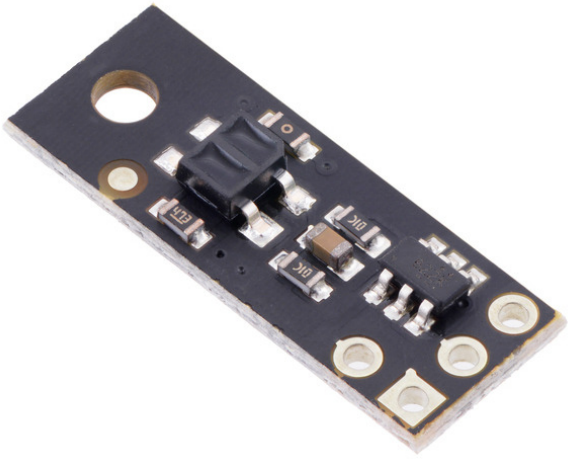
QTR-MD-01A Reflectance Sensor Pololu # 4241

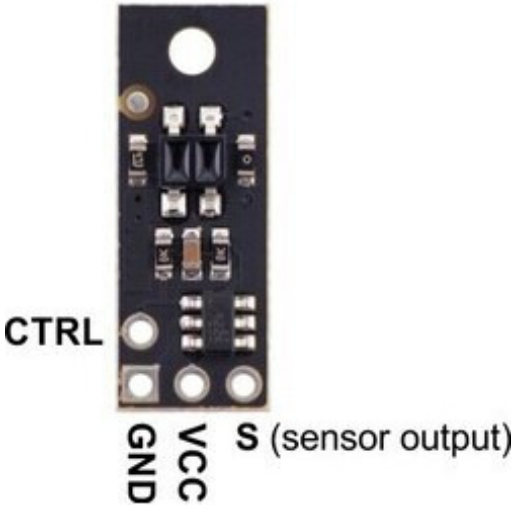
QTR-MD-01A Reflectance Sensor: 1-Channel, 7.5mm Wide, Analog Output



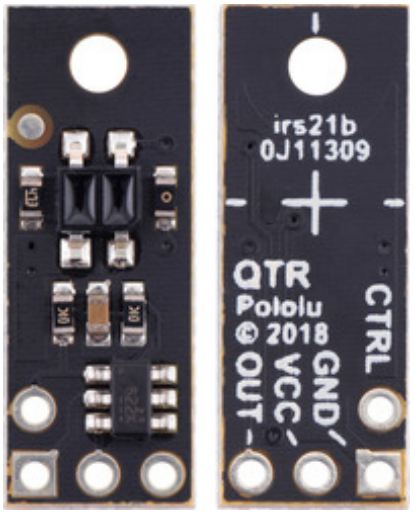
sensors	size (mm)	output	max current		optimal range
			LED	board	
1	7.5 × 20.0	analog	30 mA	32 mA	5 mm

This IR LED/phototransistor pair is great for precisely identifying changes in reflectance (like line detection). It operates from 2.9 V to 5.5 V and offers dimmable brightness control independent of the supply voltage. In general, the closer the object, the higher the contrast between light and dark readings, but high-reflectance objects are generally detectable out to around **30 mm**. This version features a traditional-style **QTR** sensor without lenses.

Details for item #4241



Pinout diagram of the QTR-MD-01A Reflectance Sensor Array.



QTR-MD-01A Reflectance Sensor, front and back views.

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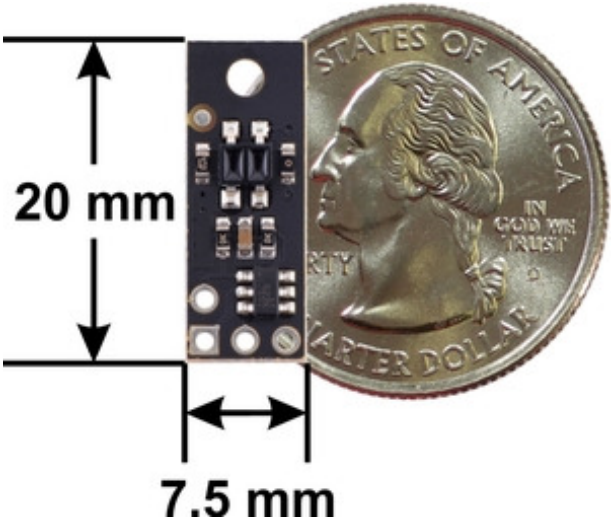
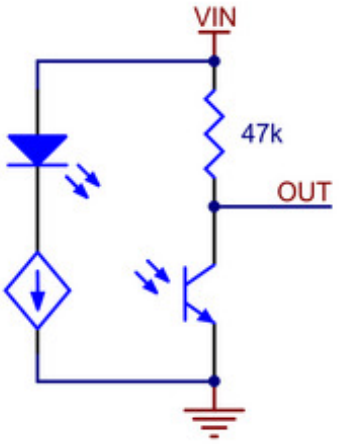
Specifications

- Dimensions: 7.5 × 20.0 × 2.5 mm (see the **dimension diagram** (1MB pdf) for more details)
- Operating voltage: 2.9 V to 5.5 V
- Sensor type: QTR
- Sensor count: 1
- Full-brightness LED current: 30 mA (independent of supply voltage)
- Max board current: 32 mA
- Output format: analog voltage (0 V to VCC)
- Optimal sensing distance: 5 mm
- Maximum recommended sensing distance: 30 mm
- Weight: 0.35 g



QTR-MD-01A Reflectance Sensor dimensions.



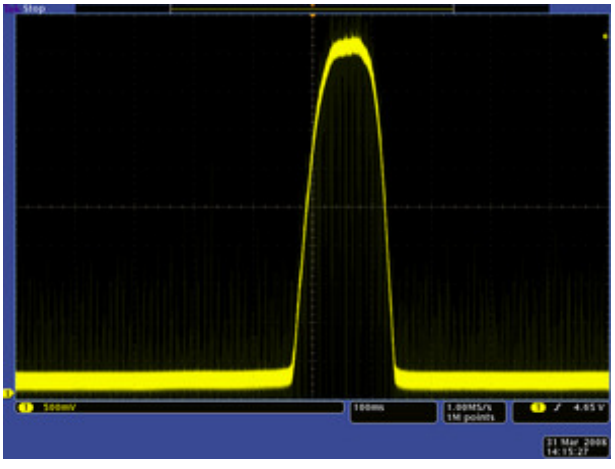
Schematic diagrams of individual QTR sensor channels for A version

Interfacing with the outputs of the A versions

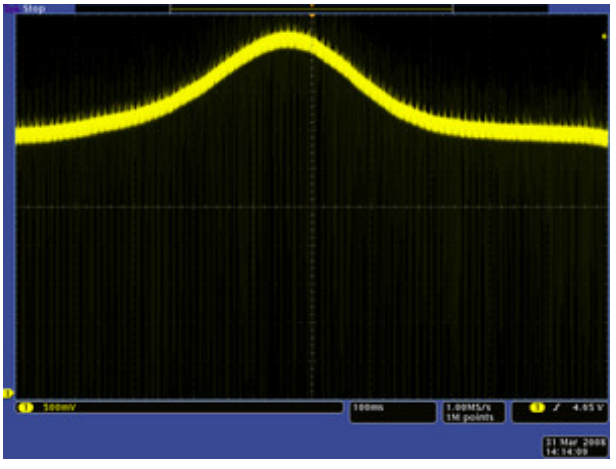
Each sensor on the A versions outputs its reflectance measurement as an analog voltage that can range from 0 V when the reflectance is very strong to VCC when the reflectance is very weak. There are several ways you can interface with the analog output:

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

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.

Emitter control

These reflectance sensor arrays maintain a constant current through their IR emitters, keeping the emitters' brightness constant, independent of the supply voltage (2.9 V to 5.5 V). The emitters can be controlled with the board's CTRL pins, and the details of the control depends on the array size and density:

MSOE application - leave the Control pin floating