

UPS HAT

UPS HAT (B) For Raspberry Pi, 5V Uninterruptible Power Supply, Multi Battery Protection Circuits

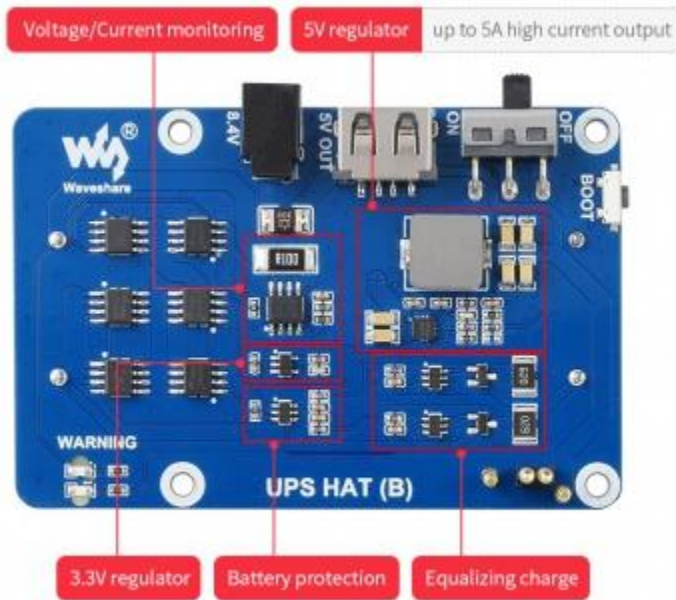
Features

- Designed for Raspberry Pi series, compatible with Raspberry Pi 3 / 3B+ / 4B, etc.
- I2C bus communication, monitoring the batteries voltage, current, power, and remaining capacity in real-time
- Multi battery protection circuits: overcharge/discharge protection, over current protection, short circuit protection, and reverse protection, along with the equalizing *charge feature, more safe and stable
- Onboard 5V regulator, up to 5A continuous output current, more sufficient power source for Raspberry Pi
- 5V USB output, convenient for powering other boards
- Batteries warning indicators, easy to check if the battery is connected correctly

Specifications

- Output voltage : 5V
- Charger : 8.4V 2A
- Control bus : I2C
- Battery supported : 2x 18650 Li batteries (NOT included)
- Dimensions : 56 × 85mm
- Mounting hole : 3.0mm

Hardware



The 8.4V interface is the charging interface, which uses an 8.4V 2A power supply for charging. 5V OUT is a USB male port that can output 5V power. The OFF/ON silkscreen is the power switch silkscreen.

Note 1: Please turn the power switch to OFF before you connect the battery, or the board may be damaged because of shorting. After installing, make sure that the Pogo pins are completely aligned with the pin header before turning on the power. If the Pogo pins are not conducting, you can press the pin to loosen it or use a knife to scratch off the oxide layer of the pin header.

Note 2: The board may not work when you mount the batteries for the first time, you need to press the Boot button to activate the circuit.

Note 3: When connecting the battery for the first time, you need to pay attention to whether the WARNING LED is on. If the LED is on, it means that the corresponding battery is connected reversely. Prohibit charging when the battery is connected reversely

Note 4: It is recommended not to exceed 4A when working for a long time and working with high current. It will heat up when working at 5A for a long time. Pay attention to heat dissipation..

Note 5: To use the power supply configured with the product to charge, using other power sources may cause the product to be damaged due to too large and unstable output power ripple.

How to use

Enable I2C interface

Open the terminal:

```
sudo raspi-config  
Choose Interfacing Options -> I2C ->yes
```

```
Raspberry Pi Software Configuration Tool (raspi-config)

1 Change User Password Change password for the current user
2 Network Options      Configure network settings
3 Boot Options         Configure options for start-up
4 Localisation Options Set up language and regional settings to match your location
5 Interfacing Options  Configure connections to peripherals
6 Overclock           Configure overclocking for your Pi
7 Advanced Options    Configure advanced settings
8 Update              Update this tool to the latest version
9 About raspi-config  Information about this configuration tool

<Select>                                <Finish>
```

```
Raspberry Pi Software Configuration Tool (raspi-config)

P1 Camera      Enable/Disable connection to the Raspberry Pi Camera
P2 SSH         Enable/Disable remote command line access to your Pi using SSH
P3 VNC         Enable/Disable graphical remote access to your Pi using RealVNC
P4 SPI         Enable/Disable automatic loading of SPI kernel module
P5 I2C         Enable/Disable automatic loading of I2C kernel module
P6 Serial      Enable/Disable shell and kernel messages on the serial connection
P7 1-Wire      Enable/Disable one-wire interface
P8 Remote GPIO Enable/Disable remote access to GPIO pins

<Select>                                <Back>
```

```
Would you like the ARM I2C interface to be enabled?

<Yes>                                <No>
```

Then reboot the Pi:

```
sudo reboot
```

Run the example

Fix the UPS HAT (B) with Raspberry Pi.

Open a terminal and run the following commands:

```
sudo apt-get install p7zip
wget https://www.waveshare.com/w/upload/4/4a/UPS_HAT_B.7z
```

```
7zr x UPS_HAT_B.7z -r -o./  
cd UPS_HAT_B  
python3 INA219.py
```

The terminal will print the IP address, battery voltage, current, and the percentage of battery quantity, as well as the CPU, GPU and memory information after starting the server.

```
Load Voltage: 7.368 V  
Current: -0.327700 A  
Power: 2.416 W  
Percent: 57.0%
```

Note: if the current value is negative, it means that the batteries are feeding the Raspberry Pi. If the current value is positive, it means that the batteries are charging.

Resources

Demo codes

- [Demo codes](#)

Document

- [Schematic](#)
- [INA219 Datasheet](#)
- [HY2120 Datasheet](#)
- [HY2213 Datasheet](#)