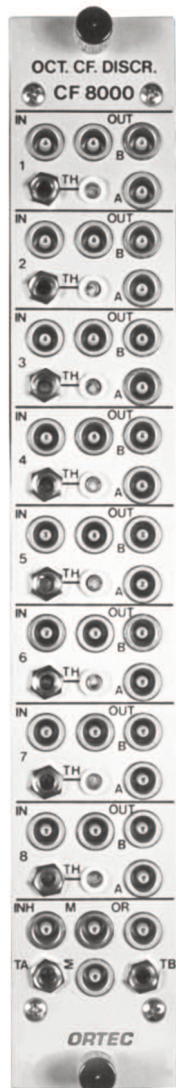


- Good time resolution with a wide range of pulse amplitudes
- Internal delay — no cable necessary
- Automatic walk adjustment
- Multiplicity and OR logic outputs
- Analog sum output
- Inhibit input
- ECL outputs
- Energy outputs



The flexible ORTEC CF8000 Octal Constant-Fraction Discriminator has the performance and convenience features necessary for ease of use in even the most demanding timing or coincidence experiments with multiple detectors. It contains eight constant-fraction discriminators in a single-width NIM module. The constant-fraction technique provides optimum time resolution over a wide range of pulse amplitudes.

Exclusive features of the CF8000 discriminator include internal shaping delay, automatic walk adjustment, an analog summation output, and built-in logic functions to minimize external logic requirements.

The input signals can range from 0 to -5 V. Each input has a separate threshold adjustment (with front-panel monitor), which may range from -10 mV to -1 V.

For each channel, there are three Fast-NIM logic outputs — one "A" and two "B" outputs. All outputs have adjustable widths. There is a single-width adjustment for all eight "A" outputs, and another width adjustment for all 16 "B" outputs. There are also eight rear-panel ECL outputs that have the same width as the "B" outputs. LEMO connectors are used for maximum packing density.

Each channel has a rear-panel "E" output that buffers the input signal.

External delay cables are not necessary on the CF8000 discriminator. Each channel has an internal shaping-delay circuit that can be set for 2, 4, 6, 8, or 10 ns. Optional delay line plug-ins are available for changing the shaping delay ranges to 5, 30, or 50 ns. For all delay plug-ins, there are five possible delay settings. (See Accessories section.)

The automatic-walk adjustment of the CF8000 instrument simplifies set-up and reduces the effects of ground-loops on the incoming signal.

Other front-panel connections include: (1) an analog sum output (Σ), which provides an attenuated summation of all inputs; (2) a multiplicity output (M), which provides a voltage proportional to the number of valid "B" outputs; (3) an OR logic output that provides a logic output for every active "B" output; and (4) an inhibit input (INH), which disables all "B" outputs.

The constant-fraction ratio is factory set at 0.4.

Specifications

PERFORMANCE

WALK $<\pm 250$ ps from -50 mV to -5 V for a pulse rise time of 1 ns, a pulse width of 10 ns, a 2-ns delay, and the threshold set at minimum.

CONSTANT-FRACTION RATIO 0.4.

INPUT/OUTPUT RATE 20 MHz maximum.

PULSE/PAIR RESOLUTION <50 ns.

TRANSMISSION DELAY

"A" Outputs 13 ns, typically.

"B" Outputs 16 ns, typically.

THRESHOLD TEMPERATURE SENSITIVITY

$<\pm 100$ ppm/ $^{\circ}$ C from 0 to $+50^{\circ}$ C.

CONTROLS

THRESHOLD CONTROL (TH) 20-turn front-panel screwdriver adjustment for each discriminator channel; nominally variable from -30 mV to -1 V.

THRESHOLD MONITOR Front-panel test point located to the right of the threshold control. Outputs actual threshold voltage.

WIDTH ADJUSTMENTS (TA and TB) 20-turn front-panel screwdriver adjustments to set the width of the "A" and "B" Fast-NIM logic outputs. Adjustment range: nominally 20-200 ns.

DELAY Internal PCB jumper setting allows the proper shaping delay to be selected. Five possible positions: 2, 4, 6, 8, or 10 ns. Other delays available on order.

INPUTS

INPUTS Front-panel LEMO connector for each channel.

INPUT RANGE 0 to -5 V.

PROTECTED TO -100 V for pulse duty cycles $<0.05\%$.

IMPEDANCE 50 Ω , dc-coupled.

INHIBIT INPUT Front-panel LEMO connector accepts negative Fast-NIM signal. Active-low signal disables "B" logic outputs.

OUTPUTS

"A" LOGIC OUTPUTS (A) Eight front-panel LEMO connectors provide adjustable-width, updating Fast-NIM logic signals for inputs above threshold setting.

Amplitude -0.7 V minimum with $50\text{-}\Omega$ load.

Width Settable from nominally $20\text{--}200$ ns by 20-turn front-panel screwdriver adjustment (TA).

"B" LOGIC OUTPUTS (B) Sixteen front-panel LEMO connectors provide adjustable-width, updating Fast-NIM logic signals for inputs above threshold setting.

Amplitude -0.7 V minimum with $50\text{-}\Omega$ load.

Width Settable from nominally $20\text{--}200$ ns by 20-turn front-panel screwdriver adjustment (TB).

MULTIPLICITY OUTPUT (M) Front-panel LEMO connector provides a pulse signal with amplitude proportional to the number of "B" logic outputs active at any instant. **Amplitude Range** Nominally 0 to -0.5 V with $50\text{-}\Omega$ load.

OR OUTPUT (OR) Front-panel LEMO connector provides logical OR of all "B" logic outputs. Negative Fast-NIM signal.

ANALOG SUM OUTPUT (Σ) A front-panel LEMO connector provides an analog summation of all input channels divided by an attenuation factor of approximately 16, with a $50\text{-}\Omega$ load.

ENERGY OUTPUTS Eight, rear-panel LEMO connectors provide the buffered input signal from each channel.

Output Impedance $50\text{-}\Omega$, ac-coupled.

ECL OUTPUTS Rear-panel 2 X 8 differential ECL logic connector that provides an ECL version of the eight "B" outputs.

Line Impedance $112\ \Omega$.

ELECTRICAL AND MECHANICAL

POWER REQUIRED $+12$ V, 40 mA; -12 V, 40 mA; $+6$ V, 250 mA; -6 V, 1000 mA.

WEIGHT 1.5 kg (3.3 lbs).

DIMENSIONS Standard single-width NIM module, 3.43 X 22.13 cm (1.35 X 8.714 in.) front panel per DOE/ER-0457T.

Optional Accessories

CFD-DELAY-5 ns Delay plug-in for 1, 2, 3, 4, or 5-ns delay settings.

CFD-DELAY-10 ns (Factory installed in the instrument) Delay plug-in for 2, 4, 6, 8, or 10-ns delay settings.

CFD-DELAY-30 ns Delay plug-in for 6, 12, 18, 24, or 30-ns delay settings.

CFD-DELAY-50 ns Delay plug-in for 10, 20, 30, 40, or 50-ns delay settings.

Ordering Information

To order the NIM module, specify:

Model	Description
CF8000	Octal Constant-Fraction Discriminator

To order delay options, specify:

CFD-DELAY-5NS
CFD-DELAY-10NS
CFD-DELAY-30NS
CFD-DELAY-50NS

Order eight delay options to populate all 8 discriminator channels.