

Potentiometers and Rotary Encoders

DT Workshop Equipment Reference — D&T / STEM resource for school workshops | Electronics & Prototyping

A potentiometer is a variable resistor that outputs a changing voltage as its knob or slider turns, while a rotary encoder outputs digital pulses showing rotation direction and steps. Pots give simple analog control; encoders give precise, endless rotation for menus.

Key Features

- Pots: 10 k ohm common for audio and control
- Linear and logarithmic (audio) tapers
- Rotary encoders: incremental with pushbutton
- Encoder resolutions 20-24 steps per turn
- Panel and PCB mounting styles

Typical Uses in the Workshop

- Adjust volume, speed and brightness in projects
- Control servo position with a knob
- Navigate menus with encoders
- Read analog values to teach ADC

Safe Operation

1. Wire pots as voltage dividers to an analog pin
2. Map the raw value to the usable range in code
3. Connect encoder A and B pins with pull-ups
4. Debounce encoder signals or use interrupts
5. Calibrate the pot range to the project

SAFETY NOTES

- Do not exceed the pot voltage rating
- Keep fingers off the track with metal pots
- Check the knob is secured
- Avoid forcing encoders past their end stops
- Store in dry trays

Maintenance & Consumables

- Clean pot tracks with contact cleaner
- Check the shaft and knob fit
- Verify encoder clicks are clean with a tester
- Check solder joints
- Keep spares in stock

Specification & Buying Notes

10 k ohm linear pots in a pack plus a few rotary encoders with push buttons cover most control projects. Panel-mounting knobs make student projects feel finished.