Makerbase

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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

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

3D Touch action order

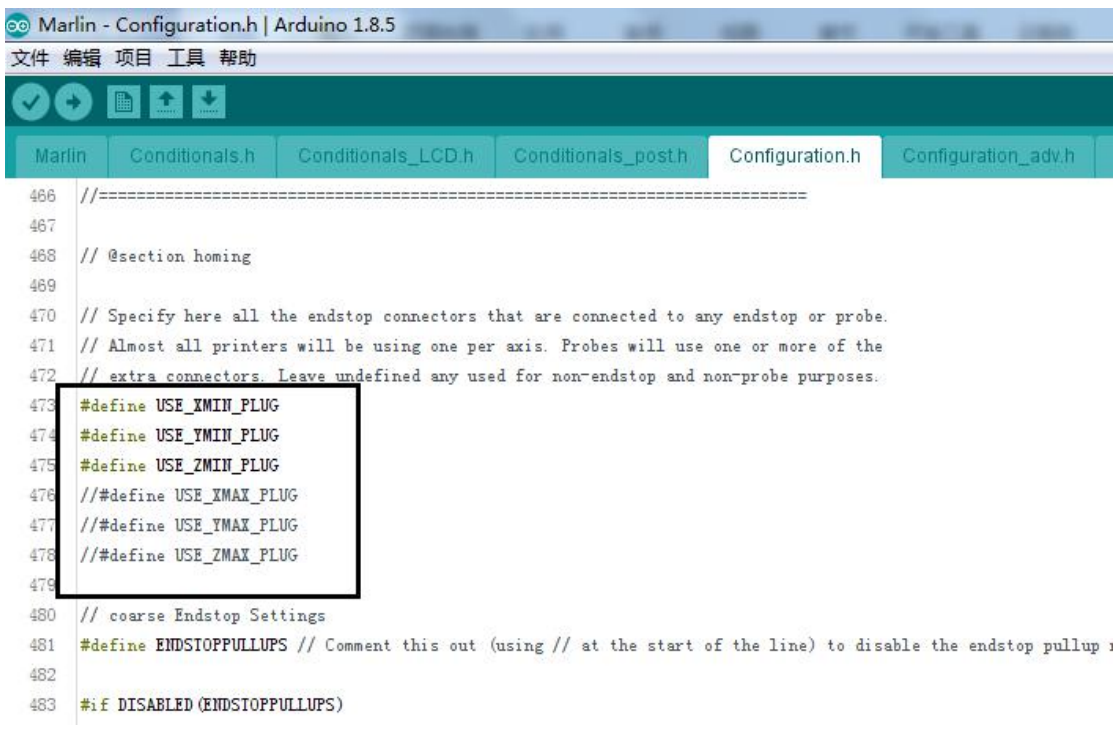
action	G-code		
	marlin	repetier	smoothieware
push	M280 P0 S10	M340 P0 S700	M280 S3.0
back	M280 P0 S90	M340 P0 S1500	M280 S7.0
Self-test	M280 P0 S120	M340 P0 S1800	M280 S8.4
All clear	M280 P0 S160	M340 P0 S2200	M280 S10.6

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



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

(2) Set the switch type of the leveling interface

Marlin - Configuration.h | Arduino 1.8.5

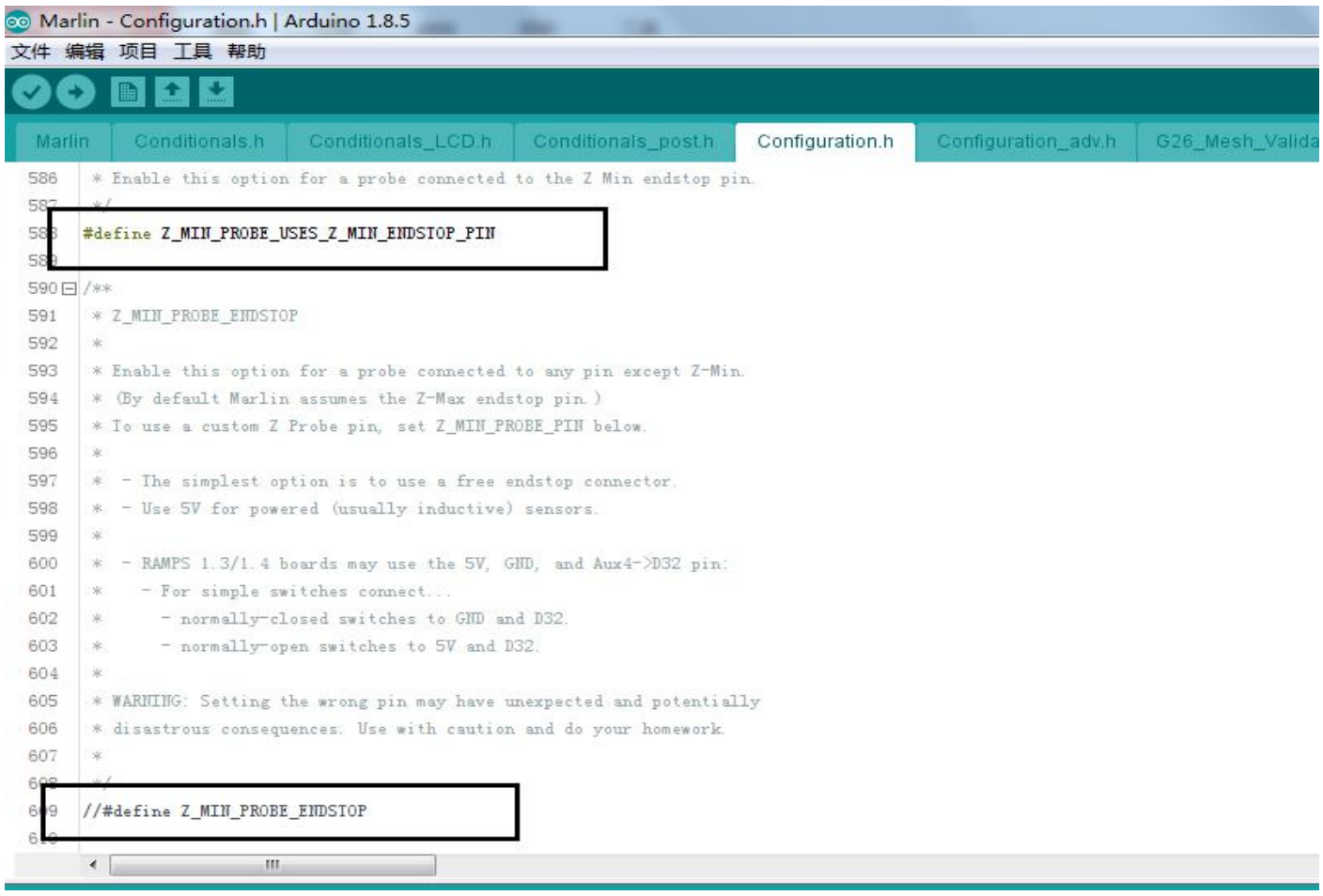
文件 编辑 项目 工具 帮助

Marlin | Conditionals.h | Conditionals_LCD.h | Conditionals_post.h | Configuration.h | Configuration_adv.h | G26_

```
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



#define Z_MIN_PROBE_USES_Z_MIN_ENDSTOP_PIN

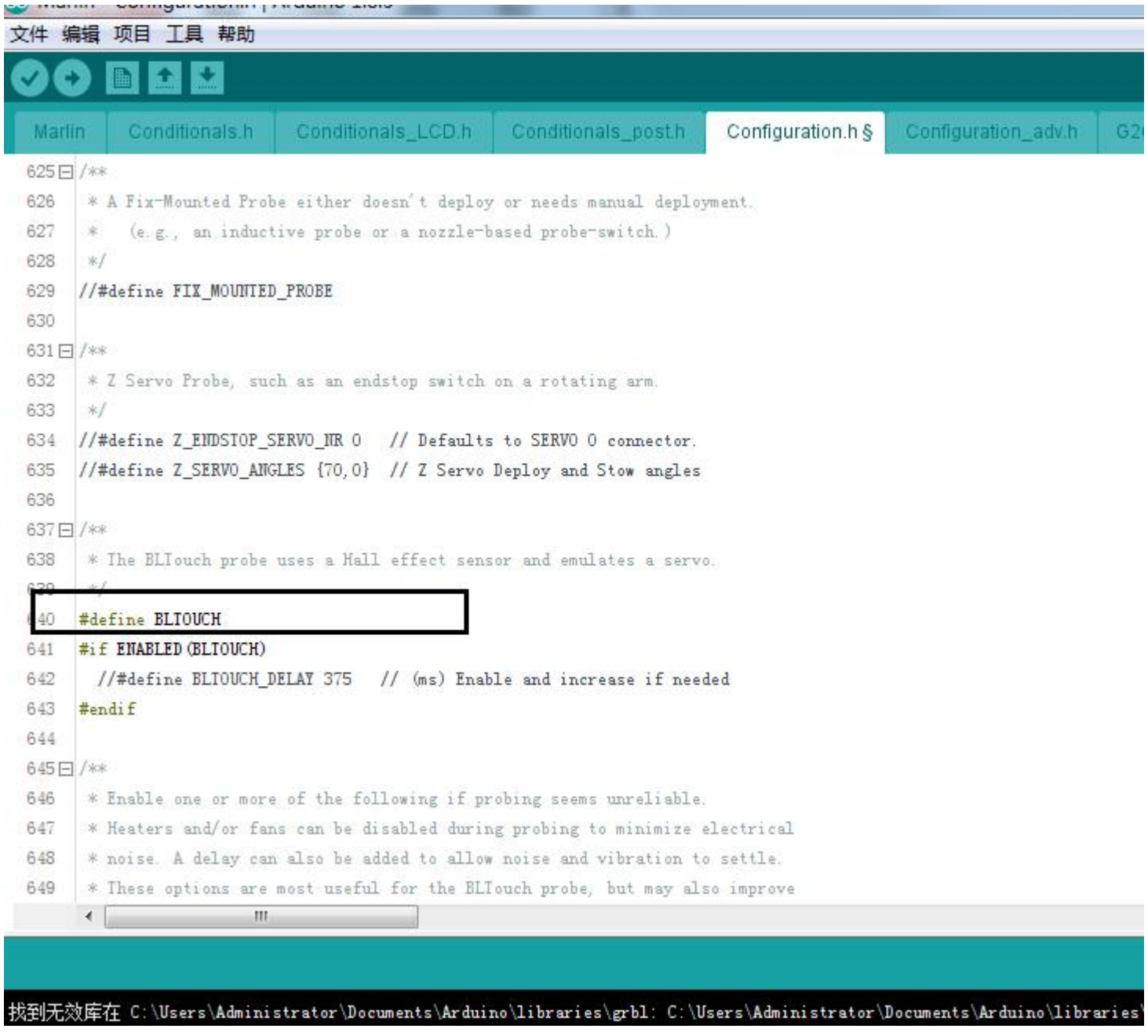
If you define this, Z-probe uses the same pin as Zmin (no need to define the pin of 3dtouch)

#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



(5) Z-probe and extrusion head offset adjustment

Marlin | Conditionals.h | Conditionals_LCD.h | Conditionals_post.h | Configuration.h § | Configuration_adv.h | G26_

```
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 | (-) N (+) | G <-- nozzle (10,10)
680  *    T |           | H
681  *      |    (-)    | T
682  *      |           |
683  *      O-- 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

Marlin | Conditionals.h | Conditionals_LCD.h | Conditionals_post.h | Configuration.h § | Configuration_adv.h | G2

```
862  *   of other systems. UBL also includes integrated Mesh Generation, Mesh
863  *   Validation and Mesh Editing systems.
864  *
865  * - MESH_BED_LEVELING
866  *   Probe a grid manually
867  *   The result is a mesh, suitable for large or uneven beds. (See BILINEAR.)
868  *   For machines without a probe, Mesh Bed Leveling provides a method to perform
869  *   leveling in steps so you can manually adjust the Z height at each grid-point.
870  *   With an LCD controller the process is guided step-by-step.
871  */
872 //#define AUTO_BED_LEVELING_3POINT
873 //#define AUTO_BED_LEVELING_LINEAR
874 #define AUTO_BED_LEVELING_BILINEAR
875 //#define AUTO_BED_LEVELING_UBL
876 //#define MESH_BED_LEVELING
877
878 /**
879  * Enable detailed logging of G28, G29, M48, etc.
880  * Turn on with the command 'M111 S32'.
881  * NOTE: Requires a lot of PROGMEM!
882  */
883 //#define DEBUG_LEVELING_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_V

```
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
```

(7) Set the zero return center

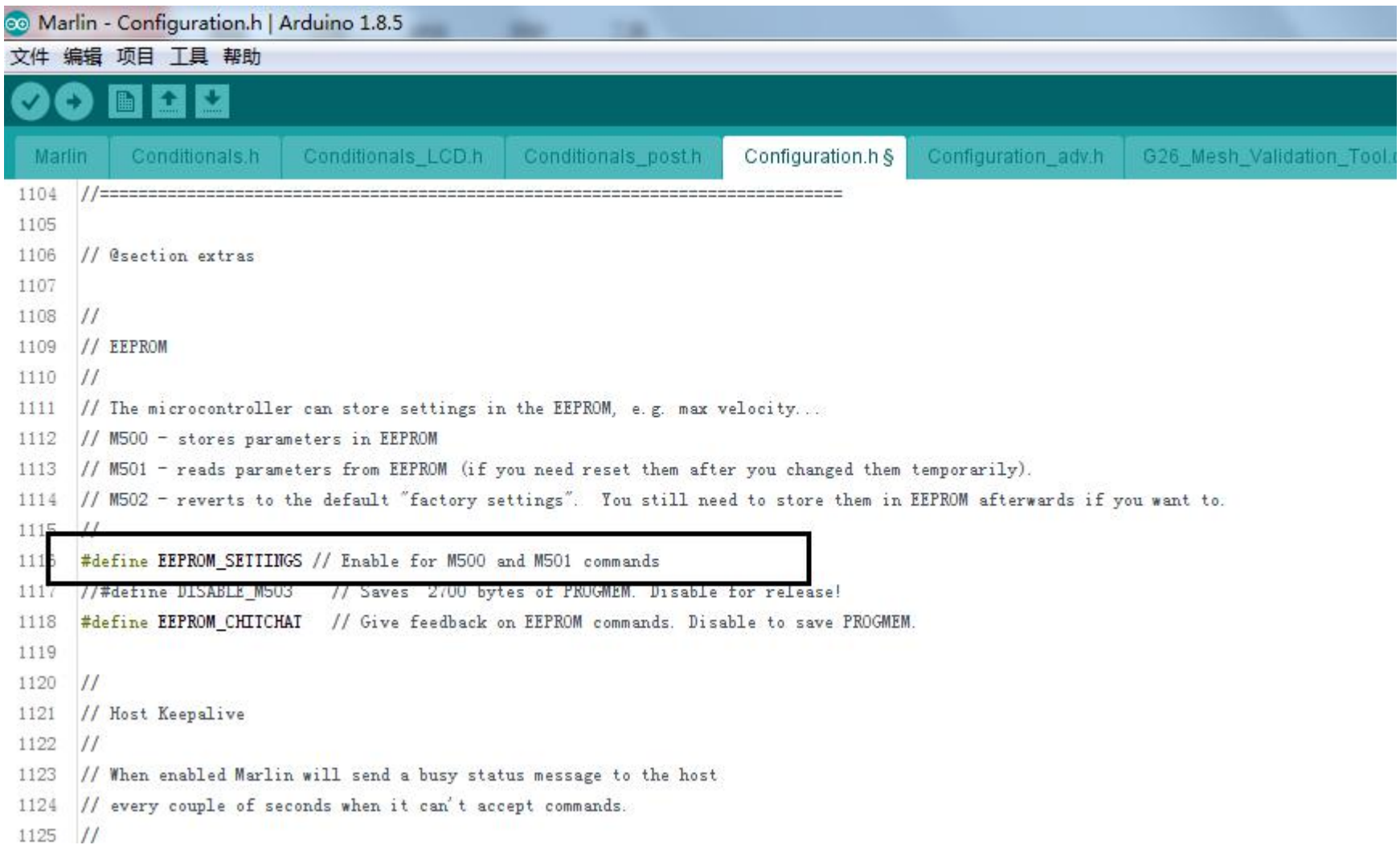
(Delta can not be set, if the machine with I3 structure uses BLtouch as the machine Z axis limit.The position sensor should be turned on to prevent the sensor from touching the hot bed. After turning on, the machine will move to the middle of the hot bed.Perform zero return on the Z axis)

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
```

(8) Save leveled data

Enable M500 to save data



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;

Marlin | Conditionals.h | Conditionals_LCD.h | Conditionals_post.h | Configuration.h § | Configuration_adv.h | G26_Mesh_Vali

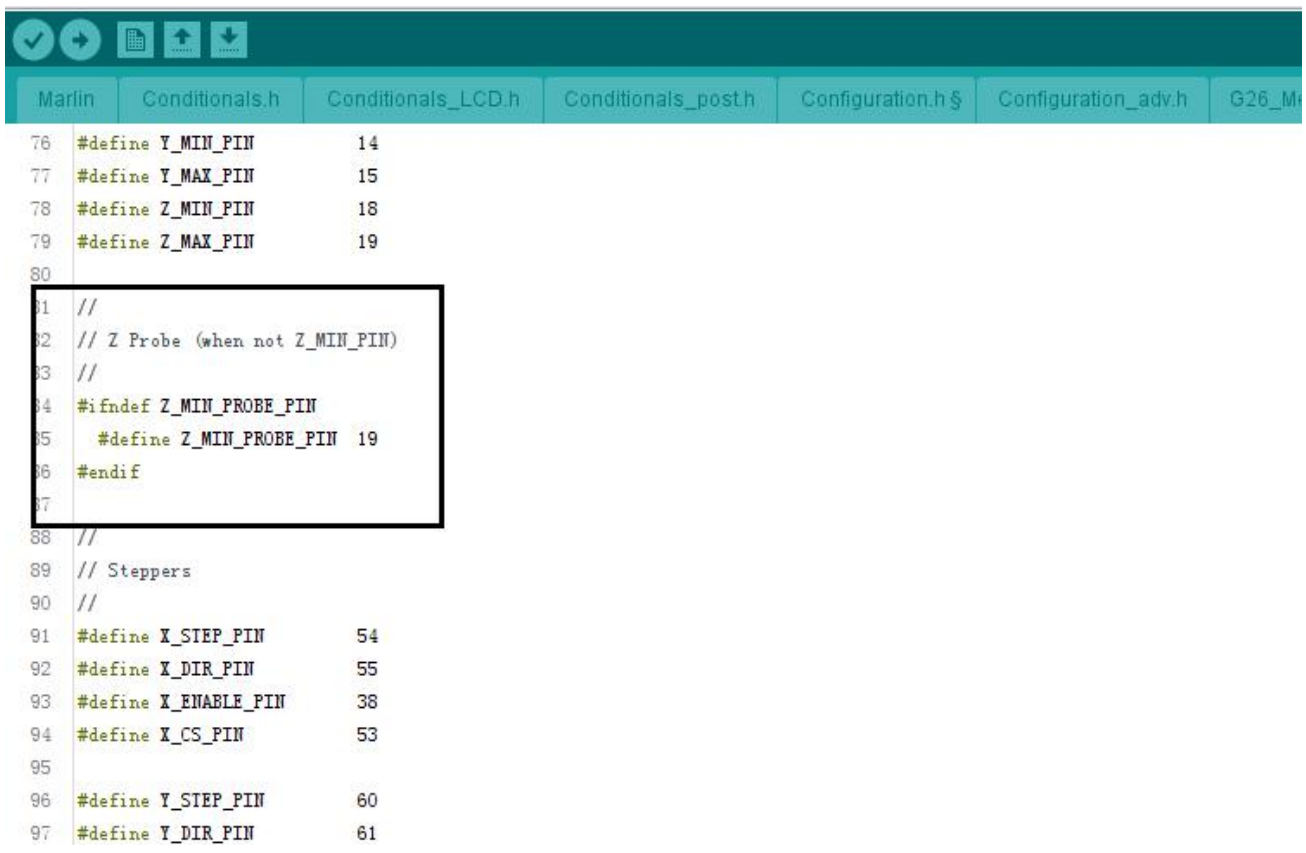
```
11670     #if ENABLED(NOZZLE_PARK_FEATURE)
11671       case 27: // G27: Nozzle Park
11672         gcode_G27();
11673         break;
11674     #endif // NOZZLE_PARK_FEATURE
11675
11676     case 28: // G28: Home all axes, one at a time
11677       gcode_G28(false);
11678       set_bed_leveling_enabled(true)
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)



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.

Marlin | Conditionals.h | Conditionals_LCD.h | Conditionals_post.h | Configuration.h § | Configuration_adv.h | G26_Mesh_Valida

```
52    #define BOARD_NAME "RAMPS 1.4"
53  #endif
54
55  //
56  // Servos
57  //
58  #ifdef IS_RAMPS_13
59    #define SERVO0_PIN        11 // RAMPS_13 // Will conflict with BTN_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
```

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