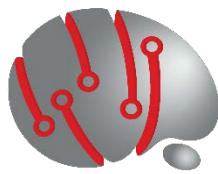




QUICK GLIMPSE INTO THE AUTONOMOUS CAR

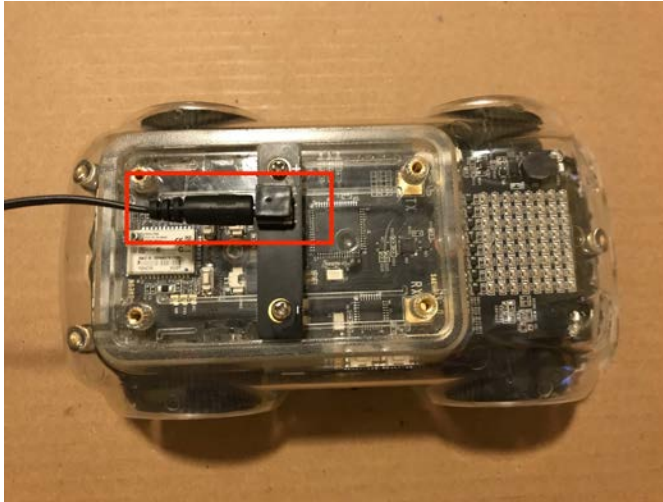


RobotLAB
SMART. USEFUL. ROBOT.

Overview

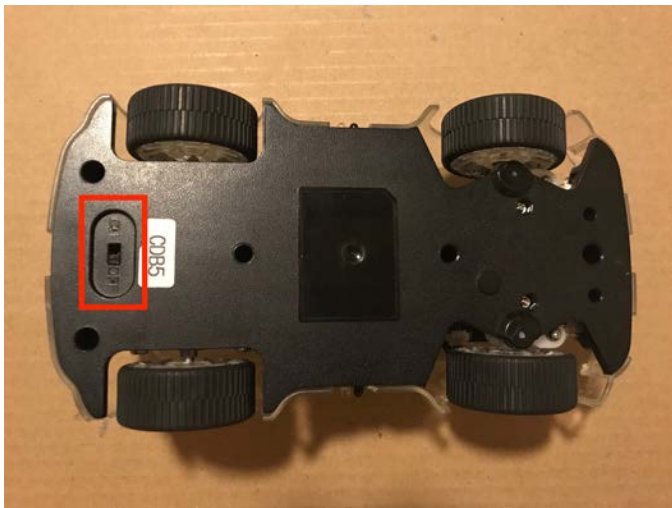
Item 1: Charging your robot

Identify the charging port on top of the robot (it may be hard to see at first).

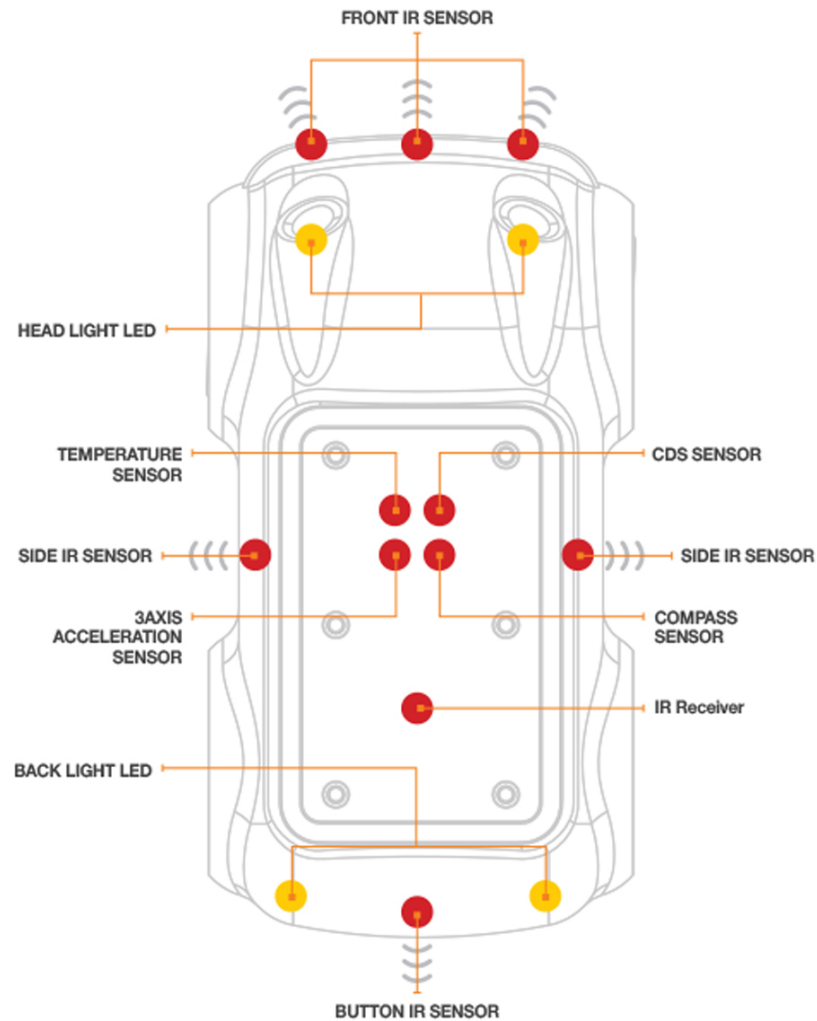


Item 2: Turning on your robot

Identify the switch on the bottom of the robot (don't peel off the sticker, you'll need it later!)



Item 3: Diagram for your reference



Item 4: Watch these three short videos before you continue

Distance Sensor Display: <https://www.youtube.com/watch?v=4wqbzkTILU0>

Resetting the Distance Sensor: <https://www.youtube.com/watch?v=mspirjGhUYg>

Autonomous Drive Mode: <https://www.youtube.com/watch?v=D0E6e-X1gzY>

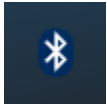
Getting Connected

Your RobotLAB Autonomous Car is only programmable on a PC with Bluetooth enabled.

In order to send programs from your computer to the robot, you need to:

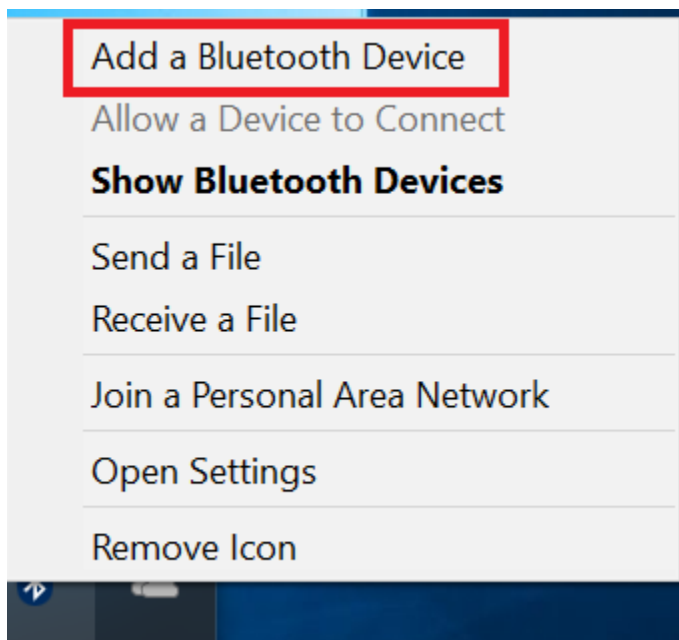
1. Turn ON your car by switching the power on the bottom of the car.
2. Pair the robot with your computer via Bluetooth
3. Connect the robot to the Orchestra program

Here are the steps to complete those two tasks:



Start by finding this symbol on your computer. You will probably find it in a menu in the bottom right corner of your screen. If you don't see it, try typing 'Bluetooth' into the search bar on the Start menu on the bottom left of your screen.

Click 'Add a Bluetooth Device'

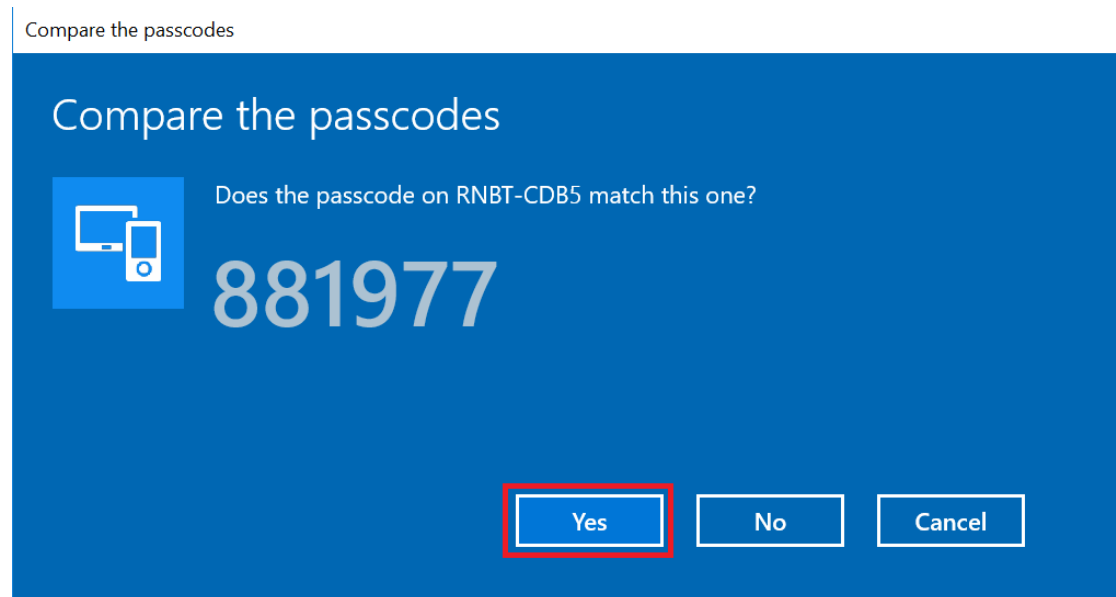


Find the device with a name matching the sticker on the bottom of your car.



Click to pair.

You will see this screen. Don't worry about comparing the number, just click yes.

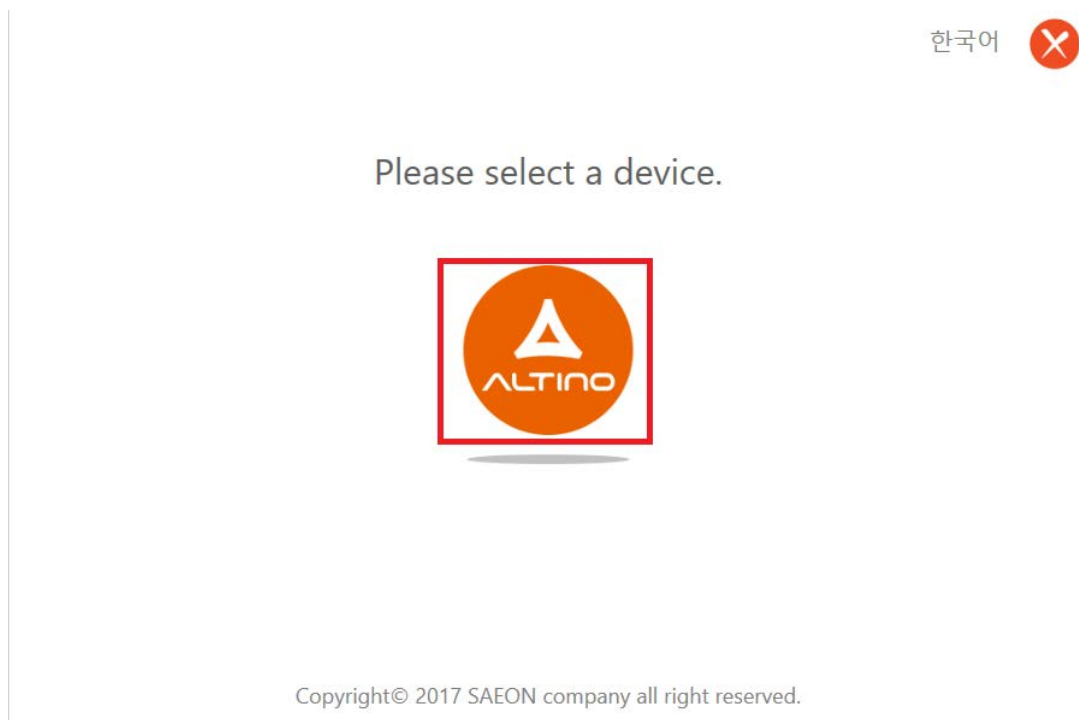


Now your car is paired to your computer via Bluetooth!

To download Orchestra, go to the RobotLAB website here and click download: <http://www.robotlab.com/-autonomous-cars> Once downloaded, click on the **Orchestra Portable 1.1.7** to extract the software



Open Orchestra, and you will see this page. Click the button that says ALTINO.



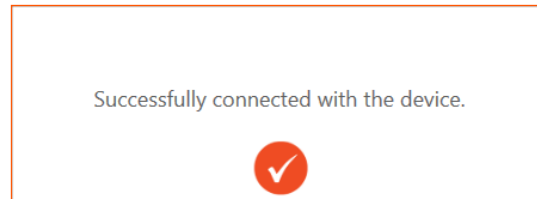
Connect your car to Orchestra by finding the number code from before, then clicking the chain link button. If you don't see the car ID number, click on the search icon.



Confirm your selection with the check button (or if you made a mistake, go back with the X).



If your connection is successful you will see this message.



If your connection is unsuccessful, quit Orchestra and try again. If that doesn't work, turn your car off and start again from the Bluetooth pairing process.




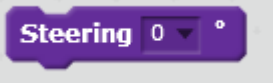



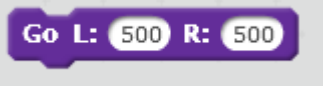

Once you are connected, you will see these two icons. The left one will open Scratch and the right one will show the live sensor data. To confirm the car is successfully connected, check the live data by clicking on the monitor icon on the right side.







Select Scratch from the next screen.



Now you will see the Scratch interface, and you can use it to program the robot.

Commonly used Blocks

	<p>If <some condition is met> then execute the code underneath</p>
	<p>Code starts when the “a” key is pressed.</p>
	<p>Repeats whatever code is inside over and over until the program is stopped.</p>
	<p>Drive straight</p>
	<p>Can be added to this block (notice how it appears to fit in the hole)</p>  <p>To create code with the same functionality as this:</p> 
	<p>Drive forward at speed 500 (speeds range from 0 to 900)</p>
	<p>Doesn't execute the next part of the code until <some condition is met></p>

	<p>Drive forward at speed 0</p>
	<p>Repeat until <some condition is met></p>
	<p>Greater-than</p>
	<p>Less-than</p>
	<p>It may not look like it, but these sensor blocks fit here:</p>  <p>So you can make a program like this:</p>

Tips and Tricks

1. When you turn on your car, you may notice that the wheels move side to side. In order for the car to start off driving straight, hold the car up while it does this.
2. If you try to run a program and it doesn't work, check to see if your car has become disconnected from Orchestra or Bluetooth.
3. Instruct students to save their files regularly.
4. Have students take screenshots of their code for their own records in case they forget to save/can't remember where they put their file.
5. Most importantly, have FUN!!!!

Access Car Menu

1. Turn on the car by flipping the switch on the underside to the ON position.
2. Hold your car with the headlights facing the ceiling, and wait for three seconds.
3. You will see an “M” appear on the LED screen. When you see it, give your car one sharp shake up and down.
4. This will take you to the menu outlined below.

Please note that the following numbers are NOT procedural steps. The number represents the menu you are in. *For example, to change the IR sensor value and save it in the memory, go directly to menu number “5” (hit enter) and submenu “b” (hit enter).*

Menu # 1: Press enter to exit settings

Menu # 2: View IR Sensor value (shortcut)

Menu # 3: Autonomous Drive

Menu # 4: Check Sensor Data

- A. IR raw value
- B. IR correction value
- C. Steering register value
- D. Acceleration sensor value
- E. Magnetic field sensor value
- F. Gyro sensor value
- G. Battery sensor value
- H. Light sensor value
- I. Temperature sensor value
- J. Exit

Menu # 5: Correct Sensor Data

- A. Correct IR Sensor value, not saved
- B. Correct IR Sensor value, saved to memory
 - It will count from 1 to 9
 - When it reaches 9, the sensor has reset
 - Hit enter and you will be taken back to the main menu
 - (when you do this, avoid putting the car near dark colors, as the sensor has a harder time measuring the distance to dark objects)
- C. Reset IR Sensor value
- D. Correct Steering value, not saved
- E. Correct Steering value, saved to memory
- F. Reset Steering value
- G. Exit the menu

Once you are in the “M” mode, try to change the number right away. If you see “Altino” on the screen, that means you are out from the “M” mode - you need to hold the device vertically for 3 seconds to get in the “M” mode again.

Lesson Plans

Three free lesson books are available here at our website:

<http://www.robotlab.com/-autonomous-cars>

MSRDS Visual Programming Language

Android Application Programming

C Language Programming

Scratching Programming

Programming Arduino

Raspberry Pi Programming

If you purchased Engage! K12, your lessons are available on:

<http://engagek12.robotlab.com>

For more information or questions, please contact us.

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