

Lego Mindstorms EV3 – Infrared (IR) Sensors

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EV3 Infrared Sensor and Beacon



- ✓ Detects proximity to the robot and reads signals emitted by the EV3 Infrared Beacon
- ✓ Proximity measurement of approximately 50-70 cm
- ✓ Working distance from the beacon of up to two meters

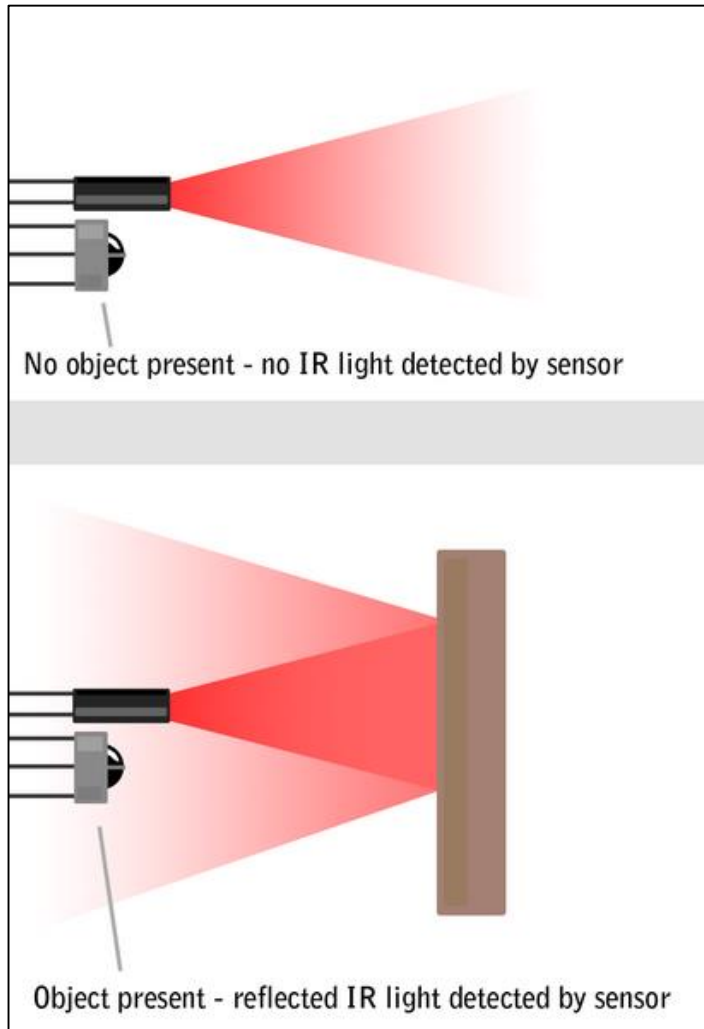


- ✓ Emits an infrared signal which the sensor can track
- ✓ Can also be used as a remote control for the EV3 brick through signals sent to the infrared sensor
- ✓ Requires two AAA batteries

Can create remotely-controlled robots, navigate obstacle courses and learn how infrared technology is used



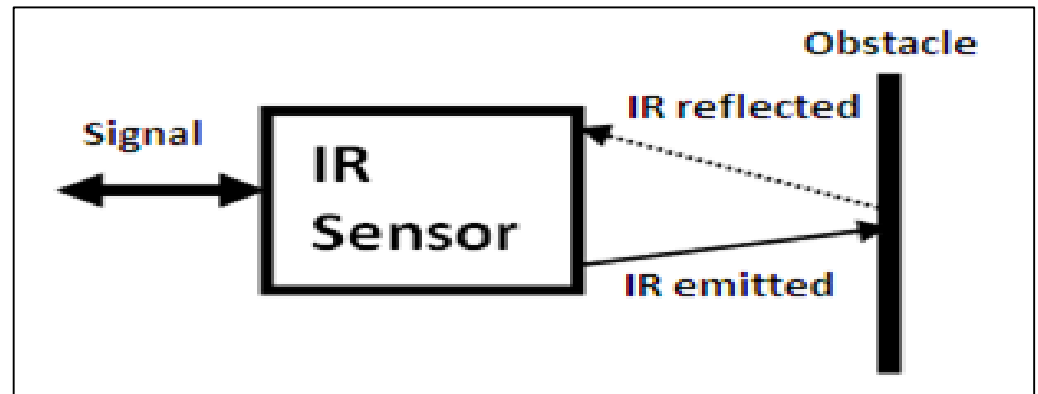
Infrared Sensor - Principles of Operation



An LED which produces light at the same wavelength as what the sensor is looking for.

Measure the intensity of the received light which bounces off the object

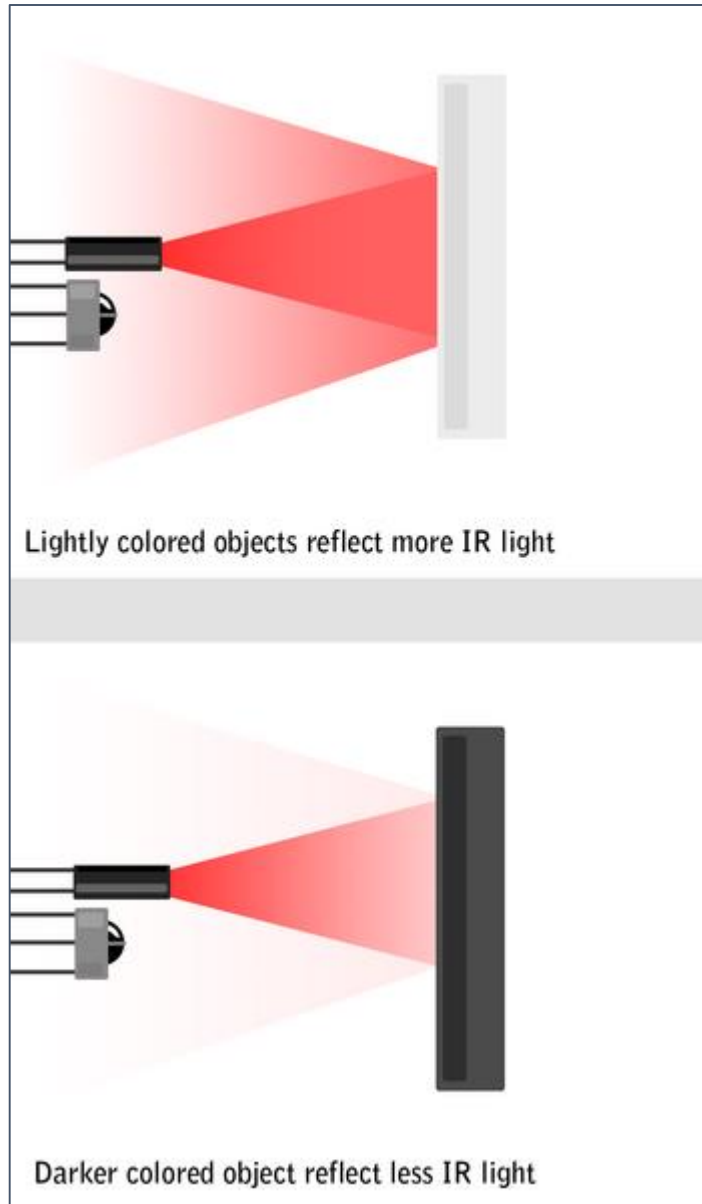
Detect presence of object using a threshold



Reference: <http://education.rec.ri.cmu.edu/content/electronics/boe/>



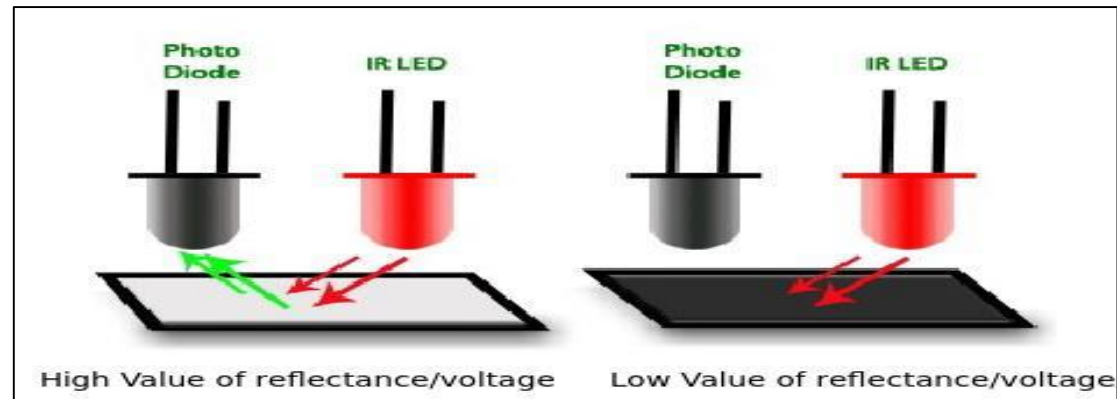
Infrared Sensor - Detecting Brightness



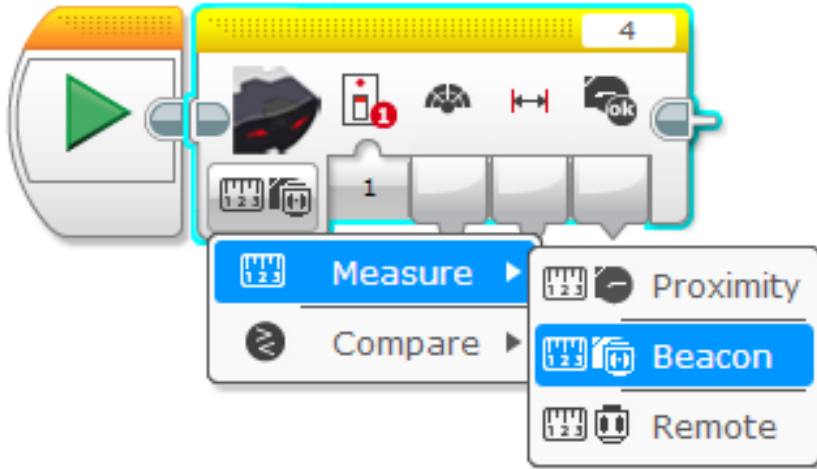
Sensor works by looking for reflected light

Sensor returns a value indicating the intensity of reflected light.

Sensor can then be used to measure how "bright" the object is. This is useful for tasks like line tracking



EV3 Infrared Sensor – Three Modes



The Infrared Sensor block can be found in the yellow sensor tab

Proximity Mode

Returns undefined unit type called proximity (not inches or centimeters)

Beacon Mode

Returns heading (angle) and distance to beacon.
Heading measurement is not in degrees.

Remote Mode

Returns which button is pressed on the remote



Activities on EV3 Infrared Sensor

1. Test how accurate the Infrared Sensor is for measuring distances from obstacles
2. Test how accurate the Infrared Sensor is for black line following
3. Create a remote control for your mobile robot that does a different action based on which button you press on the Remote
4. Create a mobile robot which should move to wherever the Beacon is using proximity and heading

