

# Phillips Scientific

## Quad Linear Gate Fan-In/Out

# NIM MODEL 744

### FEATURES

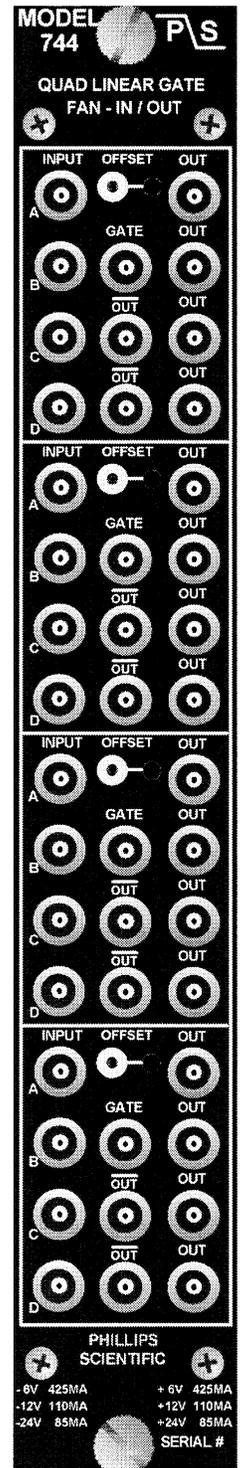
- \* Four Independent Fast Analog Switches
- \* Linear or Logic Fan-In of Four and Fan-Out of Six per Channel
- \* Wideband - DC to 250 MHz
- \* Ideal for Fast Analog Multiplexing or Demultiplexing
- \* Fully Bipolar Operation to  $\pm 2.5$  Volts
- \* Reliable - Both Inputs and Outputs are Protected

### DESCRIPTION

The Model 744 is a four-channel unity gain linear gate with fan-in/fan-out packaged in a single width NIM module. The linear gate function allows clipping of bipolar signals producing unipolar pulses for subsequent analog to digital conversion. Also tasks such as analog multiplexing from N lines to one line are easy to implement, as well as, analog demultiplexing from one line to N lines. Four linear inputs provide summing of linear levels or pulses. Both inverted and non-inverted output levels are produced simultaneously allowing very complex analog triggers to be fast and easy to develop. Direct coupling of all inputs and outputs eliminates the baseline shifts due to rate or duty cycle effects, while also making the device useful for performing logic functions.

### INPUT CHARACTERISTICS

- Summing Inputs** : Four LEMO connectors per channel; bipolar input, accepts positive or negative voltages; impedance 50 ohms  $\pm 2\%$  direct coupled, input reflections less than  $\pm 4\%$  for 1 nSec risetime.
- Protection** : Protected with clamping diodes, no damage will occur from transients of  $\pm 100$  Volts ( $\pm 2$  amps) for 1  $\mu$ Sec or less duration.
- Gate Input** : One LEMO connector per channel, 50 ohm impedance direct coupled; the analog switch is normally closed with no gate applied, and will open with a negative NIM level of -500 mV or greater. Gate opening and closing times are less than 2 nSec. Accepts normal or complemented NIM levels or pulses.
- Off-Isolation** : Better than 60 db for DC to 100 MHz inputs.
- Gate Feedthrough** : Less than 1 pC, or less than  $\pm 40$  pVolt second glitch.



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## **OUTPUT CHARACTERISTICS**

- General** : Six bridged LEMO output connectors per channel. Four non-inverted outputs and two inverted outputs, low impedance voltage source output stage.
- Protection** : Outputs can be continuously shorted to ground without damage.
- Output Voltage Swing** : Bipolar outputs deliver over  $\pm 2$  Volts across four 50 ohm loads.
- DC Offset** : A front panel 15-turn potentiometer provides  $\pm 500$ mV adjustment; the front panel test point allows easy monitoring of the DC offset.

## **GENERAL PERFORMANCE**

- Gain** : Fixed gain of  $1.0 \pm 2\%$  both inverted and non-inverted.
- Stability** : Better than  $\pm 100$   $\mu$ Volt/ $^{\circ}$ C from DC to 1 MHz, and  $\pm .05\%$ / $^{\circ}$ C above 1 MHz.
- Linearity** :  $\pm 0.4\%$ , outputs to  $\pm 2$  Volts across two 50 ohm loads or  $\pm 1.5$  Volts across four 50 ohm loads.
- Bandwidth** : DC to 250 MHz, 3 db point for 1 Volt peak to peak.
- Wideband Noise** : Less than 500  $\mu$ Volts RMS, referred to the input (32 nV/ $\sqrt{\text{Hz}}$ ).
- Risetime** : Typically 1.4 nSec, for a 1 Volt output excursion.
- Insertion Delay** : Typically 3.5 nSec.
- Crosstalk** : Greater than 60 db, DC to 100 MHz.
- Power Supply Requirements** : +6V @ 425 mA   +12V @ 110 mA   +24V @ 85 mA  
- 6V @ 425 mA   - 12V @ 110 mA   - 24V @ 85 mA  
Note: All currents are within NIM specification limits allowing a full bin  
to be operated without overloading.
- Operating Temperature** :  $0^{\circ}$ C to  $70^{\circ}$ C ambient.
- Packaging** : Standard single width NIM module in accordance with TID-20893 (Rev.) and Section ND-524.
- Quality Control** : Standard 36 hour cycled burn-in with switched power cycles.