AWS DeepRacer
Getting started guide
# Getting started guide

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In the box

1. Vehicle chassis
2. Vehicle body shell
3. Micro-USB to USB-A cable
4. Compute battery
5. Compute battery connector cable
6a. Compute battery charge adapter
6b. Computer battery charge cable
7a. Vehicle power cable
7b. Vehicle power adapter
8. Pins (spare parts)
9. Vehicle battery
10a. Vehicle battery charge adapter
10b. Vehicle battery charge cable
11. Silicon cable holder (not shown)
12. White marking tape (not shown)
Vehicle at a glance

- **Camera**: 4 MP camera with MJPEG
- **SD card slot**
- **Power button**
- **Reset button**
- **Compute battery on/off**
- **Customizable LED**
- **Status LEDs**
- **Vehicle chassis**
- **Power on/off**

Front and Back view of the vehicle.
Preparation
Charge batteries
Approx. time: 2hrs.

1. Charge compute battery
Connect the compute charge adapter, the compute battery charge cable and the compute battery. Plug into an power outlet to charge. Note: Press button to power on. Battery indicator LEDs glow when battery is charged or at capacity.

2. Charge vehicle battery
Connect the vehicle battery charge adapter, the vehicle battery charge cable and the vehicle battery. Plug into an power outlet. Note: Green LED - full charge and ready

Red and green LED indicates vehicle battery is charging
Preparation
Gather these items

- DeepRacer vehicle
- Vehicle battery
- Compute battery
- Compute battery connector cable
- Dell battery
Setup your vehicle

Approx. time: 5-10 min.

1. Unpin and remove vehicle shell
2. Unpin chassis by removing four pins
3. Lift compute module
   Note: wires attached
4. Connect vehicle battery
   Use the red connector cable, the white connector is for charging
Setup your vehicle

5. Insert vehicle battery in the cradle
6. Secure vehicle battery with velcro strap

7. Turn switch on, then off
Listen for an indicator sound, then switch off
Note: Sound indicates the vehicle battery has charge and everything is working
Setup your vehicle

8. Secure vehicle with four pins

9. Connect compute battery to vehicle
   Connect one side of the cable to the battery and the other side to the USB-C port of the vehicle

10. Insert compute battery in cradle and coil cable
    Use the same orientation of the battery as shown

11. Secure compute battery and cable velcro strap
Setup your vehicle

12. Press the power button to turn on

13. Turn on vehicle compute and wait for blue LED

Connection time: Approx. 2 minute
See LED Tips for additional information

Next: Connect to Wi-Fi
Connect to Wi-Fi

Let’s get your vehicle connected to a Wi-Fi network and use the vehicle’s IP address to drive your vehicle manually and autonomously.

Approx. time: 10-15min.

1. Connect vehicle to computer with micro-USB/USB-A cable
Connect to Wi-Fi

2. Open browser, enter `deepracer.aws`
Note: Disable Wi-Fi on your computer and disconnect ethernet cable.
Trouble connecting, see Wi-Fi Tips

3. Proceed with a non-private connection
Select advanced and ‘Proceed to deepracer.aws’ to get to unlock your AWS DeepRacer.
Note: Firefox requires a trust certificate.

4. Password printed on the bottom of the vehicle
Note: Write down the password, you will need to use it later.
Some letters in the password might be hard to recognize. Try ‘l/I, o/O/0 and i/l’ if your password doesn’t work.
Connect to Wi-Fi

5. Update Wi-Fi network to establish vehicle IP address

6. Write down vehicle IP address to access your vehicle on any browser
   Note: This is an example, not a your vehicle IP address

6. Unplug micro-USB/USB-A cable connecting vehicle to computer
Drive

Use any device with a browser to drive your DeepRacer

Connect your device to the same Wi-Fi network as your AWS DeepRacer

1. Switch on vehicle
Listen for an indicator sound, two short beeps and one long beep

2. Enter vehicle IP address to access your vehicle on any browser
Note: This is an example, not a your vehicle IP address

3. Enter password to drive
Note: Found printed on the bottom of your vehicle

4. Update software
Refresh browser if the software update takes more than 10min.

Next: Drive and experiment
Drive and experiment

1. Manually drive
Manually drive your vehicle with the touch joystick.

- Turn on the vehicle, see Drive for details
  - Gradually increase throttle limit

Note: If the vehicle moves backwards, see Calibration in navigation menu

2. Build a straight track
Build a straight track segment to experiment with pre-loaded reinforcement learning (RL) sample_model. The model has been optimized to stay within boundaries.

Approx. time: 5min.

- Lay down tape on one border of the straight line. Length varies on available space.
Drive and experiment

B. Measure a width of approx. 24”, excluding tape borders.
C. Lay down a parallel line and match the length.
D. Place the vehicle at one edge of the track.

3. Autonomous driving mode
A. Select the Autonomous driving mode, load the Sample_Model using the drop down.
B. Press Start vehicle button
C. Gradually increase the Maximum speed % until model begins to move

Note: Check if the vehicle switch is on.

In general, optimizing a trained model for transfer to a physical AWS DeepRacer vehicle is a challenging learning process. It often requires iterations through trials and errors.

For more tips, see Optimize Training AWS DeepRacer Models for Real Environments
Drive and experiment

4. Train your own 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.

Go to https://www.aws.amazon.com/deepracer

5. Join the DeepRacer League
Welcome to the world’s first global autonomous racing league, open to anyone.

Summit Circuit: Find a Race

6. Join the community
DeepRacer forum
DeepRacer Slack channel
DeepRacer Github issues
DeepRacer documentation
Tips

Battery level and recharging

**Compute battery charge**
Press and hold the power button to turn on/off.
Note: LED represents battery level

**Charge compute battery**
Connect charger and charger cable to an outlet.
Tips

Battery level and recharging

**Vehicle battery**
Use the white cable and insert in vehicle battery charger.

Green: fully charged battery
Red: battery needs recharging

Green/Red LEDs - charge required
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
Tips

Wi-Fi connection troubleshooting

Having trouble connecting, try these tips

**Step 1. Wait, the application may take up to 2 min. to be ready**
If waiting doesn't work, then try step 2

**Step 2. Turn off/disable computer's Wi-Fi and unplug ethernet connections**
If disabling the Wi-Fi doesn't work, then try step 3

**3. Push the reset button and wait for blue battery LED**
Refresh the deepracer.aws, once the LED turns solid blue. If it doesn't work, then try step 4.

**4. Visit advanced troubleshooting**
https://docs.aws.amazon.com/deepracer/latest/developerguide/deepracer-troubleshooting.html