

Raspberry Pi for Sensorgnome – Assembly

Materials

- Funcube Pro + dongles or RTLSDR (4; or 1 for each antenna)
- Industrial Strength Adhesive-backed Velcro (1/2" wide strips to fit on back of each Funcube)
- USB extension cables (4; or 1 for each Funcube)
- External GPS antenna

Tools

- Aluminum duct tape
- Hot glue gun & hot glue
- Sandpaper
- Scissors
- Ruler
- Colored electrical tape (to color code antenna ports & USB cables)

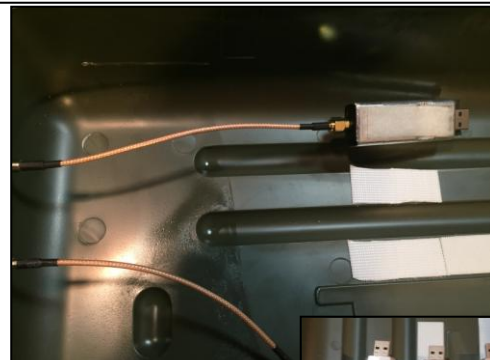
Assembling your Sensorgnome involves preparing the Funcubes (FCDs) with aluminum duct tape and glueing all components into your case. We also recommend color coding your antennas to make troubleshooting and use in the field easier.

1. Wrap each FCD with aluminum duct tape, covering the plastic portion of the Funcube. The tape should not be touching any of the metal on the FCD. Write the serial number of the FCD on the tape (Figure 1).
2. Cut matching strips of adhesive-backed Velcro to size and adhere to the flat side of each FCD (Figure 2). Connect FCD to SMA connector and adhere matching Velcro strip to inside of case lid (Figure 3 & 4).

Figure 1: Two 2.5" strips of aluminum duct tape will cover a funcube sufficiently. Make sure that no tape is touching the USB or SMA connectors.



Figure 2: Both matching sides of adhesive Velcro can be cut at the same time and the backing removed to adhere the pair to the FCD or case in each step



Figures 3 & 4: Using Velcro on FCDs keeps them in place within the Sensorgnome case and allows FCDs to be easily transferred between antennas or Sensorgnomes. Be sure that when a funcube is set in place inside the case, it can connect to the SMA cable without straining the cable.



- Secure the RPi in place with the strap you glued in the center of the case (Figure 5). Fit the GPS "tail" through the 1/4" hole and hold in place with the SMA dust cover (Figure 6). Plug MicroUSB power cable into RPi3 (Figure 7).
- Run a USB extension cable from each FCD to a port on the Raspberry Pi. Each port is numbered and will correspond with the antenna which is connected to it (Figures 8 & 9).

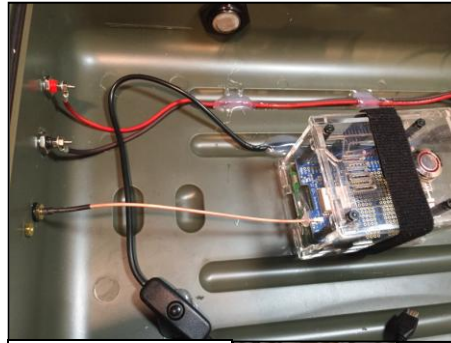


Figure 5: Make sure that you can access the Wifi pushbutton when the RPi is strapped in place.

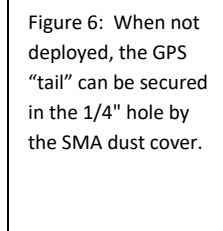


Figure 6: When not deployed, the GPS "tail" can be secured in the 1/4" hole by the SMA dust cover.

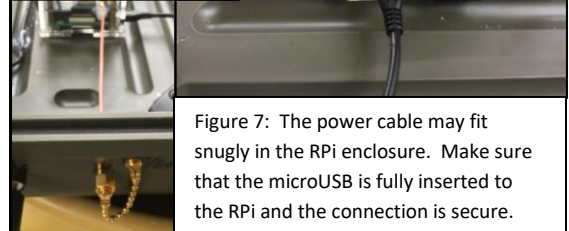


Figure 7: The power cable may fit snugly in the RPi enclosure. Make sure that the microUSB is fully inserted to the RPi and the connection is secure.

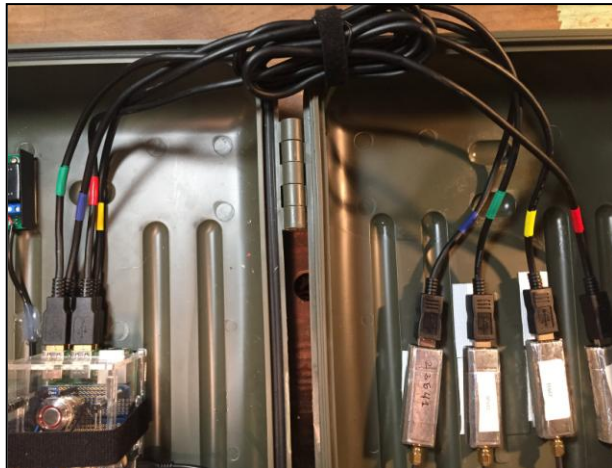


Figure 8: Use a Velcro strap to bundle the USB cables together.

- Use colored electrical tape to code each extension cable and each connector, both inside and on exterior of the case (Figures 8 & 10).

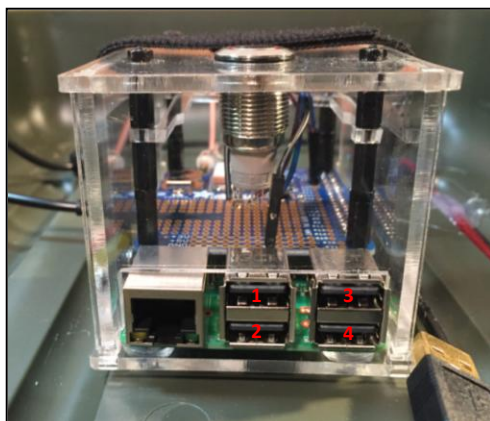


Figure 9: The USB ports on the RPi are numbered and will be how your data refers to each antenna. For example: if a north facing antenna is connected to Port 1, detections on that antenna will be referred to as being detected by Port 1.

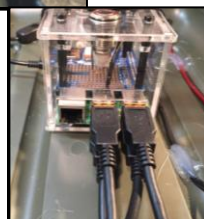


Figure 10: A color coding scheme for your antennas is helpful when troubleshooting a tower. Colored tape is also used outside the SG on coaxial cables and antennas, for easy reference throughout your system.