

How is the Auto bed leveling sensor BLTouch for 3D printer different from the existing solenoid probe methods?

BLTouch자료

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<https://blog.naver.com/charlesleeok/220469878641>

How is the Auto bed leveling sensor BLTouch for 3D printer different from the existing solenoid probe methods?

In general, the bed leveling sensor that detects the bed in direct contact with the 3D printer consists of a micro switch or photoelectric switch (Optical Sensor) or hall sensor, a control board, a probe pin, and a servo motor or solenoid that deploys or stow the probe pin.

### [servo motor]

The axis rotation value (mainly 0~180 degrees) of the servo motor is easily controlled by PWM, but even the same product is outputted to a slightly different location, so it is not accurate and the measurement accuracy is low and the noise is severe. It does not explain in more detail here.

### [solenoid]

On the other hand, the solenoid that has been used so far is relatively easy to assemble and has high measurement precision compared to the servo motor, so 3D printing enthusiasts have been using it a lot. However, if a large current is supplied to the solenoid for a long time, there are fatal problems such as heat generation and fire. See also G+ (google+), etc.

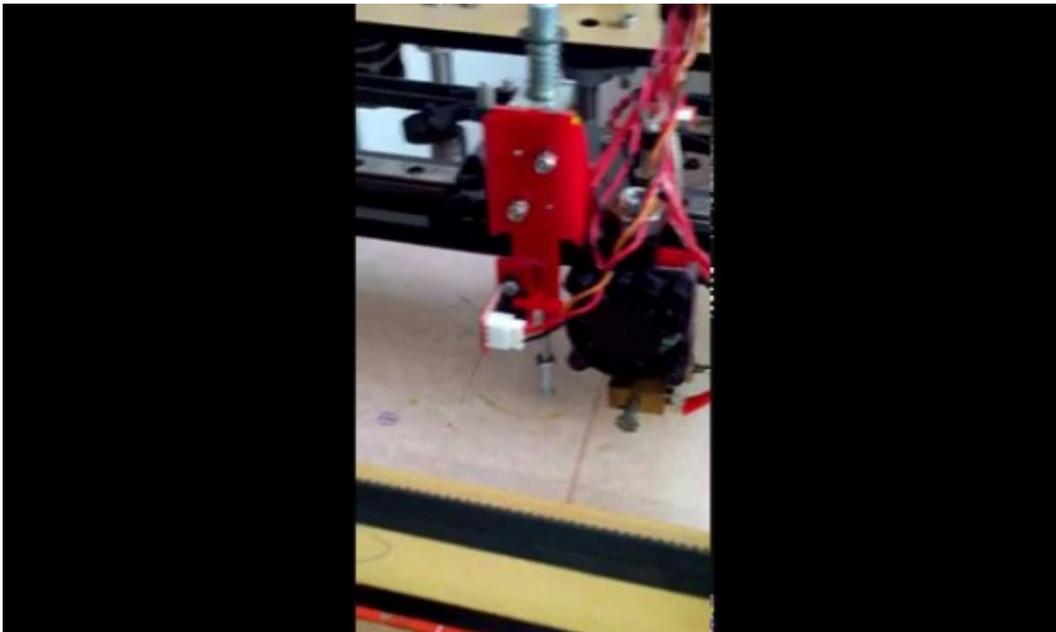
Usually solenoids have a spring for the probe stow. The probe pin is normally inside the solenoid by the spring in the solenoid. When probing is requested, the control board sends a current to the solenoid to deploy the probe pin outside.

The problem is that when the solenoid deploys the probe pin out, fire often occurs due to overheating, etc. because it overcomes internal spring elasticity and flows a strong current for a long time (typically several minutes or more) until the detection is over.

Also, hall sensors could not be used in the solenoid method due to the strong magnetic field generated by the strong current continuously supplied even during detection. Therefore, in the solenoid type, a photoelectric switch (photo interrupter) has been mainly used.

Please see the YouTube video released on October 5, 2014 by Rupin Chheda below.

<https://www.youtube.com/watch?v=lcpadyjHqhs>

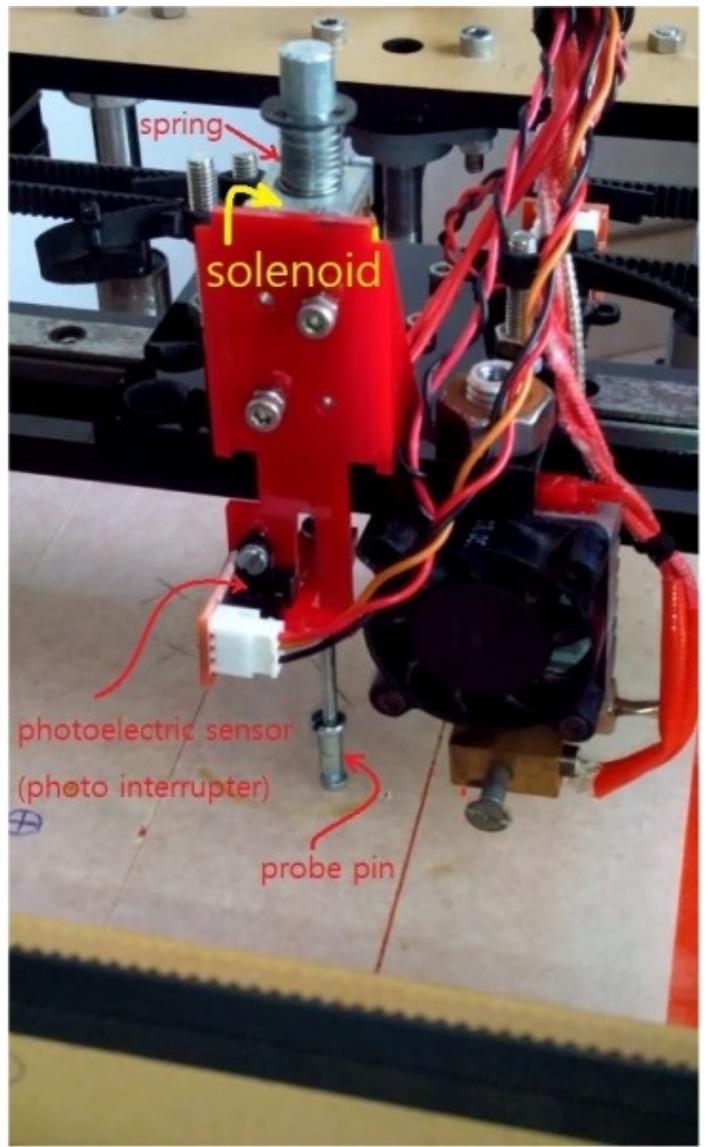
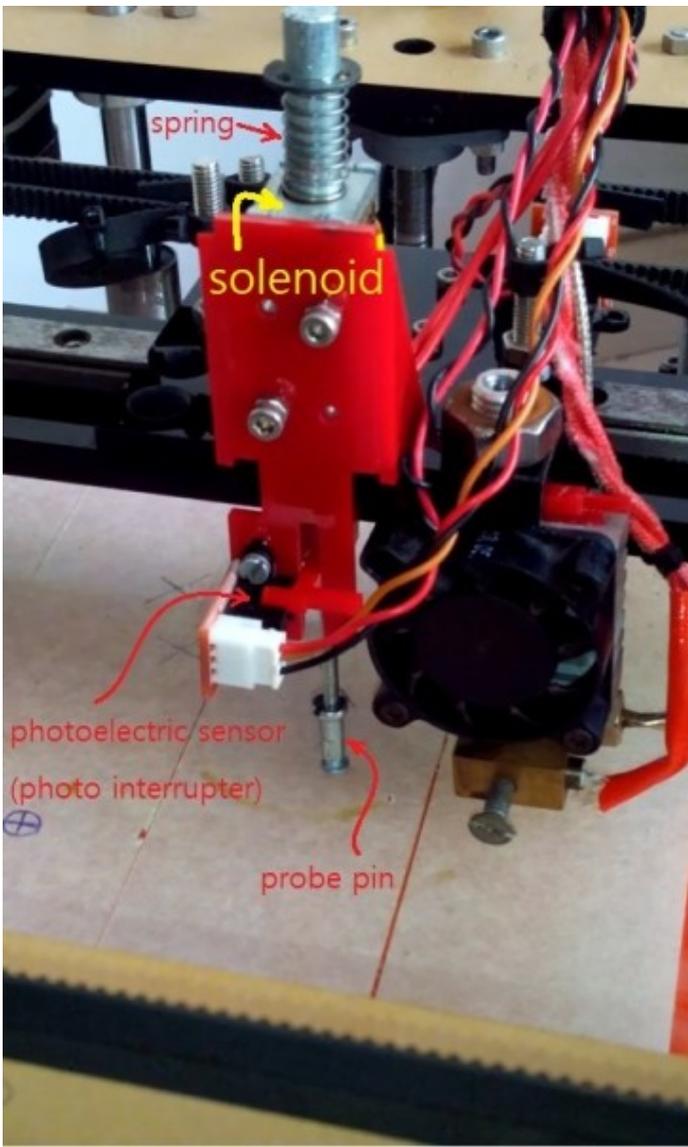


동영상

Solenoid Probe

I have recently been working on devising a better way to build a z probe that works as a endstop and a auto bed levelling probe. I am ha...

[www.youtube.com](http://www.youtube.com)

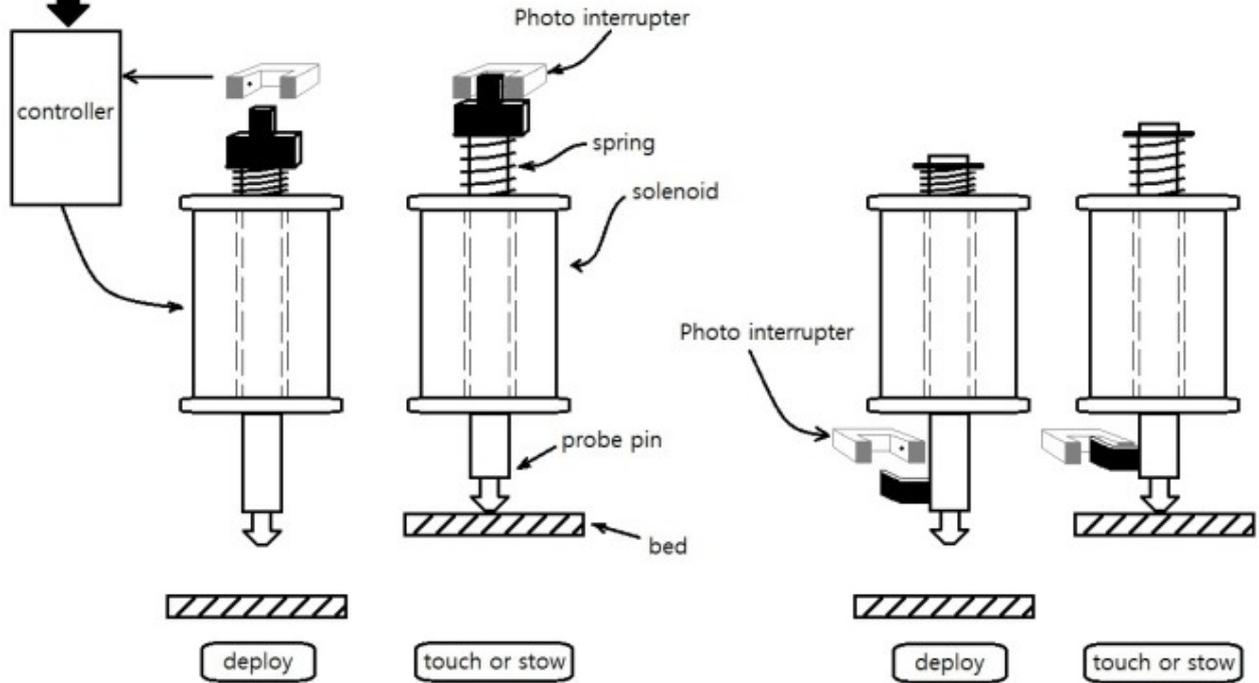


to 3D printer



controller

**Solenoid type bed leveling sensor**



[ type 1 ]

[ type 2 ]

# [BLTouch]

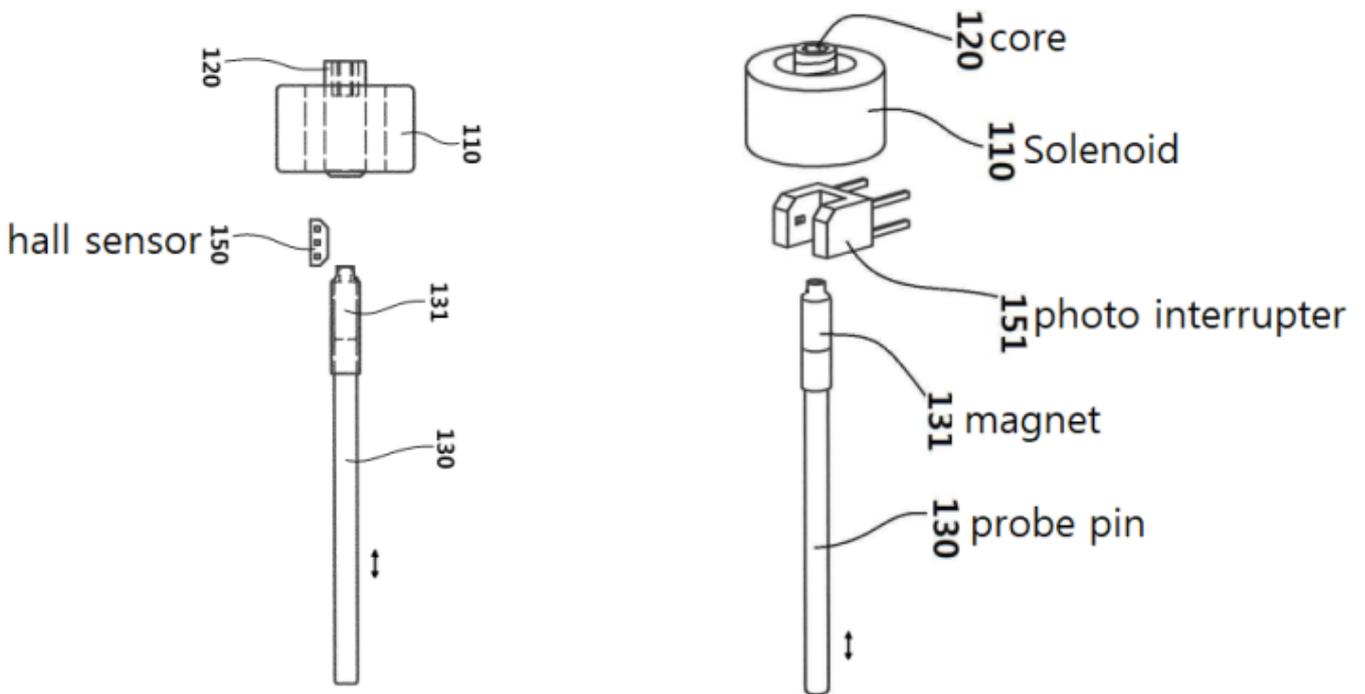
Unlike general solenoids, BLTouch does not have a spring inside. Instead, a ferromagnetic core(hexagon wrench bolt) is provided at the top of the solenoid and a permanent magnet is provided at the top of the probe pin so that it can be deployed or stowed according to the current direction of the solenoid.

For the BLTouch solenoid current conduction time, the time necessary for the detection pin to reach the desired deploy or stow position, that is, about 100ms, is sufficient, and no current is required to maintain the position of the detection pin thereafter.

As soon as the probe pin reaches the stow position by the solenoid current, the permanent magnet at the top of the probe pin is attached to the ferromagnetic core (hexagonal wrench bolt), and the position of the probe pin is maintained without additional current.

In addition, after the probe pin reaches the deploy position by the solenoid current, the probe pin is maintained without additional current by its own weight.

Since there is no spring inside the solenoid, BLTouch is a very simple, safe and innovative product that can achieve its purpose with very little current and short control time, unlike general solenoids when deploying or stowing a detection pin.



**BLTouch  
hall sensor type**

**BLTouch  
photoelectric switch**