

Keysight Technologies

MIPI® UniProSM Protocol Triggering and Decode for Infiniium Series Oscilloscope

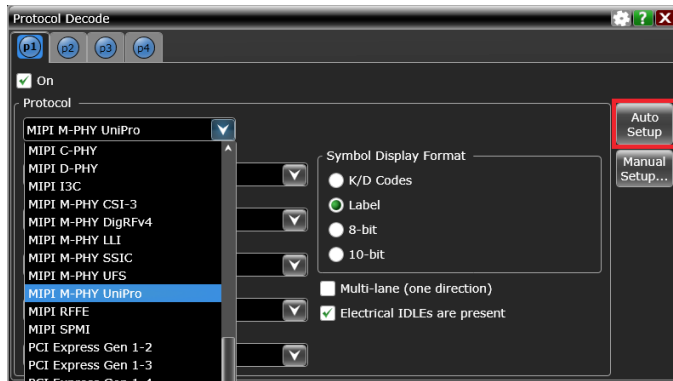
Technical Overview

MIPI® UniProSM

MIPI serial buses are the backbone for communication in mobile products. The serial bus interface provides 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, can't be done in real-time, and includes potential for human error. As well, traditional scope triggers are not sufficient for specifying protocol-level conditions.

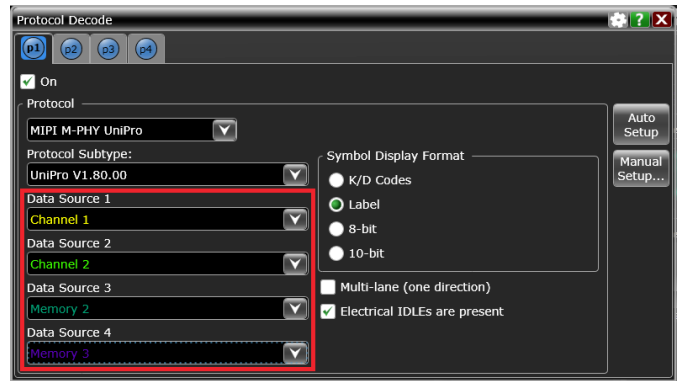
Extend your scope capability with the Keysight Technologies, Inc. MIPI UniPro triggering and decode application. This application makes it easy to debug and test designs that include MIPI UniPro buses using your Infiniium Series oscilloscope.

- Set up your scope to show MIPI UniPro protocol decode in less than 1 minute.
- Get access to a rich set of integrated 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.



1 Minute UniPro decode setup

Configure your oscilloscope to display decode in under 1 minute. Use “Auto Setup” to automatically configure sample rate, memory depth, threshold and trigger levels.



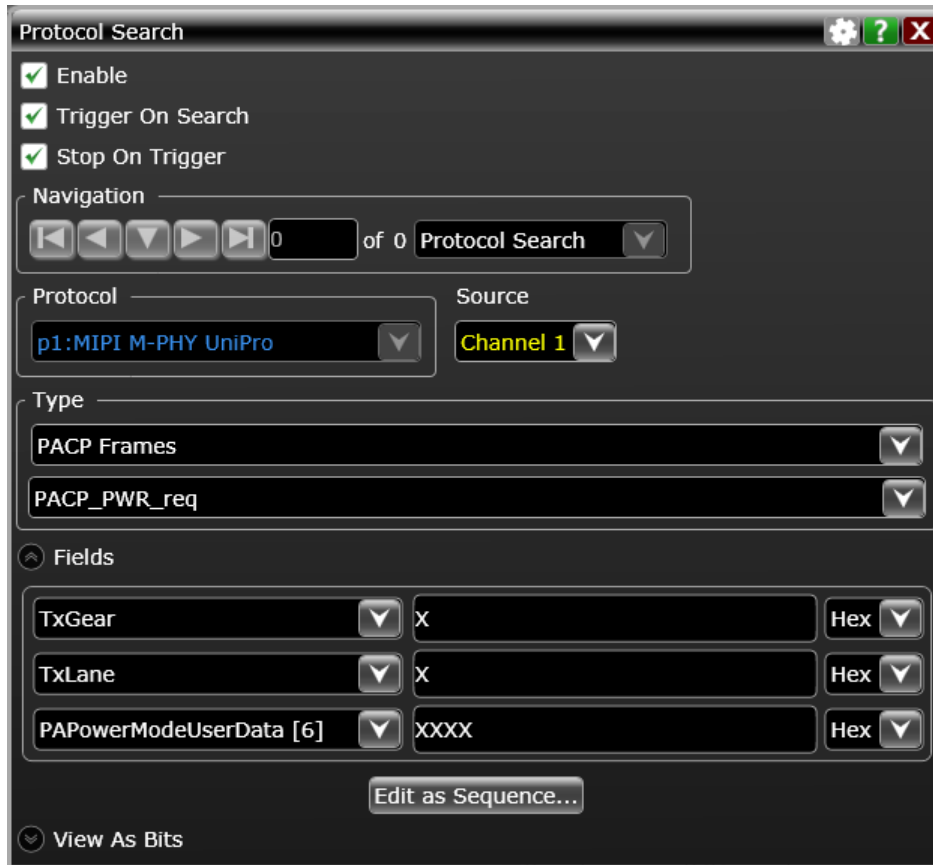
Support for live and saved waveforms

Perform and view decode information on both live and saved waveforms. Decode up to any combination of four live or saved waveforms.

MIPI UniPro Setup, Protocol Triggering and Search Capabilities

Get access to a rich set of integrated protocol-level triggers. The application includes a suite of configurable protocol-level trigger conditions specific to MIPI UniPro. When serial triggering is selected, the application uses software-based triggering.

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.

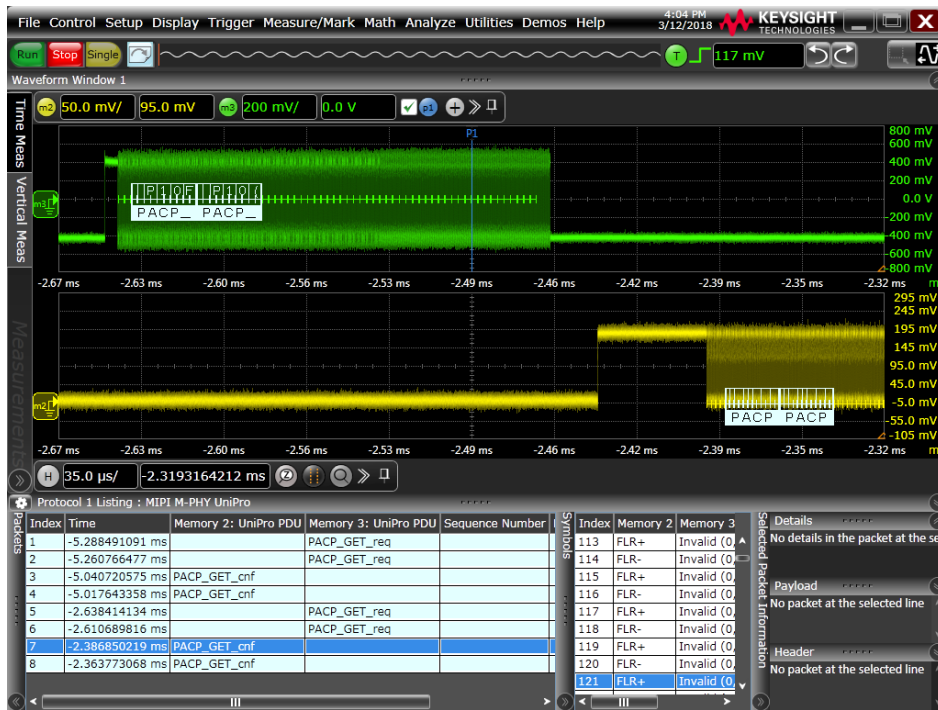


MIPI UniPro trigger and search setup

Quickly access the software-based trigger via the trigger or search menus. Software-based triggering enables quick setup of data, remote, or error frames.

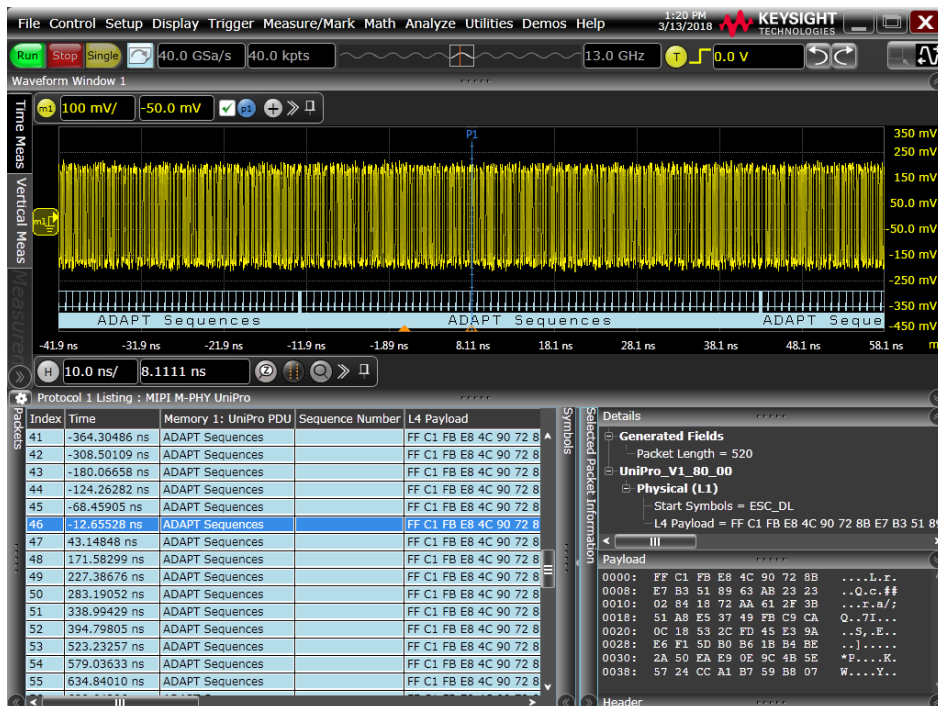
MIPI UniPro Protocol Decode

Keysight MIPI UniPro protocol decoder software provides multilane decode and descramble on scrambled data. User can select Multi-lane option and descramble option.



Time correlation between signal and decoded data

Quickly move between physical and MIPI UniPro protocol layer information using the time-correlated tracing marker. Display protocol content using embedded decode in the waveform area. Or, see protocol events in a compact listing format. Minor tick marks indicate clock transitions. Major tick marks indicate segments of the serial packet MIPI UniPro measurements are automatically time-correlated with measurement on other scope channels.



ADAPT Sequence Decode

Keysight MIPI UniPro decode can decode ADAPT sequence, which should be sent for receiver equalization optimization on Gear4 speed, so that engineer can find issue on Gear4 speed, that might occur from transmitter's wrong ADAPT pattern was received or receiver equalizer do not settled within ADAPT sequence.

Performance Characteristics

	Description
UniPro protocol supported	UniPro v1.41, v1.60, v1.80
UniPro data source	Analog channels 1, 2, 3, or 4 Waveform memories
	The application relies on probing and measurement thresholds to properly condition the signal for decode.
Data rate	Up to 11.66 Gb/s
Auto setup	Automatically configures scope settings for proper MIPI UniPro decode and software based protocol search including memory depth, sample rate and measurement thresholds
Search/Triggering (software based)	ADAPT sequence L2 frames PACP frames Triggers Control Symbol sequence Errors

Recommended Oscilloscopes

The UniPro protocol decode is compatible with Keysight Infiniium Series oscilloscopes with operating software revision 6.20 or higher. For oscilloscopes with earlier revisions, free upgrade software is available here: www.keysight.com/find/scope-apps-sw.

Data rate	Minimum bandwidth	Minimum channels	Recommended oscilloscopes
Gear1 (Up to 1.46 Gbps)	6GHz	2	9000 ¹ , S-series, 90000
Gear2 (Up to 2.92 Gbps)	12GHz	2	90000, V-series and Z-series
Gear3 (Up to 5.83 Gbps)	20GHz	2	V-series and Z-series
Gear4 (Up to 11.66Gbps)	25GHz	2	V-series and Z-series

1. Decode might be limited due to bandwidth limitation, recommended to decode for PWM signal only.

Standard Configuration

S-Series oscilloscope	Oscilloscope + 4 x Active probes (2 TX, 2 RX)
90000A series oscilloscope	Oscilloscope + 4 x Active probes (recommend using 1169B)
V-Series and Z-Series oscilloscope	Oscilloscope + 4 x Active probes (recommend using 1169B with N5442A)

Ordering Information

This application is compatible with Infiniium Oscilloscope models below.

Application software			9000 Series	S-Series	90000 Series	V-Series	Z-Series	
MIPI UniPro protocol decode software ¹	Fixed	Factory installed	-	N8808B-1FP	Option 052	N8808A-1FP	N8808A-1FP	
		User installed	N8808B-1NL	N8808B-1FP	N8808A-1NL	N8808A-1FP	N8808A-1FP	
		Transportable	N8808B-1TP	N8808B-1TP	N8808A-1TP	N8808A-1TP	N8808A-1TP	
	Floating	Server-based	N5435A-048	N5435A-048	N5435A-048	N5435A-048	N5435A-048	
		Fixed	Factory installed	-	N8818B-1FP	Option 066	N8818A-1FP	N8818A-1FP
			User installed	N8818B-1NL	N8818B-1FP	N8818A-1NL	N8818A-1FP	N8818A-1FP
UFS protocol decode software (optional) ¹	Floating	Transportable	N8818B-1TP	N8818B-1TP	N8818A-1TP	N8818A-1TP	N8818A-1TP	
		Server-based	N5436A-063	N5436A-063	N5436A-063	N5436A-063	N5436A-063	
		Fixed	Factory installed	-	N8820B-1FP	Option 068	N8820A-1FP	N8820A-1FP
User installed	N8820B-1NL		N8820B-1FP	N8820A-1FP	N8820A-1FP	N8820A-1FP		
MIPI CSI-3 protocol decode software (optional)	Floating	Transportable	N8802B-1TP	N8802B-1TP	N8802A-1TP	N8802A-1TP	N8802A-1TP	
		Server-based	N5436A-065	N5436A-065	N5436A-065	N5436A-065	N5436A-065	
		Fixed	Factory installed	Option 003	N5384A-1FP	Option 003	E2688A-1FP	E2688A-1FP
User installed	N5384A-1NL		N5384A-1FP	E2688A-1NL	E2688A-1FP	E2688A-1FP		
Serial data analysis with clock recovery (included in DSA model)	Floating	Transportable	N5384A-1TP	N5384A-1TP	E2688A-1TP	E2688A-1TP	E2688A-1TP	
		Server-based	N5436A-003	N5436A-003	N5436A-003	N5436A-003	N5436A-003	

1. Requires Infiniium 6.20 or above.

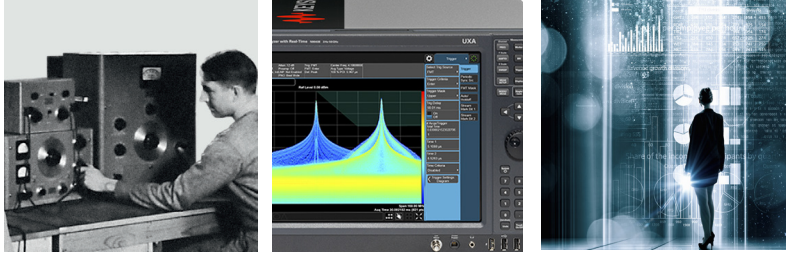
Related Literature

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

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