

Sharp GP2Y0A21YK0F Analog Distance Sensor 10-80cm

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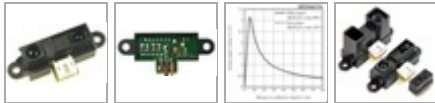
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The GP2Y0A21 Sharp distance sensor is a great way to add obstacle avoidance or motion sensing to your robot or any other project. With a detection range of 4" to 32" and an analog voltage indicating the distance, this sensor is very easy to use.

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Description Specifications (0) **Pictures (3)** **Resources (2)** FAQs (0)

Overview

The Sharp distance sensors are a popular choice for many projects that require accurate distance measurements. This IR sensor is more economical than sonar rangefinders, yet it provides much better performance than other IR alternatives. Interfacing to most microcontrollers is straightforward: the single analog output can be connected to an analog-to-digital converter for taking distance measurements, or the output can be connected to a comparator for threshold detection. The detection range of this version is approximately 10 cm to 80 cm (4" to 32"); a plot of distance versus output voltage is shown below.

The GP2Y0A21 uses a 3-pin JST connector that connects to our [3-pin JST cable for Sharp distance sensors](#) (not included) as shown in the upper picture on the right. It is also simple to solder three wires to the sensor where the connector pins are mounted (see the lower picture to the right). When looking at the back, the three connections from left to right are power, ground, and the output signal.



Feature summary

- operating voltage: 4.5 V to 5.5 V
- average current consumption: 30 mA (typical)
- distance measuring range: 10 cm to 80 cm (4" to 32")
- output type: analog voltage
- output voltage differential over distance range: 1.9 V (typical)
- response time: 38 ± 10 ms
- package size: 29.5×13.0×13.5 mm (1.16×0.5×0.53")



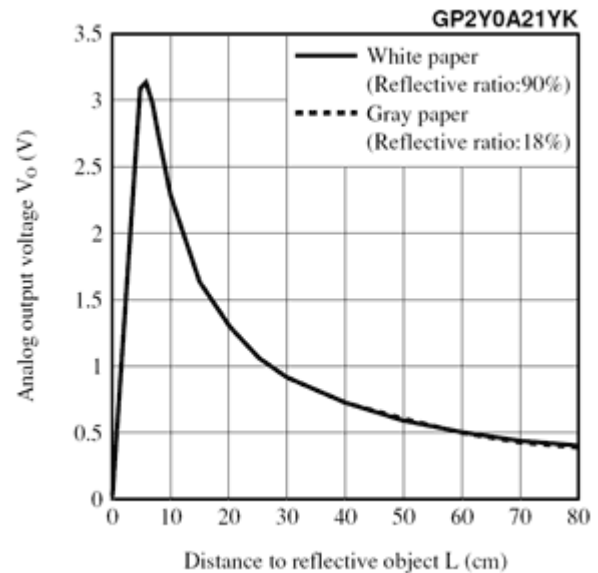
- weight: 3.5 g (0.12 oz)

Linearizing the output

The relationship between the sensor's output voltage and the inverse of the measured distance is approximately linear over the sensor's usable range. The [GP2Y0A21YK data sheet](#) (374k pdf) contains a plot of analog output voltage as a function of the inverse of distance to a reflective object. You can use this plot to convert the sensor output voltage to an approximate distance by constructing a best-fit line that relates the inverse of the output voltage (V) to distance (cm). In its simplest form, the linearizing equation can be that the distance to the reflective object is approximately equal to a constant scale factor ($\sim 27 \text{ V} \cdot \text{cm}$) divided by the sensor's output voltage. Adding a constant distance offset and modifying the scale factor can improve the fit of this line.

Alternative Sharp Distance Sensors

We carry two other versions of this sensor as well: the longer-range [Sharp GP2Y0A02YK0F analog distance sensor](#) (20 – 150 cm) and the shorter-range [Sharp GP2D120XJ00F analog distance sensor](#) (4 – 30 cm). These analog distance sensors all have identical pin-outs and very similar packages, making it easy to swap one version for another should your application requirements change. We also sell a [digital Sharp distance sensor](#), which has a very low minimum detection distance, quicker response time, lower current draw, and a much smaller package.



A variety of Sharp distance sensors.

Note: The GP2Y0A21YK0F model is a lead-free (RoHS-compliant) version of the Sharp GP2Y0A21 Distance Sensor. The manufacturer recommends you insert a bypass capacitor of 10 uF or more between Vcc and GND near this sensor to stabilize your power supply line.

People often buy this product together with:



[3-Pin Female JST PH-Style Cable for Sharp Distance Sensors \(30cm\)](#)



[Pololu Carrier with Sharp GP2Y0D810Z0F Digital Distance Sensor 10cm](#)



[Tamiya 70144 Ball Caster Kit \(2 casters\)](#)