BIGTREETECH

Smart Filament Sensor Module

Operating instruction

Ⅰ. Product introduction

Smart Filament Detection Module is a filament detection module aiming at the defects of the broken materials detection module in the market. It was launched by the 3D printing team of ShenZhen BigTree Technology CO.,LTD .

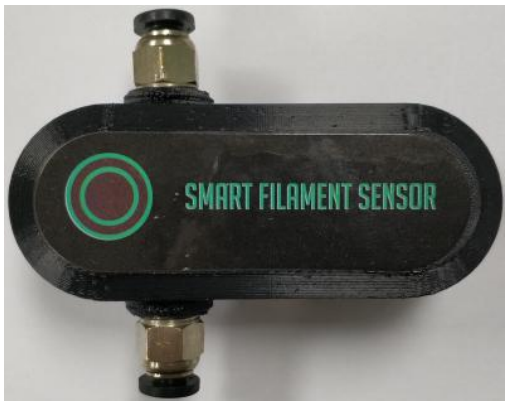
Ⅱ.Module Features

1) It can detect abnormal extrusion of filament caused by nozzle plugging, filament wrapping and extruder failure.
2) It works with open source firmware marlin 2.0.x. Marlin2.0 uses powerful development tools, Visual Studio Code integrated development environment: supports online debugging, which is more helpful for product development and performance optimization. Adopts C language development, so it has low development threshold.
3) Support motherboard with broken filament detection interface.
4) Support screen 2004,12864, TFT24 (12864 mode), tft35_v3.0 (12864 mode).
5) The module is being optimized and will be compatible with touch screen in the future.
6) Compatible touch screen TFT24, TFT35-V3.0.
7) Support for input power 3.3v-5v.

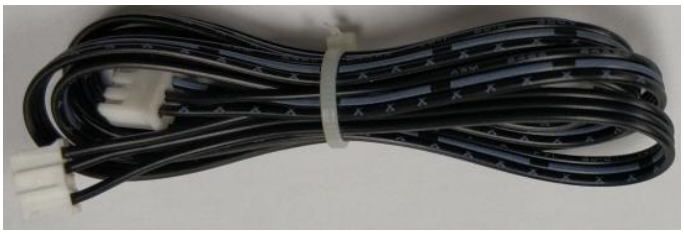
8) Support long - range and short - range extrusion.
9) Support 1.75mm diameter filament (please install the flexible filament before installing the extruder).
10) Installation is optional.

Ⅲ. Item listing

1) Smart Filament Sensor：



2) Smart Filament Detection Module Cable：



3) Smart Filament Detection Connector

4) Spare set screws：

Ⅳ.Module parameters

Module size:75mmX30mmX29.55mm

Fixed hole spacing：20.35mm

Filament detection diameter：1.75mm

Detection length：7mm

Voltage：3.3V~5V

Adapter firmware：marlin 2.0.X

Support extrusion: long - range extrusion, short - range extrusion

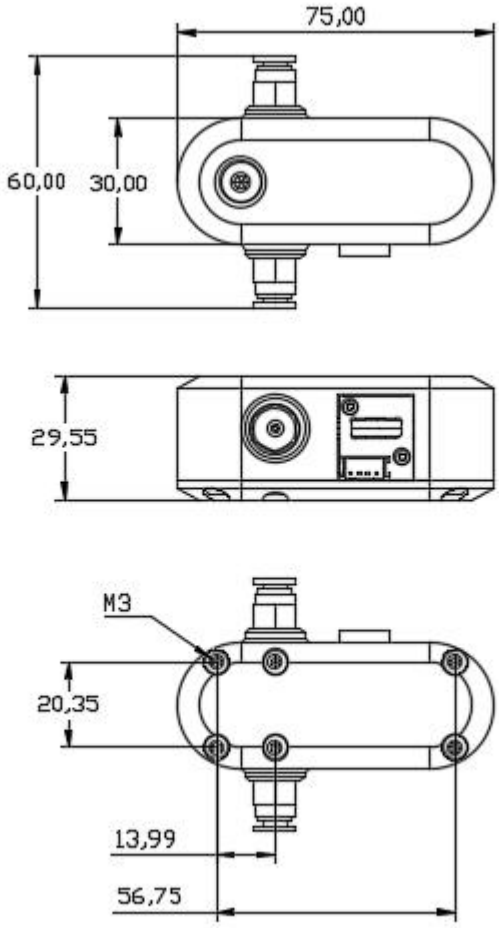


figure 1

Ⅴ. Firmware modification

1) The firmware of this product is marlin2.0.x. Screen 2004,12864, TFT24 (12864 mode), tft35_v3.0 (12864 mode) can be used directly. The motherboard that can be used :SKR V1.3; SKR mini E3. SKR E3 DIP; MKS CEN L; MKS GEN V1.4. The modification method is shown in figure 2.

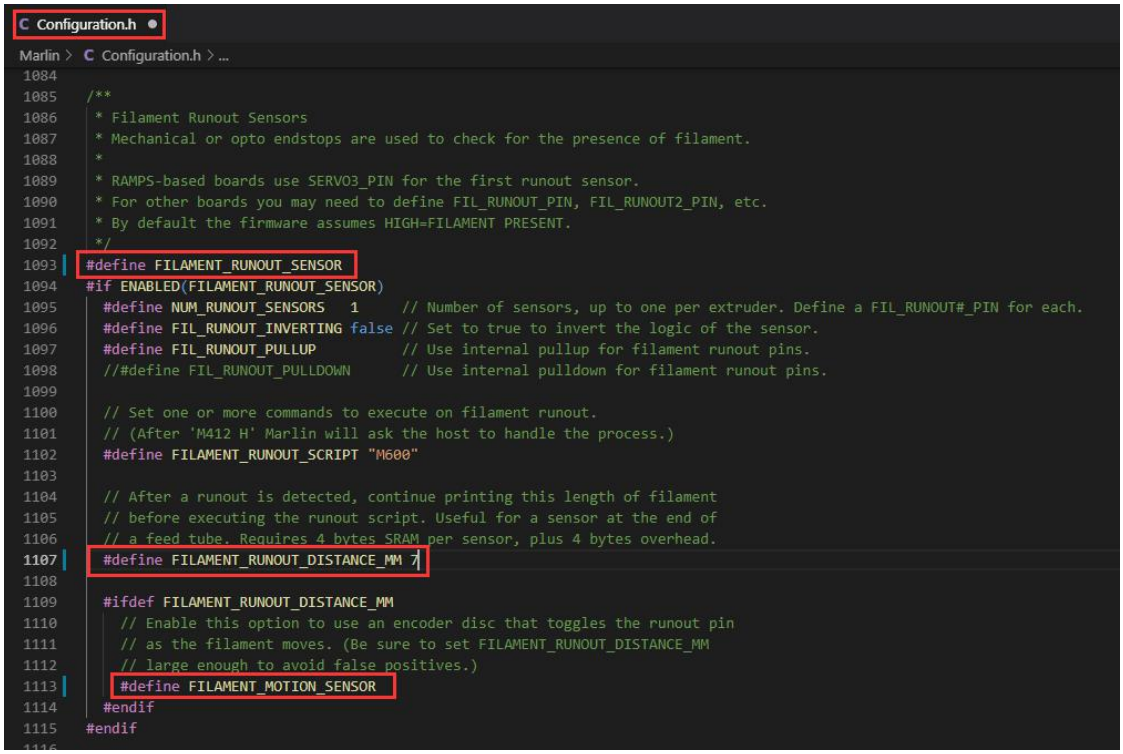


figure 2

The configuration to be modified is:

Uncomment #define FILAMENT_RUNOUT_SENSOR Turn on the consumables detection sensor

Uncomment #define FILAMENT_RUNOUT_DISTANCE_MM 7 Sets the accuracy of the sensor to 7mm

Uncomment #define FILAMENT_MOTION_SENSOR Sets the sensor to the encoder type

2) When using the serial touch screen mode, you also need to enable "M114_DETAIL" in marlin ,as shown in Figure 3

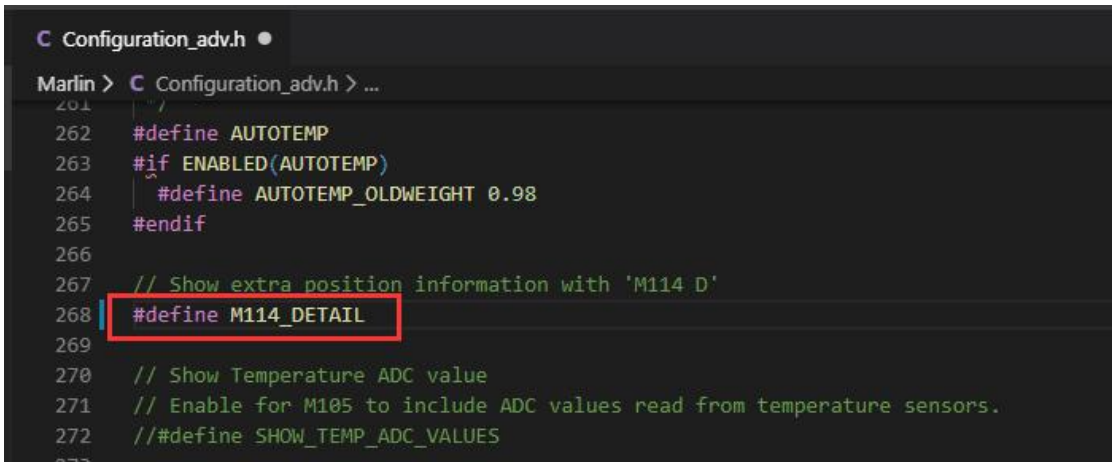


Figure 3

3) Interface to modification

Modify the interface location as shown in figure 4. Change the interface to any extended interface.

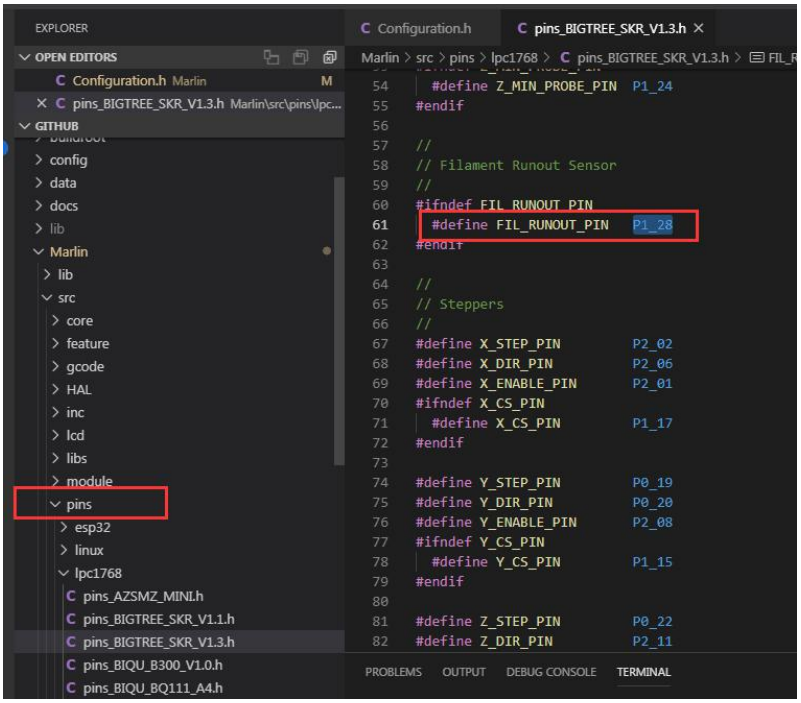


figure 4

4) Relevant parameters after modification

The modified position is shown in figure 5, and parameters such as the backpull speed and backpull distance after suspension can be controlled.

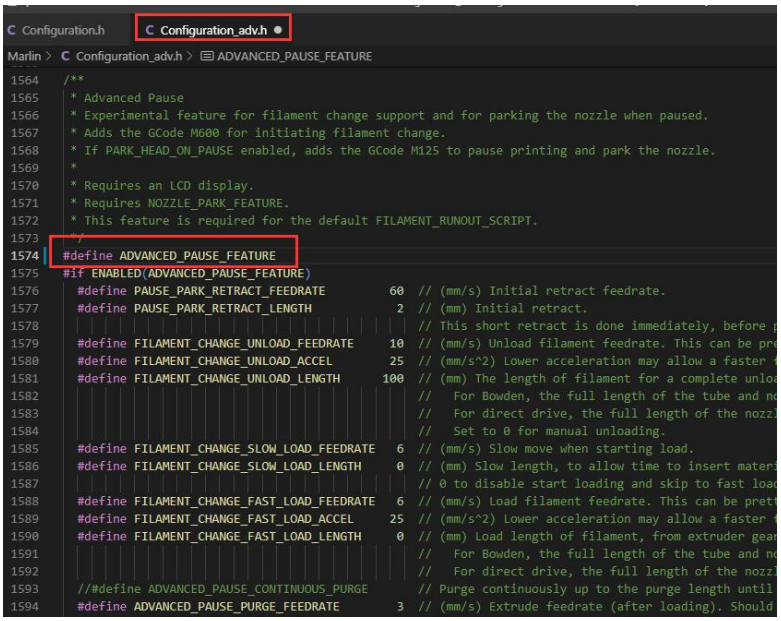


figure 5

5) Modify the pause position

The position where the nozzle stops after suspension can be set. The modified position is shown in figure 6.

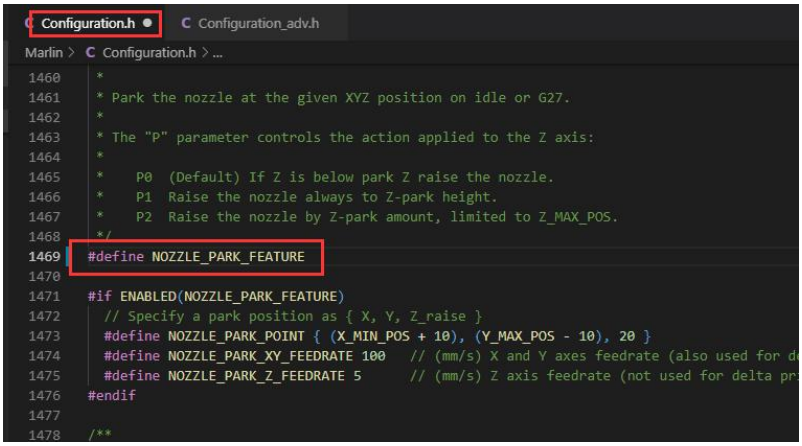


figure 6

6) Modify the screen

Modify figure 7 and figure 8 to use LCD2004. 12864, TFT24-12864 mode, TFT35-v3.0-12864 mode.

figure 7

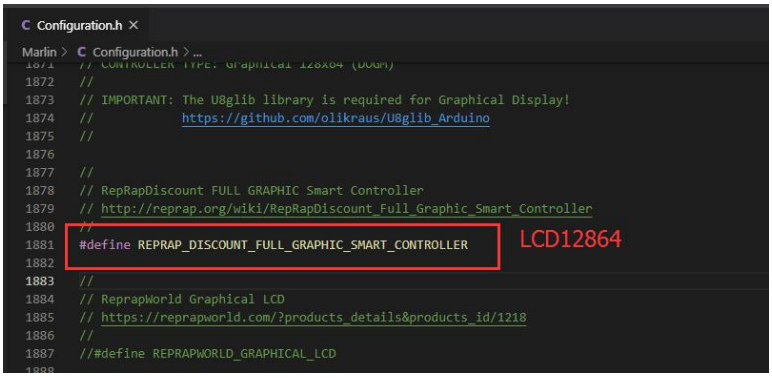


figure 8

Ⅵ.Touch screen Settings

Note: at present, the touch screen only supports TFT 24 and TFT35 V3.0 produced by our company

1) Select Settings in the ready to print screen

figure 9

2) Select function settings in the Settings interface

figure 10

3) Click filament detection in the function setting interface until the smart detection is on (The default setting of filament detection function on the screen is off. Click the icon again after the filament detection function is on to open the smart filament detection mode).

figure 11

figure 12

figure 13

Ⅵ. Wiring method

1) Take SKR V1.3 (figure 14) as an example

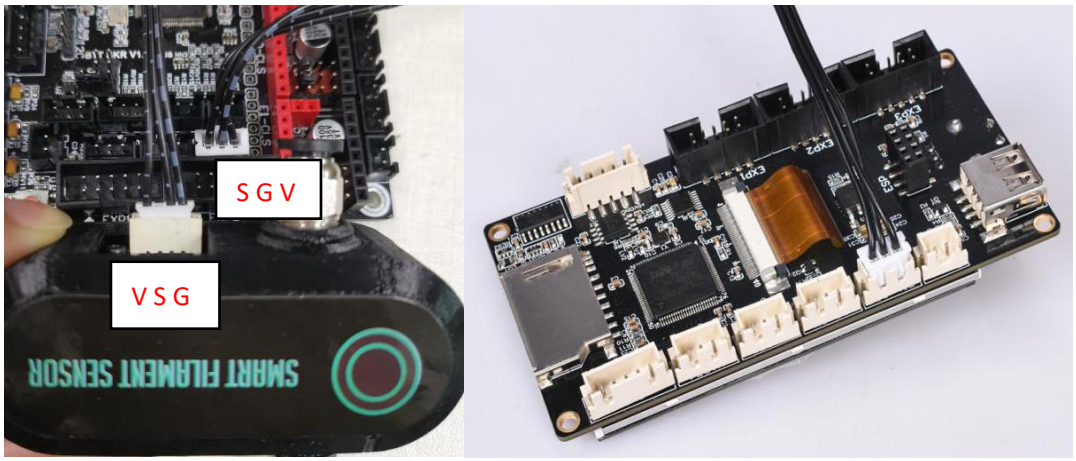


figure 14

The smart filament detection module uses a break detection interface (such as SKR V1.3 for E0DET). Any motherboard with a break detection interface can be used.

S for SIN

G for GND

V for VDD

Ⅷ.Installation method

Remove the pneumatic joint between the teflon tube and the extruder (as shown in figure 15-17)

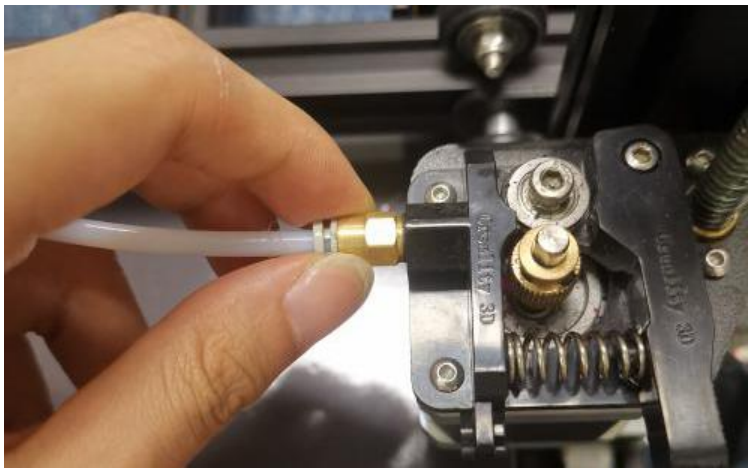


figure 15

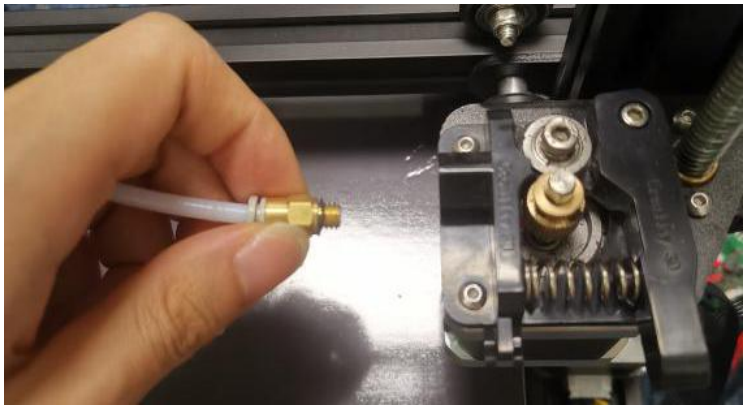


figure 16

figure 17

2)Insert the printer's teflon tube into the pneumatic joint (like Figure 18)

Note: The teflon tube needs to be fully inserted into the module in order to ensure that it will not affect the entry of filament.

figure 18

3) Screw the smart filament module connector into the extruder.(like figure 19)

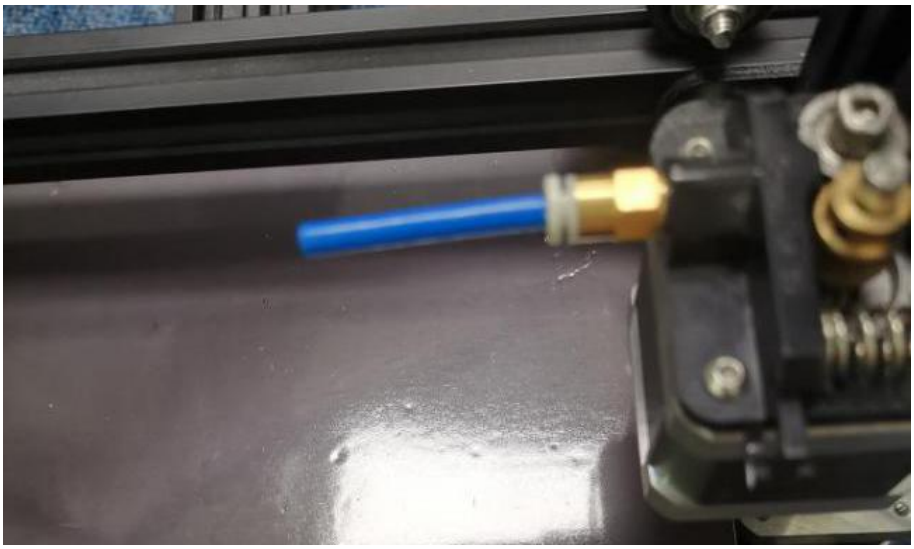


figure 19

4) Insert the smart filament module connector Teflon tube into the pneumatic joint (like Figure 20)

Note: Teflon tube needs to be fully inserted into the module so that it does not affect the entry of filament.

figure 20

5) Other fixed methods

The two screw holes shown in Figure 10 can be used for fixing, and the printed piece can be designed according to the fixed position. So this module can be applied to the proximity extruder.

figure 21

Ⅸ.Notes

1) This module is powered by 3.3v or 5V, so high voltage will cause damage to the module.

2) Frequent and wrong screwing of screws and pneumatic connectors will damage the shell.

3) Scrap and dust may cause false alarms and you need to remove the module to clean.

4) Please consult technical support before using the motherboard with no broken filament detection module.

5) If you use a touch mode on display, the smart filament sensor can only be connected to the display and use.