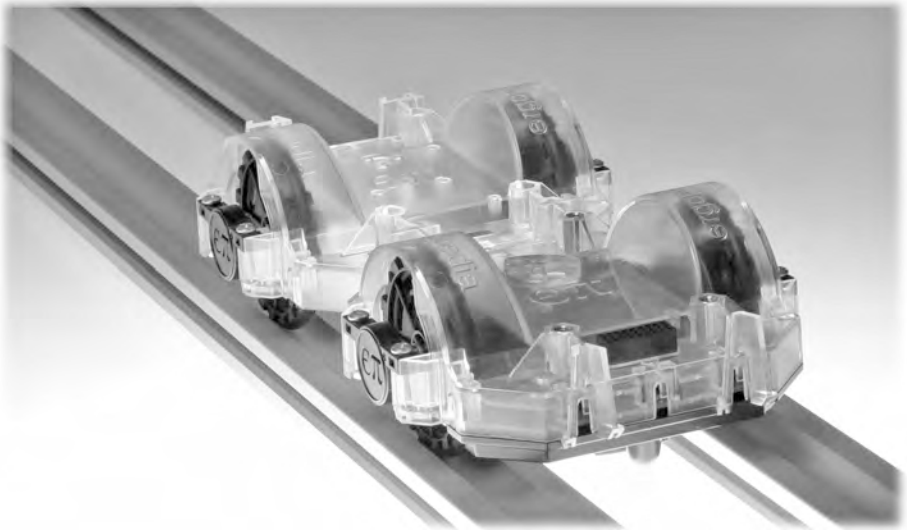


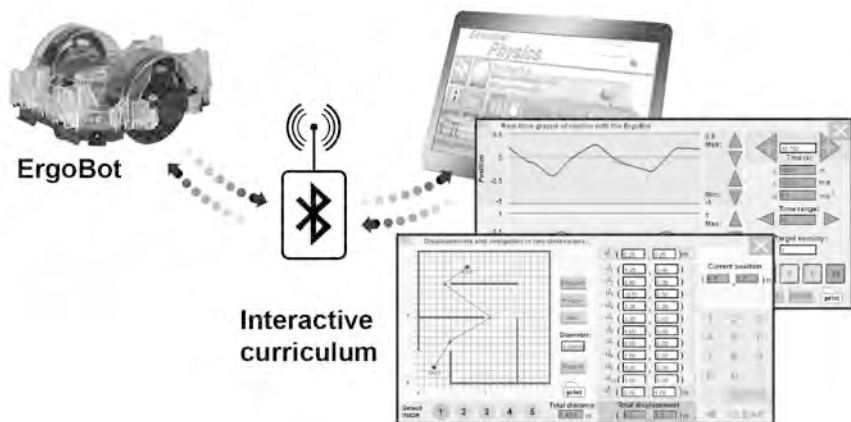
User's Guide

The ErgoBot



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Patent pending



Welcome

We are glad you choose to teach with the ErgoBot, the most dynamically fun way to engage students with the physics of motion - and with engineering and technology at the same time. The ErgoBot is part of the *Essential Physics* family of technology-enhanced learning tools. For more about *Essential Physics*, see www.ergopedia.com.

A Quick-Guide Video

This short video quickly shows you all the ways that the ErgoBot can help your students interactively learn physics, math, engineering, and technology. Watch the video anytime, online at this web address.

www.ergopedia.com



Quick User's guide to the ErgoBot

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Overview of the Ergobot

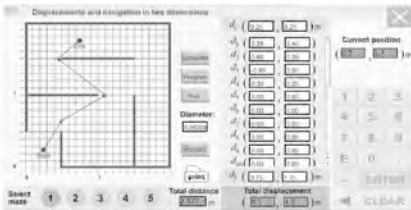
The ErgoBot is both a robot that can move under its own control and a low-friction, motion-sensing cart that wirelessly transmits position, velocity, and acceleration data in real-time.

- The ErgoBot connects to devices, such as laptops or tablets, via Bluetooth *without any installed software drivers*.
- In *freewheel mode* the ErgoBot's wheels roll freely and its internal sensors and microprocessor measure position, velocity, and acceleration in the positive and negative directions every 50 milliseconds.
- In *drive mode* the ErgoBot can move backward or forward at speeds up to 40 cm/s (± 0.4 m/s).
- The ErgoBot can turn to within $\pm 0.5^\circ$ directional accuracy.
- The ErgoBot has a rechargeable lithium ion battery that can power the robot for several hours.

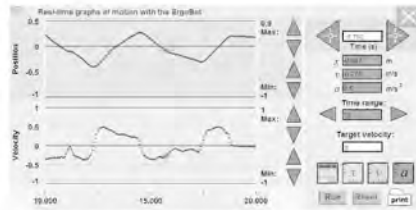
Drive mode
Switch at 90°



Freewheel mode
Switch at 45° left

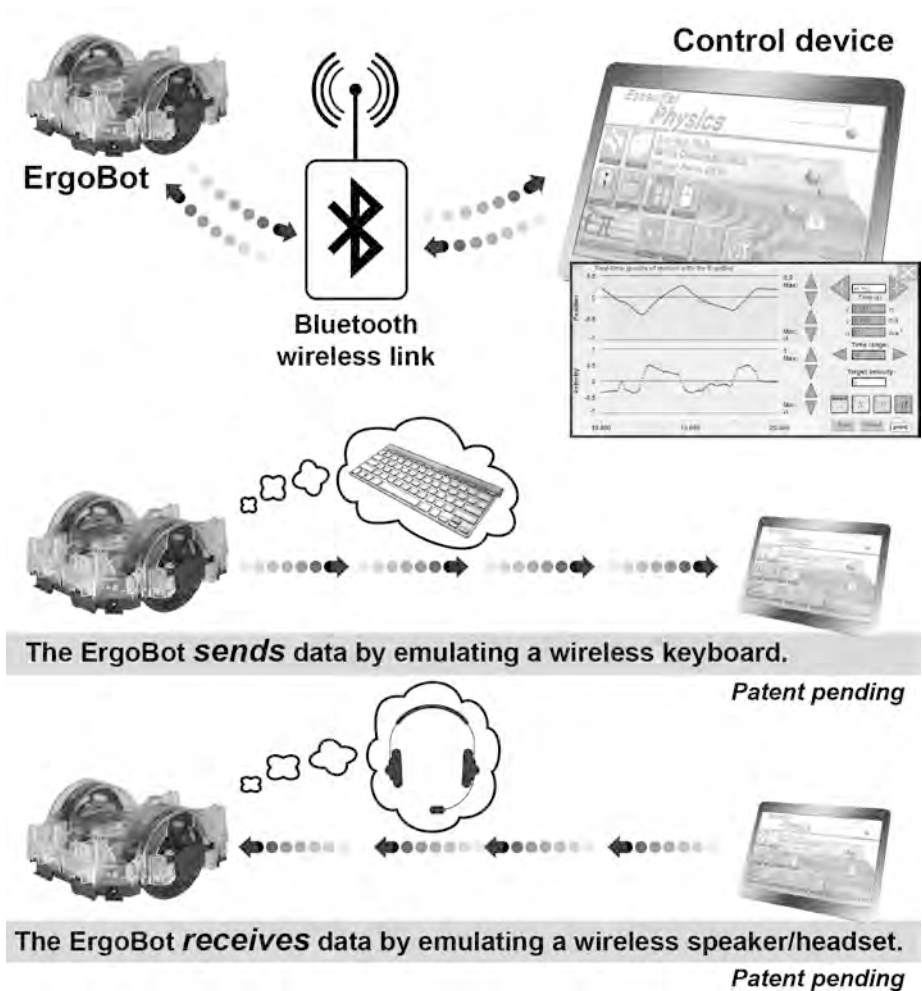


Program vector mazes and drive motion graphs.



Wireless measurement of position, velocity, and acceleration

How it works

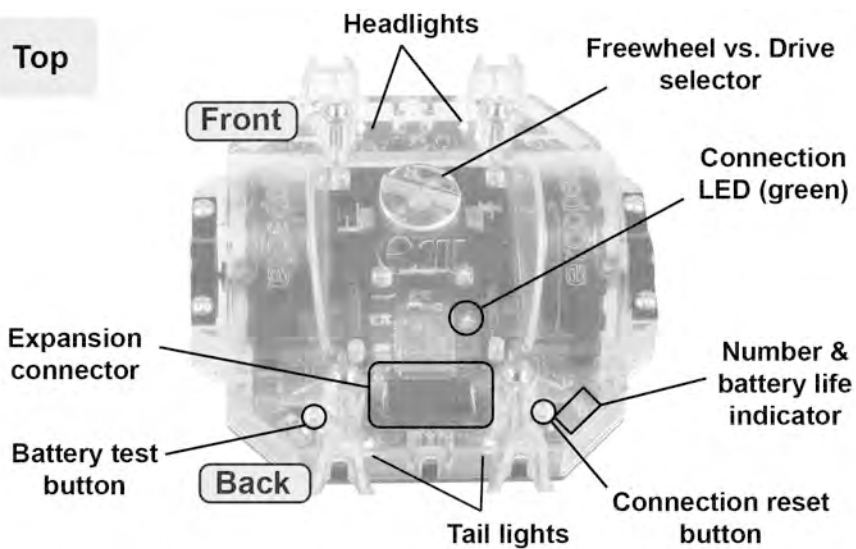


The ErgoBot connects to a control device, such as a laptop or tablet, through a wireless Bluetooth link.

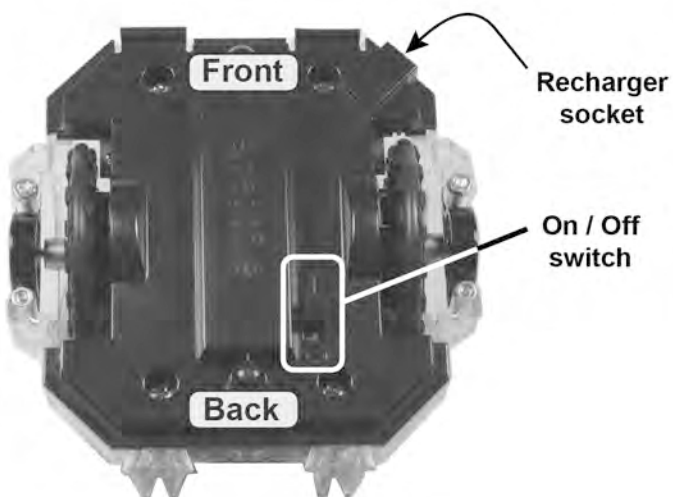
- The ErgoBot emulates a Bluetooth speaker or headset and receives control signals from the device as wireless audio "sounds." *When the ErgoBot is connected you will NOT hear any sound but your device volume must be turned up and NOT muted!*
- The ErgoBot emulates a wireless keyboard to send data to the control device.

Buttons, lights, and switches

Top



Bottom



Buttons, lights, and switches

| | |
|--|---|
| Headlights | Two blue LEDs at the front of the ErgoBot indicate the <i>positive</i> direction of motion. <i>When starting a new motion or vector program the ErgoBot assumes that the headlights point in the positive x-direction.</i> |
| Freewheel vs. Drive selector | This switch rotates forward for drive mode and 45° left for freewheel mode. <i>The switch only rotates 1/8 of a turn!</i> |
| Connection LED (green) | This will light up green when the ErgoBot is both paired AND connected through Bluetooth to a control device. |
| Number and battery life indicator | This is a two-digit red LED number from 00 to 99 corresponding to the ErgoBot ID number. This can be changed (page 15) When the battery indicator button is pressed this number shows the battery charge remaining from 5% to 100% in 5% increments. |
| Battery test button | Press this button with a pencil point to check the battery charge status. The number LED shows the charge remaining from 5% to 100% in 5% increments. |
| Expansion connector | Accepts optional Arduino-compatible expansion board allowing a wide range of robotics projects. |
| Tail lights | Two red LEDs at the back of the ErgoBot indicate the <i>negative</i> direction of motion. |
| Connection reset button | Press this button with a pencil point to break the Bluetooth connection between the ErgoBot and the current control device. A beep will sound. |
| Recharger socket | Connect the AC adapter to recharge the ErgoBot. |
| On / Off switch | Power to the ErgoBot ("1" = On, "0" = Off). |



Sounds

Sounds you hear: The ErgoBot makes these sounds in response to interactions with its control device.

- **Happy sound:** Three ascending tones (beepbeepbeep) tell you the ErgoBot has successfully received a command sequence.
- **Sad sound:** Two descending tones (beepbeep) tell you the ErgoBot did not understand a command sequence.
 - Try sending the command again by clicking Run or Program.
 - Turn up the volume on your control device and try again. Even though you don't hear the sound, the control device sends commands to the ErgoBot using Bluetooth audio.
 - Bring the ErgoBot closer to the control device and try again. Bluetooth typically works to a distance of 3-5 meters but local radio interference can affect this.
- **Musical theme:** A five note "song" plays when the ErgoBot has successfully paired and connected with a new device.
- **Single beep:** You get a single beep when the ErgoBot has successfully disconnected after pressing the disconnect button **or** when the ErgoBot has been turned on and is not connected to any device.
- **Continuous beeping:** The ErgoBot is in the wrong mode (drive/freewheel) for the command that has been sent.

Sounds you don't hear: The ErgoBot requires two-way communication between itself and the control device. Signals *from* the device *to* the ErgoBot use wirelessly transmitted sound. When the ErgoBot is connected you don't hear these sounds! The ErgoBot takes over your computer's speakers so no sound will come out of the speakers. Instead the computer "whistles" commands to the ErgoBot in an audio code. If you turn off the ErgoBot you and your students can hear the commands when you click any button that sends control data to the ErgoBot.

Attaching and detaching the front carriage

- The ErgoBot comes with a front carriage that attaches with two tapered dovetail slides. The dovetails on the front carriage attach to the mating slides at the front of the ErgoBot by engaging upwards until they click.
- The dovetail slides can grip quite firmly. Exercise care and follow the procedures below *exactly*. This is particularly important when releasing the carriage because substantial force is needed.

Attaching the front carriage



Mating dovetail slides

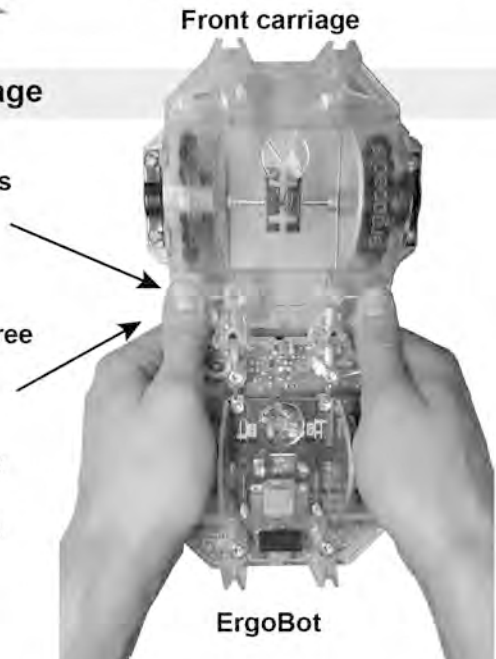
Insert the front carriage from underneath the ErgoBot.

Releasing the front carriage

Grasp the ErgoBot and front carriage with your thumbs on the top corners of the front carriage and your index fingers under the bottom.

Gently pop the front carriage free by rocking it back and forth with your thumbs applying downward pressure to the front carriage while your index fingers support and hold the ErgoBot/carriage combination.

This takes substantial force!



Interactive labs

Real-time graphs of motion with the ErgoBot

Position (m)

Velocity (m/s)

Time (s)

x (m)

y (m)

a (m/s²)

Run Reset print

A freewheel mode interactive lab

Set the time in seconds

Click Run and data collection starts when the ErgoBot beeps.

Velocity, position, and time (more advanced version)

Position (m)

Velocity (m/s)

Time (s)

Model

Variables x_1 (m)

y_1 (m/s)

Run Print

A drive-mode interactive lab

Click Run and the ErgoBot drives the graphs shown.

- The ErgoBot is controlled through interactive labs.
- Some interactive labs use **freewheel-mode** in which the ErgoBot acts like a rolling motion sensor sending data to the control device.
- Some interactive labs use **drive-mode** in which the ErgoBot actively moves under its own power to execute a motion "program" created by the control device.

Pairing and connecting

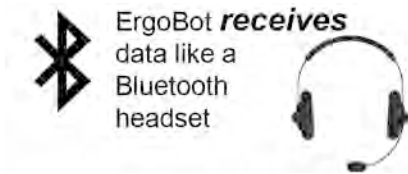
The ErgoBot connects to a **control device**, such as a laptop or tablet, via **Bluetooth®**. Bluetooth is a wireless radio technology that creates a one-to-one **pairing** between the ErgoBot and the control device. Only the paired device can interact with the ErgoBot. *The first step to using the ErgoBot is to pair and connect with a control device.*

Establishing the link between the ErgoBot and the control device has two distinct parts: **pairing** and **connecting**.

Pairing: The ErgoBot and Control Device detect and remember each other's unique hardware addresses - akin to memorizing each other's individual serial numbers.

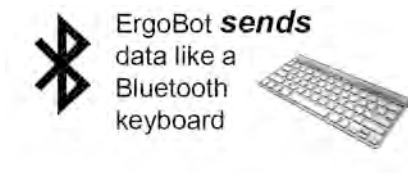
Connecting: The control device's operating system actively engages the ErgoBot by recognizing it as a wireless keyboard and wireless headset (or speaker). This allows the browser to send and receive information to the ErgoBot.

Sending commands and receiving data requires two-way communication between the ErgoBot and the control device. This is achieved without any hardware-level drivers, on virtually all devices, by having the ErgoBot emulate a Bluetooth speaker and a Bluetooth keyboard (*patent pending*).



A paired ErgoBot takes over its control device's speakers and commands are “whistled” to the ErgoBot as an audio code. If you turn off the ErgoBot you can hear the commands.

**When the ErgoBot is connected you will not hear any sound.
To resume hearing sound - turn the ErgoBot off.**



A paired ErgoBot sends data to its control device by emulating a Bluetooth keyboard essentially “typing” data to the control device.

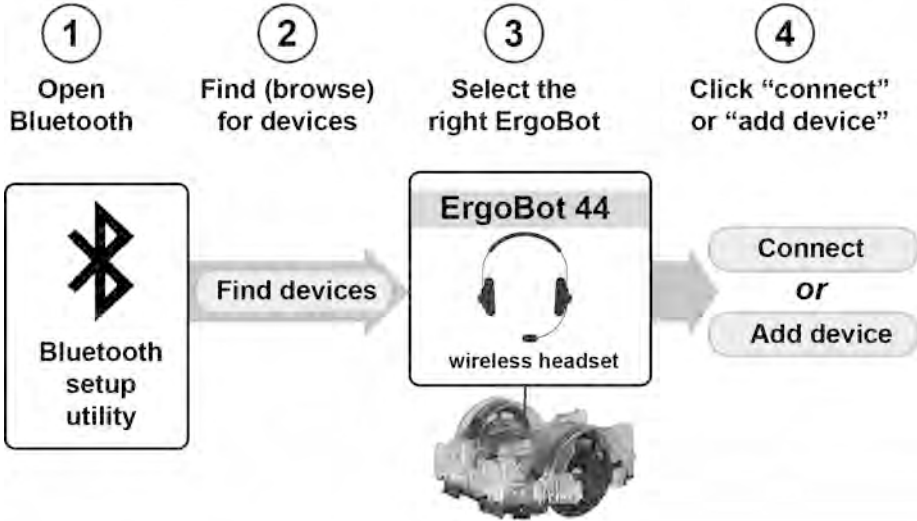
Don't use the keyboard or mouse when the ErgoBot is actively sending data (i.e. real-time motion graph data).

Pairing

The pairing process follows these general steps on most devices. The specific steps for particular devices are covered in the next section.

Be aware of software changes to your device!

Browser and operating system software may change in the future. This might cause changes in the ErgoBot pairing procedure. Find the latest pairing instructions online at www.ergopedia.com under the **Support** tab.



Un-pairing

To pair the ErgoBot with a *different* control device, the first control device must be *un-paired*. This usually takes three steps.

1. Delete or remove the pairing to the ErgoBot from the previous control device using the Bluetooth utility.
2. Press the disconnect button on the ErgoBot. The ErgoBot will beep once when it is disconnected.
3. Pair the ErgoBot with the new control device.

If you don't do step (1) first, the first control device will often re-connect automatically with the ErgoBot right after you disconnect in step (2). The new control device will not be able to connect if this happens.

Connecting

When connected, the operating system of the control device recognizes the ErgoBot and streams all audio wirelessly to it.

1. All sounds are sent to the ErgoBot instead of the device's internal speakers. *Hearing sound from a device's speakers immediately tells you that the ErgoBot's connection is not active.*
2. The ErgoBot has been accepted as a Bluetooth keyboard and characters sent by the ErgoBot are correctly transmitted to interactive labs.

Once a control device is paired with a specific ErgoBot, the ErgoBot can be turned off and on and most control devices will automatically reconnect.

If the ErgoBot does not connect - turn the ErgoBot off and on again!

Devices connect in different ways. If the ErgoBot does not connect successfully after about 90 seconds, try turning it off and on again.

Turning the ErgoBot off and on again lets the ErgoBot re-initialize the connection from its own microprocessor to the device.

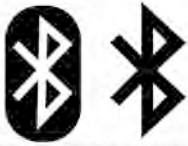
Knowing when you have connected



The ErgoBot plays this 5-note "song" when it successfully connects to the control device. When you hear this 5-note sequence, the ErgoBot is ready to interact with the control device!

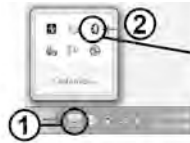
The first time you connect to the ErgoBot, most devices will ask you if you "want to connect to this device." *The ErgoBot may be identified as a Bluetooth headset or keyboard or both.* Answer "yes" to this question to make the connection.

Tips and things to look out for



Bluetooth icons

Show
hidden
icons



Choose the
Bluetooth
icon

Finding Bluetooth on some computers

Find the Bluetooth utility. The Bluetooth utility may be hidden on the desktop or in a preferences section. The diagrams above show two typical Bluetooth icons which may appear in connection with the Bluetooth setup utility. On tablets try looking in "settings."



Make sure Bluetooth is turned on. Bluetooth uses power for its wireless radio so Bluetooth is often turned off by default. You need to turn it on to use the ErgoBot.

- **Not all computers have Bluetooth capability.** *Most older desktop computers do not have Bluetooth.* To solve this problem you can purchase a USB Bluetooth device that plugs into any USB port and offers Bluetooth connectivity. This device is typically less than \$30 and is smaller than a USB thumb drive.
- **The sound on your control device cannot be muted.** The ErgoBot commands are transmitted via wireless streaming audio. The "mute" function turns off the audio output from the control device so the ErgoBot cannot "hear" its commands.
- **Turn the volume up to maximum when the ErgoBot is connected.** If you have the volume set low on your control device the ErgoBot may not hear commands properly. You cannot hear the sound but the wireless streaming audio will have the best signal strength when the volume is high.
- **Don't type on your device keyboard when the ErgoBot is actively transmitting data.** Active data transmission occurs in freewheel mode after Run has been pressed. While sending data, the ErgoBot interactive labs suppress the "pop-up" keyboard on iPads and similar tablet devices.

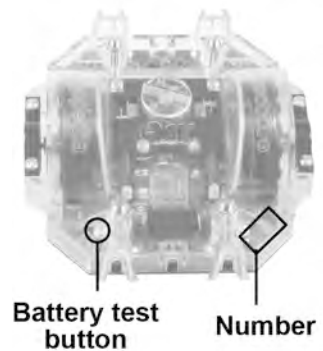
Tips and things to look out for (continued)

- **As of July 2014, Internet Explorer does not support the HTML5 audio protocol. ErgoBot interactive labs will not work in Internet Explorer.** We suggest installing the free version of either Firefox or Chrome as the default web browser.
- **Distance matters.** Bluetooth uses short-range radio. The ErgoBot must be within 1 - 2 meters of the computer to pair successfully. Once paired, the ErgoBot will often interact up to a distance of 3-5 meters. *However, the maximum distance can be shorter if radio interference is present.*
- **Be patient.** Computers don't check Bluetooth continuously but instead check only at intervals ranging from 15 seconds up to more than a minute. This time delay affects browsing for devices, connecting, pairing, and un-pairing.
- **Older machines.** Some older laptop computers must be rebooted to completely remove a Bluetooth pairing even after the device has been deleted in the Bluetooth utility.

Renaming the ErgoBot

Each ErgoBot is randomly assigned a "name" (number) between 1 and 99 from the factory. Theoretically, up to 99 ErgoBots may be active at the same time, within the same Bluetooth range, with each paired to a different device.

If you have two ErgoBots with the same number you should change the number (name) of one of them.



1. With the ErgoBot off, press and hold the battery test button while you simultaneously turn the ErgoBot on. The ErgoBot will beep, and the 2-digit number will flash "00."
2. Press the battery test button to increment the number until it reaches the number you want to name the ErgoBot.
3. Stop pressing the battery test button and wait for the ErgoBot to beep again to signal that it has accepted the new name.

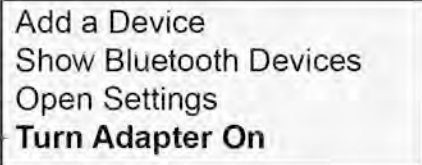
Using the ErgoBot with a Windows device

Note: The ErgoBot interactive labs do not work in Internet Explorer or Opera (as of July 2014) because Internet Explorer and Opera do not support the HTML5 audio protocol. We suggest installing the free version of either Firefox or Chrome as the default web browser.

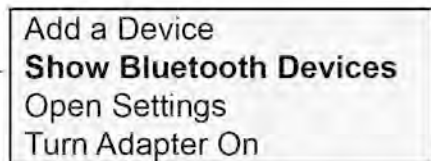
1. Turn on the ErgoBot.
2. Click the **Bluetooth button** on the system tray in the lower right corner of your computer's Desktop.



3. Select **"Turn Adapter On"** to turn on Bluetooth if it is currently off.
(You can also access this by clicking Windows
-> Control Pane
-> Devices and Printers.)



4. Click the System Tray's Bluetooth button again and now select **"Show Bluetooth Devices."**



5. Select **"Add a device"** to add the new ErgoBot as a Bluetooth device to your computer.



Using the ErgoBot with a Windows device (continued)

6. Select the device you wish to add and click "Next."



7. The device has now been added successfully to the computer. Click "Close."



8. Double-click your new device in the control panel for Bluetooth devices.



9. This shows a successful connection.



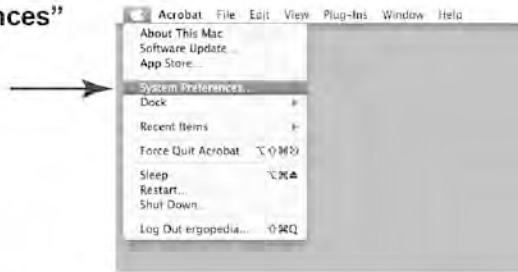
The ErgoBot should play its 5-note connection sound sometime between steps 6 and 9.



10. You may need to turn the ErgoBot off and on again, and wait 30 - 90 seconds for the computer to notice and respond.

Using the ErgoBot with a Mac OS X device

1. Turn on the ErgoBot.
2. Open the “System Preferences” on your Mac computer.



3. Open “Bluetooth” preferences.



4. Check “On” to turn on Bluetooth.



5. Click on the “+” button (or “Set Up New Device”) to add a new Bluetooth device.

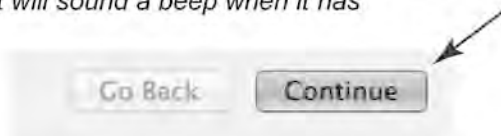


6. Select the correct ErgoBot device in the Bluetooth Setup Assistant.



Using the ErgoBot with a Mac OS X device (continued)

7. Click “Continue.” Your computer will now attempt to pair with the device. *The ErgoBot will sound a beep when it has successfully paired.*



8. Click “Quit” to exit the Bluetooth Setup Assistant.



9. If your ErgoBot sounded a “sad” two-note pattern, turn the ErgoBot off and on then wait 60 - 90 seconds to renew the Bluetooth connection.



10. A successful Bluetooth connection will sound with five tones.



“Connected”



Using the ErgoBot with an iPad or iOS device

1. Turn on the ErgoBot.
2. On your iPad, select the “Settings” app.



3. In the Settings menu, select Bluetooth.



4. Turn Bluetooth On.



Using the ErgoBot with a iPad or iOS device (continued)

5. Select the ErgoBot device to which you want to create a connection.



6. When you have made a successful connection you should hear five tones from the ErgoBot.



“Connected”



Using the ErgoBot with an Android tablet

1. Turn on the ErgoBot.
2. On your Android OS device swipe your finger down in the upper-right corner to see the menu.



3. Select "Bluetooth" from the menu.
(Either a single press or a long press, depending on your device.)



4. Turn Bluetooth On.



Using the ErgoBot with a Android tablet (continued)

5. Select **“SEARCH FOR DEVICES”** to add the new ErgoBot as a Bluetooth device.



6. Select the ErgoBot device to which you want to pair and connect.

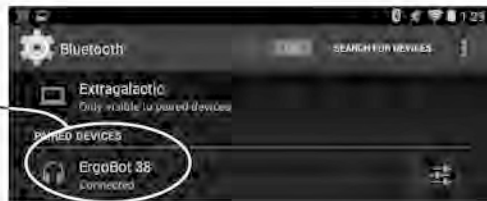


The ErgoBot will sound five notes on a successful connection.



7. This shows a successful connection.

“Connected”

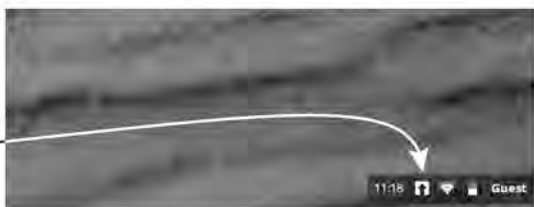


8. Sometimes you may have to turn the ErgoBot power switch on and off to refresh the Bluetooth connection.

Using the ErgoBot with a Chromebook

1. Turn on the ErgoBot.

2. On your Chromebook, select the system tray in the lower right corner.

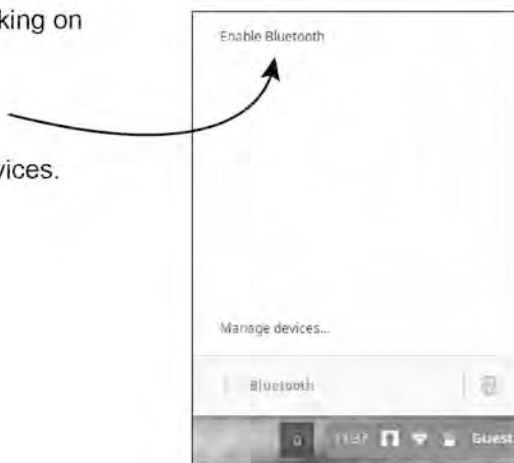


3. Select "Bluetooth" from the menu.



4. Turn Bluetooth on by clicking on "Enable Bluetooth."

The Android device will immediately look for available Bluetooth devices.



Using the ErgoBot with a Chromebook (continued)

5. Select the ErgoBot device to which you want to pair and connect.



6. This shows a successful connection.
The ErgoBot will sound five notes on a successful connection.



Device has a checkmark next to it.



7. Sometimes you may have to turn the ErgoBot power switch on and off to refresh the Bluetooth connection.

Re-pairing the ErgoBot with a new device

To pair an ErgoBot with another device, you have to do two things:

1. Delete the ErgoBot device from the prior control device using the Bluetooth utility on the control device.
2. Reset the ErgoBot's internal Bluetooth pairing memory so it can accept a new control device.

Windows: From Bluetooth Devices, select the ErgoBot, then click "Remove device."

Mac OS X: Open Bluetooth preferences from the system preferences window. Select the ErgoBot from the list of paired devices and click the "-" button at the top of the toolbar to delete the ErgoBot from the list of active devices.

iPad: Open the "Setting" app and select Bluetooth from the list on the left. Each paired devices (shown in blue text) will have either "Connected" or "Not Connected" next to its name, as well as a small right arrow icon. Touch the arrow icon, then select "Forget this Device", and finally "OK" on the pop-up dialog box.

Android: Open the menu by swiping down in the upper right of the screen. Select Bluetooth from the menu. Select the ErgoBot and press "disconnect."

Chromebook: Open the setting menu and select Bluetooth. Click "Manage devices" to open a box containing a list of paired Bluetooth devices. Click the ErgoBot entry to select it, and cause a small "x" to appear next to its name in the list. Click the "x" to delete the ErgoBot from the list of saved devices.

On the ErgoBot

Press the connection reset button with a pencil point to break the Bluetooth connection between the ErgoBot and the current control device. A beep will sound. *You must delete the Bluetooth connection from the control device first, before resetting the connection on the ErgoBot. Otherwise the first control device will re-connect automatically with the ErgoBot and a new control device will not be able to connect.*

Full memory reset

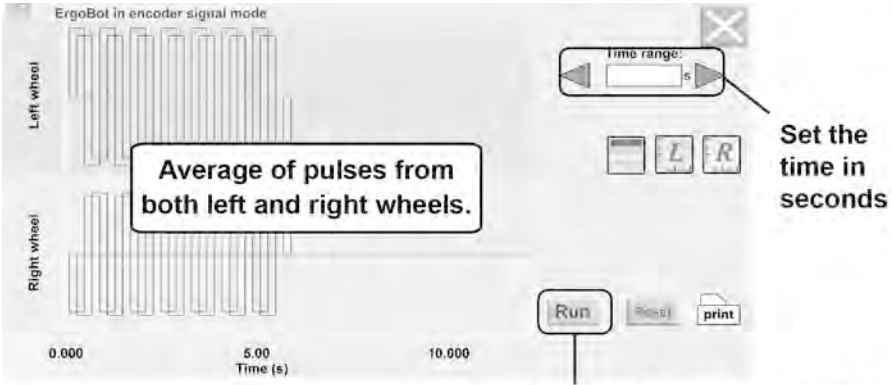
The ErgoBot remembers a list of characteristics of devices it has once paired with. This makes it faster to re-pair with a device. *However, sometimes this causes problems if a device has been updated.* It may be necessary to completely reset the ErgoBot's pairing memory.

Doing a full memory reset With the ErgoBot off, press and hold the **connection reset button** (near the number). *Turn the ErgoBot on while holding this button down.* Wait a moment, release the button, and wait for the ErgoBot to make **two beeps**.

Interactive labs with the ErgoBot

The ErgoBot interacts through software "labs" that run within a browser. The following section describes some of the interactive labs that appear in *Essential Physics*. Refer to the *Essential Physics User's Guide* for more information.

Looking at the ErgoBot signals



Click Run then wait until the ErgoBot beeps to turn the wheels and see data.

- The ErgoBot should be in **freewheel** mode.
- Set the time range for 2-10 seconds.
- Click "Run" and wait for the ErgoBot to beep three ascending notes, acknowledging the command.
- Move either wheel and you will see pulses. The pulses are from miniature photogates. There are two photogates per wheel that sense a slotted steel encoder disc that rotates with each wheel.
- The faster you turn the wheel, the closer the pulses are together.

Real-time motion graphs

View the data at 50 ms intervals.

Change the scale.

Move the cursor left and right on the time axis.

A freewheel mode interactive lab

Set the time in seconds.

Export the data

Click Run. Data collection starts when the ErgoBot beeps 3 rising tones.

See position, velocity, and acceleration vs. time graphs.

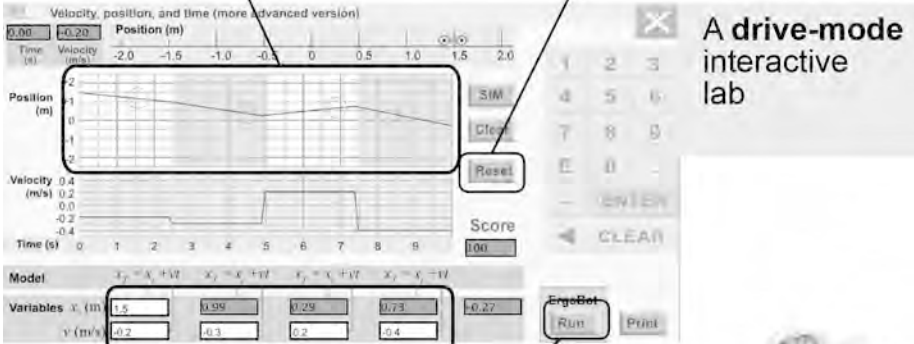
Attach the front carriage for best results.

- The ErgoBot should be in **freewheel** mode with the front carriage attached.
- Set the time range for 2, 5, or 10 seconds.
- Click "Run" and wait for the ErgoBot to beep, acknowledging the command.
- See real-time graphs of position vs. time, velocity vs. time, and acceleration vs. time. One or two graphs can be displayed at the same time (but not all three).
- Change the vertical scale on any graph by clicking on the up and down arrows.
- Move the cursor to look at individual data points.
- Click the table icon to see all the data, which can be exported.

Powered motion graphs

Get the best score by hitting the target circles on the position vs. time graph.

Reset randomly chooses four new target circles.



Create position vs time and velocity vs. time graphs.

Click Run and the ErgoBot drives the graphs.

Attach the front carriage for best results.



- The ErgoBot should be in **drive** mode with the front carriage attached.
- In this example, students enter an initial position and velocities for four successive time intervals of 2.5 seconds.
- The students get the best score by hitting the center of all four circles on the position vs. time graph.
- Click SIM and the simulated ErgoBot moves back and forth according to the motion graphs.
- Click "Run" and the real ErgoBot drives the motion graphs.
- Click Reset and four new target circles are randomly generated.
- Each challenge (four circles) can be solved using velocities between +0.4 m/s and -0.4 m/s. This is the realistic engineering challenge because other solutions while possible in theory, are not possible in practice with a real ErgoBot.

Vectors and 2-D motion (vector navigation)

Simulate shows the vectors.

Program downloads the vectors to the ErgoBot.

Solve the maze with up to 10 displacement vectors.

A drive-mode interactive lab

There are 5 different mazes

Click **Run** and the ErgoBot drives the vectors.

The ErgoBot should not have the front carriage attached.

| Vector | x (m) | y (m) |
|----------|-------|-------|
| d_1 | 0.25 | 0.25 |
| d_2 | 0.25 | 0.40 |
| d_3 | 0.60 | 0.35 |
| d_4 | 0.70 | 0.50 |
| d_5 | 0.35 | 0.25 |
| d_6 | 0.00 | 0.00 |
| d_7 | 0.00 | 0.00 |
| d_8 | 0.00 | 0.00 |
| d_9 | 0.00 | 0.00 |
| d_{10} | 0.00 | 0.00 |
| d_{11} | 0.00 | 0.00 |
| d_{12} | 0.75 | 0.75 |

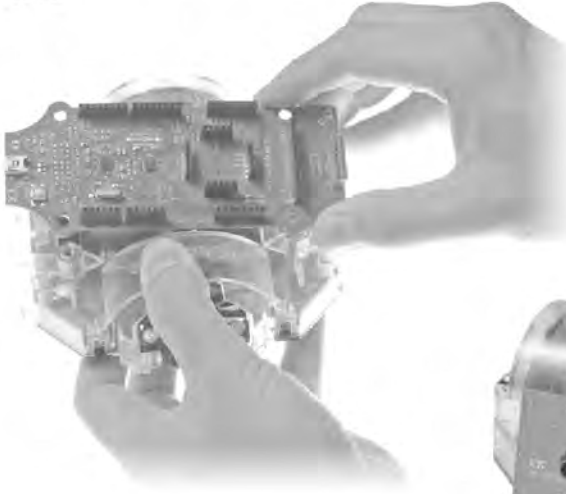
Total distance: 2.457 m

Total displacement: (0.5, 0.5) m

- The ErgoBot should be in **drive** mode with no front carriage.
- Enter displacement vectors that solve the maze.
- Click Simulate and the simulated ErgoBot (red dot) follows the vectors in two dimensions on the screen.
- Click Program to upload the vector commands into the ErgoBot's on-board memory. You should hear the three-tone "happy" sound if the commands have been successfully received. If you get the two-tone "sad" sound try moving the ErgoBot closer, check the volume on your device, and click Program again.
- Click "Run" and the real ErgoBot drives the vectors on the floor where you have set up a real maze with masking tape.

Robotics with the ErgoBot (optional)

Ergopedia's
Arduino-compatible
robotics expansion
board



The expansion
board plugs into
the header port
on the ErgoBot



The robotics module comes with
line-following and proximity sensors.

It is easy to start learning control, logic and programming concepts.

The optional expansion board (Arduino-compatible) allows full programming access to the ErgoBot's drive motors and sensors. Students can add their own sensors and program within a simple USB interface. Imagination is the only limit to this versatile and easy to use robotics platform that allows you to get right in and teach concepts such as control, logic, and programming without time-consuming construction.

- An exceptional, powerful, and easy-to-use robotics platform!
- Programmable in Arduino-C using any development environment.
- Full access to the ErgoBot's internal motors and sensors.
- Proximity and line-following sensor boards are included.
- Headers fit standard Arduino shield components making the ErgoBot platform easily expandable with a wide range of Arduino-compatible components and software.



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Compatible Browsers

The interactive labs which work with the ErgoBot are compatible with all recent versions of **Safari**, **Chrome**, and **Firefox** browsers.

The ErgoBot interactive labs do not work in Internet Explorer or Opera (as of July 2014) because Internet Explorer and Opera do not support the HTML5 audio protocol. We suggest installing the free version of either Firefox or Chrome as the default web browser.

Limited Warranty

The ErgoBot is warranted for one year against defects in materials and workmanship. This warranty includes electrical and mechanical defects arising from normal use but does not include damage from misuse or incompatibility with external software or hardware not supplied by Ergopedia. To obtain warranty coverage, return the ErgoBot(s) to Ergopedia at the above address along with a written explanation of the defect and a return address, telephone number, and email address. Ergopedia reserves the right to evaluate the validity of all warranty claims and repair or replace items found to be defective. New or repaired items will be shipped back to the user within 90 days with ground shipping charges prepaid by Ergopedia.