

**DESIGNING AND IMPLEMENTING AN AUTOMATED  
LIGHT- AND TIME-BASED CONTROL SYSTEM  
FOR DRAPES AND SECURITY LIGHTS**

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## ABSTRACT

The need to automate the various operations found in industries, commercial buildings, and homes continues to draw much attention to key players in the microelectronics industry. The development of an automated control system for the control of drapes and security lights and dependent upon sunlight illuminance levels and time of day is presented. At the heart of the system is a Z80 microprocessor to control the operations of a motor and an electromagnetic relay by use of an assembly language control program resident in an EPROM. The system also comprises one SRAM chip.

Depending on the intensity of sunlight and time of day, drapes will be opened or closed and security lights will be switched on or off. A cadmium sulphide (CdS) light sensor is used to collect light and the resulting photocurrent is converted to digital form by an analogue-to-digital converter (ADC) and then fed to an input/output interface chip after amplification. The Z80 microprocessor chip processes the data collected by use of a software code burnt into a UV-EPROM chip. An output digital data stream is then used to operate the motor and the electromagnetic relay.

This study was designed such that when the intensity of sunlight is below 60 lux, drapes will be closed and security lights switched ON and when the intensity is above 60 lux, drapes will be opened and security lights switched OFF. This intensity of light corresponds to the time of day around 6:45 am/pm. The results obtained were found to agree with the design. The system is designed such that it can be applied to any domestic or industrial setting and can be upgraded to accommodate more operations.

