

## Key Features

- Provides UPS functionality for Raspberry Pi Zero or Pi Zero W.
- UPS 5V out (via micro USB) – UPS functionality for Pi-Zero without the header.
- Uses one Lithium-Ion 14500 (AA size) rechargeable battery. Includes battery management.
- Reset switch for rebooting the Pi. An external reset switch can be connected.
- Python code shuts down the Raspberry Pi when battery is low.
- Uses GPIO 26 to monitor low battery Voltage.
- Hard shutdown when battery runs dangerously low, protecting the battery.
- LEDs can be turned off to save power.

# PiZ-UpTime – UPS and power mobility for Raspberry Pi Zero and Pi Zero W

A Raspberry Pi Zero and Pi Zero W (abbreviated here as PiZ) is a small size computer tethered to the wall power outlet. It needs the power via the micro-USB cable to operate. When PiZ needs to be moved from one location to another, it needs to be shut down and rebooted. If the power fails, the PiZ shuts down without a proper shutdown sequence, sometimes with catastrophic after effects. PiZ-UpTime provides clean, stable, reliable uninterruptable (UPS) power to PiZ. Pi-UpTime provides power mobility for PiZ.



Install one Lithium Ion 14500 battery<sup>1</sup> in the PiZ-UpTime and the PiZ continues to operate when power fails or when the power plug is disconnected. The batteries are charged when power is available. When power fails, the necessary power is generated from the batteries by PiZ-UpTime to power the PiZ, the peripherals attached to it and provide UPS power to USB Power Out port. The micro-USB port provides 5V. PiUpTime has the Raspberry Pi header already soldered on it. If a header is already soldered onto PiZ, UPS power is provided via the header. If the header is not soldered on the PiZ, a micro-USB to micro-USB cable can power the PiZ. PiZ-UpTime can be mounted on Pi-Z using spacers. After a power failure (or unplugging the power) PiZ-UpTime automatically charges the battery when power is restored. Power demands placed by the peripherals attached to the PiZ are also addressed by PiZ-UpTime. PiZ-UpTime protects the Raspberry Pi from brown-outs and other power related issues.

Battery is monitored via GPIO 26. Sample software provided uses GPIO 26 and ensures a proper shutdown when the batteries run low. An onboard sensor measures the battery level and performs a hard shutdown when the battery level is low.

A power reset switch on Pi-UpTimeUPS makes it easy to reboot the Raspberry Pi or PiZ after a software shutdown.

The LED jumper shunt removed turns off the LEDs minimizing the power lost.

<sup>1</sup> 18650 batteries are not included with Pi-UpTimeUPS board.

# Specifications

## General Information

**Model Number:** Pi-UpTimeUPS

## Raspberry Pi Models supported

Any Raspberry Pi or Pi clone with a 40-pin header.

## Power

**Input Power:** 5V via micro USB connector on PiZ-UpTime. Batteries are not charged if the micro USB connector is connected to the Pi instead of PiZ-UpTime.

**Power Adapter/battery:** Not included.

**Maximum Current:** 1.7 Amps total.

**Ripple:** Less than 25mV p-p.

**Operating Frequency:** 18.5kHz.

## Output

**5V UPS Power:** Power provided to the Raspberry Pi via the 40-pin header. UPS power can be accessed via micro-USB out connector.

## Batteries

**Batteries:** One 14500 Lithium-ion battery. Battery is not included.

**Battery capacity:** Recommend 700 mAh to 2000 mAh.

**LEDs:** Battery charge status & other information is shown by LED's on the board. Reset LED is lit when reset.

**Battery polarity:** As indicated on battery holder. No protection for incorrectly installed battery.

**Battery holder:** Self-extinguishing Thermoplastic Polyester, black color.

**Safety:** Onboard circuitry prevent over charging, deep discharging. Temperature monitor checks temperature and shuts down charging if it becomes too hot.

**Battery Charging:** Uses CCCV charging method.

**Depleted Batteries:** Uses low current charging to bring charge level up and then CCCV charging.

## Spacers

M2.5x15mm spacers recommended on the bottom.

## Reset Switch

**Reset Switch:** Reboots the Raspberry Pi after a shutdown.

## Dimensions

**Board dimensions:** 65mm x 30mm x 18mm (2.6" x 1.2" x 0.7").

**Weight:** About 20g (0.7 oz.) without batteries. Note each battery adds approximately 30 grams of weight.

**Header:** Female pins on bottom. Pin thickness appx. 0.6mm. Female pin height appx 11 mm. Male pin height appx 10.25 mm.

## Warranty

90-day limited warranty.

## Other Information

**Recommended peripherals:**

**PiZ-EzConnect** for GPIO connections, Amazon Part ID [B01FE9EQ88](#)

**Spacers** – M2.5, 15 mm spacer kit, Amazon Part ID [B01M71WKMS](#)

**Stacking header** extender to attach other HATs on top of Pi-UpTimeUPS – see Adafruit, [product ID 1979](#)

**USB cables etc.** – available on Adafruit, ebay, Amazon and other retailers.

**RoHS Compliance:** Electronic components, board etc. are RoHS compliant.

**Operating Temperature:** 0°C to +50°C with batteries. 0°C to +70°C without batteries.

**Operating Humidity:** 10% to 80% non-condensing.

**Code download:** [www.alchemypower.com](http://www.alchemypower.com)

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