



NIM Model 429A Quad Mixed Logic Fan-In/Fan-Out

The LeCroy Model 429A is a multifunctional fast logic module designed to fulfill a wide variety of signal handling needs. It combines the operations of TTL-to-NIM level translation, logic fan-in, logic fan-out, and polarity inversion in one low-cost module. Each of the four channels of the Model 429A has four inputs which accept both NIM and TTL levels. This is particularly important for present generation experiments involving MWPC systems and elaborate digital triggers.

Each channel of the Model 429A contains four independent logic inputs, four normal logic outputs, and two complementary logic outputs. Channels may be paralleled to provide up to 16 inputs and 24 outputs by means of a front-panel switch. An efficient circuit design holds the power dissipation of the entire module to within the NIM standard.

The Model 429A eliminates the extra cabling and time delay involved when conventional fan-ins and fan-outs must be cascaded. In addition, it eliminates the common use of expensive logic units to perform logical OR-ing with adequate fan-out. The ability to conveniently parallel channels permits the 429A a degree of flexibility and efficiency heretofore unavailable.

Inputs are 50 Ohm impedance for NIM or TTL signals. Unused inputs need not be terminated. Inputs may be driven with single or double amplitude NIM signals or TTL signals without affecting output amplitude. The three pairs of bridged outputs are direct-coupled current sources which deliver -32 mA into two 50 Ohm loads. Output duration is equal to the logical sum of the input durations.

The circuitry of the Model 429A is complete direct-coupled and compatible with either normal or complementary logic signals in any duty ratio. Channel paralleling is accomplished by means of a single front-panel locking switch that is not in the signal path and hence permits switching with minimal effect on signal fidelity. Front-panel lamps located between channels light to indicate channels that are combined, providing a clear, easily interpreted display of the unit's status.

NIM Model 429A QUAD MIXED LOGIC FAN-IN/FAN-OUT

SPECIFICATIONS

Number of Sections:	Four; may be cascaded by means of front-panel switch to form dual 8-fold fan-in/12-fold fan-out or single 16-fold fan-in/24-fold fan-out, with LED indication.
INPUT CHARACTERISTICS	
Number of Inputs:	Four per section.
Impedance:	50 Ohm +/-5%.
Reflections:	< 10% for input risetimes ≥ 2 nsec.
Quiescent Level:	0 volts dc.
Signal Level Requirements:	Standard NIM logical 1 input levels: -12 mA to -36 mA; standard TTL logical 1 input levels: +2 V to +5 V.
Signal Width Requirements:	4 nsec minimum, FWHM.
Coupling:	Direct.
OUTPUT CHARACTERISTICS	
Number of Outputs:	4 normal (2 bridged pairs); 2 complementary (1 bridged pair).

Output Levels:	Normal: quiescently 0 mA, > 28 mA into two 50 Ohm during outputs. Complementary: quiescently, > 28 mA into two 50 Ohm loads, 0 mA during output.
Risetimes and Falltimes:	2.3 nsec typical, 2.8 nsec maximum.
Duration:	Equal to the logical sum of the input durations.
Time Variation of Output with Input Amplitude:	< 1 nsec worst case between inputs of -600 mV and -1.6 volts; typically < 0.5 nsec.
Time Variation Between Outputs:	4 channels, 4 x 6 operation: < 0.2 nsec; 2 channels, 8 x 12 operation: < 0.4 nsec; 1 channel, 16 x 24 operation: < 0.9 nsec.
GENERAL	
Rate:	> 100 MHz.
Stage Delay:	< 6.5 nsec.
Duty Cycle Limitations:	None.
Packaging:	Single-width AEC/NIM module; in conformance with AEC standard for nuclear modules (AEC Report TID-20893); Lemo-type connectors.
Current Requirements:	+ 12 V at 35 mA +6 V at 295 mA -12 V at 50 mA -6 V at 460 mA

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