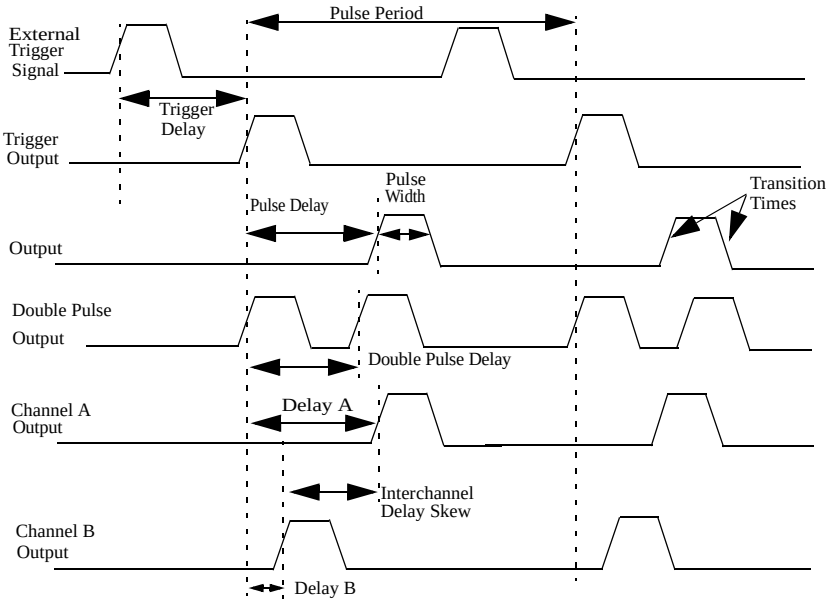
Pulse Parameter Definitions

Here you find the pulse parameter definitions of terms used in the instrument specifications. In the following figure a graphical overview of the pulse parameters is provided:

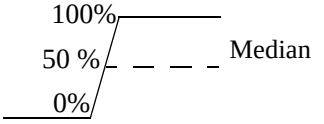
Figure 1 Overview of the Pulse Parameters



Time Reference Point:

The time reference point is at the median of the amplitude (50% amplitude point on pulse edge).

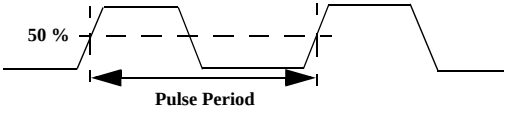
Figure 2 Time Reference at Median Amplitude



Pulse Period:

The time interval between the leading edge medians of consecutive output pulses

Figure 3 Pulse Period



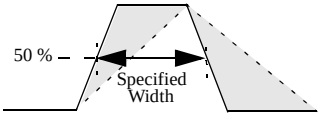
Trigger Delay

Interval between trigger point of the external trigger input signal and the trigger output pulse's leading-edge median.

Pulse Width:

Interval between leading- and trailing-edge medians. The specified and displayed value is that obtained with fastest edges, essentially equal to the interval from the start of the leading edge to the start of the trailing edge. By designing so that the pulse edges turn about their start points, the interval from leading-edge start stays unchanged (in practice, start points may shift with changes in transition time) when transition times are varied. This is more convenient for programming and the width display is easy to interpret.

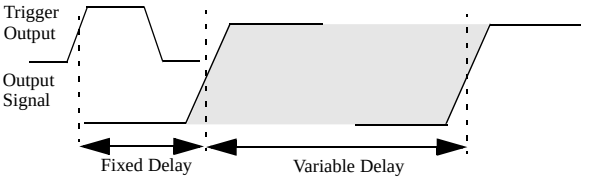
Figure 4 **Pulse Width**



Pulse Delay:

Interval between leading edge medians of trigger output pulse and output pulse. The specified and displayed value is that obtained with the fastest leading edge. Pulse delay has two components, a fixed delay from trigger output to output signal and a variable delay with respect to the trigger output.

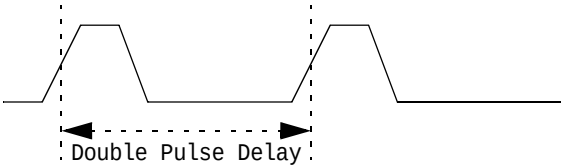
Figure 5 Pulse Delay



Double Pulse Delay:

Interval between leading edge medians of the double pulses.

Figure 6 Double Pulse Delay



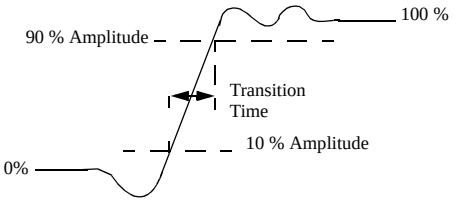
Interchannel Delay (Skew)

Interval between corresponding leading-edge medians of the output signals.

Transition Time:

Interval between the 10%- and 90%- amplitude points on the leading/trailing edge.

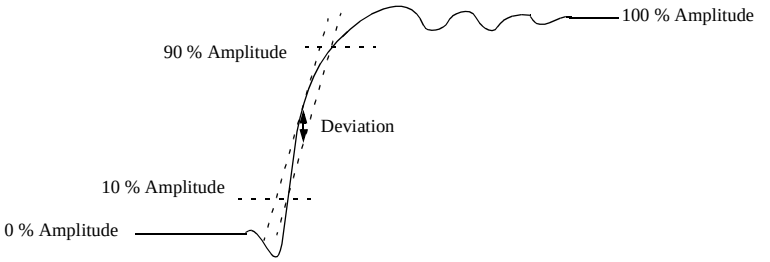
Figure 7 Transition Time



Linearity:

Peak deviation of an edge from a straight line through the 10%- and 90%- amplitude points, expressed as percentage of pulse amplitude.

Figure 8 Linearity



Jitter:

Short-term instability of one edge relative to a reference edge. Usually specified as rms value, which is one standard deviation or “sigma”. If distribution is assumed Gaussian, six sigma represents 99.74% of the peak-peak jitter.
The reference edge for period jitter is the previous leading edge. That for delay jitter is the leading edge of the trigger output. Width jitter is the stability of the trailing edge with regard to the leading edge.

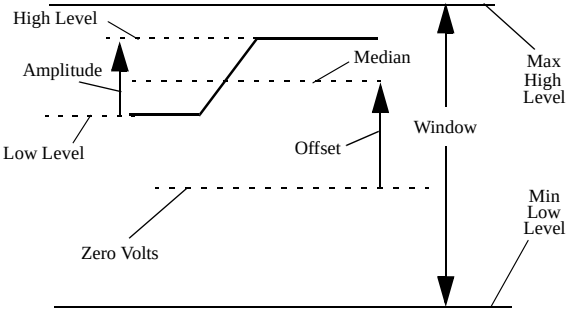
Stability:

Long-term average instability over a specific time, for example, hour, year. Jitter is excluded.

Pulse Levels:

Pulse output is specified as pulse top and pulse base (usually referred to as high level and low level), or as peak to peak amplitude and median offset. A “window” specification shows the limits within which the pulse can be positioned.

Figure 9 Pulse Amplitude

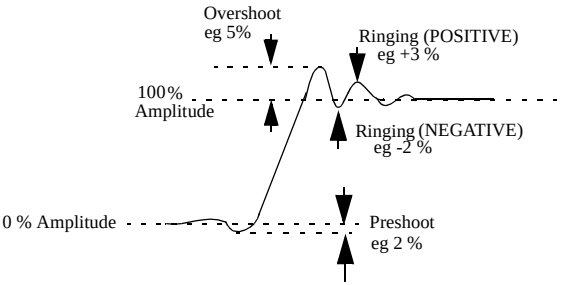


Preshoot, Overshoot, Ringing:

Preshoot and overshoot are peak distortions preceding/following an edge. Ringing is the positive-peak and negative-peak distortion, excluding overshoot, on pulse top or base. A combined preshoot, overshoot, and ringing specification of e.g. 5% implies:

- Overshoot/undershoot < 5%
- Largest pulse-top oscillation
  <± 5%, of pulse amplitude.

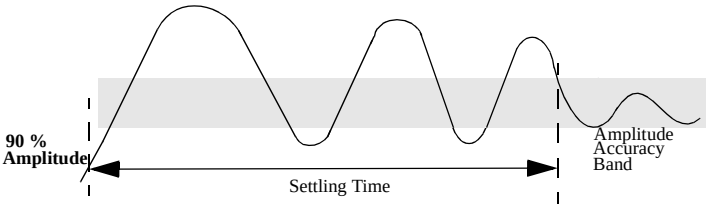
Figure 10 Preshoot, Overshoot, Ringing



Settling Time:

Time taken for pulse levels to settle within level specifications, measured from 90% point on leading edge.

Figure 11 Settling Time



Repeatability:

When an instrument operates under the same environmental conditions and with the same settings, the value of a parameter will lie within a band inside the accuracy window. Repeatability defines the width of this band.

Figure 12 Repeatability