QRD1114 IR emitted / Phototransistor

Last, but not least, is the QRD1114. The QRD1114 is actually 2 components, an IR transmitter, and a phototransistor, held together in one package. This, like the GP2Y0A21YK, works by shining an IR light and seeing how much of it bounces back. An object that is closer will bounce back more light than one far away. The QRD1114 is only able to sense objects between 0 and 3cm away. On the Arduino, the read value will be in between 600 and 1024.

Hooking it up

The QRD1114 is a little more complicated to hook up than the other two, but that is because this is actually just two raw components. But… it only requires two resistors, (200-200ohm and a 4.7k – 5.6k ohm) to get it up and running. See the illustration on the right for exact wiring. The 4.7k – 5.6k resistor is a pull-up resistor, and changing this will change the values read by the Arduino, but can be used to make it more or less sensitive.

What it is good/bad for

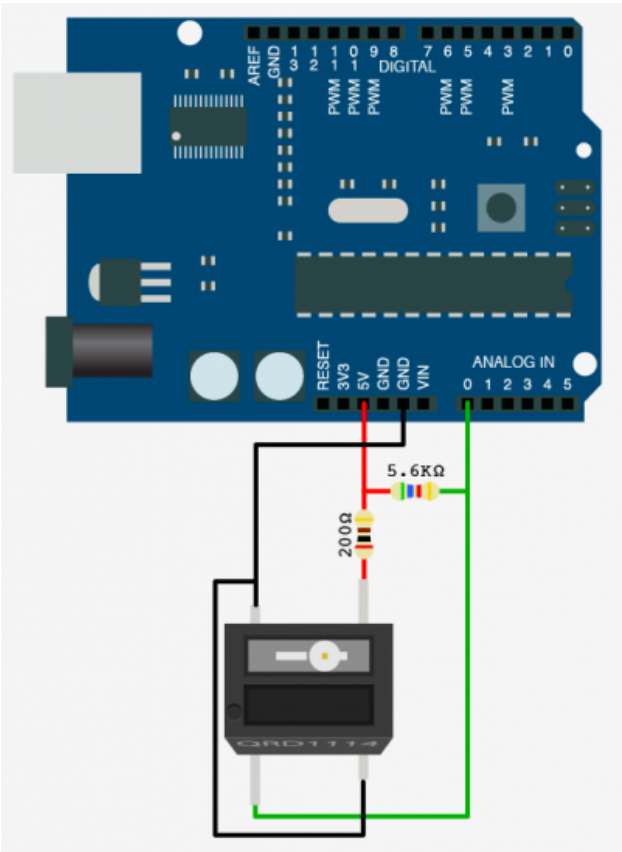
Like the Sharp sensor, this is not intended for use in determining exact distance, but for checking the proximity of objects under 3cm away. This sensor can also be used to detect white vs black surfaces because a white surface will reflect more light than a black surface resulting in a higher reading. Because of this, an array of these can be used for line detection and following.

I have quite successfully used this sensor for detecting when an object passes over a track to trigger an event. In fact, it is so fast at this detection, that properly setup, an object the size of your finger could be detected passing over it at about 10 times the speed you can flick your finger.

Because the sensor component simply measures IR intensity and is unaware of the light's source, it is susceptible to false positives caused by outside sources that put off IR such as camera flashes, lamps, and even the sun. Just make sure you consider your environment before you use this as a mission critical component.

Other options

If you are looking at detecting lines alone, a better choice might be the QRE1113 specifically designed for line sensing. If you are looking at sensing when an object passes by, and the object is small enough, you might also consider Photo Interrupter. These are great for coin drop detection etc.



Code

The code for any of these sensors is incredibly simple, and at the core, is exactly the same. All this does is read value on analog pin 0 and output it via the serial terminal. This way you can see the values change as you put your hand in front of it. I added a small delay so that the output is a bit slower and easier to read. But this also slows the reaction speed. In your project, you will want to remove the delay for best results.

Copy Code

```
int sensorPin = 0; //analog pin 0

void setup(){
  Serial.begin(9600);
}

void loop(){
  int val = analogRead(sensorPin);
  Serial.println(val);

  //just to slow down the output - remove if trying to catch an object passing by
  delay(100);

}
```


Extending this

Just because these sensors are designed to check proximity, don't let your imagination be limited to that. Obviously you could easily make a digital tripwire with a few of these, but… The LV-EZ0 can accurately sense distance, and you can ascertain time passed with your Arduino, so you can also find speed of an object. In fact I have used a device that used 2 IR reflectance sensors and could track a marble at 80+ MPH passing by just by knowing the time and exact distance between them.

These are very simple devices, but don't let that limit you to simple ideas. What about a jacket that alerts you when someone approaches behind you? Or dog door that only opens when the dog is near. I don't know, and we're not here to give you the idea, just supply the know-how. So make something crazy, and we'll see you next week.

We need your help

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