# Technical Information

## GENERAL DESCRIPTION

The LRS Model 128, 128L is a dual-channel, direct-coupled linear pulse fan-out which provides unity gain over its 100 MHz bandwidth. Each of its two independent channels accepts either standard fast logic signals or photomultiplier pulses directly and delivers 8 identical outputs. A front-panel switch may be used to combine the inputs of the two channels to form a single 16-fold fanout channel.

Each channel of the Model 128, 128L has one input and 8 outputs. Both input and output levels are at ground potential for easy interconnection to other direct-coupled circuits. A built-in diode limiter circuit provides input protection against fast transients and a constant, matched 50 Ω input impedance to ± 100 volts.

The gain of each channel, input to any output is unity into a 50 Ω load or X 2.0 into a high impedance. The non-linearity of the gain is less than one percent over a 0 to - 1.8 volt dynamic range.

Each of the outputs is fully isolated from the others and reverse-terminated in 50 Ω. The 128, 128L will deliver a maximum of - 2 volts into 50 Ω or - 3 volts into a high impedance. The circuit is linear through zero and will



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deliver a maximum of + 150 mV into 50 Ω.

The Model 128 is packaged in a NIM double-width module with BNC type connectors. The 128L is housed in a single-width module and uses LEMO type connectors.

# echnical Information

## SPECIFICATIONS

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| Number of Channels: | 2 |
| Inputs: | One per channel; direct-coupled; channel inputs may be combined by means of front-panel switch. |
| Input Impedance: | 50 Ω ± 5% and constant to the limit of the input protection. |
| Input Polarity: | Negative |
| Input Offset: | 0.0 ± 2 mV. |
| Input Protection: | A built-in diode limiter provides protection against overload, and a constant impedance up to ± 100 volts. DC overload characteristics are determined by the 250 mW dissipation limit of the 50 Ω terminating resistor. |
| Reflection Coefficient: | Less than 10% at input amplitudes up to ± 100 volts for input signals of 2 ns risetime. |
| Outputs: | 8 per channel, direct coupled. |
| Maximum Output Amplitude: | - 2 volts into 50 Ω or - 3 volts into an open circuit; + 100 mV into 50 Ω or + 150 mV into an open circuit. |
| Output Risetime: | Less than 2.5 ns, 10% to 90% with all outputs terminated. |
| Output Falltime: | Less than 3.0 ns, 10% to 90% with all outputs terminated. |
| Gain: | Input to any output: 1.0 to 50 Ω load, 2.0 into high impedance. |



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| Gain Uniformity: | Variation in gain between outputs on a single channel is ± 2.0%. |
| Output Stability: | Less than 0.5 mV/°C over a 20°C to 60°C operating range. |
| Non-Linearity: | < 1% over operating range of 0 to - 1.8 V. |
| Delay: | 3.4 ns, input to any output. |
| Input Mixing: | A front-panel switch combines the inputs of the two channels to provide a single sixteen-fold fanout channel. |
| Packaging: | In conformance with AEC standard for nuclear modules (AEC Report TID-20893); Model 128, AEC #2 module with BNC connectors; Model 128L, AEC #1 module with LEMO connectors. Completely compatible physically and electrically with LRS Power Chassis Model 108P, and with any other AEC standard power bin of any manufacturer. |
| Power Requirements: | + 12 volts at 108 mA; - 12 volts at 55 mA; - 24 volts at 44 mA. |