



Makerbase

广州谦辉信息科技有限公司

Guangzhou Qianhui Information Technology Co.,Ltd.

3D Touch Auto Level Sensor Instruction Manual

MAKER BASE

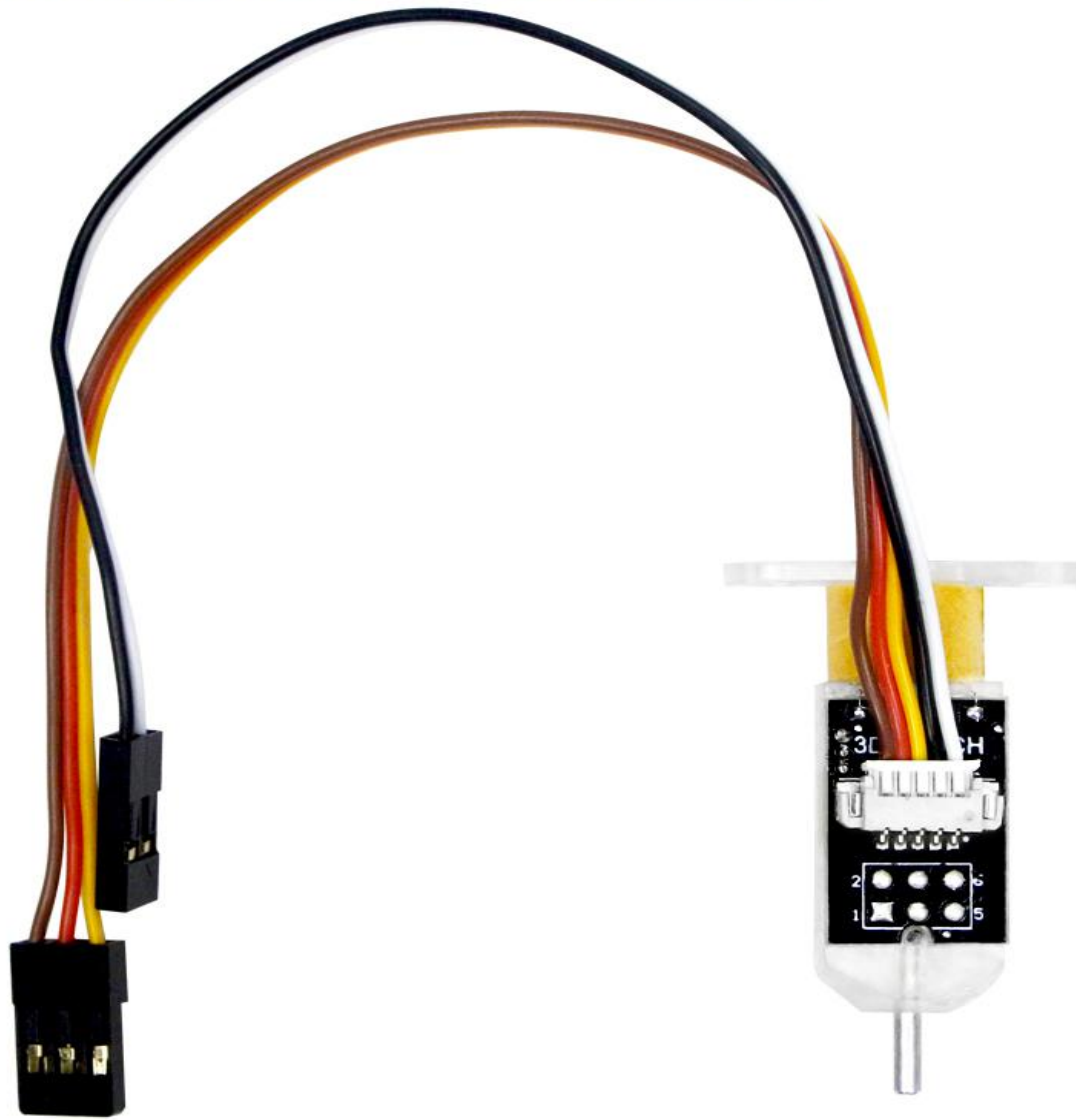
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The 3D Touch auto leveling sensor is a device that uses the Hall effect to achieve leveling. Can pass on a hot bed Touch the point to get the position of the point, then in the print, compensate by adjusting the height of the z-axis, and then tilt on the platform ,Printing can also be achieved in the case.



Product parameters

<i>Product parameters</i>	
<i>Voltage</i>	<i>5V</i>
<i>current</i>	<i>15nA</i>
<i>maximum current</i>	<i>300mA</i>
<i>Shell material</i>	<i>PC</i>
<i>shell color</i>	<i>translucent</i>
<i>Line length</i>	<i>Short:200mm long:1000mm</i>
<i>wiring</i>	<i>3pin Brown(- , gnd)</i> <i>Red(+ , 5v)</i> <i>Yellow(s ,Signal) (D11)</i> <i>2pin white (s ,signal)(Zmin or others)</i> <i>Black (- , gnd)</i>

3D Touch action order

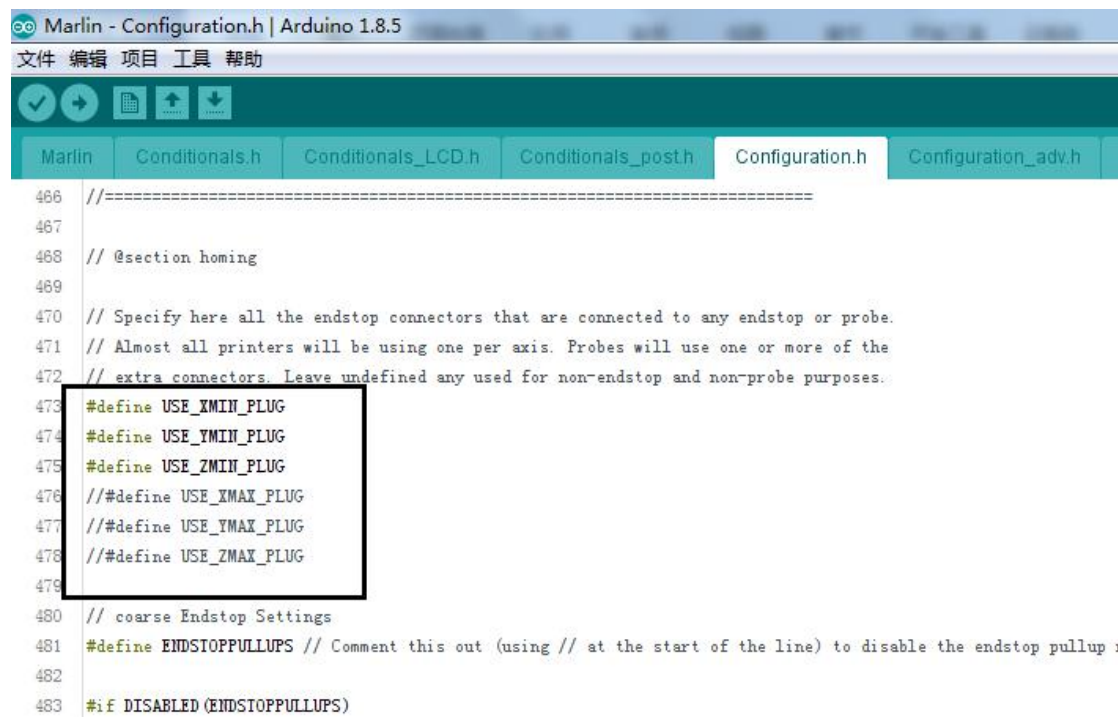
<i>action</i>	<i>G-code</i>		
	<i>marlin</i>	<i>repetier</i>	<i>smoothieware</i>
<i>push</i>	<i>M280 P0 S10</i>	<i>M340 P0 S700</i>	<i>M280 S3.0</i>
<i>back</i>	<i>M280 P0 S90</i>	<i>M340 P0 S1500</i>	<i>M280 S7.0</i>
<i>Self-test</i>	<i>M280 P0 S120</i>	<i>M340 P0 S1800</i>	<i>M280 S8.4</i>
<i>All clear</i>	<i>M280 P0 S160</i>	<i>M340 P0 S2200</i>	<i>M280 S10.6</i>

Firmware modification

Marlin firmware modification method (take Marlin 1.1.X firmware as an example) (3pin wire connection D11 (Note)Positive and negative)), 2PIN line connection Zmin.Or connect to the pin you set)

Configuration.h

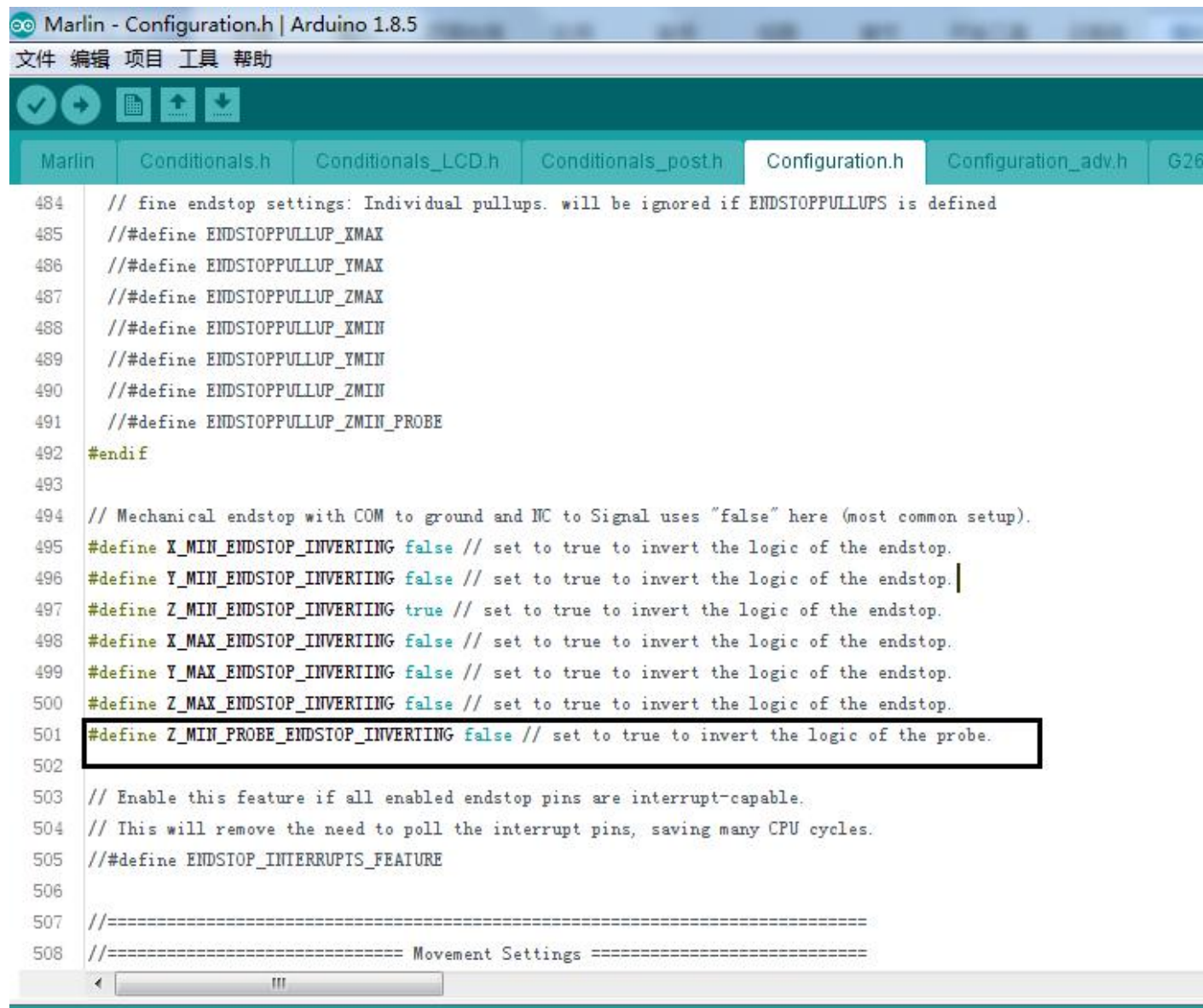
(1) Set the leveling port (Z+ or Z-), but you cannot share a pin port with the endstop. Delta structure leveling use Zmin as the interface for BLtouch and Zmax as the interface for the machine limit switch. I3 structure can be used Zmin as the interface of BLtouch, using the BLtouch sensor as the Z-axis limit sensor of the machine



```
466 //=====
467
468 // @section homing
469
470 // Specify here all the endstop connectors that are connected to any endstop or probe.
471 // Almost all printers will be using one per axis. Probes will use one or more of the
472 // extra connectors. Leave undefined any used for non-endstop and non-probe purposes.
473 #define USE_XMIN_PLUG
474 #define USE_YMIN_PLUG
475 #define USE_ZMIN_PLUG
476 // #define USE_XMAX_PLUG
477 // #define USE_YMAX_PLUG
478 // #define USE_ZMAX_PLUG
479
480 // coarse Endstop Settings
481 #define ENDSTOPPULLUPS // Comment this out (using // at the start of the line) to disable the endstop pullup
482
483 #if DISABLED (ENDSTOPPULLUPS)
```

If there is a limit used, you need to enable it here in advance.

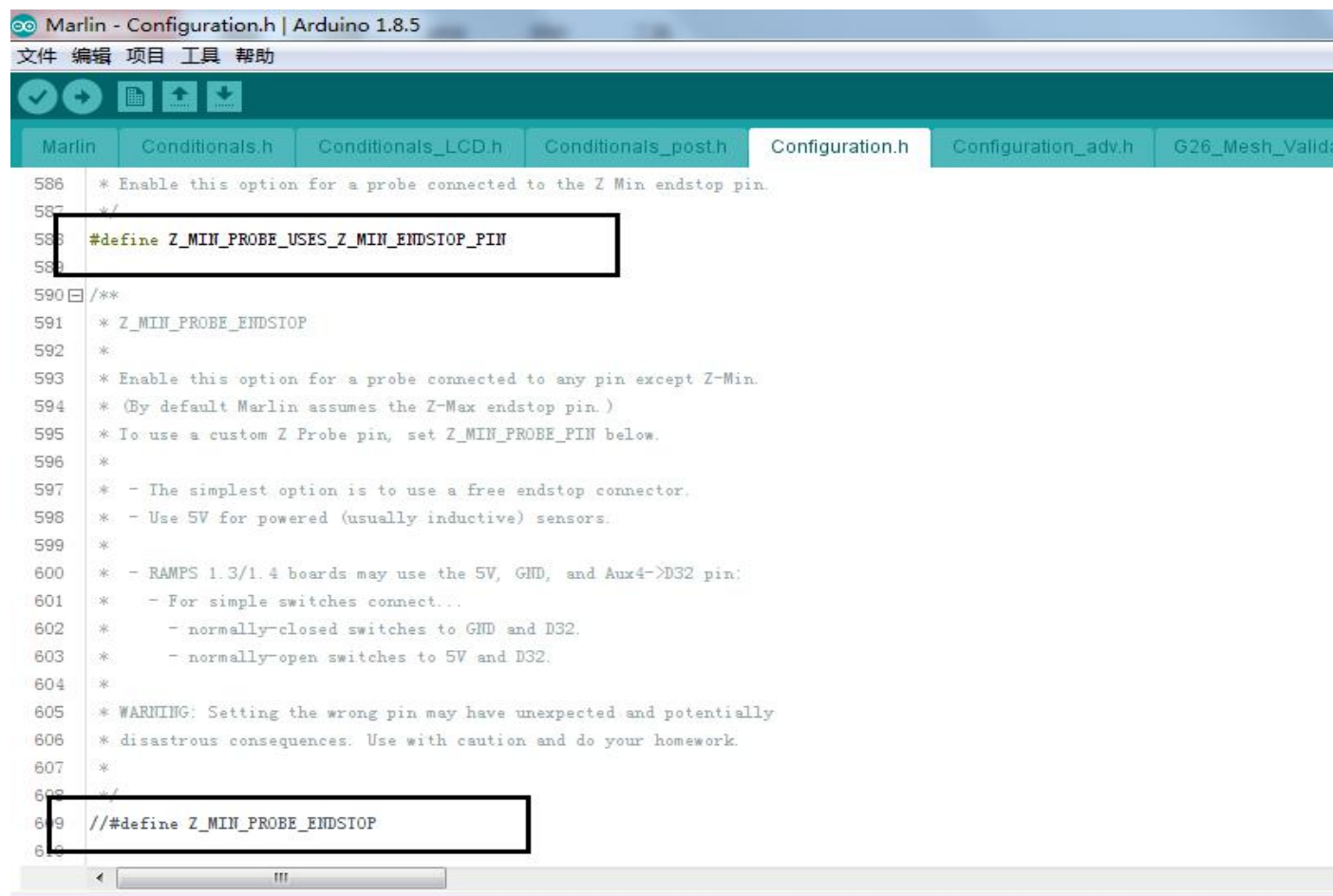
(2) Set the switch type of the leveling interface



```
484 // fine endstop settings: Individual pullups. will be ignored if ENDSTOPPULLUPS is defined
485 // #define ENDSTOPPULLUP_XMAX
486 // #define ENDSTOPPULLUP_YMAX
487 // #define ENDSTOPPULLUP_ZMAX
488 // #define ENDSTOPPULLUP_XMIN
489 // #define ENDSTOPPULLUP_YMIN
490 // #define ENDSTOPPULLUP_ZMIN
491 // #define ENDSTOPPULLUP_ZMIN_PROBE
492 #endif
493
494 // Mechanical endstop with COM to ground and NC to Signal uses "false" here (most common setup).
495 #define X_MIN_ENDSTOP_INVERTING false // set to true to invert the logic of the endstop.
496 #define Y_MIN_ENDSTOP_INVERTING false // set to true to invert the logic of the endstop.
497 #define Z_MIN_ENDSTOP_INVERTING true // set to true to invert the logic of the endstop.
498 #define X_MAX_ENDSTOP_INVERTING false // set to true to invert the logic of the endstop.
499 #define Y_MAX_ENDSTOP_INVERTING false // set to true to invert the logic of the endstop.
500 #define Z_MAX_ENDSTOP_INVERTING false // set to true to invert the logic of the endstop.
501 #define Z_MIN_PROBE_ENDSTOP_INVERTING false // set to true to invert the logic of the probe.
502
503 // Enable this feature if all enabled endstop pins are interrupt-capable.
504 // This will remove the need to poll the interrupt pins, saving many CPU cycles.
505 // #define ENDSTOP_INTERRUPTS_FEATURE
506
507 //=====
508 //===== Movement Settings =====
```

Set the switch type of the leveling switch to normally open or normally closed.

(3) Pin definition of the leveling switch



```
586 * Enable this option for a probe connected to the Z Min endstop pin.
587 */
588 #define Z_MIN_PROBE_USES_Z_MIN_ENDSTOP_PIN
589
590 /**
591 * Z_MIN_PROBE_ENDSTOP
592 *
593 * Enable this option for a probe connected to any pin except Z-Min.
594 * (By default Marlin assumes the Z-Max endstop pin.)
595 * To use a custom Z Probe pin, set Z_MIN_PROBE_PIN below.
596 *
597 * - The simplest option is to use a free endstop connector.
598 * - Use 5V for powered (usually inductive) sensors.
599 *
600 * - RAMPS 1.3/1.4 boards may use the 5V, GND, and Aux4->D32 pin:
601 *   - For simple switches connect...
602 *     - normally-closed switches to GND and D32.
603 *     - normally-open switches to 5V and D32.
604 *
605 * WARNING: Setting the wrong pin may have unexpected and potentially
606 * disastrous consequences. Use with caution and do your homework.
607 *
608 */
609 // #define Z_MIN_PROBE_ENDSTOP
610
```

```
#define Z_MIN_PROBE_USES_Z_MIN_ENDSTOP_PIN
```

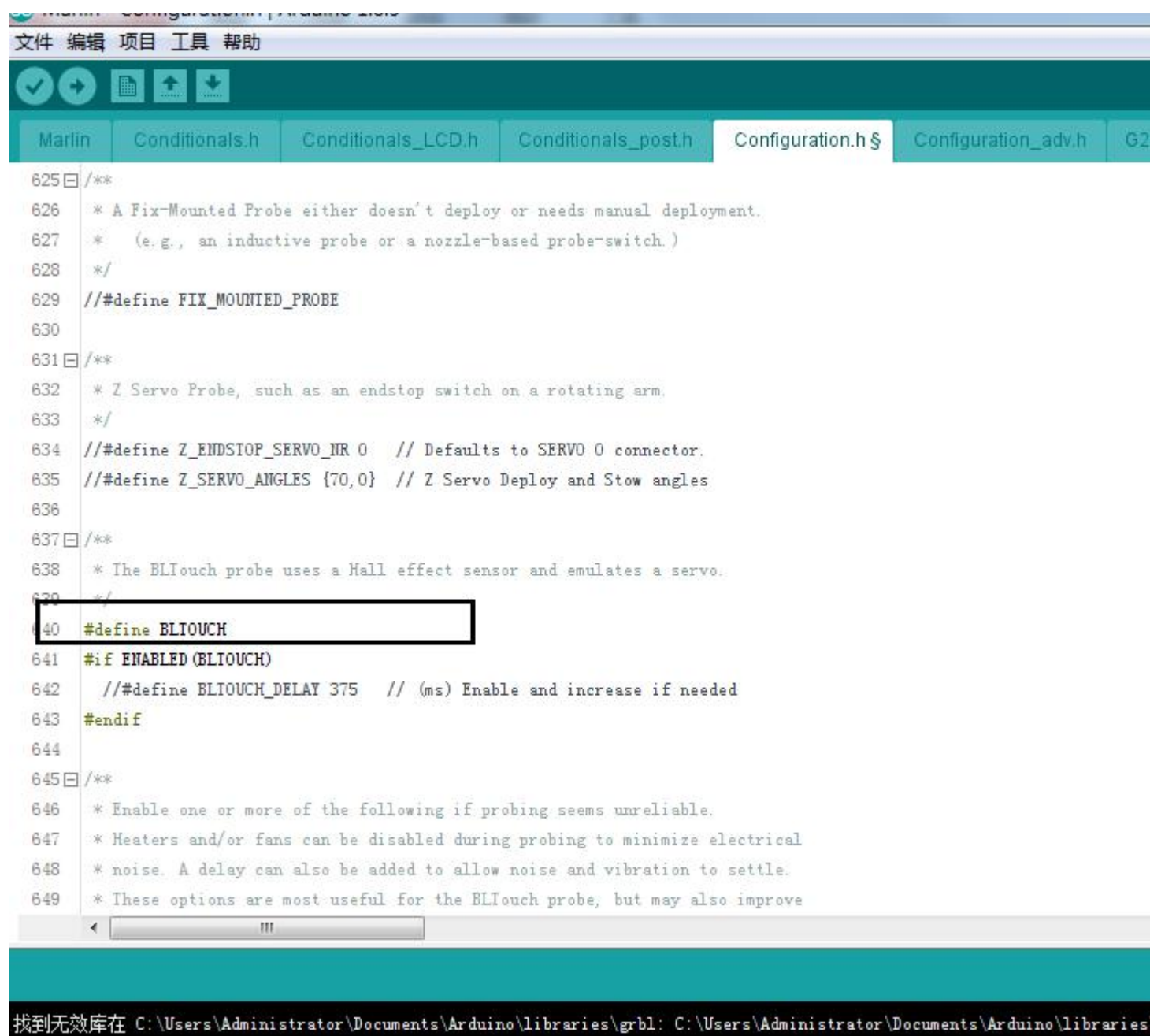
If you define this, Z-probe uses the same pin as Zmin (no need to define the pin of 3dtouch)

```
#define Z_MIN_PROBE_ENDSTOP
```

If you define this, Z-probe, The pin used by z-probe needs to be modified in the pins-ramps.h file.

For specific modifications, see the modification of the pins_ramps.h section later.

(4) Define *bltouch*



```
文件 编辑 项目 工具 帮助
Marlin Conditionals.h Conditionals_LCD.h Conditionals_post.h Configuration.h $ Configuration_adv.h G2
625 /**
626  * A Fix-Mounted Probe either doesn't deploy or needs manual deployment.
627  * (e.g., an inductive probe or a nozzle-based probe-switch.)
628  */
629  //#define FIX_MOUNTED_PROBE
630
631 /**
632  * Z Servo Probe, such as an endstop switch on a rotating arm.
633  */
634  //#define Z_ENDSTOP_SERVO_NR 0 // Defaults to SERVO 0 connector.
635  //#define Z_SERVO_ANGLES {70,0} // Z Servo Deploy and Stow angles
636
637 /**
638  * The BLTouch probe uses a Hall effect sensor and emulates a servo.
639  */
640  #define BLTOUCH
641  #if ENABLED(BLTOUCH)
642    //#define BLTOUCH_DELAY 375 // (ms) Enable and increase if needed
643  #endif
644
645 /**
646  * Enable one or more of the following if probing seems unreliable.
647  * Heaters and/or fans can be disabled during probing to minimize electrical
648  * noise. A delay can also be added to allow noise and vibration to settle.
649  * These options are most useful for the BLTouch probe, but may also improve
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```

```

670 *
671 * In the following example the X and Y offsets are both positive:
672 * #define X_PROBE_OFFSET_FROM_EXTRUDER 10
673 * #define Y_PROBE_OFFSET_FROM_EXTRUDER 10
674 *
675 *   +-+ BACK +-+
676 *   |           |
677 * L | (+) P | R ← probe (20,20)
678 * E |       | I
679 * F | (-) H (+) | G ← nozzle (10,10)
680 * I |       | H
681 *   | (-)   | I
682 *   |       |
683 *   0-- FRONT --+
684 *   (0,0)
685 */
686 #define X_PROBE_OFFSET_FROM_EXTRUDER 10 // X offset: -left +right [of the nozzle]
687 #define Y_PROBE_OFFSET_FROM_EXTRUDER 10 // Y offset: -front +behind [the nozzle]
688 #define Z_PROBE_OFFSET_FROM_EXTRUDER 0 // Z offset: -below +above [the nozzle]
689

```

(6) Leveling method and points

```

Marlin - Configuration.h | Arduino 1.8.5
文件 编辑 项目 工具 帮助
682 * of other systems. UBL also includes integrated Mesh Generation, Mesh
683 * Validation and Mesh Editing systems.
684 *
685 * - MESH_BED_LEVELING
686 * Probe a grid manually
687 * The result is a mesh, suitable for large or uneven beds. (See BILINEAR.)
688 * For machines without a probe, Mesh Bed Leveling provides a method to perform
689 * leveling in steps so you can manually adjust the Z height at each grid-point.
690 * With an LCD controller the process is guided step-by-step.
691 */
692 //#define AUTO_BED_LEVELING_3POINT
693 //#define AUTO_BED_LEVELING_LINEAR
694 #define AUTO_BED_LEVELING_BILINEAR
695 //#define AUTO_BED_LEVELING_UBL
696 //#define MESH_BED_LEVELING
697
698 /**
699 * Enable detailed logging of G28, G29, M48, etc.
700 * Turn on with the command 'M111 S32'.
701 * NOTE: Requires a lot of PROGMEM!
702 */
703 //#define DURING_INITIALIZATION_FEATURE

```



```
Marlin - Configuration.h | Arduino 1.8.5
文件 编辑 项目 工具 帮助

Marlin | Conditionals.h | Conditionals_LCD.h | Conditionals_post.h | Configuration.h $ | Configuration_adv.h | G26_Mesh_Val

898 * Enable the G26 Mesh Validation Pattern tool.
899 */
900 #define G26_MESH_VALIDATION // Enable G26 mesh validation
901 #if ENABLED(G26_MESH_VALIDATION)
902 #define MESH_TEST_NOZZLE_SIZE 0.4 // (mm) Diameter of primary nozzle.
903 #define MESH_TEST_LAYER_HEIGHT 0.2 // (mm) Default layer height for the G26 Mesh Validation Tool.
904 #define MESH_TEST_HOTEND_TEMP 205.0 // (° C) Default nozzle temperature for the G26 Mesh Validation Tool.
905 #define MESH_TEST_BED_TEMP 60.0 // (° C) Default bed temperature for the G26 Mesh Validation Tool.
906 #endif
907
908 #endif
909
910 #if ENABLED(AUTO_BED_LEVELING_LINEAR) || ENABLED(AUTO_BED_LEVELING_BILINEAR)
911
912 // Set the number of grid points per dimension.
913 #define GRID_MAX_POINTS_X 3
914 #define GRID_MAX_POINTS_Y GRID_MAX_POINTS_X
915
916 // Set the boundaries for probing (where the probe can reach).
917 #define LEFT_PROBE_BED_POSITION 15
918 #define RIGHT_PROBE_BED_POSITION 170
919 #define FRONT_PROBE_BED_POSITION 20
920 #define BACK_PROBE_BED_POSITION 170
921
922 // ...
```

(7) Set the zero return center

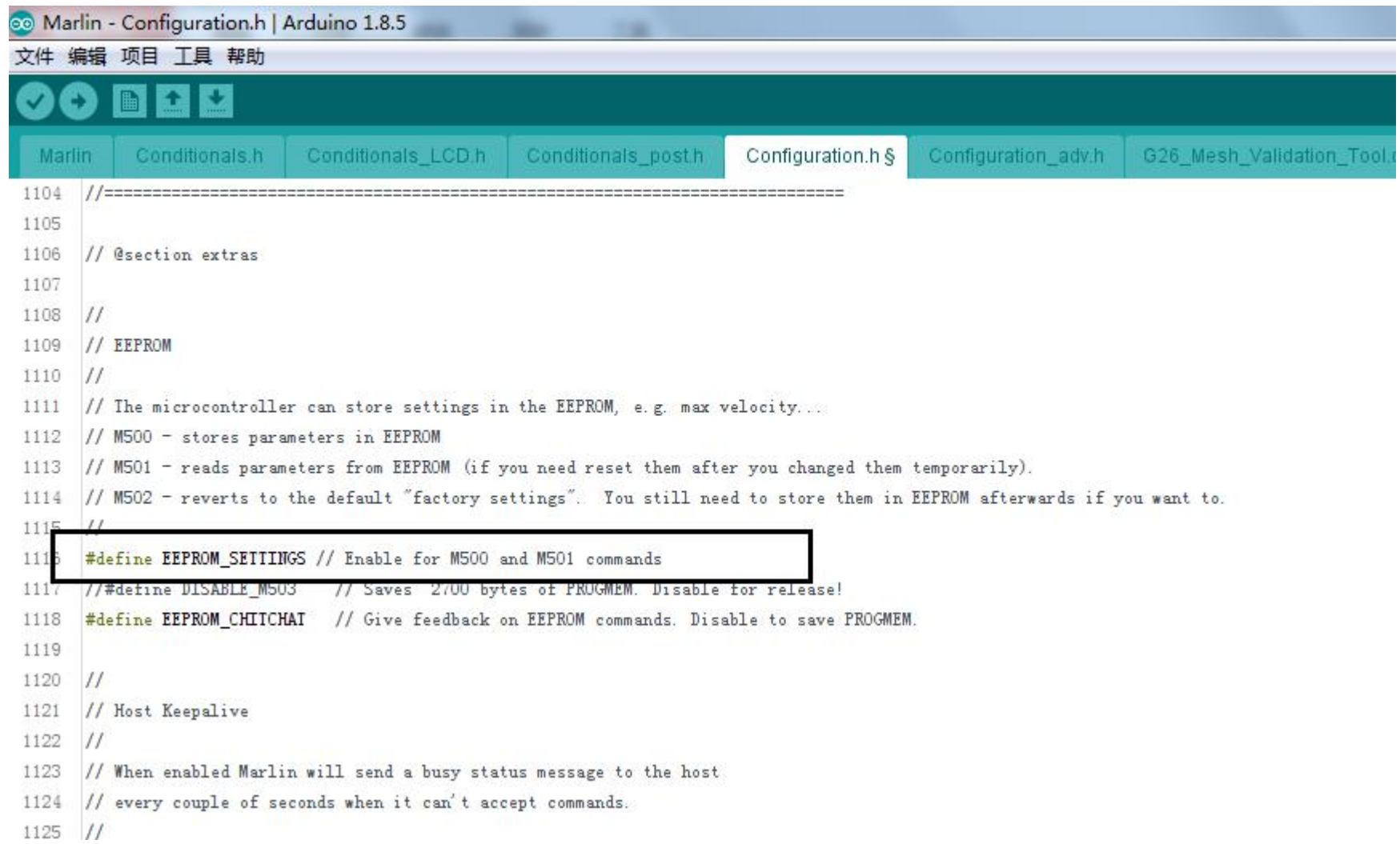
(Delta can not be set, if the machine with I3 structure uses BLtouch as the machine Z axis limit. The position sensor should be turned on to prevent the sensor from touching the hot bed. After turning on, the machine will move to the middle of the hot bed. Perform zero return on the Z axis)

```
Marlin | Conditionals.h | Conditionals_LCD.h | Conditionals_post.h | Configuration.h $ | Configuration_adv.h | G26_Mesh_Val

1027 // With this feature enabled:
1028 //
1029 // - Allow Z homing only after X and Y homing AND stepper drivers still enabled.
1030 // - If stepper drivers time out, it will need X and Y homing again before Z homing.
1031 // - Move the Z probe (or nozzle) to a defined XY point before Z Homing when homing all axes (G28).
1032 // - Prevent Z homing when the Z probe is outside bed area.
1033 //
1034 #define Z_SAFE_HOMING
1035
1036 #if ENABLED(Z_SAFE_HOMING)
1037 #define Z_SAFE_HOMING_X_POINT ((X_BED_SIZE) / 2) // X point for Z homing when homing all axes (G28).
1038 #define Z_SAFE_HOMING_Y_POINT ((Y_BED_SIZE) / 2) // Y point for Z homing when homing all axes (G28).
1039 #endif
1040
1041 // Homing speeds (mm/m)
1042 #define HOMING_FEEDRATE_XY (50*60)
1043 #define HOMING_FEEDRATE_Z (4*60)
1044
1045 // @section calibrate
1046
1047 /**
1048 * Bed Skew Compensation
1049 ...
```

(8) Save leveled data

Enable M500 to save data



```
1104 //=====
1105
1106 // @section extras
1107
1108 //
1109 // EEPROM
1110 //
1111 // The microcontroller can store settings in the EEPROM, e.g. max velocity...
1112 // M500 - stores parameters in EEPROM
1113 // M501 - reads parameters from EEPROM (if you need reset them after you changed them temporarily).
1114 // M502 - reverts to the default "factory settings". You still need to store them in EEPROM afterwards if you want to.
1115 //
1116 #define EEPROM_SETTINGS // Enable for M500 and M501 commands
1117 // #define DISABLE_M503 // Saves 2700 bytes of PROGMEM. Disable for release!
1118 #define EEPROM_CHITCHAT // Give feedback on EEPROM commands. Disable to save PROGMEM.
1119
1120 //
1121 // Host Keepalive
1122 //
1123 // When enabled Marlin will send a busy status message to the host
1124 // every couple of seconds when it can't accept commands.
1125 //
```

Open **Marlin_main.cpp** and find: Add `set_bed_leveling_enabled(true);`

as follows

case 28: // G28: Home all axes, one at a time

`gcode_G28(false);`

`set_bed_leveling_enabled(true);`

`break;`



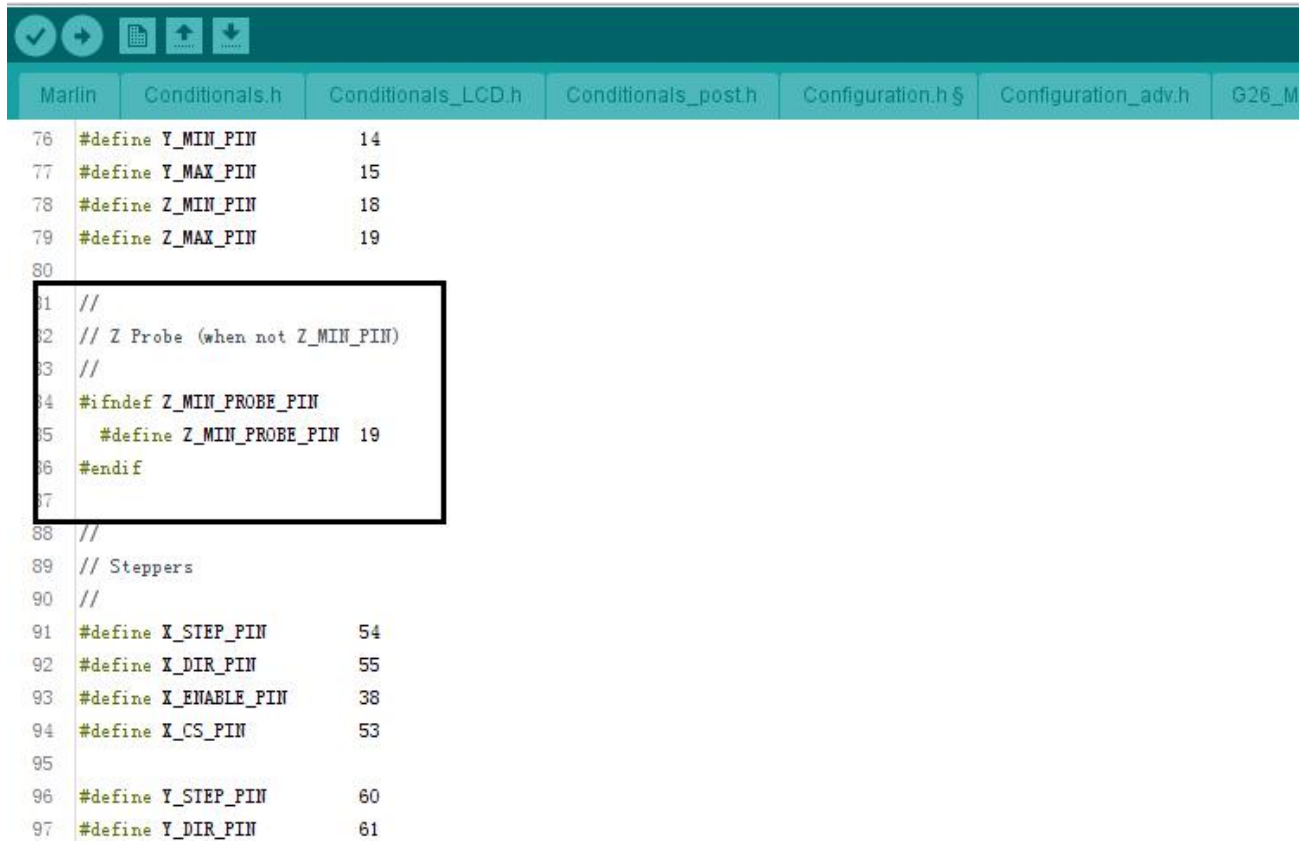
```
11670     #if ENABLED(NOZZLE_PARK_FEATURE)
11671         case 27: // G27: Nozzle Park
11672             gcode_G27();
11673             break;
11674     #endif // NOZZLE_PARK_FEATURE
11675
11676     case 28: // G28: Home all axes, one at a time
11677         gcode_G28(false);
11678         set_bed_leveling_enabled(true)
11679         break;
11680
11681     #if HAS_LEVELING
11682         case 29: // G29 Detailed Z probe, probes the bed at 3 or more points,
11683             // or provides access to the UBL System if enabled.
11684             gcode_G29();
11685             break;
11686     #endif // HAS_LEVELING
11687
11688     #if HAS_BED_PROBE
11689
11690         case 30: // G30 Single Z probe
11691             gcode_G30();
11692             break;
11693
11694     #if ENABLED(Z_PROBE_SLED)
```

(Note: Be sure to add this sentence, otherwise you will not be able to save the data)

pins_RAMPS.h Modify the following sections:

1 Define the pin of 3D-TOUCH

(If you define the #define Z_MIN_PROBE_USES_Z_MIN_ENDSTOP_PIN, Do not modify this)

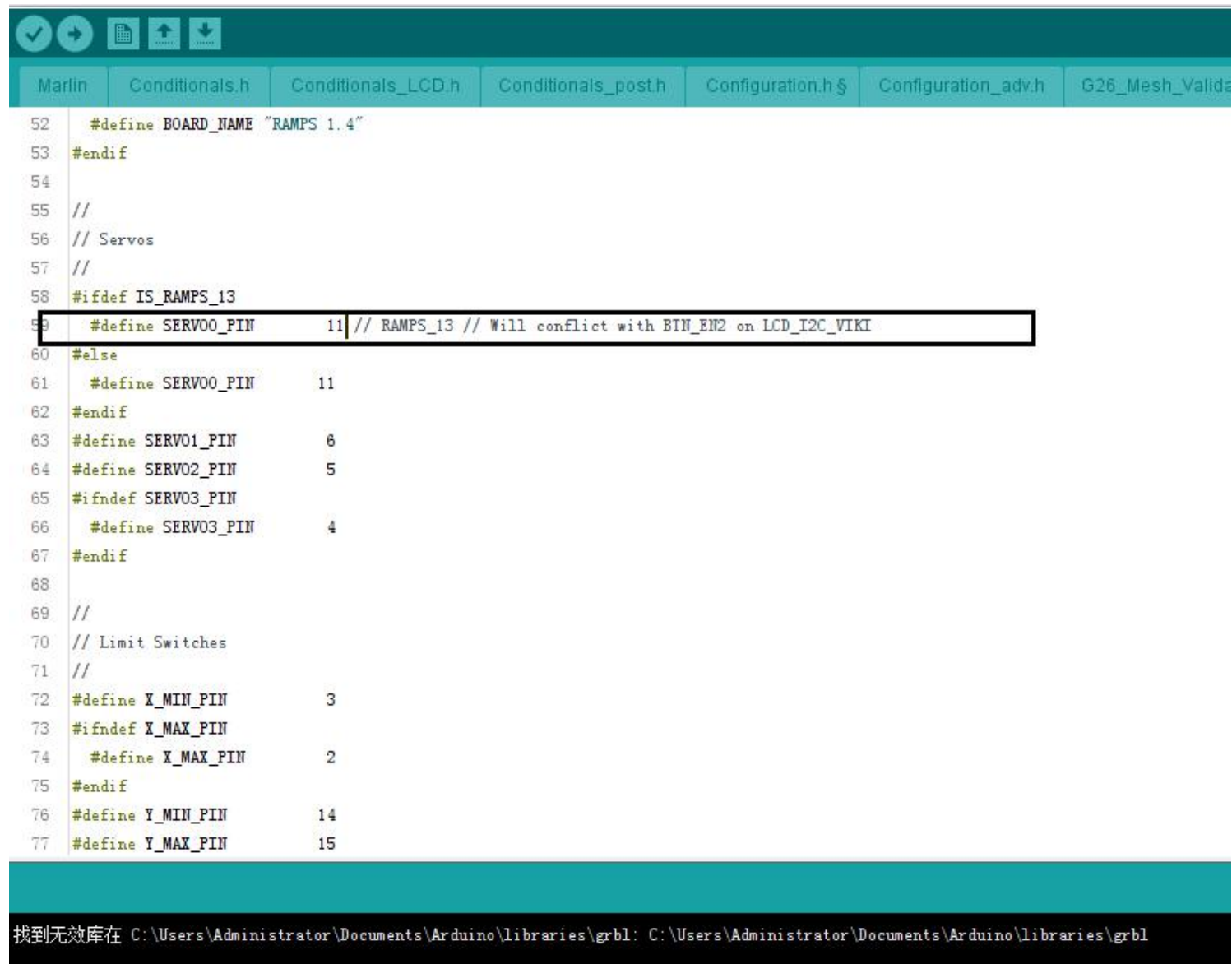


```
76 #define Y_MIN_PIN      14
77 #define Y_MAX_PIN      15
78 #define Z_MIN_PIN      18
79 #define Z_MAX_PIN      19
80
81 //
82 // Z Probe (when not Z_MIN_PIN)
83 //
84 #ifndef Z_MIN_PROBE_PIN
85   #define Z_MIN_PROBE_PIN 19
86 #endif
87
88 //
89 // Steppers
90 //
91 #define X_STEP_PIN      54
92 #define X_DIR_PIN       55
93 #define X_ENABLE_PIN    38
94 #define X_CS_PIN        53
95
96 #define Y_STEP_PIN      60
97 #define Y_DIR_PIN       61
```

As shown in the figure, change the pin of z-probe to 19 (19 is the pin of Zmax limit, you can refer to the use and part of i3 model, both use 3D-touch, also retain the original Zmin endstop), also Can be changed to a pin that is not used on the motherboard.(Generally, you can set a vacant limit switch port.)

2. Define the steering gear PIN

If you connect to the D11 connector on the motherboard, change it to 11 here.



```
52 #define BOARD_NAME "RAMPS 1.4"
53 #endif
54 //
55 //
56 // Servos
57 //
58 #ifndef IS_RAMPS_13
59 #define SERVO0_PIN 11 // RAMPS_13 // Will conflict with BIN_EN2 on LCD_I2C_VIKI
60 #else
61 #define SERVO0_PIN 11
62 #endif
63 #define SERVO1_PIN 6
64 #define SERVO2_PIN 5
65 #ifndef SERVO3_PIN
66 #define SERVO3_PIN 4
67 #endif
68 //
69 //
70 // Limit Switches
71 //
72 #define X_MIN_PIN 3
73 #ifndef X_MAX_PIN
74 #define X_MAX_PIN 2
75 #endif
76 #define Y_MIN_PIN 14
77 #define Y_MAX_PIN 15
```

找到无效库在 C:\Users\Administrator\Documents\Arduino\libraries\grbl: C:\Users\Administrator\Documents\Arduino\libraries\grbl