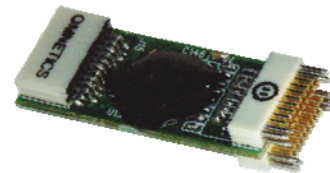




Triangle BioSystems, Int'l.

## 16 Channel Neural Stimulator Headstage



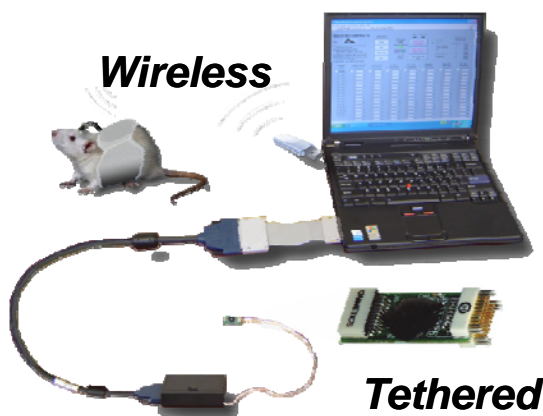
### Headstage Features

- 16 biphasic constant current drivers
- User selectable drive current (0-700 $\mu$ A) per channel
- Differential voltage range up to 12v
- Output impedance >100 Meg ohms between channels in tri-state mode
- Output "on" impedance of 20 ohms
- 5 $\mu$ Sec accuracy on clock edges
- Pico amp leakage between channels
- Complete power isolation from animal

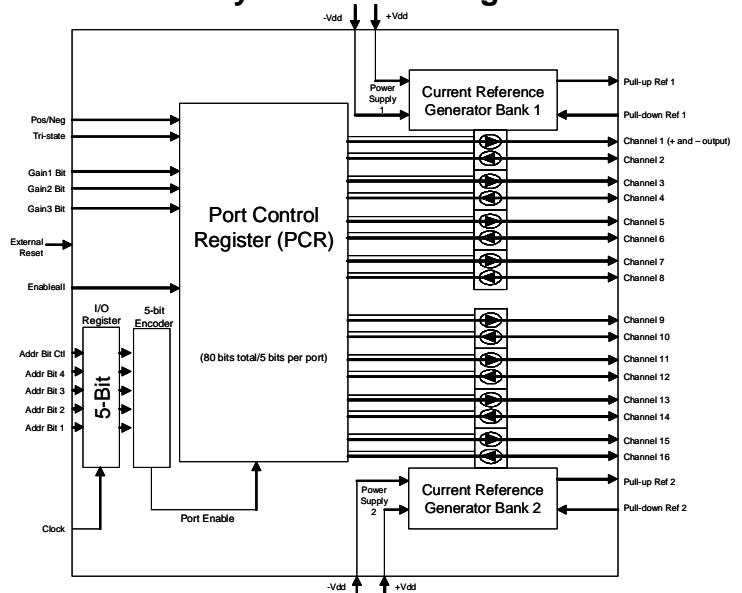
The TBSI tethered or wireless neural stimulator headstage is a very compact subassembly that drives 16 channels of current stimulation through high-impedance biphasic electrodes while providing the user with individual I/O channel control. User-defined I/O channel variables include enable/disable, current magnitude, current direction, pulse duration, pulse count, as well as timing and triggering parameters. With a unique isolated power supply of +2.5v and -2.5v, the stimulator can create extended 10v differential output levels. This can be expanded to +3.0v and -3.0v for 12v maximum differential output levels. Software control of the stimulator headstage is provided through an easy to use Labview® program.

The compact size and light weight of the neural stimulator is made possible through the development of a proprietary custom VLSI ASIC device. The headstage is coupled to the controlling computer via a power isolation board which transfers all control and triggering parameters as well as ensures animal safety.

### System Overview



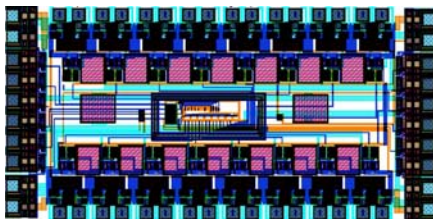
### System Block Diagram



# Headstage Specifications

## Electrical

Parameter	Min	Nom	Max	Units	Notes
<b>Analog Specifications</b>					
Maximum Current Output			500	μA	When external R bias is 100 ohms
Current Output Accuracy		1		μA	This is set by external resistor tolerance (1%)
Maximum Voltage Output (Diff)			12	Volts	Typically 2x power supply
Common Mode Center		0		Volts	If bipolar supplies (-2.5 – 2.5v) are used
Input Impedance			10	Megohm	Impedance of input gates
Output Impedance when active	40			Ohm	Impedance at 1KHz (estimated) with 50 μA buffer bias
Output Impedance when tri-state	10			Megohm	
<b>InBand Noise Specs</b>					
PSSR		-60		dB	Power Supply Rejection Ratio
Input Referred Noise		4		μV/(Hz)	Measured with no clock transitions
<b>Power Supply</b>					
Voltage	-3		3	Volts	Bipolar power supply
Current		8		ma	
<b>Mechanical</b>					
Headstage Dimensions		11 x 23		mm	Includes connectors



**Custom ASIC**



**Small Size**



## Ordering Information

### 16-Channel Tethered Neural Stimulator

Part No.	Description
Neuro16STIM	16 channel neural stimulator headstage
StimDAQ-PCI	NI DAQ board for desktop stim control
StimDAQ-PCMCIA (optional)	NI DAQ board for desktop stim control
Stim16Iso	Stimulator Isolation Board
StimHostSWexe	Stimulator software executable
StimCableO-O24	2 foot 22 conductor cable w/ Omnetics female on both ends
StimCable16-DI-2	2 Meter cable from the PCI DAQ to the Isolator board

### 16-Channel Wireless Neural Stimulator

Part No.	Description
Neuro16STIM	16 ch neural stimulator headstage
NeuroStimPack	Bluetooth ratpack (36 grams)
NeuroStimRec	Bluetooth Receiver (USB or RJ45)
StimHostSWexe	Stimulator software executable