ANALOG INPUT/SENSORS

POTENTIOMETER

CONCEPT A resistor that changes with linear or rotational movement.

BACKGROUND

Potentiometers are used in electrical circuits when the resistance needs to be changed or adjusted. The change in resistance can cause a change in voltage which can be used as a control.

The symbol for a potentiometer shows a resistor with an arrow. The arrow indicates that the output comes from a slider that moves across a resistor track. As the slider moves down the track, the resistance between the outputs increases.

In a uniform material, the electrical resistance will vary with the length. In a potentiometer, a uniform material is used as a track and as a slider contact is moved along the track, the resistance between the contact and the input points change.

APPLICATION

Rotating control knobs have been used for years to allow people to control electrical devices. From the early days of radio, the volume control was a common use for a potentiometer. As the control knob was turned, the volume coming out of the speaker would change.

REAL WORLD CONNECTIONS

Potentiometers are used anywhere a variable resistance is needed. This can be to tune circuits, control voltage levels or motor speeds. With digital controls, the potentiometer does not control the output voltage directly, but is read by a microcontroller and then the output voltage is adjusted.

Applications include:
Light dimmer
Blinking light rate control
Motor speed control
Microprocessor input control
Electrical circuit to human interface
Movement sensor
Rotation sensor