

HS-18MM User Manual

**A preamplifier headstage with 18 channels of unity gain including
16 electrode channels and 2 references.**

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1 Document Overview

This document will describe the HS-18MM features, connector descriptions, power supply requirements, and mounting.

2 HS-18MM Overview

The Neuralynx HS-18MM Amplifier is the active electronic part of the Headstage/Tether system. It provides 16 channels of unity gain amplification, one reference, ground, and differential stimulation lines. One end of the HS-18MM provides connections for electrode inputs from a VersaDrive. The other end connects to a 28-conductor tether. The HS-18MM is approximately 20 mm high and 10 mm wide. Weighing only 600mg, the HS-18MM is a good choice for use with small animals. The HS-18MM uses low noise, low power, and low input bias current op amps instead of the Source Follower FET circuit typically used by other headstage manufacturers. The op amps used on the Neuralynx HS-18MM have many advantages:

- Precise unity gain greatly improves the Common Mode Rejection Ratio (CMRR), preserving the integrity of the amplified signal
- High performance for the entire recording system for artifact and other common mode noise signal rejection
- Lower output impedance reduces noise susceptibility of the tether and other signal cabling
- Provide critical antistatic protection on each input channel
- Ensure low input bias current levels
- Eliminate signal distortion

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3 Input Connector Pinout

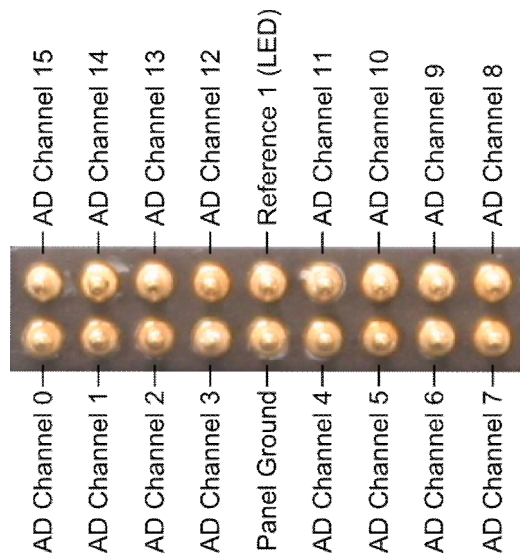


Figure 1 Mill-Max Pinout

4 Stimulus Connections

18 mil (0.4572 mm.) diameter vias are available at the locations on the PCB shown in the figure below for stimulus. The Mill-Max connector does not have access to stimulus.

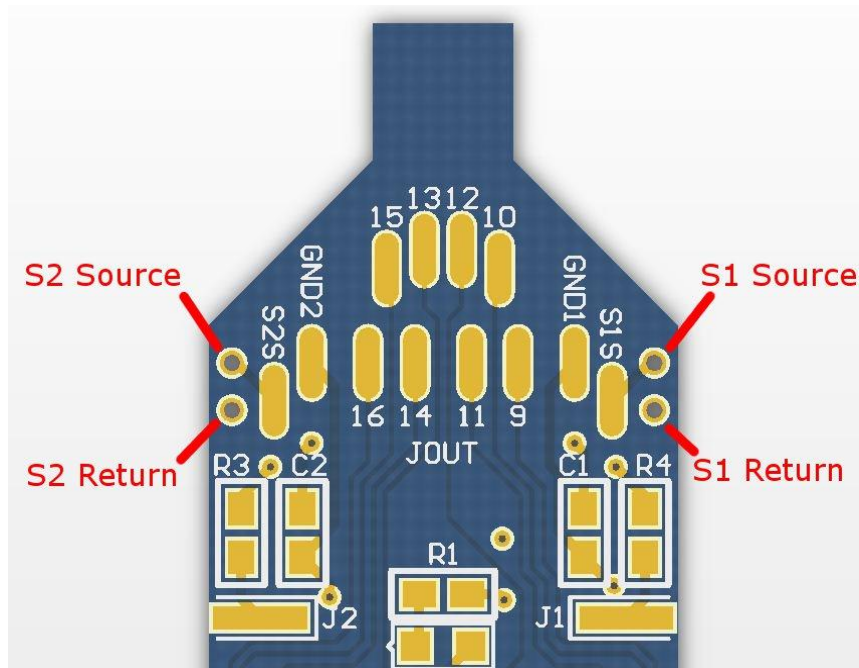


Figure 2 Stim Lines

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6 Power Supply Requirements

The HS-18MM amplifier requires +5V and -5V for the buffer op amps. Current draw is about 4 mA.

Because op amps are used for the unity gain buffer amplifiers, special care and attention must be given to the power supply design, power application and power removal. The input protection circuitry will lower the input impedance if the input voltage exceeds power supply voltage. This can occur if the input voltage exceeds the power supply voltage or by the loss of power supply voltage. The Neuralynx Digital Lynx SX contains power supplies which properly sequence power supply voltage and monitor headstage currents.

7 Mounting the Headstage to the VersaDrives

The HS-18MM is used in conjunction with Versa microdrives such as the Versa4, Versa8, and Versa8 Optical. The headstage amplifier is mounted to the drive by placing a disposable male-male Mill-Max header between the Versa drive connector and the HS-18MM input connector and carefully pressing the connectors together. Headstage power should be turned off when connecting and disconnecting to the animal.

8 Using the SM-18MM Signal Mouse

Refer to the Signal Mouse User Manual.