AWS DeepRacer Sensor Kit
Getting Started Guide

The AWS Sensor Kit is intended for use only with the AWS DeepRacer
Getting started guide

Get rolling in approximately 15-20 minutes

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⚠️ If you use macOS Catalina or later (10.15.5 +):

You will need a USB drive the first time you connect your vehicle to Wi-Fi. After you connect and your vehicle’s software updates, you can set up connections to new Wi-Fi networks using the USB cable in the box.

*How to use a USB Flash Drive to Connect your AWS DeepRacer*

Use a Firefox browser to connect to deepracer.aws or the device’s wireless IP (Chrome is not supported).
AWS DeepRacer Sensor kit: In the box

1. Vehicle body shell
2. LiDAR
3. Camera
4. Pins
5. LiDAR screws
6. USB-A extender cable
7. LiDAR to USB port connector cable
8. Phillips screwdriver
Assembled vehicle at a glance

- **Camseras**
  - 4 MP cameras with MJPEG

- **Front**
  - LiDAR
  - LiDAR holder
  - Compute battery on/off
  - LED light
  - Status LEDs
  - Vehicle chassis
  - Power on/off
  - SD card slot
  - Power button
  - Reset button

- **Back**
  - Micro USB
  - LiDAR
  - USB-C
  - Micro USB
  - HDMI
Preparation

Gather these items

- LiDAR and LiDAR bracket
- LiDAR screws
- Phillips screwdriver
- Camera
- LiDAR to USB port connector cable

Next: Install LiDAR sensor
Install sensors

1. Sensor: LiDAR
2. Sensor: Stereo Cameras
3. Reconnect

1. Unpin and remove shell
2. Unscrew shell brackets

3. Uninstall shell brackets
Use the included Phillips screwdriver to unscrew the front and back shell brackets
Note: Save screws to fasten LiDAR

Next: Install LiDAR sensor
Install LiDAR sensor

1. Pull out camera from USB port
   Grab the camera module firmly and pull upward to remove it from the USB port.

2. Unplug USB-C cable from compute battery
   Note: Dell battery cable is longer

3. Place LiDAR on vehicle chassis

Next: Install LiDAR sensor continued
Install LiDAR sensor

Fasten LiDAR - front and back

4. Fasten front screw

Note: Use screws from shell bracket

5. Fasten back screw

Next: Install LiDAR sensor continued
Install LiDAR sensor

6. Plug USB-A cable in middle USB-A port

7. Plug the USB Micro-B cable into the LiDAR

Next: Stereo camera
Install Stereo Cameras

Plug camera into the left and right USB-A ports

Next: Connect battery
Connect battery

Connect compute battery with USB-C

Next: *Connect Dell battery
Connect Dell battery

*ONLY for customers with a Dell compute battery. If you do not have a Dell compute battery, skip these instructions.

1. Plug cable in Dell compute battery
2. Slide cable under LiDAR frame
3. Wrap cable around base of LiDAR
4. Plug in USB-C

Next: Turn on vehicle
Turn on vehicle

1. Turn on compute battery

2. Turn on vehicle compute
   Two blue LED lights indicate battery is charged and Wi-Fi connected.
   See Tips on page 18-19 for LED behavior.

3. Switch on vehicle
   Listen for two short beeps and one long beep

Next: Lights and action!
Lights and action!

Check for visual cues that your sensors are ready: Is your LiDAR spinning? Is its LED lit?
Test Drive

Use any device with a browser to drive your AWS DeepRacer. Connect your device to the same Wi-Fi network as your AWS DeepRacer.

1. Enter vehicle IP address to access your vehicle on an internet browser

   **Note:** This is an example, not your vehicle IP address. If you do NOT have an IP address go to the AWS DeepRacer Getting Started Guide

2. Enter password

   **Note:** Found printed on the bottom of your vehicle

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Next: Test drive continued
Test drive

**Note:** Ensure that the vehicle is switched on.

1. **Check the sensors**

Look beneath the camera viewfinder to find your sensor connection status. The connection is successful if you see green check marks. The LiDAR view finder is switched off by default. Switch it on to verify that it's connected.

2. **Put the vehicle in manual mode**

Move the joystick in the forward direction and watch how the vehicle responds. Does the vehicle move in the forward direction?
Test drive

3. Try autonomous mode

1. Choose the **Autonomous driving** mode. Load a sample model using the drop down or load your own trained model.

2. Press **Start vehicle** button

3. Gradually increase the **Maximum speed %** until model begins to move

Optimizing a trained model for transfer to a physical AWS DeepRacer vehicle can be a challenging learning process. It requires iterations through trial and error.

For more tips, see **Optimize Training AWS DeepRacer Models for Real Environments**

Next: Drive and experiment
Drive and experiment

Visit [https://www.aws.amazon.com/deepracer](https://www.aws.amazon.com/deepracer)

Train reinforcement learning (RL) models

Train your own RL models and watch training in simulation. Evaluate models and download models to your AWS DeepRacer to test on tracks.

When loading models on your vehicle make sure the sensor configurations match. Models trained with LiDAR and stereo camera need to run on vehicles with LiDAR and stereo camera.

Next: Race
Race

Join the DeepRacer League

Welcome to the world’s first global autonomous racing league, open to anyone.

**Summit Circuit: Find a Race**

Join the community

- DeepRacer forum
- DeepRacer Slack channel
- DeepRacer Github issues
- DeepRacer documentation
Tips

Understanding LED behavior

Battery LED Guide

- **Solid blue**: Battery charged, application running
- **Blinking blue**: updating software
- **Yellow**: Device booted to OS
- **Blinking Yellow**: Loading BIOS and OS
- **Red**: Error in system when rebooting or starting application
Tips

Understanding LED behavior

Wi-Fi LED Guide

- **Solid blue**: Wi-Fi connected
- **Blinking blue**: Connecting to Wi-Fi
- **Solid red then Off**: Failed to connect to Wi-Fi

**Troubleshooting**
- Check your Wi-Fi network password
- Public Wi-Fi that requires CAPTCHA-enabled sign-in commonly found in hotels, gyms and cafes is not supported