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› [Geekworm](#) /

› [Geekworm X1205 5V UPS HAT Shield for Raspberry Pi 5 User Manual](#)

Geekworm X1205

Geekworm X1205 5V UPS HAT Shield for Raspberry Pi 5 User Manual

Model: X1205

1. PRODUCT OVERVIEW

The Geekworm X1205 is a 5V Uninterruptible Power Supply (UPS) HAT (Hardware Attached on Top) shield designed specifically for the Raspberry Pi 5. It provides reliable power backup and intelligent power management features to ensure continuous operation and safe shutdown of your Raspberry Pi 5.

Key Features:

- **Compatibility:** Designed for Raspberry Pi 5 (16GB/8GB/4GB models).
- **Power Backup:** Offers a maximum 5.1V 5000mA power backup.
- **Intelligent Power Management:** Includes features such as auto power on, safe shutdown, power loss detection, and power adapter failure detection.
- **Battery Support:** Supports 2-Cell 21700 batteries (batteries not included). Maximum battery length 70.5mm, diameter 21.1mm.
- **Multiple Power Input Options:** Can be powered via 5Vdc USB Type-C, 9-18Vdc via DC5521 barrel connector, or 9-18Vdc via XH2.54 connector.

Package Contents:

The X1205 UPS Shield package typically includes:

- 1 x X1205 UPS Shield
- 4 x CM2.5 x 4mm screws

Note: Raspberry Pi 5, batteries, power adapter, and active cooler are not included and must be purchased separately.



Image: X1205 Packing List showing the UPS Shield and included screws.

2. SETUP AND INSTALLATION

2.1 Component Identification



Image: Detailed diagram of the X1205 UPS HAT with labeled components.

Refer to the diagram above for the location and function of key components on the X1205 board:

- **1. DC9~18V input:** DC jack 5.5x2.1mm for power input.
- **2. USB-C power input:** 5Vdc 5A via USB Type-C.
- **3. Power Button:** Performs the same function as the Pi5 power button. Press three times quickly to turn off the UPS.
- **4. 5VO - 5V Power Output LED:** On indicates power on, Off indicates power off. If Pi5 is not detected, it will turn on for 3 seconds then off.
- **5. PI5 - RPi5 detection LED:** Solid on indicates Pi power on, Off indicates Pi shutdown.
- **6. CHG - Charging LED:** Flashing indicates battery charging, Solid on indicates battery fully charged, Off indicates charging disabled.
- **7. D1-D2-D3-D4 - Battery voltage level indicators.**
- **8. AON - Auto power-on:** Short to enable AUTO Power On, Open to disable AUTO Power On.
- **PSW - Power Switch:** 2.54 pitch pin header for external power switch.
- **9. 2 Cell 21700 Battery Holder:** Battery length max 70.5mm, diameter max 21.1mm, without built-in protection circuit.
- **10. 5V OUT XH2.54-2P x2:** Connectors for 5V power output.

- 11. DC9-18V input: XH2.54-2P connector for power input.

2.2 Physical Installation

Follow these steps to install the X1205 UPS HAT onto your Raspberry Pi 5:

1. Align the X1205 UPS HAT with the Raspberry Pi 5's GPIO pins.
2. Carefully press the X1205 onto the Raspberry Pi 5, ensuring all pogo pins are aligned and make proper contact.
3. Secure the X1205 to the Raspberry Pi 5 using the provided M2.5x4mm screws.

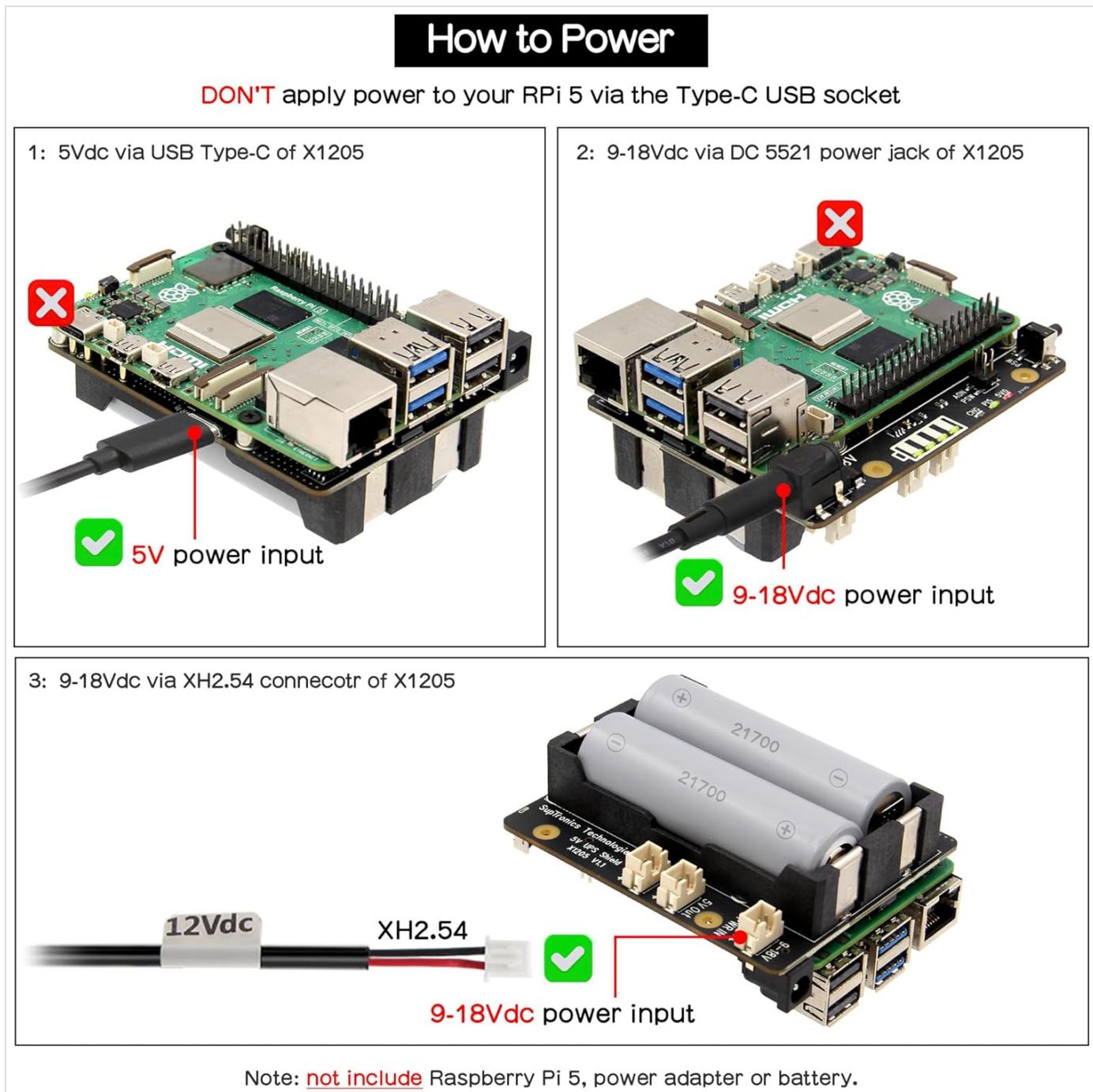


Image: The X1205 UPS HAT securely attached to a Raspberry Pi 5.

2.3 Battery Installation

The X1205 supports 2-Cell 21700 batteries. Ensure you use batteries without built-in protection circuits, as the UPS Shield has its own protection function.

1. Carefully insert the 21700 batteries into the battery holders.
2. **Crucial:** Always double-check the polarity of the battery's connector to ensure it matches the "+" to "+" and "-" to "-".

markings on the battery holder. Incorrect polarity can cause over-current, heat, and damage to the battery protection chip.



Image: Diagram illustrating 21700 battery specifications and correct polarity for installation.

2.4 Powering the X1205

The X1205 offers three methods for power input:

- **Option 1:** 5Vdc via the USB Type-C port on the X1205.
- **Option 2:** 9-18Vdc via the DC5521 barrel connector on the X1205.
- **Option 3:** 9-18Vdc via the XH2.54 connector on the X1205 (XH2.54 power cable not included).

Important: Do NOT apply power to your Raspberry Pi 5 via its own USB Type-C socket when using the X1205. Power should only be supplied through the X1205.



Image: Visual guide on the three power input options for the X1205.

2.5 Convenient Pogo Pins Connection

The X1205 utilizes pogo pins for connection to the Raspberry Pi 5, eliminating the need for cabling and soldering. Ensure all pogo pins are properly aligned and make good contact with the Raspberry Pi 5 for correct power supply functionality.



Image: Illustration of the pogo pin connection between the X1205 and Raspberry Pi 5.

2.6 Installation Video Guide

For a visual step-by-step installation guide, please refer to the official video below. This video demonstrates the installation of a similar model (X1201) with a case, which is applicable to the X1205.

Video: Installation guide for Geckworm X1201 UPS and X1201-C1 Case with Raspberry Pi 5. This video provides a comprehensive visual walkthrough of the assembly process, including attaching the UPS HAT, installing batteries, and integrating with a compatible case.

3. OPERATING INSTRUCTIONS

The X1205 UPS HAT provides intelligent power management for your Raspberry Pi 5.

3.1 Power On/Off

- **Power On:** Once connected and powered, the Raspberry Pi 5 should automatically power on. The 5VO LED (4) will be on, and the PI5 LED (5) will be solid on.
- **Safe Shutdown:** To safely shut down the Raspberry Pi 5, use the operating system's shutdown function. The PI5 LED (5) will turn off upon shutdown.
- **Power Button (3):** This button performs the same function as the Raspberry Pi 5's onboard power button. To turn off the UPS, press the button three times in quick succession.

3.2 Auto Power On (AON)

The AON jumper (8) controls the auto power-on feature:

- **Enabled:** If the AON jumper is shorted, the Raspberry Pi 5 will automatically power on when external power is supplied.
- **Disabled:** If the AON jumper is open, the Raspberry Pi 5 will not automatically power on when external power is supplied.

3.3 Battery Charging and Status

- **Charging (CHG LED 6):** The CHG LED will flash when the batteries are charging. It will be solid on when the batteries are fully charged. If the LED is off, charging is disabled.
- **Battery Level (D1-D4 LEDs 7):** The D1-D4 LEDs indicate the current battery voltage level. Refer to the product documentation for specific voltage thresholds for each LED.

4. MAINTENANCE

4.1 Battery Care

- Use only recommended 21700 batteries without built-in protection circuits.
- Always ensure correct battery polarity during installation to prevent damage.
- Store batteries in a cool, dry place when not in use.

5. TROUBLESHOOTING

5.1 Low Voltage Warning Solution

If you encounter low voltage warnings, you may need to adjust the EEPROM configuration of your Raspberry Pi 5. This involves modifying the boot.conf file.

Warning: Modifying EEPROM configuration incorrectly can lead to system instability. Proceed with caution and consult official Raspberry Pi documentation if unsure.

1. From the command line or Terminal window, run the following command: `pi@raspberrypi ~ $ sudo rpi-eeprom-config -e`
2. Change the setting of `POWER_OFF_ON_HALT` from 0 to 1.
3. Add `PSU_MAX_CURRENT=5000` at the end of the file. The file should look similar to this example:

```
GNU nano 7.2 /tmp/tmpf9i3trp/boot.conf
[all]
BOOT_UART=1
POWER_OFF_ON_HALT=1
BOOT_ORDER=0xf41
PSU_MAX_CURRENT=5000
```

4. Reboot your Raspberry Pi 5 to apply the changes: `pi@raspberrypi ~ $ sudo reboot`



Image: Guide for resolving low voltage warnings by editing the EEPROM configuration.

6. SPECIFICATIONS

Attribute	Value
Brand	Geekworm
Model	X1205
Output Wattage	30.6 Watts
Voltage	5.1 Volts
Wattage	30.6 watts
Batteries Included	No
Batteries Required	Yes
Battery Composition	Lithium-ion
Form Factor	Compact
Color	Black

Amperage	5000 Milliampere
Item Weight	64 Grams
Input Voltage	9-18 Volts DC (VDC)
Maximum Power	25.5 Watts

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