

Thank you for supporting our little initiative for a cheap, homemade head tracking device. We hope you find the device enhances your gameplay and feel confident you will have fun both using it and building it.

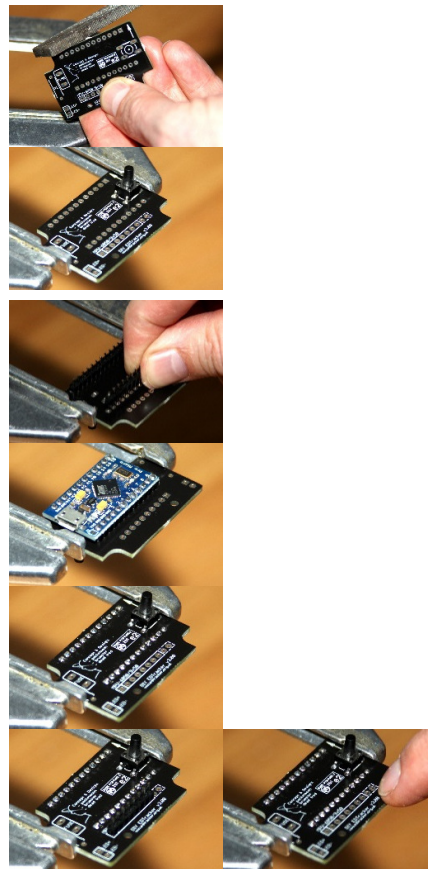
### Requirements

- 1x SparkFun Pro Micro Arduino development board (or compatible). ATmega32u4 16MHz microcontroller.
- 1x Invensense MPU6050, 9150/9250<sup>1</sup> Gyroscope development breakout board (5v tolerant)
- 1x 6mm momentary tactile button
- 1x Soldering iron with suitable tip for small PCB work
- 1x Solder
- 1x DIY EDTracker board (Version 3.0)

### Assembly Instructions

**Read carefully** – the order of components is important! In particular, it is easier to leave the header pins out of the MPU board initially. The TOP of the EDTracker board has the writing/logo. The blank side of the board is the BOTTOM.

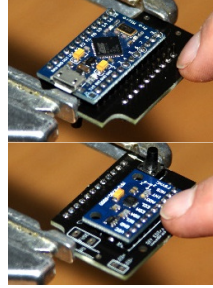
1. If you plan to put your device inside an enclosure, use a file to gently remove any remaining tags off the 4 sides of the PCB. The edges should be smooth and flat.
2. Solder the button into the top of the board first. **Pay attention to its orientation** – the pins should align and push into place with minimal pressure; they do not need bending or splaying apart.
3. Flip the board over; you are now looking at the underside. Place the header pins for the Arduino into the board (two rows of 12 pins) - short ends into the PCB, long ends protruding.
4. Place the Pro Micro onto the pins and solder it into place. Note the orientation of the USB connector – it should be at the same end of the PCB as the button.
5. Flip the board back over to the top, and solder the other side of the Pro Micro pins into the board. Although not usually necessary, you can trim the pins so they do not interfere with the MPU board later.
6. Insert the MPU header pins. If you have an 8-pin board (MPU-6050/9150), you can leave the 2 end pins unpopulated (dashed outline).



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<sup>1</sup> 9150 and 9250 MPUs include a magnetometer and are recommended. Many MPU-9250 breakout boards are 10pin rather than 8pin. The Version 3.0 DIY EDTracker PCB can accommodate both. If using an MPU-9250, verify that your breakout board can accept a 5v power input; some designs are 3.3v only.

7. Flip the EDTracker PCB over and solder the header pins in place; ensure you keep them level – if loose, the header will have a tendency to want to drop out of the PCB.
8. Finally, flip back to the top of the PCB and solder the MPU board onto the row of header pins you just completed.



The board is complete. Plug in a USB power source. You should see a red LED light on the Pro Micro board (subject to model variations). Typically MPU-6050 and 9250 boards have a power LED also – but we have noted most MPU-9250 breakouts do not include a power LED.

### Enclosures

If you are mounting your device into an enclosure we recommend using some foam padding to ensure the device fits snugly inside, and does not wobble around. We recommend Hammond 1551GBK enclosures, as the PCB is designed to fit within them. Do **NOT** place DIY EDTracker into a metal (electrically-conductive) enclosure as short circuits may occur!

### Additional IR LED supply (V3 boards only)

The EDTracker DIY PCB includes a 5v takeoff from the USB power supply in order to run one or more LEDs, for advanced builders who wish to make a hybrid head tracker combining MEMS sensors with traditional IR point tracking. 3 additional components are required on the PCB – a suitable PTC fuse to protect the circuit from over-current, a suitable current limiting resistor (R1) and a 2-pin header for the LED wiring. Do NOT attempt this feature unless you understand what you are doing – incorrect components may result in over-current, burnt-out LEDs or short circuits that may damage your USB port. This feature is included for advanced builders who wish to make use of it.

For a conventional DIY EDTracker build, leave the “R1”, “FUZE” and “LED+/-” components unpopulated. Do not connect them to anything.

### Programming Steps

Please consult the project website for the latest up-to-date procedures documented in the User Guide (under Downloads). Flashing your device can be done entirely from the EDTracker GUI and there is no need to compile source code if you don't want to. The website also provides links to the GitHub code repository; the code is under constant development and these printed instructions could be out of date.

[www.edtracker.org.uk](http://www.edtracker.org.uk)

It is important to perform the calibration steps prior to use. Failure to do this can result in axis creep over prolonged periods of time. All details are available in the manual, which is available underneath the **Downloads** section.

Make sure you download the correct manual and GUI software for your DIY device (MPU-9150 or 9250 users should download the manual for magnetometer-enabled devices).