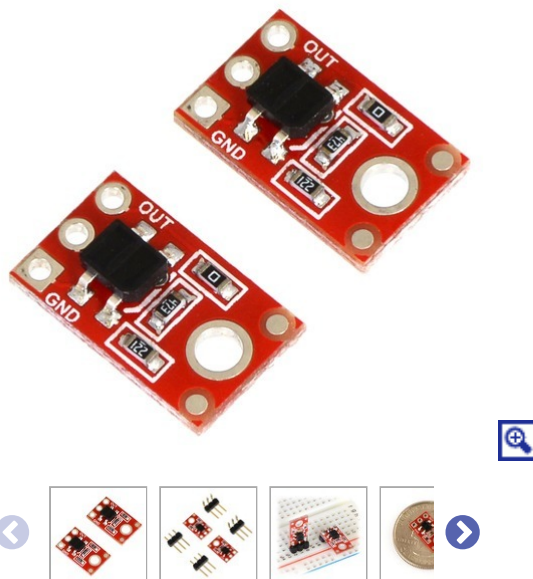


## QTR-1A Reflectance Sensor (2-Pack)



Pololu item #: 2458 **1219** in stock

Price break	Unit price (US\$)
1	4.25
5	3.75
25	3.35
100	2.99

Quantity:

Add to cart

**backorders** allowed

Add to wish list

The QTR-1A reflectance sensor carries a single infrared LED and phototransistor pair in an inexpensive, tiny 0.5" x 0.3" module that can be mounted almost anywhere and is great for edge detection and line following. **The reflectance measurement is output as an analog voltage.** This sensor is sold in packs of **two** units.

[Description](#) [Specs \(2\)](#) [Pictures \(8\)](#) [Resources \(8\)](#) [FAQs \(1\)](#) [On the blog \(1\)](#)

**Note:** The QTR-1A reflectance sensor requires an analog input to take readings. The similar [QTR-1RC reflectance sensor](#) is available with a digital I/O-compatible output.

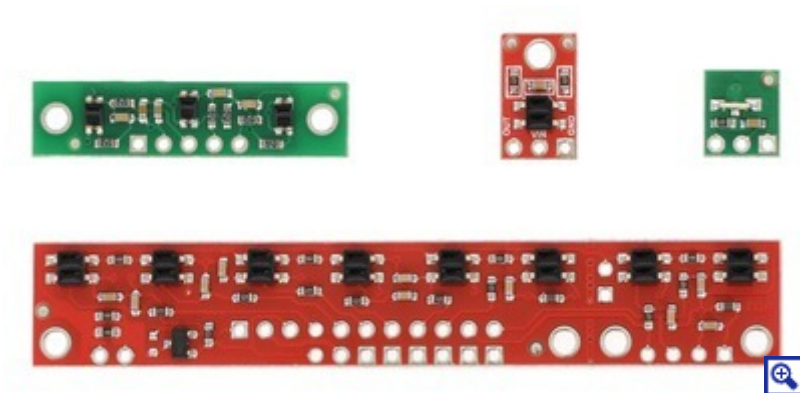
## Functional Description

The Pololu QTR-1A reflectance sensor carries a single infrared LED and phototransistor pair. The phototransistor is connected to a pull-up resistor to form a voltage divider that produces an analog voltage output between 0 V and  $V_{IN}$  (which is typically 5 V) as a function of the reflected IR. Lower output voltage is an indication of greater reflection.

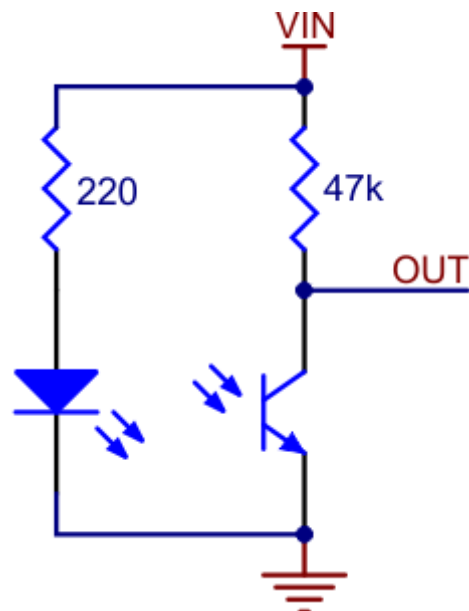
The LED current-limiting resistor is set to deliver approximately 17 mA to the LED when  $V_{IN}$  is 5 V. The current requirement can be met by some microcontroller I/O lines, allowing the sensor to be powered up and down through an I/O line to conserve power.

This sensor was designed to be used with the board parallel to the surface being sensed. Because of its small size, multiple units can easily be arranged to fit various applications such as line sensing and proximity/edge detection.

For a line sensor with eight of these units arranged in a row, please see the [QTR-8A reflectance sensor array](#); for a similar array of three slightly different sensor components, see the [QTR-3A](#). For a smaller sensor with longer range, and intended for use with the board perpendicular to the surface, please see the [QTR-L-1A reflectance sensor](#).

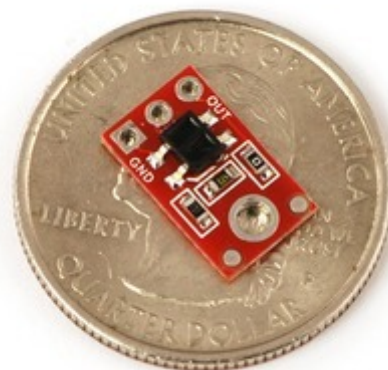


**QTR sensor size comparison. Clockwise from top left: QTR-3RC, QTR-1RC, QTR-L-1RC, QTR-8RC.**



## Specifications

- Dimensions: 0.3" x 0.5" x 0.1" (without optional header pins installed)
- Operating voltage: 5.0 V
- Supply current: 17 mA
- Output format: analog voltage
- Output voltage range: 0 to supplied voltage
- Optimal sensing distance: 0.125" (3 mm)
- Maximum recommended sensing distance: 0.25" (6 mm)
- Weight without header pins: 0.008 oz (0.2 g)

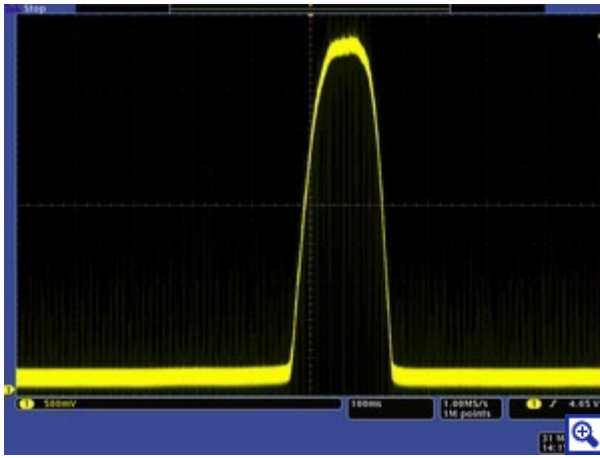


## Interfacing with the QTR-1A Output

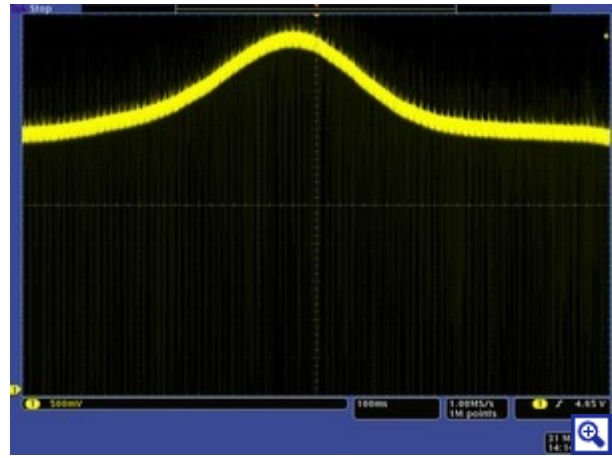
There are several ways you can interface with the QTR-1A output:

- Use a microcontroller's analog-to-digital converter (ADC) to measure the voltage.
- Use a comparator with an adjustable threshold to convert the analog voltage into a digital (i.e. black/white) signal that can be read by the digital I/O line of a microcontroller.
- Connect the output directly to the digital I/O line of a microcontroller and rely upon its internal comparator.

This last method will work if you are able to get high reflectance from your white surface as depicted in the left image, but will probably fail if you have a lower-reflectance signal profile like the one on the right.



QTR-1A output 1/8" away from a spinning white disk with a black line on it.

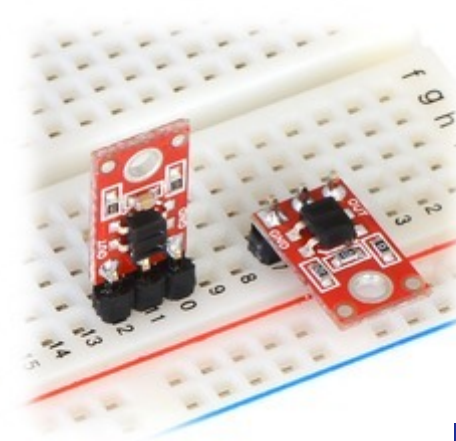
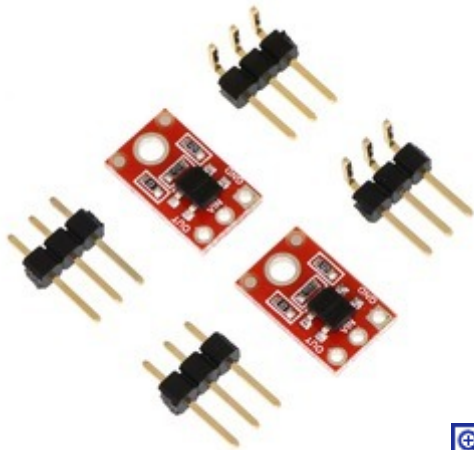


QTR-1A output 3/8" away from a spinning white disk with a black line on it.

Our [Pololu AVR library](#) provides functions that make it easy to use these sensors with our [Orangutan robot controllers](#); please see the [QTR Reflectance Sensors section](#) of our library command reference for more information. We also have a [Arduino library](#) for these sensors.

## Included Components

This module has a single mounting hole intended for a #2 screw (not included); if this mounting hole is not needed, this portion of the PCB can be ground off to make the unit even smaller. Each pack of two reflectance sensors includes sets of [straight male header strips](#) and [right-angle male header strips](#), which allow you to mount them in the orientation of your choice (note: the header pins might ship as 1×6 strips that you can break into two 1×3 pieces). You can also solder wires, such as ribbon cable, directly to the pads for the most compact installation.



People often buy this product together with:



[QTR-1RC Reflectance Sensor \(2-Pack\)](#)



[QTR-8A Reflectance Sensor Array](#)

[QTR-3A Reflectance Sensor Array](#)



## Related products



[QTR-L-1A Reflectance Sensor \(2-Pack\)](#)



[QTR-L-1RC Reflectance Sensor \(2-Pack\)](#)



[QTR-8A Reflectance Sensor Array](#)



[QTR-8RC Reflectance Sensor Array](#)



[QTR-3A Reflectance Sensor Array](#)



[QTR-1RC Reflectance Sensor \(2-Pack\)](#)



[QTR-3RC Reflectance Sensor Array](#)



[VL6180X Time-of-Flight Distance Sensor Carrier with Voltage Regulator, 60cm max](#)



[Sharp GP2Y0A51SK0F Analog Distance Sensor 2-15cm](#)



[Pololu 38 kHz IR Proximity Sensor, Fixed Gain, Low Brightness](#)



[0.100" \(2.54 mm\) Breakaway Male Header: 1x40-Pin, Right Angle](#)



[Pololu Carrier with Sharp GP2Y0D815Z0F Digital Distance Sensor 15cm](#)



[Pololu 38 kHz IR Proximity Sensor, Fixed Gain, High Brightness](#)



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## Related categories



[Pololu OTR Reflectance Sensors](#)



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