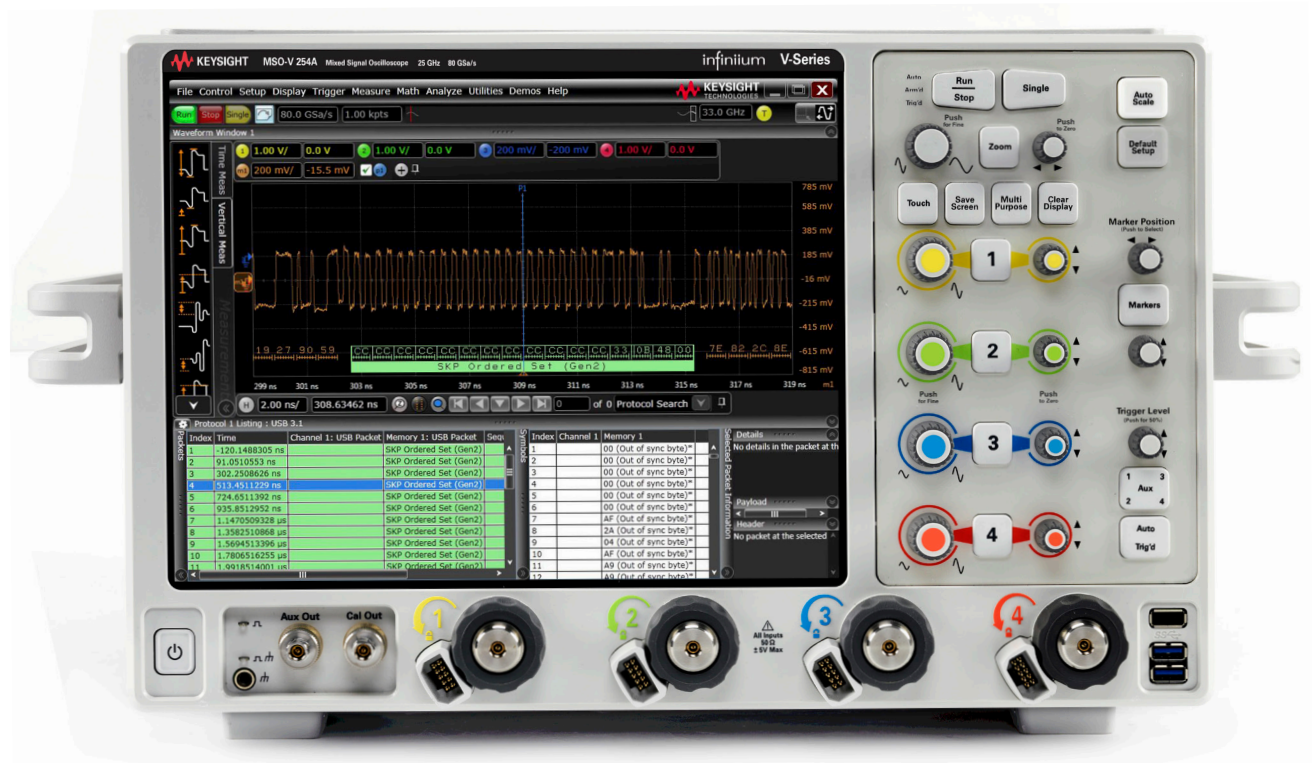


Keysight N8821A

USB 3.1 Protocol Triggering and Decode for Infiniium Series Oscilloscopes

Data Sheet



Easily Debug and Test Designs That Include USB 3.1 Protocols

Serial buses such as USB 3.1 are widely used today in electronic designs. In many designs, these serial buses provide content-rich points for debug and test. However, since these protocols transfer bits serially, using a traditional oscilloscope has limitations. Manually converting captured 1's and 0's to protocol requires significant effort. In addition, traditional scope triggers are not sufficient for specifying protocol-level conditions.

Now you can extend your oscilloscope's capability with the N8821A USB 3.1 protocol triggering and decode application. It makes it easy to debug and test USB 3.1 designs.

- Set up your scope to show USB 3.1 protocol decode in less than 30 seconds.
- Get access to a rich set of integrated software-based protocol-level triggers.
- Save time and eliminate errors by viewing packets at the protocol level.
- Use time-correlated views to quickly troubleshoot serial protocol problems back to their timing or signal integrity root cause.

Easily Debug and Test Designs That Include USB 3.1 Protocols (Continued)

30-second USB 3.1 setup

Configure your oscilloscope to display protocol decode in under 30 seconds. Use “Auto Setup” to automatically configure sample rate, memory depth and threshold and trigger levels.

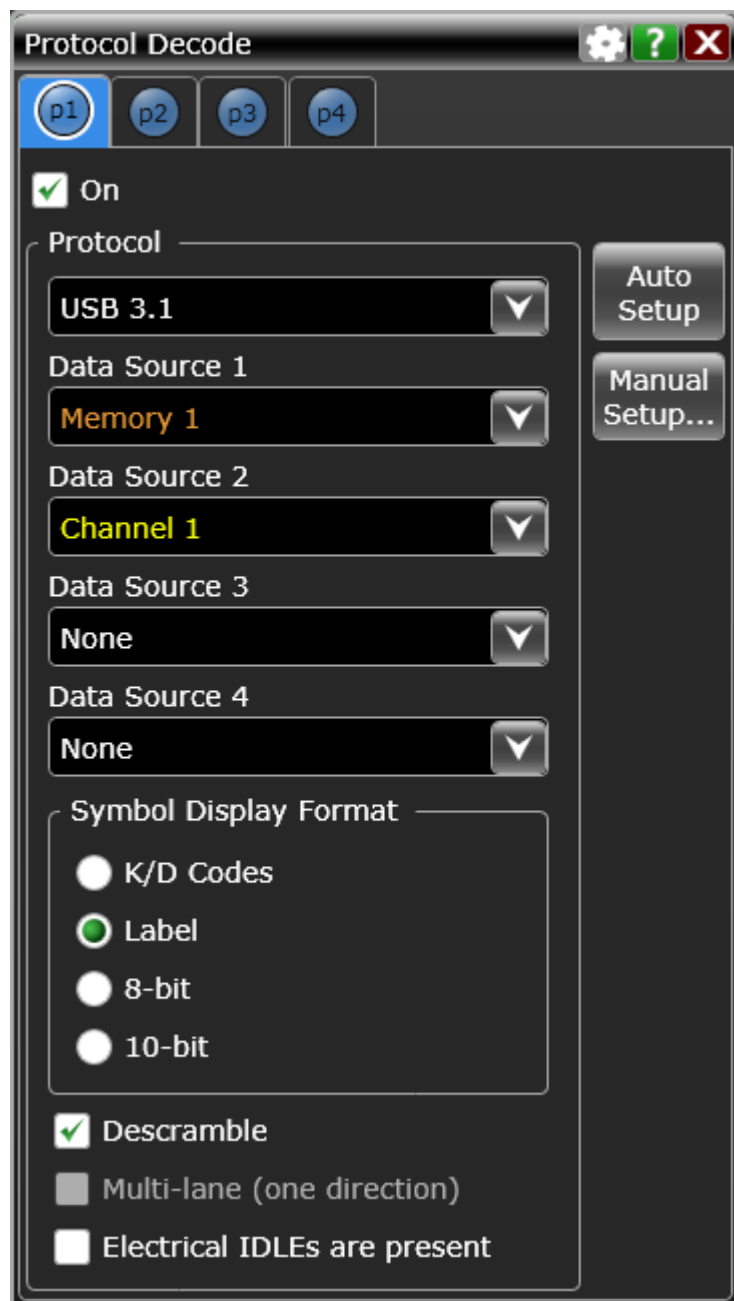


Figure 1. Configure your oscilloscope to display protocol decode in less than 30 seconds. Use “Auto Setup” to automatically configure sample rate, memory depth and threshold and trigger levels.

USB 3.1 Protocol Triggering and Searching

Get access to a rich set of integrated protocol-level triggers. The application includes a suite of configurable protocol-level trigger conditions specific to USB 3.1. The application uses software-based search triggering when serial triggering is selected.

With software-based protocol triggering, the oscilloscope takes signals acquired using scope channels and reconstructs protocol frames after each acquisition. It then inspects these protocol frames against specified protocol-level trigger conditions and triggers when the condition is met.

USB 3.1 trigger and search setup

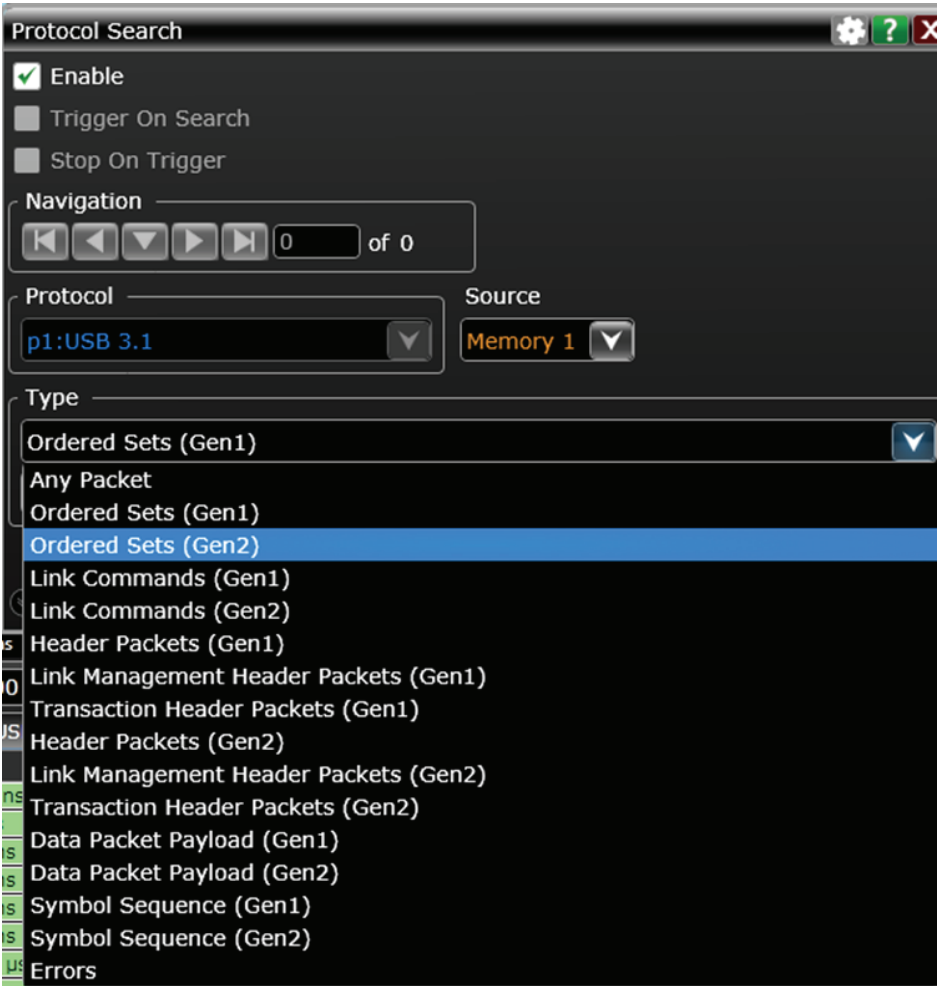


Figure 2. Choose to trigger on ordered sets, data packets, protocol errors and other packets.

USB 3.1 Protocol Triggering and Searching (Continued)

Quickly find occurrences

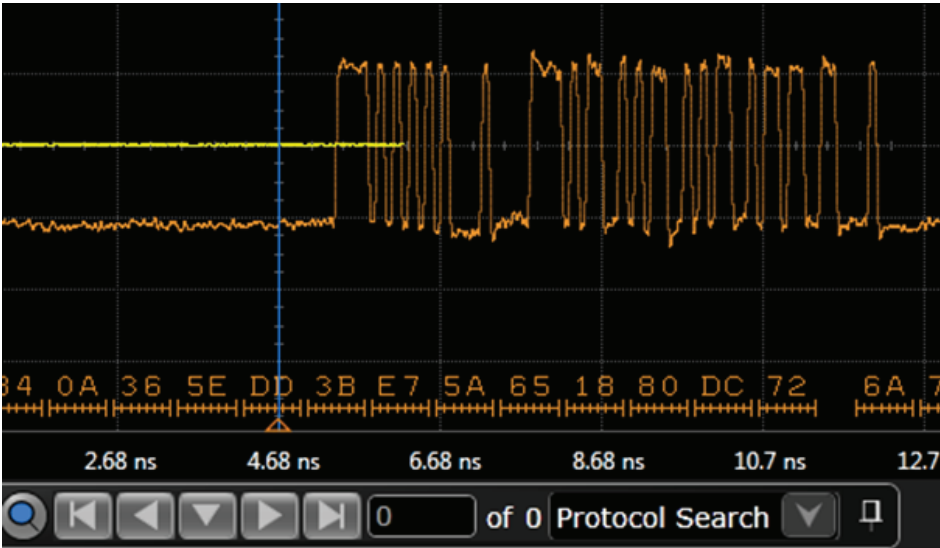


Figure 3. Quickly move to next occurrence of a specified event. Jump to the next or previous occurrence of the specified event.

USB 3.1 protocol decode

The Keysight Technologies, Inc. USB 3.1 protocol viewer includes correlation between the waveforms and the selected packet. The selected packet (highlighted blue row in the listing) is time-correlated with the blue vertical line in the waveform display. Move the blue tracking marker in time through waveforms, and the blue bar will automatically track in the packets window. Or you can scroll through the packet viewer and highlight a specific packet. The time-correlation tracking marker will move to the associated point in the waveform.

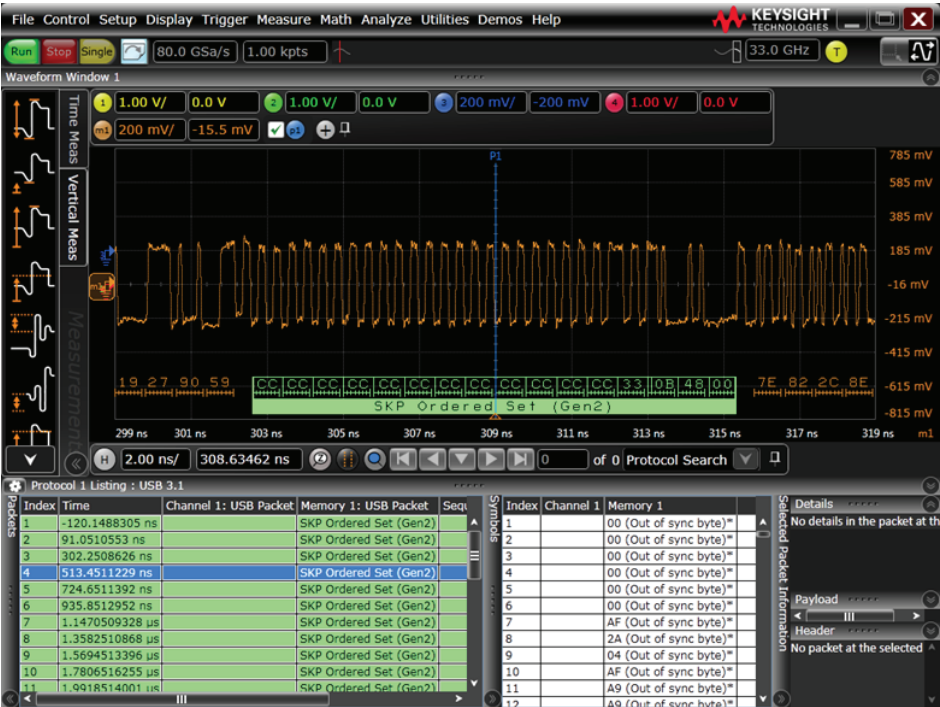


Figure 4. USB 3.1 protocol decode with precise time-correlation between waveforms and listing.

USB 3.1 Protocol Triggering and Searching (Continued)

USB 3.1 protocol decode (Continued)

Fill the entire display with compact protocol information using the full screen listing. The protocol viewer window shows the index number, time stamp value, and data content for each serial packet in the list. Scroll through all decoded serial packets to find events of interest or errors in the transmission. Data in the listing window can be saved as .csv or .txt file for offline analysis or documentation. Error packets are shown in red to help with debug.

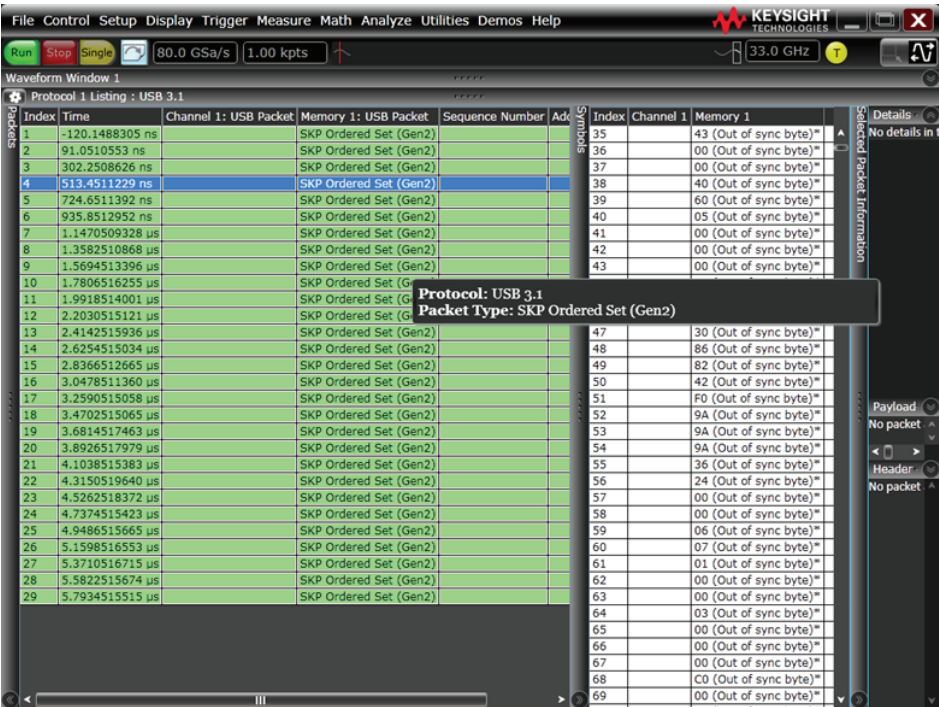


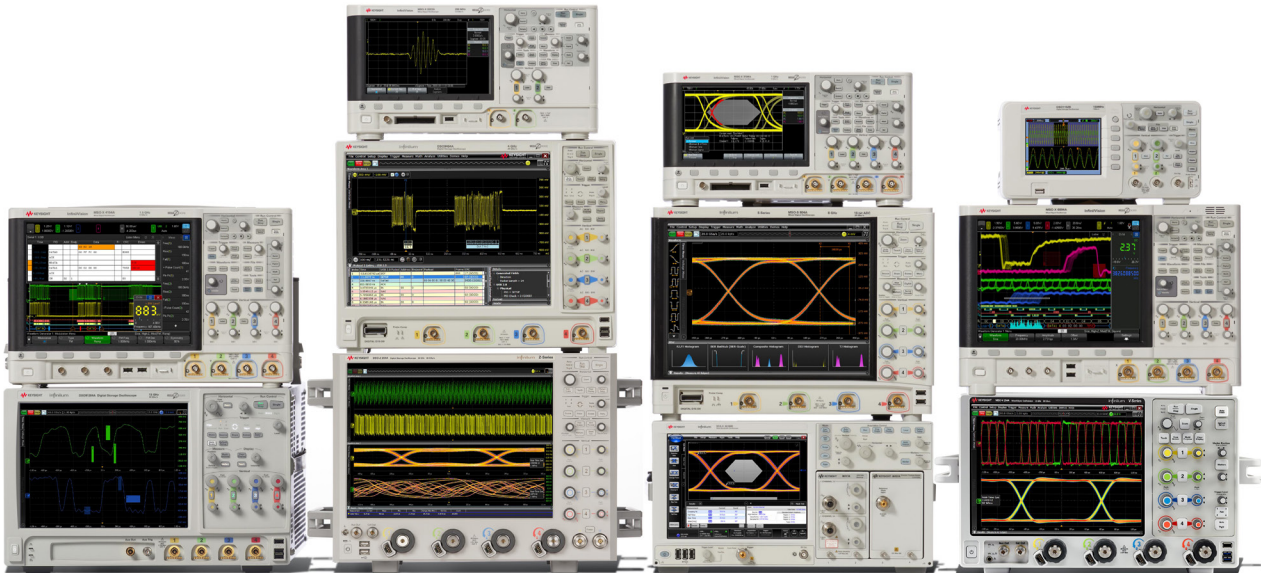
Figure 5. Full screen USB 3.1 listing.

Ordering Information

Application	License type		Infiniium V-Series and Z-Series	Infiniium S-Series	Infiniium 90000A Series	Infiniium 90000 X-Series	Infiniium 9000 Series
USB 3.1 protocol triggering and decode	Fixed	Factory-installed	N8821A-1FP	N8821B-1FP	DSO90000-086	N8821A-1FP	N8821B-1FP
		User-installed	N8821A-1FP	N8821B-1FP	N8821A-1FP	N8821A-1FP	N8821B-1FP
	Floating	Transportable	N8821A-1TP	N8821B-1TP	N8821A-1TP	N8821A-1TP	N8821B-1TP
		Server-based	N5435A-092				

Related Literature

Publication name	Publication number
Infiniium V-Series Oscilloscopes - Data Sheet	5992-0425EN



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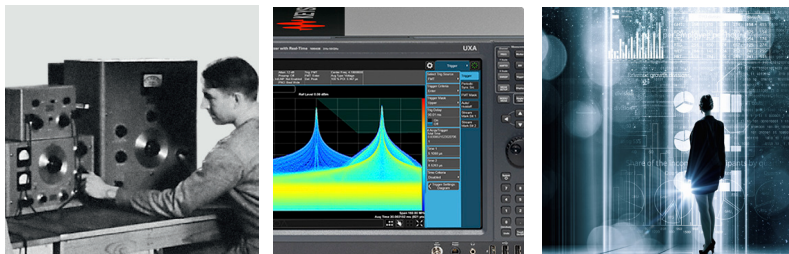
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