper drivers

iii. Check stepper motor

Extruder stopped extruding while printing

1. Is the large gear rotating?

a. Yes.

i. Check if the fan on heatsink is working. Replace the fan if it's not.

ii. Try touching the extruder metal cover while filament stopped coming out, if it's hot instead of warm, try removing the heatsink and applying some thermal paste between.

b. No.

i. Check FFCs.

Nozzle leaking

1. Heat up the hotend and clean the residue if possible

2. Take the hotend apart and put it back together following the steps below:

a. Screw the nozzle into the heater block all the way, then turn it back around half turn

b. Install the heat break all the way in

c. Install the hotend onto the printer and heat it up to 200C manually

d. Wait for 1 minute when it's at temp

e. While holding the heater block firmly (with a wrench), tighten the nozzle, be careful not to break the heat break while turning.

Status LED not working

1. Replace with spare.

a. If replacing still doesn't work, have you recently re-flashed the firmware? If so, please check your code.

2. Check FFCs.

3. Measure voltage across LED socket pins, it should be 5V across the pins while it's on (according to what color is chosen, all pins will be powered if white is chosen.)

4. Open bottom panel and check whether the LED pins are connected (see Appendix 1)

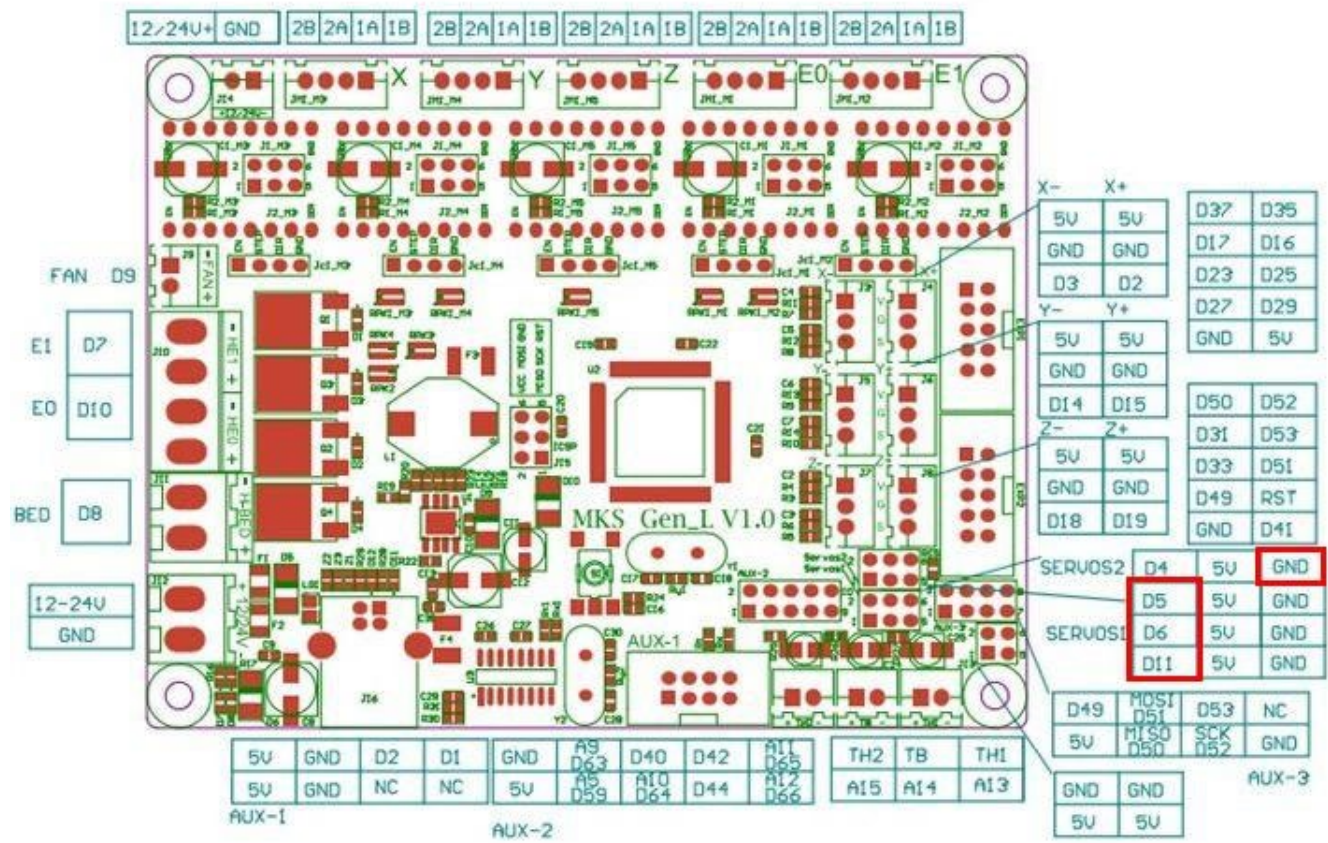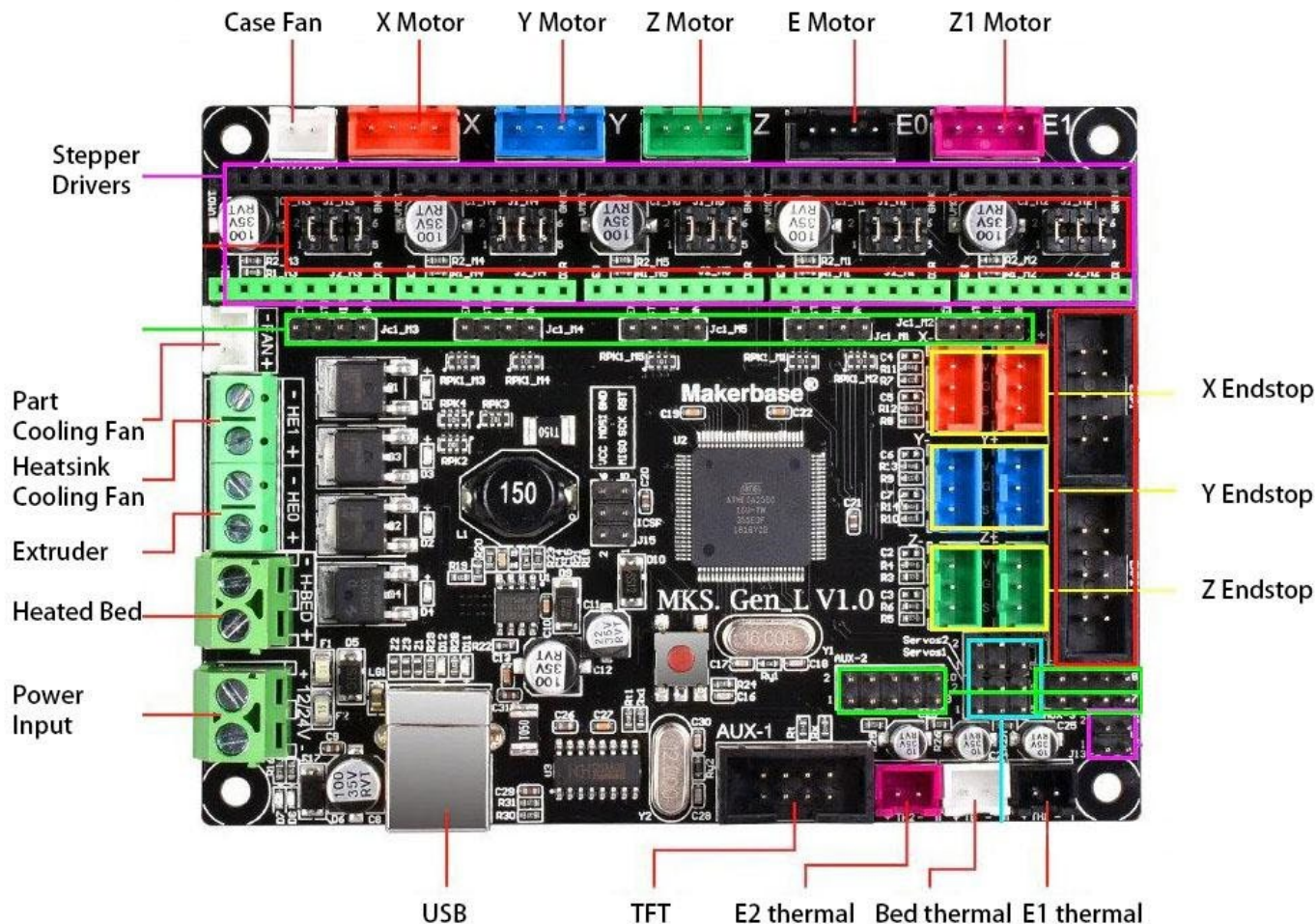# Filament Runout Sensor triggered randomly

1. Replace filament runout sensor

Checksum Mismatch

1. Remove the bottom panel

2. Remove both the TFT control board and card reader extension board from the printer
3. Apply non-conductive coating around all screw holes (e.g. nail polish)
4. Put them back onto the printer when the coating is dry
5. If the problem still exists after applying the coating, contact customer service for further assistance.

Appendix 1 - mainboard pinout

Case Fan | **X Motor** | **Y Motor** | **Z Motor** | **E Motor** | **Z1 Motor**

Stepper Drivers

Part Cooling Fan
Heatsink Cooling Fan
Extruder
Heated Bed
Power Input

X Endstop
Y Endstop
Z Endstop

Makerbase®
MKS. Gen_L V1.0

USB | TFT | E2 thermal | Bed thermal | E1 thermal

LED Pins

Appendix 2 - How to flash firmware

To flash firmware, you need to install Arduino IDE from arduino.cc

Download the firmware from our Github page at https://github.com/artillery3d

After extracting the firmware from the zipped file, goes to Marlin directory and double click on Marlin.ino.

In Arduino IDE, click on the tick on the top left corner to compile and verify the firmware.
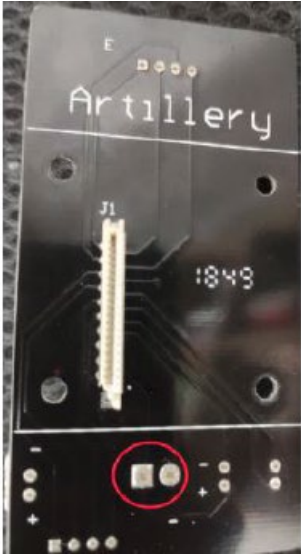
Before flashing, after connecting the printer to the computer, select the following in toolbar.

Tools -> Board -> "Arduino/Genuino Mega or Mega 2560"

Port -> Port will shows up after you connected your printer

After making the changes, click on the Upload button next to the Verify button.

Appendix 3 - Breakout Board Pinout

Heater cartridge pin

Appendix 4 - Endstop Test

To run enstops test, you need to connect your printer to your computer, and use a program like Pronterface.

After connecting to the computer and Pronterface is connected, send the following command to the printer while it is cold.

```
M119
```

It should return the current status of the endstops, either triggered or open.

Place a metal object to trigger the endstop and send M119 and see if the status changes. If the returns shows Open even when triggered, you have a defective endstop.

Appendix 5 - PID Autotune

To run PID auto tuning, you need to connect your printer to your computer, and use a program like Pronterface.

After connecting to the computer and Pronterface is connected, send the following command to the printer while it is cold.

```
M303 E0 S240 C8
```

Wait for the following message and write down the Kp, Ki and Kd values. (The value will be different from the sample below.)

```
Classic PID
Kp: 19.56
Ki: 0.71
Kd: 134.26
PID Autotune finished ! Place the Kp, Ki and Kd constants in the configuration.h
```

Since EEPROM is disabled on our machine, go to the slicer of your choice, and in the starting Gcode, add the following line at the top. (Remember to replace the value with the return on your computer.)

```
M301 P19.56 I0.71 D134.26
```

For a more accurate tuning, you may want to turn on the part cooling fan from the touch screen before running PID autotune.
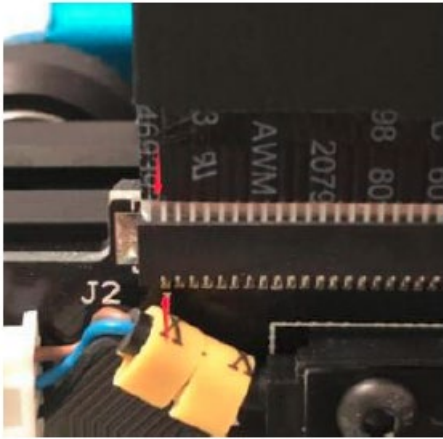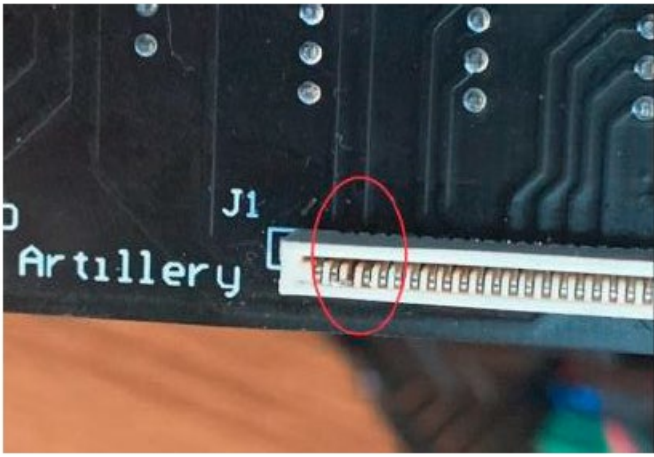
FAQ

温度问题

温度显示 0/0

1. 重启打印机

2. 打印机连线到电脑

3. 在电脑端，使用如 Pronterface 的 3D 打印软件与打印机连线

4. 如果未能正常显示温度，则打印机控制主板有问题

5. 如果无法与打印机连线，打开设备管理器，观察连接打印机的时候是否有一个新增的串口

6. 如果没有显示新增的串口，则打印机控制主板有问题，更换打印机主板

温度显示 -15/0

1. 检查垂直的 30 针排线

   a. 把 30 针排线从底座拔出

   b. 目测排线金手指及转接板上插座是否存在氧化或变色

   c. 目测插座是否存在烧焦或变形（如排线没有安装到位，接触不良会导致端子产生高热导致插座变形）

   d. 目测排线线身是否存在破损

   e. 如果排线存在 B、D 的问题，更换 30 针排线

   f. 如果插座存在 B、C 的问题，请联系客户服务。

2. 检查水平的 20（X1）/ 24（小天才） 针排线

   a. 拿掉挤出机右侧的塑料盖子

   b. 目测排线金手指及转接板上插座是否存在氧化或变色

   c. 目测插座是否存在烧焦或变形（如排线没有安装到位，接触不良会导致端子产生高热导致插座变形）

   d. 目测排线线身是否存在破损

   e. 如果排线存在 B、D 的问题，更换 30 针排线

   f. 如果插座存在 B、C 的问题，请联系客户服务。

温度显示异常（不显示室温也不是-15）

1. 确定机器完全冷却

2. 如果喷嘴温度显示异常，拔出挤出机排线，同时留意温度变化

   a. 如果温度显示为 -15，则热敏电阻有问题，更换热敏电阻

b. 如果温度没有改变，拔出垂直 30 针排线并留意温度变化

i. 如果温度显示为 -15，参考温度显示-15/0 之检查垂直的 30 针排线进行排查

ii. 如果温度并没有改变，则打印机主板问题，更换主板或使用 E2 thermal 端口替代（需更改并重刷固件，参考附录 2）

3. 如果温度异常为热床温度：

a. 关闭电源并拔除电源线及 USB 线

b. 把打印机侧躺，小心不要压倒 X 轴电机上的端子

c. 移除底盖上的 6 颗螺丝

d. 移除底盖前，请先拔掉机箱散热风扇的电源

e. 拔除热床热敏电阻线 (bed thermal)（参考附录 1）

i. 打印机接上并打开电源（小心不要触摸机器内的任何电子零件）

ii. 如果温度没有改变，则主板有问题，更换主板或以 E2 代替（需更改并重刷固件，参考附录 2）

iii. 如果温度改变，则硅胶热床热敏电阻问题，更换硅胶热床。

温度突然显示 0/0

1. 关机，过一会重新开机

2. 若温度依然显示 0，通过 USB 线与电脑连接并用软件确定是否能显示温度

3. 如果电脑无法连线或不显示温度，则主板有问题，更换主板

4. 如果电脑软件正常显示温度，则触屏主板有问题，更换触屏主板。

喷嘴温度打印时上下浮动

1. 进行 PID 自动调整（参考附录 5）

吹料风扇启动后出现 Thermal Runaway

1. 进行 PID 自动调整（参考附录 5）

喷嘴问题

Mintemp/Maxtemp 错误

1. 检查热敏电阻是否插稳

a. 如果没有插稳，重新插

2. 用手摇动热敏电阻线，确定温度是否会浮动

a. 如果温度大幅度浮动，则热敏电阻有问题，更换热敏电阻

3. 移除加热块硅胶套，目测一下热敏电阻是否存在破损

a. 如果有破损，更换热敏电阻

4. 检查排线（参考温度问题 – 温度显示 -15/0）

5. 如果排线及热敏电阻都没有问题，下一步需要打开底盖进行下一步检查

   a. 打开底盖后，把 E1 thermal 及 bed thermal 线对调

   b. 打印机接上并打开电源（小心不要触摸机器内的任何电子零件）

   c. 留意温度

      i. 如果热床（即喷嘴）温度显示正常，喷嘴（即热床）温度显示不正常，则问题在 E1 thermal 端子，更换主板或以 E2 thermal 替代

      ii. 如果喷嘴（即热床）温度显示正常，热床（即喷嘴）温度显示不正常，则问题存在于热敏电阻至主板之间的连线上，重新检查线路，或联系客服寻求进一步帮助

6. 如果上面的检查都没找出问题，小心把热敏电阻从喷嘴上拿下来，并直接接到主板 E1 thermal 上

   a. 如果显示室温，则热敏电阻工作正常

   b. 如果显示 -15 或异常，则热敏电阻问题。

Thermal Runaway / Heating Failed（温度丢失/加热失败）

1. 确定电源街上并打开

2. 重启机器（主板有可能因之前的问题导致死机）

3. 从触屏手动加热喷嘴

   a. 如果加热正常，则为步骤 2 所导致

   b. 如果加热失败，请进行以下检查：

      i. 加热时，可从机箱右侧散热口往里面观察主板上 E1 端子旁的 LED 是否有亮起

         1. 如果没有 LED 亮起，则主板有问题，更换主板。

      ii. 给加热块加热（以吹风机或打火机），留意温度是否有变化

         1. 没有变化则热敏电阻可能有问题，进行热敏电阻检查（参考 Mintemp/Maxtemp 错误）

         2. 温度有变化，进行下一步（需要万用表）

      iii. 移除挤出机右侧的塑料盖子

      iv. 检查加热管端子是否连通（参考附录 3）

         1. 加热管两脚不连通，则加热管有问题，更换加热管

         2. 加热管两脚连通，则在加热时检查电压（DC 模式）

            a. 如果电压大幅度低于 24V，进行电源检查（参考无法开机）

            b. 检查加热管电阻，加热管电阻应大约等于 9 欧姆

热床问题

无法加热

1. 关闭电源并拔出电源线

2. 把打印机侧躺，小心不要压倒 X 轴电机上的端子

3. 移除底盖上的 6 颗螺丝

4. 移除底盖前，请先拔掉机箱散热风扇的电源

5. 重新接上电源并通电（请注意，千万不要触碰机箱内的电子元件）

6. 打印机保持侧躺，从触屏手动加热热床

7. 留意主板上热床（Heated Bed）端子旁的 LED 是否亮起，没有亮起则主板有问题，更换主板

8. 目测继电器，留意继电器之 LED 是否亮起，没有亮起则继电器有问题，更换继电器

9. 如果主板及继电器均没有问题，使用万用表检查热床两根电源线是否连通，同时检查电阻。如果两线不通或没有电压，则热床有问题，更换热床。

Thermal Runaway ID bed / Mintemp bed（热床温度丢失/最低温度错误）

1. 温度通常来自热床的热敏电阻

2. 手动前后移动热床并留意温度是否变化

   a. 如果温度有变化，尝试把热床线往机箱里面塞并重新打印

3. 如果还是重复出现，更换硅胶热床。

打印件无法粘住在热床上

1. 重新调平，确保 4 个角与喷嘴的距离大概为 0.1mm（1 张 A4 纸的厚度）

2. 调平前请先加热热床及喷嘴，并让他保持温度 1 分钟左右

3. 热床温度比商家建议温度增加 10 度能粘得更好

4. 有需要是可用水轻擦平台表面，但必须在平台冷却到室温后方可进行。清洁时绝对不可使用任何清洁用品。

Printer halted. Kill（无故死机）

1. 检查排线（参考温度问题 – 温度显示 -15/0）

2. 检查所有限位开关正常工作（参考附录 4）

电机不工作/异常

1. 检查排线（参考温度问题 – 温度显示 -15/0）

2. 打开底盖

3. 把有问题电机轴的电机驱动与正常工作的对调

4. 摆正机器，接上电源并通电，在触屏上手动移动电机（电机在复位前无法往负数移动）

   a. 如果电机工作正常，则电机驱动有问题，更换电机驱动

   b. 如果电机还是不工作

      i.   把有问题轴的电机与没问题的对调

      ii.   手动移动电机

           1.   工作不正常，如果为 X 或挤出机电机，检查排线

           2.   工作正常，则电机有问题，更换电机

无法开机

1. 确定打印机版本与您的国家电压兼容

2. 更换插座内的保险丝

3. 假如更换保险丝后还是无法开机

    a.   断开电源并打开底盖

    b.   机器侧躺的时候重新接上电源并打开

    c.   请注意不要触碰机器内电子元件

    d.   注意变压器上的 LED

      i.   LED 没有亮起

           1.   使用万用表，拨到 AC 模式，测量 L、N 之间的电压是否跟您国家的相同（注意，此处涉及到主电压，请确定您清楚并知道怎么样安全进行，如果你有怀疑，千万不要继续)

           2.   如果没有输入，重新检查保险丝是否正常工作。

      ii.   LED 有亮起，但是很暗

           1.   如果输入电压正常，检查变压器输出是否 24V

           2.   如果没有输出，或输出远低于 24V，更换变压器

层纹问题

响尾蛇 X1

1. 调整偏心轮，确保轮子都轻轻压住型材

2. 拉紧 X、Y 轴皮带

3. 使用卡尺，对 XZ 框架的上下端内部宽度进行测量，确定他们在 0.2mm 的范围之内

    a.   要调整框架宽度，先把底部螺丝松开，并把型材往外拉（如果下端比上端窄），同时把螺丝锁紧。

4. 把 X 型材（2060）往上移动到顶部，确保型材两端与顶部型材的距离一样

    a.   你可能需要把 Z 轴皮带导轮的螺丝松开，并把 Z 轴电机线拔掉

5. 如果上面的调整均无法解决层纹问题，尝试把丝杆从机器上拿下来，在平整的表面上滚动以确保丝杆没有弯曲。

小天才

1. 拉紧 X、Y 轴皮带

2. 把两端 Z 轴滑车上，固定 X 轴 2060 铝型材的 4 个螺丝松开（不是松掉）

3. 尝试把 X 轴型材左右移动，型材应该能左右滑动

4. 重新把 4 个螺丝锁紧

5. 把 X 型材（2060）往上移动到顶部，确保型材两端与顶部型材的距离一样

    a. 你可能需要把 Z 轴皮带导轮的螺丝松开，并把 Z 轴电机线拔掉

6. 如果上面的调整均无法解决层纹问题，尝试把丝杆从机器上拿下来，在平整的表面上滚动以确保丝杆没有弯曲。

滑车直接撞上限位器/热床

1. 进行限位器测试（参考附录 4）

挤出机问题

挤出机不挤出

1. 确定喷嘴温度为 170C 或以上（挤出机在 170C 以下不会工作）

2. 手动挤出时大齿轮是否有转动

    a. 有

        i. 是否逆时针方向旋转？

            1. 是

                a. 检查挤出机手柄是否断裂。如果断裂，请联系客服。

                b. 尝试手动把耗材推过喷嘴以检查是否堵头

                c. 调整手柄压力

            2. 否

                a. 你最近有否重刷固件

                    i. 有，检查你的源码

                    ii. 没有。进行对调电机驱动以排除是否驱动问题。

    b. 没有

        i. 检查排线

        ii. 检查电机驱动

        iii. 检查电机

打印中途不出料

1. 大齿轮有否转动？

    a. 有

i. 检查散热风散有否转动

1. 没有转动，先关闭打印机，把吹料风扇与散热风扇对调并通电

2. 加热喷嘴到 50C 以上，如果此时候风扇转动，则散热风扇坏，更换散热风扇

3. 如果加热后风扇依然没有转动，检查排线，并用万用表测试转接板上风扇端子是否有 24V。

ii. 用手触摸打印机金属盖子，如果盖子烫手，则有可能散热不良，可尝试在散热片及挤出机盖子间涂上散热膏。

b. 没有

i. 检查排线

喷嘴漏料

1. 加热喷嘴并清理加热块上的残留耗材

2. 把喷嘴拆散，并根据下列步骤重新组装：

   a. 把铜喷嘴安装到加热块上，拧到底并反转半圈

   b. 装上喉管，拧紧

   c. 把加热块装回机器上，并加热到 200C

   d. 等候 1 分钟

   e. 使用扳手固定住加热块，拧紧铜喷嘴，拧紧时注意不要弄断喉管

挤出机 LED 不工作

1. 换上备用 LED

   a. 如果备用也不工作，你有否最近重刷固件？如果有请检查你的源码。

2. 检查排线

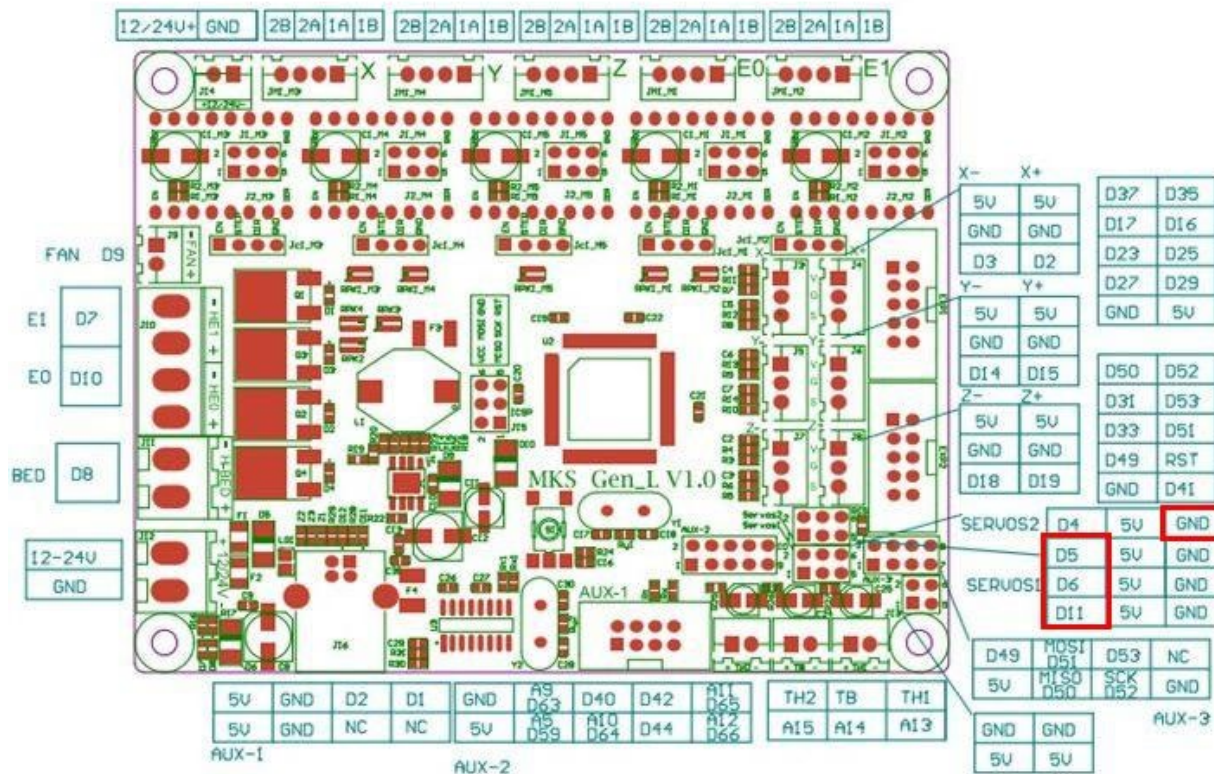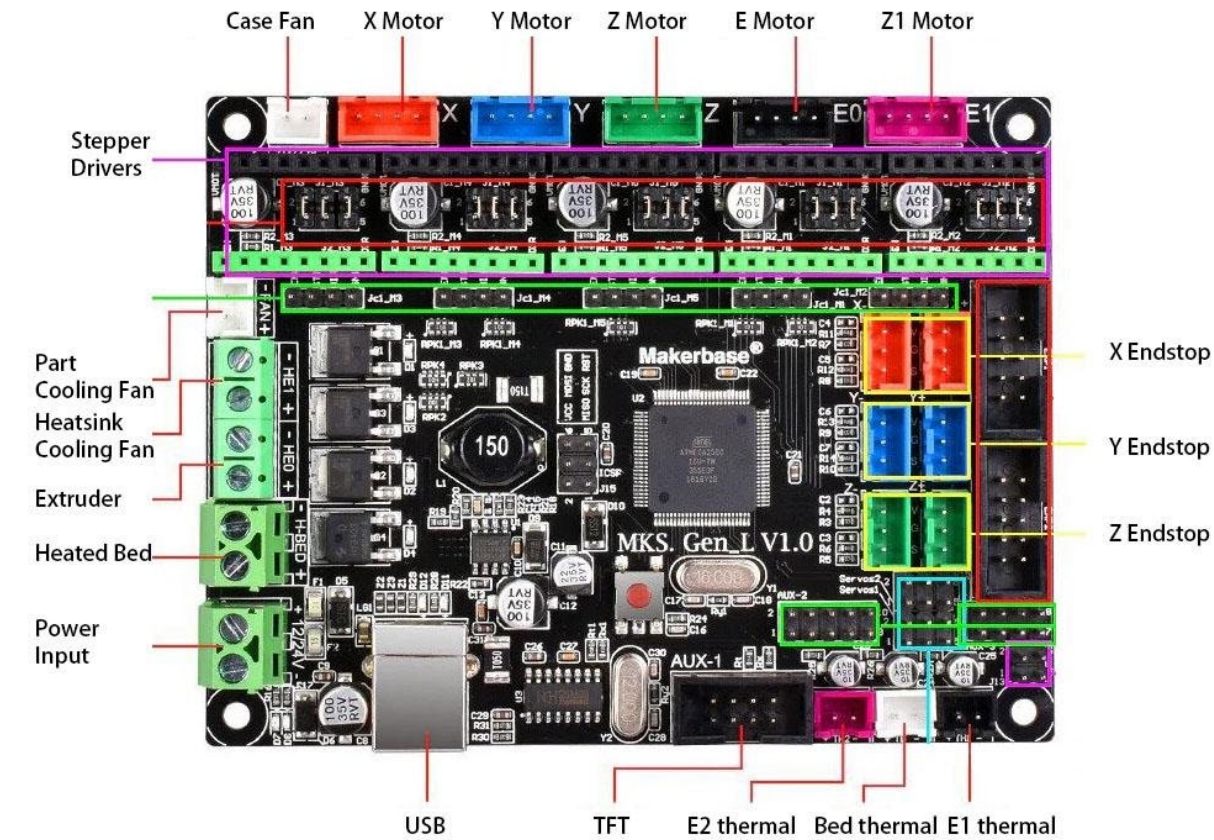3. 在触屏上选择打开 LED（白色）并测量 LED 针脚的电压

4. 打开底盖并确认 LED 延长线没有松脱

断料感应器随机触发

1. 更换断料感应器

Checksum Mismatch

1. 打开底盖

2. 移除触屏主板及 USB 转接板

3. 在触屏主板及转接板上的螺丝孔边上涂上非导电涂层（如指甲油）

4. 涂层完全干透后重新装上机器

5. 如果问题还不能解决，更换触屏主板及 USB 转接板

附录 1

LED 针脚

附录 2 – 如何刷固件

要重刷固件，你需要到 http://arduino.cc 下载 Arduino IDE 并安装。

你可以到 https://github.com/artillery3d 下载适用于我们机器的固件

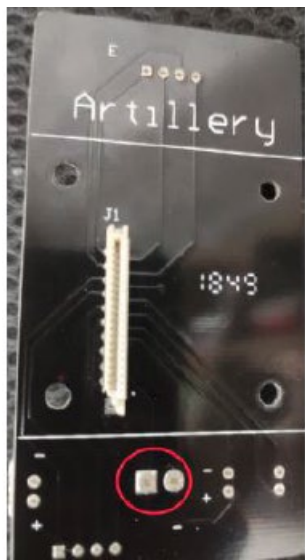下架并解压到本地，进入 Marlin 文件夹并双击 Marlin.ino

点击 Arduino IDE 左上角的勾号以编译及验证源码

正式上传钱，请先进行下列步骤

工具 -> 开发板 选择 "Arduino/Genuino Mega or Mega 2560"

端口 选择打印机连接到电脑后显示的新端口

进行以上步骤后，点击勾号旁的上传键

加热管针脚

附录 4 – 限位开关测试

要进行限位开关测试，请先连接打印机到电脑，并打开 Pronterface。

连线后，在 Pronterface 向打印机发送下列命令

```
M119
```

打印机会反馈当下限位开关的状态，triggered 为触发，open 为未触发

使用金属工具（如螺丝刀或扳手）触发限位开关，并向打印机发送 M119 命令。如果限位开关状态没有改变，则限位开关有问题。

附录 5 - PID 自动调整

要进行限位开关测试，请先连接打印机到电脑，并打开 Pronterface。

连线后，在打印机喷嘴室温状态下，在 Pronterface 向打印机发送下列命令

```
M303 E0 S240 C8
```

等候过程结束并返回下列信息，记录当中的 Kp, Ki 及 Kd 数值（每台机器的数值不一样）

```
Classic PID
Kp: 19.56
Ki: 0.71
Kd: 134.26
PID Autotune finished ! Place the Kp, Ki and Kd constants in the configuration.h
```

由于 EEPROM 为锁定状态，要使用新数值，你需要在切片软件的开始 Gcode 部分的顶部添加下列命令（请确定您使用的是您机器返回的数值）

```
M301 P19.56 I0.71 D134.26
```

为了取得更准确的数值，您可以在开始进行自动调整前，先手动在触屏上打开吹料风扇。