

Hall Effect Sensors

DT Workshop Equipment Reference — D&T / STEM resource for school workshops | Sensors & Modules

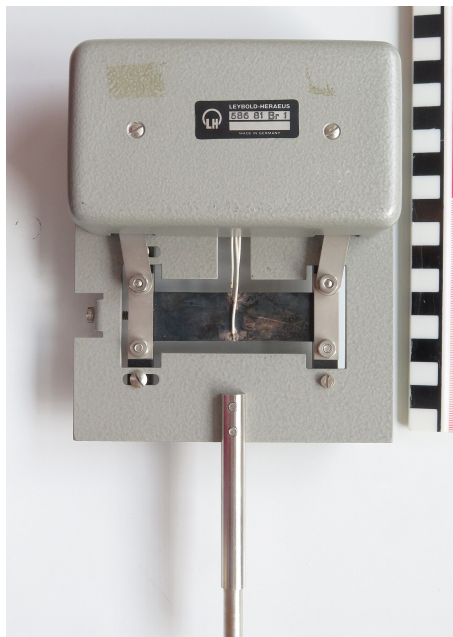


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A Hall effect sensor detects magnetic fields, directly or through a magnet attached to a rotating part, to measure rotation, count revolutions, detect speed and sense position. It is the standard sensor for wheel speed on robots and for tachometers and lock detection.

Key Features

- Digital (switch) or analog (linear) output
- Detects north or south poles
- Works through non-magnetic housings
- 3.3-5 V operation
- Simple 3-pin wiring

Typical Uses in the Workshop

- Count wheel rotations for odometry
- Build contactless speed tachometers
- Detect door and lid positions
- Measure motor speed with a disc magnet

Safe Operation

1. Mount the sensor near the magnet path
2. Set the gap between 1-5 mm typical
3. Check the magnet pole orientation
4. Count pulses in code with interrupts
5. Calibrate pulses per revolution

SAFETY NOTES

- Keep strong magnets away from credit cards and watches
- Do not place sensors near high current wiring
- Check polarity
- Keep the sensor away from water
- Mount firmly so vibration does not move it

Maintenance & Consumables

- Check the magnet is still attached
- Clean the sensor area of metal filings
- Check wiring and connectors
- Verify counts against manual measurement
- Store with spare magnets

Specification & Buying Notes

A pack of 3144E-style Hall switches plus small disc magnets covers speed and rotation projects. Linear versions (49E) suit position sensing. Buy quality modules with pull-up resistors.