Keysight N8845A
SPMI Protocol Trigger and Decode for Infiniium Oscilloscopes

Technical Overview

KEYSIGHT TECHNOLOGIES

Unlocking Measurement Insights

Easily Debug and Test Designs that include MIPI® SPMI℠ using your Infiniium Oscilloscopes

System Power Management Interface (SPMI) is a MIPI (Mobile Industry Processor Interface) standard to managing power in mobile devices or other applications that appreciate it features. This interface can have up to 4 Masters and up to 16 Slaves in the one bus, so that multiple masters, like AP (Application Processor) or RFIC (Radio Frequency IC), or BBIC (Baseband IC) can control on or more power switches, PMIC (Power Management IC) or Protocol activated LDO regulators (Low Drop Out) with just 2 electrical lanes (SDATA and SCLK).

The biggest advantage of using this interface is that it is possible to control device status like Wakeup, Sleep, Reset, and Shutdown without sideband signal lanes. This helps engineers save space in compact form factor designs. Real time power related chip control provides more optimized power consumption on each of the SPMI interfaced chips.

Many of the products designed today face challenges of time-to-market. Trouble shooting SPMI can be time-consuming and error-prone when one is manually scrolling through data looking for regions of interest.

Save time by extending your oscilloscopes capability with the SPMI trigger and decode solution. This solution makes it easier to debug and test designs that include SPMI with your Infiniium oscilloscope.

- In 30 seconds or less, you can set your oscilloscope up to show SPMI protocol decode.
- Get easy access to a rich set of integrated protocol-level triggers.
- Save time and eliminate errors by viewing packets at protocol level.
- Quickly troubleshoot any serial protocol problems by using time-correlated views between listed decoding data and captured waveforms.

Easy to find
Simply 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 I3C setup
Configure your oscilloscope to display SPMI protocol decode in under 30 seconds. Use "Auto Setup" to automatically configure sample rate, memory depth and threshold and trigger levels.
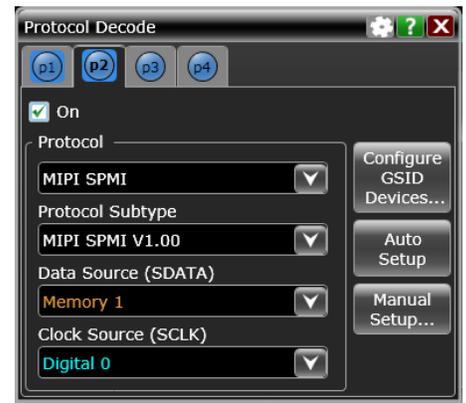
Support for saved waveform and digital channels
Acquire serial clock and data using any combination of analog and digital channel. Also supports waveforms saved to channel memory allowing data to be analyzed at a later time.
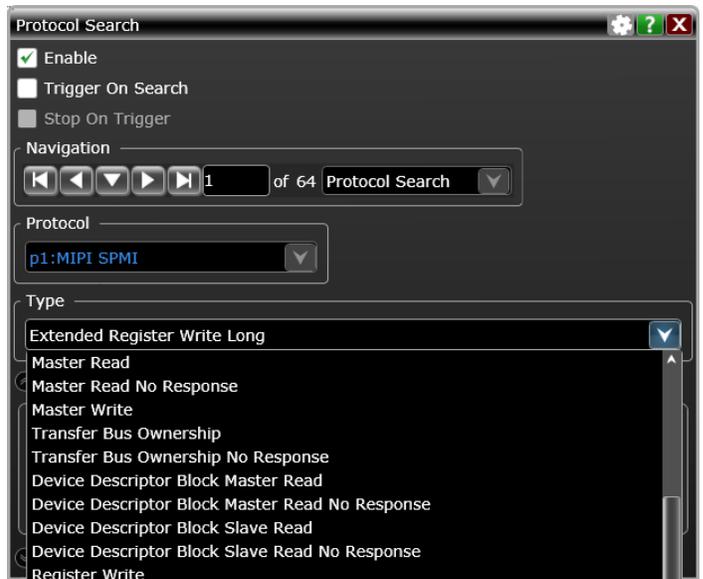
SPMI Protocol Triggering and Searching

Get access to a powerful set of integrated protocol level triggers. The decoder software includes a suite of configurable protocol level trigger conditions for the SPMI interface bus. When serial triggering is selected, the decoder software enables special real time hardware based triggering functions inside of S-Series oscilloscopes.

Hardware-based serial triggering ensures that the oscilloscope never misses a trigger event when it is armed. The hardware serial trigger of the S-series oscilloscope will provide hassle free triggering, and signal acquisition using either the oscilloscope's analog channel inputs or digital channel inputs, if it has MSO (Mixed Signal Oscilloscope) option.
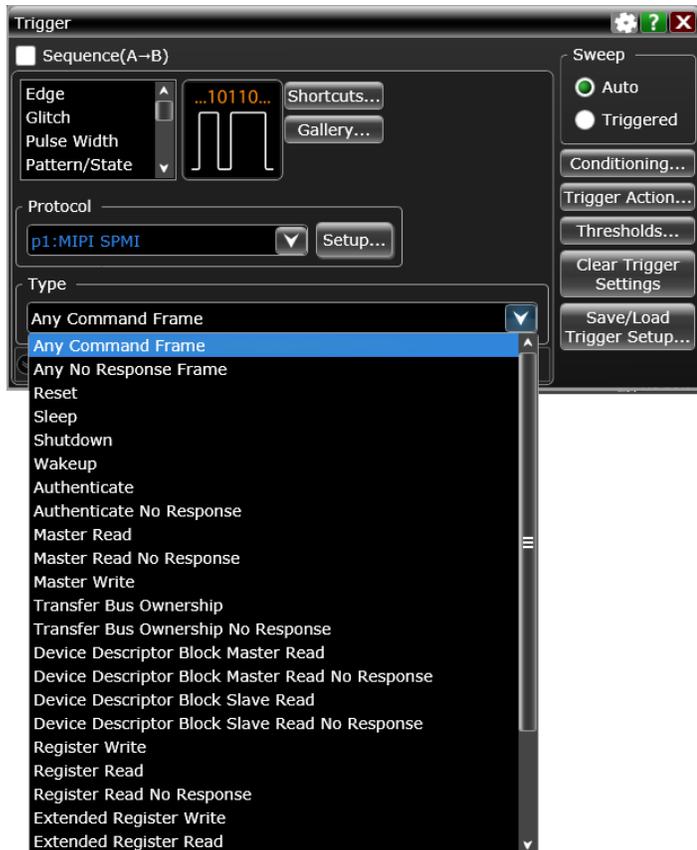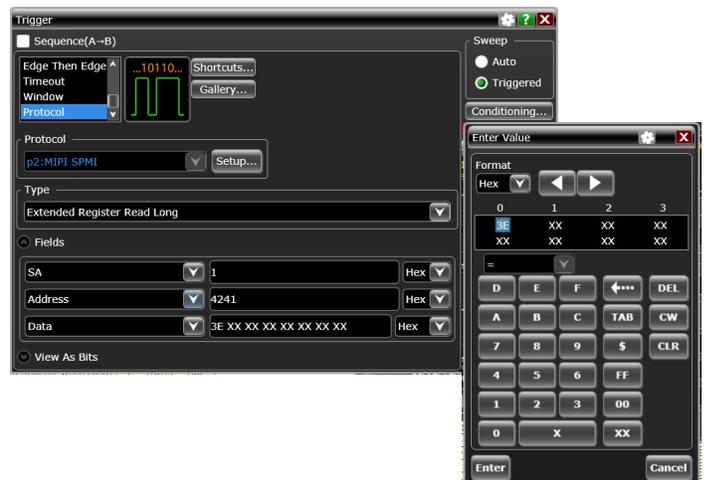

SPMI trigger setup
Trigger supports many types of data patterns, supported by the SPMI specification.

Post-acquisition searching
Search for specific packets from the acquired protocol listing.

In depth trigger/search
Use up to 3 different field values to search for or trigger on a specific type of data.

SPMI Protocol Decode

The Keysight N8845A SPMI protocol decoder software supports GSID (Group Slave identifier) so that if the system master supports GSID to send the same protocol command to several slaves, it will not show ACK/NACK error.
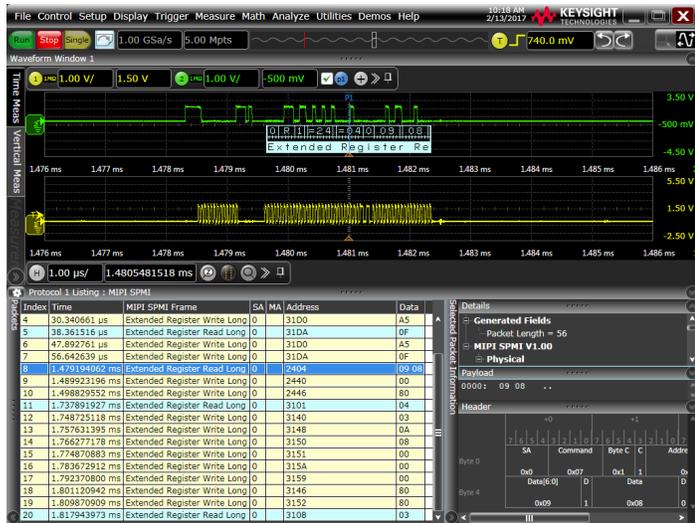
Protocol decode with time correlation between waveform and listing

SPMI protocol list window is correlated between the waveform and the selected packet on the list. The selected packet, the highlighted blue row, is time-correlated with the blue line in the waveform display so that engineers can see the signal shape of a specific data packet more efficiently.

GSID configuration

Because of differences between USID and GSID, the N8845A allows for the configuring of GSID of up to 8 sets allowing the systems operator to identify proper behavior depending on GSID address.
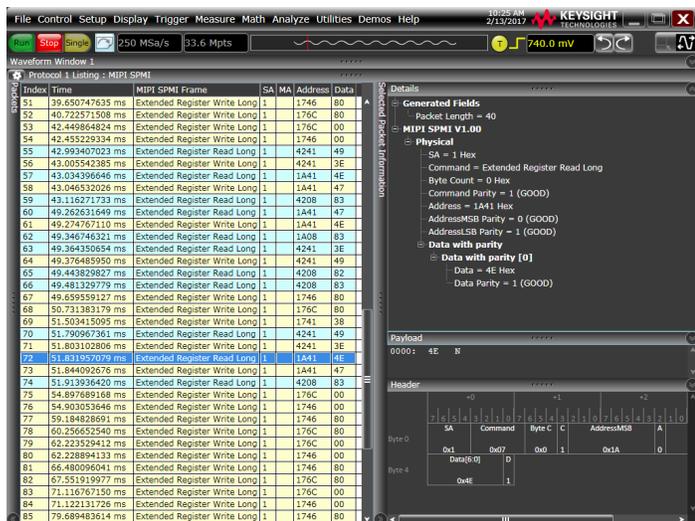
Resize-able windows

Flexible window size, even up to full screen, on the protocol decoder window provides flexibility to see the region of interest on protocol side.

This application is available in the following license variations

– Fixed to an oscilloscope
– Floating license
    – Server-based license
    – Transportable license

Performance Characteristics

SPMI protocol supported	SPMI v1.0
	SPMI v2.0
SPMI source (SCLK, SDATA)	Analog channels 1, 2, 3, or 4
	Digital Channels D0-D15 (on MSO models)
	Waveform memories
Support clock rate	Up to 26 MHz
Configuration option	GSID (Group Slave ID)
Triggering [1]/Search	Reset
	Sleep
	Shutdown
	Wakeup
	Authenticate (No response)
	Master Read (No response)
	Master Write
	Transfer Bus Ownership (No response)
	Device Descriptor Block Master Read
	Device Descriptor Block Slave Read
	Register Write/Read
	Extended Register Write/Read
	Extended Register Write/Read Long
	Register 0 Write

1. Hardware based serial triggering is supported by S-Series only.

Standard Configuration

9000A and S-Series oscilloscope	Oscilloscope (500 MHz or above) + 2x Passive probe
90000A series oscilloscope	Oscilloscope + 2 x high impedance probe kits (E2697A)
V-Series and Z-Series oscilloscope	Oscilloscope + 2 x high impedance probe (N5449A)

Ordering Information

This application is compatible with Infiniium Oscilloscope models below.

Application software			9000 Series	S-Series	90000 Series	V-Series	Z-Series
SPMI protocol trigger		Fixed			N8845A-1FP		
and decode software [1,2]	Floating	Transportable			N8845A-1TP		
		Server-based			N5435A-114		

1. Require Infiniium 6.00 or above.
2. Hardware based serial triggering is supported by S–Series only.

Related Literature

Publication title	Publication number
Infiniium S-Series High-Definition Oscilloscopes - Data Sheet	5991-3904EN
Infiniium 9000 Series Oscilloscopes - Data Sheet	5990-3746EN
Infiniium V-Series Oscilloscopes - Data Sheet	5992-0425EN
Infiniium 90000 Series Oscilloscopes - Data Sheet	5989-7819EN
Infiniium Z-Series Oscilloscopes - Data Sheet	5991-3868EN

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LAN eXtensions for Instruments puts the power of Ethernet and the Web inside your test systems. The business that became Keysight was a founding member of the LXI consortium.

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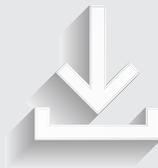
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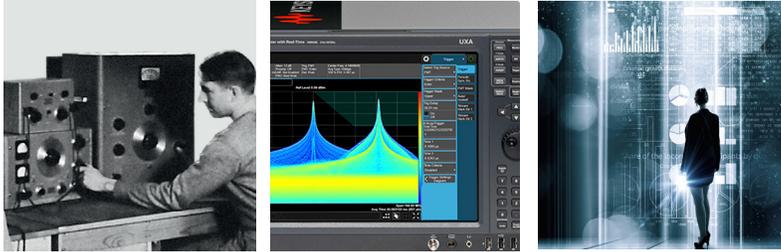www.keysight.com/find/software

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