

FUNCTIONAL DESCRIPTION

The Model 3412 16-channel CAMAC ECL discriminator is a high performance unit. It has 16 inputs which accommodate a wide range of input signal levels and operates with input rates up to 200 MHz. The 3412 has differential ECL logic outputs (which offer noise immunity). These outputs are compatible with LeCroy's ECLine family of CAMAC modules including the following: Model 2366 Universal Logic Module, Model 4448 Coincidence Register, Model 4508 Programmable Lookup Unit, Model 4516 Logic Unit, Model 4532 Majority Logic Unit and many more. Descriptions and specifications of the above units can be found on their own separate data sheets.

The 3412 uses 16 of LeCroy's new, state-of-the-art, monolithic integrated circuits, MDC100, which offer a Double Pulse Resolution (DPR) of 4 nsec and output widths from < 5 nsec to > 100 nsec. The MDC100 also features built-in hysteresis which eliminates multiple pulsing on slow input transitions.

The 3412 accepts negative-going pulses via front-panel Lemo connectors. Threshold ranges from -10 mV to -1.023 V for the 3412, and from -15 mV to -1.023 V for the 3412E. The threshold can be adjusted remotely by CAMAC control or locally by a front-panel

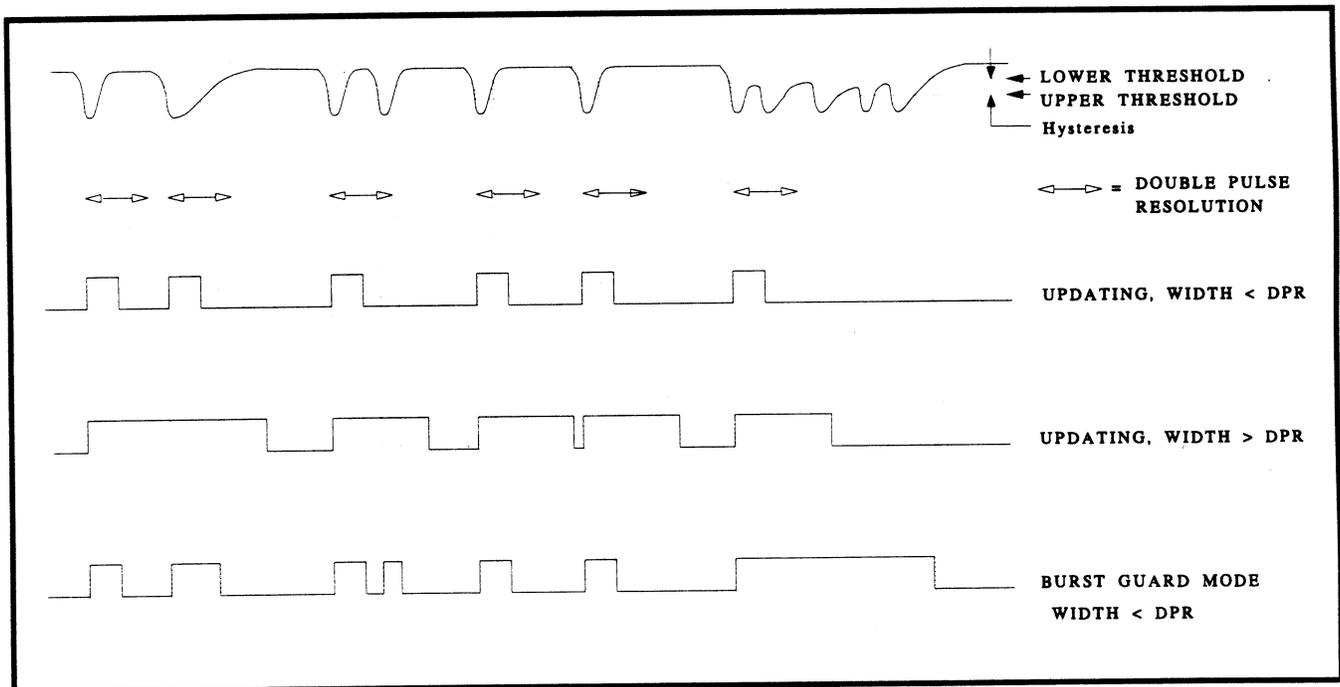
potentiometer. A monitor point is provided to permit accurate measurement of the threshold with a voltmeter.

Each channel has two separate differential ECL outputs. The output width can be adjusted from < 5 nsec to > 100 nsec. Each channel can be masked by either externally applied signals from the rear-panel veto connector, or by CAMAC control. In Local mode, only the external inhibit signals will be active.

Three discriminator modes of operation are built into the 3412: Non-updating, Updating and Burst Guard. These modes can be selected by CAMAC control in Remote or by a side-panel DIP switch in Local.

A current sum output is provided by a rear-panel Lemo. Each discriminator that is active provides 1 mA of current to an external 50Ω load.

A built-in test feature simulates an input signal for each channel upon receipt of either an F(25) command or a NIM level signal applied to the test input connector. This permits rapid, simultaneous testing of all enabled discriminator channels.



Model 3412 Output Modes

INPUT

Signal Inputs: Sixteen inputs via Lemo front-panel connectors, 50 Ω $\pm 2\%$. Protected to ± 2 A for 0.5 μ sec clamping at ± 5 V. Reflections < 5% for input pulses of 2 nsec rise time for amplitudes up to 1 V; input offset voltage typically ± 3 mV.

Test Input: One Lemo connector on front panel, 50 Ω $\pm 2\%$, triggers all enabled channels. Requires NIM level signal (< -600 mV). Minimum width, 3 nsec. Maximum rate, 20 MHz. Rise time < 2 nsec.

Veto-Input: One Lemo front-panel connector, 50 Ω $\pm 2\%$. Permits simultaneous fast inhibiting of all channels. Requires NIM level signals. Direct coupled. Must precede input signal by approximately 6 nsec and overlap its leading edge in Update mode or overlap complete input signal in Burst Guard mode. Minimum duration, 8 nsec.

Individual Vetos (masking): 16 differential (100 Ω twisted pairs) ECL lines (Emitter ORed with CAMAC mask) inhibit selected discriminator channels. Differential True signals inhibit channel; unconnected inputs go to False or uninhibited state; 34-pin rear-panel connector.

THRESHOLD

General: Threshold setting common to all channels; front-panel screwdriver adjustment in local mode or through 12-bit DAC in remote mode (0.25 mV resolution). Stability better than 0.3%/°C to 60°C operating temperature. Threshold monitor point on front panel has 10:1 ratio of monitor voltage to actual voltage $\pm 5\%$.

Hysteresis: Approximately 5 mV for the 3412, 6 mV for the 3412E.

MODEL 3412

Setting: -10 mV to -1.023 V $\pm (5\%$ or 2 mV whichever is greater) minimum usable threshold is -8 mV ± 2 mV, channel to channel.

Note:

$$V_T = \frac{-X}{4095} (1024) - 10 \text{ mV}$$

where V_T = Threshold Voltage in (mV)
 X = DAC Counts (0-4095)

MODEL 3412E

Setting: -15 mV to -1.023 V $\pm (5\%$ or 3 mV whichever is greater) minimum usable threshold is -12 mV ± 3 mV, channel to channel.

Note:

$$V_T = \frac{-X}{4095} (1024) - 15 \text{ mV}$$

where V_T = Threshold Voltage in (mV)
 X = DAC Counts (0-4095)

OUTPUT

Discriminator Outputs: Two separate outputs per channel. ECL level (-0.8, -1.7 V) into 100 Ω twisted-pair. Duration: < 5 nsec to > 100 nsec in the Non-updating mode, continuously variable via screwdriver control in the Local mode or by CAMAC control in Remote mode. Common to all channels. Rise times and fall times < 2 nsec. Width stability better than 0.3%/°C maximum.

Output Width Matching: $\pm 10\%$ channel to channel.

Current Sum Outputs: Rear-panel Lemo connector; high impedance current source; generates a current proportional to the input multiplicity at the rate of -1 mA $\pm 10\%$ per hit (-50 mV per hit into a 50 Ω load); for output widths > 8 nsec*.

Output Operation Modes: Non-updating or Updating with or without Burst Guard. The modes are selectable by a side-panel DIP switch in Local mode or CAMAC control in Remote mode.

GENERAL

Maximum Rate: 200 MHz guaranteed.

Mode Select: Local mode and programmable mode selectable via CAMAC command, or front panel push-button to enable Local mode.

LED Indicators: Remote mode selected (RMT) and CAMAC accessed (N).

Double Pulse Resolution: 5 nsec, typical.

Time Slewing: Less than 500 psec for input amplitudes from 2x to 20x over threshold.

Input-Output Delay: < 8 nsec. Delay matching better than ± 950 psec.

Test-Output Delay: < 11 nsec typical, 13 nsec maximum.

Mode Switch: A side-panel DIP switch enables Non-updating, Updating or Burst Guard and Extended Width operation for all channels. A front-panel LED is lit when Updating operation is selected.

Remote to Local Switch: Recessed front panel forces unit from remote to Local mode.

Packaging: RF-shielded, CAMAC #1 module.

Power Requirements: 2.5 A at -6 V; 1.4 A at +6 V; 30 mA at -24 V; 60 mA at +24 V.

Environment: Proper operation of the 3412 requires +25°C air intake with sufficient airflow to maintain temperature rise of exhaust air to < 20°C.

* Product enhancements for units shipped after October 1995.