SHADOW ALARM

■ D. MOHAN KUMAR

This opto-sensitive circuit sounds an alarm whenever a shadow falls on it. So it can be used at night by shopkeepers to protect the valuables in their showrooms. A dim lighting in the room is necessary to detect the moving shadow. Unlike opto-interruption alarms based on light-dependent resistors (LDRs), it does not require an aligned light beam to illuminate the photo-sensor.

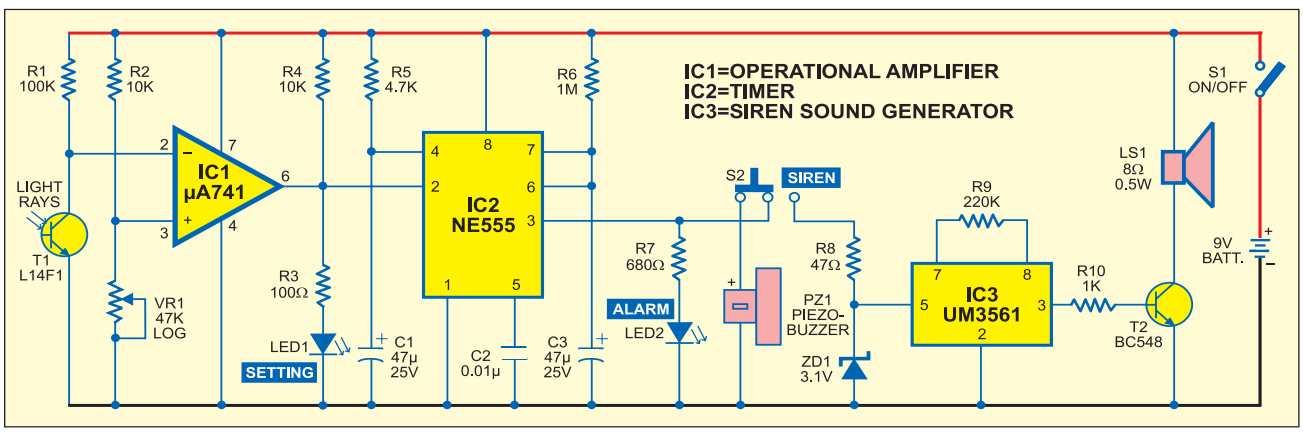
The non-inverting input of IC1 gets a controlled voltage from potential divider R2 and VR1.

In the presence of ambient light, the phototransistor conducts and the inverting input (pin 2) of IC1 gets a lower voltage than its non-inverting input (pin 3). This makes the output of IC1 high, which is indicated by the glowing of LED1.

When a shadow falls on the photo-sensor, the output of IC1 goes low. This low pulse triggers the monostable and zener diode ZD1 provide 3.1V DC to IC UM3561.

The circuit is easy to assemble as it requires only a few low-cost components. Enclose it in a cabinet with the photo-sensor inside. Drill a 5mm hole on the front panel of the cabinet to let ambient light fall on the photo-sensor.

Adjust potmeter VR1 (47k) until LED2 stops glowing and the buzzer stops beeping while LED1 glows. This is the position of VR1 to be maintained for that particular intensity of light. LED1 will continue to glow even when a shadow is detected.



The circuit is powered by a 9V PP3 battery and uses the most sensitive photo-sensor L14F1 to detect shadows. It is portable and can be used at any place that is to be monitored.

Op-amp µA741 (IC1) is used as a voltage comparator. Its inverting input is biased by the voltage obtained from the junction of 100k resistor R1 and the collector of phototransistor T1.

(IC2) designed for a delay of 51 seconds using R6 and C3. The output of IC2 is used to light up LED2 and activate the alarm.

Slide switch S2 is used to select either the buzzer or siren. When it is towards left the buzzer beeps, and when it is towards right IC UM3561 (IC3) activates to give a loud alarm simulating a police siren. Resistor R8

The circuit is now ready to use. To test it, move a paper in front of the unit. If LED2 glows along with the beep of the buzzer, it means that the photo-sensor has detected a shadow. ●