

FACTFILE: GCE TECHNOLOGY & DESIGN

1.17 ELECTRONIC SYSTEMS: PART 6



Thyristor

Learning Outcomes

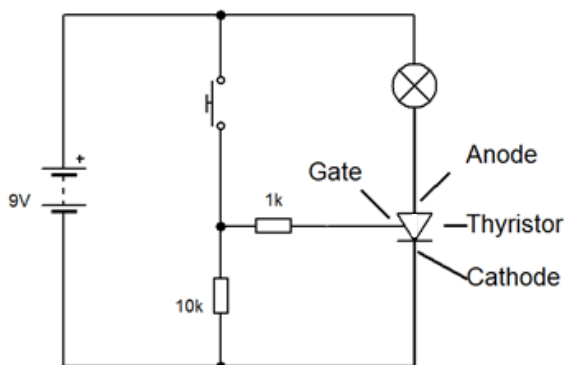
Students should be able to:

- demonstrate knowledge and understanding of the following system:
 - thyristor;
 - incorporate these devices into applications to meet specified criteria.

Course Content

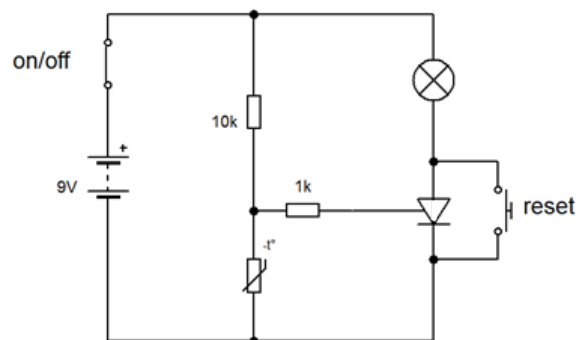
The Thyristor

A thyristor is an electronic device with three legs called the Anode (A), Cathode (C) and Gate (G). It can be used in a circuit in a similar way to a transistor with a voltage divider connected to the gate of the thyristor and an output device connected between the anode and + supply as shown.



When the signal voltage from the voltage divider reaches a suitable value, the thyristor will trigger and switch on the output component. A small current flowing into the gate is sufficient to cause a large current to flow into the anode. A useful feature of the thyristor is that, once triggered, current will continue to flow through the output component, even after the input signal has returned to a low voltage. This action is called 'latching'. The latching action of the thyristor is useful in alarm circuits.

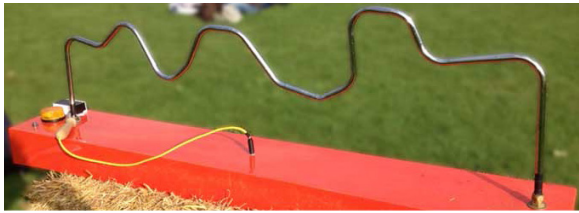
The following circuit will switch on a lamp when it is cold. The thyristor will latch and the bulb will stay lit even when the temperature has risen again.



In order to turn off the bulb, it is necessary to momentarily stop the current into the anode. This may be done by disconnecting the battery, opening the on/off switch or momentarily pressing the reset switch.

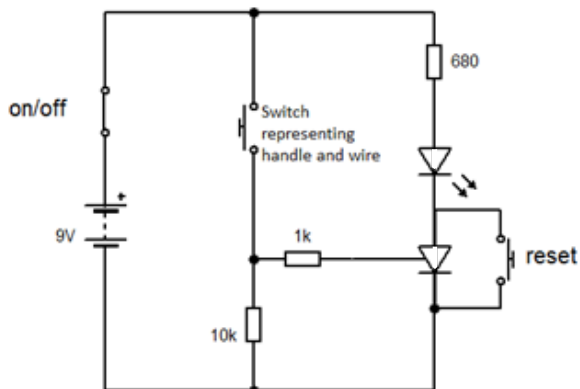
Worked Example

Design a circuit for a steady hand game. It is necessary for an LED to light when the handle touches the wire and remain lit until a reset switch is pressed.



© Fun Activities: Buzzwires / Steady Hand Game. Leisure King Ltd

Solution





Revision Questions

- 1 The output from a logic circuit is to be used to switch on a lamp using a thyristor.
 - (i) Draw a labelled circuit diagram showing how the output from the logic circuit can be used to switch on a lamp operating from a 24 V power supply using a thyristor. The circuit should include a means of resetting the thyristor.

A large, empty rectangular box with a light green border, intended for the student to draw a circuit diagram. The box is currently blank.

Source: CCEA AS Jan 2011

