Double Hit Resolution of the CFD950
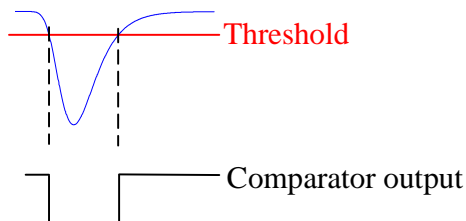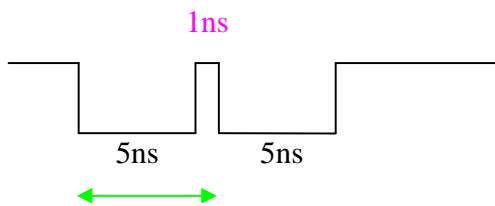
The comparator gives an output signal as long as the analog input signal is above threshold:

Threshold

Comparator output

The output signal width is adjustable by a shaper, with a minimum 'stable' pulse width of 5ns, and a shaper 'dead time' of **~1ns**.

Blocking mode:

1ns

5ns   5ns
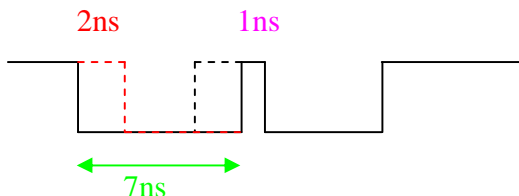
The total dead time of the CFD is ~**6ns**. A second input pulse within the output pulse width is ignored

Updating mode:

Output pulse width is extended by a second input pulse by the selected width. Assuming a 2ns analog signal (above threshold) the minimum output pulse width then is 7ns, with an additional shaper dead time of 1ns.

2ns   1ns

7ns

For *second pulse rejection* the 'double pulse resolution' can be improved down to ~1ns by measuring the output pulse width (CAEN TDC V1190B/V1290A: trailing&leading edge detection, 5ns double hit resolution).
However, this *cannot be used for fast timing purposes*.