InfiniiScan+ Event Identification Software for Infiniium 90000 (N5414B), 9000 H- and 9000A (N5415B) Series Oscilloscopes

Data Sheet

Now featuring more zones for zone qualify triggering!

Agilent Technologies

Identify signal integrity issues quickly and easily

Today's digital signals are increasingly complex. Designers of serial links and parallel busses want to quickly identify signal anomalies in their designs. Engineers have traditionally relied on hardware triggering and deep memory to capture such illusive events. However, these classic methods fall short in some key areas.

Agilent Technologies' InfiniiScan software allows you to use an oscilloscope to identify signal integrity issues that hardware triggering is unable to find in your electronic designs. This innovative software scans through thousands of acquired waveforms per second to help you isolate signal anomalies, saving you time and improving designs.

Consideration	Classic methods	InfiniiScan software
Number of events that can be monitored simultaneously	One, the hardware trigger event	Up to five different events or the same event on four channels
Number of occurrences of that event that can be identified	One, the occurrence at the hardware trigger point	Unlimited number of events within the acquired time window
Variety of events that can be identified	Approximately ten, fixed and limited by hardware triggering capabilities	Software descriptions provide increased event definition flexibility
Maximum speed of events that can be isolated	Minimum input setting of 300 ps, limited by hardware triggering circuits	Events as narrow as 70 ps can be isolated, limited only by sample rate resolution
Difficulty in defining the proper setup to capture the event	Requires triggering expertise. Many people end up pressing the Single key many times or spending hours scanning though acquired data.	If you can see it, you can capture it using the zone qualify capability or any of InfiniiScan's other power isolation mechanisms
Finding an event of interest in a deep memory capture	Manually inspecting waveforms is impractical, as 1 M point of memory represents 10,000 screens of waveforms	Scope scans the waveform so you don't have to, and no programming is required
Looking for a third state event	Trigger on two events and scan through data to find the third stage	With InfiniiScan and hardware triggering of the 90000 Series, trigger on the first two events and the scope scans for the third

InfiniiScan overcomes these classic limitations by using software to overcome the limitations of hardware triggering. InfiniiScan inspects individual waveforms and lets you know where the anomalies are. InfiniiScan moves an oscilloscope a few steps closer to the ideal of a "Find Problem" button. InfiniiScan can also isolate events as narrow as 70 ps — well beyond the limitations of hardware-based approaches. With InfiniiScan, there is no need to manually inspect waveforms

as InfiniiScan will scan a waveform automatically to identify a single waveform anomaly out of 10,000 screens of data without requiring programming.

Agilent InfiniiScan consists of three components, InfiniiScan software finders, measurement limit test, and two-stage (N5415B) and three-stage (N5414B) triggering.
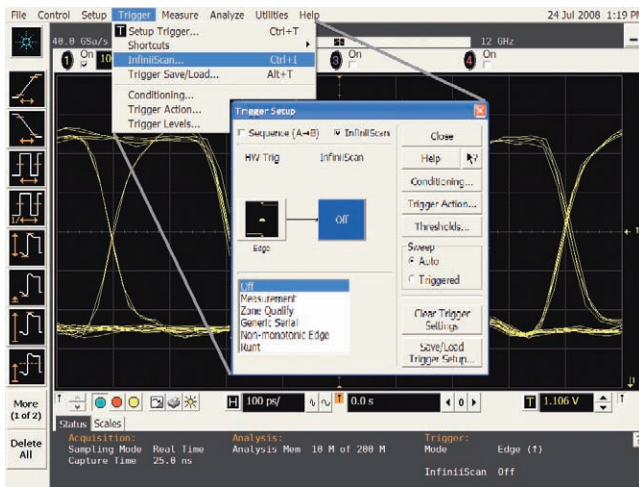

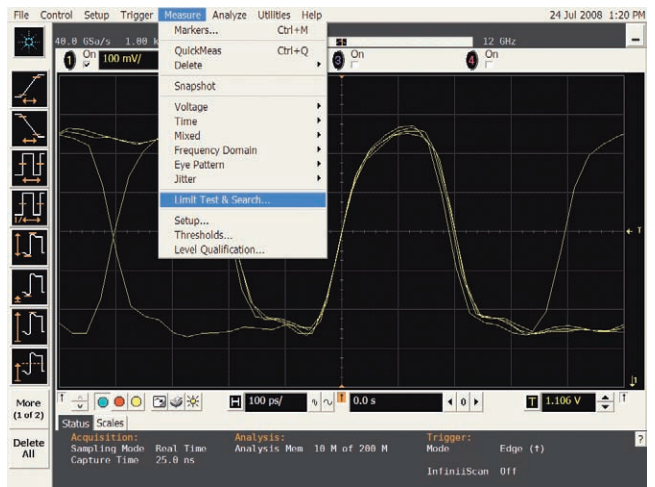*Figure 1. InfiniiScan menu is conveniently located by the trigger menu*

Figure 2. Measurement limit test setup can be found under "limit and test search" in the "acquisition" menu
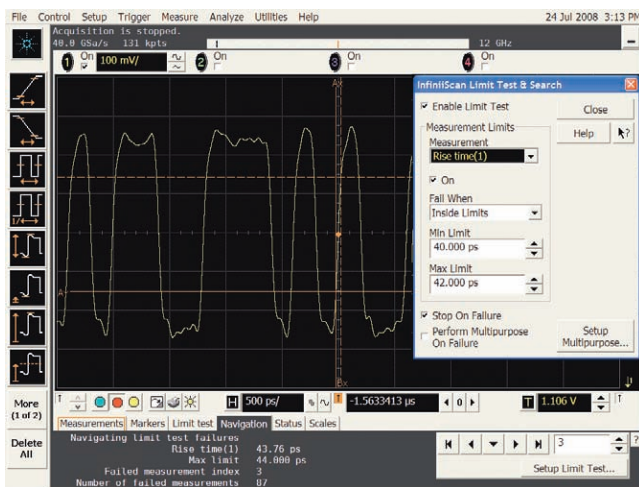

Figure 3. Limit test search allows you to quickly see how many failures you have and then step through the failures one by one

InfiniiScan Software Finders

InfiniiScan software finders consists of five unique features: measurement finder, zone qualify finder, generic serial pattern finder, non-monotonic edge finder and runt finder.

Measurement finder allows you to set boundary conditions to the specified measurement results (inside/outside limits). The oscilloscope will then tell you if it finds such an event. For example, you can set a measurement finder to have the oscilloscope identify a rise time you specify.

Measurement finder will work with only the measurement that the oscilloscope makes. This provides insight that hardware triggering cannot find.
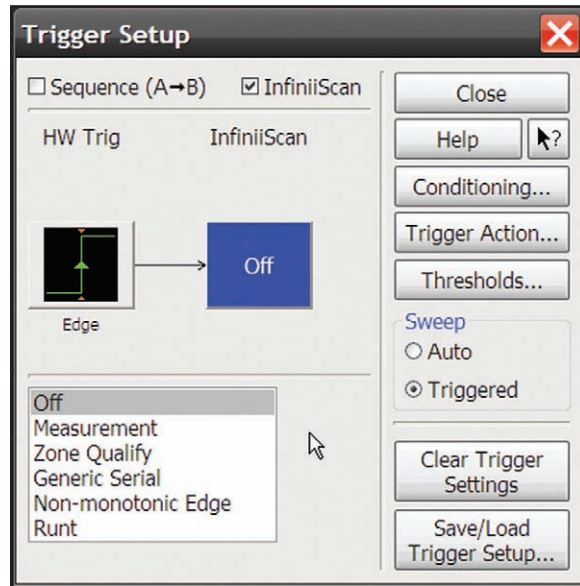

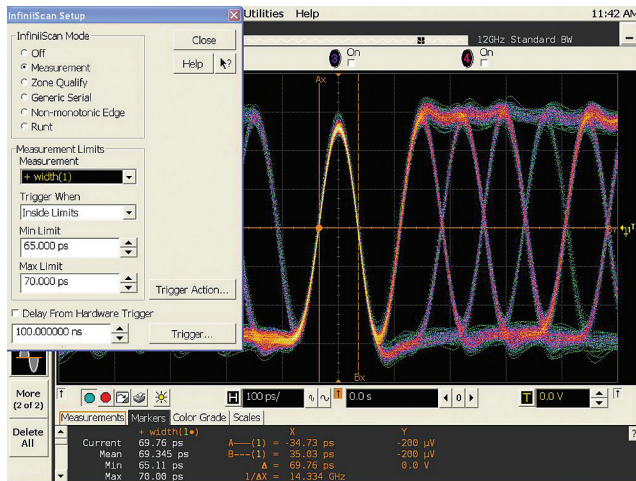*Figure 4. InfiniiScan + Trigger menu*

Figure 5. InfiniiScan measurement finder identifies a glitch that occurs between 65 ps and 75 ps
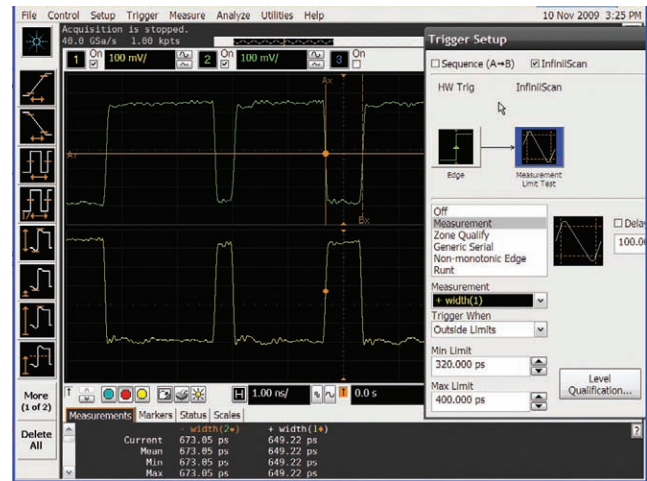

Figure 6. InfiniiScan measurement finder identifies a rise-time slower than 36 ps in order to locate ISI issues that are occurring on a single-bit pulse

InfiniiScan Software Finders (continued)

Zone Qualify Trigger

The *Zone qualify finder* allows you to draw a "must pass" or "must not pass" zone on the oscilloscope screen to visually determine the event identify condition. If you can see the event of interest on the screen, you can create a trigger that will isolate it, saving significant time over some complicated hardware triggers
.
InfiniiScan + now supports up to eight zones on screen, it also allows you to trigger on multiple channels. Boolean logic ties the channels together, allowing for an essential unlimited number of zone and channel combinational triggers.   To change channel mapping, simply right click on the zone of your choice and choose the channel to which the zone is assigned.

InfiniiScan + also provides a "hide zone" menu option that removes the zones from the screen, while still triggering with InfiniiScan. Use this feature to capture screen images without showing zones in the image.
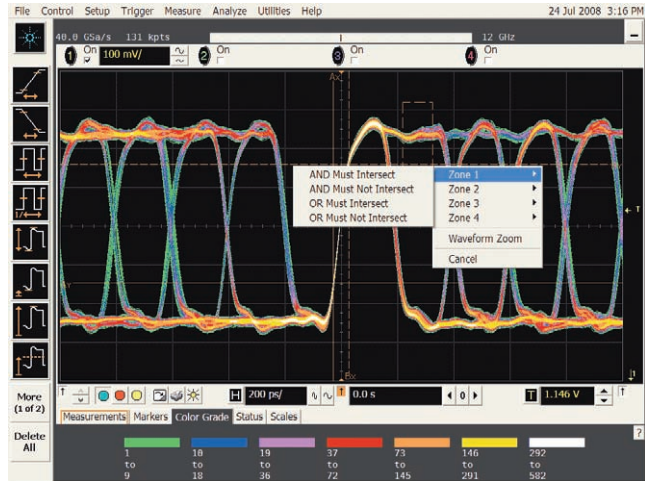

Figure 8. Notice how zone qualify is able to easily isolate the exact signal you need. This is very useful for many applications, including separating reads and writes for memory signals.
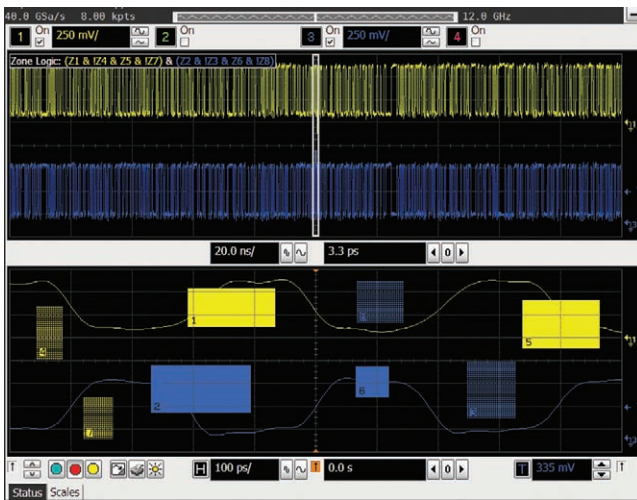

Figure 7. The InfiniiScan zone qualify finder is used to isolate single-bit pulses. Only the waveforms that pass the must-not-intersect (upper left) and must-intersect (lower right) graphical zones are displayed.
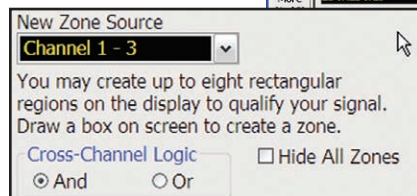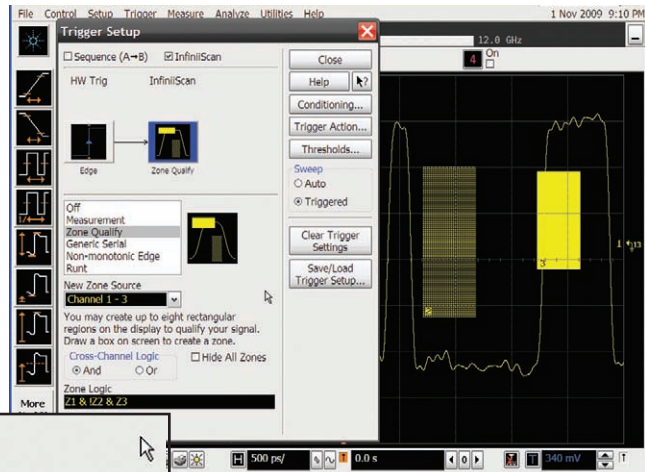

Differential and Common Mode Triggering

With Infiniium software version 2.01 or later, you can choose hardware accelerated differential and common mode channels. Combining this HW accelerated math and InfiniiScan yield the world's first function trigger.

Figure 9. Differential and Common Mode Triggering are now possible with Infiniium Software and InfiniiScan

InfiniiScan Software Finders (continued)

The **generic serial finder** lets you set up to an 80-bit serial pattern for the oscilloscope to identify up to 8.5 Gbs. Hardware solutions are currently limited to 40 bits and a maximum speed of 3.125 Gbs. Serial patterns can be expressed in hexadecimal or binary. User-definable CDR (clock data recovery) methods are available. Fixed-frequency CDR is standard. Other CDR methods (PLL, explicit, etc.) are available if ordered in conjunction with Agilent's EZJIT jitter analysis or serial data analysis software packages. Combine InfiniiScan with Infiniium's protocol viewer tools for the ultimate protocol analysis on an oscilloscope. Get unprecedented analysis capability.

Figure 10. InfiniiScan's generic serial finder is used to isolate a specific portion of a high-speed serial data stream.

InfiniScan's **runt finder** allows you to identify under-sized signal pulses to resolutions that are beyond the capability of hardware approaches by using hysterisis and threshold levels you specify.

The **non-monotonic edge finder** is a unique capability of InfiniiScan. It allows you to identify non-monotonic edges caused by signal reflections. This feature is strongly demanded by the test and measurement industry to help identify poor signal terminations. There is no method for finding such an event with hardware triggering.

Figure 11. InfiniiScan's runt finder can be used to isolate runt pulses that occur in a signal.

Figure 12. InfiniiScan's non-monotonic edge finder isolates a signal anomaly caused by a poor termination.

InfiniiScan Software Finders (continued)

Note: For the 90000 Series oscilloscope, two-stage and three-stage triggers can easily be set up via the trigger menu. You can use InfiniiScan for first, second or third stage triggering.

For the 9000A and 9000 H-Series oscilloscopes you can get two-stage triggering by using the delay from hardware trigger control. Hardware trigger must be followed by InfiniiScan triggering after specifying a delay between the events. You can use the delay capability to facilitate a higher percentage of pre-finder and post-finder information.

Three-stage triggering (available only on the 90000 Series): The 90000 Series easily combines both the 90000 Series' powerful hardware triggering capability with InfiniiScan to form a powerful three-stage triggering system. This combines the speed of hardware triggering with the flexibility of software triggering.
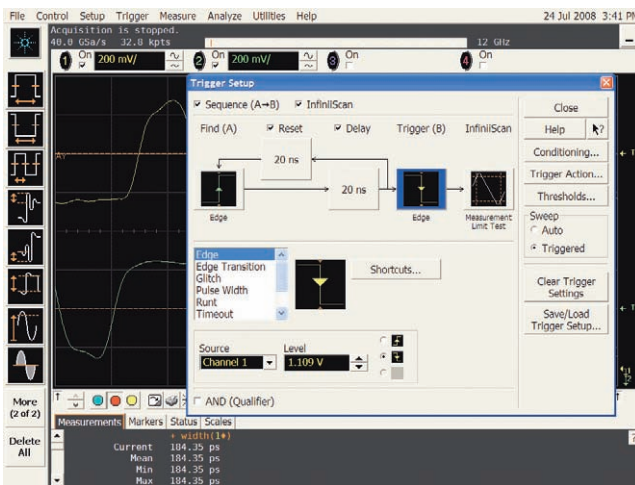
Figure 13. Easily set up three-stage triggering.

Figure 14. InfiniiScan combines the speed of hardware triggering with the flexibility of software triggering.

InfiniiScan Measurement Limit Test

Measurement limit test operation

InfiniiScan measurement limit test counts the number of violations against specified measurement value conditions. This feature lets you set up to five different conditions over all channels. For example, you can monitor the valid rise time window for channel 1 while monitoring the valid signal period window on channel 3. The navigation capability of measurement limit test will move the display to the exact location of any and all anomalous events that have been identified on every waveform. This navigation capability is also not possible with hardware-based approaches or any previous oscilloscope software package.

- Choose up to five measurements (measurements must be turned on prior to starting InfiniiScan measurement identification)

- Define unacceptable ranges (in range, out of range)

- Scope scans waveforms

- Acquire and repeat until found

- Navigate to anomalous events

- Actions on failure: stop, print, e-mail, screen shot, save setup, save waveform, measurement

The InfiniiScan software will not replace the use of hardware triggering for capturing rare anomalies that occur more infrequently than 1-ms to 1-sec. However, InfiniiScan works as a companion to the hardware triggering system by augmenting these traditional capabilities in new ways via InfiniiScan's innovative searching, measuring and scanning techniques. InfiniiScan identifies signal integrity issues previously difficult or impossible to find with traditional hardware triggering or deep memory approaches, making it a valuable addition to your toolbox for many oscilloscope applications.
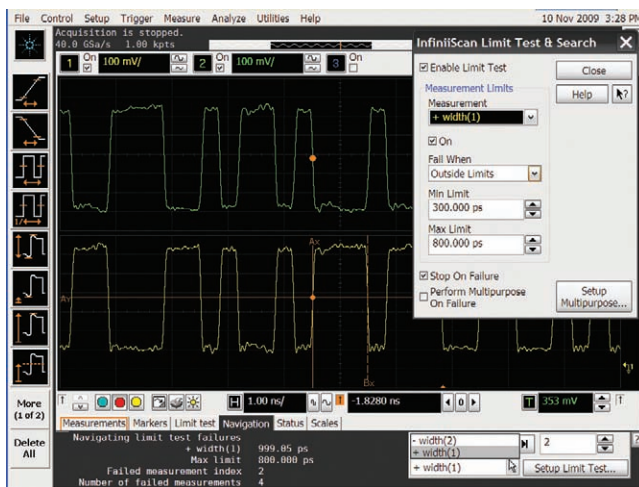
Figure 15. InfiniiScan measurement limit test identifying glitches on two channels simultaneously. Navigation controls (first, previous, next, last) also shown.

Figure 16. InfiniiScan measurement limit test simultaneously monitoring five different events (positive pulse width, negative pulse width, peak to peak voltage, fall time and rise time) on a single signal.

Ordering Information

Model	Description
N5414B	InfiniiScan Event Identification Software for Infiniium 90000, and 80000 Series
N5415B	InfiniiScan Event Identification Software for Infiniium 9000A, 9000 H- and 8000 Series

Oscilloscope compatibility

Oscilloscope	Software version
90000A Series	1.41 or later
90008A Oscilloscope/Digitizers	All
9000A Series	All
9000 H-Series	All

Triggering aupport	N5415B	N5415A	N5414B	N5414A
Zone Qualify Zones	8	4	8	4
Supports Multiple Channels Zone Qualify	X		X	
Measurement Limit Testing	X	X	X	X
Generic Serial Trigger	X	X	X	X
Runt	X	X	X	X
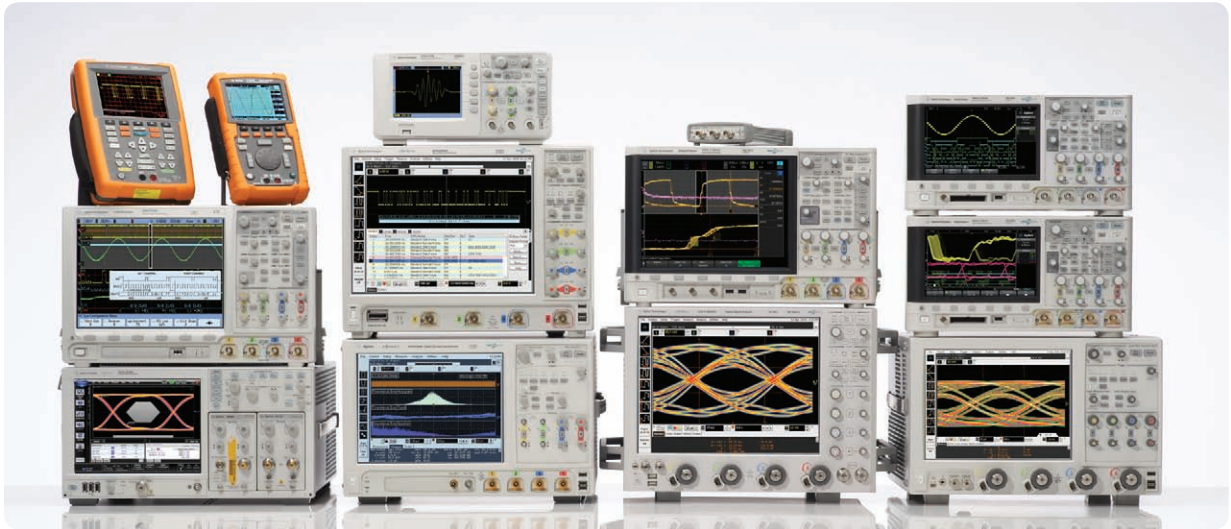
Agilent Technologies Oscilloscopes

Multiple form factors from 20 MHz to > 90 GHz | Industry leading specs | Powerful applications