Solid State Transducers (Ch 8)

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http://www.electronics-tutorials.ws/electromagnetism/hall-effect.html
Semi-conductive Transducers

- A device made of semi-conductive material that changes one form of energy to another

- 6 Basic Technologies
1. Thermistors

- A thermally sensitive resistor based on semi-conductive material
  - PTC vs. NTC
  - Linear vs. Nonlinear
2. Pressure Sensors

- A piezoelectric sensor is a device that uses the piezoelectric effect, to measure changes in pressure, acceleration, strain or force by converting them to an electric charge.
  - Piezo is Greek for press
  - [http://www.youtube.com/watch?v=Z3y5W5p7Ofg](http://www.youtube.com/watch?v=Z3y5W5p7Ofg)

![Piezo schematic symbol](http://cladlab.com/wp-content/gallery/electronics-misc/piezo-schematic-symbol.jpg)
3. Photoelectric

- Produce a change in either resistance or voltage when exposed to light
  - Photovoltaic (i.e. Photocell)
  - Photoconductive (i.e. Photodiode)
4. Hall Effect Sensors

- Strip of semi-conductive material connected to a constant current source
- A magnetic presence 90° to the constant current will produce a voltage at the perpendicular to the constant current

http://www.youtube.com/watch?v=AcRCgyComEw
5. LED

- Light Emitting Diodes
- The PN Junction emits light or photons when a charge is applied
- Light color depends on the impurities present in the semi-conductive material
  - Older technology used plastic lenses

http://2.bp.blogspot.com/-il6hmkIKRtE/UqiVXjtoimI/AAAAAAAAARo/TR3BGroHA4IM/s1600/led+symbol.png
6. LCD

- Liquid Crystal Display
- Works by reflect or not reflect concept
  - Or pass, no pass
- Construction
  - Nematic Fluid
- Modern TVs are LCD or LED or should we say LED LCD!
  - [http://www.youtube.com/watch?v=TJsebZQCn74](http://www.youtube.com/watch?v=TJsebZQCn74)