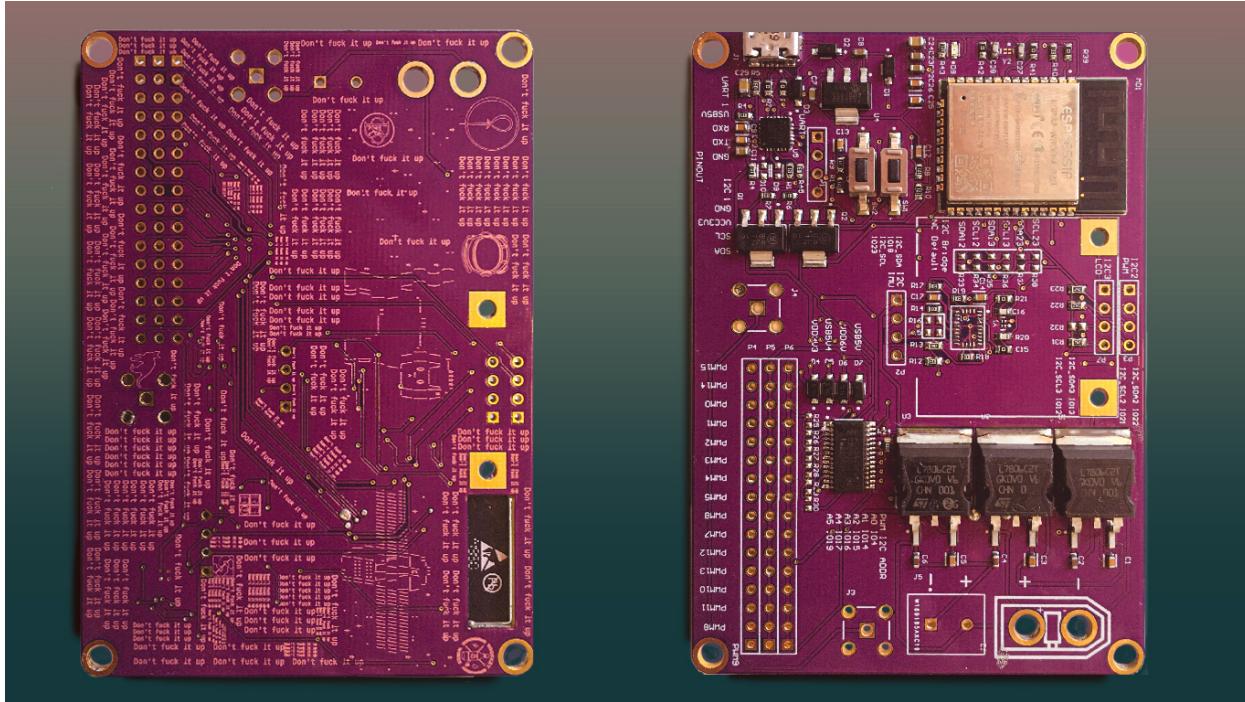
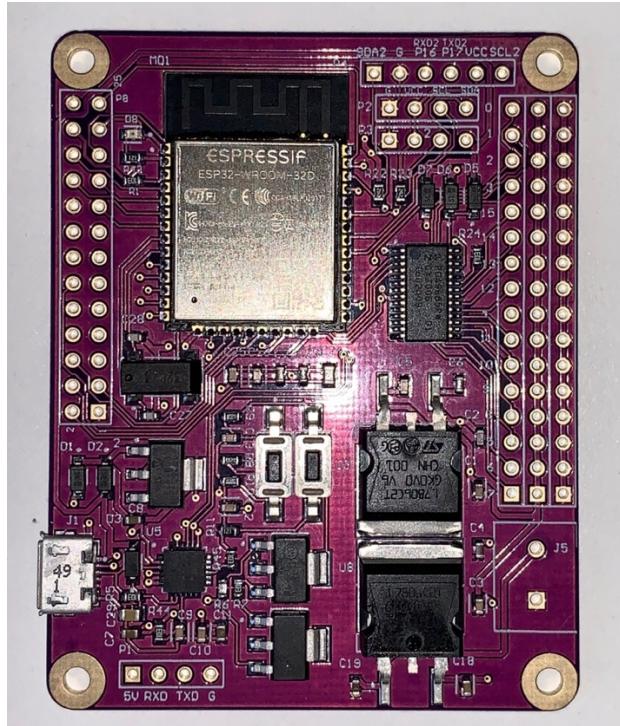


Getting Started

In the package you will receive an Antenny Board. We have Antenny v1 and Antenny v2 out there. Antenny v2 board fixed the I2C_3 channel pull up bugs and break out all the unused pins on the board. Antenny V2 and V3 board have the similar pin layout.



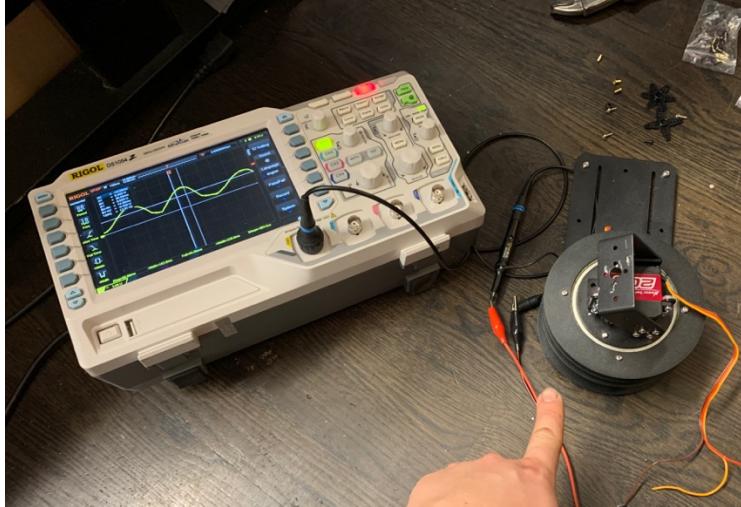
Pic 1. Antenny v1



Pic 2. Antenny v2

Important Updates for Antenny connection

1. Servo motor gimbal



When the servo motor moves by external force, the motor will generate back EMF between the power and GND. The voltage of the back EMF can reach 15+V as spike which would break the PWM driver on the Antenny board.

When connected the servo motor gimbal with the Antenny board, please make sure that the servo motor wouldn't move by accident or by super heavy load. The Servo motor should only move by the electricity and controlled by PWM signal provide by Antenny board.

2. External I2C device

When external I2C device can response to ID code scan but cannot function well, that indicate the poor connection or exceeded length of the I2C wire. Lower the frequency of the I2C channel can usually solve the problem.

Hardware setup for Antenny board

1. Requirement

a. Soldering kits

You need to prepare your own soldering kits for stable connection of through hole connectors.

b. Pin headers [[Amazon.com](#)]

We include some pin headers necessary for the Nyan-sat base station setup. But if you want to extend the function of the Antenny board, it is always good to have some more around.

c. Jumper wires [[Amazon.com](#)]

We also include some jumper wires in the kits for you to connect IMU board to the Antenny board. But in case you need more function, have some more around.

d. External power supply or lipo battery

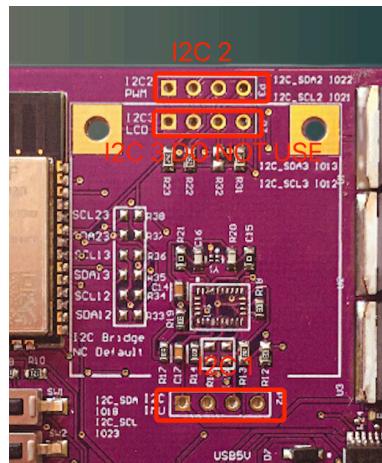
In order to drive the servo gimbal, you need an external 6v to 30v power supply or lipo battery. USB can only power the servo motor if there is only light load.

2. Hardware connections

a. I2C connections

ESP32 can only support 2 I2C channel at the same time. However, you can chain multiple devices in the same I2C channel. We have 3 I2C channel connectors on Antenny v1 Board and 2 I2C channel connectors on Antenny v2 Board. For IMU connection, we recommended to use I2C_1 connector. You need to solder pin headers into the through holes. PWM driver is chained in to I2C_2 Channel.

i. Antenny V1:



Pic 3. Antenny v1 I2C connectors

All the pinout for I2C connectors is the same:

Pin1 Pin2 Pin3 Pin4

GND VCC SCL SDA

In Antenny v1 board I2C channel 3 is Not Recommended to use. IO12 need to be pulled down at boot time. Bug fixed in the Antenny v2 board.

I2C_1 SDA IO18

I2C_1 SCL IO23

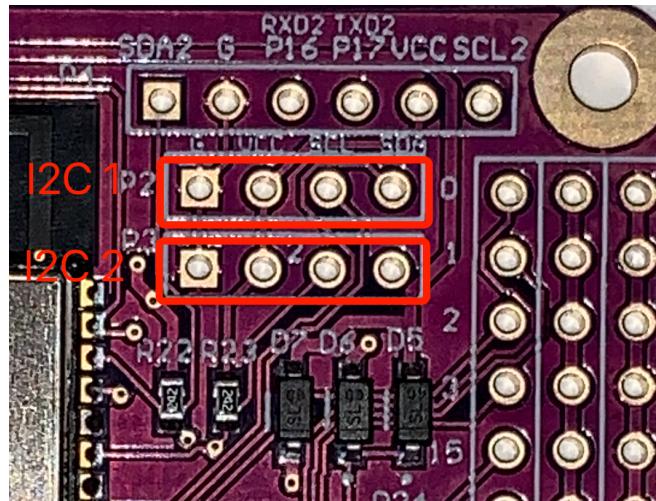
I2C_2 SDA IO22

I2C_2 SCL IO21

I2C_3 SDA IO13

I2C_3 SCL IO12

ii. Antenny V2:



Pic 4. Antenny v2 I2C connectors

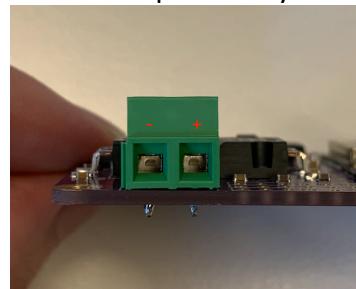
Pinout:

Pin1 Pin2 Pin3 Pin4
GND VCC SCL SDA

I2C_1 SDA IO19
I2C_1 SCL IO18
I2C_2 SDA IO22
I2C_2 SCL IO21

b. External Power connection

You need to solder the green block connectors on the board. Pin 1 of the block connector is Negative/GROUND, Pin2 of the block connector is Positive. You can connect to external power source or lipo battery with 6v to 30v.

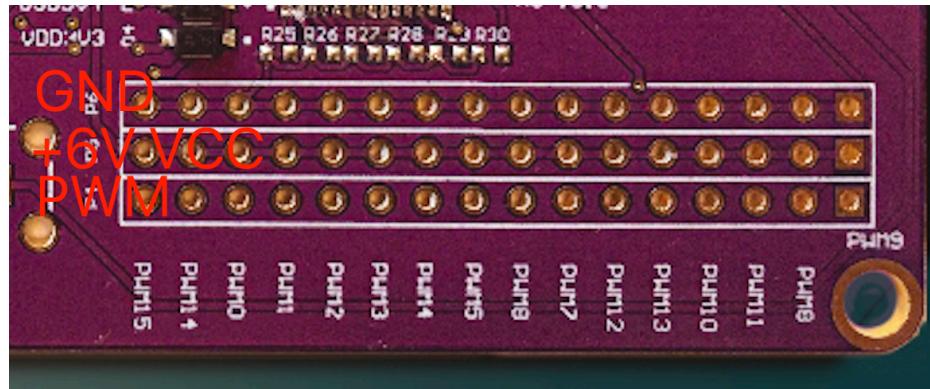


Pic 5. Antenny v2 Power block

c. PWM driver

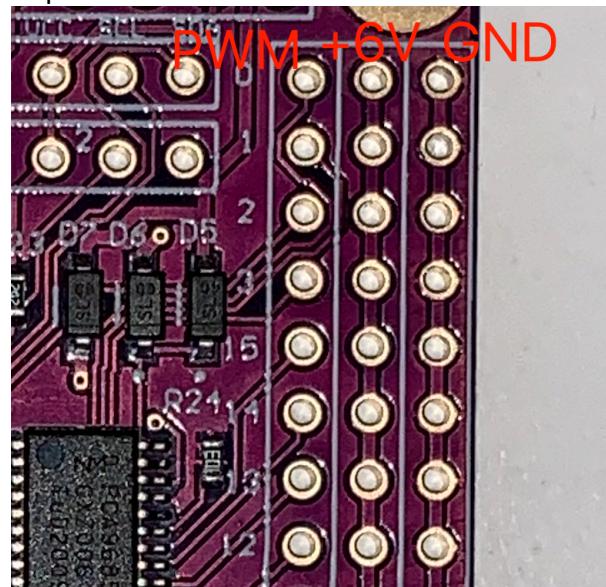
PWM driver provides 16 Channels. You can use any two of the channels to drive the servo gimbal.

For Antenny v1, the PWM channels are Labeled around the pins.



Pic 6. Antenny v1 PWM pinout

For Antenny v2 Board. PWM pinout shows in the pic blow. The PWM channels are Labeled around the pins.



Pic 7. Antenny v2 PWM pinout

You can change the PWM driver's IDcode in I2C channel by setting the IO pins connected to the A* pins. Usually we set All A* pins to low.

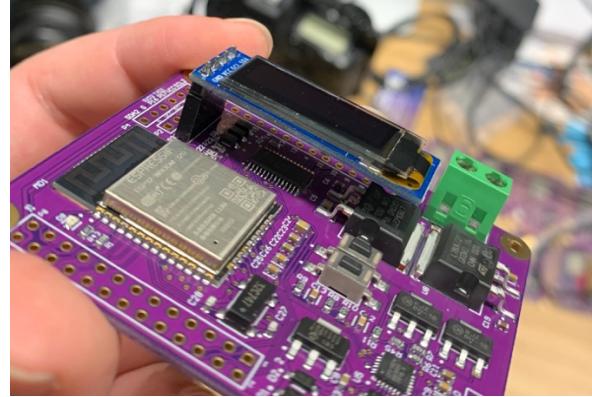
	Antenny v1	Antenny v2
A0	IO4	IO23
A1	IO14	IO25
A2	IO15	IO26
A3	IO16	IO27
A4	IO17	IO2
A5	IO19	IO4

Example micro python code to set pins:

```
import machine
from machine import Pin
pin = machine.Pin(4, machine.Pin.OUT)
pin.value(0)
```

- d. OLED screen (optional) [[Amazon.com](#)]

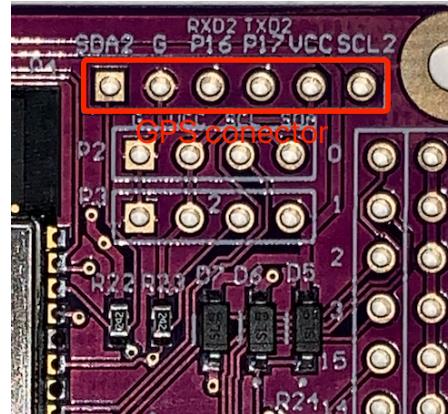
The OLED is optional and does NOT come with the kits. You can easily plug the screen to the Antenny v2 Board to extend its capability.



Pic 8. Antenny v2 with OLED

- e. GPS module (optional) [[Aliexpress](#)]

The GPS module connectors can be found on Antenny v2 board. The pinout is labeled on the board.



Pic 9. Antenny v2 GPS connector

- f. Unused breakout pins

Antenny v2 board breakout all unused pins on ESP32 and labeled on the back of the board. You can use them for future development.

- g. Extra Power Regulator

In the kit of Antenny v2 kit, there are 2 extra power regulators. They wouldn't affect the function of the Antenny v2 board. You can solder them on back of the board in order to make the Antenny v2 board provide more Output current.