Wink & Ringo Comparison

Two closely related robots...

Thank you for your interest in the Wink and Ringo robots. The two robots are closely related. This guide will help you better choose between them for your application.

The Wink Project

Wink was created around a set of free and open source lesson plans. The lessons allow the user or students to get straight into doing something interesting with the robot. We skip over the dry programming theory and continually work toward making the robot do something fun. Along the way we introduce the core concepts of the C language, which are also applicable to further learning in other languages such as Python and Java.

The lessons are written with classroom and workshop sessions in mind, though they can certainly be used by kids (and grown ups!) at home. Even if the teacher is unfamiliar with code, the lessons are easy to pick up and follow.

Wink is a perfect platform for anyone who has no experience with programming or robotics. We've tried to introduce the concepts in a fun way that is easy to understand. Our aim is to remove the intimidation factor that comes with learning a written programming language.

The lessons are split into three skill levels. The first five lessons are Skill Level 1. With guidance from a parent or teacher, kids as young as 5 years old can make the eyes change color and control the motors. By age 8, most students should be okay on their own with Level 1, though they may need some guidance to spot common errors. The function names are case sensitive and every new programmer tends to forget semi colons.

Skill Level 2 and 3 lessons will be understood by students in late elementary school and middle school.

If you're looking to introduce kids (or yourself) anywhere in the elementary or middle school range to written code and robotics, Wink will likely be your best option.

As for Wink's actual hardware, we designed the robot to be as simple and low cost as possible while still being able to do common entry level robotics tasks. We included basic sensors and "personality potential" to make him fun to learn with. Wink can perform light seeking, barrier detection and avoidance, line following, drag racing (yes, drag racing), as well as plenty of other things we haven't though of. As the student learns to code they will be inspired to customize the examples and write their own code to do fun things on their own.

Wink is optionally available with a TV remote control IR receiver and an IR remote control. With this upgrade the robot can be controlled with the remote control. Several Wink robots can also send data between each other easily by modulating their IR headlight to send data and use the IR receivers to receive the data. We have simple functions that allow for this communication.

Wink and Ringo robots use the same IR protocol and remotes, so you can mix both robot types in a swarm group.

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The Ringo Project

Ringo was our first robot. We determined how much mass could be comfortably hauled around by the little pager motors, then added as many sensors and smarts as possible within this constraint.

The idea behind Ringo is to give the user a ton of sensors and outputs in a fun package that can then theoretically be used to enable all kinds of interesting behaviors. We get the user started with some fun example behaviors then encourage them to take it from there.

Ringo is ideal for anyone who has a bit of code experience and enjoys making robots do interesting things. Ringo can also be used by people who have no coding experience. He comes with a 67 page PDF guide book that explains and gives examples of how to write code to control all of his parts. As he is basically an Arduino UNO on a custom board and is programmed using the Arduino IDE environment. He is just as easy to learn as any other Arduino project (that is to say, pretty easy).

Ringo would be right at home with middle school, high school, and university level classes, as well as the hobbyist robot hacker. Ringo could certainly be used with younger kids for basic functions. We are presently working to write “wrapper” functions to some of the more complex navigation functions to make them easy to use for more entry level programmers. If an instructor had a bit of coding or Arduino experience, writing these functions on your own is easy (and some instructors have done this - we’re building these new functions based on their excellent feedback and examples).

Ringo’s primary extras (beyond what Wink offers) include the addition of an accelerometer and gyroscope, which allows for inertial navigation. You can use these sensors to drive in straight lines and specific arcs. They can be used to determine if the robot has been bumped (and from which direction), rotate a specific number of degrees, or determine how far the robot has traveled from its starting position. Ringo also includes improved light sensors, a piezo speaker that can make different tones, and more RGB LED lights. Have a look at the table below for more specific comparisons.

Common between the robots...

Both robots are programmed using the popular Arduino IDE (which is free and open source). Both robots use the same programming adapter which is used to load code onto the robot. Uploading new code can be done at any time as the programmers automatically reset the processor prior to loading new code. The robots can be re-programmed over and over. Programmers are included with each robot purchase. Both robots include a rechargeable battery with a run time of 2 to 3 hours. The robots include an automatic charging system right onboard. Any time they are plugged into the programming adapter they automatically begin charging and automatically stop charging when full. A charging indicator shows that charging is in progress. Because they charge whenever plugged in, as the students edit and play with code, the robot is always being charged along the way so it is rare that the robots ever run low of power, even during long sessions.

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General Hardware Comparison...

	Wink Robot	Ringo Robot
Accelerometer & Gyroscope	None	3-Axis Accelerometer 3-Axis Gyroscope These sensors allow the robot to do inertial navigation.
Colored Lights	Two - Both Eyes	Six - Both Eyes, Body Top, Body Tail, Underside Tail, Underside Front
Sound	Single frequency buzzer. Creates single tone. Useful for simple beeps and alerts.	Multi frequency piezo. Can be used to create tones of different pitches, buggy happy and sad sounds, etc.
Ambient Light Sensor Type	Basic Phototransistors. These are lower cost and work well in normal room lighting. They are great for simple comparison for light seeking, etc. They can see if room lights are turned on, etc.	PIN Diodes with logarithmic amplifier. These are more accurate and work over a wide range from near total dark to near direct sunlight.
Ambient Light Sensor Locations	Three near nose. One points straight ahead, and a left/right are angled outward at 30 degrees to measure differential light - useful for light seeking.	Three, angled 120 degrees apart, with 60 degree half-angles on each. This effectively allows 360 degree light sensing. Two are up front at the eyes, each angled 60 degrees outward, and one at the tail pointing to the rear. This allows rear light sensing.
Bottom Line/ Edge Sensors	4 Sensors in an array across the underside of the nose. They allow for higher speed line following. This front arrangement is actually better than the Ringo arrangement for line following.	3 Sensors - one under each front “antenna” and one under the tail. This allows basic line following/edge detection, and the rear sensor allows the robot to sense a line or edge when reversing direction.
Barrier Detection	Barrier detection is possible using the front facing IR headlight and ambient light sensors to see light reflected from object.	Barrier detection is possible using the front facing IR LED and ambient “eye” light sensors to see light reflected from object.
Ninja Skills	Wink is FAST. You’ll be amazed how fast he moves on the tips of the pager motors. His low mass makes him very zippy. Each motor can go forward and reverse independently at speeds ranging from 0 to 255.	Ringo is juust a bit slower than Wink but not by much, due to his slightly larger size and mass. Each motor can go forward and reverse independently at speeds ranging from 0 to 255.

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Wireless Hardware Comparison...

	Wink Robot	Ringo Robot
IR Data Sending	IR Data can be sent via the IR headlight at the front of the robot. Packets of 1 to 20 bytes can be sent using existing function.	IR Data can be sent using 3 different IR senders, angled 120 degrees apart, allowing 360 degree sending. Each sender can be independently enabled. One is on the nose, and the other two are angled outward toward the rear. Packets of 1 to 20 bytes can be sent using existing function.
IR Data Reception	Optional. Robots purchased without the IR option will not have this sensor populated. Robots purchased with the IR upgrade will have a 38kHz IR receiver installed before shipping. This allows them to receive data from the IR remote, other robots, or anything else that can send IR data.	A 38kHz IR remote control is installed on all Ringo robots. This allows them to receive data from the IR remote, other robots, or anything else that can send IR data.
Remote Control	IR remote control is optional. The remote is included with robots purchased with the IR upgrade option.	IR remote control is included standard with all Ringo robots.