NN64AC/NN32AC - Acute Headstage

NN64AC 64-Channel Acute Headstage

The 16 Channel acute The 64 Channel Acute headstage is recommended for extracellular neurophysiology using silicon electrodes, metal microelectrodes or microwire arrays with input impedances from 20 kOhm to 5 Mohm.

The headstage features two 40-pin connectors designed for use with NeuroNexus Acute 64-channel probes. The headstage connects to a PZ series preamplifier via four mini 26-pin connectors or with System 3 Medusa preamplifiers (such as four RA16PAs) via four DB25 connectors. In either case, each connector carries the signals for 16 channels, power and ground. Therefore, each connector can be connected independently. The connector labeled Bank-1 carries channels 1-16, Bank-2 carries 17-32, etc.

Part Numbers:

NN64AC—64 Channel Acute Headstage for Medusa PreAmps

NN64AC-Z—64 Channel Acute Headstage for Z-Series (PZ) PreAmps

The headstage has sensitive electronics. Always ground yourself before handling.

Headstage Voltage Range

When using a TDT preamplifier the voltage input range of the preamplifier is typically lower than the headstage and must be considered the effective range of the system. Check the specifications of your amplifier for voltage range. Also keep in mind that the range of the headstage varies depending on the power supply provided by the preamplifier. TDT preamplifiers supply +/- 1.5 VDC, but third party preamplifiers may vary. TDT recommends using preamplifiers which deliver +/- 2.5 VDC or less. Check the preamplifier voltage input and power supply specifications and headstage gain to determine the voltage range of the system.

The table below lists the input voltage ranges for the NN64AC and NN64AC-Z headstages for either a +/- 1.5 VDC or +/- 2.5 VDC power source.

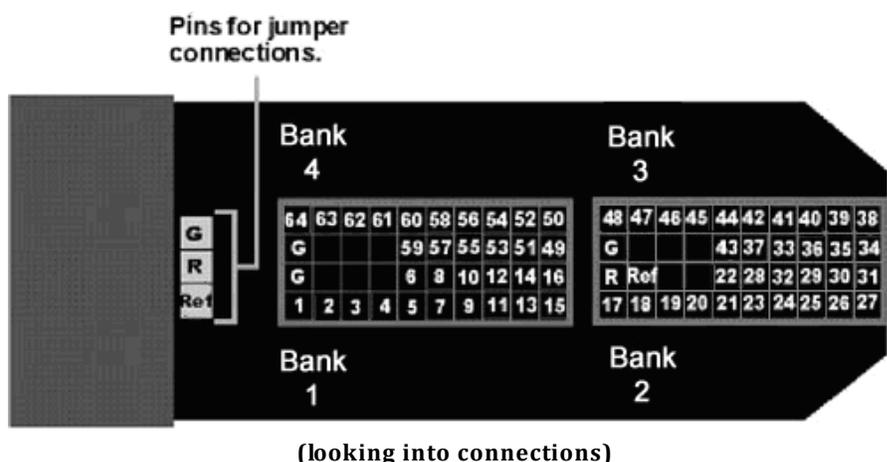| Headstage input range when using +/- 1.5 VDC power source	Headstage input range when using +/- 2.5 VDC power source
+/- 0.9 V	+/- 1.9 V

Technical Specifications

⚠️ WARNING! When using multiple headstages ensure that all ground pins are connected to a single common node. See "Headstage Connection Guide" on page 6-99, for more information.

Input Referred Noise	rms 3 μV bandwidth 300-3000 Hz rms 6 μV bandwidth 30-8000 Hz
Headstage Gain	Unity (1x)
Input Impedance	10^{14} Ohms

Pinout Diagram

(looking into connections)

The numbers in the diagram above show the channel connections to the amplifier. The headstage also features jumper locations to short G, R and Reff refers to the built-in reference site on the NeuroNexus probe). The ground channel (G) should either be tied to an external ground or to the reference (R) for a single ended input.

Important! When using the NN64AC with the NeuroNexus Acute 64-channel probe, keep in mind that there are several versions of the probe. Check the NeuroNexus Website for pin diagrams. Also, see "MCMap" in the *RPvdsEx Manual*, for a description and examples on how to re-map channel numbers.

Jumper Configuration

The following table describes the jumper configurations and associated requirements.

Jumper Connections	Operation	Requirements
G R Ref	Shorts headstage Ground and Reference inputs together, yielding single-ended amplification of signals relative to ground.	Connect common Ground/Reference wire to the headstage or electrode.

Jumper Connections	Operation	Requirements
G R Ref	Shorts headstage Reference input to the pin labeled Ref（a low impedance site on the probe）yielding differential amplification of signals relative to the voltage of the Ref site.	Connect Ground wire to the headstage or electrode.
G R Ref	Headstage Ground and Reference separated and Ref pin is not used, yielding differential amplification of signals relative to the voltage of the Reference.	Connect both a Ground wire and a Reference wire to the headstage or electrode.

NN32AC - 32 Channel Acute Headstage

The 32 Channel Acute headstage is recommended for extracellular neurophysiology using silicon electrodes, metal microelectrodes or microwire arrays with input impedances from 20 kOhm to 5 Mohm. The headstage features a 40-pin connector designed for use with the NeuroNexus Acute 32-channel probe. The headstage connects to a PZ series preamplifier via two mini 26-pin connectors or to two RA16PA preamplifiers via two 25-pin connectors. For either headstage, Connector A carries the signals for channels 1-16, power and ground. This connector must be connected whether you are acquiring data from one of these channels or not.

Part Numbers:

NN32AC—32 Channel Acute Headstage for Medusa PreAmps

NN32AC-Z—32 Channel Acute Headstage for Z-Series（PZ）PreAmps

The headstage has sensitive electronics. Always ground yourself before handling.

Headstage Voltage Range

When using a TDT preamplifier the voltage input range of the preamplifier is typically lower than the headstage and must be considered the effective range of the system. Check the specifications of your amplifier for voltage range. Also keep in mind that the range of the headstage varies depending on the power supply provided by the preamplifier. TDT preamplifiers supply +/- 1.5 VDC, but third party preamplifiers may vary. TDT recommends using preamplifiers which deliver +/- 2.5 VDC or less. Check the preamplifier voltage input and power supply specifications and headstage gain to determine the voltage range of the system.

The table below lists the input voltage ranges for the NN32AC and NN32AC-Z for either a +/- 1.5 VDC or +/- 2.5 VDC power source.

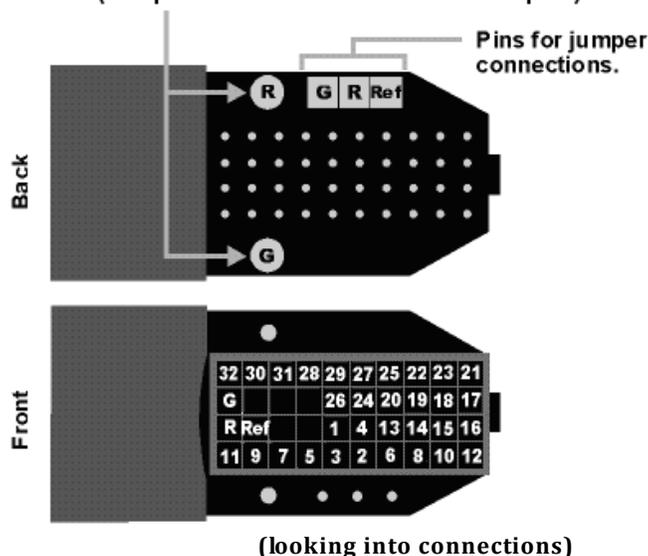| Headstage input range when using +/- 1.5 VDC power source	Headstage input range when using +/- 2.5 VDC power source
+/- 0.9 V	+/- 1.9 V

Technical Specifications

⚠️ WARNING! When using multiple headstages ensure that all ground pins are connected to a single common node. See "Headstage Connection Guide" on page 6-99, for more information.

Input Referred Noise	rms 3 μV bandwidth 300-3000 Hz rms 6 μV bandwidth 30-8000 Hz
Headstage Gain	Unity (1x)
Input Impedance	10^{14} Ohms

Pinout Diagram

(looking into connections)

Important! When using the NN32AC with the NeuroNexus Acute 32-channel probe, keep in mind that there are several versions of the probe and the NN32AC was designed to correspond to the NeuroNexus rev 3 probe. Check the NeuroNexus Website for pin diagrams. Also, see "MCMap" in the *RPvdsEx Manual*, for a description and examples on how to re-map channel numbers.

The numbers in the diagram above show the channel connections to the amplifier.

The surfaced connections on the back of the headstage include female connectors to simplify connections to external devices and jumper locations to short G, R and Reff refers to the built-in reference site on the NeuroNexus probe). The ground channel(G) should either be tied to an external ground or to the reference (R) for a single ended input.

Jumper Configuration

The following table describes the jumper configurations and associated requirements.

Jumper Connections	Operation	Requirements
G R Ref	Shorts headstage Ground and Reference inputs together, yielding single-ended amplification of signals relative to ground.	Connect common Ground/Reference wire to the headstage or electrode.
G R Ref	Shorts headstage Reference input to the pin labeled Ref (a low impedance site on the probe) yielding differential amplification of signals relative to the voltage of the Ref site.	Connect Ground wire to the headstage or electrode.
G R Ref	Headstage Ground and Reference separated and Ref pin is not used, yielding differential amplification of signals relative to the voltage of the Reference.	Connect both a Ground wire and a Reference wire to the headstage or electrode.