

HE280 Interface Board

Purpose

Provide an alternative, universal interface to the accelerometer probe built into the HE280 PCB. Additionally, eliminate the long, problematic run of I2C that the stock PCB requires.

HE280 Probing Description

The HE280 has an onboard IIS2DH accelerometer. This device is interfaced to the RAMBo controller through 3 pins on the HE280's 8 pin edge connector. Two of these support I2C communication with RAMBo primarily used to configure the accelerometer and to reset it after a probe event. The third pin is used to transmit the accelerometer's interrupt signal (when an event on the Z axis occurs) to the RAMBo. It is the primary signal that a probing event has occurred.

The Repetier firmware has been customized to configure, probe and reset this accelerometer. Because of this, the HE280 probing can not be used on other controllers and firmware.

Concept

The idea behind the HE280 interface board is to perform all accelerometer processing in a dedicated micro controller, most likely Arduino based. This board would plug into the HE280's 8 pin connector and communicate with the accelerometer through the 3 pins described above. This significantly shortens the I2C run from 600mm to less than 15mm (well within the I2C spec).

The board would repurpose the 3 cables running back to the controller that were previously used for I2C and interrupt signals. These would now be used to connect to a standard controller's 3 pin endstop connector. Duet, Smoothie and Arduino based controllers (including RAMBo) support 3 wire endstops:

- GND
- Vcc
- Signal

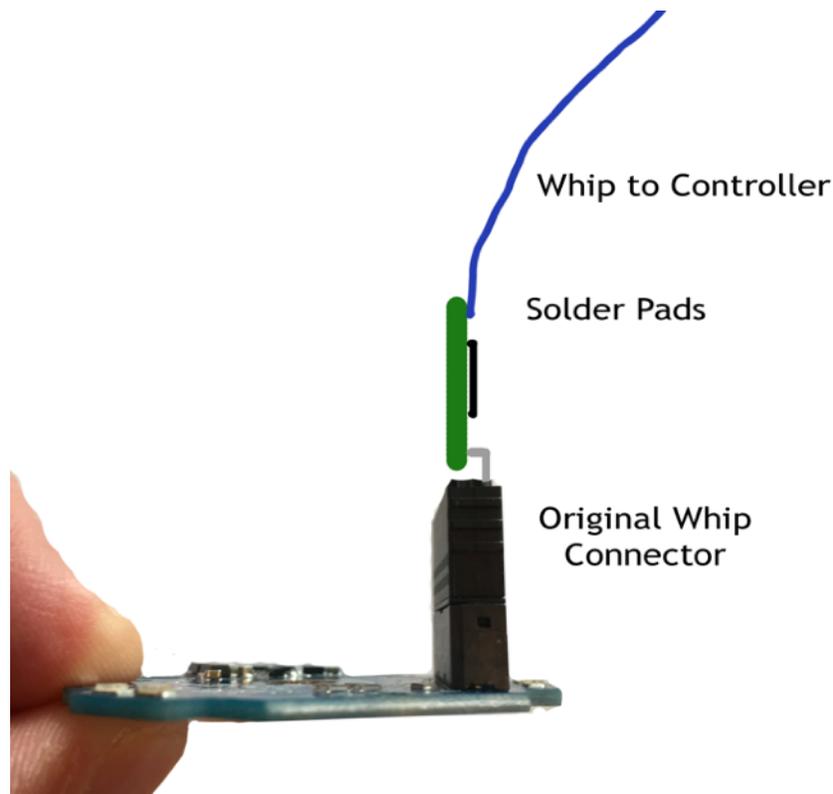
The board will run code (Arduino) to configure the accelerometer and watch for the interrupt signaling a probing event on the Z axis and then pass this event to the controller through the 3 wire endstop. Finally, it would reset the probe after a pre-configured latch delay to enable it for the next probe event.

In this way, the interface board acts as an intermediary interface making the accelerometer look and function like a more or less standard endstop device.

Design

Proposed 22mm x 15mm board with an 8 pin header (90° bend) along the long edge of the board to plug into the HE280 8 pin connector by repurposing the original press-to-fit female connector. The original whip wires (8 of them) are soldered to pads on the

opposite long edge. 5 of the 8 lines simply pass through to the HE280. The board intercepts the I2C and interrupt lines.



Ideally, the processor would be powered by the Vcc/GND from the endstop connector. Duet endstops operate at 3.3VDC so the processor may need to operate on 3.3V. An unknown is, are there Arduino/Arduino like processors that support 3.3VDC to 5VDC? The Proof of Concept was prototyped on an Arduino Micro. I am currently porting to an ATTiny85 trinket.

In addition to the processor, a simple on-board LED is used to signal boot up (signal error messages by rapid flashing, etc) and then to indicate probing trigger when in operation.

A 2 pin MOLEX connector attached to an input pin on the processor is used to configure NC or NO end switch operation.

Three 2 pin MOLEX connectors are used to configure 8 preset accelerometer sensitivity settings so the probe can be adapted to other printers. NOTE: this has not been tested and may in fact not be necessary but it makes sense to design it into the initial prototypes so it can be tested.