

Qualified First Trigger

Unique Trigger Captures Data From Cyclic Processes

Many measurement applications require the acquisition of bursts of data following an independent, index synchronization pulse. This is true for sector data stored on a disk drive, mechanical analysis of rotating machines and engines, and read/write operations to multiplexed memory. In each case, the underlying operation involves a cyclic process with synchronization sources associated with each individual event within the cycle as well as a once per cycle index pulse.

A good example of this type of process is the organization of data sectors on a disk drive. In figure 1 the upper trace shows read data from a group of sectors. Each sector has an associated sector pulse, shown in the middle trace (channel 3), and the synchronization point for the entire track of 96 sectors is the index pulse shown in the bottom trace.

The Qualified First Smart Trigger permits a single cycle synchronizing pulse, such as the

index pulse of the disk drive, to initiate multiple segment acquisitions each triggered by an individual sector pulse. This process, shown in figure 2, keeps the sequence mode acquisition synchronous with the cyclic process.

Figure 2 shows the Smart Trigger setup menu for Qualified First trigger. The user specifies the qualification source, slope, and threshold voltage as well as the trigger source. If desired, holdoff by time or event can be

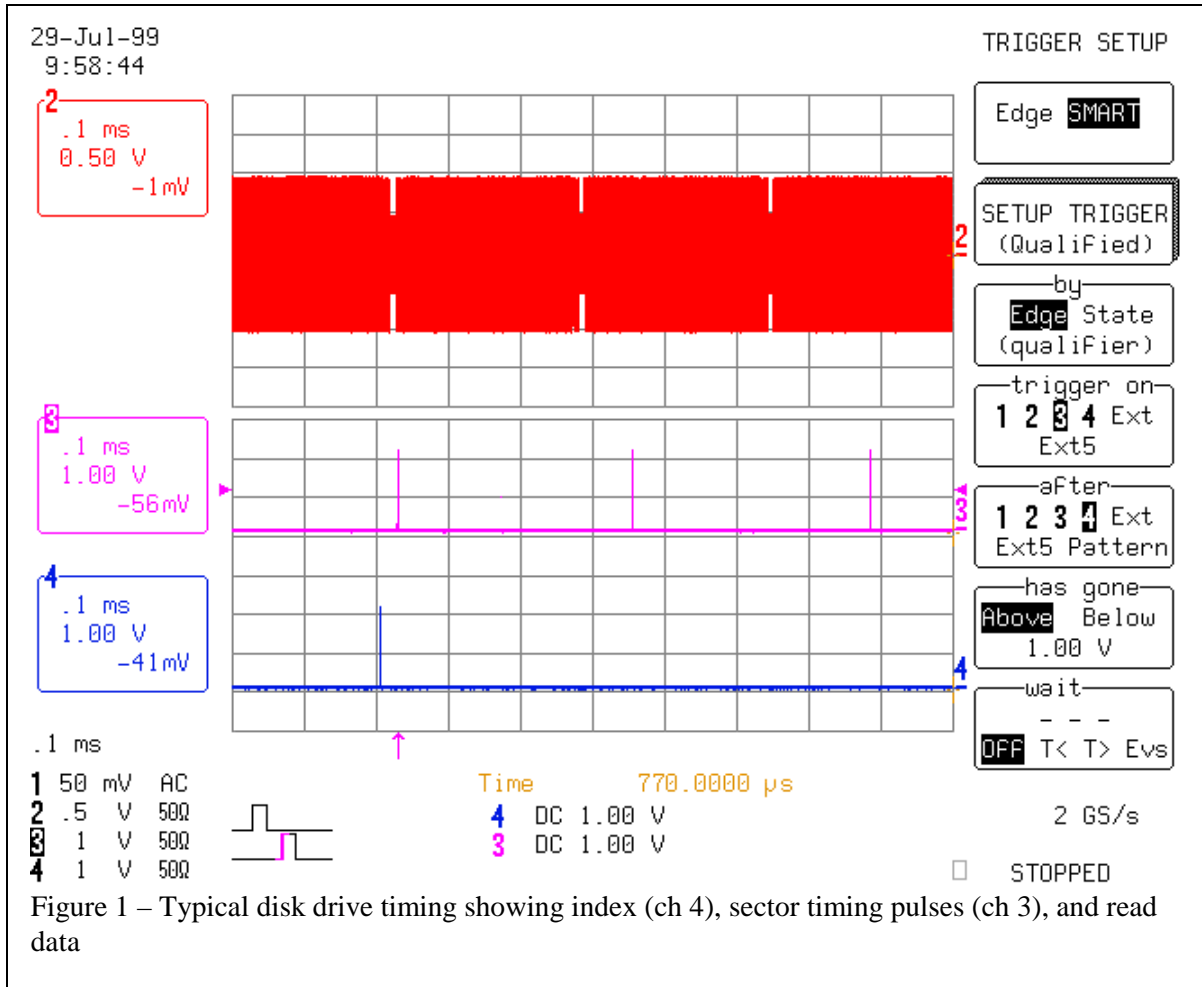


Figure 1 – Typical disk drive timing showing index (ch 4), sector timing pulses (ch 3), and read data



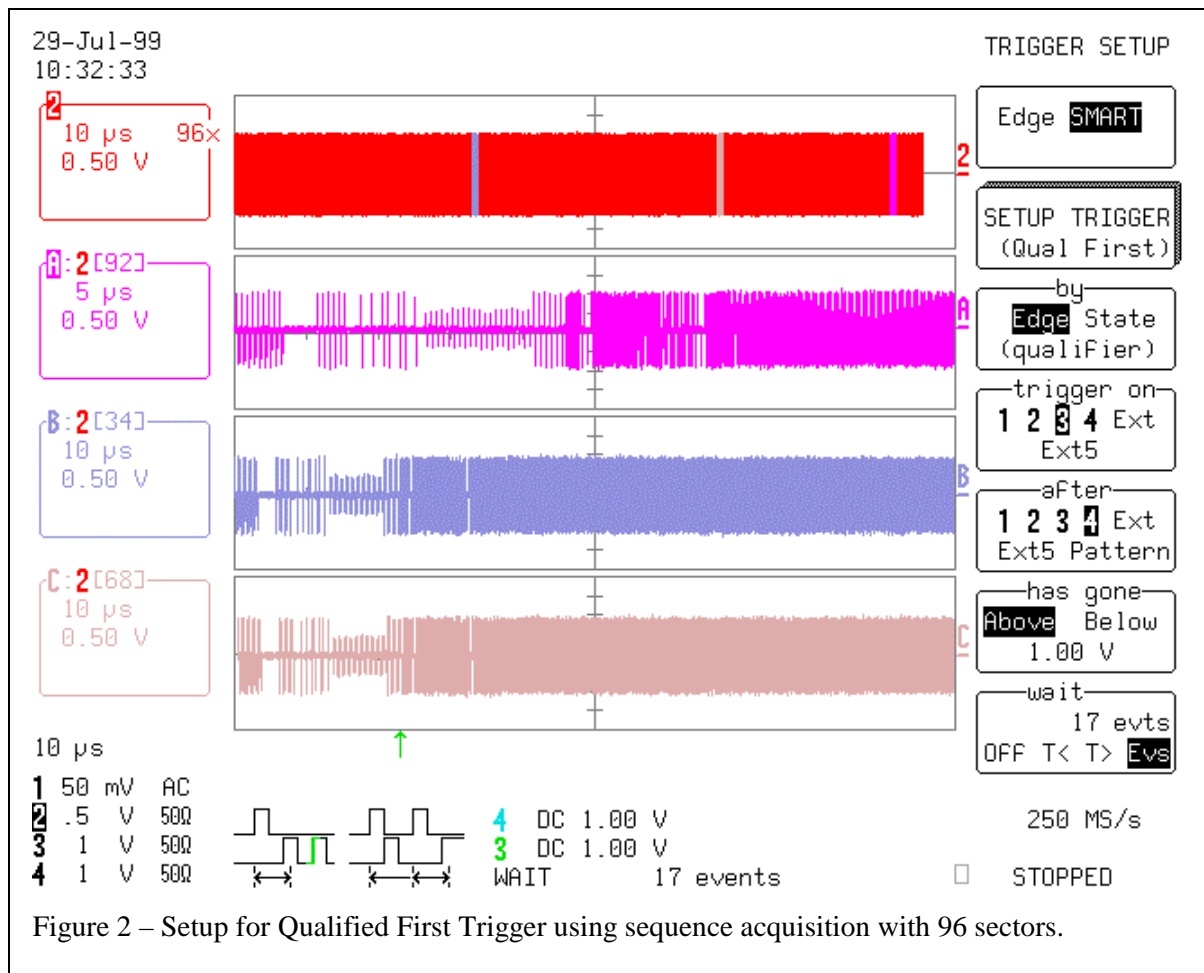


Figure 2 – Setup for Qualified First Trigger using sequence acquisition with 96 sectors.

invoked to account for any delay between the qualification source and a specific trigger event. In this example holdoff (wait) has been arbitrarily set for 17 trigger events.

Note that qualified first trigger mode requires that the scope be setup for sequence mode acquisition. If sequence mode is not used the trigger defaults to a normal qualified trigger.

As in any sequence mode acquisition the zoom traces can be used to look at individual segments as shown in traces A

(segment 92), B (segment 32), and C (segment 68) in figure 2.

Qualified first trigger is an extremely useful tool for the study of cyclical phenomena using segmented memory and is available on selected models of LeCroy oscilloscopes.

