

## AllSky camera enclosure, modular

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### Summary

Multi function camera enclosure for a variety of cameras, domes, and computers.

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[asi](#) [playerone](#) [pcg02](#) [allskeye](#)

**4/6/2024 version 2 update:** version 2 update uploaded, one major change. The original exterior with fan filters installed, the M3 button head screw caps plus the fan filter mount bubpout make inserting the internal chassis difficult, the clearance is too tight. I changed the fan filter housing profile (removed bump outs created M2.5 screw mount points) on the walls, and it now uses M2.5x4 screws to mount the lower profile fan filters.

After this version 2 update, I will mark this project as complete as it all works as intended.

4/5/2024 update: Added a new camera top plate with an integrated BME280 sensor bracket that projects into the dome. This mounting solution makes for easier wiring during assembly. Slight adjustments to ASI camera bracket for better lens positioning. Also modified the RPi HQcam mount slightly.

This is an AllSky camera enclosure designed to be used with a variety of computers, cameras, and domes. Highly modular, .STEP files uploaded so you can tinker.

Tested and works with:

MeLE PCG02 mini PC

Raspberry Pi 4b

ZWO ASI224mc w/ Arecont 1.55m

Raspberry Pi HQcam w/ Arecont 1.55mm

There is a set of mount points on the inside bracket for both a Raspberry Pi and a MeLe PCG02 mini computer. This way you can either use Thomas Jacquin's Linux AllSky software off Github or the AllSkEye Windows based software on the MeLe computer. Raspberry Pi mounts onto the VESA screw points using an adapter board. PCG02 uses the VESA mount points on the computer.

I currently have it designed around the JMX 4" x 2.244" high acrylic dome off Amazon. It looks like it is identical to the 4" dome offered by DewControl.com. The dew ring insert is for the small dew heater ring off of DewControl.com. There is a bracket for a BME280 sensor within the dome ring housing.

I'm working on a power distribution/electronics carrier board. It will hold an LM2596 buck converter, WAGO lever nuts, and an Arduino.

The Arduino will be for controlling relays for the case fans, the dew heater ring, and interfacing with the BME280 sensor, if you choose to use a MeLe Windows PC with AllSkEye, as it lacks the GPIO of the Linux Raspberry Pi.

The exterior walls includes multiple parts. The black parts are to be printed in black filament to reduce glare within the dome, and the rest can be printed in white for heat rejection.

Did my best to chamfer as many bodies as possible to reduce the need for supports, supports are unavoidable in certain spots though.

There are 6 M4 heat thread inserts in the back of the exterior walls for you to come up with, and attach, your own mounting solution for your own needs. There are also 4 M4 heat set inserts in the bottom, in case you need a mounting solution from underneath.

A note on heat set inserts. Throughout the design, I used a lot of M3x5x4 heat set inserts, they're needed in most spots. With the exception of: 60mm and 40mm fan mounts (use short M3 screws), RPi HQcam bracket plastic attachment to camera PCB (use bare 2.5mm screws), LM2596 buck (use M3 short screws), VESA mount to RPi adapter plastic (use short M3 screws and ensure they dont protrude and touch the Pi motherboard, and RPi motherboard to VESA-adapter (use bare 2.5mm 6mm screws).

The electronics carrier board has multiple wiring options to suit your own needs.

I designed it to have space for four 5 wire Wago 221 connectors. It has space for two LM2596 buck converters. On the backside of the electronics carrier board is space for M3 heat set inserts to mount an Arduino Uno board for sensors/motors/dew/fan control.

I also created an adapter board to screw onto the Arduino mount points, which will hold a single relay. This is for Raspberry Pi users who want to use a single relay to control the dew ring.

I created a dome TPU gasket glue guide. Print it in draft, place the TPU ring down, apply a thin bead of clear sealant, then carefully place your dome on top of it. This will allow you to glue the TPU gasket to the JMX dome without getting your nice enclosure all messy. I add a thin bead of dielectric grease on the bottom TPU to provide more waterproofing.

If you're concerned about water intrusion using my method, you can also just apply a thin bead of clear sealant on the bottom and top of the TPU gasket, place your dome, and screw it down. But that approach will make replacing a yellowed dome more difficult down the road, might have to reprint a new exterior wall setup.

Below is a list of components used for the enclosure:

JMX 4" acrylic dome:

[https://www.amazon.com/gp/product/B07KGHYM4H/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o04\\_s00?ie=UTF8&th=1](https://www.amazon.com/gp/product/B07KGHYM4H/ref=ppx_yo_dt_b_asin_title_o04_s00?ie=UTF8&th=1)

Lever nuts:

[https://www.amazon.com/dp/B07NPGV7G2?psc=1&ref=ppx\\_yo2ov\\_dt\\_b\\_product\\_details](https://www.amazon.com/dp/B07NPGV7G2?psc=1&ref=ppx_yo2ov_dt_b_product_details)

6010 12v fans:

[https://www.amazon.com/gp/product/B08R9JNB2Y/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o03\\_s00?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B08R9JNB2Y/ref=ppx_yo_dt_b_asin_title_o03_s00?ie=UTF8&psc=1)

4010 12v fan, mounts behind MeLe PC or RPi to help cool it:

[https://www.amazon.com/dp/B0711FVD48?psc=1&ref=ppx\\_yo2ov\\_dt\\_b\\_product\\_details](https://www.amazon.com/dp/B0711FVD48?psc=1&ref=ppx_yo2ov_dt_b_product_details)

M4 heat set inserts for the external mount points:

[https://www.amazon.com/dp/B0CB8MY18Z?psc=1&ref=ppx\\_yo2ov\\_dt\\_b\\_product\\_details](https://www.amazon.com/dp/B0CB8MY18Z?psc=1&ref=ppx_yo2ov_dt_b_product_details)

M3 heat set inserts:

[https://www.amazon.com/dp/B07D683Q26?ref=ppx\\_yo2ov\\_dt\\_b\\_product\\_details&th=1](https://www.amazon.com/dp/B07D683Q26?ref=ppx_yo2ov_dt_b_product_details&th=1)

Dust filter material to build disposable dust filters:

[https://www.amazon.com/dp/B086R9DTNQ?psc=1&ref=ppx\\_yo2ov\\_dt\\_b\\_product\\_details](https://www.amazon.com/dp/B086R9DTNQ?psc=1&ref=ppx_yo2ov_dt_b_product_details)

Right angle USB 3 B cable:

[https://www.amazon.com/dp/B0BYZHKGPS?psc=1&ref=ppx\\_yo2ov\\_dt\\_b\\_product\\_details](https://www.amazon.com/dp/B0BYZHKGPS?psc=1&ref=ppx_yo2ov_dt_b_product_details)

BME280 sensors:

[https://www.amazon.com/dp/B0965GDJPM?psc=1&ref=ppx\\_yo2ov\\_dt\\_b\\_product\\_details](https://www.amazon.com/dp/B0965GDJPM?psc=1&ref=ppx_yo2ov_dt_b_product_details)

DC power plug off Amazon:

[https://www.amazon.com/gp/product/B0BGLL71QT/ref=ppx\\_yo\\_dt\\_b\\_asin\\_title\\_o00\\_s00?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B0BGLL71QT/ref=ppx_yo_dt_b_asin_title_o00_s00?ie=UTF8&psc=1)

## Model files



### STEP files

17 files

**electronics-carrier-board.step**

**camera-holder-top.step**

**asi-camera-bracket.step**

**rpi-hqcam-bracket.step**

**bottom-m4-screws-to-npt-mount.step**

**external-bme280-hole-cover-if-not-using.step**

**external-bme280-bracket-exterior-shell.step**

**external-bme280-sensor-mount.step**

**external-bme280-sensor-tpu-gasket.step**

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**tpu-bottom-gasket.step**

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**amazon-dc-power-port-attachment.step**

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**arduino-mount-to-single-relay-adapter-bracket.step**

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**dome-bme280-mounting-bracket.step**

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**allsky-mele-pcg02-housing-v23.step**

☐ Camera top with BME280 bracket integrated, makes for easier wiring during assembly

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**vesa-to-pi-adapter-bracket.step**

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**allsky-exterior-housing-v2.step**

☐ Updated fan filter mounting

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**v2-internal-chassis.step**



**allsky-electronics-board.3mf**

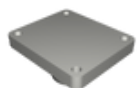
☐ Multicolor letters inset for wiring guide.

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**allsky-bottom-tpu-gasket.3mf**

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**allsky-bottom-075in-npt-mount.3mf**

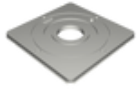
☐ Bottom mount using 4 M4 screws, it threads onto the top of a 3/4" NPT pipe

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**dome-tpu-gasket.3mf**

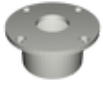
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### **dome-gasket-gluing-template.3mf**

☐ Use this to apply silicone sealant to connect TPU gasket to JMX dome, as a guide

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### **amazon-dc-jack-port.3mf**

☐ Insert for the base to install the DC jack linked from Amazon, with a weather proofing "jacket"

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### **external-bme280-jacket.3mf**

☐ protects external BME280 from the elements, uses 4 M3 heat set inserts

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### **external-bme280-tpu-gasket.3mf**

☐ TPU gasket for external BME280, use hot glue over square inside part once wires are run to seal

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### **camera-top-plate.3mf**



### **asi-camera-bracket.3mf**

☐ Tested with ASI224mc and Arecont 1.55mm CS lens

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### **external-bme280-mount.3mf**

☐ BME280 mount that goes in base to monitor outside of the enclosure conditions

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### **arduino-mount-to-relay-adapter.3mf**

☐ Allows you to mount a single relay to Arduino mount holes, necessary for Pi users

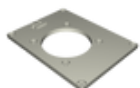
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### **rpi-hqcam-bracket.3mf**

☐ Tested with RPi HQcam and Arecont 1.55mm

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### **camera-top-plate-w-bme280-bracket.3mf**

☐ Camera top with BME280 bracket integrated, makes for easier wiring during assembly

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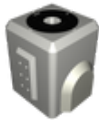
### **vesa-to-pi-adapter-bracket.3mf**

☐ Adapts the VESA holes to a board to mount the Pi, uses 3mm screws to VESA, and Pi uses 2.5mm

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### **v2-disposable-fan-filter-bracket.3mf**



### **allsky-exterior-housing-v2.3mf**

☐ V2 updates internal fan filter mounting with a narrower profile

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### **v2-internal-chassis.3mf**

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