CONFIGURATION GUIDE

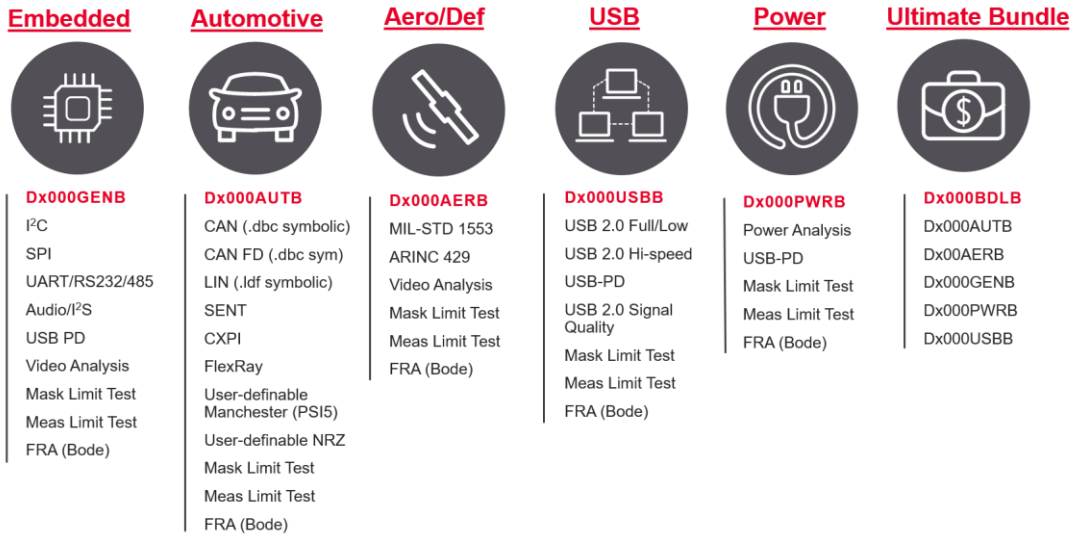
# InfiniiVision Software Ordering Guide

## Application Specific Software Products

KEYSIGHT TECHNOLOGIES

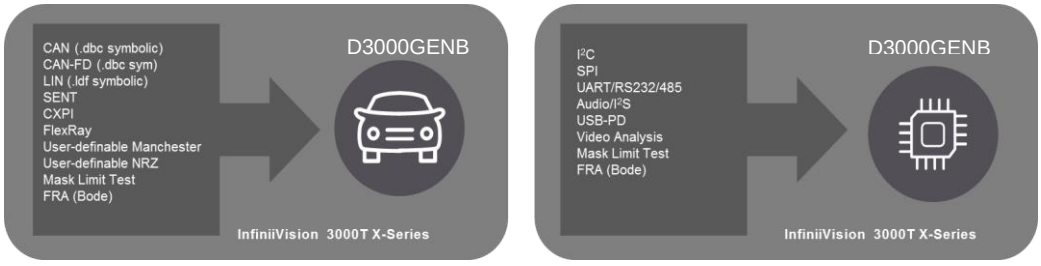
## Application Specific Software Products

Five application-focused software packages, as well as a value-priced ultimate bundle package, are supported in InfiniiVision X-Series oscilloscopes. Applications areas supported include Automotive, Aerospace & Defense, Embedded Design, Power Testing, and USB 2.0. Unlike other oscilloscope software products in the market, you don't need to worry about which protocol or features you need to pick first. All you need is to pick the application for your current and anticipated projects.




Multiple automotive serial bus protocols and features are often required to test automotive serial bus systems. With the InfiniiVision D3000AUTB automotive package (for InfiniiVision 3000T/G X-series), you can get all automotive-related trigger, decode and analysis features you need, including CAN, CAN FD, LIN, SENT, CXPI, FlexRay, Manchester, NRZ, Mask, and FRA (Bode plots). Moreover, the cost for this package is extremely affordable and priced similar to single protocol software options from other oscilloscope vendors.

If you are working with embedded designs, triggering on and decoding I2C, SPI, and UART/RS232/RS485 may be required. Although support for just one protocol may be needed today, it can be annoying if you need to purchase support for additional protocols for future projects. The D3000GENB embedded software package (for InfiniiVision 3000T/G X-series) also supports USB PD, Audio (I2S), Enhanced HDTV video analysis and frequency response analysis (Bode plots).




This document provides an overview of each InfiniiVision software package with direct links to dedicated software package data sheets that provides additional information for each application.

## 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 (gain and phase Bode plots) to help test and debug automotive electronic systems.

| InfiniiVision X-Series | | 2000A | 3000A | 3000T | 3000G | 4000A | 6000A | P9240 | M9240 |
|---|---|---|---|---|---|---|---|---|---|
| Automotive software package model number | | D2000AUTB | D3000AUTB | D3000AUTB | D3000AUTB | D4000AUTB | D6000AUTB | P9240AUTC | M9240AUTB |
| Serial trigger & decode | CAN [1] | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | CAN FD [1] | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | LIN [2] | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | FlexRay | | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| | SENT | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | PSI5 (user-definable Manchester) | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | User-definable NRZ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | CXPI | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Advanced analysis | Mask limit test [3] | ✓ | ✓ | ✓ | Std | ✓ | ✓ | ✓ | ✓ |
| | Measurement limit test | ✓ | ✓ | ✓ | Std | ✓ | ✓ | | |
| | Frequency response analysis (bode plots) | | | ✓ | Std | ✓ | ✓ | ✓ | ✓ |
| | Advanced math | Std | ✓ | Std | Std | Std | Std | Std | Std |

### Recommended probes for automotive differential buses

| Differential bus (max bit rate) | N2791A (25-MHz BW) | DP0010A [4] (250-MHz BW) |
|---|---|---|
| CAN (1 Mbps) | ✓ | |
| CAN FD (10 Mbps) | | ✓ |
| FlexRay (10 Mbps) | | ✓ |

1. Symbolic decoding supported by importing .dbc file, except on the 2000A and 3000A Series.
2. Symbolic decoding supported by importing .ldf file, except on the 2000A and 3000A Series.
3. CAN, CAN FD, FlexRay, and SENT mask files available for download at no additional charge.
4. The DP0010A differential probe is not compatible with Keysight's InfiniiVision 2000A and 3000A 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, enhanced HDTV video analysis, and frequency response analysis (Bode plots) to help test and debug electronic systems found in the aerospace & defense industries.

| InfiniiVision X-Series | | 3000 A | 3000 T | 3000 G | 4000 A | 6000 A | P924 0 | M924 0 |
|---|---|---|---|---|---|---|---|---|
| Aero software package model number | | D3000AERB | D3000AERB | D3000AERB | D4000AERB | D6000AERB | P9240AERC | M9240AERB |
| Serial trigger & decode | MIL-STD 1553 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | ARINC 429 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Advanced analysis | Mask limit test | ✓ | ✓ | Std | ✓ | ✓ | ✓ | ✓ |
| | Measurement limit test | | ✓ | Std | ✓ | ✓ | ✓ | ✓ |
| | Frequency response analysis (bode plots) | | ✓ | Std | ✓ | ✓ | ✓ | ✓ |
| | Enhanced HDTV video triggering & analysis | ✓ | ✓ | Std | ✓ | ✓ | ✓ | ✓ |
| | Advanced math | ✓ | Std | Std | Std | Std | Std | Std |

### Recommended probes for aerospace differential buses

| Differential bus (max bit rate) | N2791A (25-MHz BW) | DP0010A [1] (250-MHz BW) |
|---|---|---|
| MIL-STD 1553 (1 Mbps) | ✓ | |
| ARINC 429 (100 kbps) | ✓ | ✓ |

1. The DP0010A differential probe is not compatible with Keysight's InfiniiVision 2000A and 3000A X-Series oscilloscopes.

## 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, enhanced HDTV video analysis, and frequency response analysis (Bode plots) to help test today's embedded designs. All features included in this package are standard on the InfiniiVision 3000G X-Series.

| InfiniiVision X-Series | | 2000A | 3000A | 3000T | 4000A | 6000A | P9240 | M9240 |
|---|---|---|---|---|---|---|---|---|
| Embedded software package model number | | D2000GENB | D3000GENB | D3000GENB | D4000GENB | D6000GENB | P9240GENC | M9240GENB |
| Serial trigger & decode | $I^2C$ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | SPI | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| | UART (RS-232/485) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | $I^2S$ (audio) | | ✓ | ✓ | ✓ | ✓ | | |
| | USB-PD | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Advanced analysis | Mask limit test | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Measurement limit 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 |
|---|---|---|
| $I^2S$ (audio) | 2.8 MHz | Single-ended passive probes |
| $I^2C$/SMbus | < 4 MHz | Single-ended passive probes |
| RS232/UART | < 10 MHz | Single-ended passive probes |
| RS422/485 | 10 MHz differential | DP0010A differential active probe |
| 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 | 3000G | 4000A | 6000A | M9240 |
|---|---|---|---|---|---|---|---|---|
| Power package model number: | | | D3000PWRB | D3000PWRB | D3000PWRB | D4000PWRB | D6000PWRB | M9240PWRB |
| Power Supply Characterization Measurements | 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 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | RDS(ON) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | VCE(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 | | ✓ | ✓ | ✓ | ✓ | ✓ |

| InfiniiVision Series: | | 3000A | 3000T | 3000G | 4000A | 6000A | M9240 |
|---|---|---|---|---|---|---|---|
| Power package model number: | | D3000PWRB | D3000PWRB | D3000PWRB | D4000PWRB | D6000PWRB | M9240PWRB |
| Other advanced analysis capabilities | Frequency response analysis (bode plots) | ✓ | ✓ | Std | ✓ | ✓ | ✓ |
| | USB PD (power delivery) trigger & decode | ✓ | ✓ | Std | ✓ | ✓ | ✓ |
| | Mask limit test | ✓ | ✓ | Std | ✓ | ✓ | ✓ |
| | Measurement limit test | ✓ | ✓ | Std | ✓ | ✓ | ✓ |
| | Advanced math | ✓ | Std | Std | Std | Std | Std |

## 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 (6000 X-Series only, mask testing, and frequency response analysis (Bode plots) to help test and debug high-speed digital signals, such as USB 2.0.

| InfiniiVision Series: | | 3000T | 3000G | 4000A | 6000A |
|---|---|---|---|---|---|
| USB package model number: | | D3000USBB | D3000USBB | D4000USBB | D6000USBB |
| Serial trigger & decode | USB 2.0 low- & full-speed | ✓ | ✓ | ✓ | ✓ |
| | USB 2.0 Hi-speed [1] | ✓ | ✓ | ✓ | ✓ |
| | USB PD (power delivery) | ✓ | Std | ✓ | ✓ |
| Advanced analysis capabilities | USB 2.0 signal quality test [2] | | | ✓ | ✓ |
| | Jitter analysis | | | | ✓ |
| | Mask limit test | ✓ | Std | ✓ | ✓ |
| | Measurement limit test | ✓ | Std | ✓ | ✓ |
| | Frequency response analysis | ✓ | Std | ✓ | ✓ |

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).

| InfiniiVision Series: | | | 2000A | 3000A | 3000T | 3000G | 4000A | 6000A | P9240 | M9240 |
|---|---|---|---|---|---|---|---|---|---|---|
| Ultimate package model number: | | | D2000BDL B | D3000BDL B | D3000BDL B | D3000BDL B | D4000BDL B | D6000BDL B | P9240BDL C | M9240BDL B |
| Serial trigger & decode | $I^2C$ | Embedded package | ✓ | ✓ | ✓ | Std | ✓ | ✓ | ✓ | ✓ |
| | SPI | | ✓ | ✓ | ✓ | Std | ✓ | ✓ | | |
| | UART | | ✓ | ✓ | ✓ | Std | ✓ | ✓ | ✓ | ✓ |
| | $I^2S$ | | | ✓ | ✓ | Std | ✓ | ✓ | | |
| | 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 | | | ✓ | Std | ✓ | ✓ | ✓ | ✓ |
| | USB low & full-speed | USB package | | | ✓ | ✓ | ✓ | ✓ | | |

| InfiniiVision Series: | | | 2000A | 3000A | 3000T | 3000G | 4000A | 6000A | P9240 | M9240 |
|---|---|---|---|---|---|---|---|---|---|---|
| Ultimate package model number: | | | D2000BDL B | D3000BDL B | D3000BDL B | D3000BDL B | D4000BDL B | D6000BDL B | P9240BDL C | M9240BDL B |
| | USB hi-speed [1] | USB package | | | ✓ | ✓ | ✓ | ✓ | | |
| Advanced analysis | USB signal quality test | | | | | | ✓ | ✓ | | |
| | Jitter analysis | | | | | | | ✓ | | |
| | Power analysis | Power package | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| | Mask test | Power package | ✓ | ✓ | ✓ | Std | ✓ | ✓ | ✓ | ✓ |
| | Frequency response analysis | | | | ✓ | Std | ✓ | ✓ | ✓ | ✓ |
| | Advanced math | | Std | ✓ | Std | Std | Std | Std | Std | Std |
| | Enhanced HDTV video test | Embedded/aero | | ✓ | ✓ | Std | ✓ | ✓ | ✓ | ✓ |

1. USB hi-speed trigger & decode available in ≥ 1-GHz bandwidth models only.

## 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 |
| Ultimate Bundle Software Package Data Sheet | 5992-3918EN |

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