
Photodiode Interfacing with Arduino Uno

Objective:
Detect light intensity or changes in light using a **photodiode** and process the signal using Arduino.

Components Required:

- Arduino Uno
- Photodiode
- Resistor (e.g., 10kΩ for voltage divider)
- Breadboard & jumper wires

Circuit Overview:

- The **photodiode** is usually connected in **reverse bias** (anode to GND, cathode to resistor and analog pin).
- It forms a **voltage divider** with a resistor.
- The output voltage at the junction changes based on light intensity.

Working Principle:

- When light falls on the photodiode, it generates a small **current** proportional to light intensity.
- This current causes a **voltage drop** across the resistor, which is read by Arduino's **analog input**.
- The Arduino processes this value to measure **brightness**, detect shadows, or trigger actions.

Use Cases:

- Light level measurement
- Intrusion or shadow detection
- Optical communication projects
- Light-based counters or timers

Note:
For more sensitivity, use an **operational amplifier (OpAmp)** to amplify the photodiode signal.
