Omni Rover 3WD

operating instructions

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Vstone®

ヴイストン株式会社

table of contents

1.First of all

Thank you for purchasing the Omni Rover 3WD.

This is an instruction manual that explains how to use this product and its specifications. Please read this manual carefully before use.

Please use it safely.

2 Specifications

size	Approximately 160(ÿ) × 105(H) mm
weight	Approx. 462g (with battery)
Servomotor	metal gear servo motor
Body material	MDF
Operating voltage	Servo motor 5V, logic 3.3V
power supply	4 AA Ni-MH rechargeable batteries (sold separately) or 5V AC adapter (sold separately)
Compatible OS	Windows, Mac OS X, Linux (Arduino IDE compatible environment required)
control board	V-duino (VS-RC202)

3 Note

When handling this product, please follow the precautions and use it correctly.

• Do not subject this product to strong impact.

• Do not get this product or its parts wet or use it in humid or dusty locations. Failure due to short circuit etc.

    Failure to do so may result in failure.

• Do not use this product near children or store it within the reach of children.

• When using tools, be careful not to injure yourself.

• Due to its characteristics, Omni-wheels have poor straight-line performance, and may vary due to individual differences in motors, slight deviations when fixed, and remaining charge of the rechargeable battery.

    For example, the vehicle may not go straight straight. Origin adjustment described in Chapter 4, adjustment by program,

    Please charge the rechargeable battery.

• Unexpected behavior may occur during adjustment or operation of this product. Possibility of injury or malfunction due to falling of this machine

    Please leave enough space while working.

• Check the polarity of the connectors and attach them securely. If you make a mistake, there is a possibility of malfunction or fire.

• Be careful not to get the cables pinched or caught in the tires. There is a possibility of wire breakage or short circuit.

• When disconnecting the cable, hold the plug/connector part. If you hold the cord when plugging or unplugging it, it will break.

    Doing so may cause electric shock or fire due to wires or short circuits.

4 Move the robot

We will explain the steps to operate this product using the sample program published on the web page.

The structure of this chapter and the contents of each section are as follows.

4.1 Building the development environment

Setup for using this product on a PC

4.2 Fixing the battery box and board

How to fix the battery box and board using Velcro

4.3 Adjusting the origin of the servo motor

Explanation about the origin of the servo motor and how to adjust it

4.4 Automotion

How to use the sample program "omnirover3wd_auto_motion.ino"

4.5 Wireless operation using Wi-Fi

How to use the sample program "omnirover3wd_HTML_Controller.ino"

For the following work, please use four AA Ni-MH rechargeable batteries and a No. 00 precision Phillips screwdriver or a 2.0mm or larger screwdriver.

You will need the precision flathead screwdriver shown below. Please prepare in advance.

4.1 Building the development environment

First, set up the development environment to enable the use of V-duino (hereinafter referred to as the "board") on your PC. set store

For instructions on how to set up the software, see the "Software Setup" in the V-duino instruction manual, which can be downloaded from the web page below.

Please refer to "P.
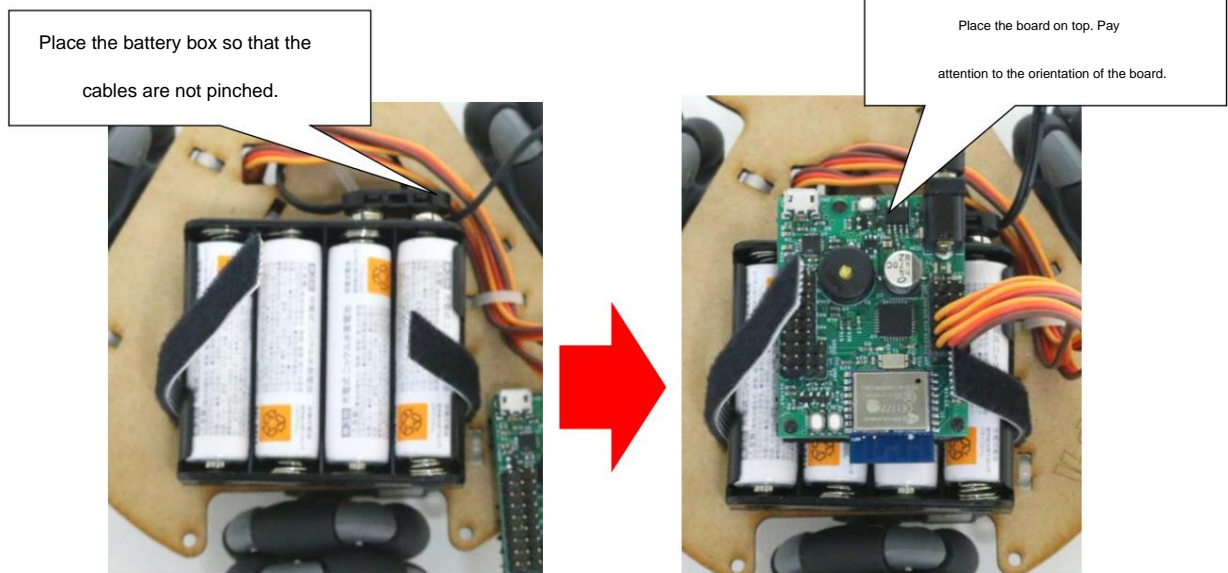
ÿ V-duino instruction manual

https://www.vstone.co.jp/products/vs_rc202/download.html

4.2 Fixing the battery box and board

  Place the AA Ni-MH rechargeable battery into the battery box and attach the battery box and board with Velcro according to the following steps.

Please fix it with

  To secure the battery box and board, place the battery box between the Velcro tapes and place the board on top of the battery box as shown in

the figure below. At this time, be careful not to let the battery box pinch the cables of the servo motor, etc.

Place the battery box so that the

cables are not pinched.

Place the board on top. Pay

attention to the orientation of the board.

  Finally, secure the battery box together with the board using Velcro. Gently pull the Velcro on the board.

Please tighten it so that it will not come out even if it is stretched.

Hold the board together
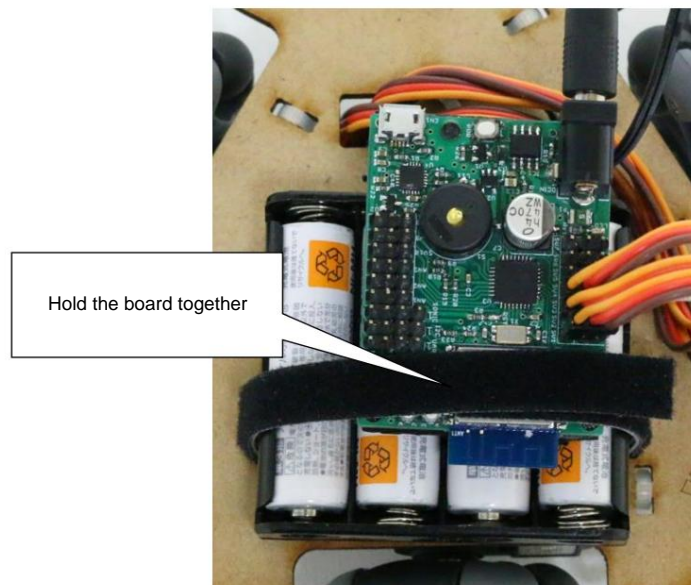
4.3 Servo motor origin adjustment

Adjust the origin of the servo motor. Omni Rover 3WD's servo motor has an output shaft that rotates infinitely.

To do. The numerical value in the program at which the rotation of the output shaft stops is called the origin. In the initial state, this output

Adjustment is necessary because the origin of the force axis may shift and the tire may rotate on its own.

Connect the board with a USB cable to the PC on which the software setup has been completed, and follow the steps below to align the origin.

Execute the sketch for the drawing. At this time, remove the DC plug from the board.

Connect with USB cable

remove it from the board
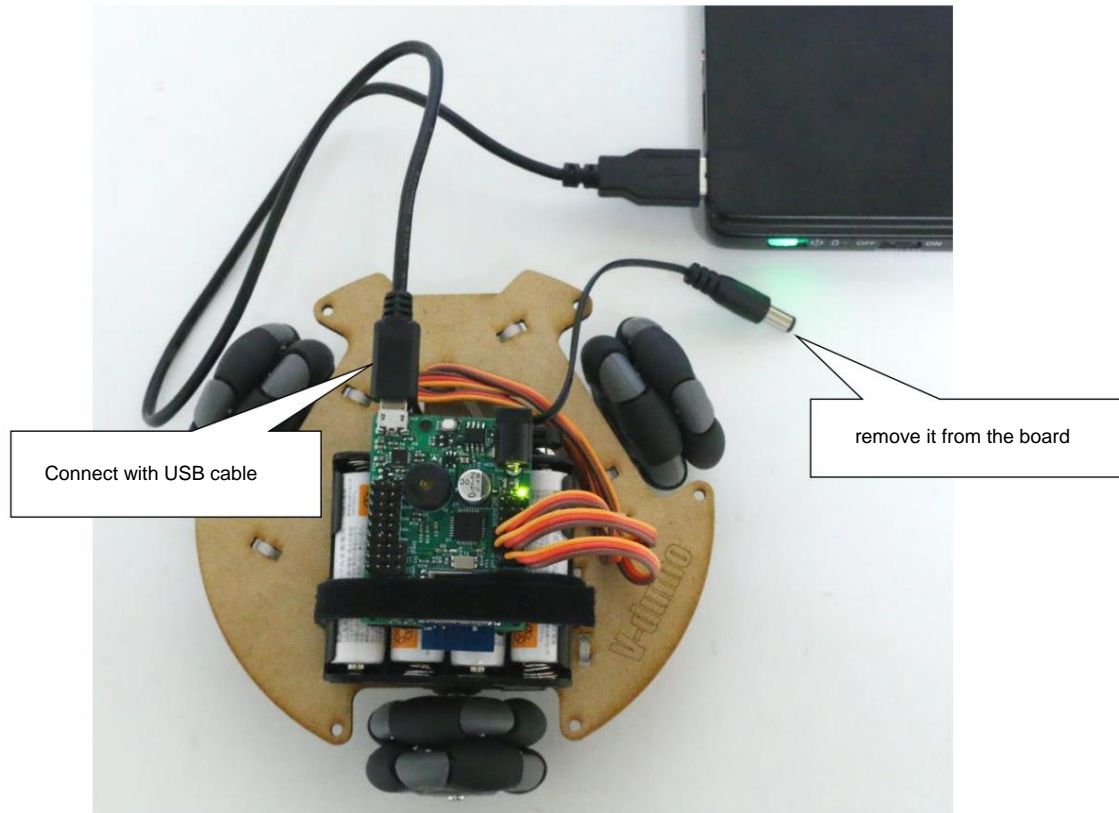
Start Arduino IDE, select [Tools > Board] from the menu, select Generic ESP8266 Module,

Make other settings as follows.

board settings

[board]	Generic ESP8266 Module
[Flash Mode]	DIO
[Flash Frequency] 40MHz	
[CPU Frequency]	80MMz
[Flash Size]	2M(1M SPIFFS)
[Debug port]	Disabled
[Debug Level]	none
[Reset Method]	nodemcu
[Upload Speed]	115200
[Serial port] Port connected to the board	

ボード: "Generic ESP8266 Module"
Flash Mode: "DIO"
Flash Frequency: "40MHz"
CPU Frequency: "80 MHz"
Flash Size: "2M (1M SPIFFS)"
Debug port: "Disabled"
Debug Level: "なし"
Reset Method: "nodemcu"
Upload Speed: "115200"
シリアルポート
ボード情報を取得

Select [File > Sketch example > VS-RC202 > vs-rc202_set_home_position] from the menu to create the sketch.

Write it on the board.

*The menu display may differ depending on your environment.


sketch writing

Sketch selection
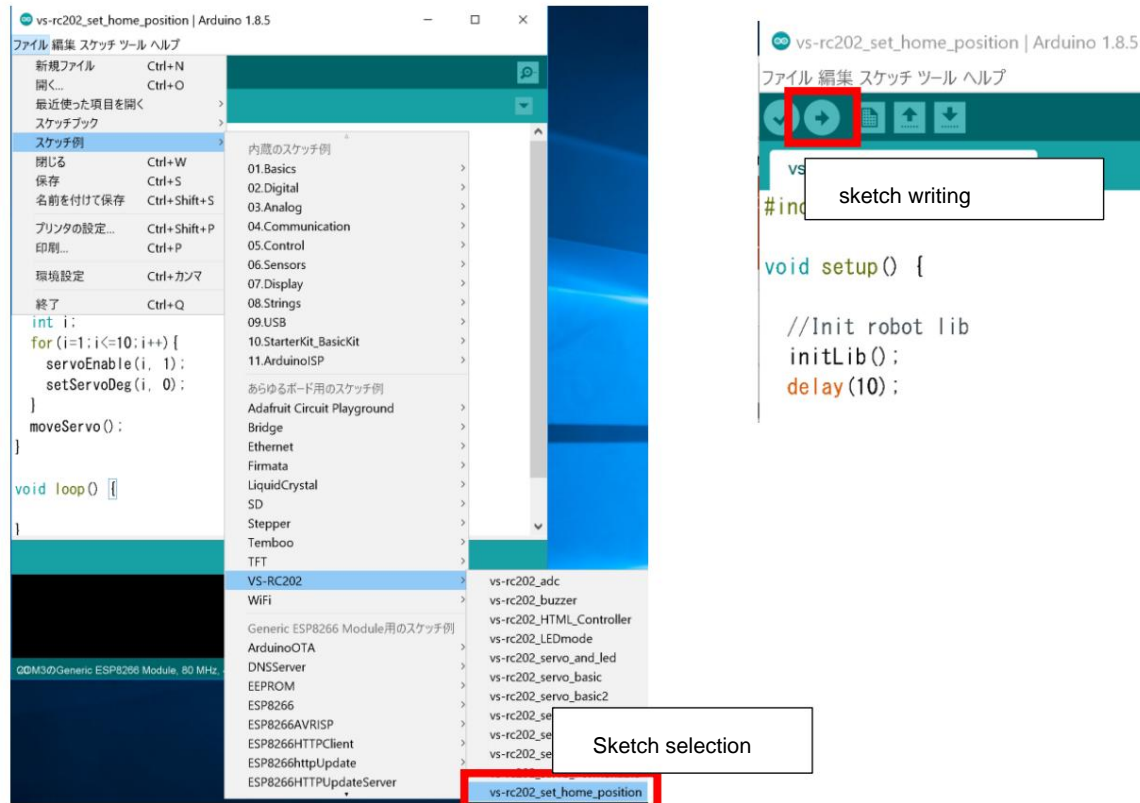
Perform the following work with the robot lifted. The robot's tires may start spinning. Connect the battery box to the board with the USB cable removed from the board, and press the power button to turn on the LED.

I'll light it. At this time, check that the tires do not rotate on their own.
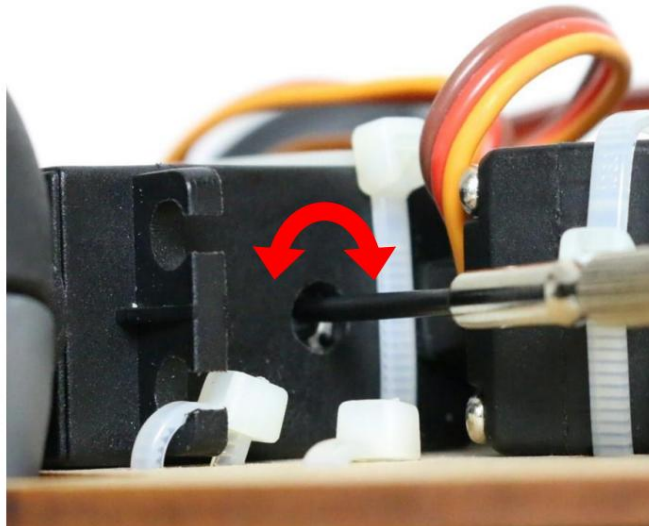

Power button

LED
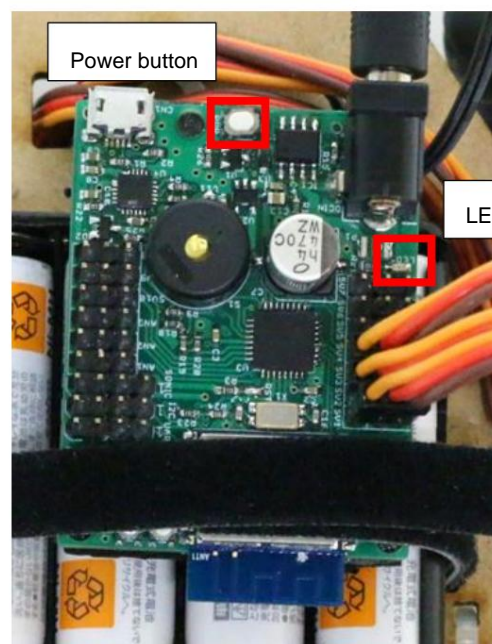
If the tire rotates on its own, the origin of the servo motor to which the tire is attached has shifted.

Make adjustments accordingly. There is a hole in the side of the servo motor, and inside it is a white part with a cross-shaped groove.

Adjustment parts
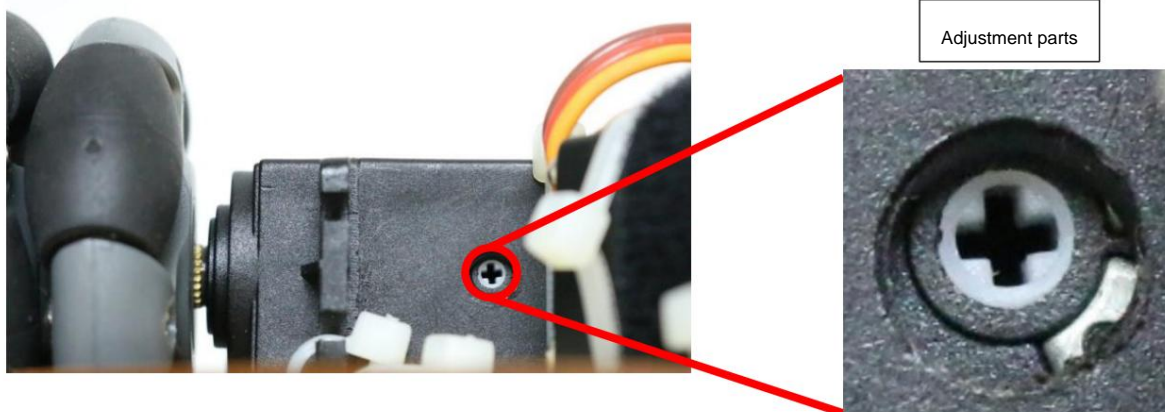
Turning this part with a precision Phillips screwdriver or a precision flathead screwdriver will change the rotation speed of the tire.

Masu. Please adjust this part by turning it slowly so that it stops rotating. At this time, be careful not to use a screwdriver of the wrong size ,

force the screwdriver, or try to forcefully turn the white parts, as this may damage the servo motor. .

Home adjustment is complete when all three servo motors stop. Press and hold the power button for more than 3 seconds to turn on the

Turn off the power to the board.

4.4 Automotion

We will write the program that actually operates the robot onto the board.

This product uses an automotion program that automatically repeats a fixed action as a sample program.

We have prepared a program for wireless operation via Wi-Fi. Sample sample from the web page below.

Please download the program.

ÿ Omni Rover 3WD sample program

https://www.vstone.co.jp/products/vs_rc202/download.html

Now let's write the automotion program. Remove the DC plug from the board and disconnect the PC and USB cable.

Start Arduino IDE with the cable connected. Select [File > Open] from the menu and select

Open the downloaded sample program "omnirover3wd_auto_motion.ino".

Next, write to the sketch. Click the arrow mark "Write to microcontroller board" button.

stomach. If the sketch writing is completed successfully, "Writing to the board has been completed." will be displayed. workman
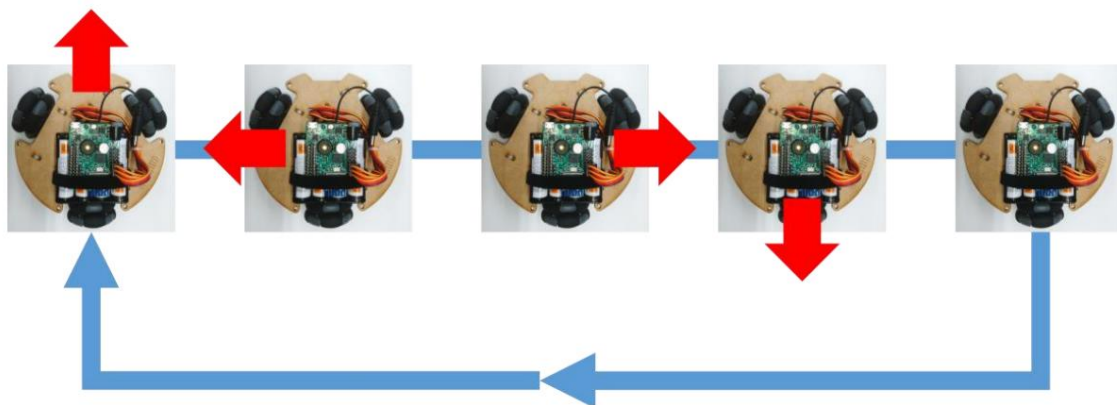
If an error occurs, check the board settings and port settings.

*Writing may take some time. Do not disconnect the cable until you see the message.

Unplug the USB cable from the board, connect the DC plug to the board, and press the power button. Lo as shown below.

The bot moves forward, translates left, translates right, moves backward, and stops.

To stop the robot, press and hold the power button for more than 3 seconds to turn off the

power. If you hold down a moving robot from above, it may put a load on the servo motors and cause malfunctions.

Therefore, when pressing the power button while the robot is operating, be sure to lift the robot.

4.5 Wireless operation using Wi-Fi

Move the robot using Wi-Fi. From then on, you will need an environment where you can communicate via Wi-Fi. robot in advance

Please note the SSID and password of the Wi-Fi router you want to connect to.

Connect the PC with the USB cable while keeping the board and DC plug connected , and start the Arduino IDE. At this time,

please be careful as the robot may start moving. Select [File > Open] from the menu and open "omnirover3wd_HTML_Controller.ino".

Once opened, go to the menu Tools > ESP8266 Sketch Data

Select Upload. After a while, the Arduino IDE prompt will display [100%], indicating completion.
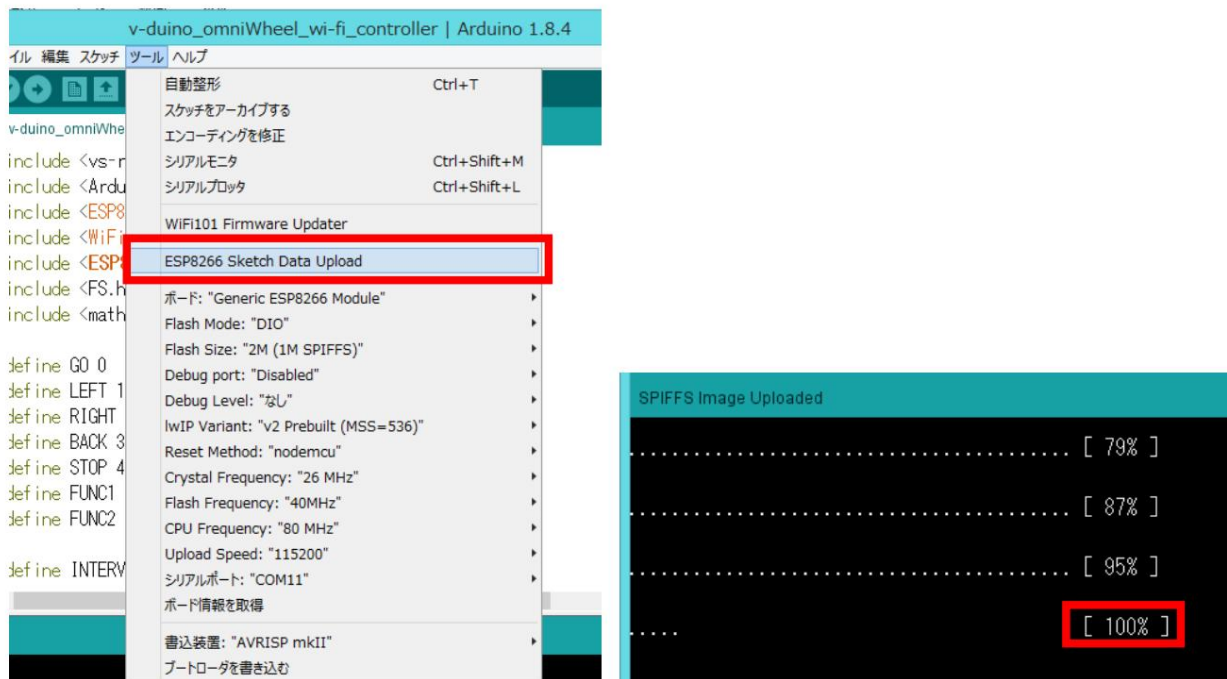
If ESP8266 Sketch Data Upload is not displayed, the initial settings have not been completed, so please refer to "Software Setup"

in the V-duino instruction manual to complete the initial settings.

Next, rewrite the sketch.

There is a part in the sketch where you write the Wi-Fi SSID and password, so please enter your wireless LAN router.

Please write your SSID and password.


9

After entering the SSID and password, press the write button to write the sketch.

Once the writing is complete, open the serial monitor. From the Arduino IDE menu, select Tools > Serial Monitor

Select . If you get the error " error: espcomm_upload_mem failed", you may have selected the wrong port.

or the USB cable may not be connected. Once the serial monitor opens, change the baud rate to

Set to 115200. If the SSID and password are set correctly, the wireless LAN router will open as shown below.

The SSID and assigned IP address will be displayed.
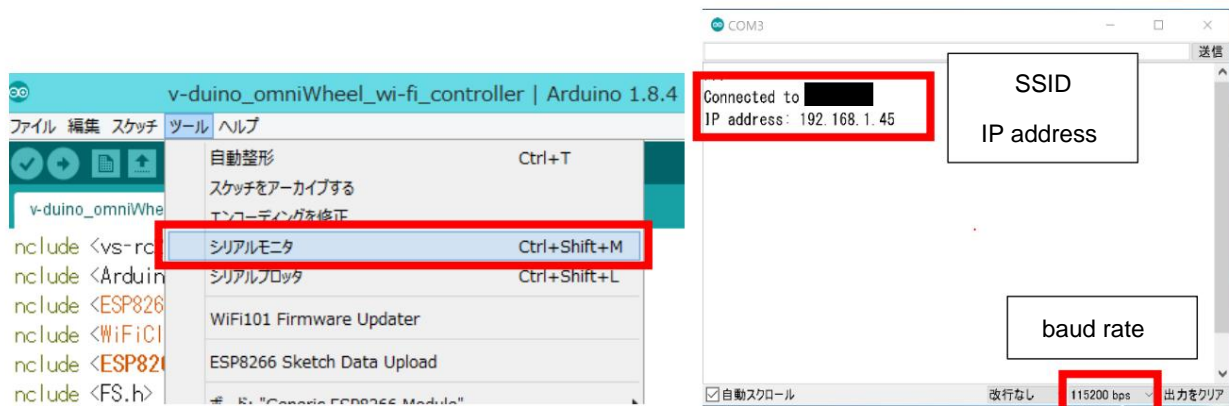
If nothing is displayed on the serial monitor, press the reset button on the board.

reset button

Ten
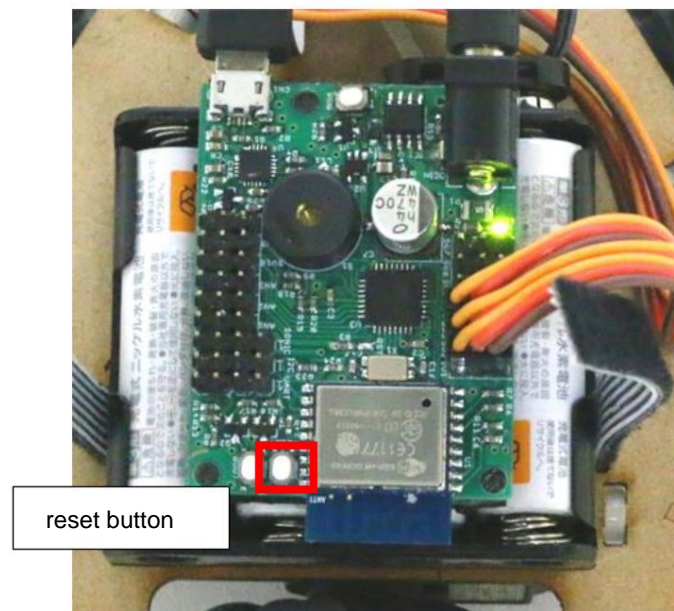
Connect your smartphone (or PC) to the wireless LAN router that the robot is connected to and start the browser.

vinegar. Then, enter the IP address displayed on the serial monitor in half-width alphanumeric characters in the URL field to display the page.

To do. If the connection is successful, a page like the one shown below will be displayed. If the page does not display, please enter your IP address.

Please check that the response is correct and that the robot is powered on.

When the HTML is displayed, disconnect the USB cable from the board and operate the robot. From the second time onwards, connect to the PC.

Obtain an IP address automatically without connecting. If you are unable to connect, try disconnecting from your wireless LAN router.

The assigned IP address may have changed, so please check the serial monitor again.

[Method of operation]	
[LEFT TURN] Left turn	
[RIGHT TURN] Right turn	
[GO]	forward
[LEFT]	left translation
[RIGHT]	right translation
[BACK]	Recession
[STOP]	Stop
[BUZZER]	play music from buzzer
[OFF]	Power OFF
[SENSOR1]	AN1 sensor value*
[SENSOR2]	AN2 sensor value*
[SENSOR3]	AN3 sensor value*
[SONIC]	Ultrasonic sensor value*
[Vin]	Power-supply voltage

*Sensor not included

To turn off the robot, disconnect the USB cable from the board and press the browser's OFF button, or turn off the power.

Press and hold the power button for more than 3 seconds.

5 For further use

Once you get used to operating the Omni Rover 3WD, try learning the program by referring to the V-duino instruction manual.

The V-duino instruction manual can be downloaded from the link below. Examples of works using V-duino are also available. If

Please use this as a reference.

https://www.vstone.co.jp/products/vs_rc202/download.html

6 FAQ

Q: The robot does not go straight. A:

Due to its characteristics, omni wheels are inferior in straight-line performance compared to regular tires. Also, the same number on the program

Even if you input , the rotation speed may change due to individual differences between servo motors and the remaining battery power of the rechargeable battery. origin

This may be improved by making adjustments, adjusting the offset value and output value of the servo motor, and charging the rechargeable battery.

I will.

Q: Generic ESP8266 Module is not displayed in Arduino IDE. A: Please install

the ESP8266 configuration file according to the steps on page 16 of the V-duino instruction manual.

Q: I cannot write the program using Arduino IDE. A: The

board selection, USB connection, writing settings, or COM port selection may be incorrect.

Q: The operation page is not displayed in the browser. A:

The SSID and password of the Wi-Fi router are not set correctly in the sketch, or the URL field of the browser

The IP address written in is incorrect. *Depending on your browser, you may need to add "http://" at the beginning.

There is a possibility.

Q: Even though the Wi-Fi router settings and IP address match, the operation page is not displayed in the browser. A: You may

have forgotten to upload the html file itself to V-duino. V-duino instruction manual P.18 hand

Please upload the html file according to the instructions.

Q: The robot's response is slow.

A: When operating from a browser, delays may occur depending on radio wave conditions, communication distance, obstructions, etc.

Q: The power suddenly turns

off. A: When the power supply voltage drops below a certain level, the power turns off automatically to prevent over-discharge. In addition, a large number of servos

There is also a possibility that the power will turn off due to an electrical load, such as when a motor is connected.

Q: The robot starts running on its own.

A: The initial origin adjustment may have been insufficient, or the origin may have shifted due to long-term operation. Perform origin adjustment again.

Please.

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