

OPS243 Enclosure with Battery Support

Feature Set

- Small form factor enclosure mountable on tri-pod
- Supports OPS243 with WiFi interface
- USB interface for charging
- LED indicators for operation, charging, charge done
- 2,000mAHr battery supports 2-3 hrs. operating life
- Size 96 x 107 x 32 mm, 95g (enclosure only), 170g (loaded, OPS243, battery, charger board)



The OPS243 enclosure with battery support provides a complete solution for monitoring or measurement objects in a portable system. It provides internal supports for a battery and a charger/voltage converter board voltage for powering the OPS243. When coupled with an OPS243 with WiFi interface, data is captured and sent to the cloud where it is viewable by any device capable of subscribing to MQTT data. A small 2,000mAHr battery provides 2-3 hours of active operation.

Description

Operating Principle

The system utilizes a battery charger/convert board from Adafruit to convert the 3.7V LiPo battery voltage to 5V which is supplied to the OPS243. The USB micro connection to the charger/converter board is used to charge the battery and power the OPS243.

Block Diagram

The block diagram of the assembled OPS243 in the enclosure is shown in Figure 1. The key components shown are the OPS243, charger/converter board, and battery.

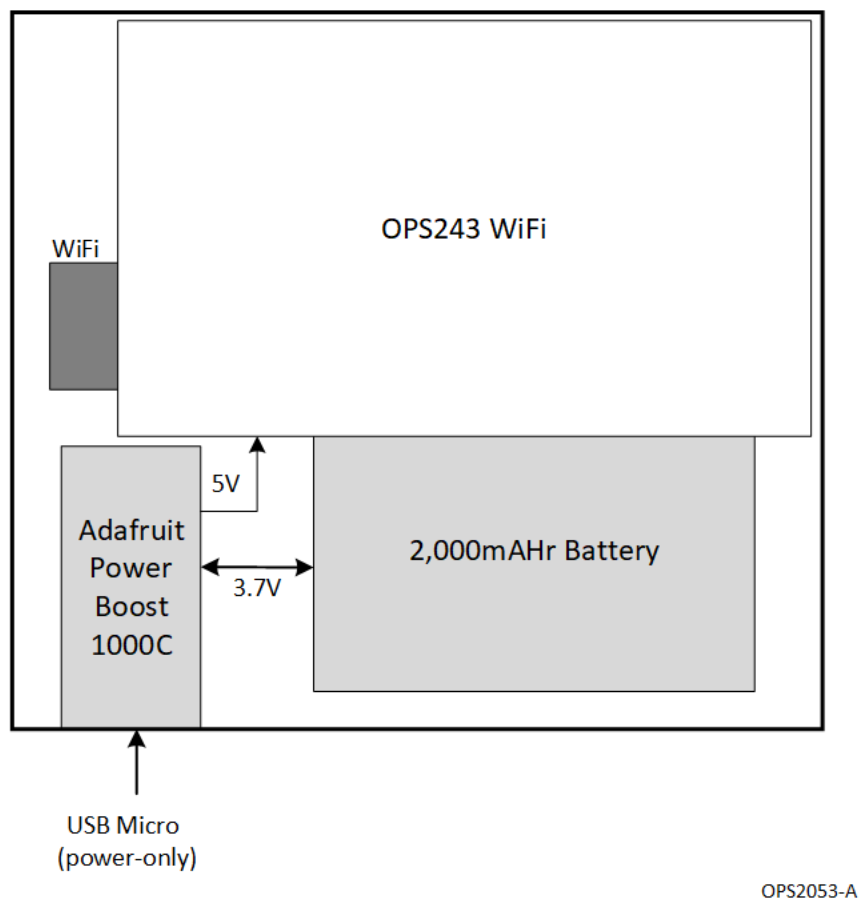


Figure 1. Fully Assembled System Block Diagram

USB

The micro USB interface is used for battery charging only. There is no data connection to the OPS243 in the assembly. Any configuration commands should come over the WiFi interface or be configured before assembly and saved to persistent memory (A! API command).

WiFi

An OPS243 with WiFi interface is pre-configured to send data via MQTT to an MQTT broker in the cloud from which most any internet connected device (PC, website, Raspberry Pi, etc.) may subscribe to the data. API commands may be sent to the OPS243 over MQTT as well to configure as desired. Before receiving any data, the OPS243 WiFi must be connected to a WiFi network. This can be done using the SoftAP app available on [Android](#) or [iOS](#).

LED

The battery charger/converter board provides several LEDs indicating the status of the battery and system. These are viewable on the backside of the enclosure. The description of each LED is listed in Table 1. When the red LED first turns on there is around 8-12% battery charge left or 10-20 minutes of operation.

Table 1. LED Functions

LED	Function	Notes
Blue	5V Power Output Active	OPS243 powered on
Red	Low Battery Indicator	Battery <3.2V
Yellow	Battery Charging in Process	
Green	Battery Charge Done	Full charge

OPS243 Power Consumption

The OPS243 is a low power radar sensor which comes in two versions, the OPS243-A and OPS243-C. The -A is a Doppler/speed reporting radar sensor while the -C provides Doppler/Speed along with FMCW/range reporting. The OPS243 with WiFi interface generally consumes between 1.9 to 2.3W in Active mode. In Idle mode, this reduces to 0.9 to 1.1W. The current consumption at 5V for these sensors is provided in Table 2 along with estimated operating time with a 2,000mAh battery. The operating time takes into account efficiency of the voltage conversion and realistic available battery charge (not 100%).

Table 2. OPS243 WiFi Power Consumption

Sensor	Active Mode (mA)	Idle Mode (mA)	Battery Life Active Mode (2,000mAh)
OPS243-A	385	189	3.0 Hrs
OPS243-C	456	220	2.5 Hrs

To extend battery life, several techniques may be employed. A simple one is turning off the OPS243 LEDs with an API command. This may save upwards of 10mA. If not being used, making use of Idle mode reduces current consumption by close to 50%.

Assembly Instructions

Overview

The OPS243 is assembled with battery and charger/converter board in several simple steps which are outlined below. Before assembling the OPS243 into the enclosure, connect the sensor to your WiFi network. You can use the SoftAP app or give direct API commands over USB interface. If using USB, connect the sensor to your PC and use a terminal program such as Teraterm, Putty, or Minicom. Alternatively you can bring up the [serial port](#) web page on the OmniPreSense website. The API commands for making a WiFi network connection of using SoftAP are described in application note [AN-20](#).

Key Components

- OPS243 WiFi Enabled Sensor
- Enclosure Top
- Enclosure Bottom
- Battery Charger/Converter Board
- 2,000mAHr LiPo Battery
- Power/Ground Connection Wires
- Threaded Insert

OPS243-B2-ENC Enclosure - Exploded Assembly

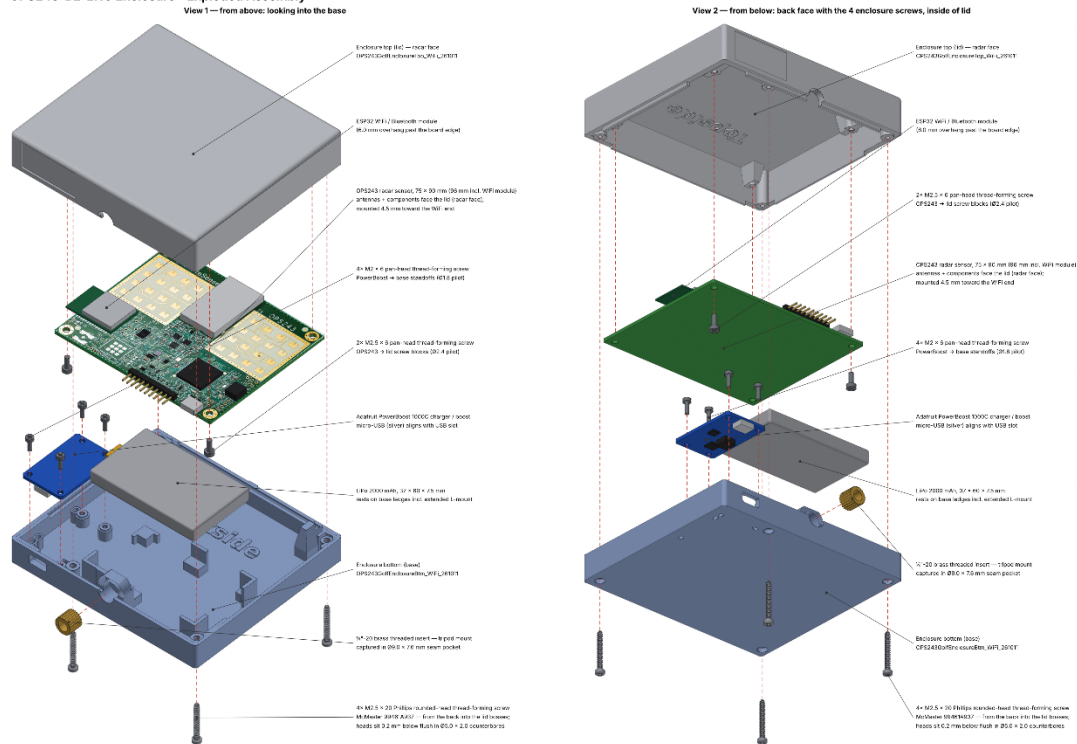


Figure 2. Exploded View of Assembly

Step 1

Solder the black wire to the ground terminal of the charger/converter board. The other end of the wire should have an appropriate connector for the OPS243 10-pin header (2.54mm pitch). Next solder a red wire to the 5V terminal of the charger/converter board. Make the wire lengths of 10cm/4 in.

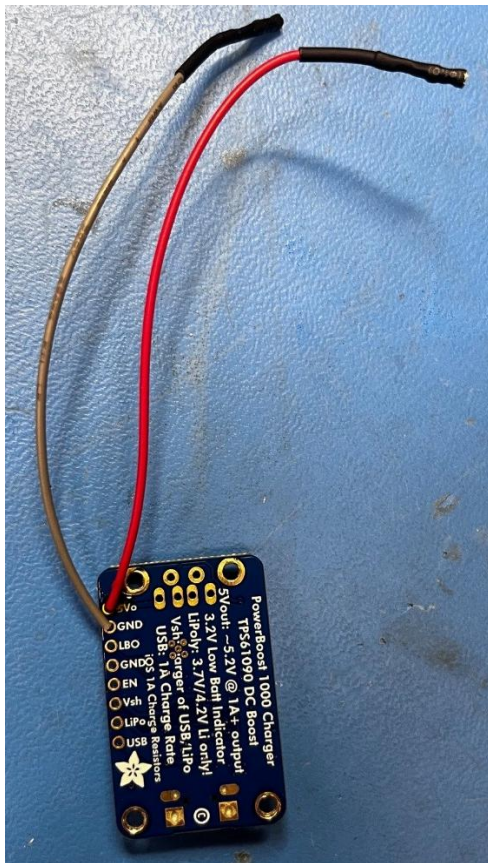


Figure 3. Battery Connected to Charger/Converter Board

Step 2

Connect the battery to the charger/converter board with the keyed connector. The blue LED on the charger/converter board will light up showing 5V output is active.

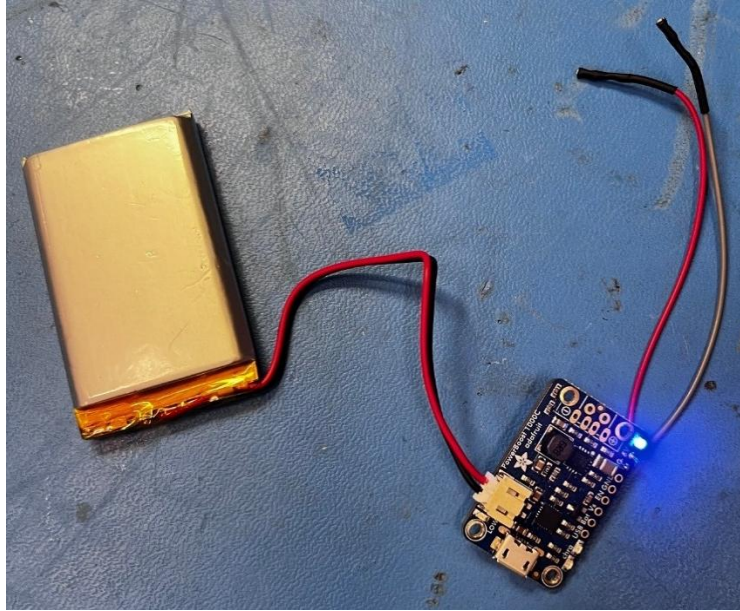


Figure 4. Battery Connected to Charger/Converter Board

Step 3

Turn the charger/converter board upside down so its components face the inside of the bottom enclosure. Place the board on the four mounts and use the M2 x 6mm screws to screw the board in place. The micro USB connector will slot into the opening on the bottom of the enclosure. Place the battery in its slot.

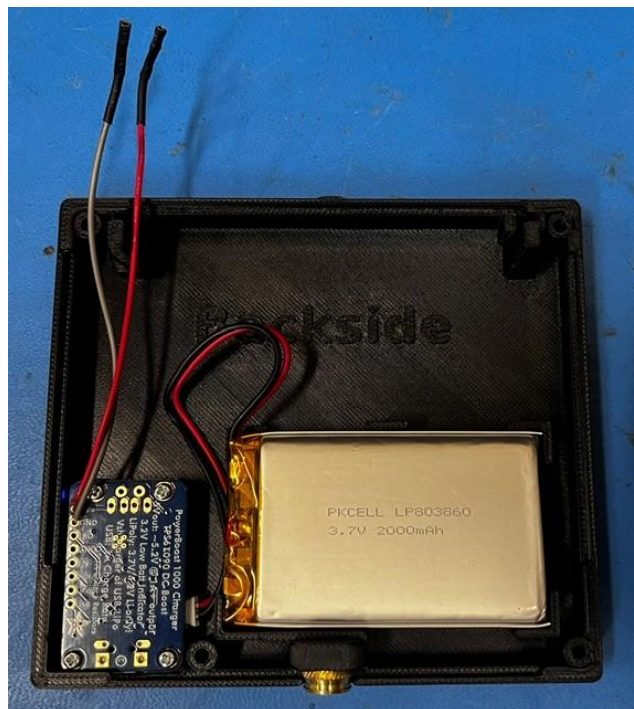


Figure 5. Charger/Converter Board Mounted in Bottom Enclosure

Step 4

Mount the OPS243 in the top enclosure with the antenna side facing the inner face of the enclosure. It's good to connect the power and ground wires to the OPS243 before mounting in the top enclosure. The green heartbeat LED and possibly the red/blue motion detect LED will light up (Figure 6). Screw in the two M2.5 x 6.5mm screws.



Figure 6. OPS243 in Top Enclosure



Figure 7. OPS243 in Top Enclosure

Step 5

Snap the top enclosure into the bottom enclosure and screw in the 4 M2.5 x 20mm screws on the backside to complete the assembly.



Figure 8. Assembled Unit (backside with screws)

A blue LED seen on the backside indicates the charger/converter board is providing 5V to the OPS243. With the USB cable connected to power the OPS243 and charge the battery, the yellow LED lights up.



Figure 9. Backside LEDs with USB Charging Battery (yellow LED)

Bill of Material

The following of the list of components for a fully assembled system excluding the OPS243.

Component	Qty	Supplier	Part Number	Description
Charger/Converter Board	1	Adafruit	2465	3.7V→5V
Battery	1	Adafruit	2011	2,000mAHr
Mount Screws	4	McMaster	90380A326	M2 x 6mm
OPS243 Mount Screws	2	McMaster	94997A225	M2.5 x 6.5mm
Threaded Insert	1	McMaster	93365A160	1/4"-20 UNC 0.3"
Power/Ground Wires	2	Digikey	AC163029	127mm Jumper Wire

The mechanical outline drawing for the OPS243 is shown in Figure 10. All units are in mm [mils].



Ordering Information

The ordering part numbers for the OPS243 module is listed in Table 3. Please use these part numbers when submitting orders. The full assembly includes the battery, battery charger/converter board, and wiring harness for OPS243. The OPS243 should be purchased separately and can be provided in the assembled version if bought together.

Table 3. Ordering Part Numbers

Radar Sensor	Battery/Charger Board Provided	Battery Size Support	Ordering Part Number
OPS243	No	2,000mAh	OPS243-B2-ENC
OPS243	Yes	2,000mAh	OPS243-B2-ASM

Revision History

Version	Date	Notes
A	October 13, 2026	Initial release.