

Digital vs. Analog Headstages

| Headstage Specification | Digital | Analog | Trade-offs |
|---|----------------|----------------------------|---|
| Noise - RMS | 2.4 μ V | 1.3 μ V | High / low noise |
| Noise - Peak | 10 μ V | 5 μ V | High / low noise |
| A/D Resolution | 16-bit | 24-bit | Low / high resolution |
| A/D Effective Resolution | 11-bit | 19-bit | Low / high effective resolution |
| Dynamic Range | 10 mV | 262 mV | Artifact saturation |
| Electrode Offset | 400 mV | 1100 mV | Options in electrode metals |
| Coupling | AC Only | AC & DC | Frequency response range |
| Input Leakage at +/-400 mV | <20 nA | <0.1 nA | High / low leakage |
| References per 32 Channels | 1, fixed local | 8, selectable local/global | Artifact & noise rejection options |
| Headstage Mass (32 Channels) | 2.5 grams | 2.4 grams | Similar headstage size |
| Tether Diameter | 3 mm | 2 mm | Similar tether size |
| Max Sampling Rate (32 Channels) | 30 kHz | 40 kHz | Low / high sample rate |
| Input Impedance at 10 Hz | 1.3 G Ω | >100 G Ω | Low / high common mode rejection |
| Input Impedance at 1 kHz | 13 M Ω | >73 M Ω | Spike sensitivity |
| Frequency Response, 1 MΩ Electrode (-6dB, 50%) | 1.5 kHz | 8 kHz | Spike amplitude signal to noise ratio |
| Reference Input Capacitance | 325 pF | 2 pF | Broad input impedance range, optimal frequency response |
| Reference Input Impedance at 1 kHz | 0.5 M Ω | 73 M Ω | Noise & artifact rejection |

