

PhotonVision Step by Step

[PhotonVision's quick start guide](#)

Step 0: Disable the web server on your roboRio

[see wpilib documentation on how to do this](#)

Step 1: Buy hardware

- Processor: [Orange Pi with metal case](#)
- Camera: [Arducam 100fps Mono Global Shutter USB Camera](#),
- Power Supply: [DC 12V/24V to 5V USB C Step Down Converter Type-C Interface 5A 25W 2 pack](#)
- Micro SD Card: 32 GB?



Step 2: Put together your Orange Pi

[Follow this video](#)

Step 3: Install image on SD card from photonVision

Find latest image

<https://github.com/PhotonVision/photonvision/releases/tag/v2025.3.1>

 photonvision-v2025.3.1-linuxarm64_orangepi5plus.img.xz	884 MB	Mar 27
--	--------	--------

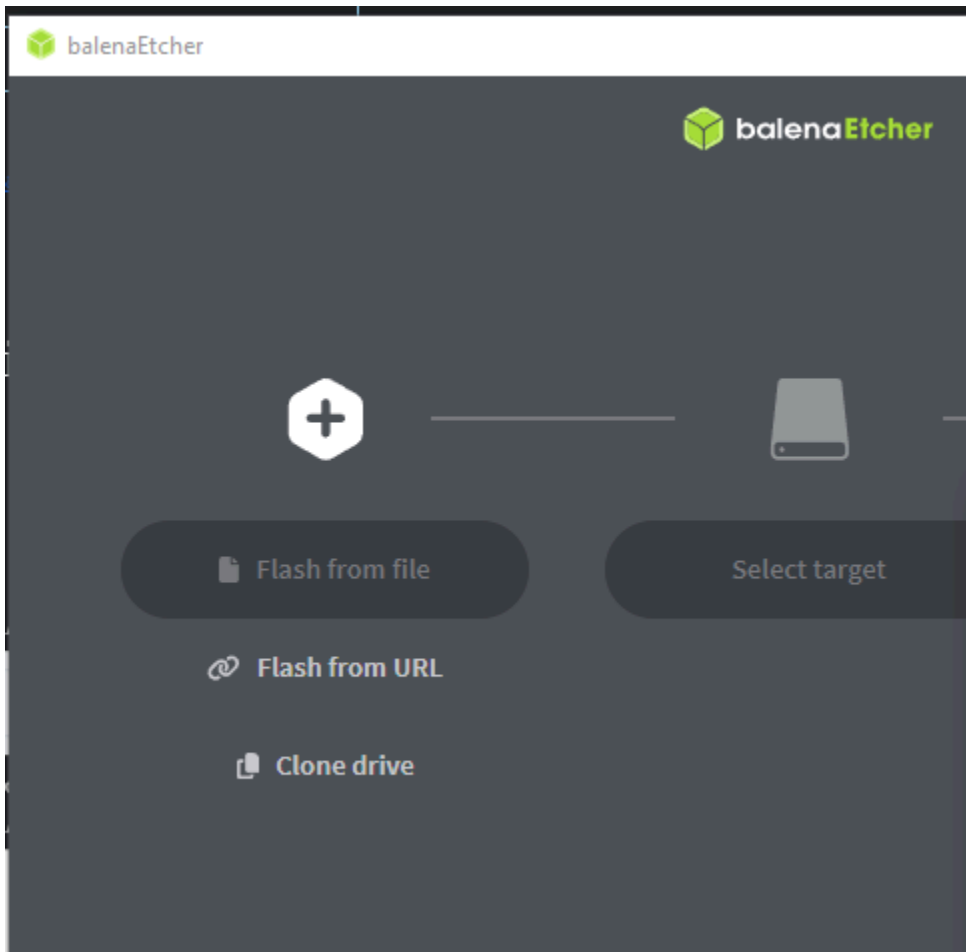
Also download and install an image burning tool like Balena Etcher

<https://etcher.balena.io/#download-etcher>

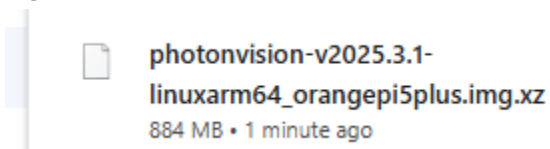
Download Etcher

ASSET	OS	ARCH	
ETCHER FOR WINDOWS (X86 X64) (INSTALLER)	WINDOWS	X86 X64	Download

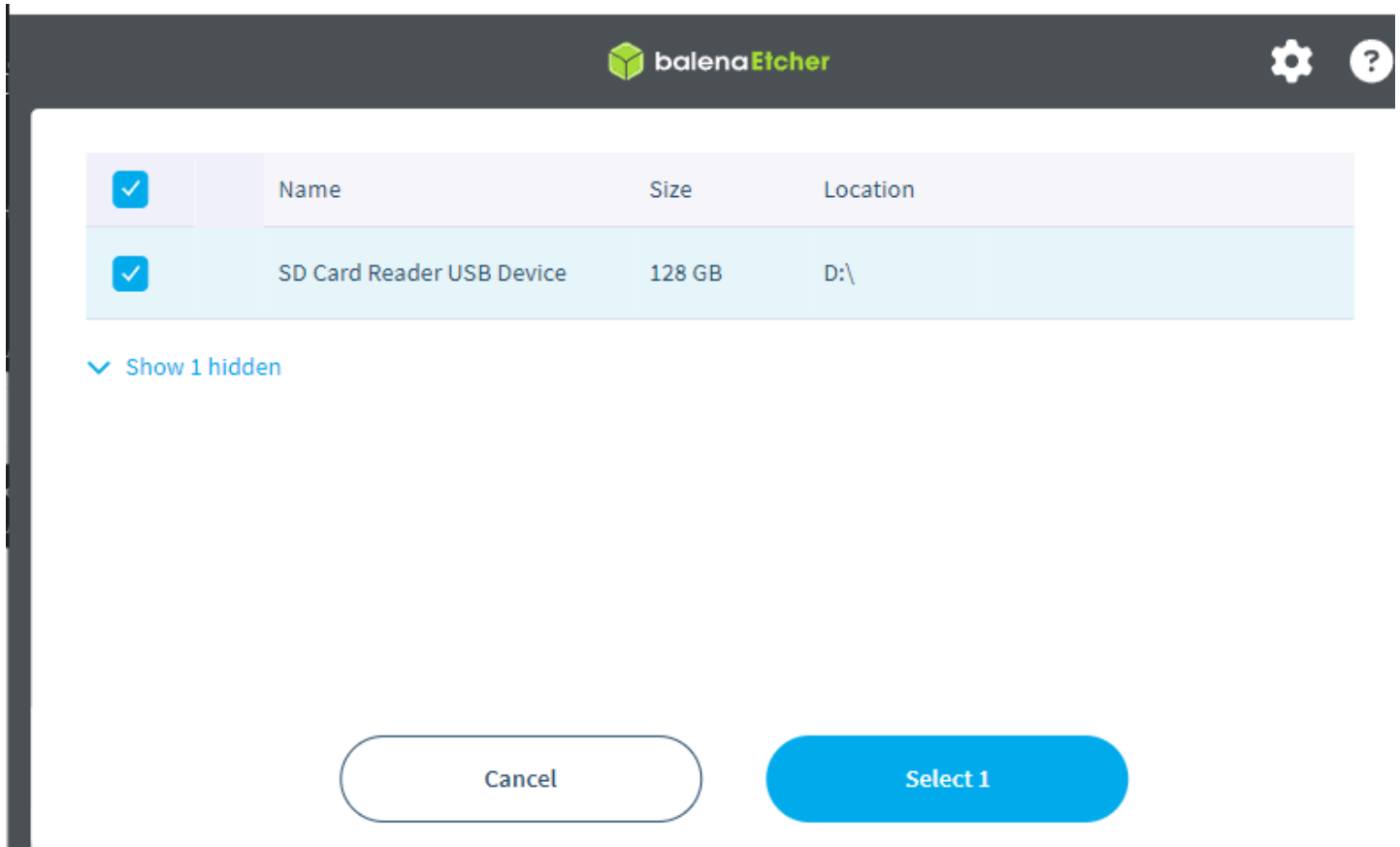
Open up Etcher Startup, and download by file



Input Photon Vision downloaded file



Then, input the flash drive into the computer, and select it



Then, just flash

SD Card Reader not showing: If your SD card reader is not showing up. You will need to Search for it.

Step 4: Once flash is complete, plug micro usb into CUBE (Video)

Now, properly set everything up.

Connect Cube to any monitor, tv, laptop, etc.

Connect HDMI into HDMI 1 on the Cube, and to the computer.

Also connect any keyboard to it, and charge it.

(img)

Once light shows it, you know you're good.

Step 5: Log into Orange Pi computer

The username and password of an orange pi by default are:

Username: pi

Password: raspberry

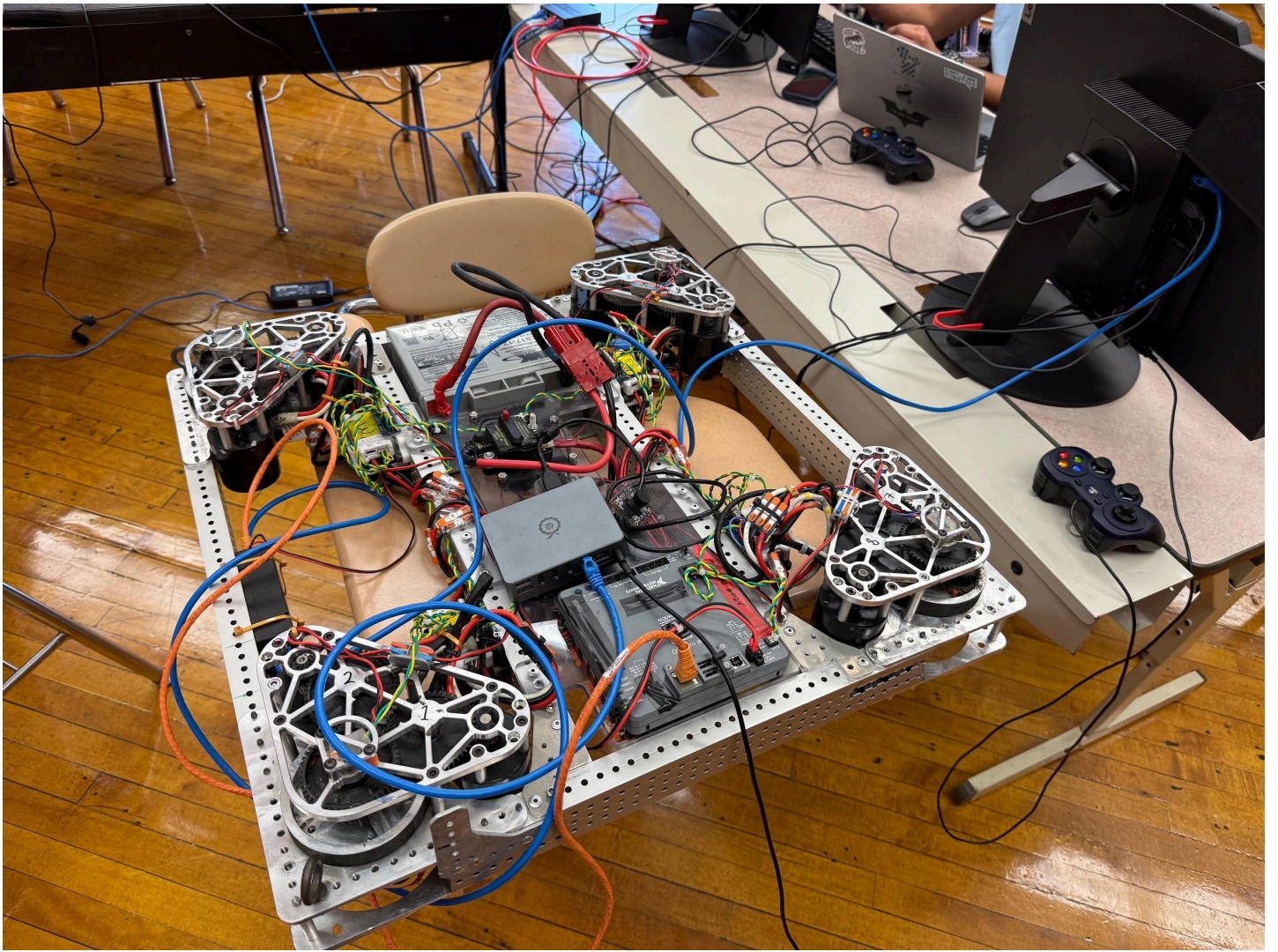
Now, confirm that photonvision is working, to do this, type this command at the end.

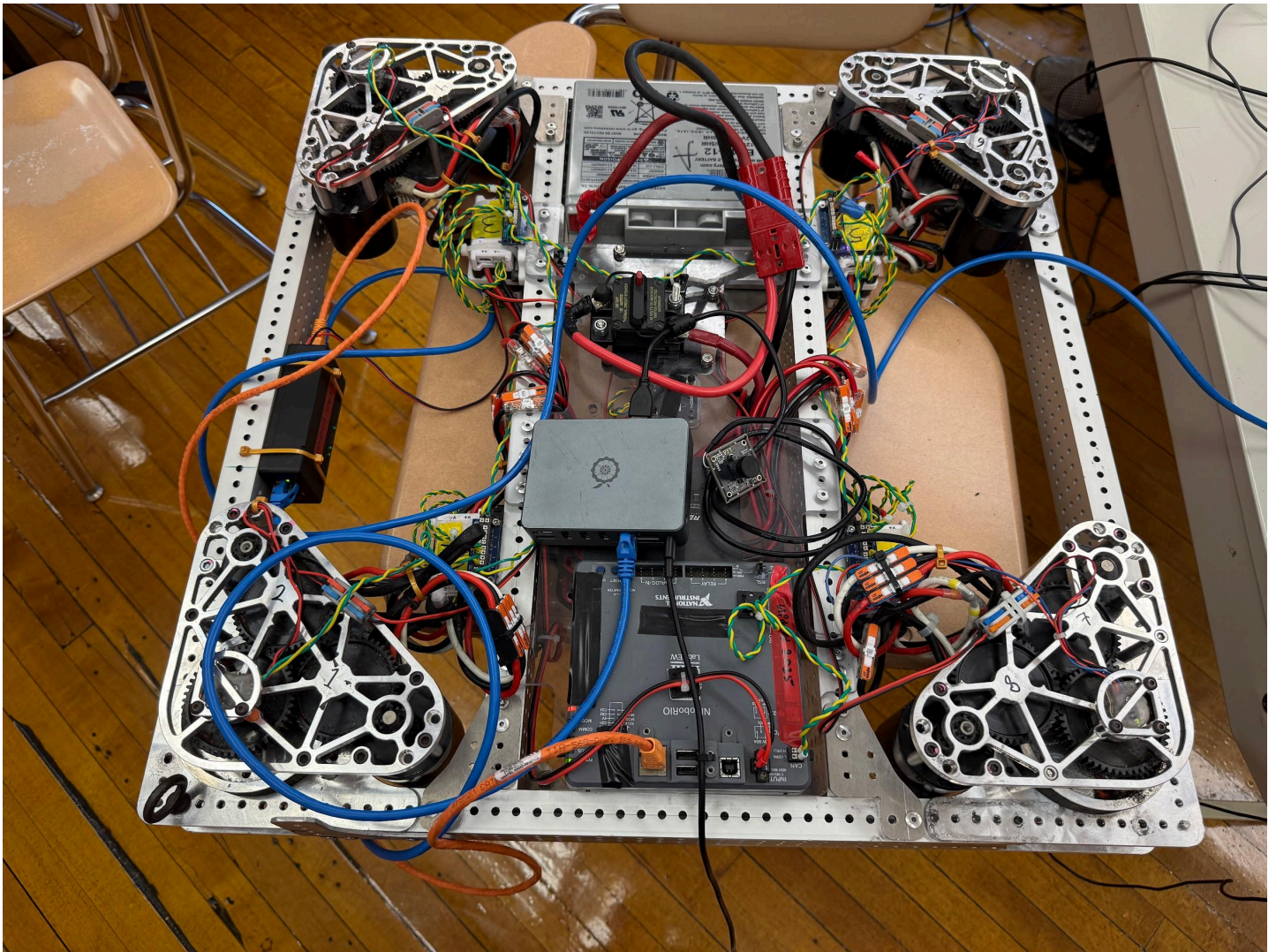
```
sudo systemctl status photonvision
```

Reason why: To confirm that Photon Vision's service is actually doing it. If its enabled you will see green text on the screen. Any red text is a problem.

```
sudo systemctl restart photonvision
```

Once you're done with that, unplug it, then plug it into a new network/robot, as seen here





Plug cameras into PhotonVision with custom cable to USB-A. The USB port used on the orange-PI seems to matter, which one to use?

Then, plug ethernet cable to the Single-board computer and the network

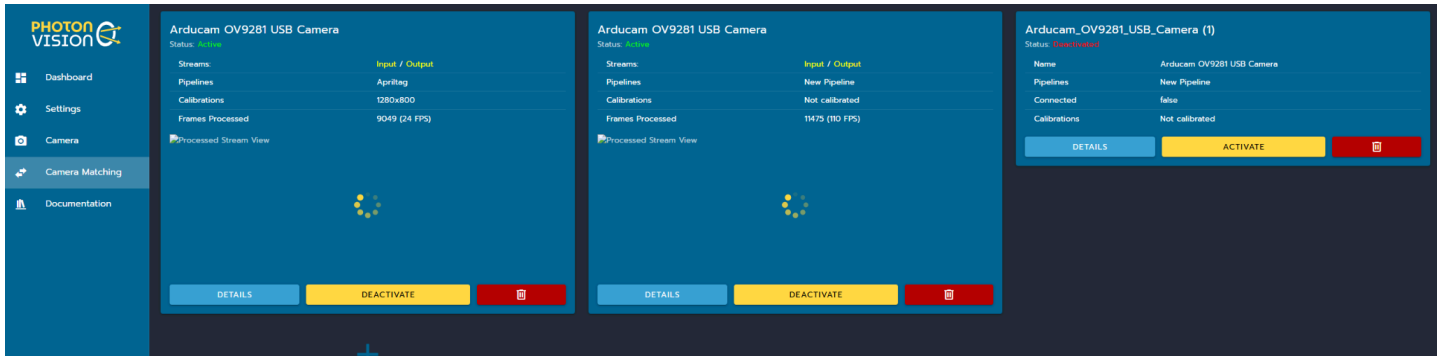
Next, connect to Robot wifi

<http://photonvision-a.local:5800/#/dashboard>

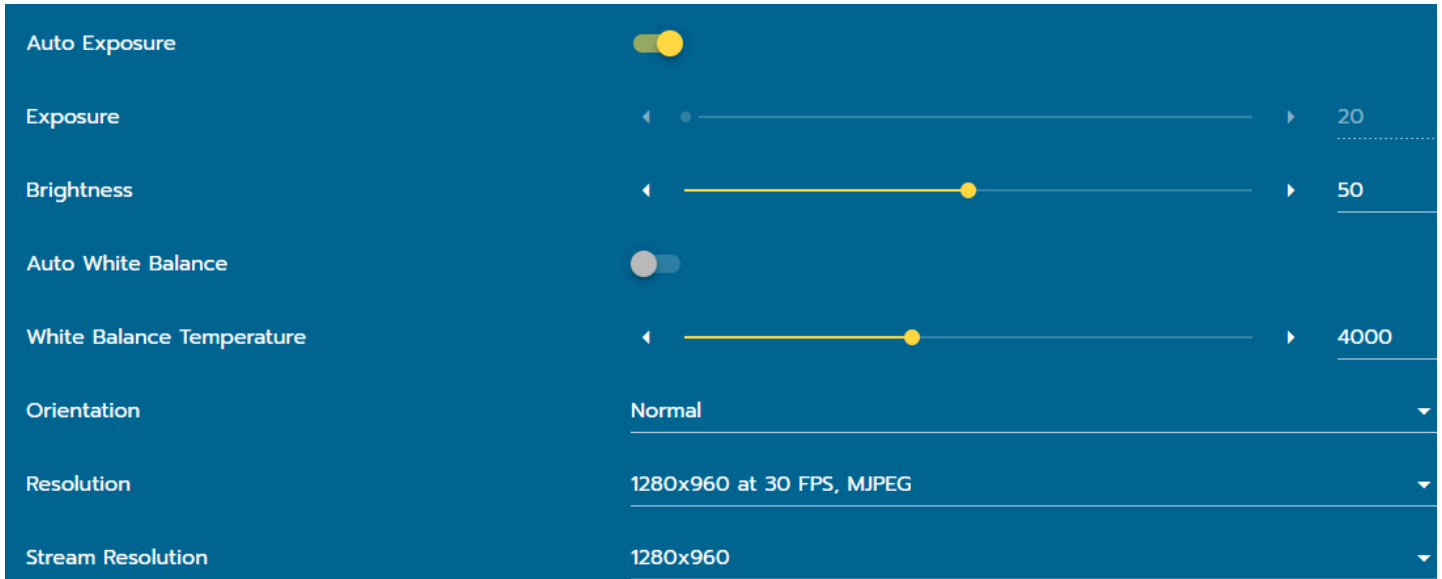
Put that link in to a new tab, and it should be good

or if you have another camera, like 1781, has the name photonvision-a:

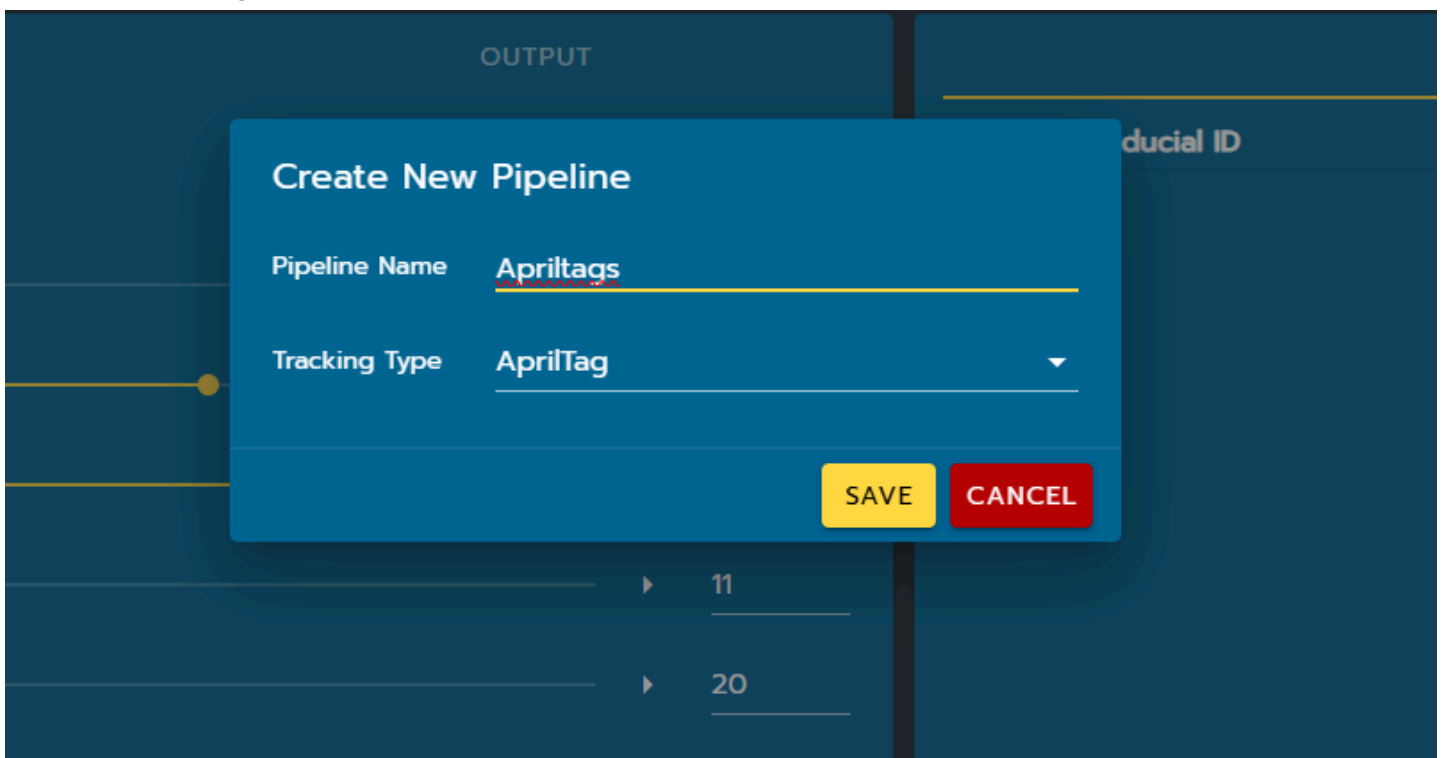
Go to Camera Matching and press Activate



Then just configure it with auto exposure and stream resolution



Create a new Pipeline



Then, change pipeline to Apriltags

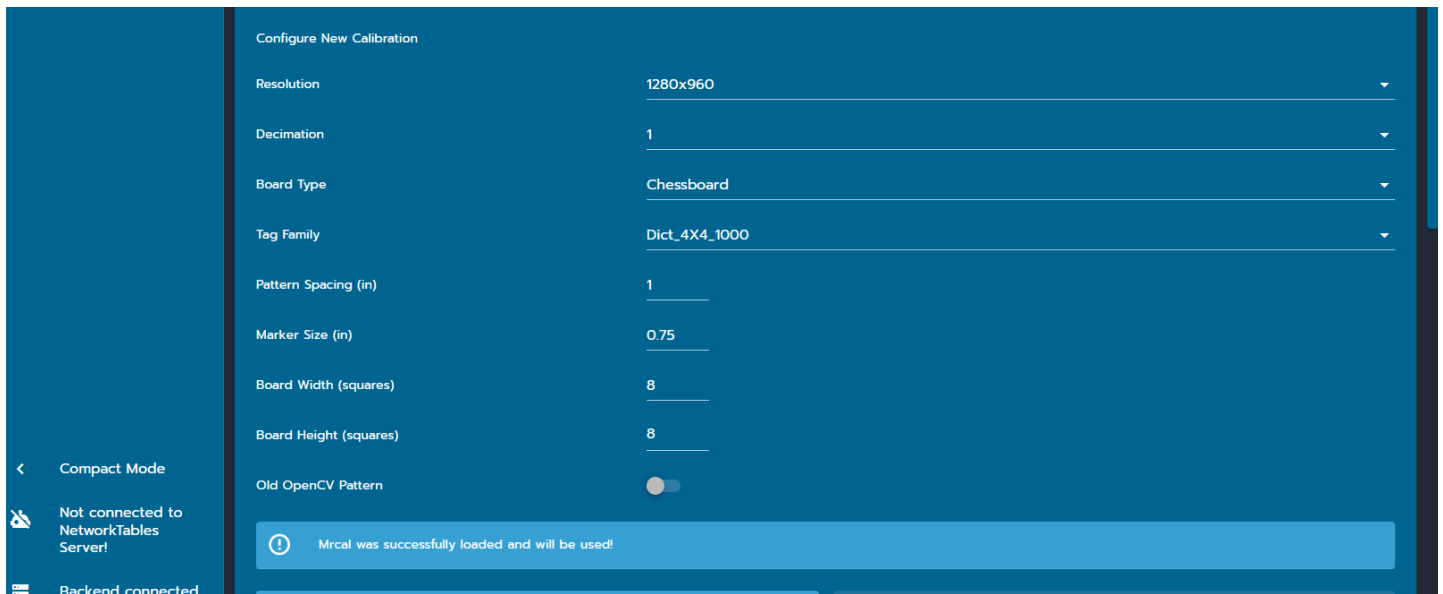
Camera	Logitech,_Inc._Webcam_C270	▼
Pipeline	Apriltags	▼
Type	AprilTag	▼

Then, it should be good (Also reconfigure again)

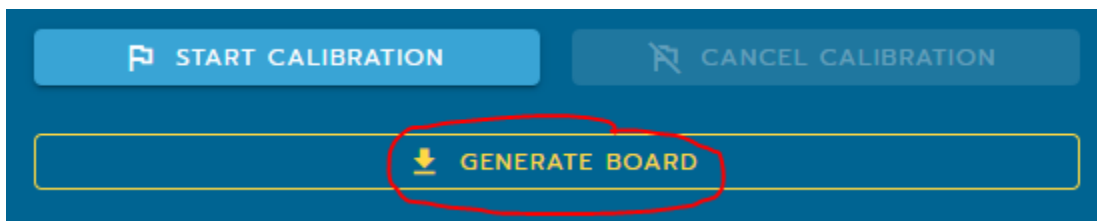
Go to camera

	Dashboard
	Settings
	Camera
	Camera Matching
	Documentation

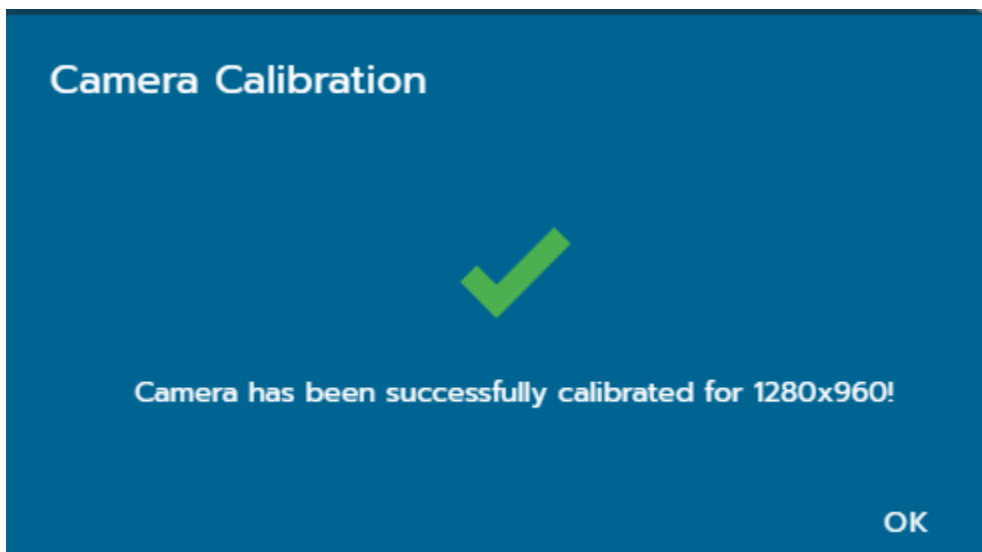
Step 6: Calibration Board



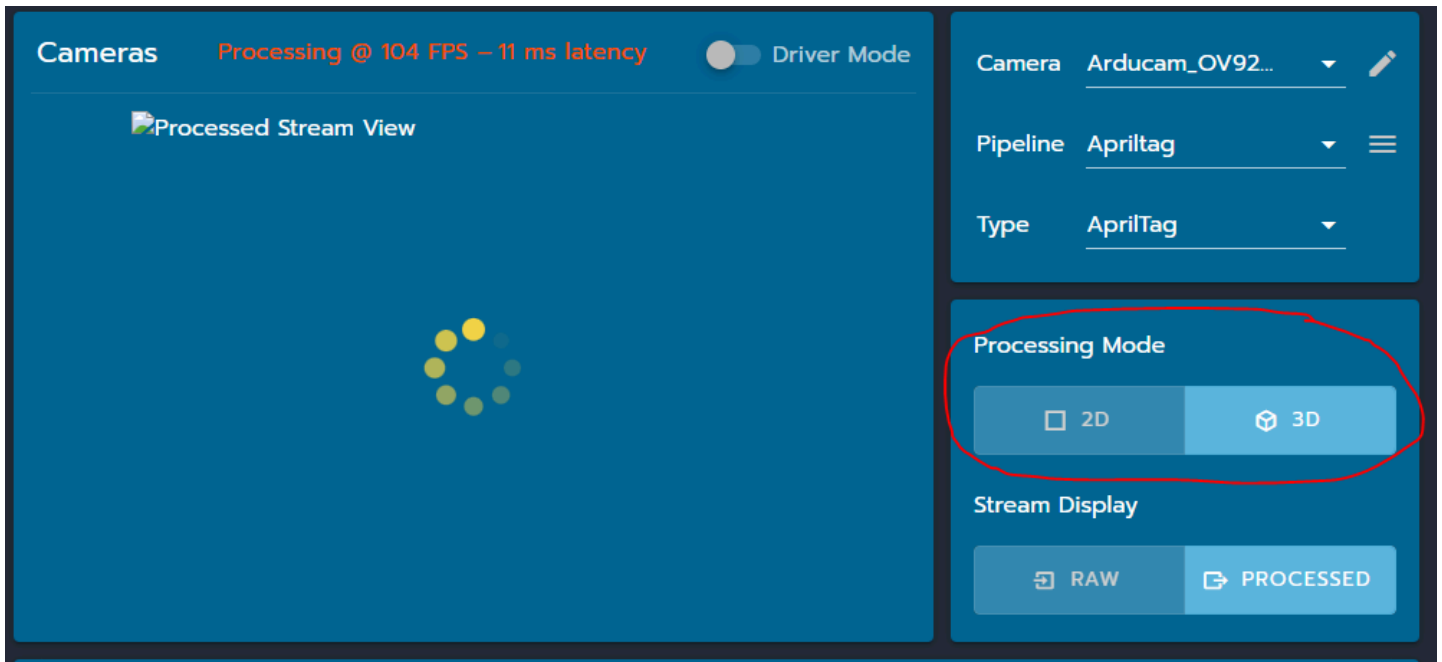
Download Checkboard, set it as Checkboard and generate board, then start calibration and place it into the camera. If rgb lights appear, it is good.



Then, just repeat, in taking snapshots whenever lights occur, and once you have enough, press end calibration.



Lastly, try 3d by clicking 3d On Dashboard



get a April tag(still on Dashboard)

if you see a 3d cude and are able to move around, it is good.



If Drive is Corrupted, do this.

1. Plug flash drive into computer
2. Go to Disk Manager
3. And delete all garbage from the disk(bottom)

Then, just repeat the steps again, yay!

Step 7: Networking PhotonVision

Follow instructions on

<https://docs.photonvision.org/en/latest/docs/quick-start/networking.html>

The ip address of the orange pi should be 10.TE.AM.11 or you can try:

photonvision.local 10.TE.AM.??/24

But what if you have two orange pi's?

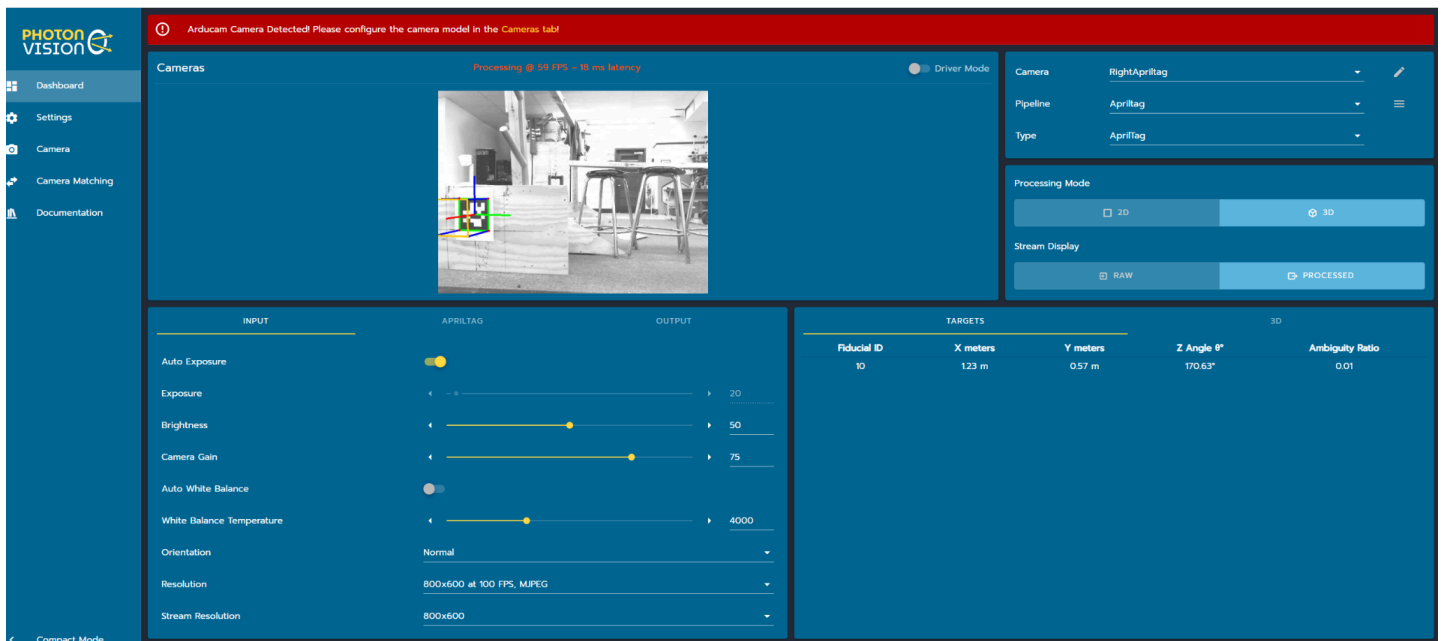
orange pi's addresses:

photonvision-a.local 10.TE.AM.??/24

RightAprilTag

LeftAprilTag

photonvision-b.local

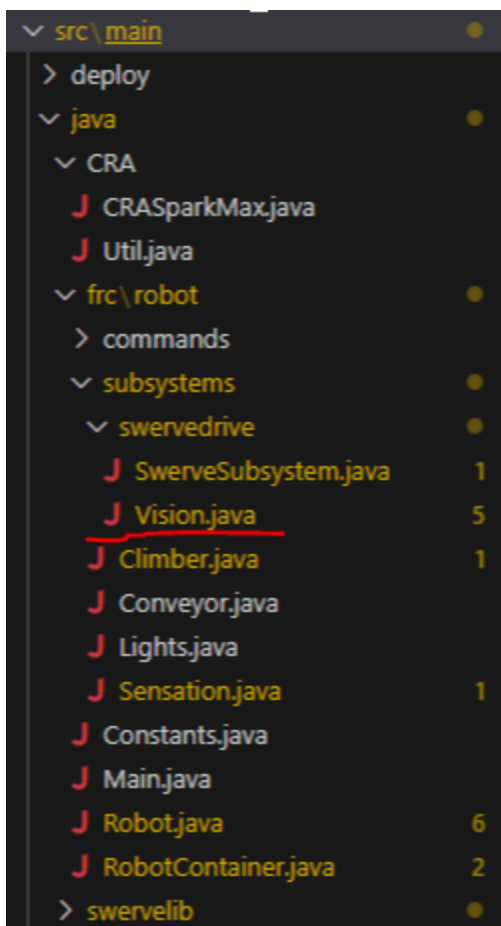


Step 8: Edit Code:

1. Fork or clone our repository: You will need to go to Chicago Robotics Alliance (CRA)

Go to your code:

- Go to vision



Rename the cameras and delete a camera if needed.

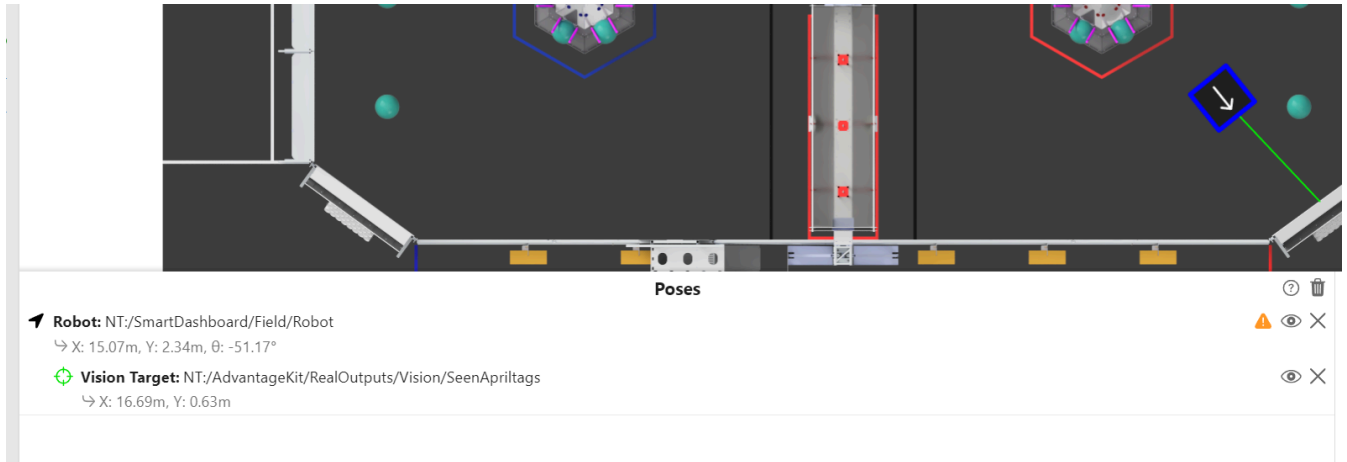
```
343 enum Cameras
344 {
345
346     LEFT_CAM(name:"LeftApritag",
347         new Rotation3d(Units.degreesToRadians(degre
348         new Translation3d(Units.inchesToMeters(inc
349         VecBuilder.fill(n1:4, n2:4, n3:8), VecB
350
351     RIGHT_CAM(name:"RightApritag",
352         new Rotation3d(Units.degreesToRadians(c
353         new Translation3d(Units.inchesToMeters
354         VecBuilder.fill(n1:4, n2:4, n3:8), Vec
355
356     LEFT_SIDE_CAM(name:"LeftSide",
357         new Rotation3d(Units.degreesToRadians(c
358         new Translation3d(Units.inchesToMeters
359         VecBuilder.fill(n1:4, n2:4, n3:8), Vec
360
```


Step 9: Verifying System is Working

2. Open AdvantageScope (in WPILib tools folder).

3. Go to

Open odometry tab in AdvantageScope and drag /SmartDashboard/Field/Robot. Then, drag "on top of" that the AdvantageKit/RealOutputs/Vision/SeenApriltags



Then you will see a green line connecting the robot to all the april tags it can see.