

IR Proximity Sensor

Purpose: the IR proximity sensor is useful in scenarios where you need to know if an object is within a pre-determined range of the sensor.

How it Works: the sensor is equipped with both an IR transmitting LED and IR receiving photodiode. The IR light being emitted reflects off an object and is then received into the photodiode. Adjusting the potentiometer allows you to set the range of the sensor.

PIN	NOTES
VCC	3.3 – 5V DC input*
GND	Ground
OUT	Outputs a digital signal equal to the input voltage. High (3.3 - 5V) = no reflection detected. Low (1/10 VCC) = reflection is detected within range.
Range	2 – 15 cm <i>CCW lowers detection distance; CW increases detection distance.</i>
Detection Angle	35°

*Range decreases as VCC decreases. Using 5V will allow a larger range but output voltage to microcontrollers may be higher than the acceptable limit. Ask the PSC Staff for more information.

Notes:

- When the potentiometer is rotated fully CCW, the output pin will send a constant “High” signal. Similarly, when the potentiometer is rotated fully CW, the output pin will be in a constant “Low” state. For proper object detection, you want to ensure the potentiometer is somewhere in-between.
- The light above the “output” pin will turn on/off to help indicate whether the sensor is seeing IR reflection or not.
 - On = reflection is detected within range
 - Off = no reflection detected
- When an object sits slightly outside the range set by the potentiometer, the output pin may send an unstable signal. The further clockwise you spin the potentiometer, the larger the “noise range” is. Increasing the voltage input also seems to help reduce the “noise range”.
- The photodiode is affected by ambient light, so you need to make sure the sensor is well shaded or enclosed from external light sources.
- Beware of electrostatic discharge as it could blow the LM393 comparator (the small black chip) and IR receivers.
- Adjusting (bending) the angle of the transmitter and receiver leads will greatly impact the detection distance of the sensor. If your sensor only detects over short distances, try slightly adjusting those angles for better results.
- Materials (especially reflective surfaces) mounted too close to sides of the emitter will bounce signals back. For best results create a “blinder” or something to shield the sides of the emitter.

