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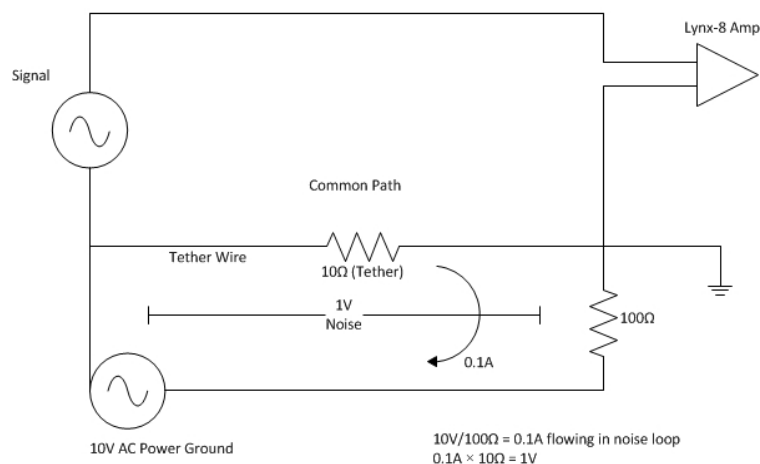

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Tips to Reduce Noise

Conducted Noise: Conducted noise occurs when the signal is in electrical contact with a noise source. This is because the noise current source and our signal share a common path. This usually takes the form of a ground loop, an extra ground connection between 2 components with different internal potentials. The ground loop acts like an antenna, effectively picking up interference, leading to a system ground reference that is no longer stable. However subtle, the differences in potential can induce lots of noise.

Schematic of Ground Loop



Ohms Law yields $10V/100\text{ohms} = 0.1A$ flowing in the noise loop. The tether has a resistance of 10 ohms, $0.1A \times 10\text{ohms} = 1V$.

Real World Example



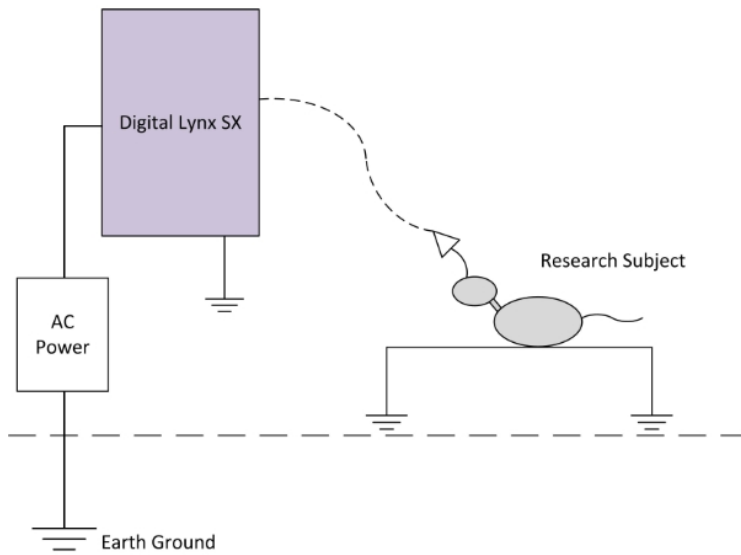
HS-18

[HS-18](#): It provides 16 channels of Unity Gain amplification (buffering) with 1 reference and 1 buffered ground.



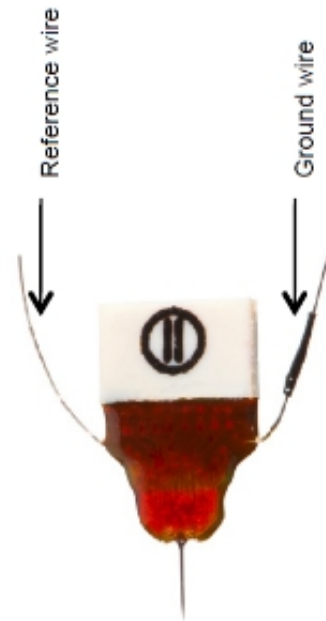
ADPT

[ADPT-HS18-N2T-16](#): Small lightweight adapter used to connect a Neuralynx HS-18 or HS-16 to a NeuroNexus Technologies Microelectrode Array Probe. The compatible probes are the [C16](#), [C32](#), [CM16](#), and [F16](#).



The picture above demonstrates a ground loop situation that might occur in the laboratory. Introducing 2 different ground connections can lead to induced noise.

Solution: Provide a common ground. Plug in necessary electronic devices to a power strip with a common ground which should help eliminate ground loops in your recording setup. Start simple using the most basic connections during the equipment setup process and remove unnecessary ground connections.

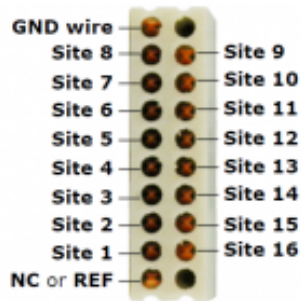


GND and REF

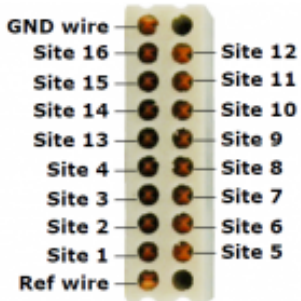
Common areas where the GND and REF wires are fixed are bone screws located on the skull, or fixed by other means to skin, or muscle depending on the experiment.

NLX Headstage + ADPT-HS-XX-N2T-YY + NeuroNexus Probe

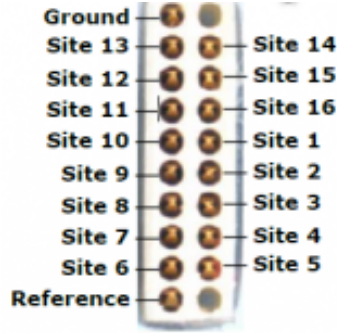
As shown below, the output pinouts of various NeuroNexus probe connectors vary with Probe Package. The input connector on the ADPT-HS-XX-N2T-YY is always the same and works with all the probe packages shown below. The probesite mapping to Neuralynx A/D channels is different for each Probe Package. Nexus configs presaved in your Neuralynx Configuration Folder may need to be updated to reflect the most current version of NeuroNexus pinout.



C16



CM16



F16

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