SN-PIR
PIR (Passive Infra-Red) Sensor

User's Manual

V1.1

December 2007

Index

1. INTRODUCTION AND OVERVIEW

The PIR (Passive Infra-Red) Sensor is a pyroelectric device that detects motion by measuring changes in the infrared levels emitted by surrounding objects. This motion can be detected by checking for a high signal on a single I/O pin. The product features include:

- Single bit output
- Small size makes it easy to conceal
- Compatible with all types of microcontrollers
- 5V till 20V operation with <100uA current draw

2. PRODUCT SPECIFICATION AND LIMITATIONS

2.1 Theory of Operation

Pyroelectric devices, such as the PIR sensor, have elements made of a crystalline material that generates an electric charge when exposed to infrared radiation. The changes in the amount of infrared striking the element change the voltages generated, which are measured by an on-board amplifier. The device contains a special filter called a Fresnel lens, which focuses the infrared signals onto the element. As the ambient infrared signals change rapidly, the on-board amplifier trips the output to indicate motion.

2.2 Pin Definitions and Ratings

Pin	Name	Function
-	GND	Connects to Ground
OUT	Output	Connects to an I/O pin set to INPUT mode (or transistor/MOSFET)
+	Vcc	Connects to Vcc (+5V to + 20V) @ ~100uA

Table 2.1

2.3 Jumper Setting

Position	Mode	Description
H	Retrigger	Output remains HIGH when sensor is retriggered repeatedly. Output is LOW when idle (not triggered).
L	Normal	Output goes HIGH then LOW when triggered. Continuous motion results in repeated HIGH/LOW pulses. Output is LOW when idle.

Note: The sensor is active high when the jumper is in either position.

Table 2.2

2.4 Calibration

The PIR Sensor requires a 'warm-up' time in order to function properly. This is due to the settling time involved in 'learning' its environment. This could be anywhere from 10-60 seconds. During this time there should be as little motion as possible in the sensors field of view. There is a variable resistor (Delay Time) on the PIR sensor to control the 'ON' delay time for the sensor. Turning the variable resistor clockwise will give longer 'ON' delay time while turning anticlockwise with reduce the 'ON' delay time.

2.5 Sensitivity

The PIR Sensor has a range of approximately 5 meters. The PIR sensor can sense object up to 120° within 1 meter range. The sensitivity can vary with environmental conditions. The sensor is designed to adjust to slowly changing conditions that would happen normally as the day progresses and the environmental conditions change, but responds by making its output high when sudden changes occur, such as when there is motion.

2.6 Recommended Operating Condition

Parameter	Symbol	Rating	Unit
Operating power supply	Vcc	+4.5V - +5.5V	V
Operating Temperature	T	-15°C - +70°C	°C

Table 2.3

3. PRODUCT LAYOUT

3.1 Product Dimensions

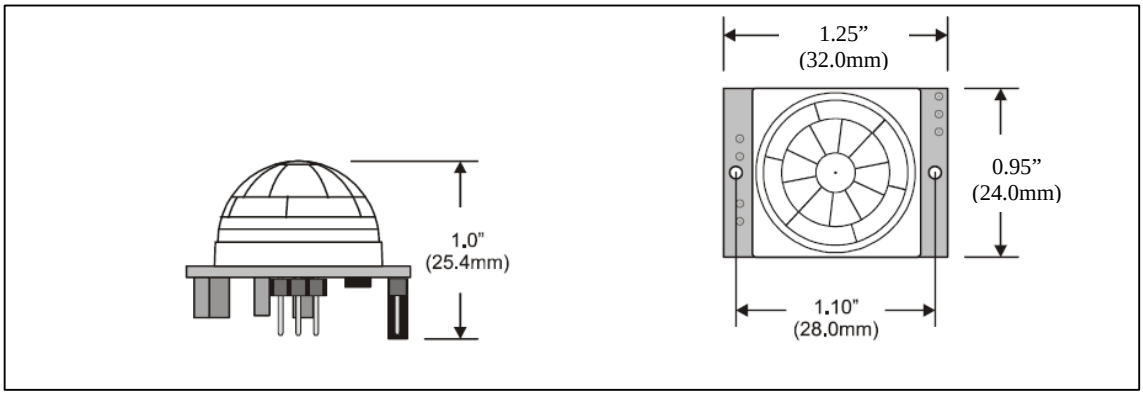

Figure 3.1

3.2 Product Layout

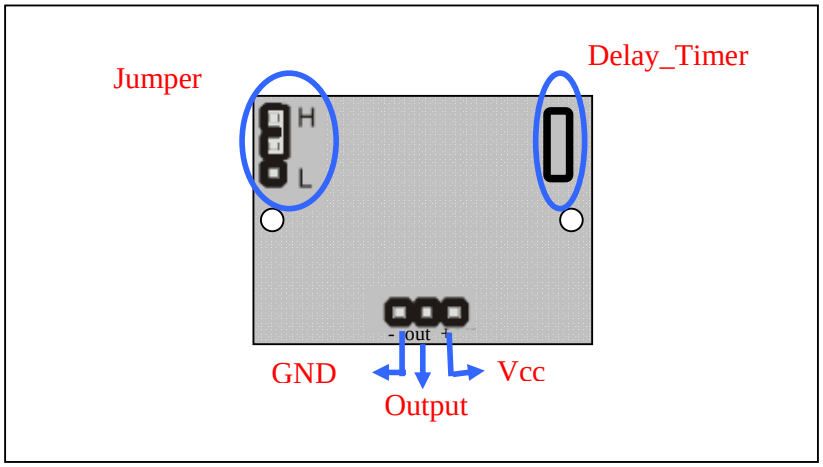

Figure 3.2

4. GETTING STARTED

4.1 Connecting and Testing

Connect the 3-pin header to your circuit so that the minus (-) pin connects to ground, the plus (+) pin connects to Vcc and the OUT pin connects to your microcontroller's I/O pin. One easy way to do this would be to use a standard servo/LCD extension cable. The unit output is high whenever there is motion detected. Please refer Appendix A for example application of PIR sensor.

5. WARRANTY

- Product warranty is valid for 6 months.
- Warranty only applies to manufacturing defect.
- Damage caused by miss-use is not covered under warranty.
- Warranty does not cover freight cost for both ways.

Prepared by
Cytron Technologies Sdn. Bhd.
19, Jalan Kebudayaan 1A,
Taman Universiti,
81300 Skudai,
Johor, Malaysia.

Tel: +607-521 3178
Fax: +607-521 1861

URL: www.cytron.com.my
Email: support@cytron.com.my
sales@cytron.com.my

Appendix A

Schematic for Cytron product, Alarm System: Motion Detector (Product code: PR14), an example application of PIR sensor.