PIR Motion Sensors

DT Workshop Equipment Reference — D&T / STEM resource for school workshops | Sensors & Modules

Photo: oomlout — CC BY-SA 2.0 — via Wikimedia Commons (PIR_Motion_Detector.jpg)

A PIR (passive infrared) motion sensor detects changes in infrared radiation from warm moving bodies, triggering an output when someone enters its range. It is the standard sensor for automatic lights, alarms and any project that reacts to presence.

Key Features

- Detection range 3-7 m typical
- 120 degree detection cone
- Adjustable sensitivity and delay time
- 3-pin connection: VCC, OUT, GND
- 3.3-5 V operation

Typical Uses in the Workshop

- Trigger lights, buzzers and cameras on movement
- Build burglar alarm models
- Automate displays when visitors approach
- Track movement for counting and logging

Safe Operation

1. Set sensitivity and delay with the trimmers
2. Mount the sensor facing the detection area
3. Wire output to the microcontroller input
4. Wait 30-60 seconds after power for warm-up
5. Test by walking across the field of view

SAFETY NOTES

- Do not use PIR as a real security system without certification
- Keep out of direct sunlight that causes false triggers
- Mount away from heaters and vents
- Check wiring polarity
- Keep the sensor dry

Maintenance & Consumables

- Wipe the lens dome clean periodically
- Check the mounting is firm
- Retest range after LED or heating changes
- Keep the sensor away from dust
- Replace failed modules from stock

Specification & Buying Notes

HC-SR501 style modules are cheap and standard. Buy modules with adjustable time and sensitivity, and a goblet lens for wider range. Note the delay makes them poor for instant-logging projects.