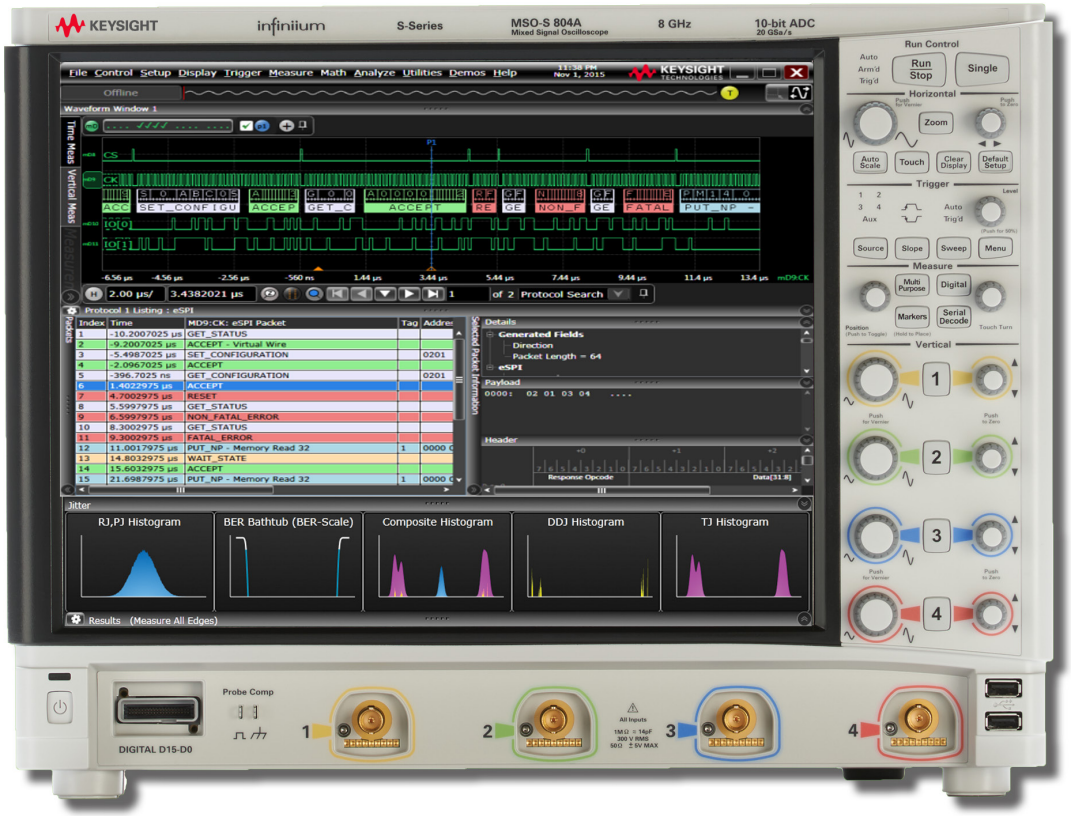
Keysight N8835A
eSPI Protocol Trigger and Decode
For Infiniium Oscilloscopes

Data sheet



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Easily debug and test designs that include eSPI protocol using your Infiniium oscilloscopes

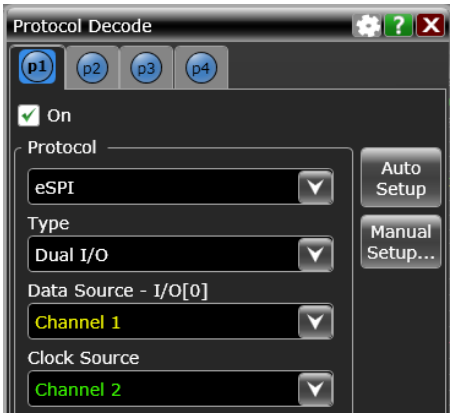
Enhanced Serial Peripheral Interface (eSPI) is developed by Intel as a successor to its Low Pin Count (LPC) bus. So it can carry out not only legacy SPI data, but also Embedded Controller (EC), Baseboard Management Controller (BMC) and Super-I/O. This standard allows designers to use 1-bit, 2-bit, or 4-bit communications at speeds from 20 to 66 MHz to further allow designers to trade off performance and cost.

Extend your scope capability with eSPI triggering and decode application. This application makes it easy to debug and test designs that include eSPI protocols using your Infiniium oscilloscopes.

- Set up your scope to show eSPI protocol decode in less than 30 seconds
- Get access to a rich set of integrated protocol-level triggers
- Save time and eliminate errors by viewing packets at protocol level
- Use time-correlated views to quickly troubleshoot serial protocol problems

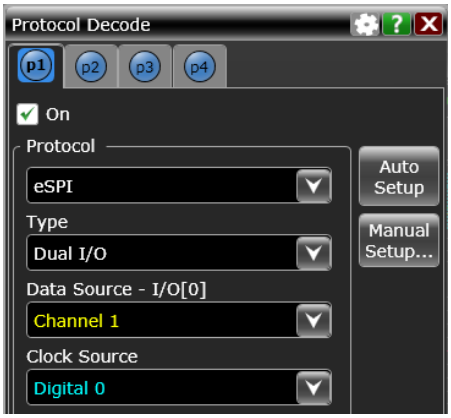
Easy to find

Turn decode on/off via the “Serial Decode” button on the front of the instrument or in the “Setup” menu. View decode embedded on the waveform display or in the protocol viewer listing window.



30-second eSPI setup

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.



Support for both analog and digital channels

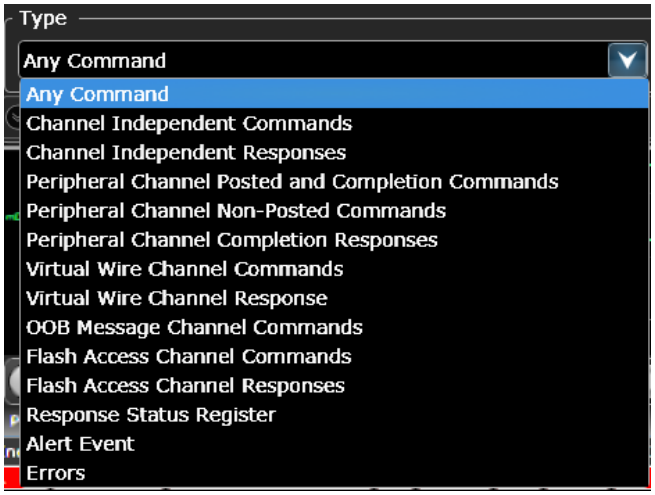
Acquire serial buses using any combination of scope or digital channels. Using digital channels on MSO models preserves analog channels for viewing other time-correlated signals.

eSPI 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 eSPI. When serial triggering is selected, the application enables special real-time triggering hardware inside the scope [1]. Hardware-based triggering ensures that the scope never misses a trigger event when armed. This hardware takes signals acquired using either the oscilloscope or digital channels [2] and reconstructs protocol frames. It then inspects these protocol frames against specified protocol-level trigger conditions and triggers when the condition is met.

eSPI trigger setup

Choose a combination of several fields for specific types.

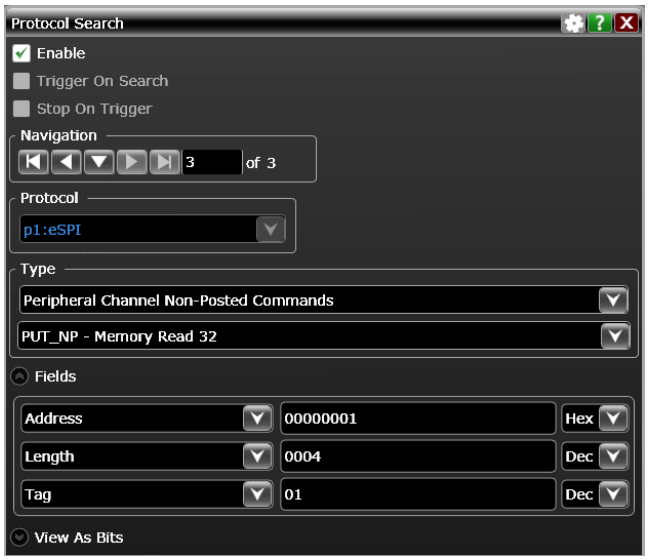


eSPI trigger type

N8835A eSPI trigger supports a variety of commands that eSPI supports.

Payload editor

Use the payload editor to specify data values word-by-word. Operators give additional triggering flexibility.



Post-acquisition searching

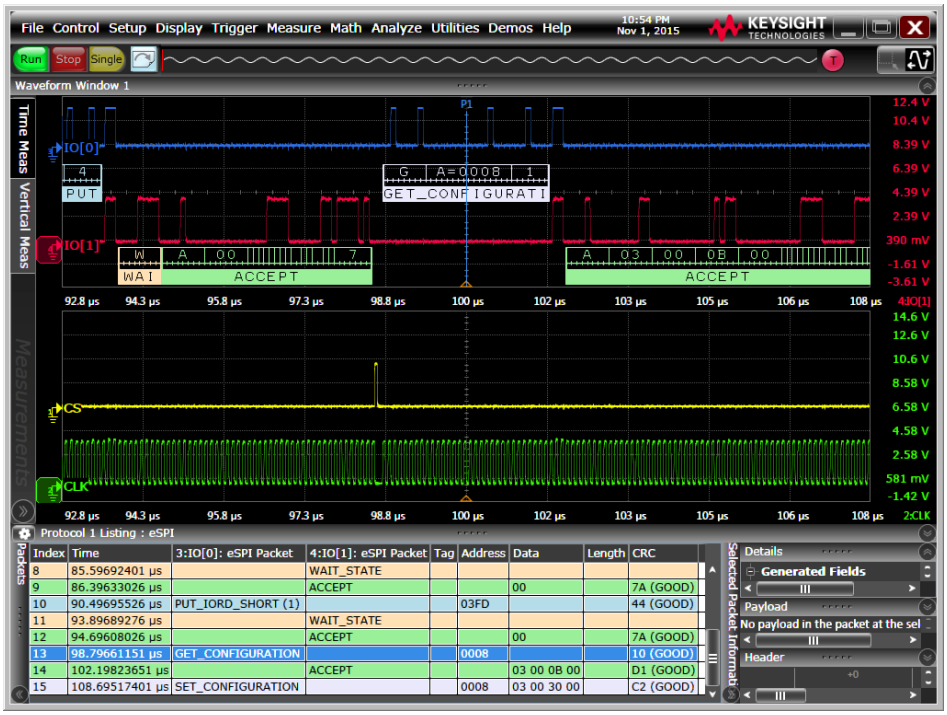
Search acquired protocol listing using a menu that is identical to the trigger menu.

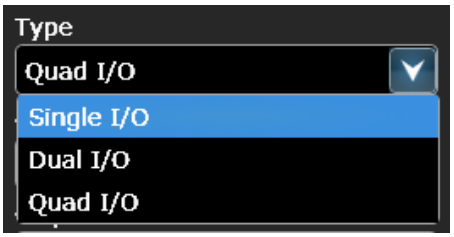
1. Hardware-based serial trigger supported by S-Series oscilloscopes only.
2. Digital channels are optional, and MSO model option is required.

eSPI Protocol Decode

eSPI protocol decode with precise time-correlation between waveforms and listing

The Keysight Technologies, Inc. eSPI 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 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 scroll through the packet viewer and highlight a specific packet. The time-correlation tracking marker will move to the associated point in the waveform.



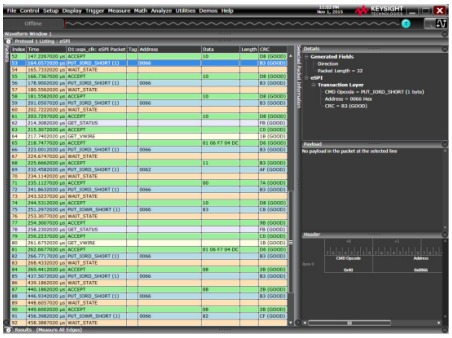


Support for Single, Dual and Quad Input/Output(I/O) mode

The application supports Single, Dual and Quad I/O mode eSPI. Use digital channels on MSO models to preserve analog channels for simultaneously viewing other signals.

eSPI decode embedded in waveform

Utilize the oscilloscope waveform area to display decode information. For eSPI, Single I/O mode displays each of Host/ Slave line. Dual and Quad mode, which support more than one slave, show decoded data on clock signal.



Full screen eSPI listing

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 though all decoded serial packets to find events of interest or errors in the transmission. Data in the listing window can be saved to a .csv or .txt file for offline analysis or documentation.

eSPI specifications and characteristics	
eSPI protocols supported	Single mode – Clock, Chip select, MOSI, MISO, Alert# (optional) [3]
	Dual mode – Clock, Chip select, I/O[0], I/O[1], Alert# (optional) [3]
	Quad mode – Clock, Chip select, I/O[0], I/O[1], I/O[2], I/O[3], Alert#(optional) [3]
eSPI source (all signals)	Analog channels 1, 2, 3, or 4
	MSO models can additionally use digital channels D0 to D15
Max clock/data rate	Up to 66 Mbps (automatic)
Autoset	Automatically configures oscilloscope settings for proper eSPI decode and protocol triggering
Triggering	Hardware-/software-based triggering on – Channel Independent Commands – Channel Independent Responses – Peripheral Channel Posted and Completion Commands – Peripheral Channel Non-Posted Commands – Peripheral Channel Completion Responses – Virtual Wire Channel Commands – Virtual Wire Channel Response – OOB Message Channel Commands – Flash Access Channel Commands – Flash Access Channel Responses – Response Status Register – Alert Event (hardware-based trigger only) – Errors (CRC error)
Protocol search	All above in triggering except Alert event

3. Alert # pin can be assigned to digital channel only.

eSPI Supporting Matrix [4]

		Decode		Triggering		
		Single or dual I/O	Quad I/O	Single or dual I/O (HW)	Quad I/O (HW)	Software-based
MSOs	S-Series	Yes	Yes	Yes	Yes	No (on digital channel)
	V-Series/90000 X-Series	Yes	Yes	No	No	Yes
	9000 Series	Yes	Yes	No	No	Yes
DSO/As	S-Series	Yes	No	Yes	No	Yes
	V-Series/90000 X-Series	Yes	No	No	No	Yes
	9000 Series	Yes	No	No	No	Yes
	90000A Series	Yes	No	No	No	Yes
	Z-Series	Yes	No	No	No	Yes
	MultiScope	Yes	No	No	No	Yes

4. Requires Infiniium 5.51 baseline software or above.

Ordering Information

eSPI protocol triggering and decode			
Fixed	Factory-installed	S-Series	DSOS000-096
		90000A Series	DSO90000-087
		V-Series	DSOV000-093
		Z-Series	DSOZ000-093
	User-installed		N8835A-1FP
Floating	Transportable		N8835A-1TP
	Server-based		N5435A-091

Related Literature

Publication title	Publication number
Infiniium 90000 Series Oscilloscopes - Data Sheet	5989-7819EN
Infiniium 9000 Series Oscilloscopes - Data Sheet	5990-3746EN
Infiniium S-Series High-Definition Oscilloscopes - Data Sheet	5991-3904EN
Infiniium Z-Series Oscilloscopes - Data Sheet	5991-3868EN
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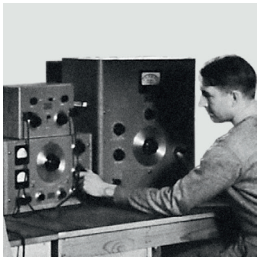
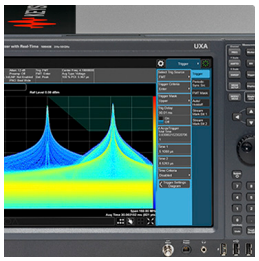


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