COETZER OPTICAL SYSTEMS (Pty) Ltd

Light Sensing Circuit Module

Overview

Compatible with Arduino UNO R4 WiFi or any Qwiic-enabled board, with simple I2C integration for comprehensive optical sensing.

Key Takeaways

A light sensor circuit module detects ambient light using a photoresistor (LDR) and provides analog and/or digital outputs for controlling devices or measuring light intensity.Overview

A light sensor module typically uses a photoresistor (LDR), which changes its resistance based on the light intensity: resistance decreases with more light and increases in darkness ( ). Many modules, like the LM393 light detection module, combine the LDR with a comparator to provide both analog output (AO) for continuous light measurement and digital output (DO) for threshold-based detection ( ).

Module Components
• LDR (Light Dependent Resistor): Senses light intensity and varies resistance accordingly ( ).

• LM393 Comparator: Converts the analog signal from the LDR into a clean digital ON/OFF signal based on a set threshold ( ).

• Variable Resistor (Trim Pot): Adjusts the sensitivity of the module to light levels ( ).

• Power LED: Indicates the module is powered ( ).

• Output LED: Shows the detection status; turns on or off depending on light intensity ( ).
Working Principle
• Analog Mode (AO): The module outputs a voltage proportional to the light intensity. This can be read by an analog input pin on a microcontroller like Arduino to measure brightness levels ( ).

• Digital Mode (DO): The comparator triggers a high or low signal when light crosses a set threshold. This is useful for automatic light control, such as turning on a lamp when it gets dark ( ).
Wiring Example with Arduino
• Connect VCC to 5V and GND to ground.

• Connect AO to an analog input pin (e.g., A0) to read light levels.

• Connect DO to a digital input pin if using threshold detection.

• Adjust the trim pot to set the desired light sensitivity ( ).
Applications
• Automatic night lights or street lamps

• Light intensity monitoring

• Security systems (detecting light changes)

• Robotics and IoT projects requiring ambient light detection ( )
Summary

A light sensor module is a versatile, low-cost device that can provide both analog and digital signals for light detection. Its combination of an LDR and comparator allows for precise threshold control and continuous light measurement, making it ideal for Arduino and other microcontroller projects. Adjusting the onboard potentiometer allows fine-tuning of sensitivity for different lighting conditions ( ).

Article Content

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Circuit working: The light sensor circuit along with a relay module is an electronic circuit that is designed by using LDR, diode, relay,

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