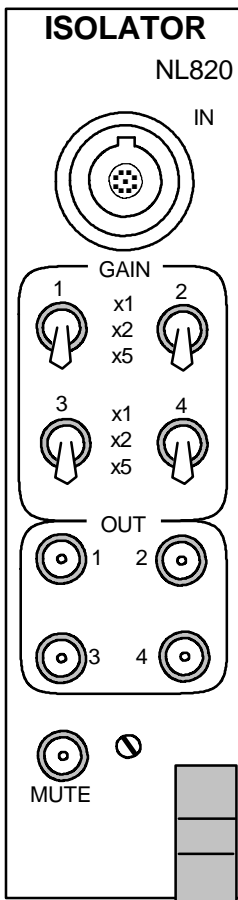


NL820A - Isolator (4-channel)

**Introduction**

The **NL820A ISOLATOR** is the module at the heart of the **NeuroLog™ System** Isolated Amplifier range of components that meet, or exceed, the BS5724 and IEC601-1 patient leakage specifications.

The NL822 and NL824 miniature, low-noise pre-amplifiers and **NL134/135/136/144 FILTERS** and **NL530 CONDITIONER** complete the system (see system drawing on page 5).

General Description

The NL820A is a four channel analogue signal isolation module designed to plug into the **NeuroLog™** rack system. Opto-isolator and transformer techniques are employed to provide signal and power supply isolation from the power supply ground. The leakage current between amplifier inputs and ground is less than the limit specified in IEC 601-1 for class CF equipment.

Refer to Fig. NL820A-2 for a module overview.

Four single-ended inputs with a common isolated terminal are provided together with positive and negative isolated supplies for powering external pre-amplifiers or control devices. Each channel has adjustment of sensitivity by a three step switch to provide x1, x2 and x5 amplification. Input signals in the range DC to higher than 10kHz and amplitudes up to ± 1 volt can be handled by the module. Multiple NL820A isolators can be operated in the same NL900 rack to provide higher numbers of channels.

The NL820A is fitted with an insulated multi-way input socket providing connections to the four signal channels and the isolated power source. The optional NL822 and NL824 Pre-amplifiers are supplied complete with connecting cable and matching plug.

Fig. NL820A-1 identifies the pin numbers of the matching plug that is available as Part Number NL969P should you wish to use your own front-end Pre-Amplifier.

Pin No Function

1	Channel 1
2	Channel 2
3	Common
4	+13V to Pre-Amp
5	-13V to Pre-Amp
6	Common
7	Channel 3
8	Channel 4
9	Mute to Pre-Amp

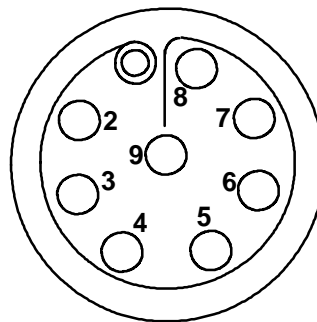


Fig. NL820A-1 Outside view of socket & wiring view of plug

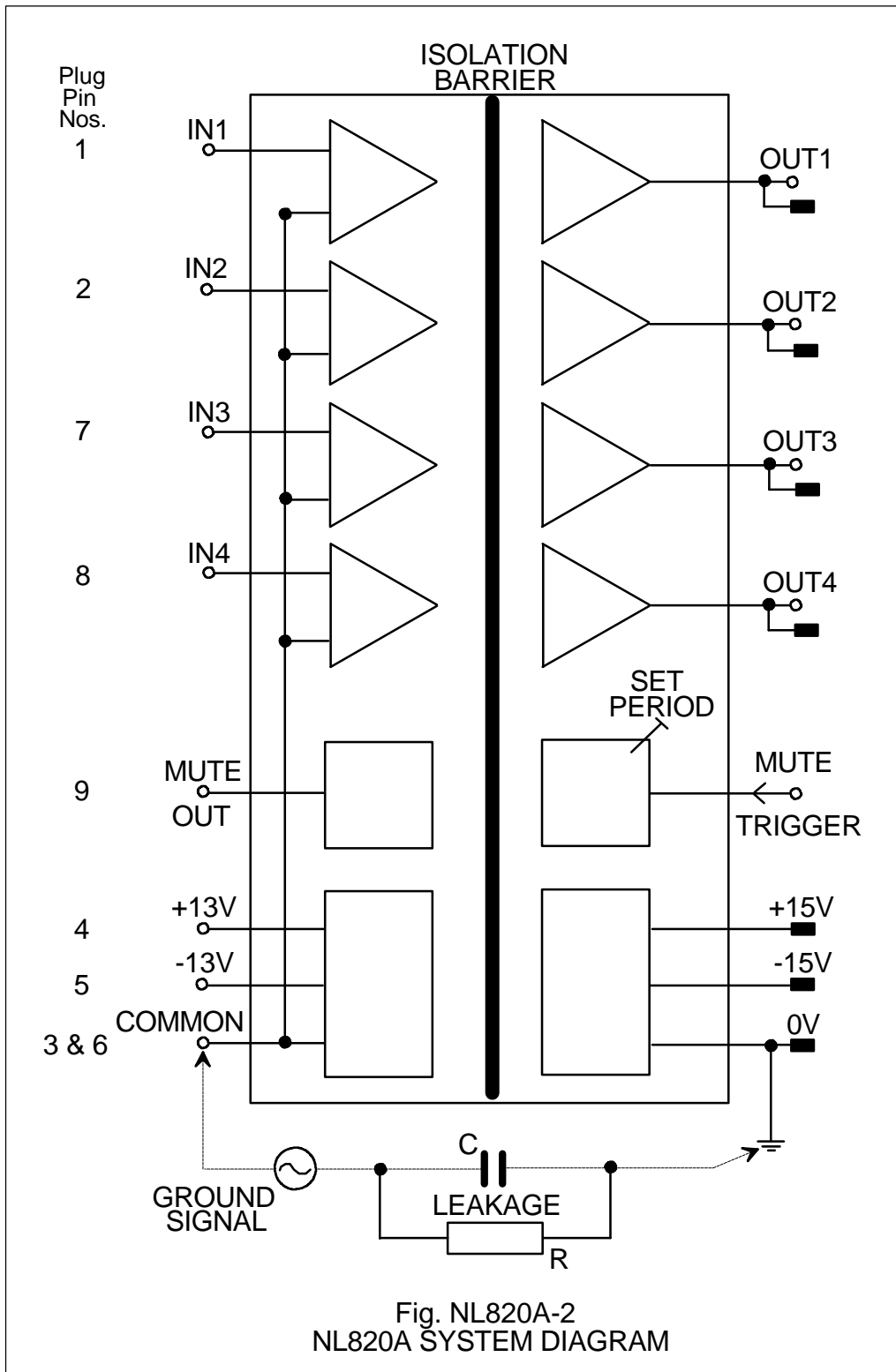


Fig. NL820A-2
NL820A SYSTEM DIAGRAM

Mute Facility

When used with NL822 and NL824 AC signal pre-amplifiers large artefact signals present at the inputs which would lead to "blocking" of the system can be reduced or removed by the use of a mute control. In order to provide operation of this mute control without bridging the isolation barrier, a logic trigger signal applied to the front panel socket on the NL820A generates a pulse of adjustable width which is coupled via an opto-isolator and the connection cable to the pre-amplifier.

The mute period may be adjusted via the trimmer control mounted behind the front panel over the range of approximately 1 to 10 milliseconds timed from the positive going edge of the applied trigger signal.

Longer mute periods can be achieved by using a logic signal of the required period to override the internal pulse width generator.

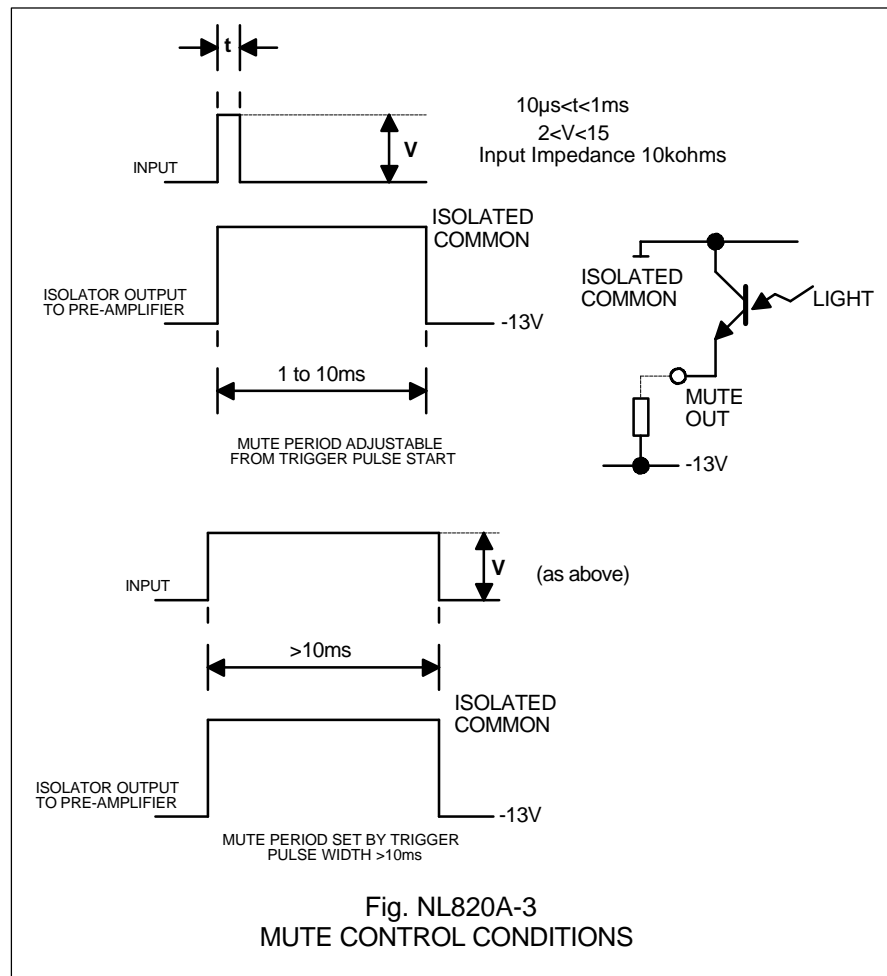


Fig. NL820A-3 illustrates the mute control requirements.

Safety

It should be self evident that by ensuring that a high impedance path is presented to any earth return current that could be present under fault conditions, the NL820A will provide a higher order of electrical safety than conventional amplifier components.

Care should therefore be taken to preserve the isolation barrier created within the NL820A module by avoiding any unintentional ground connection to the amplifier inputs or isolated power supply. At 50/60Hz power line frequency the impedance present between the input circuit common terminal and supply ground is of the order of 100M ohms due to the leakage capacity specified at less than 35 pF.

NL820A Edge Connector

No.	Function
1	not used on NL820A
2	channel 1 out
3	channel 2 out
4	not used on NL820A
5	channel 3 out
6	not used on NL820A
7	+15V
8	keyway
9	0V
10	not used on NL820A
11	channel 4 out
12	+5V
13	-15V

Specification

Isolation:	Voltage	- $\pm 2,500$ volts DC or DC plus peak AC
	Capacitance	- 35pf
	Resistance	- 10k Mohms (10^{10} ohms)
	Ground signal attenuation	- 2 x signal frequency Hz/ 10^6 (approx.)

See Fig NL820A-2 for definition of isolation measurements.

Gain: x1, x2, x5 - accuracy $\pm 3\%$

Input:	Amplitude	- ± 1 volt linear range; ± 10 volts absolute
	Impedance	- 10k ohms
	Bias current	- less than 50 nA
	Noise	- less than 4 mV at 150 kHz
	Offset	- less than 10 mV

Output:	Amplitude	- ± 5 volts maximum, dependant on gain setting
	Frequency response	- DC to 15kHz (-3dB point)

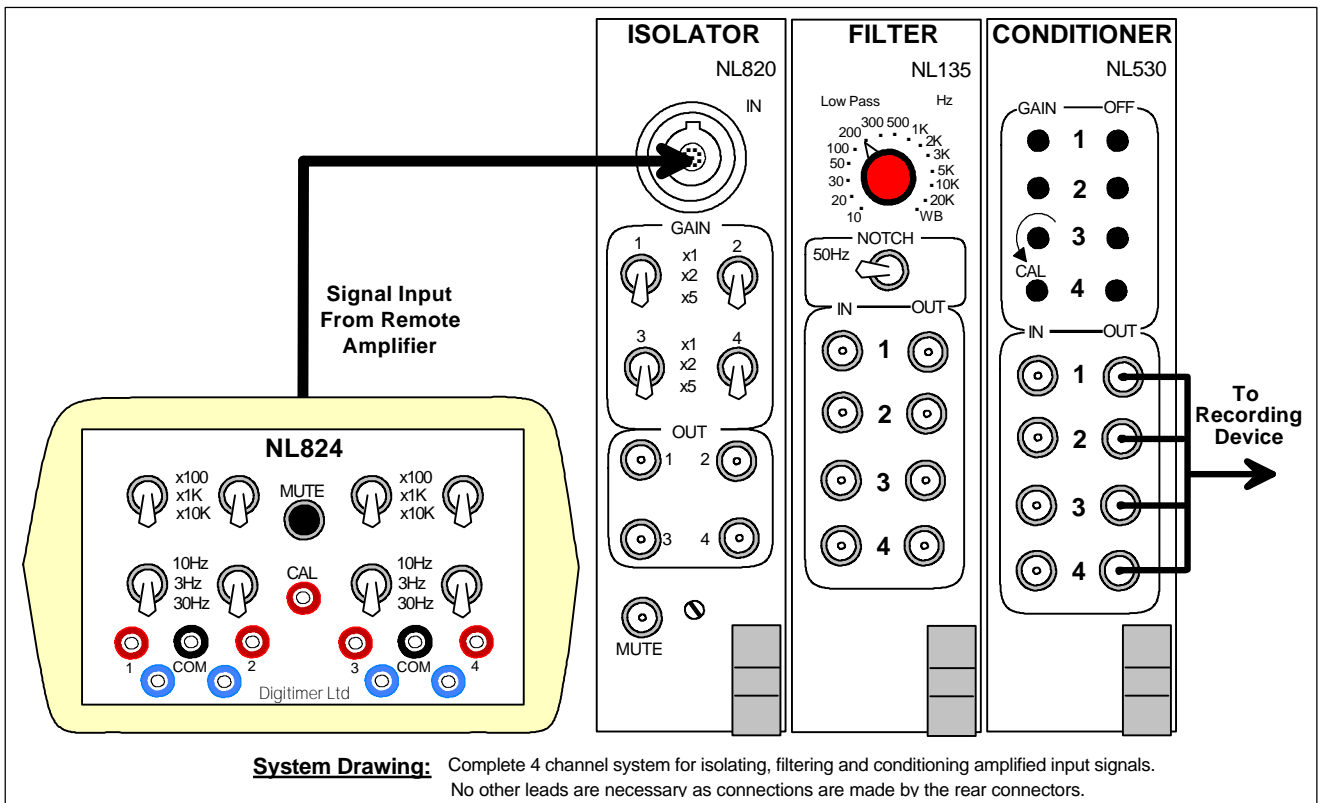
Isolated Power: ± 13 volts nominal un-regulated, current maximum ± 40 mA,
output impedance 35 ohms nominal

Input Power: +15 volts regulated at 45 mA, -15 volts at 40 mA, +5V at 100 μ A (from NL900).
Add 1.2mA for each 1mA of Isolated power used.
+15V @ 93 mA, -15V @ 88 mA, +5V @ 100 μ A for max. isolated power specified

Refer to NL822 and NL824 data sheets for suitable pre-amplifier modules.

Optional Accessories

NL969P	9-way plug to mate with NL820A. (As used on NL822 and NL824 leads)
NL969S	9-way socket to mate with NL822 and NL824. (As used on NL820A front panel)
NL969T	"T" adaptor connects 2 x NL822 into a NL820A for 4-channel use.



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File Reference: N:\DOCS\COMPANY\MANUALS\NEUROLOG \NL820A.SAM