

VIAM - Setting Up A VIAM "Party Rover"

5/17/2025 - Update With new instructions from the VIAM site.

Mr. Burnham Notes ▾

This is a tutorial on setting up a Raspberry Pi, Joining a VIAM fleet, Installing the VIAM server, and driving your Rover around. I'll be writing this tutorial as a beginner guide, so you don't need to have much background on VIAM and Rovers running the VIAM server. I'll try to mark the sections as beginner, intermediate or expert, so you can run through the setup faster if you already understand some of this.

Let's get started. Ready... Cool, here we go.



Prerequisite & Baseline Knowledge:

The plan is to provide a detailed introduction, step by step software and hardware instructions... But having used a Raspberry Pi or Jetson Nano is helpful. Please provide

feedback if there are sections or steps that are not clear, broken links or other improvements you can suggest. Email me at TopClown@STEAMClown.org

Parts & Software used in this project:

Hardware components

	Item	#	Description / Link
1	Raspberry Pi 4 or 5, power, HDMI Cables, etc	1	www.raspberrypi.com/products/Raspberry Pi 5 or Raspberry Pi 4
2	Viam Rover (Or better yet, build your own Rover)	1	https://www.viam.com/resources/rover
3	Batteries	4	Amazon.com: 3.7 Volt 18650 Rechargeable Battery 9900mAh

Software components

- [Raspberry Pi OS](#) (or other Python capable board like the Jetson Nano)
- Viam Software Instructions
- My [VIAM Rover GitHub Repository](#)

Additional Electronic Files and Links

- List the links to other files. These are items like 3D Print STL files, Laser cut files, code examples.
- More links...
- Include and or link to github to point to software and other electronic files.

Project Overview:

We, you and I, are going to build a Rover, and control it over a full stack solution from VIAM. Once connected, you, the operator, can be anywhere in the world, and the Rover/Robot can be elsewhere in the world, and you can control it. How cool is that!!!

In this tutorial we are going to walk through the steps to go from Zero to a Rover driving. Let's get started. First a little introduction of the VIAM team, website, and goals.

Viam is a full stack solution for the kinds of devices that exist anywhere from your home, your office, in cars or boats, in warehouses or factories, at arenas, or other public places.

Viam is already an extensive platform, and continues to expand, because building products in the physical world is hard, and cobbling together a dozen tools or building them yourself takes a huge amount of valuable work from the engineers who should be focused on your unique products.

Viam is designed to run everywhere, from a Raspberry Pi, to a massive Linux server, to an ESP32.

For more on VIAM, visit their [VIAM Company & Product Overview](#) site. You might see if you can answer the following questions:

- xxx

Steps?

1. Introduction to the VIAM Rover
2. try driving a Rover "rental" on the VIAM site
3. get a raspberry Pi or other capable hardware platform
4. install the Raspberry Pi OS
5. update and install any other required tools or apps
6. update and install optional Tools and apps
7. Setup a VIAM account or join a VIAM fleet (We will be joining the Mechatronics Fleet)
8. Setup the VIAM server on the Raspberry Pi
9. Verify it's running (do I need hardware first?)
10. review the VIAM Rover Hardware
11. connect the Hardware based on the Software pin expectations
12. Drive
13. labs...

Step 1: Introduction to the VIAM Rover

Overview:

In this step, we are just going to review the VIAM rover. You are going to have a better understanding of the VIAM Rover hardware capabilities, and what the VIAM Rover can do. In this step you will accomplish the following:

- Understand the VIAM Rover Hardware features, as described on the VIAM web site
- Learn about what you can do with a VIAM Rover
- This Step should take about 10 minutes to complete.

Tools, Components & Software Used:

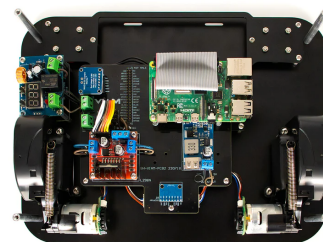
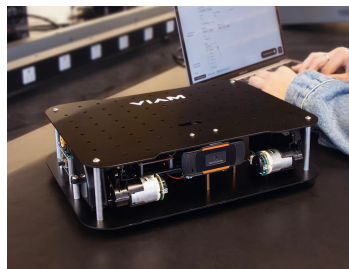
Let's explore the VIAM Rover Introduction site

- [VIAM Rover Introduction Page](#)
- Without spending too much time, or clicking too deep into the web site, you could also check out these resources:
 - [VIAM Rover 2 GitHub](#) (Open Source Files)

Let's Get Started:

Let's jump and go to the VIAM Rover web page and review what it can do. Spend a few minutes reviewing the features of the VIAM rover. Pay attention to what is included in the kit, and what you must provide.

- [VIAM Rover Introduction Page](#)



What Should be Working/Done:

You should have a good understanding of the Hardware features of the VIAM rRover. See if you can answer the following questions.

- Add a few questions
- [here](#)

If you feel that you have mastered this step, and can answer these questions, and comfortably describe the features of the VIAM Rover, move on to the next step. If not, maybe spend a few more minutes reviewing this [VIAM Rover Introduction Page](#).

Step 2: Drive a Viam Rover (Rent/Check out and drive)

This is where you get to drive a VIAM Rover.

Overview:

VIAM has a few Rovers that you can connect to, drive around and try out the web interface.

Let's Get Started:

Try Viam, no assembly required. Viam is a software platform that makes it easy to bring any smart machine idea to life: from paper, to prototype, to production, to scale.

Want to try Viam without any hardware setup? Take over a Viam Rover in our lab now!

- Go to the [Try VIAM page](#) and click on the "Try Now" button

What Should be Working/Done:

WooHoo!!!

You should now have been able to try out a VIAM rover. While it was fun to drive a Rover, probably in New York, let's now start the steps to configure, build and drive your own Rover.

Step 3: Rover Hardware (Raspberry Pi 4): What Do You Need?

Overview:

This step is where we make sure you have all the needed Hardware for your Rover.

VIAM has a Rover Kit (that you just explored), but you can also build a DIY Rover that has the same features as a VIAM Rover. Here is a list of what you need from a Hardware feature list.

Tools, Components & Software Used:

This is a list of the Hardware, Tools, and Software that you will need.

-

Let's Get Started:

VIAM does provide a VIAM Rover kit, and you can take a look at what is included and what the setup steps are. If you have a VIAM Rover, or are going to buy one, then check out this "[Unbox and Set Up your Viam Rover 2](#)" page

- Take a minute, or many longer to collect, order or find the needed components.

What Should be Working/Done:

You should now have the following items, and are ready to move on to the next step:

- Re-list the items
- [here](#)

Step 4: Introduction to "Connect Devices"

Overview:

- In this step, you are going to explore the VIAM web page covering how to "Connect Devices"

Tools, Components & Software Used:

List any tools, components or software used in this step. Describe how to prepare these items.

- [list them](#)
- [here...](#)

Let's Get Started:

The VIAM web site is AWESOME, but the links from point "A" to point "B" can get a little convoluted, and it's easy to get wandering down links, and get lost. So I'm trying to give you a list of links that keep driving you to getting a VIAM Rover setup with a Raspberry Pi, specifically a Raspberry Pi4.

Setting Up A Raspberry Pi

- Start Here: <https://www.viam.com/resources/rover> and click on the "[our documentation](#)" link
- This will land you on this page: <https://docs.viam.com/dev/reference/try-viam/rover-resources/rover-tutorial/>
- On this page you will want to scroll down to the

Did you get lost?

- You might get lost and land on this [VIAM Basics](#) page. This is also a good jumping off page, and also has the links to where you want to go if you are configuring a Raspberry Pi.
- Scroll down to **How do I get started?** and click on [To start, set up a computer or SBC](#)
- Now scroll down and click on the expansion link [SBC setup instructions](#)

- Your instructor has given you an SD card and Pi. If not, Click on the [Raspberry Pi Image](#) and follow the instructions.
-

What Should be Working/Done:

You should now be on the [Raspberry Pi Setup Instruction Page](#). Move on to the next step.

STOP

Step 5: Raspberry Pi Setup Guide (Booting Your Raspberry Pi)

Overview:

- This is where you power on your Raspberry Pi for the first time. It's also the time you verify you have all the right interfaces turned on, and the right apps and tools installed.

Tools, Components & Software Used:

The following are required and optional apps and tools you will want to install.

- [list them](#)
- [here...](#)

Let's Get Started:

Now that you have an SD card, you are ready to insert it and power on your Raspberry Pi. You might still follow the instructions here on this VIAM Raspberry Pi setup page:

<https://docs.viam.com/operate/reference/prepare/rpi-setup/>.

It is recommended to NOT connect your Raspberry Pi to your Rover, but rather connect a keyboard and mouse and monitor and just boot it as a desktop device.

- Boot the Raspberry Pi
- **Where & Who Are You:** Go to the Raspberry Pi configuration, and verify you are in the right country, keyboard, and time zone:
- **Set Interfaces:** Go to the Raspberry Pi configuration, and turn on:
 - SSH
 - VNC
 - I2C

- SPI
- **Update & Upgrade** - In a command terminal, run:
 - sudo apt update
 - sudo apt upgrade -y
- **Install Apps & Tools:**
 - Ideally, you have a bash script with your personalized set of tools and apps. Run this now.
 - But the following are recommended:
 - List stuff like net tools, and Arduino, etc
-

What Should be Working/Done:

You should now have a Raspberry Pi configured and ready to update with the VIAM specific Server and tools. Move on to the next step.

Step 6: Installing the VIAM Server

Overview:

- This is the start of the Raspberry Pi Installation and Setup instructions. You will want to install a clean new Raspberry Pi OS image. You will then have an opportunity to install other Apps and Tools. Finally you will install and start the VIAM Server.

Tools, Components & Software Used:

The following are required and optional apps and tools you will want to install.

- list them
- here...

Let's Get Started:

Now that you have landed on the

<https://docs.viam.com/operate/reference/prepare/rpi-setup/> page, you are ready to re-image or update your Raspberry Pi.

If you already have an OS installed, check the following:

- **add the instructions to test your OS installation**

If you still need to Install the Raspberry Pi OS, follow these steps:

1. scroll down to the "[Install Raspberry Pi OS](#)" link
2. Download the [Raspberry Pi Imager](#) and launch it.
3. Connect the microSD card to your computer.

4. Click **CHOOSE DEVICE**. Select your model of Pi. (We are using RPi4 or RPi5)
5. Click **CHOOSE OS**. Select **Raspberry Pi OS (other)**.
6. Select **Raspberry Pi OS Full (64-bit)**. You should be brought back to the initial launch screen.
7. Click **CHOOSE STORAGE**. From the list of devices, select the microSD card you intend to use in your Raspberry Pi. If no devices are listed, make sure your microSD card is connected to your computer correctly.
- 8.
- 9.

What Should be Working/Done:

This is just a last paragraph to tell the reader what they should have accomplished, what should be complete, what should be working... AND how they will know. Is there some test to run, is there some mechanical capability the item should have? Just make sure they are done with this step before they move on.

Step 7: Raspberry Pi Hardware Pins

Overview:

The VIAM Rover2 has a specific set of pins it is using... I'll try to document it here. to replicate and use the VIAM rover jason file and configuration, you will need to connect the Raspberry Pi I/O pins the same way.

Tools, Components & Software Used:

List any tools, components or software used in this step. Describe how to prepare these items.

- [Raspberry Pi 4 Jason file for the VIAM Rover 2](#)
- [Raspberry Pi 5 Jason file for the VIAM Rover 2](#)
-

Let's Get Started:

Connecting Power and Ground: You have 2 options:

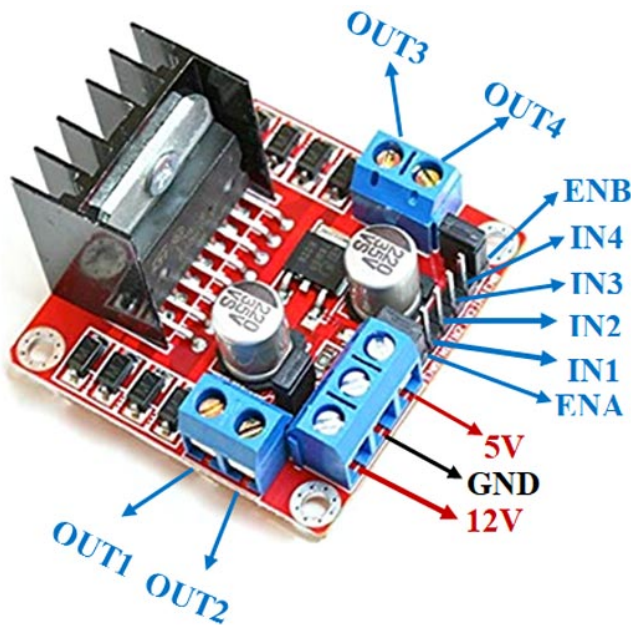
- **Connect a regulated and stable 5 volts**
 - Connect a regulated and stable 5 volts to the 5V VCC pin (pin 2 or 4 on the Raspberry Pi Header)
 - Connect a GND (pin 6 on the Raspberry Pi Header)
- **Connect a USB C connector from the Bat-DC2DC-5v regulator**

- If you have a Battery 2 5vDC converter with a USB C connection on the 5V side, use that to power the Raspberry Pi. The DC2CD converter needs to be able to provide up to 4.5 AMPS (the ones we are using are 5Amps)

Connecting The Motor Controller:

- The plan is to use the same Raspberry Pi Pin connections as the VIAM Rover2 for the motor controller. That controller is currently a L298N Driver
- The VIAM Jason file for the Rover2 is linked here:
- [Raspberry Pi 4 Jason file for the VIAM Rover 2](#)
- Raspberry Pi Pin list for Motors:

RP1 Pin	Label	Device	Description
15	pwm	Right Motor	enA (Could be a N/C)
31	a	Right Motor	in1
29	b	Right Motor	in2
35	a	Left Motor	in3
33	b	Left Motor	in4
37	pwm	Left Motor	enB enA (Could be a N/C)



Connecting The Motor Controller To VIAM Rover 1:

- The plan is to use the same Raspberry Pi Pin connections as the VIAM Rover1 for the motor controller. That controller is currently a L298N Driver
- The VIAM Jason file for the Rover1 is linked here:
- [Raspberry Pi \(any?\) Jason file for the VIAM Rover 1\(ViamRover202210b\)](#)
- Raspberry Pi Pin list for Motors:

RP1 Pin	Label	Device	Description
15	pwm	Right Motor	enA (Could be a N/C)
11	a	Right Motor	in1
13	b	Right Motor	in2
16	a	Left Motor	in3 (Maybe switch a/b)
18	b	Left Motor	in4
22	pwm	Left Motor	enB enA (Could be a N/C)

What Should be Working/Done:

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RP1 Pin	Label	Device	Description
40	re		interrupt
38	le		interrupt
15	pwm	Right Motor	enA
31	a	Right Motor	in1
29	b	Right Motor	in2
35	a	Left Motor	in3
33	b	Left Motor	in4
37	pwm	Left Motor	enB

Step N: Raspberry Pi Setup Guide

< Replace This Text/Paragraph/Section - Give an Overview for the Step - This paragraph is an intro to getting started on the specific project. The reader has gotten this far, they are ready to start... get them going with some explanations and then jump into the steps.

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Overview:

Give an overview for this step. Include a "Why are we doing this step in this order". This can be a short or long or multiple paragraphs.

- This Step will include... < list what they are going to accomplish >
- This Step should take about N minutes to complete.

Tools, Components & Software Used:

List any tools, components or software used in this step. Describe how to prepare these items.

- list them
- here...

Let's Get Started:

Now tell them what they are doing, and how to do it... This is the details of the step.

This is probably a few paragraphs or sub-steps. It can be a mix of paragraphs and bullet points. Pictures or videos are also good to have.

- Paragraphs describing the step
- Pictures describing the step
- Blocks and links to code. Your code should be nice to look at. It should look like code, so you could put it in a table cell and color the background and change to a monospaced font like `Courier New`, which is the typical default for a computer terminal font, but you might like other fonts. I currently like Roboto Mono or something like Helvetica Neue. See this [Google Docs code font tip](#)

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What Should be Working/Done:

This is just a last paragraph to tell the reader what they should have accomplished, what should be complete, what should be working... AND how they will know. Is there some test to run, is there some mechanical capability the item should have? Just make sure they are done with this step before they move on.

Related and "What's Next?"

< Replace This Text/Paragraph/Section With Your "Dig Deeper" Plan - This where you provide a paragraph on what you think your or reader should do next. Describe what your plan to do or what they should do to learn more, dig deeper, or how to expand their learning on this topic.

- List links
- list another...

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< Delete this before you are done > Project Parking Lot - "What's Next", Stuff To Save, Delete or Reorganize:

Each day you work on this project, you should spend some time here moving and organizing topics you have put here... Think of this as the "What am I doing next" section

- Save lots of Photos - Choose images that will be useful to illustrate your instructions
-

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Daily Blog Of Work and Project Progress:

Reference and Appendix:

https://www.bristol.ac.uk/esu/media/tutorials/design-principles/page_08.htm

https://www.reddit.com/r/learnprogramming/comments/yf9zb2/what_makes_a_good_tutorial/

How to Make an Actually Good Tutorial

<https://uwaterloo.ca/centre-for-teaching-excellence/catalogs/tip-sheets/key-strategies-effective-tutorials>

<https://www.webdew.com/blog/tutorial-video-examples>

<https://dailyblogtips.com/11-essential-tips-to-writing-the-ultimate-tutorial/>

<https://codingwriter.com/how-to-write-better-tutorials-part-1/>

<https://dev.to/savvasstephnds/in-your-own-opinion-what-makes-a-tutorial-beginner-friendly-mg4>

<https://medium.com/@keshidong.dev/how-to-format-code-in-google-doc-833e28b304f1>

Notes

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