RB-Pol-157

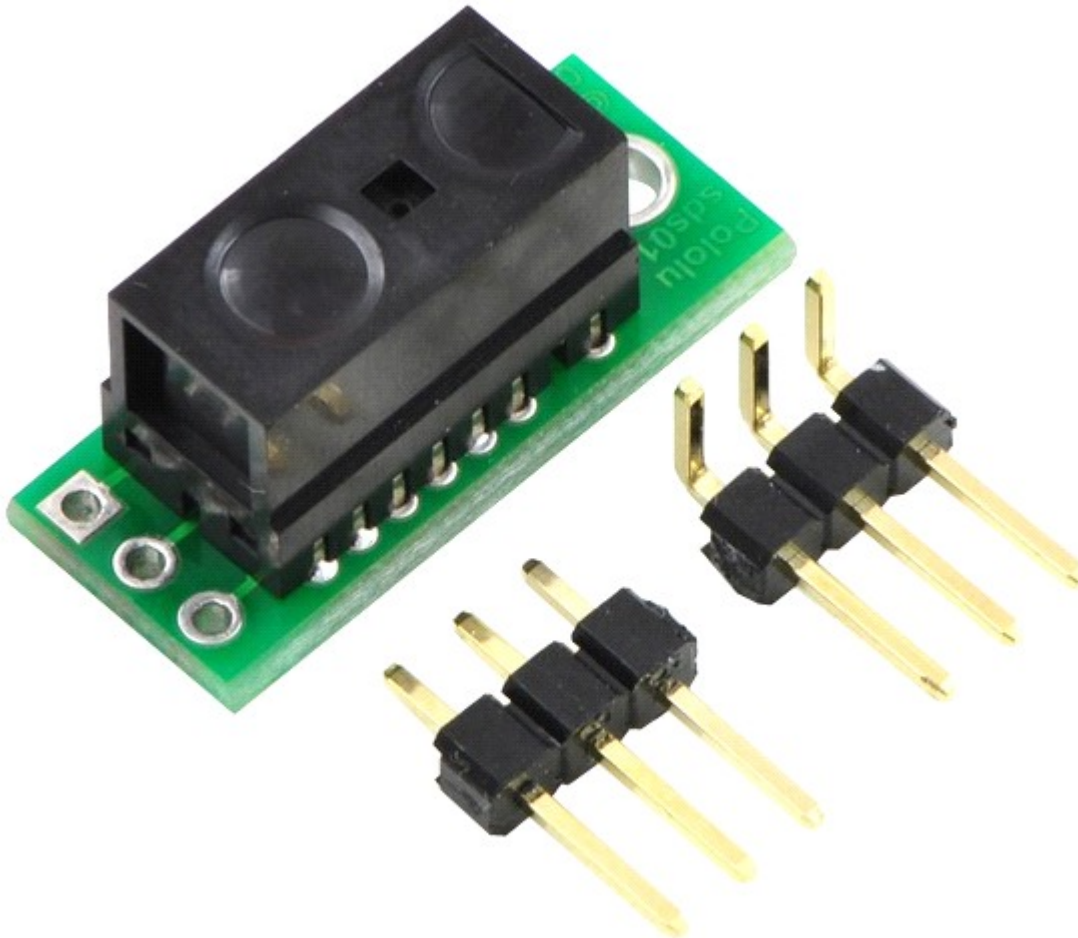**Sharp GP2Y0D810Z0F IR 2 - 10cm Range Sensor**

Overview

The GP2Y0D805 and GP2Y0D810 are Sharp's smallest and fastest distance sensors, and our tiny carrier board for these sensors includes all of the external components required to make them work. With a sample rate of almost 400 Hz and a sensing distance to 5 cm (GP2Y0D805) or 10 cm (GP2Y0D810), this sensor provides an attractive alternative to shorter-range LED-phototransistor reflectance pairs and longer-range but slower sensors such as the Sharp GP2Y0A21YK0F analog distance sensor. The output, Vo, is driven low when the sensor detects an object; otherwise, the output is high.

The GP2Y0D805Z0F detects objects between 0.5 cm and 5 cm away from the sensor face, and the GP2Y0D810Z0F detects objects between 2 cm and 10.25 cm away. There are a few millimeters of hysteresis around the maximum range threshold and no hysteresis at the minimum range threshold. Note that these sensors will only tell you if there is an object within the detection range along their lines of sight; they will not tell you how far away the object is.

Some example applications include:

- break-beam sensor or photogate alternative

- non-contact bumper or obstacle detector

- a counter or timer of objects as they pass by

Using the Sensor

The Pololu carrier board lets you interface with the GP2Y0D805 or GP2Y0D810 sensor using a three-pin 0.1" connector, such as the included 3×1 straight male header strip and 3×1 right-angle male header strip. You can connect to these pins with a servo cable or with a custom-made cable using pre-crimped wires and a 3×1 crimp connector housing.

The square pad is ground, the middle pad is VIN (2.7 – 6.2 V), and the remaining pad is the sensor output, OUT. Depending on your power source, you might notice an increase in performance by placing a large (>10 uF) capacitor between power and ground somewhere near the sensor.

A red LED on the back of the PCB lights when the output is low, indicating that the sensor is detecting something. If so desired, you can disable this LED by cutting the trace between it and the OUT pin where it is marked on the silkscreen or by desoldering the LED.

The GP2Y0D805 and GP2Y0D810 have an optional enable input that can be used to put the sensor into low-power mode. The Pololu carrier board connects this input to Vcc so that the sensor is always enabled, but you can solder a wire to the pad labeled "enable" on the back of the PCB if you want control over this input. Note that you will need to cut the trace that connects the enable line to Vcc on the PCB if you want to be able to disable the sensor. This trace is marked on the silkscreen, and there is a caret that indicates where we suggest you make the cut.

The carrier board has a 0.086" mounting hole for a #2 screw. You can make the module more compact by cutting or grinding off this portion of the PCB if you do not need the mounting hole.

Feature summary

- operating voltage: 2.7 V to 6.2 V

- average current consumption: 5 mA (typical)

- distance measuring range for GP2Y0D805Z0F: 0.5 cm to 5 cm (0.2" to 2")

- distance measuring range for GP2Y0D810Z0F: 2 cm to 10 cm (0.8" to 4")

- output type: digital voltage

- steady state response time: 2.56 ms typical (3.77 ms max)

- module size: 21.6 x 8.9 x 10.4 mm (0.85" x 0.35" x 0.41")

- weight without header pins: 1.3 g (0.05 oz)

Alternative Sharp Distance Sensors

We carry three analog sharp distance sensors as well: the Sharp GP2D120XJ00F 4-30 cm, the Sharp GP2Y0A21YK0F 10-80 cm, and the Sharp GP2Y0A02YK0F 20-150 cm. These analog distance sensors have longer minimum detection distances and much lower response times than the GP2Y0D8105 and GP2Y0D810, but they can see farther and report the distance to the detected object rather than simply if an object is detected.

Note: This product comes with the GP2Y0D805Z0F or GP2Y0D810Z0F soldered into the carrier PCB. We sell the sensor modules by themselves, and we sell the carrier PCB without the sensor for those who already have the sensor or who want to solder the board together personally.