BLTouch - Classic: Auto Bed Leveling Sensor for 3D Printers

**BLTouch - Classic (BLTouch-C) Servo No. : 0**

<table>
<thead>
<tr>
<th>BLTouch-Classic</th>
<th>Available PWM Range</th>
<th>Marlin Servo PWM</th>
<th>Repetier Servo PWM</th>
<th>Smoothieware</th>
</tr>
</thead>
<tbody>
<tr>
<td>Push-pin Down</td>
<td>900 us (10°)</td>
<td>M280 P0 S10</td>
<td>M340 P0 S100</td>
<td>M280 S3.0</td>
</tr>
<tr>
<td>Push-pin Up</td>
<td>1400 ~ 1600 us (80° ~ 100°)</td>
<td>M280 P0 S90 (M402)</td>
<td>M340 P0 S1500 (Probe finished script)</td>
<td>M280 S7.0</td>
</tr>
<tr>
<td>Self-test</td>
<td>1700 ~ 1900 us (110° ~ 130°)</td>
<td>M280 P0 S120</td>
<td>M340 P0 S1800</td>
<td>M280 S8.4</td>
</tr>
<tr>
<td>Alarm Release</td>
<td>2100 ~ 2400 us (150° ~ 180°)</td>
<td>M280 P0 S160</td>
<td>M340 P0 S2200</td>
<td>M280 S10.6</td>
</tr>
<tr>
<td>M119 Test Mode</td>
<td>700 ~ 1200 us (50° ~ 70°)</td>
<td>M280 P0 S60</td>
<td>M340 P0 S1200</td>
<td>M280 S5.5</td>
</tr>
</tbody>
</table>

**Specification**

- **Voltage (Brown-Red wire):** 4.8 ~ 5.5 V
- **Current:** 15mA
- **Maximum (Peak) Current:** 300mA
- **Z Probe Output Voltage:** 4.8 ± 0.5 V
- **Color:** Semitransparent White
- **SMT & Soldering:** Lead Free
- **Cable Length:** 150±5 mm
- **Weight:** 0.35 oz (10g)

**BLTouch CAD Dimension**

- **Wiring**
  - **3Pin:** Brown(-, GND), Red(+5V), Orange(control signal)
  - **2Pin:** Black(-, GND), White(Zmin)

* Additional power supply can be needed in case which your board does not supply enough amperage.
* Electronic devices can be damaged or even destroyed if connected to the wrong side polarity.
  [wrong terminal connect to 5V(+), GND(-)]
* If your board apply 3.3V logic, please look at the post below at G+ BLTouch Community.
  [https://plus.google.com/113792662927481823969/posts/5yfLRs2N7JQ]
* The action as pulling/pushing hard the push-pin can make the BLTouch damaged and less accurate.

### Signal Timing Diagram

**Correct position of Core**

- **If your board is 3.3V Logic, please following below**

- to be continued on the back -

[www.antclabs.com] [www.bltouch.com] PayPal Account & Email: antclabs@gmail.com

If you want to order through PayPal, please send us e-mail including quantity, address, zip code, phone number and name.
### Setting Configuration.h (e.g. Marlin firmware)

Please refer to other auto bed leveling setting documents (YouTube or G+, etc.).

**Troubleshooting:**
[https://igg.me/at/BLTouch-C/ts/11834379](https://igg.me/at/BLTouch-C/ts/11834379)

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#### Marlin RC7 / RCBugFix Cartesian configuration.h Setting

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Look at the Configuration.h at your previous firmware and edit Configuration.h at RC7.</td>
</tr>
<tr>
<td>2</td>
<td>Check your 3D printer works well.</td>
</tr>
<tr>
<td>3</td>
<td>Please install your BLTouch.</td>
</tr>
<tr>
<td>4</td>
<td>Edit Configuration.h like below.</td>
</tr>
</tbody>
</table>

```c
#define BLTOUCH  //remove // at the start of the line
#define X_PROBE_OFFSET_FROM_EXTRUDER -31 //Your BLTouch X_PROBE_OFFSET_FROM_EXTRUDER
#define Y_PROBE_OFFSET_FROM_EXTRUDER 5 //Your BLTouch Y_PROBE_OFFSET_FROM_EXTRUDER
#define Z_PROBE_OFFSET_FROM_EXTRUDER -1.5 //Your BLTouch Z_PROBE_OFFSET_FROM_EXTRUDER
#define XY_PROBE_SPEED 4000
#define Z_PROBE_SPEED_FAST HOMING_FEEDRATE_Z / 2
#define Z_PROBE_SPEED_SLOW (Z_PROBE_SPEED_FAST / 4)
//define MIN_PROBE_ENDSTOP //add // at the start of the line
#define Z_MIN_PROBE_OFFSET_USES_MIN_ENDSTOP_PIN //remove // at the start of the line
//===================================
#define AUTO_BED_LEVELING_FEATURE //RC7, remove // at the start of the line
// Choose a line of below three lines and remove // at the start of the line
//define AUTO_BED_LEVELING_3POINT
//define AUTO_BED_LEVELING_LINEAR
#define AUTO_BED_LEVELING_BILINEAR
#define Z_SAFE_HOMING //remove // at the start of the line //option
//===================================
#define R_C SERVO support //remove // at the start of the line
#define NUM_SERVOS 3 //remove // at the start of the line
```

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#### Marlin RC7 / RCBugFix Delta configuration.h Setting

<table>
<thead>
<tr>
<th>Step</th>
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<tbody>
<tr>
<td>1</td>
<td>Copy the file below and overwrite at the Marlin folder.</td>
</tr>
<tr>
<td></td>
<td>MarlinExample_configuration/3DeltaGenericWconfiguration.h</td>
</tr>
<tr>
<td></td>
<td>MarlinExample_configuration/3DeltaGenericWconfiguration_adv.h</td>
</tr>
<tr>
<td>2</td>
<td>Save as other name</td>
</tr>
<tr>
<td>3</td>
<td>Look at the Configuration.h at your previous firmware and edit Configuration.h at RC7 / RCBugFix</td>
</tr>
<tr>
<td>4</td>
<td>Check your 3D printer works well.</td>
</tr>
<tr>
<td>5</td>
<td>Please install your BLTouch.</td>
</tr>
<tr>
<td>6</td>
<td>Edit Configuration.h like below.</td>
</tr>
</tbody>
</table>

```c
#define BLTOUCH  //remove // at the start of the line
#define X_PROBE_OFFSET_FROM_EXTRUDER 0 //Your BLTouch X_PROBE_OFFSET_FROM_EXTRUDER
#define Y_PROBE_OFFSET_FROM_EXTRUDER -23 //Your BLTouch Y_PROBE_OFFSET_FROM_EXTRUDER
#define Z_PROBE_OFFSET_FROM_EXTRUDER -1.5 //Your BLTouch Z_PROBE_OFFSET_FROM_EXTRUDER
#define XY_PROBE_SPEED 4000
#define Z_PROBE_SPEED_FAST HOMING_FEEDRATE_Z / 2
#define Z_PROBE_SPEED_SLOW (Z_PROBE_SPEED_FAST / 4)
//define Z_MIN_PROBE_ENDSTOP //add // at the start of the line
#define Z_MIN_PROBE_OFFSET_USES_MIN_ENDSTOP_PIN //remove // at the start of the line
//===================================
#define AUTO_BED_LEVELING_FEATURE //RC7, remove // at the start of the line
// Choose a line of below three lines and remove // at the start of the line
//define AUTO_BED_LEVELING_3POINT
//define AUTO_BED_LEVELING_LINEAR
#define AUTO_BED_LEVELING_BILINEAR
#define DELTA_PROBEABLE_RADIUS (DELTA_PRINTABLE_RADIUS - 50) //Recommend to edit over 30
#define MANUAL_X_HOME_POS 0 // remove // at the start of the line
#define MANUAL_Y_HOME_POS 0 // remove // at the start of the line
#define HOMING_FEEDRATE_Z 3000 // Put a value which you want to HOMING_FEEDRATE_Z
//===================================
#define R_C SERVO support //remove // at the start of the line
#define NUM_SERVOS 3 //remove // at the start of the line
```

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#### Previous Versions before RC7

Before installing BLTouch, please setup your configuration.h and check if it works well with your 3D printer.

```c
//===================================
const bool Z_MIN_ENDSTOP_INVERTING = false;

//===================================
#define Z_MIN_ENDSTOP //add // at the start of the line
#define Z_MIN_PROBE_OFFSET_USES_MIN_ENDSTOP_PIN //remove // at the start of the line
//===================================
#define AUTO_BED_LEVELING_FEATURE //RC4 ~ RC6
//===================================
#define AUTO_BED_LEVELING_FEATURE //RC7, remove // at the start of the line
//===================================
#define AUTO_BED_LEVELING_3POINT
//===================================
#define AUTO_BED_LEVELING_LINEAR
#define AUTO_BED_LEVELING_BILINEAR
```

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