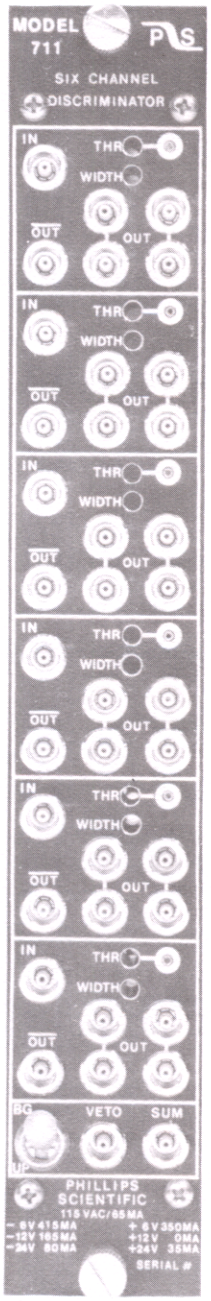
Phillips Scientific

Hex 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 -1 Volt 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 4 nSEC to 1 uSEC 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 should inputs occur that are less than the discriminator resolving time, the outputs 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 -1 mA 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 (-32 mA) 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 1 nSEC, and their shapes are virtually unaffected by the loading conditions of the other outputs.

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INPUT CHARACTERISTICS

General:

One LEMO connector input per channel; 50 ohms ±1%, direct coupled; less than 2% input reflection for a 2.0 nSEC input risetime. Input protection clamps at +.7V and -5V and can withstand transients of ±2 amps (±100 Volts) for 1 uSEC with no damage to the input.

Threshold:

Variable from -10 mV to -1 Volt; 15 turn screw-driver adjustment; better than ±0.2%/°C stability; 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 (-500 mV), 50 ohms impedance direct coupled; must precede the negative edge of input pulse by 5 nSEC to veto; 4 nSEC minimum input width.

Bin Gate:

Rear panel slide switch enables or disables bin slow gate in accordance with TID-20893. Responds in approximately 10 nSEC to Bin Gate signal.

OUTPUT CHARACTERISTICS

General:

Five (5) LEMO connector outputs per channel; Two pairs of negative bridged outputs and one complementary output. The bridged pairs deliver a double-amplitude pulse of -32 mA (-1.6 Volts into a single 50 ohm load, or -800 mV when both outputs are 50 ohm terminated). The complementary output is quiescently -16 mA (-800 mV into 50 ohms) and delivers 0 mA (0 Volts into 50 ohms) during output. Output risetimes and falltimes are less than 1.5 nSEC 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 allows 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 4 nSEC to 1 uSEC. Burst Guard: The output duration equals either the input signals time-over-threshold (TOT), or the preset duration of 4 nSEC to 1 uSEC, whichever is greater. For input bursts of 150 MHz or greater, the output will equal the duration of the burst, should it be greater than the preset duration. Output width stability is ±.15%/°C of setting.

Summed Output:

One LEMO connector output common to all eight (8) channels; -1 mA output pulse (-50 mV into 50 ohms) for each channel fired. Output duration is equal to the output width setting of the respective channel. Output risetimes and falltimes are less than 2.5 nSEC into 50 ohms. Up to 18 channels can be directly "OR'D" by cable. -1 Volt of dynamic range.

GENERAL PERFORMANCE

Rate:

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

Double-Pulse Resolution:

Less than 6.5 nSEC; typically 6 nSEC with output width set at minimum

Input to Output Delay:

Less than 8 nSEC.

Multiple Pulsing:

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

Power Supply Requirements:

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

Note: All currents within NIM specification limits allowing a full-powered bin to be operated without overloading.

Operating Temperature:

0°C to 70°C ambient.

Packaging:

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

Options:

Contact Phillips Scientific to find out about available options.

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