

Angle Sensor Investigation

Factories use robots or automation to replace people. There are many reasons why machines can work better than people.

There are companies now that have built robots that look like humans...they walk and climb stairs like humans. These robots have many sensors but some of these are surprisingly simple to make.

A light dimmer dial uses a sensor. It is a variable resistor...a 'pot' or **potentiometer**. As you turn the dial, the ability to conduct electricity gets worse...so less electricity gets to the lights...they get darker.



Your challenge...

- Can an inexpensive potentiometer be tricked into becoming an angle sensor?
- Could this idea work to detect when a robot has lifted its leg to climb a stair?

Extra info...

- A potentiometer provides resistance to electricity.
- Resistance is measured in ohms.
- 1000 ohm = 1 kilo ohm (1k ohm)
- "Pots" can be wired in 'backwards' so as you turn the dial, the ability to conduct electricity gets better...volume control dials work this way.

1. **Build** an angle sensor.
2. **Test** your sensor. Measure the resistance reading using the 20k setting on the meter.
3. **Use** your sensor. Draw a table to record results. Take readings of resistance every ten degrees starting from 0 degrees up to 90 degrees.
4. Draw a graph of resistance reading (y axis) compared to the angle in degrees (x axis).
5. Use your graph to predict the resistance reading at an angle of 120 degrees and 145 degrees.
6. Write a conclusion...answer the questions in the challenge!

