

# INSTRUCTIONS

## For Assembly of the SIS Hub Package

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**NOTICE:** Use of this document is subject to the terms of use described in the document “Terms\_of\_Use\_License\_and\_Disclaimer” that is included in this release package. This document can also be found at:

[https://github.com/TeamPracticalProjects/SISProject/blob/master/SISDocs/Terms\\_of\\_Use\\_License\\_and\\_Disclaimer.pdf](https://github.com/TeamPracticalProjects/SISProject/blob/master/SISDocs/Terms_of_Use_License_and_Disclaimer.pdf)

### 1) INTRODUCTION.

#### OVERVIEW

The SIS hub PCB can be run in the open air, but we feel it should be protected in some way and we recommend enclosing the SIS hub PCB and receivers in a plastic box. These instructions will guide you.

These instructions use an 0.55-liter pencil box of the brand Really Useful Box ([http://www.reallyusefulproducts.co.uk/usa/html/onlineshop/rub/b00\\_55litre.php](http://www.reallyusefulproducts.co.uk/usa/html/onlineshop/rub/b00_55litre.php)). We purchased ours at Staples for \$5.00.

#### TOOLS AND SUPPLIES

Before beginning assembly of the shield board, the following tools and supplies should be at hand:

Parts: Refer to the Parts List at:

[https://github.com/TeamPracticalProjects/SISProject/blob/master/SISDocs/SIS\\_Hub\\_Parts\\_List.pdf](https://github.com/TeamPracticalProjects/SISProject/blob/master/SISDocs/SIS_Hub_Parts_List.pdf)

- a) Assembled SIS hub PCB. Instructions for assembling the SIS hub PCB can be found at:  
[https://github.com/TeamPracticalProjects/SISProject/blob/master/SISDocs/SIS\\_Hub\\_Packaging\\_Assembly\\_Instructions.pdf](https://github.com/TeamPracticalProjects/SISProject/blob/master/SISDocs/SIS_Hub_Packaging_Assembly_Instructions.pdf)
- b) Panel Mount USB Cable - B Male to B Female
- c) Plastic standoffs, 1/2-inch, 6-32 threaded at both ends.
- d) 6-32 plastic screws, 1/4" long
- e) Plastic cable ties and stick-on cable tie holders.

Tools:

- f) Sharp box knife
- g) Philips screwdriver
- h) Awl or other marking device
- i) Drill with 1/8-inch bit, 5/32" bit and 1/4-inch bit

Supplies:

- j) Electrical tape

## LAYOUT

In this step you will make sure your parts all fit in the box and decide where the panel mount connectors will go.

Open your plastic case and put it in front of you. Place the SIS hub PCB into the case, near the middle. Connect the USB cable to the SIS hub PCB and note where you may place the panel mount connector without putting undue strain on either end of the cable. Photo 1 shows where we decided to mount the SIS hub PCB in our box.

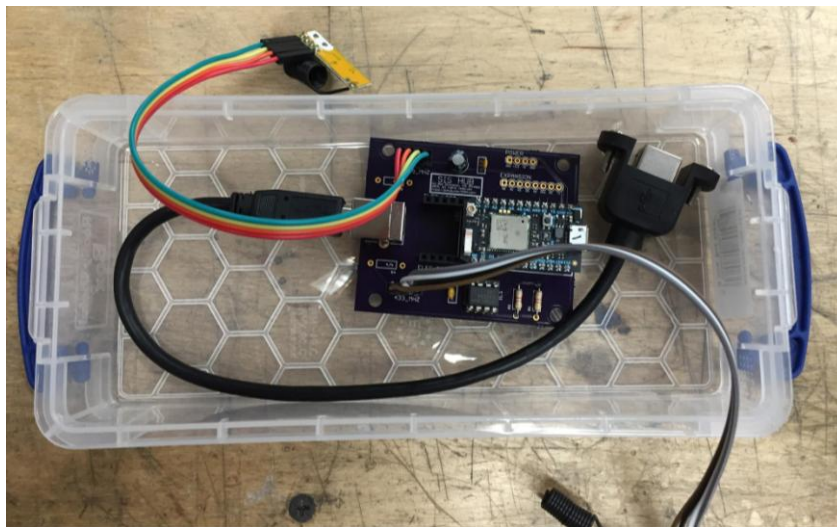


Photo 1: Placement of the SIS hub in the box

## MOUNT THE PCB

In this step you will mount the SIS hub PCB to the case bottom.

Holding the PCB in the location you have selected, use an awl, ballpoint pen, or other sharp item to mark the four hole positions in the bottom of the case. You might adjust the PCB position slightly to avoid the hexagonal bracing in the case bottom.

Use the 5/32-inch drill to put four holes in the case bottom. Screw in four plastic standoffs. Then place the PCB on the standoffs and close the lid - make sure it fits with enough clearance.

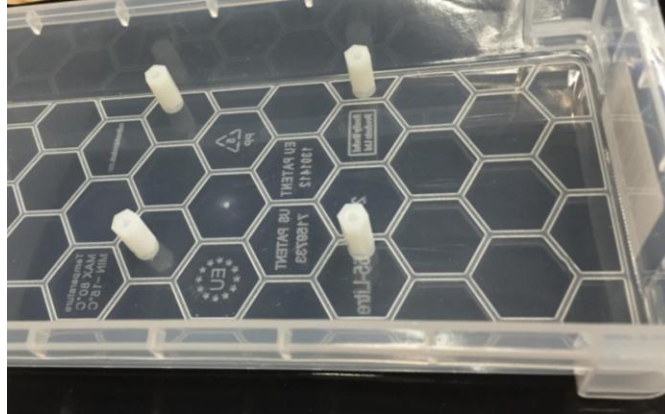


Photo 2: Standoffs Mounted in Box

## Mount the USB cable

In this step you will mount the USB cable panel mount connector to the case.

Place the panel mount connector against the case in the position you have chosen. From the outside of the case carefully mark the center of the two mounting holes. Using the  $\frac{1}{8}$ -inch drill bit, drill these two holes.

Hold the panel mount connector up to the holes and make sure they are aligned correctly. Using a tool scribe a square approximately around the outside of the metal USB connector that is part of the panel mount connector.

Use the  $\frac{1}{4}$ -inch drill bit to drill a hole in the center of the scribed square.

Now is the most delicate part. Using the box cutter, carefully cut from the center hole to the corners of the scribed square. Be careful that you do not cut your hand if the knife slips!!!

Now use the box cutter to score along each of the sides of the scribed square. Continue to score the lines until the plastic bits come free and you have a square hole in the side of your case.

Alternatively, use a small file to file the round hole out to match the square outline.

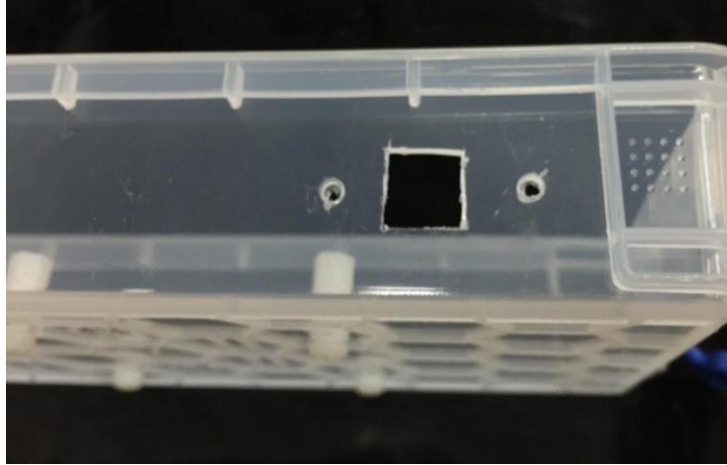


Photo 3: The hole for the panel mount connector

Use the panel mount screws to attach the other end of the cable to the case. You should place the arched side of the USB connector towards the top of your case.

### **Drill Ventilation Holes.**

In this step you will drill 4 ea  $\frac{1}{4}$ " holes in the side of the box for cooling. The hole placement is not critical. We recommend placing one hole on each long side of the box, halfway between the top and the bottom and approximately centered along the side (under the center-most lid support tab). We recommend placing the other hole on each side of the box, half way between the first hole and the end of the box. Choose the end that does NOT have the USB connector on this side of the box and the opposite end on the other side of the box. Drill a  $\frac{1}{4}$ " hole at each of these four positions. Leave the holes open to provide ventilation when the SIS Hub is operating.

### **Add the PCB**

Connect the USB cable to the SIS hub PCB. Snake the cable under the PCB and between the plastic standoffs as you place the PCB on top of the standoffs. Use four plastic screws to mount the PCB to the standoffs.



Photo 4: Where the USB cable goes

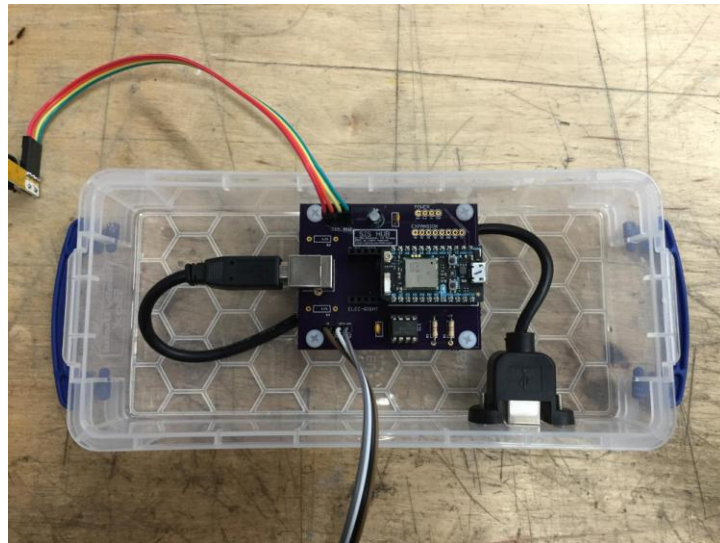


Photo 5: The SIS hub Mounted in Box

## Mount the Receivers

In this step you will mount the two radio frequency receivers.

Choose two positions at opposite corners of the box. Ensure that the receivers are at least 4” away from the chip antenna on the Photon module on the SIS hub PCB and also at least 4” away from each other. This will maximize receiving range. Using a bit of electrical tape, or a small piece of double-sided tape, stick the two receivers to the inside of the case.

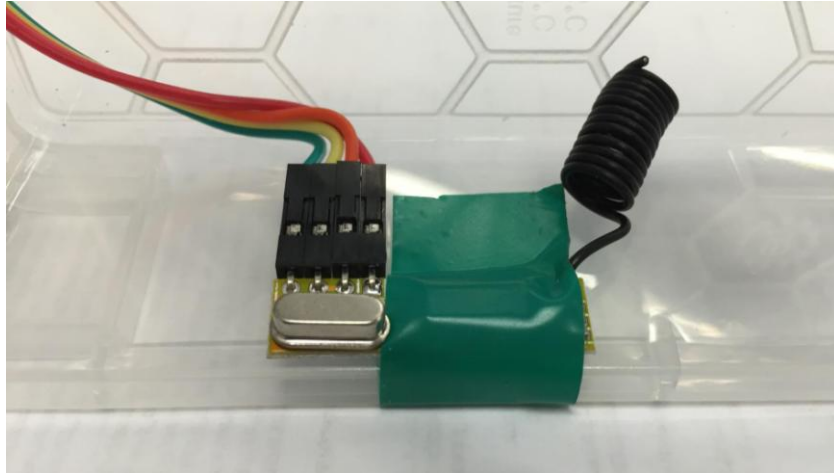


Photo 6: Taping a Receiver to the Box

## Power On

Place the top on your case and latch it. Plug your SIS hub into a USB power source and your SIS hub is ready for use!



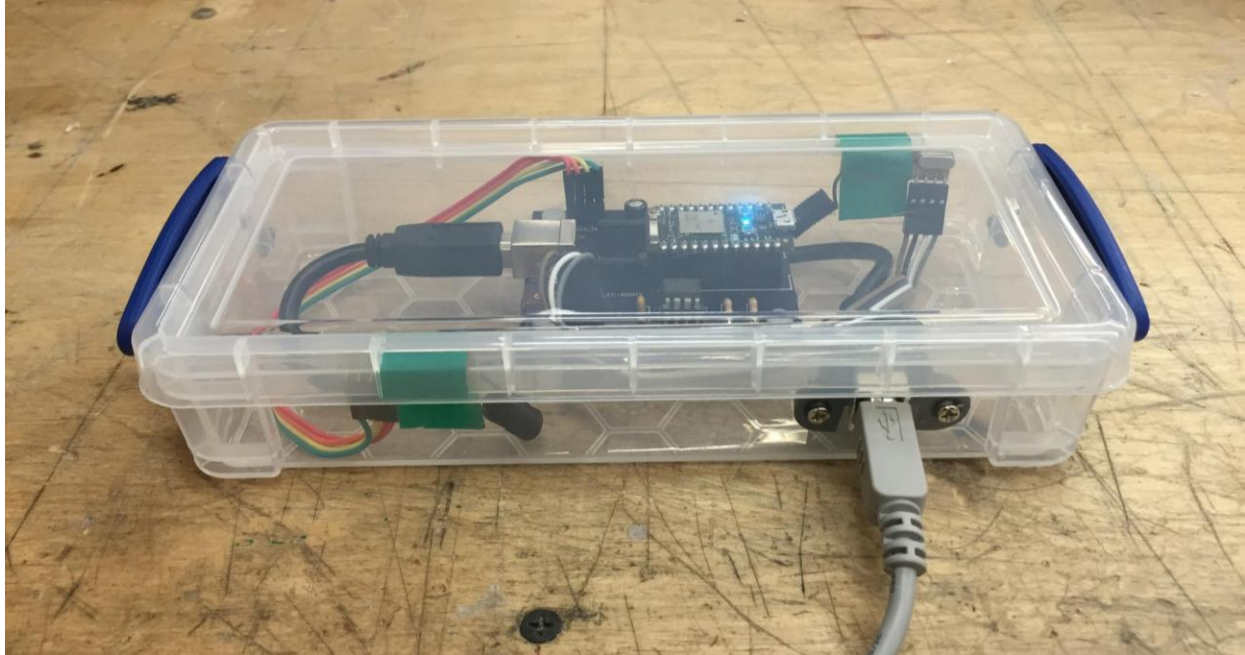


Photo 7: The Finished Product