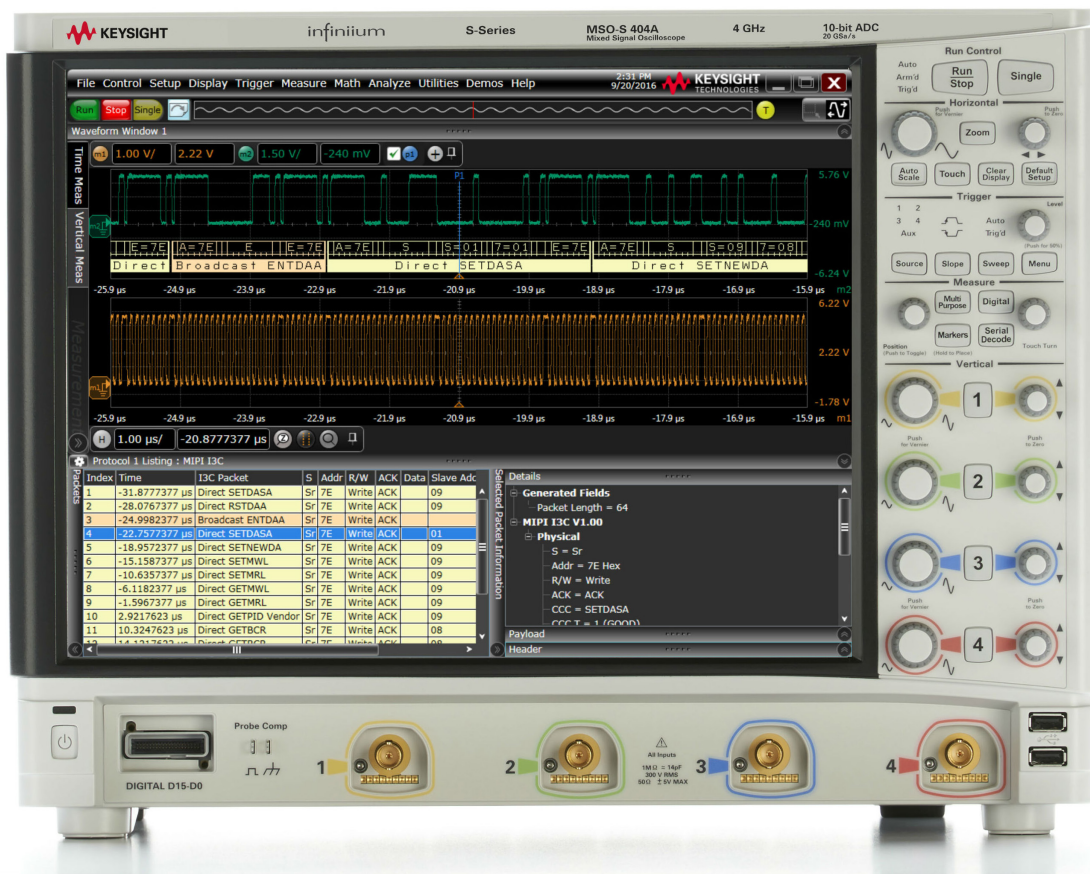


# Keysight N8843A

## I3C<sup>SM</sup> Protocol Trigger and Decode for Infiniium Oscilloscope

Data Sheet



Unlocking Measurement Insights

This application is available in the following license variations

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

## Easily debug and test designs that include MIPI I3C interface using your Infiniium Oscilloscopes

Improved Inter Integrated Circuit (I3C) is one of MIPI® (Mobile industry Processor Interface) standard aimed for next generation Sensor interface. This new interface improved upon the feature of I2C (inter Integrated Circuit) and provide backward compatibility with Legacy I2C devices. I3C is consist of 2 two bidirectional wires called SDA, SCL and optimized for multiple slave devices which controlled by one I3C master device at a time. I3C supports Higher speed than Legacy I2C which is 12.5 MHz and supporting several new high data rate (HDR) mode called as HDR-DDR (Double Data Rate), HDR-TSL (Ternary Symbol Legacy) and HDR-TSL (Ternary Symbol for Pure bus).

Extend your oscilloscope capability with I3C trigger and decode application. This application makes it easy to debug and test design that include I3C interface using your Infiniium oscilloscopes.

- Set your oscilloscope up to show I3C 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



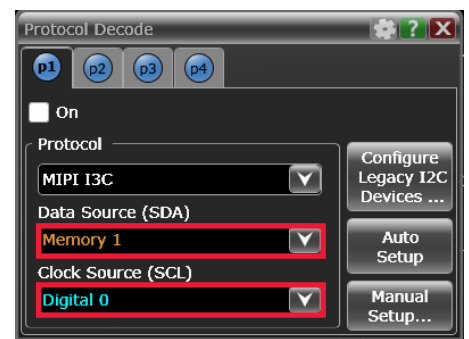
### Easy to find

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 I3C setup

Configure your oscilloscope to display I3C 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 captured waveform using memory channel so capture signal first and analyze after then.

## I3C Protocol Triggering and Searching

Get access to a rich set of integrated protocol level triggers. This decoder software includes a suite of configurable protocol level trigger conditions for I3C interface bus. When serial triggering is selected, decoder software enables special real time hardware based triggering function inside of S-Series oscilloscope.

Hardware-based serial triggering ensures that oscilloscope never misses a trigger event when it armed. This function is activated on S-Series oscilloscope, and acquire signal using either oscilloscope's analog channel input or digital channel input if it has MSO (Mixed Signal Oscilloscope) option.



### I3C trigger setup

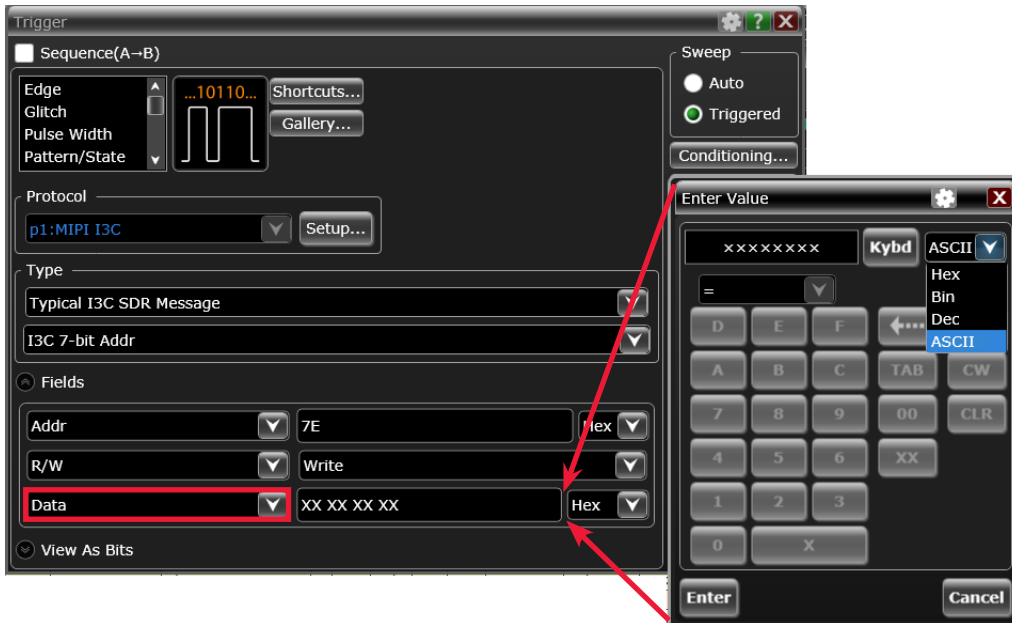
Trigger support several types of data pattern, supported by I3C specification.



### Post-acquisition searching

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

## I3C Protocol Triggering and Searching (Continued)

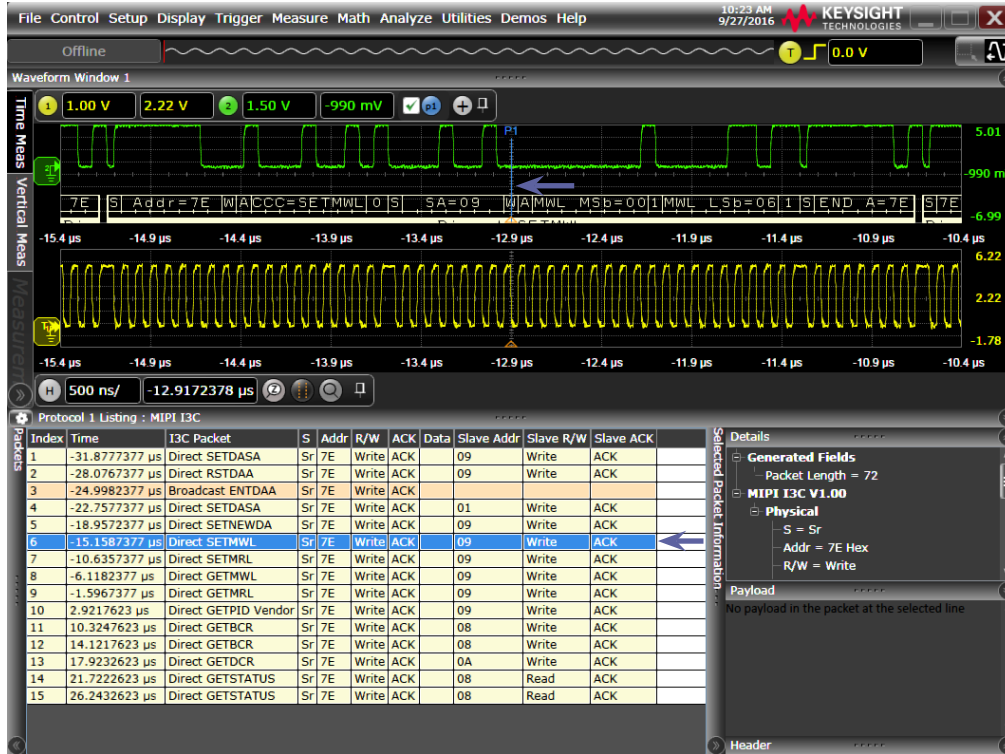


### In depth trigger/search

Using up to 3 field values of specific packet type, possible to trigger on specific pattern that want to see. This field include Payload trigger/search.

## I3C Protocol Decode

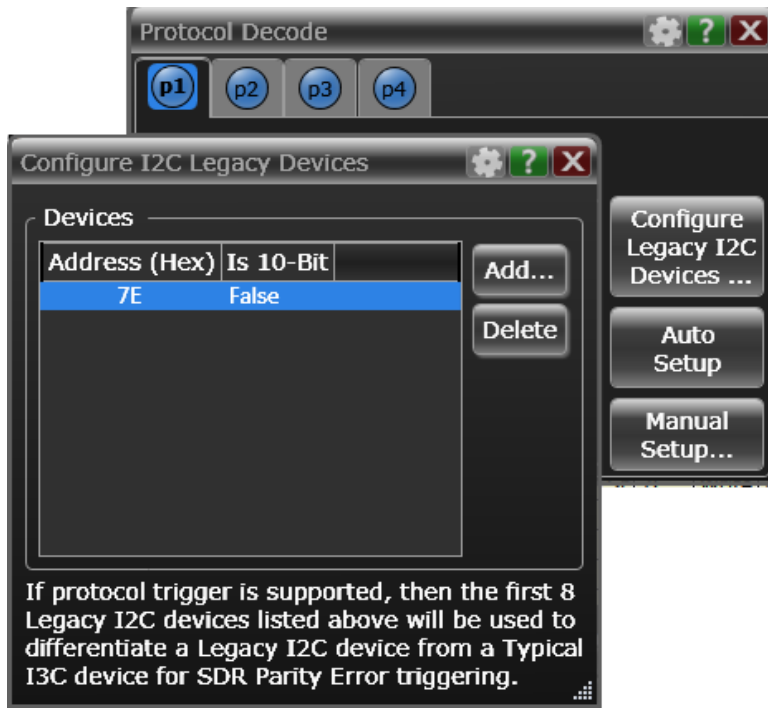
Keysight N8843A I3C protocol decoder software identifying legacy I2C message based on Legacy I2C address registration, so that engineer can distinguish the communication between I3C and Legacy I2C protocol data easily and can find ACK or NACK error based on address.



## Protocol decode with time correlation between waveform and listing

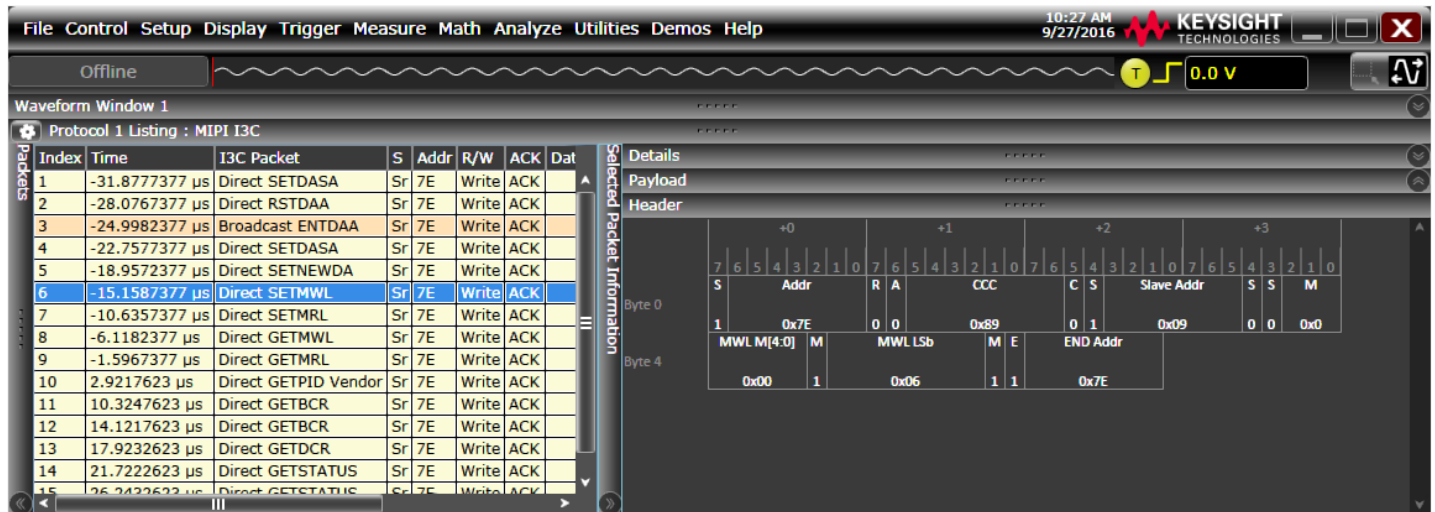
I3C protocol list window is correlated between the waveform and the selected packet on the list. The selected packet, highlighted blue row is time-correlated with the blue line in the waveform display so that engineer can see signal shape on specific packet data more efficiently.

## I3C Protocol Decode (Continued)



### Legacy I2C address configuration

Isolate Legacy I2C device on the bus will provide easy distinguish Legacy I2C device and Standard I3C device and also provide right SDR Parity calculation on trigger and decode.



### Resize-able window size

Flexible window size on protocol decoder window provide more usability to see specific part of interest. Especially full screen listing window show more protocol dependent data on acquired waveform so that help the engineer find out communication error on protocol side.

## Performance Characteristics

Options	Description
I3C protocol supported	Legacy I2C standard mode, fast mode, fast mode+ (plus)
	I3C SDR (standard data rate)
	I3C HDR-DDR (double data rate)
I3C source (SDA, SCL)	Analog channels 1, 2, 3, or 4
	Digital channels D0-D15 (on MSO models)
	Waveform memories
Support clock rate	Up to 12.5 MHz
Configuration option	Legacy I2C configuration
Triggering/Search	Start/Restart
	Stop
	Legacy I2C message
	Typical I3C SDR message
	I3C SDR broadcast message
	I3C SDR direct message
	Errors

## Standard Configuration

Options	Description
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 kits (N5449A)

## Ordering Information

This application is compatible with Infiniium Oscilloscope models below.

Application software		9000 Series	S-Series	90000 Series	V-Series	Z-Series
I3C protocol trigger and decode software <sup>1</sup>	Fixed			N8843A-1FP		
	Floating	Transportable		N8843A-2FP		
		Server-based			N5435A-107	

1. Require Infiniium 5.70 or above.
2. Hardware based serial triggering is supported by S-Series only.

## Related Literature

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



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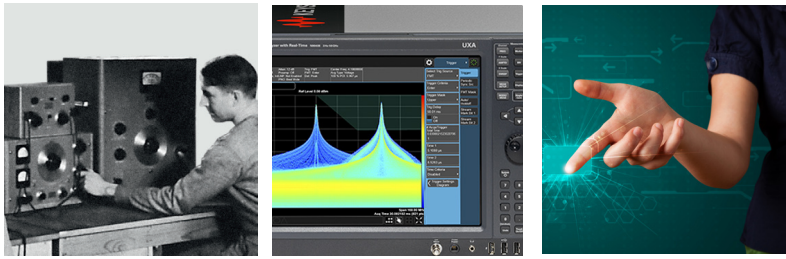
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