InfiniiVision Software Ordering Guide

Application Specific Software Products

KEYSIGHT
TECHNOLOGIES

Application Specific Software Products

Six optional application-focused and one ultimate bundle software package are supported on InfiniiVision oscilloscopes. The application-focused packages are targeted at Automotive, Aerospace & Defense, Embedded Design, Power Testing, USB 2.0, and NFC measurement applications. Unlike other oscilloscope software options in the market, you don't need to worry about which individual protocols and/or advanced analysis features you need to select and purchase for your scope. Each of the InfiniiVision software packages come with a suite of serial protocols and advanced measurement capabilities tuned for a broad set of industry/application-specific measurement applications.

Automobile	**A/D**	**Embedded**	**Power**	**USB**	**NFC**	**Ultimate Bundle**
D$000AUTA	**D$000AERA**	**D$000GENA**	**D$000PWRA**	**D$000USBA**	**D$000NFCA**	**D$000BDLA**
CAN (.dbc symbolic)	MIL-STD 1553	I^{2}C	Power Analysis	USB 2.0 Full/Low	NFC Trigger	D$000AUTA
CAN-FD (.dbc sym)	ARINC 429	SPI	USB-PD	USB 2.0 Hi-speed	NFC Automated Test	D$000AERA
LIN (.ldf symbolic)	Video Analysis	UART/RS232/485	Mask Limit Test	USB-PD	Resonant Frequency	D$000GENA
SENT	Mask Limit Test	Audio/I^{2}S	FRA (Bode)	USB 2.0 Signal Quality		D$000PWRA
CXPI	FRA (Bode)	USB-PD		Jitter Analysis (6000X only)		D$000USBA
FlexRay		Video Analysis		Mask Limit Testing		D$000NFCA
User-definable Manchester		Mask Limit Test		FRA (Bode)		
User-definable NRZ		FRA (Bode)				
Mask Limit Test						
FRA (Bode)						

Application Specific Software Products

For example, there are multiple automotive protocols and features required for testing today's automotive serial buses. With InfiniiVision's automotive software package you can get all automotive-related trigger, decode and analysis features you need, including CAN, CAN FD, LIN, CXPI, FlexRay, SENT, PSI5 (user-definable Manchester), user-definable NRZ, mask limit testing, and frequency response analysis (Bode plot). Moreover, the price you'll pay for a suite of measurement capabilities and protocols in a single software package from Keysight may be less than the price of other vendor's single protocol option.

CAN (.dbc symbolic) CAN-FD (.dbc sym) LIN (.ldf symbolic) SENT CXPI FlexRay User-definable Manchester User-definable NRZ Mask Limit Test FRA (Bode) **InfiniiVision 3000T X-Series**	**D3000AUTA**
I^2C SPI UART/RS232/485 Audio/I^2S USB-PD Video Analysis Mask Limit Test FRA (Bode) **InfiniiVision 3000T X-Series**	**D3000GENA**
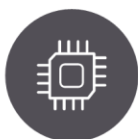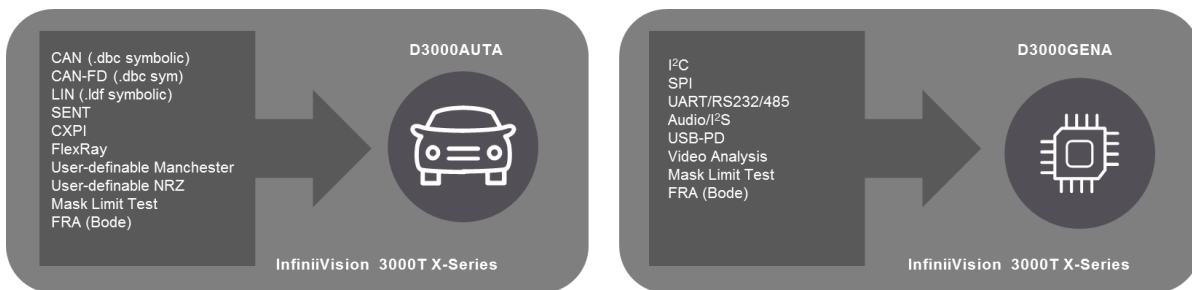
If you are testing embedded designs, you may need to trigger and decode on one or more of today's the more ubiquitous serial buses including I^2C, SPI, and UART/RS232/RS485. Although one particular protocol analysis tool, such as I^2C, may suffice for your current embedded project, your next embedded project may require UART, SPI, or I^2S support. The embedded software package comes with a broad set of trigger and decode protocol support, as well advanced measurement capabilities.

The following pages of this document provide an overview of InfiniiVision's optional software packages along with tables that show each enabled protocol and advanced measurement capabilities, model numbers for ordering, and compatibilities for the various Keysight InfiniiVision X-Series oscilloscopes. For more detailed information on these optional software packages, refer the data sheets listed near the end of this document.

Automotive Software Packages

The Automotive Software Package for Keysight's InfiniiVision oscilloscopes enables protocol triggering and decode for a broad range of the most common automotive serial buses used today for power train and body control and monitoring. This package also enables other advanced analysis capabilities including eye-diagram mask testing and frequency response analysis to help test and debug automotive electronic systems.

InfiniiVision Series:		2000A	3000A	3000T	4000A	6000A	P9240	M9240
Automotive Package Model Number:		D2000AUTA	D3000AUTA	D3000AUTA	D4000AUTA	D6000AUTA	P9240AUTB	M9240AUTB
Serial Trigger & Decode	CAN[1]	✓	✓	✓	✓	✓	✓	✓
Serial Trigger & Decode	CAN FD[1]			✓	✓	✓	✓	✓
Serial Trigger & Decode	LIN[2]	✓	✓	✓	✓	✓	✓	✓
Serial Trigger & Decode	FlexRay		✓	✓	✓	✓		
Serial Trigger & Decode	SENT			✓	✓	✓	✓	✓
Serial Trigger & Decode	PSI5 (User-definable Manchester)			✓	✓	✓	✓	✓
Serial Trigger & Decode	User-definable NRZ			✓	✓	✓	✓	✓
Serial Trigger & Decode	CXPI			✓	✓	✓	✓	✓
Advanced Analysis	Mask Test[3]	✓	✓	✓	✓	✓	✓	✓
Advanced Analysis	Frequency Response Analysis			✓	✓	✓	✓	✓
Advanced Analysis	Advanced Math	Std	✓	Std	Std	Std	Std	Std

Recommended probes for automotive differential buses

Differential bus (max bit rate)	N2791A (25-MHz bandwidth)	N2818A [1] (200-MHz bandwidth)
CAN (1 Mbps)	X	X
CAN FD (10 Mbps data phase)		X
FlexRay (10 Mbps)		X

1. The N2818A differential probe is not compatible with Keysight's InfiniiVision 2000 X-Series oscilloscopes.

Aero Software Packages

The Aero Software Package for Keysight's InfiniiVision oscilloscopes enables protocol triggering and decode for the MIL-STD 1553 and ARINC 429 serial buses. This package also enables other advanced analysis capabilities including eye-diagram mask testing and frequency response analysis (FRA) to help test and debug electronic systems found in the aerospace & defense industries.

InfiniiVision X-Series:		3000A	3000T	4000A	6000A	P9240	M9240
Aero Package Model Number:		D3000AERA	D3000AERA	D4000AERA	D6000AERA	P9240AERB	M9240AERB
Serial Trigger & Decode	MIL-STD 1553	✓	✓	✓	✓	✓	✓
	ARINC 429	✓	✓	✓	✓	✓	✓
Advanced Analysis	Mask Test	✓	✓	✓	✓	✓	✓
	Frequency Response Analysis (Bode plots)		✓	✓	✓	✓	✓
	Enhanced HDTV Video Triggering & Analysis	✓	✓	✓	✓	✓	✓
	Advanced Math	✓	Std	Std	Std	Std	Std

Recommended probes for MIL-STD 1553 and ARINC 429 differential buses

Differential bus (max bit rate)	N2791A (25-MHz bandwidth)	N2818A (200-MHz bandwidth)
MIL-STD 1553 (1 Mbps)	X	X
ARINC 429 (100 kbps)	X	X

Embedded Software Packages

The Embedded Software Package for Keysight's InfiniiVision oscilloscopes enables protocol triggering and decode for a broad range of the most common serial buses used today for embedded and mixed-signal designs. This package also enables other advanced analysis capabilities including mask testing and frequency response analysis to help test today's electronic designs.

InfiniiVision Series:		2000A	3000A	3000T	4000A	6000A	P9240	M9240
General-purpose Package Model Number:		D2000GENA	D3000GENA	D3000GENA	D4000GENA	D6000GENA	P9240GENB	M9240GENB
Serial Trigger & Decode	I^{2}C	✓	✓	✓	✓	✓	✓	✓
	SPI	✓	✓	✓	✓	✓		
	UART (RS-232/485)	✓	✓	✓	✓	✓	✓	✓
	I^{2}S (Audio)		✓	✓	✓	✓		
	USB-PD			✓	✓	✓	✓	✓
Advanced Analysis	Mask Test	✓	✓	✓	✓	✓	✓	✓
	Frequency Response Analysis (Bode Plots)			✓	✓	✓	✓	✓
	Enhanced HDTV Video Test		✓	✓	✓	✓	✓	✓
	Advanced Math	Std	✓	Std	Std	Std	Std	Std

Recommended probes for embedded protocols

	Speed	Recommended Probes
I^{2}S (audio)	2.8 MHz	Single-ended Passive Probes
I^{2}C/SMbus	< 4 MHz	Single-ended Passive Probes
RS232/UART	< 10 MHz	Single-ended Passive Probes
RS422/485	10 MHz differential	N2792A/N2818A
SPI	1~100 MHz	Single-ended Passive Probes/N2795A active probes
USB-PD	300 kHz	Single-ended Passive Probes

Power Software Packages

The Power Software Package for Keysight's InfiniiVision oscilloscopes enables a broad range of automated power supply characterization measurements including critical frequency response measurements such as power supply rejection ratio (PSRR) and control loop response. This package also enables hardware-based pass/fail mask testing and USB PD triggering and decode.

	InfiniiVision Series:		3000A	3000T	4000A	6000A	M9240
	Power Package Model Number:		D3000PWRA	D3000PWRA	D4000PWRA	D6000PWRA	M9240PWRB
12755	Input Analysis	Real power	✓	✓	✓	✓	✓
		Apparent power	✓	✓	✓	✓	✓
		Reactive power	✓	✓	✓	✓	✓
		Power factor	✓	✓	✓	✓	✓
		Crest factor (V&I)	✓	✓	✓	✓	✓
		Phase angle	✓	✓	✓	✓	✓
		Current harmonics	✓	✓	✓	✓	✓
		Inrush current	✓	✓	✓	✓	✓
	Switching Device Analysis	Switching loss	✓	✓	✓	✓	✓
		$R_{DS(ON)}$	✓	✓	✓	✓	✓
		$V_{CE(SAT)}$	✓	✓	✓	✓	✓
		Slew rate (V&I)	✓	✓	✓	✓	✓
		Modulation analysis	✓	✓	✓	✓	✓
		Auto probe deskew	✓	✓	✓	✓	✓
	Output Analysis	Output ripple	✓	✓	✓	✓	✓
		Turn on/off time	✓	✓	✓	✓	✓
		Efficiency	✓	✓	✓	✓	✓
		Transient response	✓	✓	✓	✓	✓
	Frequency Response Analysis	PSRR		✓	✓	✓	✓
		Control loop response		✓	✓	✓	✓
	Other Advanced Analysis Capabilities	Frequency Response Analysis (Bode plots)		✓	✓	✓	✓
		USB PD (Power Delivery) Trigger & Decode		✓	✓	✓	✓
		Mask Test	✓	✓	✓	✓	✓
		Advanced Math	✓	Std	Std	Std	Std

NFC Software Packages

Keysight's low-cost near field communication (NFC) test solution consists of an InfiniiVision X-Series oscilloscope, True*form* waveform generator, programmable 3-in-1 NFC reference antenna (poller, listener, and resonant frequency coils), and PC-based NFC compliance test software that performs thorough analog testing of NFC-enable devices. All 4-channel InfiniiVision 3000T and 4000 X-Series oscilloscopes (DSO or MSO models) are compatible with performing NFC compliance testing.

TEST	NFC-A	NFC-B	NFC-F (212 kbps)	NFC-F (424 kbps)	NFC-V
Listener mode tests					
Overall Pass/Fail	✓	✓	✓	✓	✓
Frame delay time (FTD)	✓	✓	✓	✓	✓
Load modulation amplitude (LMA)	✓	✓	✓	✓	✓
Response data	✓	✓	✓	✓	✓
Poller mode tests					
Overall Pass/Fail	✓	✓	✓	✓	✓
t1	✓				✓
t2	✓				✓
t3	✓				✓
t4	✓				✓
t5	✓				✓
Data rate	✓	✓	✓	✓	✓
Field strength (Vov)	✓	✓	✓	✓	✓
Carrier frequency (Fc)	✓	✓	✓	✓	✓
Modulation depth	✓	✓	✓	✓	✓
Modulation index	✓	✓	✓	✓	✓
Response data	✓	✓	✓	✓	✓
Overshoot	✓	✓	✓	✓	✓
Undershoot		✓	✓	✓	
Rise time (tr)		✓	✓	✓	
Fall time (tf)		✓	✓	✓	
Resonant frequency test					
Frequency at highest return loss	✓	✓	✓	✓	✓

Keysight's N2116A 3-in-1 programmable NFC reference antenna.

USB Software Packages

The USB Software Package for Keysight's InfiniiVision oscilloscopes enables USB 2.0 low-, full-, and hi-speed protocol triggering and decode, as well as USB PD (Power Delivery) trigger and decode. This package also enables other advanced analysis capabilities including USB 2.0 automated signal quality testing, jitter analysis, mask testing, and frequency response analysis (Bode plots) to help test and debug high-speed digital signals, such as USB 2.0.

InfiniiVision Series:		4000A	6000A
USB Package Model Number:		D4000USBA	D6000USBA
Serial Trigger & Decode	USB 2.0 Low- & Full-speed	✓	✓
	USB 2.0 Hi-speed[1]	✓	✓
	USB PD (Power Delivery)	✓	✓
Advanced Analysis Capabilities	USB 2.0 Signal Quality Test[2]	✓	✓
	Jitter Analysis		✓
	Mask Test	✓	✓
	Frequency Response Analysis	✓	✓

1. USB 2.0 hi-speed trigger & decode supported on ≥ 1-GHz bandwidth models only.
2. USB 2.0 hi-speed signal quality tests on ≥ 1.5-GHz bandwidth models only.

Probing the USB 2.0 Differential Bus

To test USB 2.0 low- and full-speed designs, the only probes required are two 10:1 passive probes, which are shipped as standard accessories with every Keysight InfiniiVision X-Series oscilloscope.

To test USB 2.0 hi-speed designs based on pre-compliance standards with the appropriate device or host test fixture, 50-Ω SMA cables with SMA-to-BNC adapters are all that is required. For this use-model of testing, the test fixture (E2666B for device, E2667B for host) is programmed to generate a specific test pattern.

During the design and debug phase of product development, engineers often need to test "live traffic" in their hi-speed designs (non-compliance testing). In this case, a test fixture is not required, but a differential active probe with sufficient bandwidth is required. For this use-model of testing, Keysight recommends an InfiniiMode N2750A Series differential active probe.

Keysight's InfiniiMode N2750A Series differential active probe.

Ultimate Software Packages

The Ultimate Bundle Software Package bundles all the serial bus protocol trigger & decode capabilities, as well as all the advanced measurement capabilities of the individual licensed industry/application software packages (Auto, Power, Aero, USB, and Embedded). In addition, this package enables the NFC trigger and automated NFC test software.

InfiniiVision Series:		2000A	3000A	3000T	4000A	6000A	P9240	M9240
Ultimate Package Model Number:		D2000BDLA	D3000BDLA	D3000BDLA	D4000BDLA	D6000BDLA	P9240BDLB	M9240BDLB
Serial Trigger & Decode — I^2C	Embedded Package	✓	✓	✓	✓	✓	✓	✓
SPI		✓	✓	✓	✓	✓		
UART		✓	✓	✓	✓	✓	✓	✓
I^2S			✓	✓	✓	✓		
CAN	Auto Package	✓	✓	✓	✓	✓	✓	✓
CAN FD			✓	✓	✓	✓	✓	✓
LIN		✓	✓	✓	✓	✓	✓	✓
FlexRay			✓	✓	✓	✓		
SENT			✓	✓	✓	✓	✓	✓
PSI5 (User-definable Manchester)			✓	✓	✓	✓		
User-definable NRZ			✓	✓	✓	✓	✓	✓
CXPI			✓	✓	✓	✓	✓	✓
MIL-STD 1553	Aero Package		✓	✓	✓	✓	✓	✓
ARINC 429			✓	✓	✓	✓	✓	✓
USB-PD	USB/Pwr/Embd			✓	✓	✓	✓	✓
USB low & full-speed	USB Package				✓	✓		
USB hi-speed[1]					✓	✓		
Advanced Analysis — USB Signal Quality Test					✓	✓		
Jitter Analysis						✓		
Power Analysis	Power Package		✓	✓	✓	✓		✓
Mask Test	All Packages	✓	✓	✓	✓	✓	✓	✓
Frequency Response Analysis			✓	✓	✓	✓	✓	✓
Advanced Math		Std	✓	Std	Std	Std	Std	Std
Enhanced HDTV Video Test	Embedded/Aero		✓	✓	✓	✓	✓	✓
NFC Trigger and Automated Test[2]	N/A				✓	✓		✓	✓

1. USB hi-speed trigger & decode available in ≥ 1-GHz bandwidth models only.
2. NFC trigger available on the P9240 and M9240 Series, but automated NFC test software not compatible with these Series

Recommended Probes for Typical Serial Bus Measurements

Applications	Speed and Signal Type	Recommended Probe	Required Probe BW
LIN	625 kbps, Single-ended	Passive Probes (1 Mohm, single-ended)	>50 MHz
ARINC 425	100 kbps, Differential	N2792A/N2818A	200 MHz
CAN 2.0	5 Mbps, Differential	N2792A/N2818A	200 MHz
CAN FD	10 Mbps, Differential	N2792A/N2818A	200 MHz
MIL Std 1553	1 Mbps, Differential +/-25Vpp	N2792A/N2818A	200 MHz
I2S (audio)	~2.8 MHz, Single-ended	Passive Probes (1 Mohm, single-ended)	>100 MHz
I2C/SMbus	<4 MHz, Single-ended	Passive Probes (1 Mohm, single-ended)	>100 MHz
RS232/UART	<10 Mbps, Single-ended	Passive Probes (1 Mohm, single-ended)	>100 MHz
RS422/485	10 Mbps, Differential	N2792A/N2818A	200 MHz
Flexray	10 Mbps, Differential	N2792A/N2818A	200 MHz
SPI	1 – 100MHz, Single-ended	Passive Probes (1 Mohm, single-ended) or N2795A	>100 MHz passive or 1 GHz active
MOST	150 Mbps, Differential	N2750A	1.5 GHz
USB2.0	480 Mbps, Differential	N2750A	1.5 GHz
USB power delivery	300 kbps, Single-ended	Passive Probes (1 Mohm, single-ended)	>50 MHz

Related Literature

Publication Title	Publication Number
Power Software Package Data Sheet	5992-3925EN
Automotive Software Package Data Sheet	5992-3912EN
Embedded Software Package Data Sheet	5992-3924EN
Aero Software Package Data Sheet	5992-3910EN
USB Software Package Data Sheet	5992-3920EN
NFC Software Package Data Sheet	5992-3911EN
Ultimate Bundle Software Package Data Sheet	5992-3918EN

Ordering Information

Compatibility requirements

New InfiniiVision software structure will be based on new released firmware 7.30 and 2.50.

New InfiniiVision Firmware Versions	Product Family
Firmware 7.30+	InfiniiVision 3000T, 4000A, 6000A and P924x series
Firmware 2.50+	InfiniiVision 2000A, 3000A X-series

Flexible Software Licensing and KeysightCare Software Support Subscriptions

Keysight offers a variety of flexible licensing options to fit your needs and budget. Choose your license term, license type, and KeysightCare software support subscription.

License Terms

Perpetual – Perpetual licenses can be used indefinitely.
Time-based – Time-based licenses can be used through the term of the license only (6, 12, 24, or 36 months).

License Types

Node-locked – License can be used on one specified instrument/computer.
Transportable (M9240 Series only) – License can be used on one instrument/computer at a time but may be transferred to another using Keysight Software Manager (internet connection required).

KeysightCare Software Support Subscriptions

Perpetual licenses are sold with a 12 (default), 24, 36, or 60-month software support subscription. Support subscriptions can be renewed for a fee after that.

Time-based licenses include a software support subscription through the term of the license.

KeysightCare Software Support Subscription provides peace of mind amid evolving technologies.

- Ensure your software is always current with the latest enhancements and measurement standards.
- Gain additional insight into your problems with live access to our team of technical experts.
- Stay on schedule with fast turnaround times and priority escalations when you need support.

Selecting your license

1. Choose your software product (eg. D3000AUTA).
2. Choose your license term: perpetual or time-based.
3. Choose your license type: node-locked or transportable (available for the M9240 Modular Series oscilloscopes only).
4. Depending on the license term, choose your support subscription duration.

Examples

If you selected:	Your quote will look like:	
	Part Number	**Description**
D3000GENA node-locked perpetual license with a 12-month support subscription	D3000GENA	Embedded Analysis Software for 3000 X-Series
	R-B5J-001-A	Node-locked perpetual license
	R-B6J-001-L	12-month software support subscription
	Part Number	**Description**
M9240GENB transportable time-based 6-month license	M9240GENB	Embedded Analysis Software for M924xA oscilloscopes
	R-B4N-004-F	6-month time-based, transportable license with software support subscription

To configure your product and request a quote:

http://www.keysight.com/find/software

Contact your Keysight representative or authorized partner for more information or to place an order:

www.keysight.com/find/contactus

FAQs and Resources

What are the benefits?

You now have the flexibility to choose what's best for your needs and budget. For example, you are not limited to buying a license that is perpetually locked to one instrument – now you can, for example, purchase a time-based license that can be used for 6 months until the project is ended. This can help you save on software costs for short term projects or set your software costs on a recurring subscription instead of a costly one-time purchase.

With our recurring support subscription, software updates with enhancements and bug fixes are also guaranteed, along with ensured and tracked response times on all technical support inquiries for the duration of the support subscription.

How can you convert your legacy software to the new software?

Keysight is offering an upgrade program for existing customers with legacy licenses on their products. They will only need to pay for 12 months of support to upgrade to the new software model that corresponds to their existing software. For many, this will be an excellent option since our new software products contain multiple licenses rolled into one!

There are a few options: you can press "Start my Upgrade" and fill in your own license info. We will then generate a quote for the support, and when the order is placed, generate your new license. You can also press "contact me" and enter in your company and Keysight contact information, and we'll take care of the rest.

Learn more at: www.keysight.com

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at: www.keysight.com/find/contactus

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