

# Battery Types and power requirements

---

- ◆ Sealed lead-acid (SLA)
  - Cheap and easily rechargeable but heavy.
- ◆ Lithium-ion (Li-ion)
  - Compact but expensive and difficult to charge.
- ◆ Nickel Cadmium (NiCd)
  - Moderate life, high discharge rate and economical.
- ◆ Nickel-Metal Hydride (NiMH)
  - Improvement over the NiCd at the expense of reduced cycle life and lower load current.
- ◆ Lithium Polymer (Li-polymer)
  - A cheaper, high energy density version of the Li-ion (under development).
- ◆ Reusable Alkaline
  - Replaces disposable household batteries; suitable for low-power, low-cost applications.

# Comparison of Rechargeable Battery Types

	NiCd	NiMH	SLA	Li-Ion	Li-Polymer	Reusable Alkaline
Energy density	40-60	60-80	30	100	150-200	80
Cell voltage	1.2V	1.2V	2V	3.7V	2.7V	1.5V
Typical Battery cost	\$50.00	\$70.00	\$25.00	\$100.00	\$90.00	\$15.00
Cycle life	1500	500	200-500	500-1000	150-200	80

## ◆ Example of a Batteries: Which has more energy?

- A 7.2 V Li-Ion battery rated at 1350mAh, 9.72 Whr
- A 6 V NiMh battery pack rated at 1600mAh, 9.6 Whr
- A 7.2V NiCd battery pack rated at 1200mAh, or 8.64 Whr
- A 12V sealed lead-acid (SLA) battery rated at 900mAh? 10.8 Whr