SkyCamOne HAT for Raspberry Pi 4B [Rev.B]

Quick Start Guide

Version 1.2, February 2025

Thank you for choosing a Titan Astro product! We hope you will enjoy it thoroughly and wish you many clear and dark skies!

⚠ Important
Your Titan Astro SkyCamOne HAT for Raspberry Pi 4B is a sensitive electronic device. Handle with care. Avoid exposure to extreme temperatures, moisture, or physical shock. Do not attempt to disassemble or modify the device. Improper handling may damage the device and void the warranty.

Warning
Do not supply power to your SkyCamOne HAT or Raspberry Pi before properly connecting both!

This guide will help you set up your SkyCamOne HAT for Raspberry Pi 4B. Assembly, the loading of the software and connecting to the device.

This is a Quick Start Guide and it does not include everything there is to know.
We recommend you visit our website for more information, FAQs and troubleshooting tips: www.titanastro.com/support.

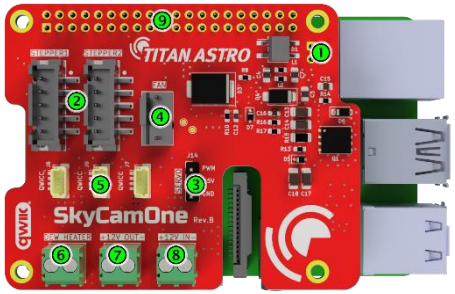
Package Contents

Please make sure your package contains all necessary components:

- One SkyCamOne HAT for Raspberry Pi 4B
- One 40-pin (2x20) rising header
- One 4-pin (2x2) rising header
- One set of spacers (standoffs), nuts and screws (4 each)
- This Quick Start Guide
- One Titan Astro sticker

If any of these components are missing or defective, please contact Titan Astro support.

Board Layout



1. PoE (Power over Ethernet) IEEE 802.3bt class 4 with 30 Watt output
2. Double stepper motor control at 5 Volts
3. Servo motor control
4. Fan control for standard 4-pin PC fans at 5 Volts
5. Three I2C connectors (QWIIC) for sensors
6. Dome/dew heater control at 5 Volts and max. 3.5 Watt
7. Power output at 12 Volts
8. 12 Volts power in (car, battery etc)
9. 40-pin RPi header

Getting Started

Follow below steps to get started with your SkyCamOne HAT.

Note
Please note that the SkyCamOne HAT has been designed to be mounted on top of a Raspberry Pi 4B with the most common cooling devices. If you have a cooling solution (heatsinks, fan), install it before installing the SkyCamOne HAT.

1. Unboxing and Inspection:

- Carefully unpack the SkyCamOne HAT and its components.
- Visually inspect the HAT and your Raspberry Pi for any physical damage.

2. Mounting the HAT:

- Disconnect the Raspberry Pi from power before beginning installation.
- Install the spacers using the four provided nuts. Firmly press the GPIO rising header on top of the Raspberry Pi GPIO pins; orientation does not matter as long as all pins fit into place. Do the same with the 4-pin PoE rising header.
- Align the HAT with the 40-pin GPIO header 9 and PoE header on the Raspberry Pi. Set the SkyCamOne HAT on top of the spacers, and use the four screws to secure it in place.
- Gently press down on the HAT to ensure a secure connection.

3. Connecting Power, SSD Drive and Peripherals:

- **Power:**
  - **With a 12V Power Supply:**
    Ensure the SkyCamOne is connected to a 12V DC power source via the **12V IN** 8 terminal block. *Connect the positive lead to the left terminal and the negative lead to the right side terminal.* Your Raspberry Pi 4B will draw power from the SkyCamOne HAT's 5V power rail.

Caution
Make sure your power source does not exceed 15 Volts or the SkyCamOne HAT might suffer irreparable damage!

  - **With PoE (Power over Ethernet):**
    Connect a CAT5 or CAT6 ethernet cable from your PoE power injector or PoE switch to the Ethernet port of the Raspberry Pi 4B. The SkyCamOne HAT will draw power from PoE and supply it to the Raspberry Pi 4B.

Tip
Be aware that on some PoE capable switches, not all ports provide power - some are regular (non-powered) ethernet ports. Consult the user manual of your switch for more information.
Also, make sure your PoE injector or switch is capable of delivering at least 15 Watts. With most switches, the advertised power is divided over the PoE ports and might thus be insufficient. The more peripherals you connect to the SkyCamOne HAT, the more power you will require.

Note
The SkyCamOne HAT for Raspberry Pi 4B is capable of handling up to a maximum of 30 Watt of power through PoE.

- **Peripherals:** Connect any necessary peripherals;
  - **Stepper motors:**
    Connect up to to stepper motors to the headers marked as **STEPPER1** and **STEPPER2**. The steppers can only be connected in one way for the connector to fit into the header.
  - **Servo:**
    Connect a servo to the header marked as **SERVO**. The servo can be connected in two ways, as the connector can be reversed. *If your servo does not work, turn this connector around.*
  - **Sensors:**
    Connect any I2C QWIIC capable sensor using a QWIIC cable to either one of the three available headers marked as **QWIIC**. You can also chain sensors that have two QWIIC connectors on board. You can connect up to a maximum of 255 sensors to the SkyCamOne HAT.
  - **5V PC Fan:**
    Connect a 5V PWM PC Fan (any size) to the 4-pin header marked **FAN**.
  - **Dew Heater:**
    Connect a 5V dew heater to the **DEW HEAT** 6 terminal block.

4. Software Installation:

First, ensure that your Raspberry Pi runs the latest software. Run the following command to update:

```
$ sudo apt update && sudo apt full-upgrade
```

Next, ensure hat your Raspberry Pi firmware is up-to-date. Run the following command to update your firmware to the latest version:

```
$ sudo rpi-eeprom-update -a
```

Then, reboot with `sudo reboot`.

Download our latest test scripts for your HAT from www.titanastro.com/support.

Troubleshooting

Check our webpage for our most up-to-date help and troubleshooting tips.

Additional Tips:

- **Heat Dissipation:** Ensure proper airflow around the HAT to prevent overheating.
- **Cable Management:** Keep cables organized and away from moving parts to avoid damage.
- **Power Supply:** Use a reliable power supply capable of delivering sufficient power to the Raspberry Pi and the HAT.

ⓘ Note

Depending on when your SkyCamOne HAT was produced, your HAT can be of a different color then depicted in this manual. It can be blue or green instead of red.

What is important is the revision of your HAT. You can find the revision number on the top side of your HAT.

For the SkyCamOne HAT for Raspberry Pi 4B, the revision should be Rev.B or higher.

Reference: pinout

The following table shows the Raspberry Pi GPIO pin numbers that you need to use in your allsky software or scripts. For the steppers, each line represents a stepper coil. You should use them in sequence (A,B,C,D). The dew heater can be used with a simple ON/OFF or with PWM.

FUNCTION	PIN	GPIO/BCM	WIRINGPI
STEPPER1 A	38	GPIO20	28
STEPPER1 B	40	GPIO21	29
STEPPER1 C	37	GPIO26	25
STEPPER1 D	35	GPIO19	24
STEPPER2 A	33	GPIO13	23
STEPPER2 B	32	GPIO12	26
STEPPER2 C	31	GPIO6	22
STEPPER2 D	29	GPIO5	21
DEW HEATER	11	GPIO17	0
FAN TACH	24	GPIO8	10
FAN PWM	26	GPIO7	11
SERVO	12	GPIO18	1

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