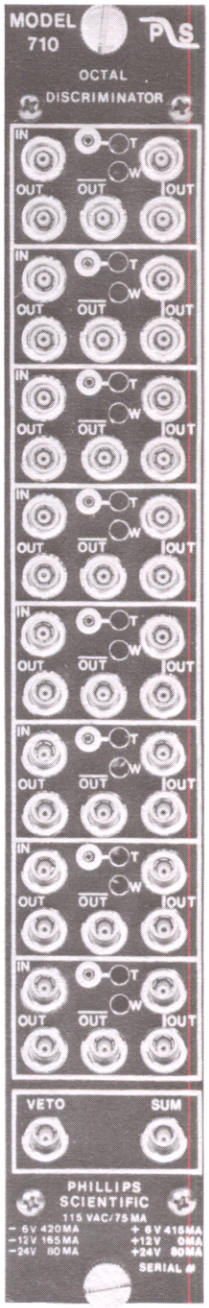
Phillips Scientific

Octal Discriminator

NIM MODEL 710

FEATURES

- 150 MHZ RATE CAPABILITY
- DEADTIMELESS UPDATING OPERATION
- FOUR OUTPUTS PER CHANNEL
- FAST VETO AND BIN GATE INHIBITING
- LINEAR SUMMED OUTPUT



DESCRIPTION

The model 710 is a high-performance, eight-channel, leading edge discriminator packaged in a single-width NIM module. It features independent threshold and width controls, a fast veto for inhibiting, a prompt linear summed output, and a versatile output configuration with four updating outputs per channel.

The 710 has high input sensitivity of -10 mV 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 unique summed output, common to all eight 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 16 channels can be "OR'D" directly by cable to other summed outputs providing a versatile scheme to form a trigger.

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 eight 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.

Output durations are continuously variable via a front panel control over the range of 4 nSEC to 150 nSEC. The updating design permits deadtimeless operation which is desirable for fast coincidence applications at high rates.

The 710 has four high-impedance current switching outputs per channel. They are configured as one pair of double-amplitude bridged outputs, one normal NIM level and one complemented NIM level. When only one output from the 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 outputs operate into 50 ohm loads. The output risetimes and falltimes are typically 1 nSEC, and their shapes are 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%, DC coupled; less than 2% input reflection for a 2.0 nSEC input rise-time. Input protection clamps at +.7 volts and −5 volts and can withstand ±2 amps for 1 μSEC with no damage to the input.

Threshold:

-10 mV to −1 volt; one front panel 15 turn screwdriver adjustment for each channel; 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 eight (8) channels; accepts normal NIM level pulse (−500 mV) the veto input must precede the negative edge of input pulse by 5 nSEC; 4 nSEC minimum input width.

Bin Gate:

Rear panel slide switch enables or disables bin slow gate in accordance with TID-20893.

OUTPUT CHARACTERISTICS

General:

Four (4) LEMO connector outputs per channel; one set of negative bridged outputs; one normal NIM level and one complementary output. The bridged pair 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 normal NIM output delivers −16 mA (−800 mV into 50 ohms). The complementary output is quiescently −16 mA (−800 mV into 50 ohms) and delivers 0 mA (0 volts into 50 ohms) during output. Output rise-times and falltimes are less than 1.5 nSEC from 10% to 90% levels.

Width Control:

One front panel control per channel; 15 turn screwdriver adjustment; outputs continuously variable from 4 nSEC to 150 nSEC. Output width stability is ±.15%/°C of setting.

Updating Operation:

The output pulse will be extended if a new input pulse occurs while the output is active. This provides deadtimeless operation and 100% duty cycle can be achieved.

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 fall-times are less than 2.5 nSEC into 50 ohms. Up to 16 channels can be directly "OR'D" by cable. −1 volt of dynamic range.

GENERAL PERFORMANCE

Continuous Repetition Rate:

Greater than 150 MHz, with output width set at minimum.

Pulse-Pair Resolution:

Better than 6.5 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 volts @ 420 mA	+ 6 volts @ 415 mA
−12 volts @ 165 mA	+12 volts @ 0 mA
−24 volts @ 80 mA	+24 volts @ 80 mA
115 volts AC @ 75 mA	

NOTE: All currents are within NIM specification limits allowing a full 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 ND-524.

Quality Control:

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

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