

# Phillips Scientific

## Six Channel Discriminator

# NIM MODEL 711

### FEATURES

- \* Six Channels In Single Width NIM Module
- \* 150 MHz Rate Capability
- \* Burst Guard Capability
- \* Deadtimeless Updating Outputs
- \* Fast Summed Output
- \* Fast Veto and Bin Gate Inhibiting

### DESCRIPTION

The Model 711 is a high-performance, six channel, leading edge discriminator packaged in a single width NIM module. It features independent threshold and width controls, updating or burst guard operation, a fast veto for inhibiting, a prompt linear summed output, and a versatile output configuration with five outputs per channel.

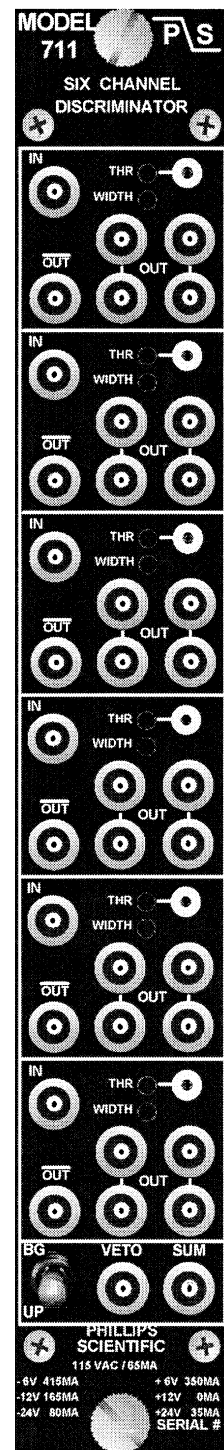
The 711 has high input sensitivity of -10mV variable to -1Volt via a 15-turn front panel control. A front panel test point on each channel provides a DC voltage equal to ten times the actual threshold to insure accurate settings.

A two position switch permits the 711 to be used as either a conventional updating discriminator or, when in the Burst Guard position, an updating discriminator with the time-over-threshold feature. As an updating discriminator the output width is variable from 4nSec to 1mSec via a front panel screwdriver adjustment. Should inputs occur at time intervals less than the double-pulse resolution (typically 6nSec), the unit will not respond. In the Burst Guard mode when inputs occur that are less than the discriminator resolving time, the output will be extended until the trailing edge of the last pulse within the burst.

Inhibiting of the discriminator can be accomplished in two ways. A front panel LEMO input accepts a NIM level pulse for fast simultaneous inhibiting of all six channels. Secondly, a slow bin gate via the rear panel connector inhibits the module and is enabled or disabled from a rear panel slide switch.

A unique summed output common to all six channels delivers -1mA of current for each activated channel, thus allowing a fast decision to be made on the number of channels simultaneously hit. Up to 18 channels can be "OR'D" directly by cable to other summed outputs providing a versatile scheme to form a trigger.

The 711 has five high-impedance current switching outputs per channel. They are configured as two pairs of double-amplitude bridged outputs and one complemented NIM output. When only one output from a bridged pair is used, a double-amplitude NIM pulse (-32mA) is generated for driving long cables. Two normal NIM levels are produced when both of the bridged pairs operate into 50 ohm loads. The output risetimes and falltimes are typically 1nSec, and their shapes are virtually unaffected by the loading conditions of the other outputs.



**Phillips Scientific**

"A THEORY DEVELOPMENT COMPANY"

31 Industrial Ave. \* Mahwah, NJ 07430 \* (201) 934-8015 \* Fax (201) 934-8269

## INPUT CHARACTERISTICS

### General:

One LEMO connector input per channel; 50 ohms,  $\pm 1\%$ , direct coupled; less than  $\pm 2\%$  input reflection for a 2.0nSec input risetime; Input protection clamps at +.7Volt and -5Volts, and can withstand  $\pm 2$ Amps ( $\pm 100$ V), for 1mSec with no damage to the input.

### Threshold:

From -10mV to -1Volt; One front panel 15-turn screwdriver adjustment for each channel; better than  $\pm 0.2\%/^{\circ}\text{C}$  stability; A front panel test point provides a DC voltage ten (10) times the actual threshold setting.

### Fast Veto:

One LEMO connector input common to all six (6) channels; accepts normal NIM level pulse (-500mV), 50 ohms, direct coupled; The veto input must precede the negative edge of input pulse by 5nSec; 4nSec minimum input width.

### Bin Gate:

Rear panel slide switch enables or disables slow bin gate in accordance with TID-20893. Inhibits the module within 10nSec after the bin gate signal is applied.

## GENERAL PERFORMANCE

### Continuous Repetition Rate:

Greater than 150 MHz minimum, input to output. Typically 160 MHz.

### Pulse-Pair Resolution:

Better than 6.5nSec; typically 6.0nSec with output width set at minimum.

### Input to Output Delay:

Less than 8.0nSec.

### Multiple Pulsing:

One and only one output pulse regardless of input pulse amplitude or duration.

### Power Supply Requirements:

- 6 Volts @ 415 mA	+6 Volts @ 350 mA
-12 Volts @ 165 mA	+12 Volts @ 0 mA
-24 Volts @ 80 mA	115 VAC @ 65mA
	+24 Volts @ 35 mA

**Note:** All currents are within NIM specification limits permitting a full powered bin to be operated without overloading.

### Operating Temperature:

0  $^{\circ}\text{C}$  to 70  $^{\circ}\text{C}$  ambient.

### Packaging:

Standard single width NIM module in accordance with TID-20893 and Section ND-524.

### Quality Control:

Standard 36-hour, cycled burn-in with switched power cycles.

## OUTPUT CHARACTERISTICS

### General:

Five (5) LEMO connector outputs per channel; Two pairs of negative NIM bridged outputs, and one complementary output. The bridged pairs deliver a double amplitude pulse of -32mA (-1.6 Volts), into a single 50 ohm load and -16mA (-800 mV) with both terminated. The complement is quiescently -16mA (-800mV) and goes to 0mA (0Volt) into 50 ohms during output. The output rise and fall times are less than 1.5nSec from 10% to 90% levels. The output pulse shapes are optimized when the bridged outputs are 50 ohm terminated.

### Output Duration:

A two position front panel locking toggle switch selects either updating operation or burst guard operation, common for all six (6) channels.

**Updating:** The output width is controlled by a front panel 15-turn screwdriver adjustment, continuously variable from 4nSec to 1mSec. The output pulse will be extended if a new input pulse occurs while the output is active. This provides deadtimeless operation and a 100% duty cycle can be achieved.

**Burst Guard:** The output duration equals either the input signal's time-over-threshold or the preset duration from the width control, whichever is greater. For input bursts of 150 MHz or higher, the output will equal the duration of the burst. Output width stability is  $\pm 0.15\%/^{\circ}\text{C}$  of setting.

### Summed Output:

One LEMO connector output common to all six (6) channels; -1mA output pulse (-50mV into 50 ohms) for each channel fired. Output duration is equal to the output width setting of the respective channel. Output rise and fall times are less than 2.5nSec into 50 ohms. Up to 18 channels can be directly "OR'D" by cable. Dynamic range greater than -1Volt.