Neuralynx
High Density Electrophysiology Recording Systems

BNC-Panel-32-Input
User Manual

Used to mate any input signals on BNC Connectors to a Digital Lynx AC or DC Input Board.

105 Commercial Drive, Bozeman, MT 59715
Phone 406.585.4542 • Fax 866.585.1743
www.Neuralynx.com
support@Neuralynx.com

Revision **1.0**
12/5/2011

Table of Contents

List of Figures and Tables

Document Revision History

04/19/2011	Rev 1.0	Initial Creation of the document

1 Document Overview

This document will describe the use of the BNC-Panel-32-Input.

2 BNC-Panel-32-Input Overview

The BNC-Panel-32-Input consists of two rack mount panels with 16 open female BNC connectors per panel. These panels are intended to be used as signal inputs to a Digital Lynx. Each signal is routed to a single 40 pin connector. When both panels are used, their outputs are combined into one 80 pin connector for mating to the Differential Input Connector on a Digital Lynx AC or DC Input Board.

3 Glossary

Differential Input – This refers to the 80 pin connector on the AC and DC Input Boards. This contains each channel and its corresponding reference.
Digital Lynx Input Range – The Digital Lynx can measure signal amplitudes between 0 and 132mV.
Acquisition System – Term referring to a Digital Lynx or a Lynx-8 Analog System.

4 Hardware Overview

4.1 Front of Panel

A picture of the front of one panel is shown in Figure 4-1. Notice the BNC connectors and their corresponding channels.

Figure 4-1 Panel Front

Channel 1 corresponds to the left most BNC connector while channel 16 corresponds to the right most BNC connector.

4.2 Back of Panel

There are four different sections on the back of the patch panels that will be discussed.

4.2.1 Section #1: Component Sockets DIP1, DIP2, DIP3, and DIP4

These sockets are used to attenuate an input signal. This is accomplished using a resistor divider as shown in Figure 4-2 for each channel.

Figure 4-2 Resistor Divider

Resistor networks can be placed at these locations to reduce the input signal down to the Input Range of the Digital Lynx. Neuralynx provides resistor networks for 5 different signal sizes. Use Table 1 to choose the correct resistor networks for your application. The BNC-Panel-32-Input comes with the resistors for ±5V installed.

Signal Size	DIP1/DIP2	DIP3/DIP4	Attenuation
±10V	4116R-1-103LF	4116R-1-121LF	≈76:1
±5V	4116R-1-103LF	4116R-1-271LF	≈38:1
±2V	4116R-1-103LF	4116R-1-681LF	≈16:1
±1V	4116R-1-103LF	4116R-1-152LF	≈8:1
±0.132V	4116R-1-220LF	none	≈1:1

Table 1 Resistor Network Values

If values in Table 1 do not match your needs you can use the following equations and example to assist you in selecting different resistor networks.

$$\frac{DIP2}{DIP4} = \left({Vin\ Max}/{0.132}\right) - 1 \qquad \frac{DIP1}{DIP3} = \left({Vin\ Max}/{0.132}\right) - 1$$

Example:

A user wants to reduce a 5V amplitude signal down to the input range of a Digital Lynx. Using the equation stated above the ratio of DIP2 to DIP4 is:

$$\left({5}/{0.132}\right) - 1 \approx 37$$

If the user chose a 1kΩ resistor network for DIP4 they would need a 37kΩ resistor network for DIP2.

Leaded resistors may also be used to set different reduction values for each channel.

4.2.2 Section #2: Header Pin Blocks TP1 and TP2

TP1 and TP2 each have eight of the 16 BNC shields routed to them. TP1 contains the shields of channels 1 through 8 and TP2 contains the shields of channels 9 through 16. Refer to Figure 4-3.

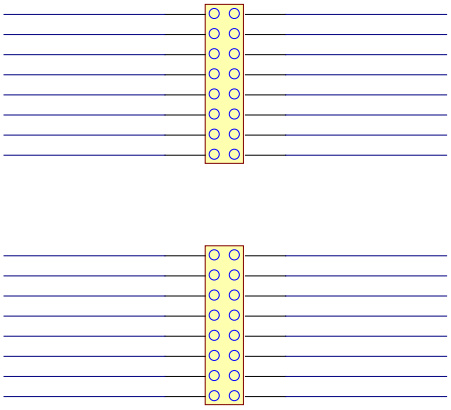

Figure 4-3 TP1 and TP2 Jumper Blocks

The bottom row of TP1 and TP2 is grounded. By placing jumpers vertically in these locations, the shields of each BNC connector can be individually grounded. To make the shields a common reference, install the jumpers vertically in these locations. If isolated shields are desired, leave TP1 and TP2 empty.

4.2.3 Section #3: Header Pin Blocks TP3 and TP4

TP3 and TP4 control the differential signal(reference) of each channel. They are shown in Figure 4-4.

Figure 4-4 TP3 and TP4 Jumper Blocks

The top row of TP3 and TP4 is connected to ground, the middle row contains each channel's differential signal, and the bottom row is connected to each channels corresponding BNC shield. By connecting the middle row to the top or bottom row, the user can reference Ground or that channel's Shield. If jumpers are installed at TP1 and TP2, then Ground and Shield will be connected together and the jumper position will make no difference. Each channel requires a jumper at TP3 and TP4 for the BNC-Panel-32-Input to operate properly.

4.2.4 Common Configurations

The two most basic jumper configurations are shown in Figures 4-5 and 4-6

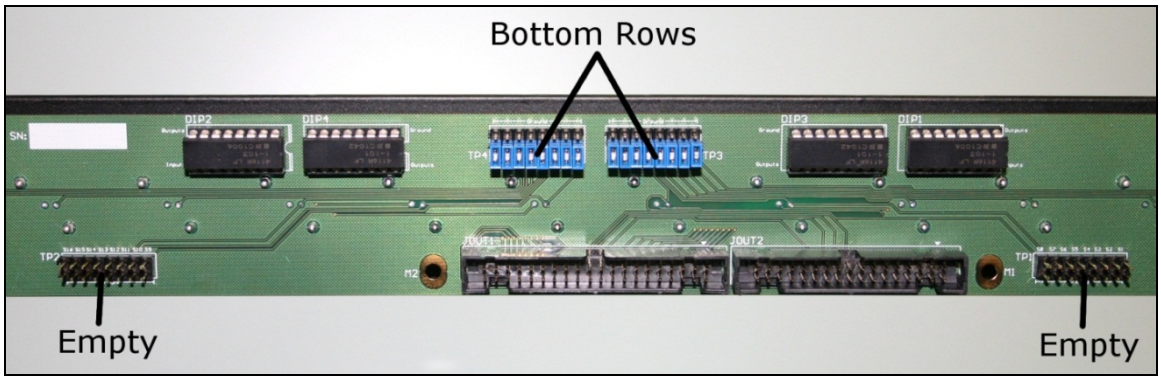

Figure 4-5 Shields as Reference

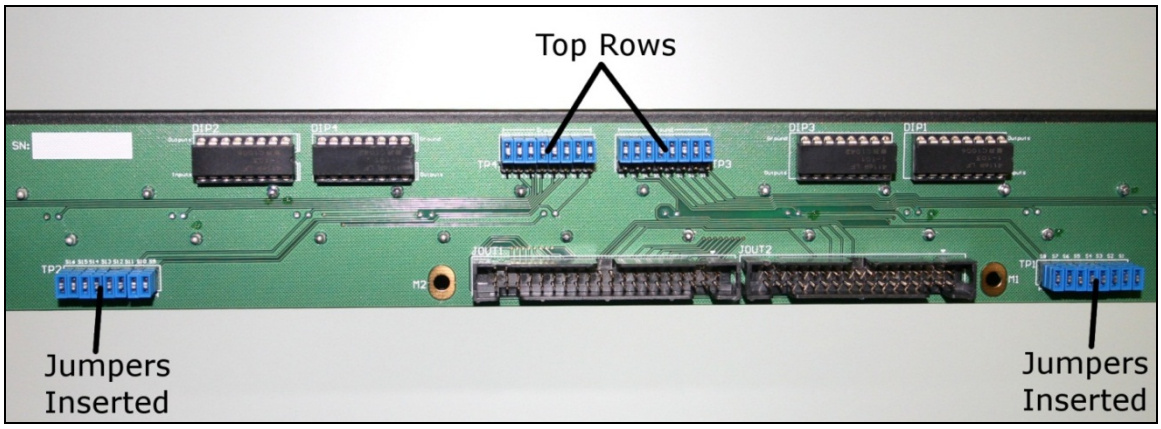

Figure 4-6 Shields Grounded (Signal Attenuated)

4.2.5 Section #4: Output Connector

This is a 40 pin connector (JOUT1) and contains half the channels of the Differential Input Connector on the AC or DC Board. The pinout is shown in the figure below.

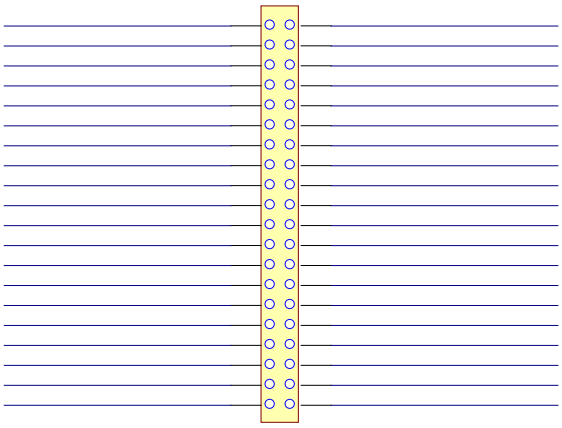

Figure 4-7 40 Pin Connector Pinout

The two panels for the BNC-Panel-32-Input have been labeled as 32 Input #1 (channels 1-16 channels) and 32 Input #2 (channels 17-32). The provided cable is also labeled to correspond with 32 Input #1 and 32 Input #2.

5 Installation

5.1 Rack Mounting

The BNC-Panel-32-Input is intended to be mounted on a rack just like an ERP-27 or Lynx-8 Amplifier. Hold the patch panel level against the rack and insert screws into the top two holes of the metal plate. Two screws will adequately hold the patch panel in place, but it is recommended that four be used.