



Triangle BioSystems, Int'l.

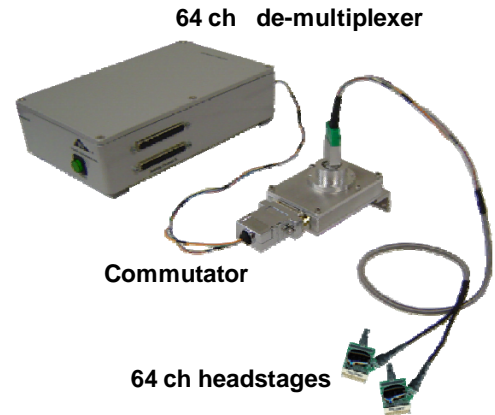
M-Series multiplexer headstages for reduced wire cables

Headstage Features

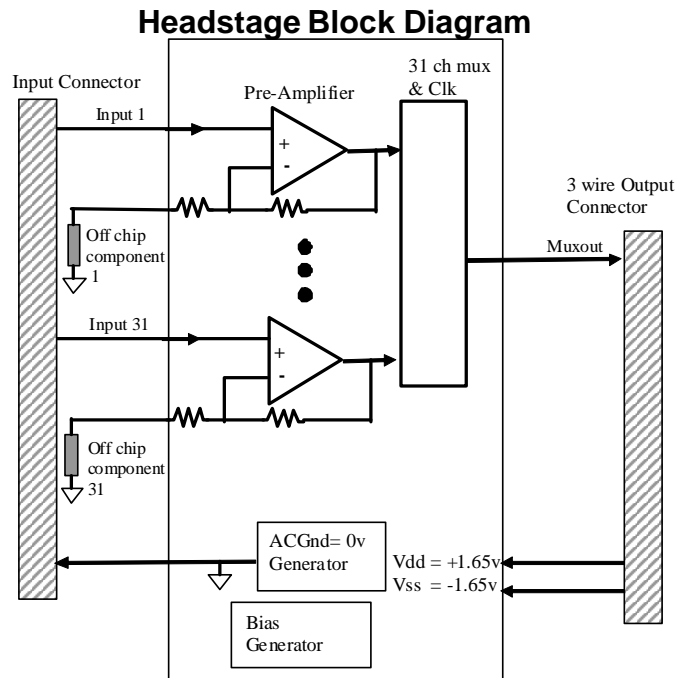
- 3 wire interface cable for 31 channels with 5 feet standard length
- Size: 5x15x20 mm, Weight < 0.8 grams
- Also available with multiple headstage options for 64, 96, 128, 160, 192, 224 channels with 4, 5, 6, 7, 8, 9 wired cables respectively.
- Available with system gain of 120 and 600
- Bandpass filtering of .8Hz to 7kHz
- Optional Blue, Red and Green LED mounting options for video tracking

Triangle BioSystems, Int'l. offers a family of multiplexing channel analog multiplexing headstage subassemblies that are used to provide a reduced wired connection between implanted electrodes and neural recording and analysis equipment. The main function of the headstage is to precondition the neuron pulse signals and provide a high gain, bandpass filtered buffered connection over a 3 wire cable. Each headstage design is based on a custom, low power VLSI developed by TBSI. The result is a solution with superior performance and reduced wire connection in a very small form-factor with less weight.

The 32 channel high gain, bandpass filter headstages are available with system gain of 120 and 600 with a adjustable bandpass filtering from the factory.



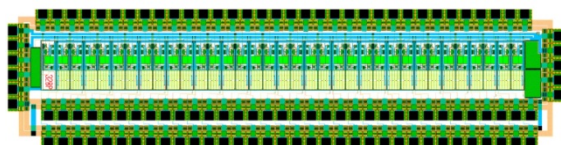
128 channel headstage system with a 6 wire cable (uses 4, 32 channel multiplexer headstages)



Headstage Specifications

Electrical

Parameter	Min	Typ	Max	Units	Notes
Power Supply					
Headstage Power supply	2.99	3.0	3.01	Volts	3.0 Bipolar power supply (+2.1v, -.9v and ACgnd @ 0v)
Average Icc 3.0v	5.6	6.1	6.7	ma	Without LEDs
Analog Channel					
Max Input voltage range	-2		+2	mVolts	For gain of 600 System (headstage gain of 100)
Max Input voltage range	-10		+10	mVolts	For gain of 120 System (headstage gain of 5)
Max Output voltage range	-1.2		+1.2	Volts	Measured at DB37 connector of receiver
Common mode center		0		Volts	ACgnd @ 0v
dc Offset	-10	0	10	mVolts	For bipolar power supplies only
System Gain 120	115	120	125		Factory selectable gain
System Gain 600	590	600	610		Factory selectable gain
Bandwidth @ 3v	.8		7000	Hz	-3dB input signal level BW
Input impedance		22		Mohms	At 1kHz
Output impedance		158		ohms	At 1kHz
Input referred noise		6.2		µVrms	for DC - 10khz frequency with all inputs grounded
Channel sample Rate		50		kHz	Per channel sampling rate
THD			-63	dB	@ 5kHz and 1 volt p-p input
Phase Delay		30		uSecs	@ 5 kHz input
Headstage Mechanical					
Length		20		mm	Edge to Edge of connector pins
Width		15		mm	
Height		5		mm	
Weight			.8	grams	
Miscellaneous					
Reference Bias Current		78		uA	Included inside headstage
Operating Temperature	62	72	82	F	Recommended Temperature Operation



Custom VLSI ASIC

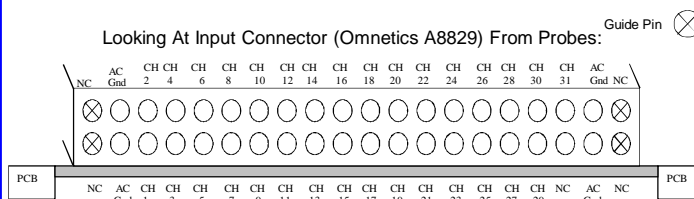
Number of channels	Number of wires in cable	Number of demux receivers
32	3	1
64	4	1
96	5	1
128	6	1
160	7	2
182	8	2
224	9	2

Multiple of 32 Channel Headstage options

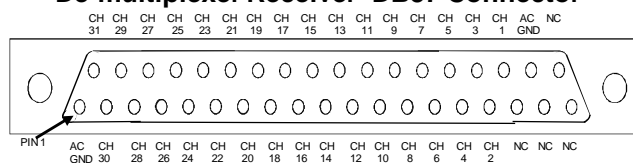


Headstage Connector

Looking At Input Connector (Omnetics A8829) From Probes: Guide Pin



De-multiplexer Receiver DB37 Connector



Ordering Information

Part Number	Gain
NeuroM32BPG100 Headstage	Gain 100
De-multiplexer32 Receiver	Gain 6
A9114 Electrode Cable (12 inches)	NA
Headstage Cable length is 4 feet	NA
10 channel Commutator (optional)	NA
Gain Reduction board (optional)	1/300