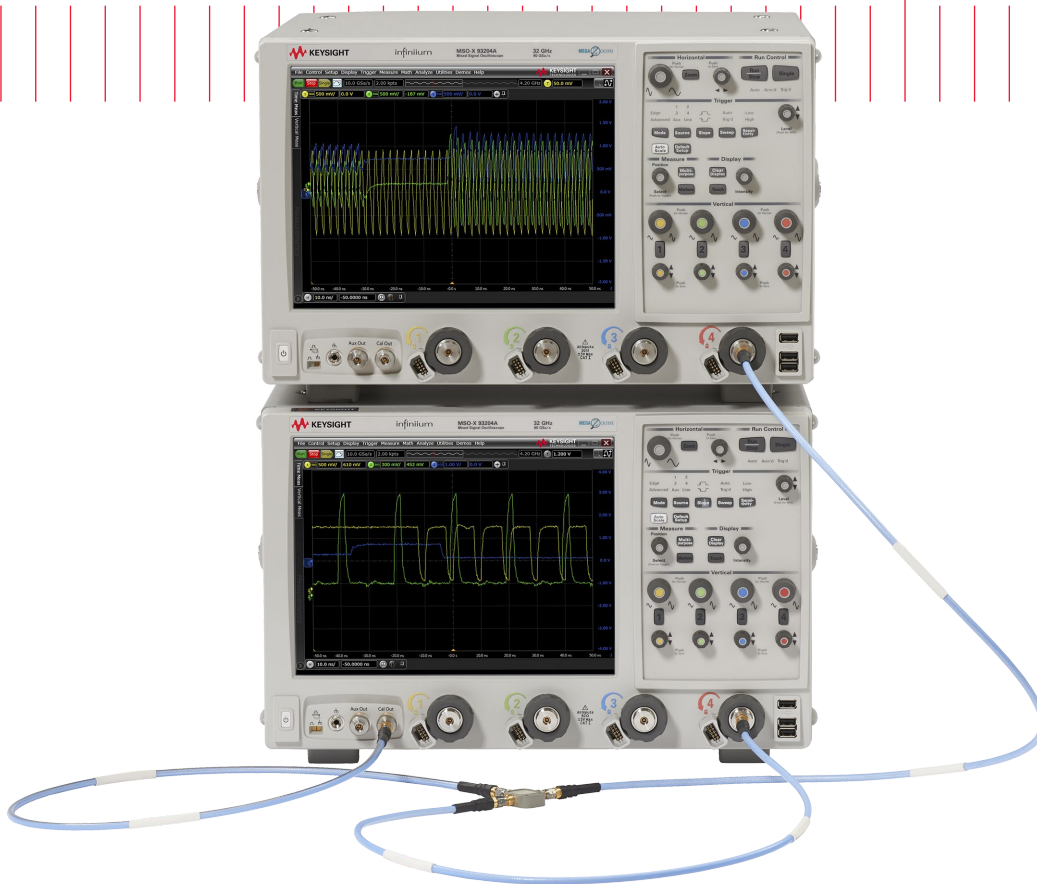# Keysight N8834A
MultiScope Application

Achieve Greater Insight and Productivity – Infiniium 9000, S-Series, 90000A, 90000 X-, 90000 Q-, V-Series and Z-Series

InfiniiVision 2000 X-, 3000T X-, 3000A X-, 4000 X-, 6000 X-, 6000 and 7000B Series

Data Sheet

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Unlocking Measurement Insights

Introduction

Introducing the new MultiScope application

Need more than four simultaneous oscilloscope channels? Ever placed two oscilloscopes together to see eight channels simultaneously? The Keysight Technologies, Inc. N8834A MultiScope application enables Infiniium and InfiniiVision real-time oscilloscope users to bring multiple oscilloscopes together for measurement on a single timebase. Capture, view, and analyze up to 40 time-correlated oscilloscope channels. If your need for more than four simultaneous channels goes away, each oscilloscope can be used independently and then brought back together when there are future needs for more than four channel measurements.

Are you working on applications like power rails, high-speed multi-lane serial buses, optical networking, or DDR memory systems? The N8834A MultiScope software allows connection of 2 to 10 oscilloscopes to achieve up to 40 channels on a single timebase. Each oscilloscope is daisy chained via cables and power splitters to the first oscilloscope, called the leader. Automated calibration is available to allow channel correlation across frames down to less than 1 ps. All oscilloscopes connect to a control PC via LAN or USB. The PC runs the Infiniium application (user interface) and allows users to change settings on all oscilloscopes. The Infiniium application on the PC shows all waveforms and measurements and offers analysis in addition to controlling the oscilloscope settings. The leader can also work as the controller in the absence of a control PC.

Features

– Save costs by connecting up to 10 of your existing Infiniium Series oscilloscopes to achieve 40 channel acquisitions in a single timebase.
– Data is presented to the user on a control PC or the leader scope as if all oscilloscope channels existed on a single frame.
– Oscilloscopes can be separated and used independently when four channels or fewer are needed.
– Application supports multiple frames using the same family of oscilloscopes (e.g. all V-Series scopes) or a heterogeneous combination of different oscilloscope families (e.g. one 9000 Series and one S-Series). Time-correlation precision depends on which frames are connected together.
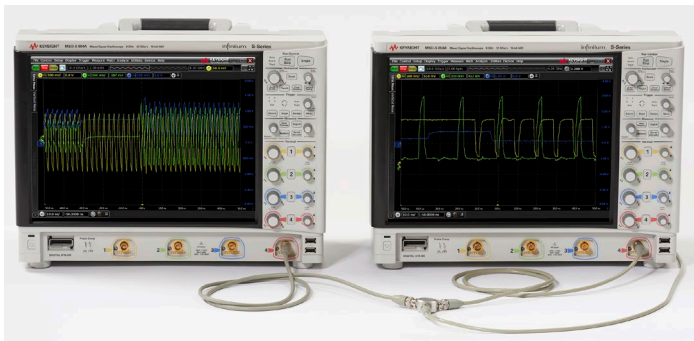
MultiScope connection of two S-Series oscilloscopes.
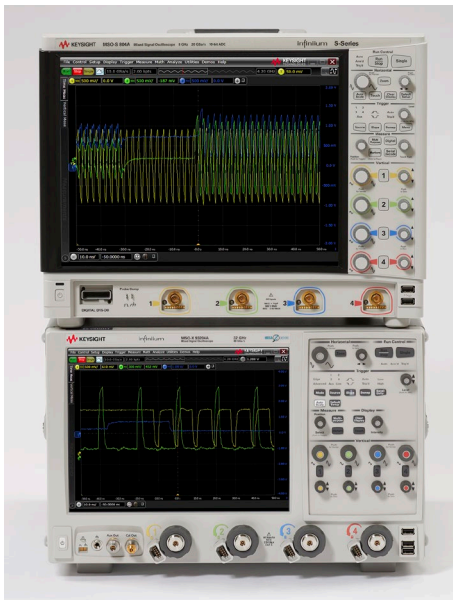
Heterogeneous combination: One S-Series oscilloscope and one 90000 X-Series oscilloscope.

Increase your productivity and efficiency

The N8834A MultiScope software works well with the new PC-hosted mode, which allows you to see live signals acquired from the oscilloscopes on a PC installed with the N8900A Infiniium Offline oscilloscope analysis software. Users can test lanes on the MultiScope from the comfort of their own workbench. Users can remotely login to the MultiScope application from the PC and observe live traffic. The Infiniium Offline oscilloscope analysis software application allows users to save the setup and waveform files in a composite format (.osc) to be analyzed offline on the PC, freeing up the MultiScope connection for others.


Analyze data on PC. User can either connect to live data for online analysis via hosted mode or save the setup file to be viewed offline via offline mode.
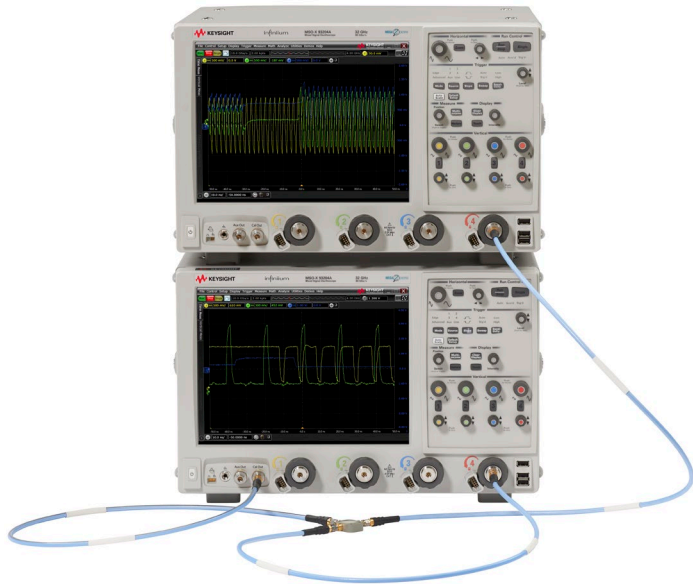
MultiScope Software Architecture

Control PC

The N8834A MultiScope application runs on a Windows 7 PC. All the scopes are connected to the control PC via LAN or USB. A control PC must be used if InfiniiVision scopes exist in the multiscope configuration.

– PC supports both hosted/online and offline analysis.
– Scope front panels are disabled during MultiScope operation. MultiScope is controlled by a PC installed with the N8900A Infiniium Offline analysis software or the leader scope in the absence of a PC.
– Display up to 16 grids per window, up to 8 windows.
– Full support of all measurements, functions, and analysis on all channels.
– Test at the comfort of your workbench.
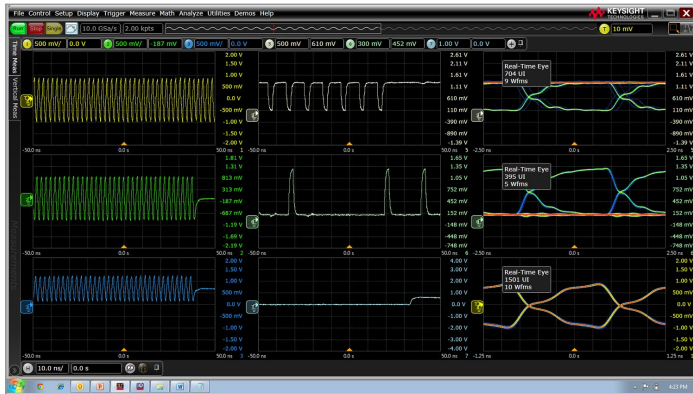
View of 6 channels and 3 eye diagrams on a single window with 8 grids.

The leader and the followers

The leader oscilloscope connects to the control PC via LAN or USB or can act as the controller in the absence of the PC. The one leader oscilloscope can connect two to nine followers. The connection between oscilloscopes is daisy chained with cables and splitters.

– Support edge or glitch trigger on leader (other triggering modes (including InfiniiScan) are not supported).
– One-time deskew eliminates frame-to-frame skew created by trigger daisy chain connection.
– Achieve inter-scope intrinsic jitter of 150 fs with precision calibration on the 90000 Q-Series and Z-Series Infiniium oscilloscopes.
– 10-MHz reference clock aligns sample for deep memory synchronization.

Daisy chained connection with power splitter and BNC cables.

Leader scope is used to control and display multichannel waveforms.

Calibration Methods

There are three calibration methods available with the N8834A MultiScope software. Each calibration method provides a different level of channel-to-channel skew value. Manual calibration is available for users who are interested in viewing multi-channel signals but not concerned about the skew factor across channels. External trigger helps users achieve 100 ps channel-to-channel skew. The most accurate measurements can be achieved with the drift correction method with skew in the range of 200 fs.

1. Manual

Manual calibration requires no cabling and users can achieve skew correction by manually dialing in the right skew values between the channels. InfiniiVision scopes supports only manual calibration.

2. Basic

The trigger out process provides the most basic level of inter-oscilloscope time synchronization. This process connects the trigger output signal (Trig Out) from the leader oscilloscope through each follower oscilloscope (Aux Trig) in a daisy chain configuration. The followers are each armed in descending order from furthest from the leader (F{N}) to nearest to the leader (F{1}). The leader's trigger is armed last. Once the leader triggers, each follower will trigger in turn, down through the chain.

3. Precision

The horizontal position of channels within different oscilloscope frames can drift with temperature (inter-oscilloscope drift). The drift correction synchronization process corrects for this drift by monitoring the inter-oscilloscope drift on a separate, dedicated synchronization channel. The idea is that any "time corrections" that keep the synchronization channels aligned will also keep the signals aligned. Precision calibration will consume one of the channels on each oscilloscope and is only available on 90000 X-, 90000 Q-, V-Series, and Z-Series oscilloscopes. On the Infiniium 90000 X- and V-Series, a maximum of two oscilloscopes can be connected to perform precision calibration. A sync port is available for precision calibration on 90000 Q- and Z-Series.

MultiScope Application Setup

1. Set up a MultiScope connection with cables and splitters to create a daisy chain configuration.

2. Connect all the scopes to the control PC using LAN or USB cables or use the leader scope as the controller.

3. Perform calibration using one of the calibration methods.

4. Customize the display using the Infiniium Offline oscilloscope analysis software on a PC or the Infiniium analysis software on the leader scope.
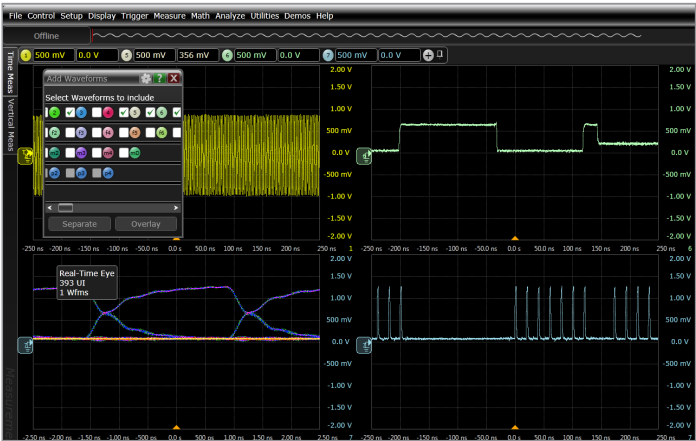
Add waveform
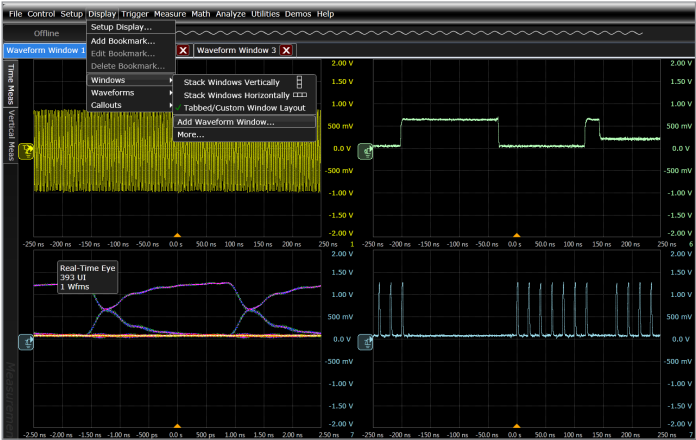
Add window

N8834A Infiniium MultiScope Configuration Table

	90000 Q-Series / Z-Series			90000 X-Series/ V-Series		S-Series		90000A Series	9000 Series			
	DSOX95004Q/ DSOZ504A, DSOX96204Q/ DSOZ634A	DSOX92004Q/ DSOZ204A, DSOX92504Q/ DSOZ254A, DSOX93304Q/ DSOZ334A		DSOV084A, DSOX91304A/ DSOV134A, DSOX91604A/ DSOV164A, DSOX92004A/ DSOV204A, DSOX92504A/ DSOV254A, DSOX92804A/ DSOV284A, DSOX93304A/ DSOV334A		DSOS054A, DSOS104A, DSOS204A, DSOS254A, DSOS404A, DSOS604A, DSOS804A		DSO090254A, DSO090404A, DSO090504A, DSO090804A, DSO091204A, DSO091304A	DSO9064A		DSO9104A, DSO9254A, DSO9404A	
Max bandwidth	50 to 63 GHz	33 GHz	20 to 33 GHz	20 to 33 GHz	8 to 16 GHz	6 to 8 GHz	0.5 to 4 GHz	2.5 to 13 GHz	600 MHz		1 to 4 GHz	
Max sample rate	160 GSa/s	80 GSa/s	80 GSa/s	80 GSa/s	40 GSa/s	20 GSa/s	10 GSa/s	40 GSa/s	10 GSa/s	5 GSa/s	20 GSa/s	10 GSa/s
Max channels/ frame	2	4	4	2	4	2	4	4	2	4	2	4
Max frames	10			10		10		10	10			
Sync port	Not available	Available	Available	Not available		Not available		Not available	Not available			
External reference frequency	100 MHz			10 MHz		10 MHz		10 MHz	10 MHz			
Calibration modes												
Manual	Yes			Yes	Yes	Yes		Yes	Yes			
Basic (inter-scope intrinsic jitter [2])	Yes (10 ps)			Yes (10 ps)	Yes (10 ps)	Yes (5 ps)		Yes (5 ps)	Yes (N/A)			
Precision [1] (inter-scope intrinsic jitter [2])	Yes (0.15 ps)			Yes (0.5 ps)	Yes (0.5 ps)	No		No	No			
Cable kit to connect to two frames	N2105A			N2123A		N2124A		N2124A	N2124A			

1. Precision calibration is available on 90000 Q- and Z-Series for up to 10 scopes and on 90000 X- and V-Series for up to 2 scopes.
2. Inter-scope intrinsic jitter value is used to calculate MultiScope delta-time measurement accuracy.

Recommended Oscilloscopes

The N8834A Multiscope software is compatible with Infiniium Series Oscilloscope with operating software revision 5.60 or higher. For oscilloscopes with earlier revisions, free upgrade software is available at: www.keysight.com/find/scope-apps-sw.

Ordering Information for Infiniium Oscilloscope Multiscope Configuration

Software options

Application	License type		Infiniium V/Z-Series	Infiniium S-Series	Infiniium 90000 Series	Infiniium 9000 Series
Infiniium analysis software (optional)	Floating	Transportable	N8900A-001	N8900A-001	N8900A-001	N8900A-001
		Server-based			–	
Multiscope software – connect 2 scopes	Fixed	User-installed	N8834A-AFP	N8834A-AFP	N8834A-AFP	N8834A-AFP
	Floating	Transportable	N8834A-ATP	N8834A-ATP	N8834A-ATP	N8834A-ATP
		Server-based			N5435A-085	
Multiscope software – connect up to 5 scopes	Fixed	User-installed	N8834A-BFP	N8834A-BFP	N8834A-BFP	N8834A-BFP
	Floating	Transportable	N8834A-BTP	N8834A-BTP	N8834A-BTP	N8834A-BTP
		Server-based			N5435A-086	
Multiscope software – connect up to 10 scopes	Fixed	User-installed	N8834A-CFP	N8834A-CFP	N8834A-CFP	N8834A-CFP
	Floating	Transportable	N8834A-CTP	N8834A-CTP	N8834A-CTP	N8834A-CTP
		Server-based			N5435A-090	
Multiscope software (upgrade to connect from 2 to up to 5 scopes)	Fixed	User-installed	N8834A-DFP	N8834A-DFP	N8834A-DFP	N8834A-DFP
	Floating	Transportable	N8834A-DTP	N8834A-DTP	N8834A-DTP	N8834A-DTP
		Server-based			–	
Multiscope software (upgrade to connect from 5 to up to 10 scopes)	Fixed	User-installed	N8834A-EFP	N8834A-EFP	N8834A-EFP	N8834A-EFP
	Floating	Transportable	N8834A-ETP	N8834A-ETP	N8834A-ETP	N8834A-ETP
		Server-based			–	

Note: Transportable license is required for viewing the multiscope channels on a PC via Hosted mode.

Ordering Information for InfiniiVision Oscilloscope Multiscope Configuration

Application	License type		InfiniiVision Series
Infiniium analysis software (required)	Floating	Transportable	N8900A-001
		Server-based	–
Multiscope software – connect 2 scopes	Floating	Transportable	N8834A-ATP
		Server-based	N5435A-085
Multiscope software – connect up to 5 scopes	Floating	Transportable	N8834A-BTP
		Server-based	N5435A-086
Multiscope software – connect up to 10 scopes	Floating	Transportable	N8834A-CTP
		Server-based	N5435A-090
Multiscope software (upgrade to connect from 2 to up to 5 scopes)	Floating	Transportable	N8834A-DTP
		Server-based	–
Multiscope software (upgrade to connect from 5 to up to 10 scopes)	Floating	Transportable	N8834A-ETP
	Server-based	–	–

Cable kits

N2123A	Infiniium 90000 X- and V-Series multi-frame cable kit for two frames
N2124A	Infiniium 9000, 90000A, and S-Series multi-frame cable kit for two frames
N2105A	Infiniium 90000 Q- and Z-Series multi-frame base kit for stacking two frames

Performance Characteristics

Control PC requirement	Windows 7 64 bit, minimum 4 G RAM (recommended 8 G), 1 G free hard drive space Infiniium software 5.50 and above *Note: Control PC is not required for Infiniium Series scopes if leader scope is used as the controller. A control PC must be used if InfiniiVision scopes exist in the multiscope configuration*
Leader and followers oscilloscope requirement[1]	Infiniium software 5.50 and above[2]
Channels supported	Analog channel 1 to 4 *Note: Digital channels on all MSO models are not supported*
Trigger modes [3]	
Edge	Triggers on a specified slope (rising, falling, or alternating between rising and falling) and voltage level on any channel or auxiliary trigger
Glitch	Triggers on glitches narrower than the other pulses in your waveform by specifying a width less than your narrowest pulse and a polarity
Note: All other trigger modes are not supported	

1. Front panel control is disabled during MultiScope operation. Oscilloscope control is handled by the Infiniium Offline software on PC or the leader scope.
2. Software 4.30 or above requires Windows 7. N2753A Infiniium Windows XP to 7 OS upgrade kit (oscilloscope already has M890 motherboard). N2754A Infiniium Windows XP to 7 OS and M890 motherboard upgrade kit (oscilloscope without M890 motherboard). Verify the M890 motherboard using the procedure found in the Windows 7 upgrade kit data sheet with the publication number 5990-8569EN.
3. If leader scope is used as the controller, all trigger modes supported on the leader scope will be available in the multiscope configuration.

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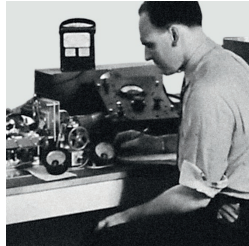
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