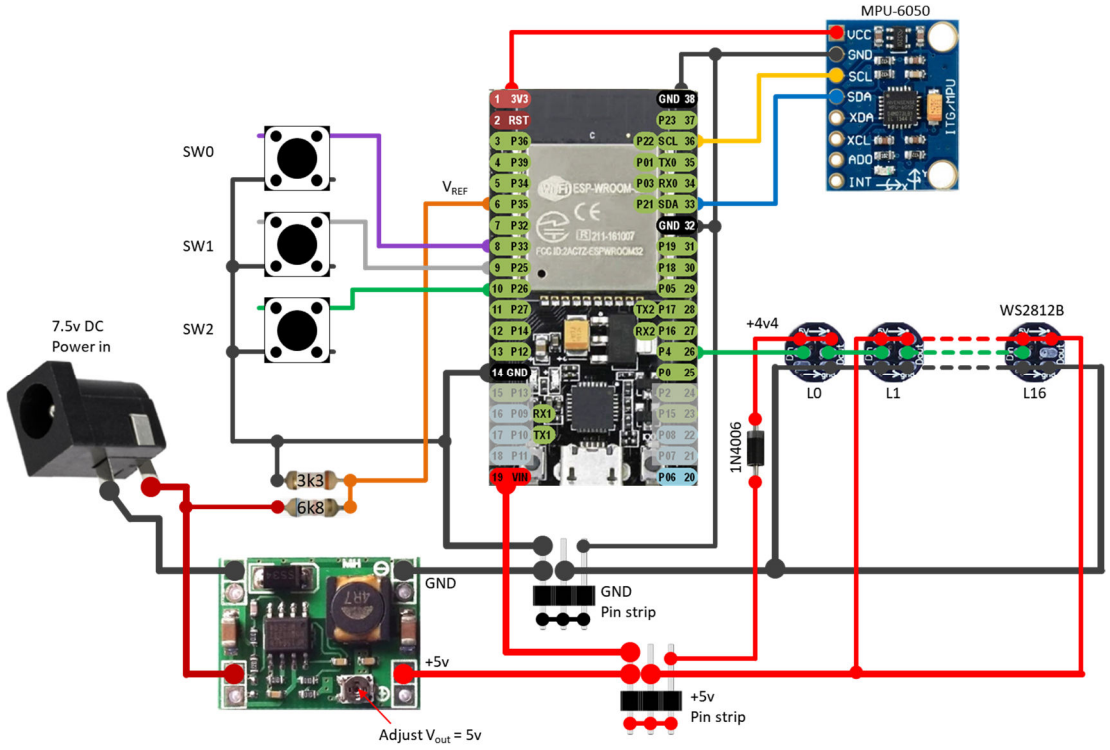
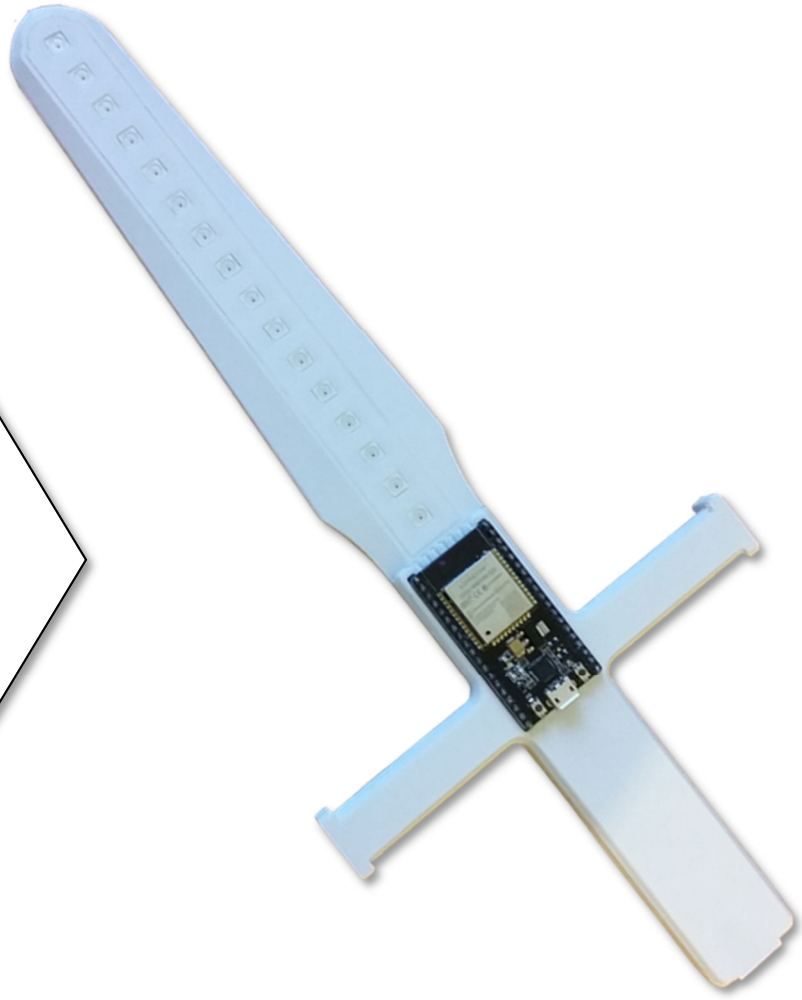
Magical Sword II

Circuits & Wiring

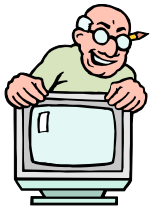




Hand Tools:

Recommended:

- Fine nosed pliers
- Side cutters
- 1.5 mm Drill
- 2.0 mm Drill
- 4.0 mm Drill
- Needle files
- Screwdrivers
- Craft knife



Note: Not all items needed are shown here.

Tools & Materials:

Temperature controlled soldering iron
Solder flux
Resin cored solder
Hot melt glue gun {optional)
2-part epoxy resin glue
Screw drivers
Wire wrapping tool
Wire wrapping wire 30 AWG
24 AWG stranded wire (red & black)
Multimeter

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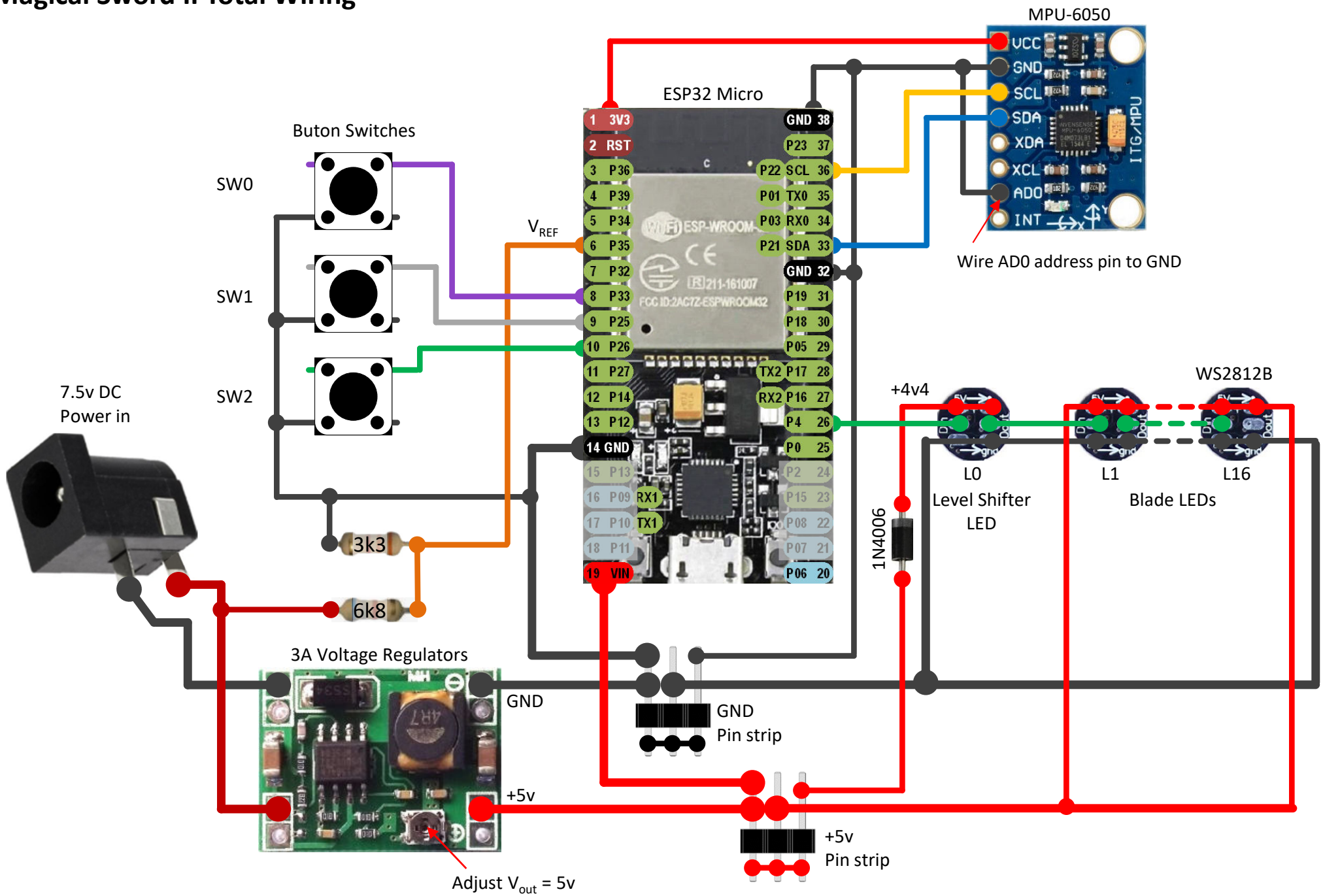
Magical Sword II Total Wiring



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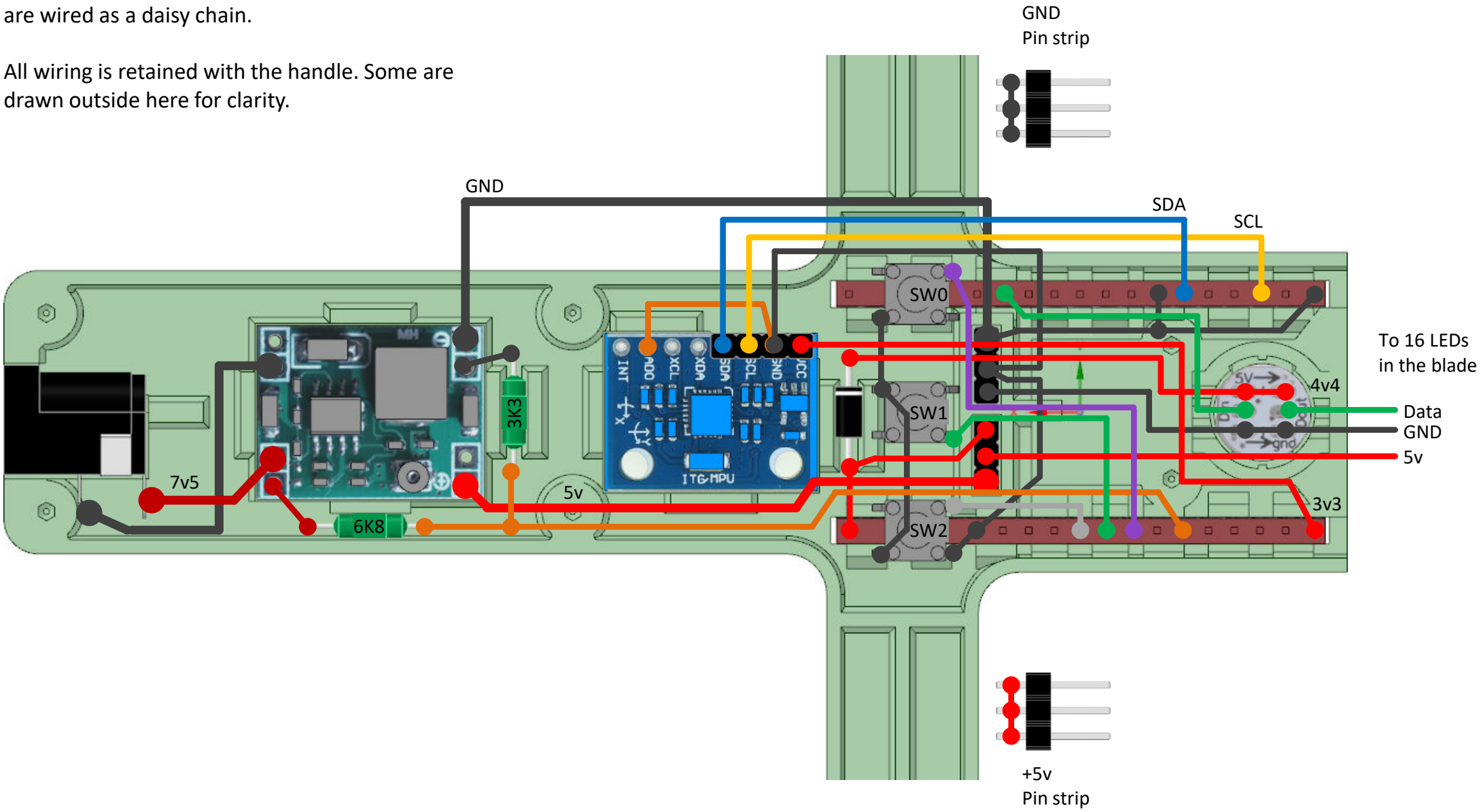
Handle Top Total Wiring

Diagram exclude the 16 LEDs in the blade, which are wired as a daisy chain.

All wiring is retained with the handle. Some are drawn outside here for clarity.



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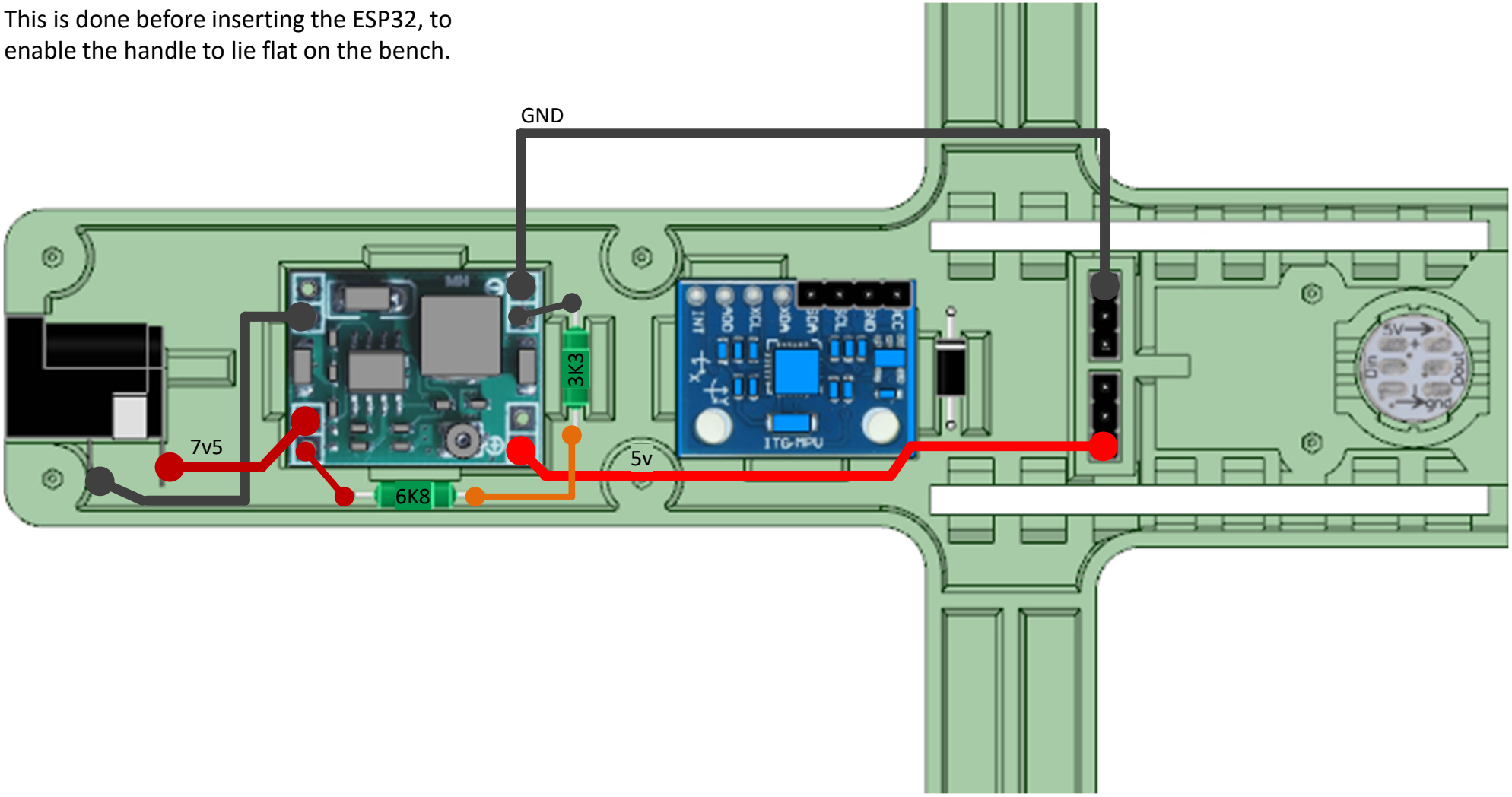
Handle Wiring – Step 1

Start by making the soldered connections to the power socket, DC-DC converter, resistors and pin strips.

This is done before inserting the ESP32, to enable the handle to lie flat on the bench.



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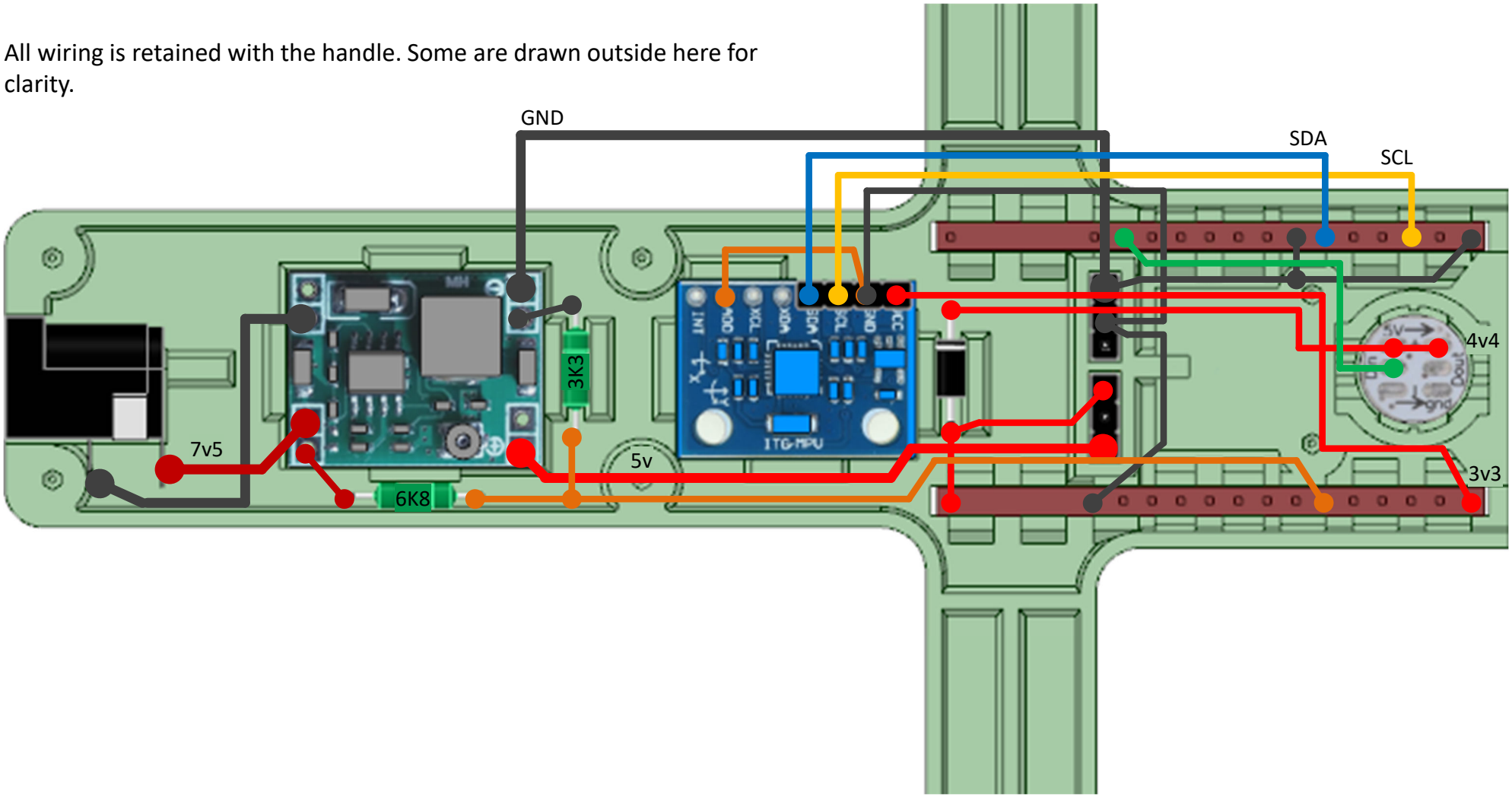
Handle Wiring – Step 2

Insert the ESP32 and use wire wrap wiring to make these connections.

Diagram exclude the 16 LEDs in the blade, which are wired as a daisy chain.

All wiring is retained with the handle. Some are drawn outside here for clarity.



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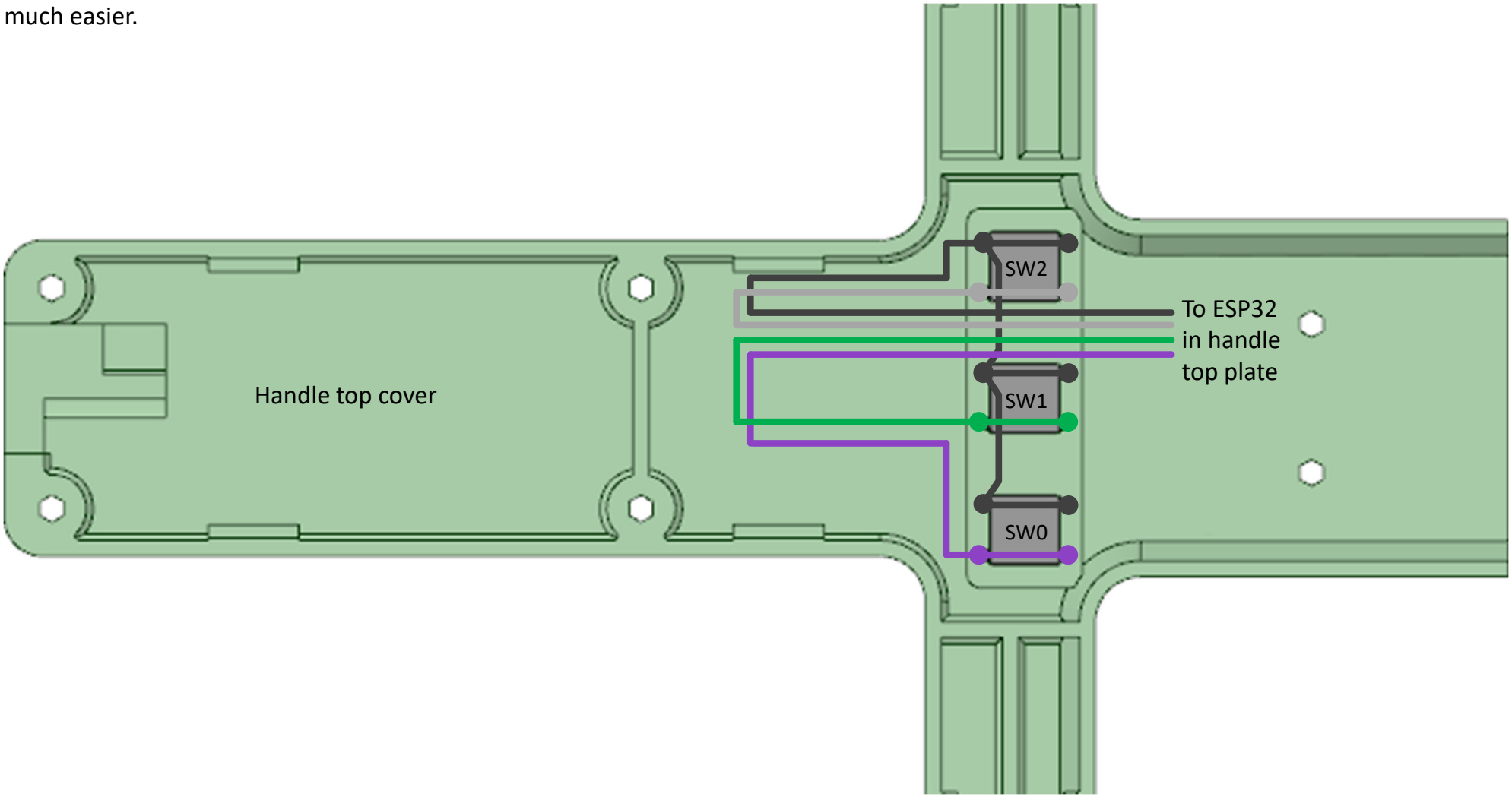
Handle Wiring – Step 3

Note that sufficient wire length is allowed to loop the wires back into the handle body, which will make subsequent connections to the ESP32 much easier.

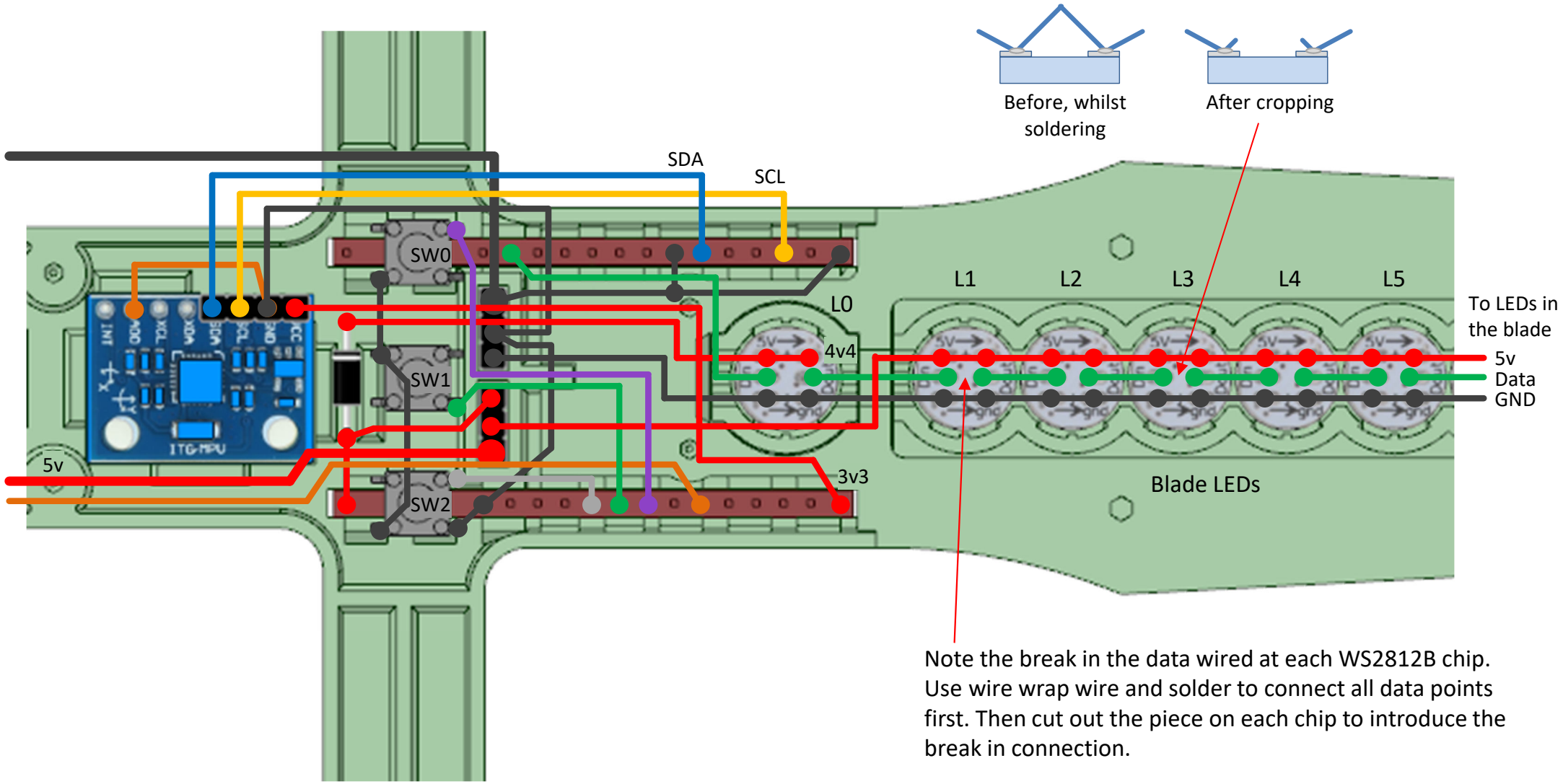


Blade RGB LED Wiring – Step 4

Note that the level shifter LED in the handle takes its power rail from the 1N4006 diode, at 4v4.

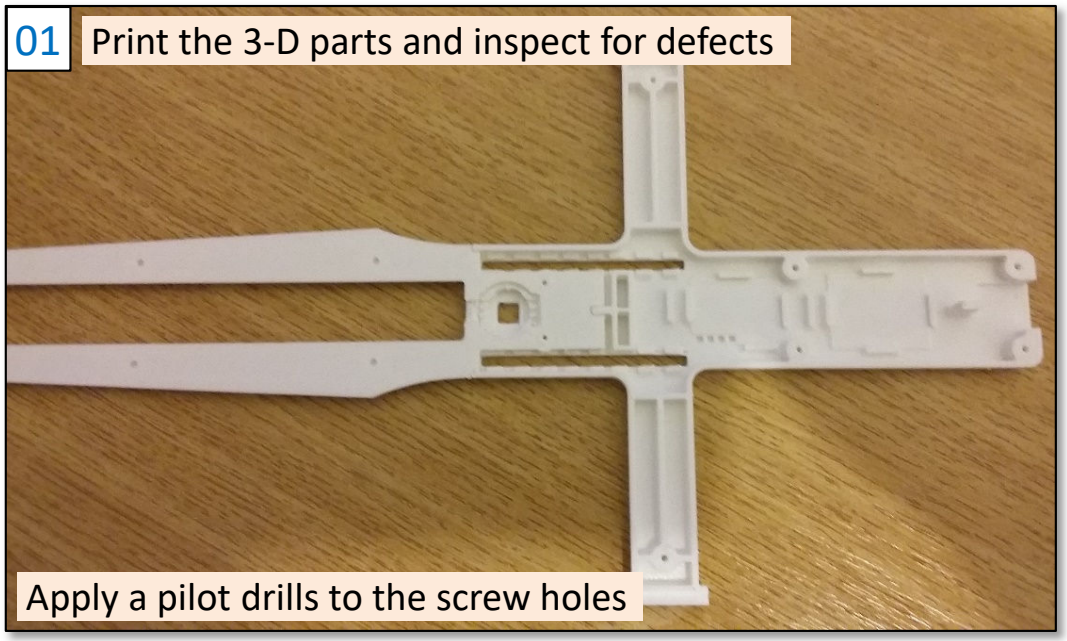
The LEDs in the blade take their power rail from the 5v pin strip.

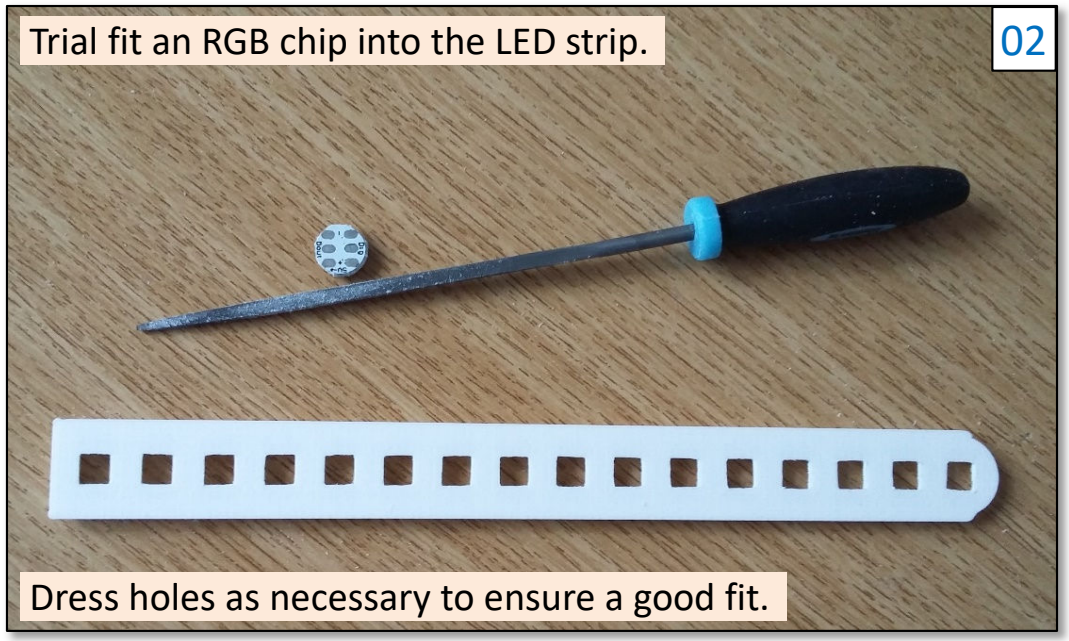
The centre data connection of the LED chips is formed as one long connection. With the wire being bent and raised above the centre of each chip. Once all chips are soldered, it is then cropped out, to break the connection, between data in and data out.

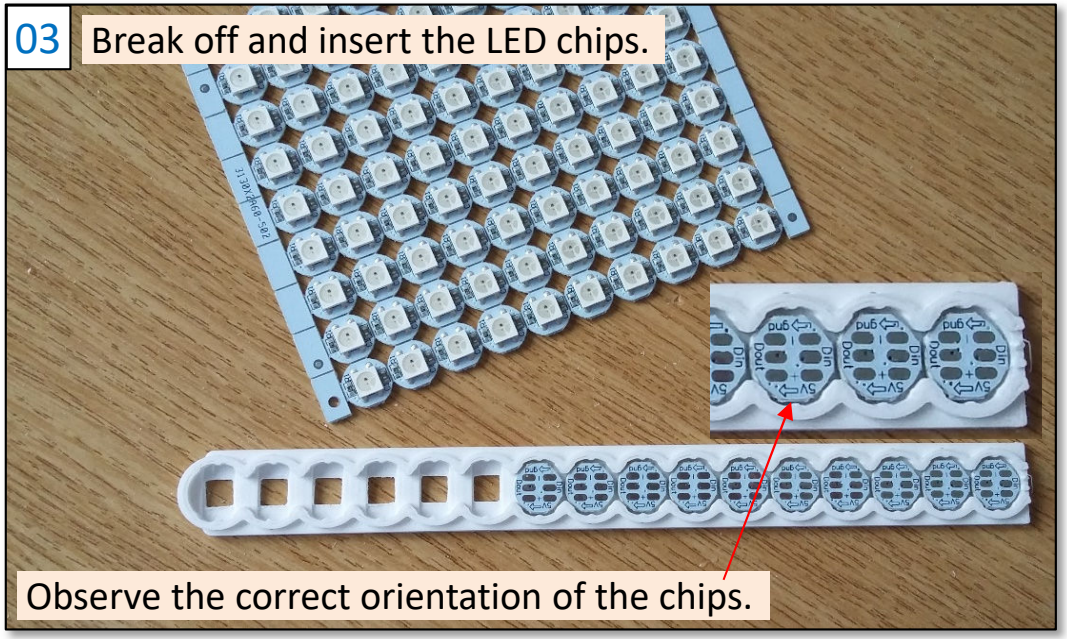


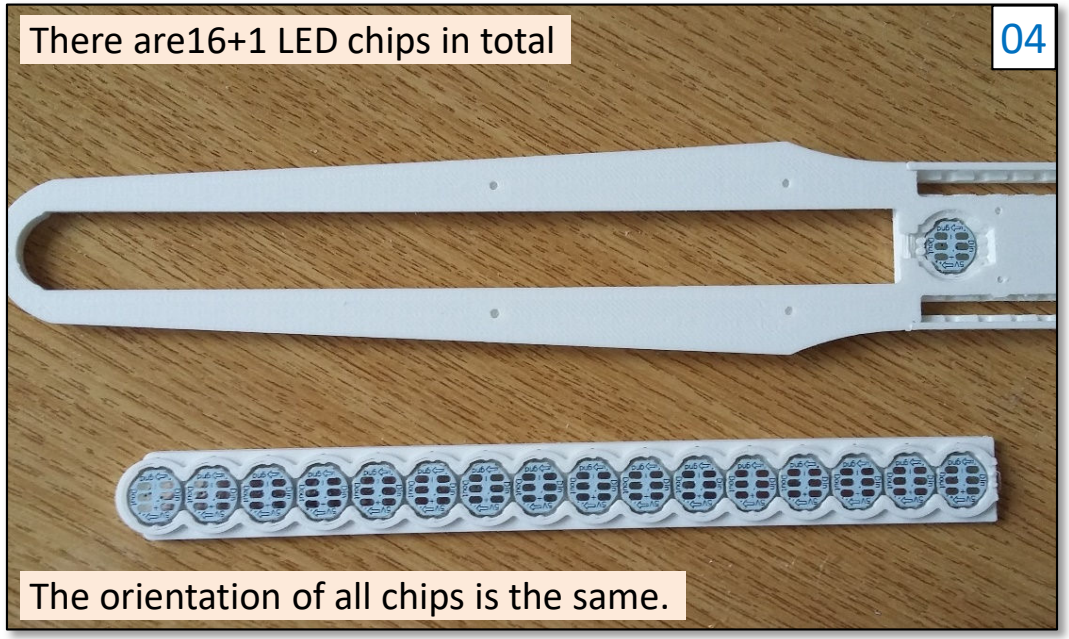
Note the break in the data wired at each WS2812B chip. Use wire wrap wire and solder to connect all data points first. Then cut out the piece on each chip to introduce the break in connection.

Recorded Build Sequence



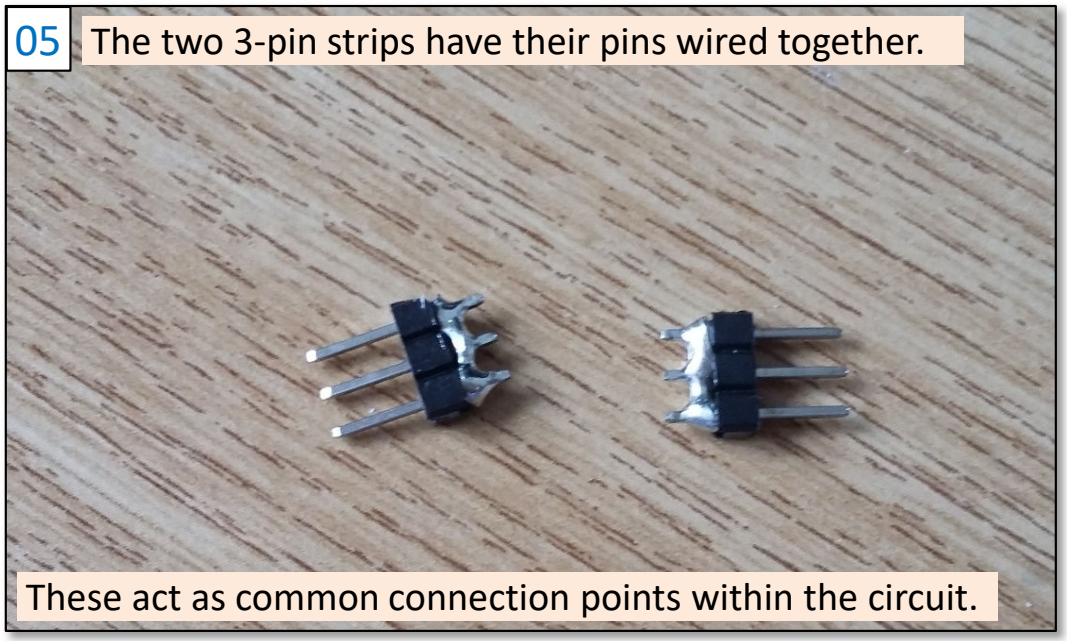






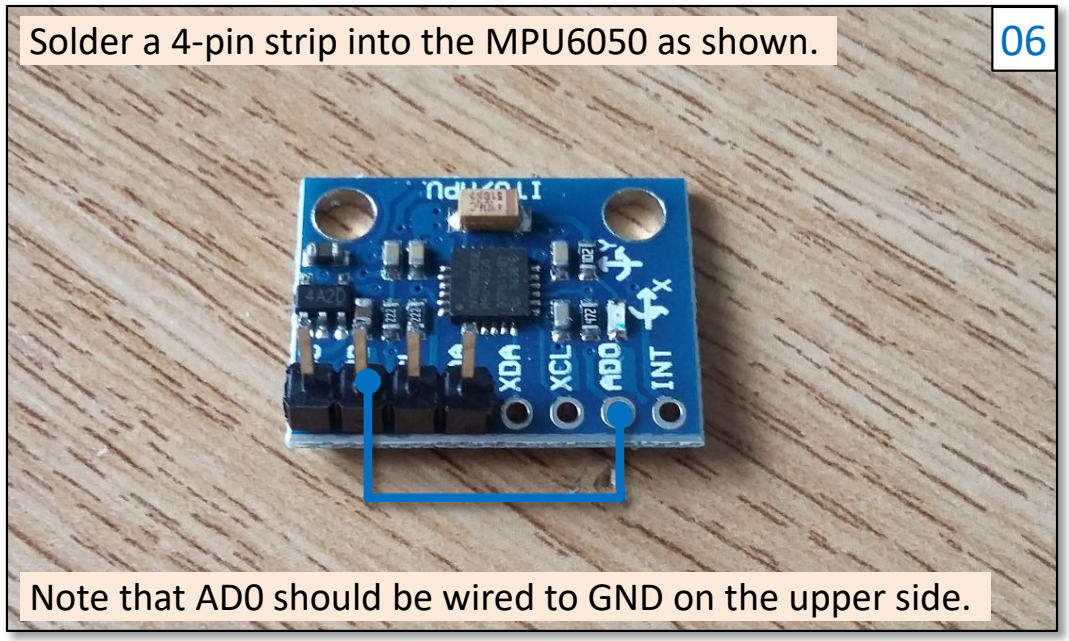
Recorded Build Sequence

05 The two 3-pin strips have their pins wired together.



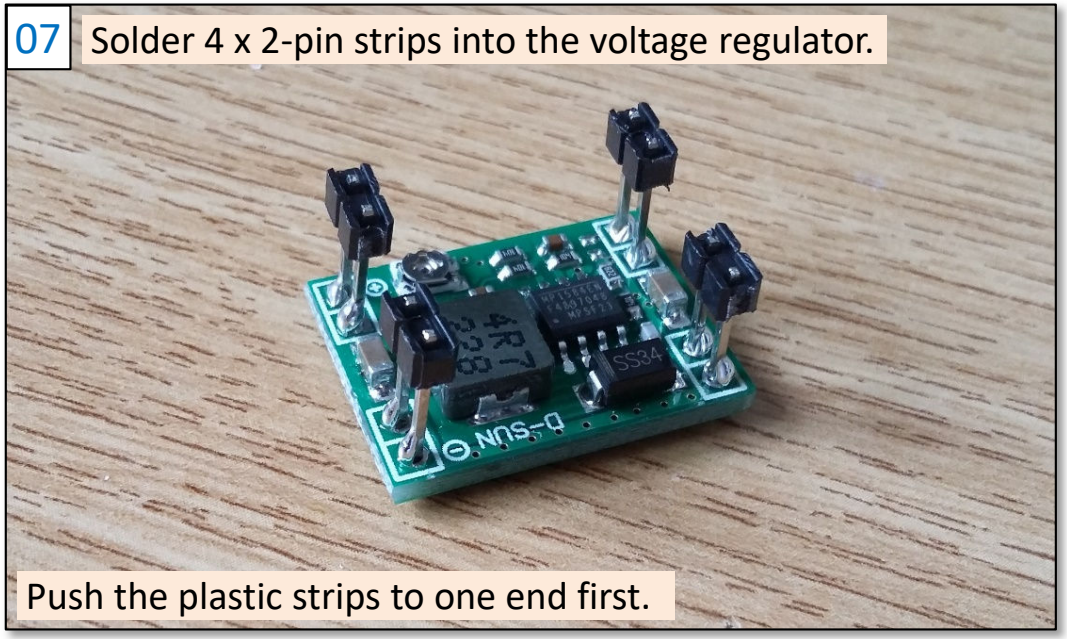
These act as common connection points within the circuit.

Solder a 4-pin strip into the MPU6050 as shown. 06



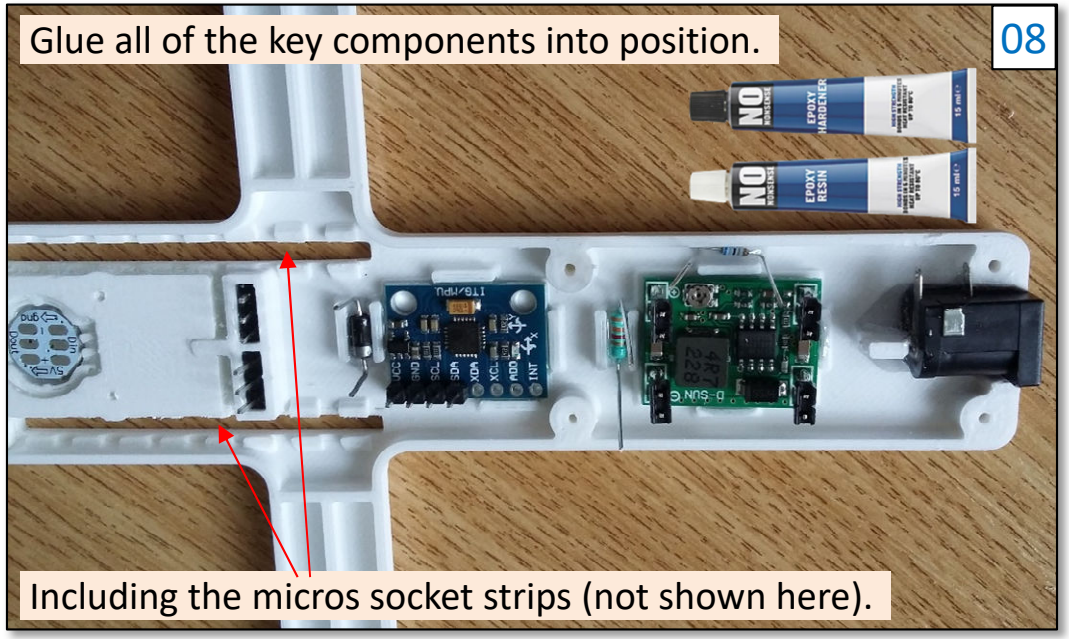
Note that AD0 should be wired to GND on the upper side.

07 Solder 4 x 2-pin strips into the voltage regulator.



Push the plastic strips to one end first.

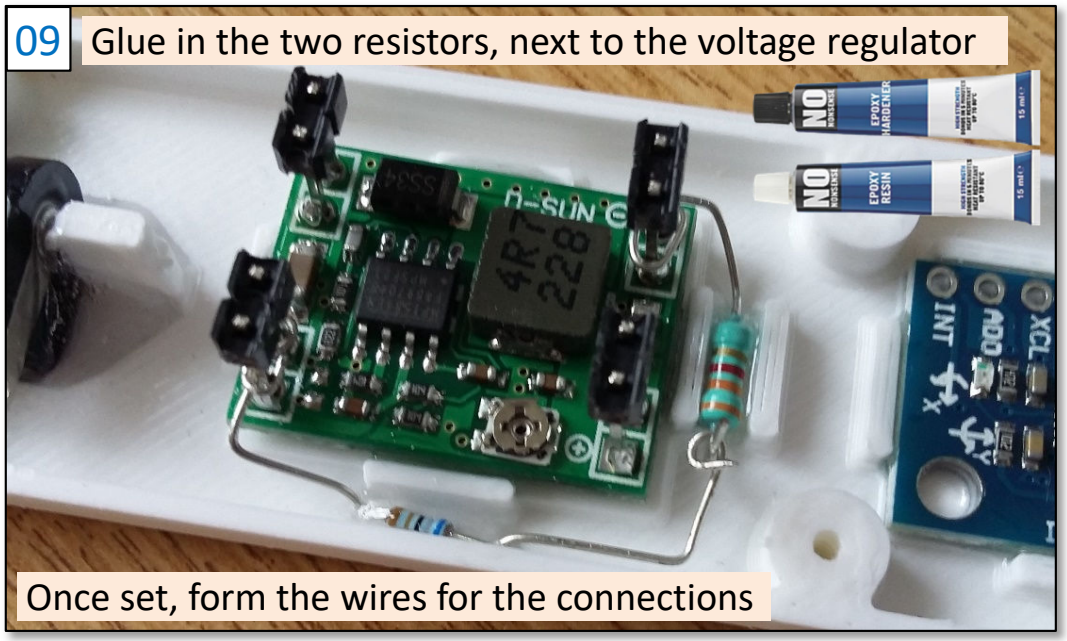
Glue all of the key components into position. 08



Including the micros socket strips (not shown here).

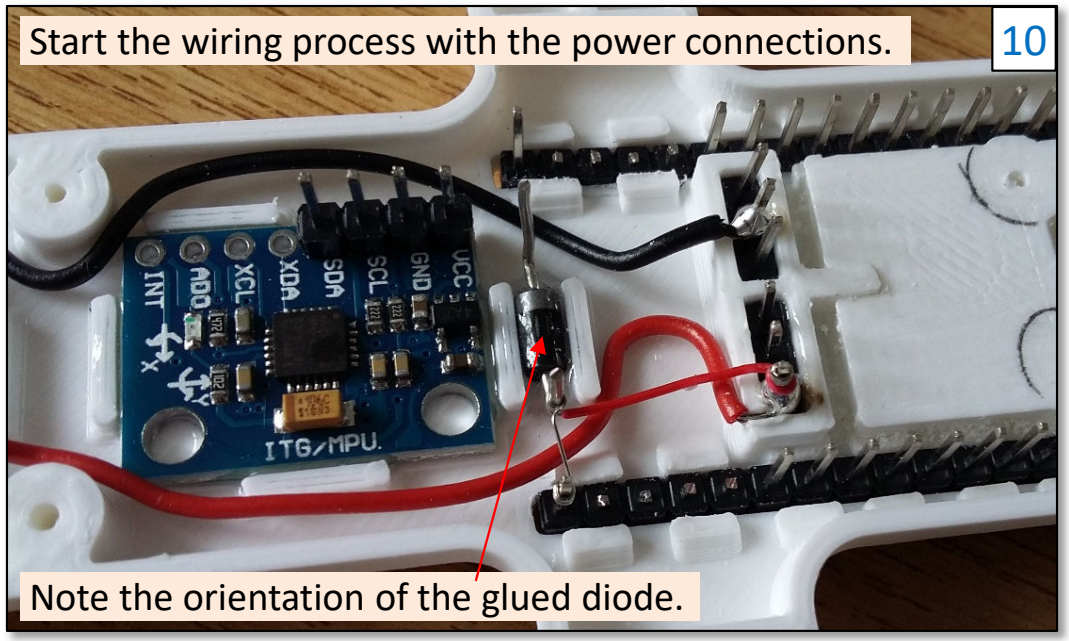
Recorded Build Sequence

09 Glue in the two resistors, next to the voltage regulator



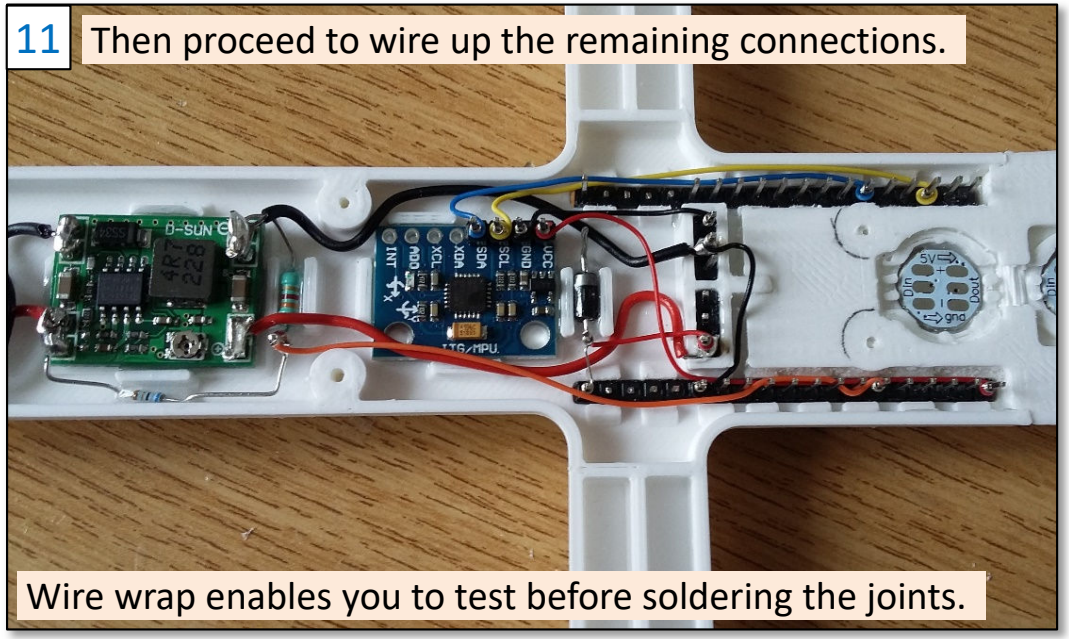
Once set, form the wires for the connections

10 Start the wiring process with the power connections.



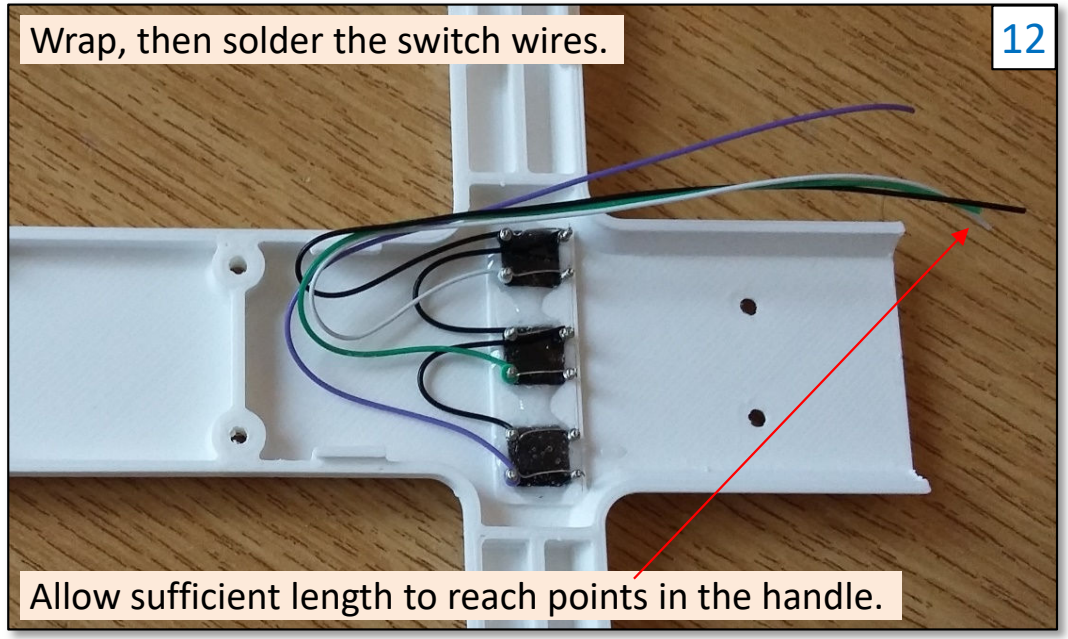
Note the orientation of the glued diode.

11 Then proceed to wire up the remaining connections.



Wire wrap enables you to test before soldering the joints.

12 Wrap, then solder the switch wires.



Allow sufficient length to reach points in the handle.

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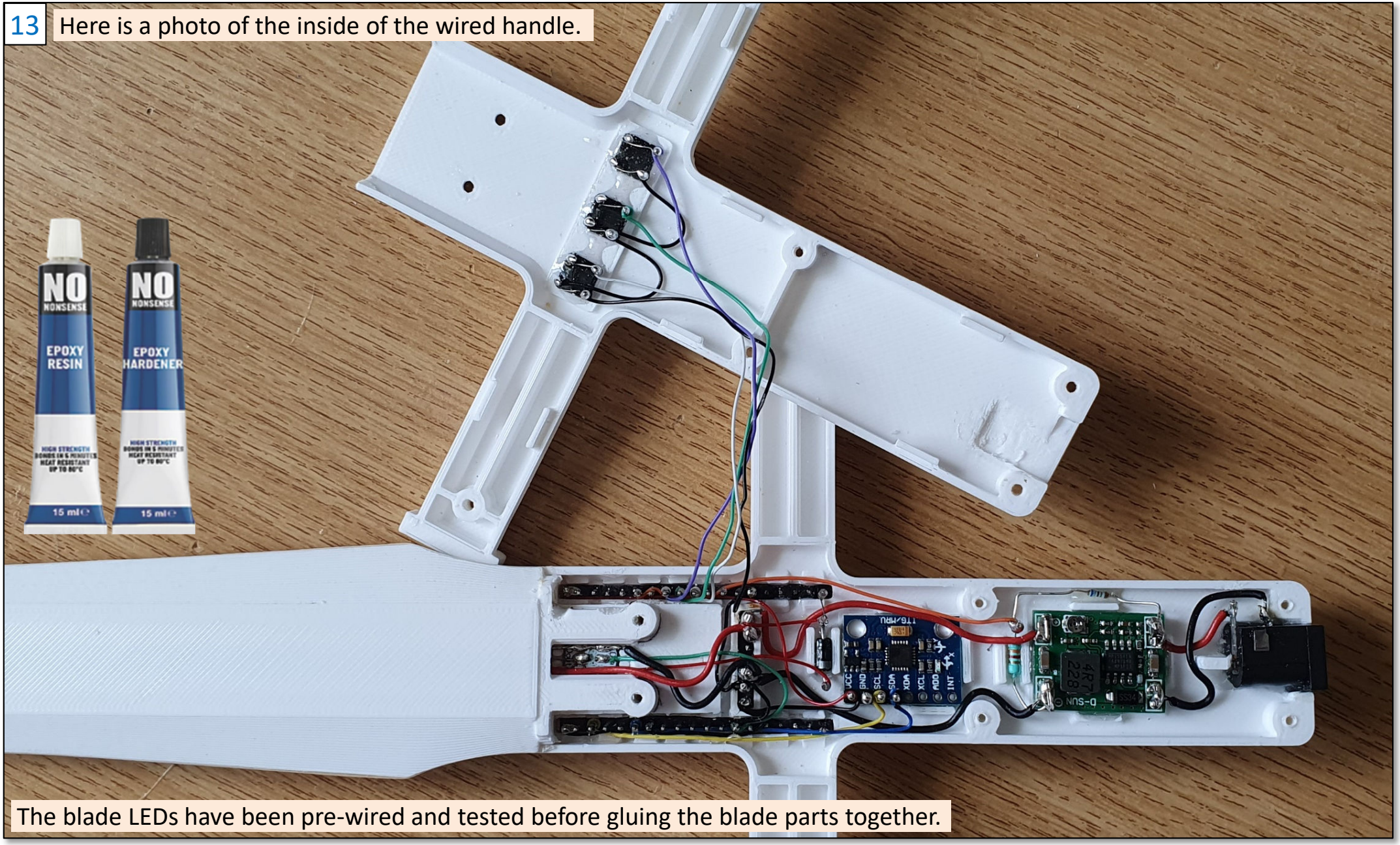
Recorded Build Sequence

13 Here is a photo of the inside of the wired handle.



The blade LEDs have been pre-wired and tested before gluing the blade parts together.

Completed Magic Sword II Project