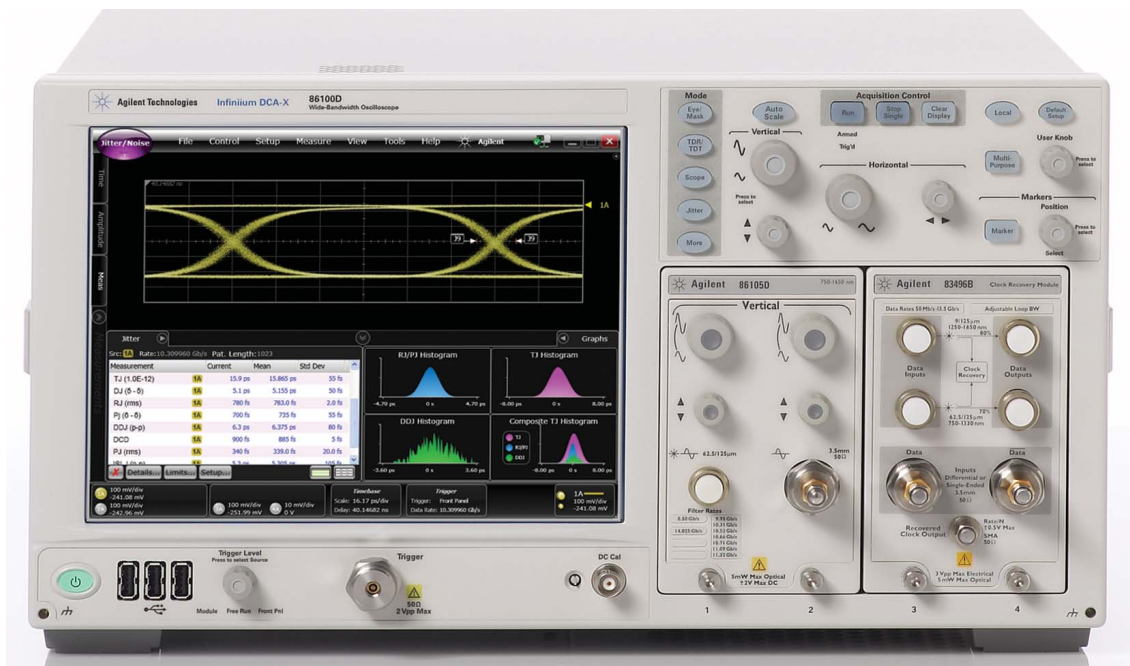


# infiniium DCA-X

## Agilent 86100D Wide-Bandwidth Oscilloscope Mainframe and Modules



See the TRUE performance of your designs.

The 86100D DCA-X is the premier solution for accurate and precise measurements on high-speed digital designs from 50 Mb/s to over 80 Gb/s. Applications include:

- Optical—Transceiver design and manufacturing compliance test
- Electrical—ASIC/FPGA/IC design and channel characterization
- TDR/TDT/S-parameter—Serial bus design, cable, and PCB channel characterization

The DCA-X provides powerful analysis and measurement insight for the novice and expert user alike:

- Scope, eye diagram and mask testing
- Jitter and amplitude analysis
- Equalization, de-embedding, and embedding
- Phase locked loop (PLL) analysis
- Phase noise analysis

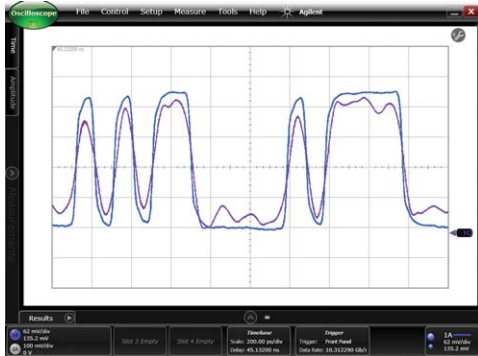


Agilent Technologies

# Overview of the Infiniium DCA-X

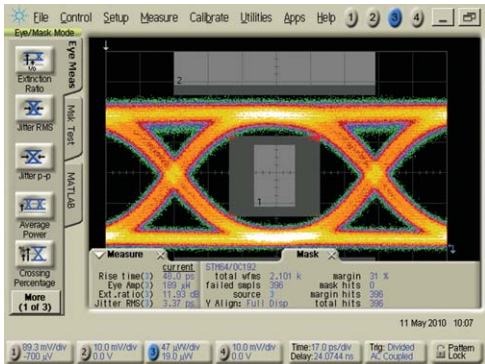
The 86100D DCA-X can be viewed as four powerful instruments in one:

## Scope Mode



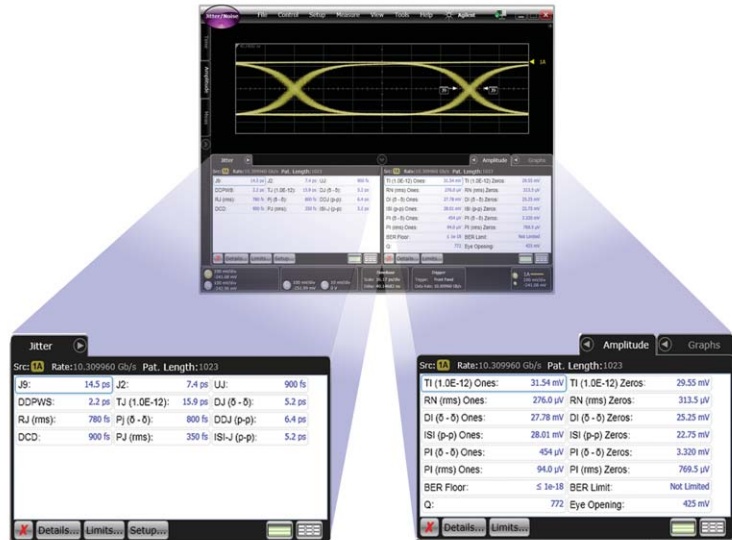
A full function oscilloscope providing high-fidelity waveform characterization

## Eye/Mask Mode



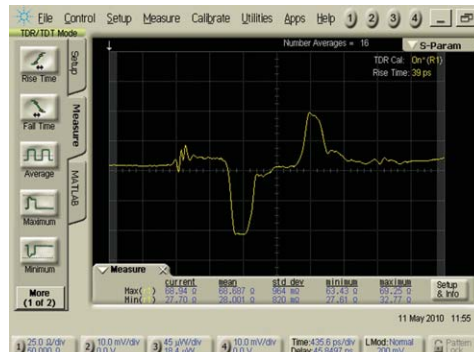
A digital communication analyzer providing fast transmitter characterization using eye diagram analysis, calibrated reference receivers, and automated mask margin measurements

## Jitter Mode



Precision jitter, amplitude, and frequency analysis capability

## TDR/TDT Mode



Accurate time domain reflectometry/transmission impedance and S-Parameter measurements

## Table of Content

- Benefits .....3
- 86100D Hardware Options .....6
- Dual User Interfaces.....7
- 86100D Modes of Operation .....8
- 86100D Software Options.....9
- Module Overview .....14
- Electrical/Optical, Optical Only .....15
- Electrical Only .....15
- Time Domain Reflectometry/  
Transmission (TDR/TDT) .....17
- Clock Recovery .....18
- Precision Timebase.....19
- Probes .....20
- Interfaces and Accessories.....22

These basic instrument modes are further complemented by the following features that provide additional insight and analysis capability:

- De-embedding, embedding, equalizer capability
- Phase Noise/Jitter Spectrum Analysis
- Phase Locked Loop (PLL) Analysis
- Custom analysis (MATLAB)
- And more...

# Benefits

## The DCA-X provides users with a variety of benefits:

### Improved margins, differentiated products

Standards are continually moving towards faster and faster data rates in response to market demands. As a result, data signals have shorter bit periods and faster edge speeds. In order for digital communication systems to approach error-free performance, engineers often employ techniques such as emphasis and equalization, and they take great care to minimize jitter and noise impairments on their signals.

The 86100D DCA-X is architected to provide the optimum combination of wide-bandwidth, low noise, and low jitter so that you measure the TRUE performance of your design, not the scope itself.

With bandwidth >90GHz, jitter <60fs, and noise as low as 250uV, the DCA-X provides industry-leading waveform fidelity that yields:

- more accurate waveform measurements
- lower jitter measurements
- improved mask margins, higher yields

With the addition of Option SIM InfiniiSim-DCA, signal degradation due to fixtures or cables can be removed, or de-embedded, providing even more margin. Alternatively, it is also possible to simulate the signal at the end of a fixture or cable (embedding) for additional insight or compliance.

### Industry standard compliance

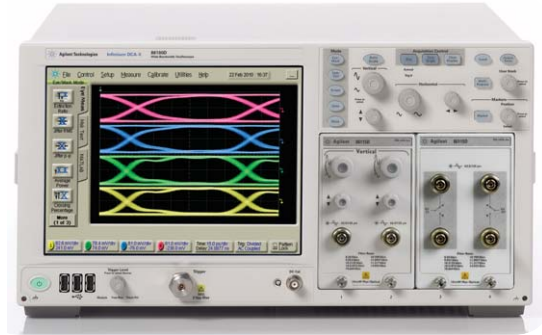
The DCA makes it easy to perform industry standard compliance measurements accurately and quickly. The 86100D provides:

- Over 50 built-in standards-based masks with automated mask margin analysis
- Optical reference receivers with the widest data rate coverage in the industry
- Fast, accurate, and compliant jitter measurements

## Lower cost of test

Increased channel density and fast measurement functions and algorithms (such as fast Auto Scale and ER tuning) result in lower cost of test per port.

- High density channel count configurations
- Optimized algorithms for high volume manufacturing



## Faster time to market

Start making meaningful measurements quickly and get your product to market faster. The DCA-X user interface has been designed so that novice users quickly become proficient scope users.

- One-button mode buttons quickly configure standards-based measurements
- Context sensitive Follow-Me HELP
- Customizable displays

## Upgradeable and backwards compatible

The modular architecture of the 86100D means that the instrument can evolve to meet your needs. There's no need to purchase capability until you need it.

- Modular - add capacity and/or new capabilities
- Protect your investment
  - 100% backwards compatible with all DCA modules (used with 54750A, 83480A, 86100A/B/C mainframes)
  - 100% code compatible with 86100C DCA-J
- Plan for the future – the DCA-X supports future modules and new measurement capability

# The 86100D Infiniium DCA-X Wide-Bandwidth Oscilloscope— Engineered for unmatched measurement accuracy, insight, and ease-of-use

## High-resolution touch screen display

See your signal more clearly with a larger 10.4" XGA (1024 x 768) high-resolution color touch screen display

## Dual user interfaces

A dual user interface comes standard. FlexDCA enables next generation measurement capability while the classic DCA-J user interface provides 100% backwards compatibility

## FlexDCA Remote Access Software

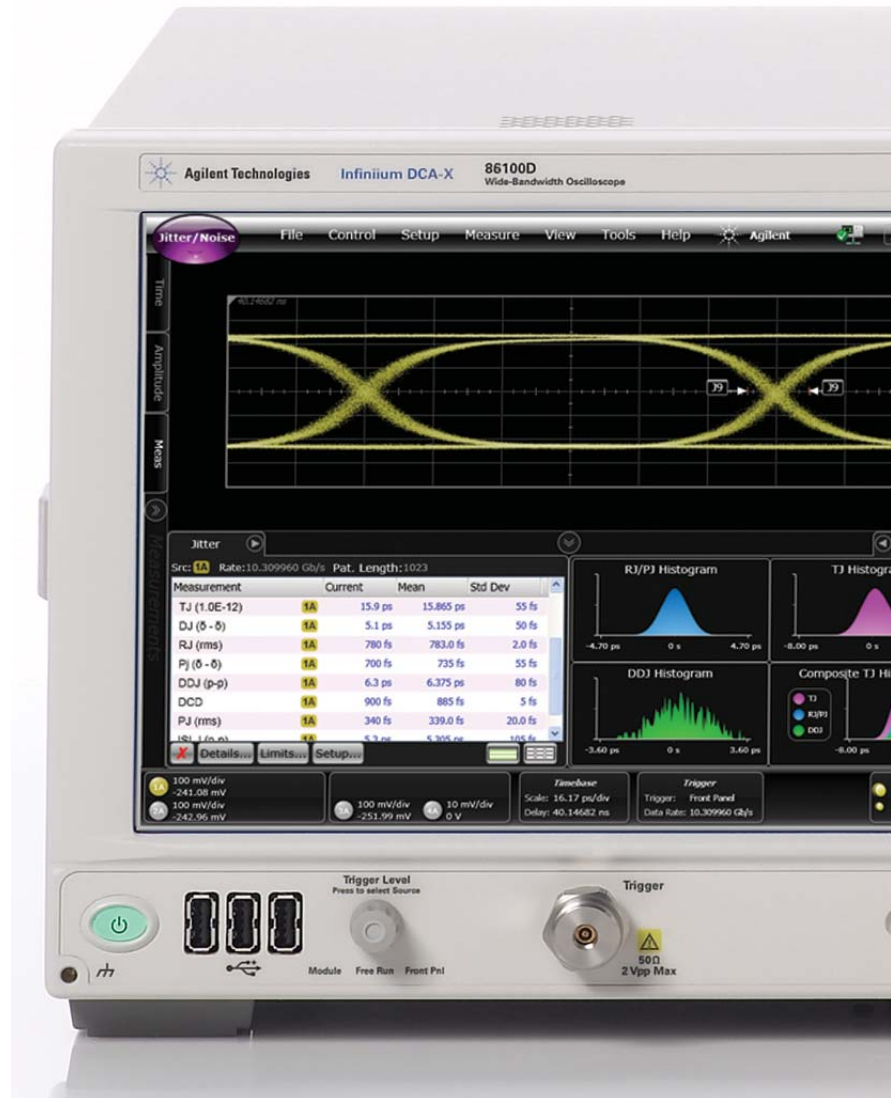
The new user interface is also available as N1010A FlexDCA Remote Access Software, a PC-based application that provides connected (via LAN) and offline operation

## Easy access to USB ports

Three front panel USB 2.0 host ports for your USB keyboard, mouse, and memory stick

## De-embedding / Embedding Capability

Integrated de-embedding/embedding capability using 86100D-SIM InfiniiSim-DCA removes signal degradation from fixtures and provides greater insight



## Display and document results quickly

Display up to 64 measurements simultaneously, ideal for documenting your results.

## Probing

30 GHz differential and single-ended probing capability is available for the DCA Series scopes using the InfiniiMax III probing system and the N5477A probe adapter.

### Dedicated mode buttons

One-touch Mode buttons quickly configure standards-based measurements

### Customizable controls

Vertical gain and offset controls can be assigned to any channel or math function for quick and easy amplitude adjustments

### One-touch operation

Customizable multipurpose key can be configured to print/save screen shots, save waveforms or load a favorite setup.

### Analog control

The User Knob controls any analog entry area that is active, making adjustments easier and faster than keying in numbers from a keypad.

### Easy-to-use marker controls

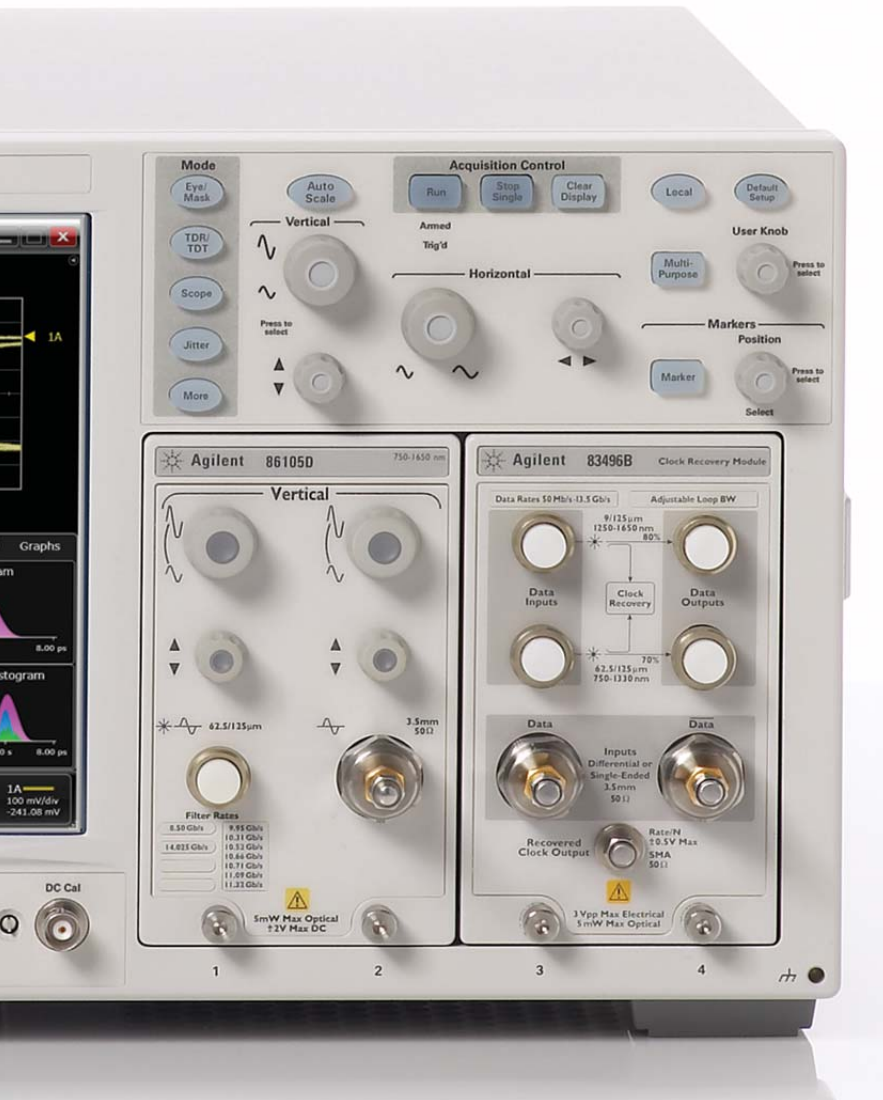
Control multiple markers without lifting your fingers off of the controls! Simply push the knob to select another marker and start making adjustments quickly and easily..

### Compatible

Fully backwards compatible with ALL legacy DCA modules (from 54750A, 83480A, and 86100A/B/C mainframes)

### Modular

Choose from a variety of plug-in modules that perform precision optical, electrical, and TDR/TDT measurements. Select modules to obtain the specific bandwidth, filtering, and sensitivity that matches your measurement needs.



### Foundation for the future

Supporting up to 16 measurement channels and next generation modules, the 86100D DCA-X provides the foundation for efficient testing of high-density ASIC / FPGA / SERDES and parallel designs

## 86100DU-GPI

### Precision measurements on high-speed digital designs from 50 Mb/s to over 80 Gb/s

Applications include:

#### Optical

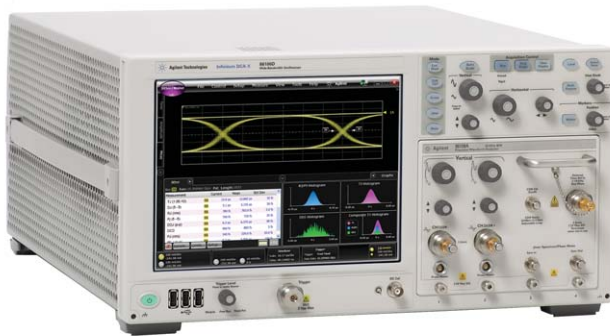
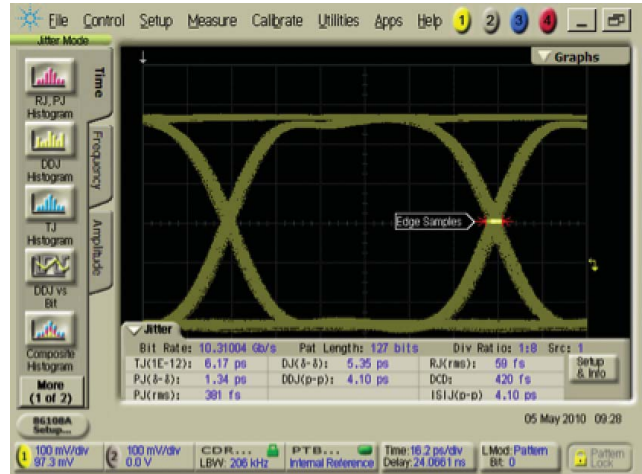
- Transceiver design and manufacturing compliance test

#### Electrical

- ASIC/FPGA/SERDES/IC design and characterization

#### TDR/TDT/S-parameter

- Serial bus design, cable and PCB characterization



### 86100D Mainframe Hardware options

#### Trigger option<sup>1</sup>

- Option STR – Standard Trigger  
For basic eye diagram measurements
- Option ETR – Enhanced Trigger  
For pattern waveform and more advanced measurements such as jitter analysis. Option ETR increases trigger bandwidth to > 13 GHz, adds pattern trigger capability, and adds support for clock recovery triggering through the module bay.

A standard unit may be upgraded later by ordering 86100DU-ETR.

#### Hard Drive option

- Option 090 – Removable hard drive
- Option 092 – Fixed internal hard drive (default)

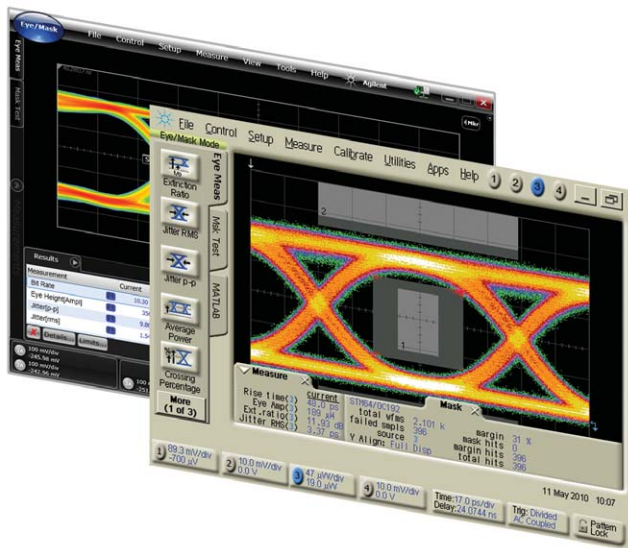
#### GPIB option

- Option GPI – GPIB card, factory installed (default)
- Option GPN – No GPIB card interface

To add a GPIB card later, order Agilent part number 82351A or contact your local Agilent service center.

1. 86100D-ETR is recommended when using any DCA module equipped with a rear-panel trigger circuit. Examples include 54754A, 83496x, and 86108A modules. If operating these modules in an 86100D with Option STR, an external cable (such as P/N 5062-6690) must be connected from the module's front panel trigger/clock output to the 86100D's trigger input.

# 86100D DCA-X Overview



## Dual user interfaces

(standard with every 86100D)

The 86100D DCA-X includes two user interfaces for even greater ease-of-use and 100% backwards compatibility with the 86100C DCA-J. Switch between FlexDCA, the new vector-based interface, and the classic DCA user interface, at the touch of a button.

### FlexDCA user interface

- De-embedding, embedding using Option SIM
- New measurements such as DDPWS, UJ, J2, J9
- Graphical signal processing
- Up to 64 simultaneous measurements

### “Classic” DCA user interface

- Provides 100% backwards compatibility with the 86100C DCA-J
- Same familiar user-interface that was used on earlier 86100 Series oscilloscopes

## Eye diagram analysis and mask testing

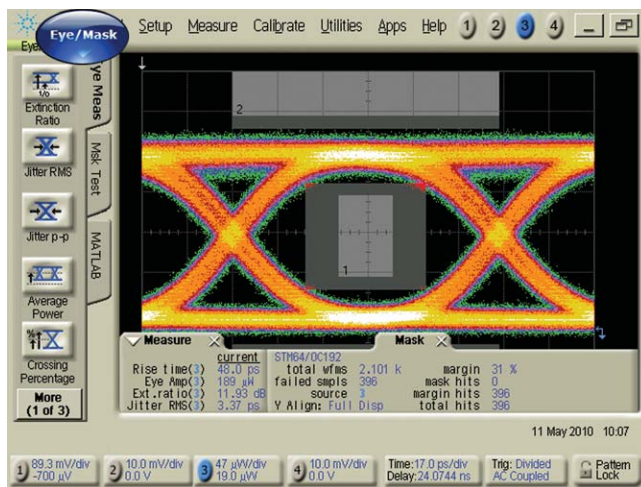
(standard with every 86100D)

Characterize high-speed transmitters and transceivers quickly and accurately. Eye/Mask mode offers:

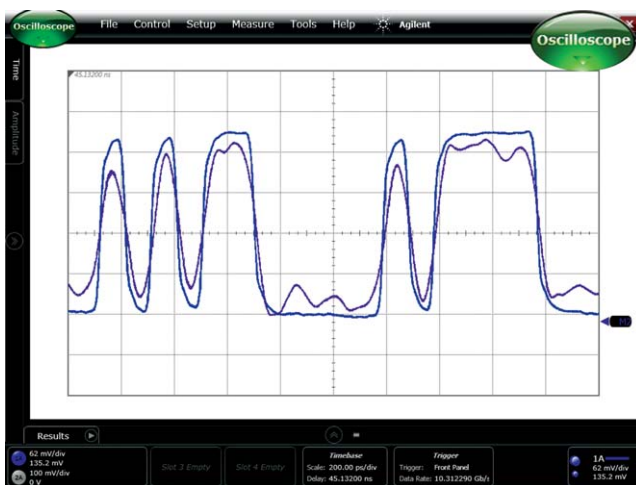
- Accurate Extinction Ratio and eye measurements
- Industry standard mask testing with built-in margin analysis
- ‘1’ and ‘0’ levels, jitter, rise or fall times and more
- Eye Line mode provides insight into the effects of specific bit transitions within a data pattern.

For more detailed information:

[www.agilent.com/find/86100D](http://www.agilent.com/find/86100D)



## 86100D DCA-X Overview



### Oscilloscope measurements

(standard with every 86100D)

Highest accuracy waveforms. Wide-bandwidth, low-noise, and low-jitter samples result in accurate waveform measurements.

- Comprehensive time measurements such as rise time, fall time, jitter rms, jitter p-p
- Amplitude measurements such as  $V_{amp}$ ,  $V_{pp}$ , overshoot,  $V_{rms}$ , OMA
- Display and measure simulated waveforms

For more detailed information:

[www.agilent.com/find/86100D](http://www.agilent.com/find/86100D)

### Time domain reflectometry/transmission (TDR/TDT)

(86100D with 54754A)<sup>1</sup>

Precision impedance and S-parameter measurements on serial bus designs, cables, and printed circuit boards.

#### Accurate impedance measurements

Integrated TDR calibration de-embeds cable and fixture losses (TDR Calibration is standard with every 86100D)

#### Live S-parameters at the touch of a single button

For more information, refer to the section on Enhanced Impedance and S-parameter software on page 11.

#### Easy to use

Visual guides for novice and expert users

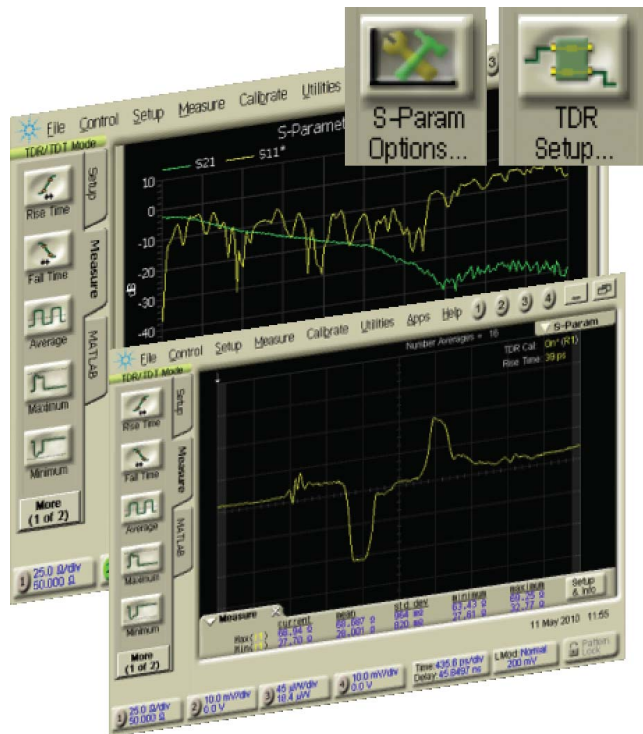
#### Variable rise time

Increase the edge speed (e.g. 15-20 ps) to locate closely spaced discontinuities; or decrease the edge speed (e.g. 50-200 ps) to emulate system level performance

**Advanced signal integrity analysis** using N1930B Physical Layer Test System (PLTS)

For more detailed information refer to:

[www.agilent.com/find/tdr](http://www.agilent.com/find/tdr)



1. 86100D-ETR recommended.



## 86100D DCA-X Overview

### Jitter analysis

(86100D-200<sup>1</sup>)

As data rates increase in both electrical and optical applications, jitter is an ever increasing design and measurement challenge. The DCA-X provides:

- Simple, one button execution of jitter analysis
- Compliant, fast and accurate results on both optical and electrical signals
- Automated jitter decomposition into:
  - TJ/RJ/DJ/PJ/DDJ/ISI/DCD
  - UJ/J2/J9/DDPWS and more...

For more detailed information:

[www.agilent.com/find/86100D-200](http://www.agilent.com/find/86100D-200)

<sup>1</sup> Requires 86100D-ETR.



### Amplitude and noise analysis/RIN/Q-Factor

(86100D-300<sup>2</sup>)

In addition to jitter, signal quality can also be impacted by impairments in the amplitude domain. Option 300 helps identify root cause of signal degradation in the ONE and ZERO level of the signal.

- Automated separation into: total interference (TI), random noise (RN), deterministic interference (DI), period (PI) and inter-symbol interference (ISI)
- Relative intensity noise (RIN), a common optical transceiver measurement
- Q-Factor, a figure of merit derived from the eye diagram

For more detailed information:

[www.agilent.com/find/86100D-300](http://www.agilent.com/find/86100D-300)

<sup>2</sup> Requires 86100D-ETR/200

## 86100D DCA-X Overview (continued)

### De-embedding/embedding capability

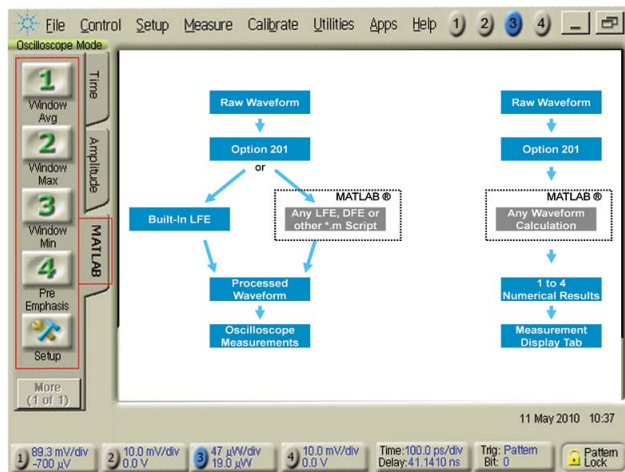
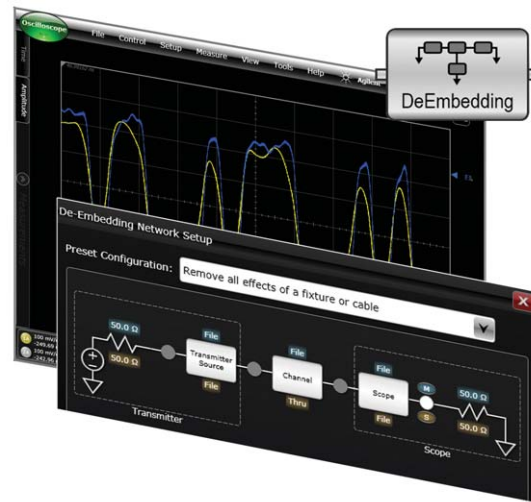
(86100D-SIM InfiniiSim-DCA)

Improve insight and design margins and comply with new standards based measurements. InfiniiSim-DCA provides an intuitive graphical interface that helps users:

- Improve margin by removing signal degradation caused by fixtures and cables
- Simulate the signal at the end of a user-defined fixture or cable
- Predict performance at a location you cannot directly observe
- Any measurement available for live signals can also be performed on simulated signals (jitter, waveform, eye analysis)

For more detailed information:

[www.agilent.com/find/86100D-SIM](http://www.agilent.com/find/86100D-SIM)



### MATLAB – custom measurements

(86100D-061/062<sup>1</sup>)

MATLAB<sup>®</sup> is a powerful data analysis software environment and scripting language. It can be purchased directly from Agilent and installed on your scope to extend the functionality of your DCA-X<sup>2</sup>.

- Create custom measurements using Matlab, displayed real-time on the DCA-X and similar to built-in measurements
- Design and apply your own filters or functions to waveforms
- Visualize signals using 2-D and 3-D plots

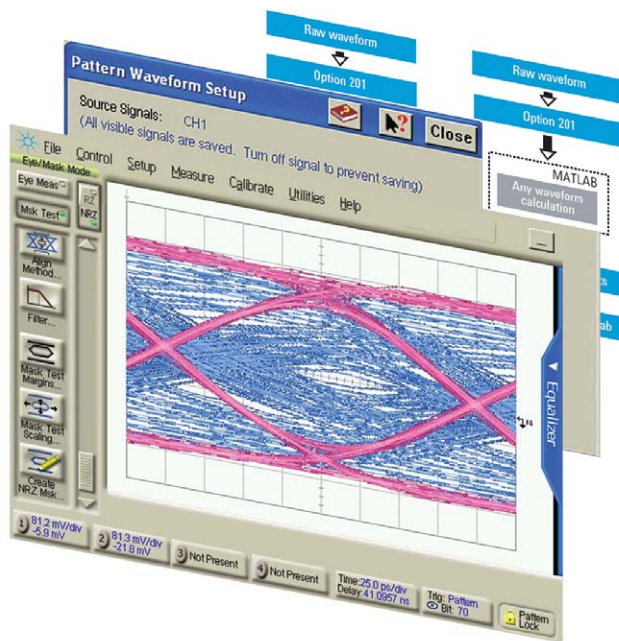
For more information:

[www.agilent.com/find/matlab\\_oscilloscopes](http://www.agilent.com/find/matlab_oscilloscopes)

<sup>1</sup> Requires 86100D-201.

<sup>2</sup> Integrated operation with classic DCA user interface only.

## 86100D DCA-X Overview (continued)



### Equalization/deep memory waveform capture/Matlab interface (86100D-201<sup>1</sup>)

Accelerate your design cycle using these powerful tools:

- Built-in linear feedforward equalizer (LFE)
  - Simulate equalizer designs on actual signals before designing hardware
- Deep waveform memory capture<sup>2</sup>
  - Save .csv files up to 4096 samples/bit, up to 2<sup>23</sup> bits long; ideal for post-processing
- Real-time, integrated MATLAB interface
  - Create custom measurements in MATLAB and have the scope display the results in real-time (MATLAB sold separately)

For more information:

[www.agilent.com/find/86100D-201](http://www.agilent.com/find/86100D-201)

<sup>1</sup> Requires 86100D-ETR.

<sup>2</sup> This is a standard feature when using the FlexDCA user interface.

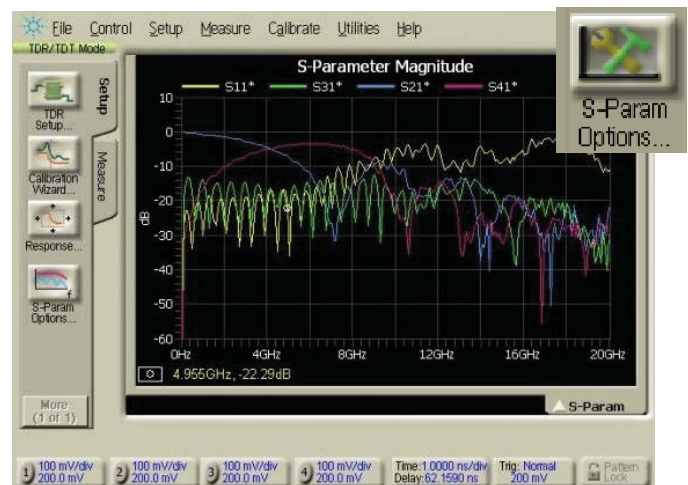
### Enhanced impedance and S-parameter software (86100D-202)

Accurately characterize serial bus designs, cables, and printed circuit boards. 86100D-202 compliments TDR/TDT mode to provide:

- Integrated, calibrated and real-time S-parameter measurements – ideal for MFG and R&D
- S-parameters include magnitude, phase and group delay (user selectable)
- Accurate return loss, insertion loss (attenuation), near-end cross talk (NEXT), Far-end cross talk (FEXT), phase, and group delay measurements
- TDR peeling – remove unwanted effects from multiple reflections
- Supports Picosecond Pulse Labs (PSPL) edge accelerators when faster steps are required.

For more information, refer to

[www.agilent.com/find/86100D-202](http://www.agilent.com/find/86100D-202)



## 86100D DCA-X Overview (continued)

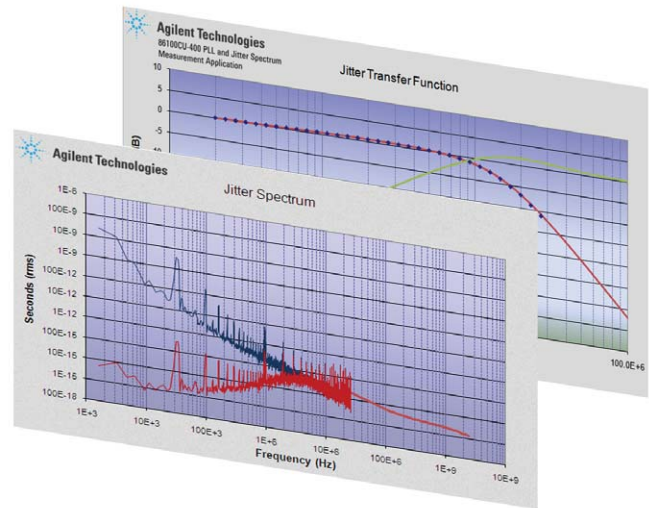
### Phase locked loop (PLL) and phase noise measurements (86100DU-400<sup>1</sup>)

Phase Locked Loops (PLL) are used in a wide variety of applications including clock extraction circuits, multiplier/dividers, and PLLs. Understanding their performance is of critical importance due to their influence on jitter. Option 400 is a PC based application that characterizes PLL bandwidth and peaking by controlling a precision jitter source and receiver.

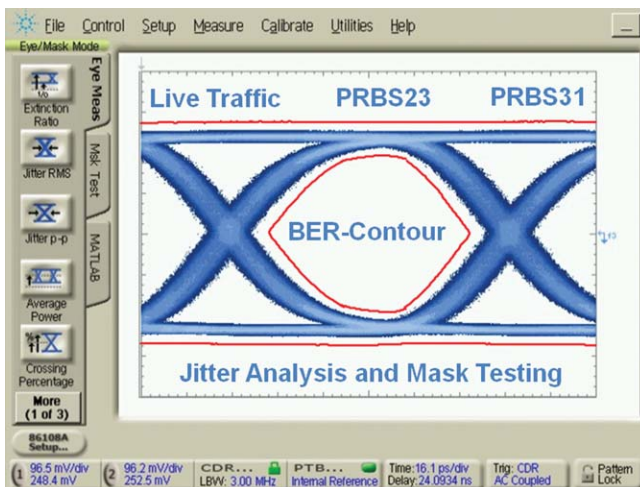
- Automated PLL bandwidth and peaking measurements with report generation
- PCI Express<sup>®</sup> PLL testing approved by PCI-SIG
- Flexible, can be customized for unique PLL applications
- Fast and accurate jitter spectrum/phase noise measurements on clock and data signals

For more information:

[www.agilent.com/find/jtf](http://www.agilent.com/find/jtf)



<sup>1</sup> Requires an 83496A with Option UAB, 83496B, or 86108 module.



### Advanced eye analysis, jitter on PRBS31 (86100DU-401<sup>2</sup>)

To ensure that digital communication systems approach error-free performance, data test patterns that emulate actual traffic are often used. Option 401 is a PC based application that overcomes pattern length limitations of test equipment and performs:

- Jitter measurements on long patterns, including PRBS23, PRBS31, and live traffic
- Compliant jitter measurements such as:
  - TJ/RJ/DJ/J2/J9/DDPWS<sup>3</sup>
- Precision mask testing using BER contour base masks

For more information:

[www.agilent.com/find/eye](http://www.agilent.com/find/eye)

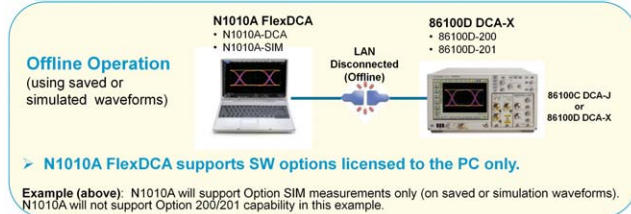
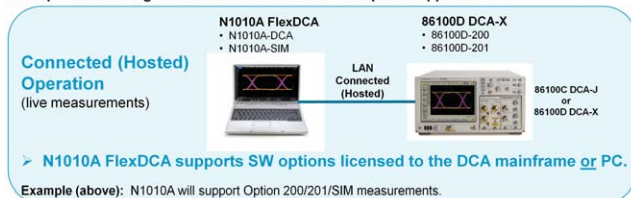
<sup>2</sup> For best accuracy when measuring jitter on long patterns, it is recommended that 86100DU-401 be used in conjunction with 86100D-200.

<sup>3</sup> DDPWS requires 86100D-200.

## 86100D DCA-X Overview (continued)

### N1010A FlexDCA Connected (Hosted) vs Offline

Examples illustrating the N1010A FlexDCA software option support model



### Remote Access Software, connected or offline operation (N1010A FlexDCA)

The FlexDCA user interface that comes standard on the 86100D DCA-X is also available as a standalone product. N1010A FlexDCA is a PC-based software application that:

- Duplicates the integrated FlexDCA user interface for use from a PC (LAN control)
- Controls an 86100C or 86100D from the lab, office, or even from a remote site (great for troubleshooting)
- Provides offline analysis capability on saved waveforms or use the built-in waveform simulator
- Allows engineers to reproduce or simulate measurements and “what-if” simulations at a desk, without the need for hardware
- Uses N1010A and 86100D SW options when connected; uses N1010A SW options when operating offline

For more information:

[www.agilent.com/find/flexdca](http://www.agilent.com/find/flexdca)

# Module Overview Optical/Electrical: 750-1650 nm

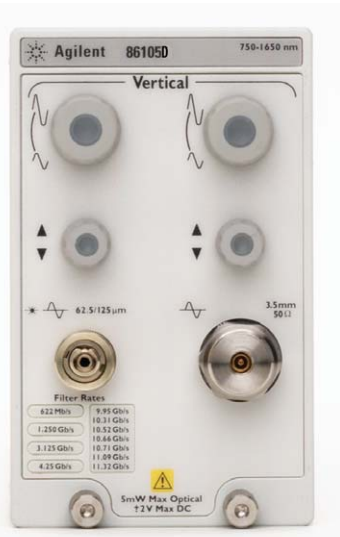
## 86105C - Engineered for highest flexibility

9 GHz optical/20 GHz electrical, 750 to 1650 nm – SMF and MMF

The 86105C has the widest coverage of data rates with optical modulation bandwidth of 9 GHz and electrical bandwidth of 20 GHz. The outstanding sensitivity (to -21 dBm) makes the 86105C ideal for a wide range of design and manufacturing applications. Available filters cover all common data rates from 155 Mb/s through 11.3 Gb/s.

For more information:

[www.agilent.com/find/86105C](http://www.agilent.com/find/86105C)



## 86105D - Engineered for highest accuracy

20 GHz optical, 35 GHz electrical, 750-1650 nm, MMF and SMF

The 86105D is the premier solution for optical waveform analysis of high-speed signals using short or long wavelength technologies. The optical receiver bandwidth exceeds 20 GHz and the electrical bandwidth exceeds 35 GHz, providing excellent waveform fidelity. Switchable compliance filters are available at all common rates from 8.5 to 14.025 Gb/s (16XFC). Sensitivity to -12 dBm.

For more information:

[www.agilent.com/find/86105D](http://www.agilent.com/find/86105D)

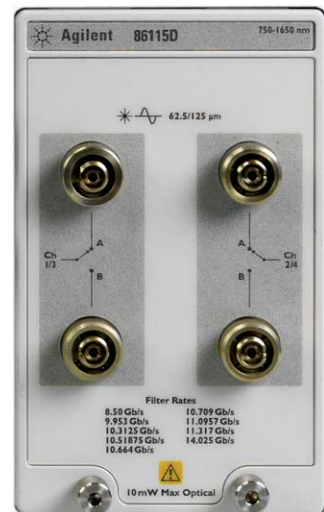
## 86115D- Engineered for highest productivity

20 GHz optical multi-port, 750-1650 nm, MMF and SMF; designed for high-volume/parallel optical transceiver test

For high volume manufacturing or testing of parallel optical systems, the 86115D can be used. The 86115D can be configured with two or four optical ports in a single plug-in module. Each port has specifications similar to the optical channel of the 86105D and covers all common rates from 8.5 to 14.025 Gb/s. (The 86115D does not have an electrical channel.) A multiple optical channel plug-in can offer significant savings compared to other configurations.

For more information:

[www.agilent.com/find/86115D](http://www.agilent.com/find/86115D)



## Optical/Electrical: 1000-1600 nm

### 86116C - Engineered for highest data rates

#### 86116C-025

40 GHz optical/80 GHz electrical module, SMF

With more than 40 GHz optical bandwidth (1300-1620 nm), the 86116C-025 was engineered to address 100 Gb ethernet (4x 25 G) and 16X Fibre Channel (single mod variant) designs.

For more information:

[www.agilent.com/find/86116C](http://www.agilent.com/find/86116C)

#### 86116C-040

65 GHz optical/80 GHz electrical module, SMF

With more than 70 GHz characteristic optical bandwidth and over 93 GHz characteristic electrical bandwidth, 86116C-040 has been optimized to accurately characterize high-speed telecom signals. It includes built-in compliance filters for 40 G SONET/SDH.

For more information:

[www.agilent.com/find/86116C](http://www.agilent.com/find/86116C)



## Dual Electrical Modules



### 86108A - Engineered for highest precision and accuracy

32 GHz dual channel electrical with integrated precision timebase and clock recovery

Accuracy and ease-of-use for high-speed digital communications signals. The 86108A has bandwidth in excess of 32 GHz, channel noise of less than 300  $\mu$ V, and residual jitter at an astounding level of < 60 fs (typical). Integrated clock recovery provides a 'triggerless' single connection measurement on signals from 50 Mb/s-14.2 Gb/s, and any rate in between. Perform analysis even in the presence of spread-spectrum clocking.

Jitter spectrum and phase noise analysis on clock and data signals is available with 86100DU-400 PLL and jitter spectrum analysis software.

For more information:

[www.agilent.com/find/86108A](http://www.agilent.com/find/86108A)

### 86112A - Engineered for low noise applications

20 GHz dual channel electrical

The Agilent 86112A provides two accurate measurement channels with user-selectable bandwidths of 12.4 or 20 GHz. The lower bandwidth mode provides excellent oscilloscope noise performance for accurate measurement of small signals. The high bandwidth mode provides high-fidelity display and measurement of high-speed waveforms.

For more information:

[www.agilent.com/find/86112A](http://www.agilent.com/find/86112A)



## Optical/Electrical: 1000-1600 nm

### 86117A - Engineered for highest waveform fidelity

50 GHz dual channel electrical

The Agilent 86117A provides designers and manufacturers with a cost-effective solution for testing 40 Gb/s electrical signals. The 86117A has 50 and 30 GHz bandwidth settings available on each electrical channel with 2.4 mm male electrical connectors.

For more information:

[www.agilent.com/find/86117A](http://www.agilent.com/find/86117A)



### 86118A - Engineered for closest proximity to DUT

70 GHz+ dual remote sampling head

The 86118A has two electrical channels, each housed in a compact remote sampling head, attached to the module with separate light weight cables. With over 80 GHz of bandwidth (typical), this module is intended for very high bit rate applications where signal fidelity is crucial. It is often paired with an 86107A Precision Timebase module required for extremely high-speed signal fidelity measurement applications. 86118A Option H01 provides hardware de-skew capability.

For more information:

[www.agilent.com/find/86118A](http://www.agilent.com/find/86118A)





# Time Domain Reflectometry/Transmission (TDR/TDT)

## 54754A - Engineered for novice and expert users<sup>1</sup>

Differential & single-ended TDR/TDT module

The Agilent 54754A provides two 18 GHz channels that have built-in TDR step generators. With extremely well matched step responses, the two channels work in tandem to provide differential or common mode TDR stimulus/response, or may be used independently. Either channel works as a normal oscilloscope vertical system when the TDR/TDT step generators are turned off.

For more information:

[www.agilent.com/find/54754A](http://www.agilent.com/find/54754A)



## N1021B - Engineered for high-performance and durability

18 GHz differential TDR/TDT probe kit

The N1021B is an ergonomically designed high performance handheld probe to interface TDR/TDT modules such as the 54754A to printed circuit boards (PCBs) and components that lack common coaxial high-frequency connectors. The built-in wheel adjusts the pitch between the differential tips to make good contact to pads or access points. Hardened tips make the N1021B extremely durable.

For more information:

[www.agilent.com/find/N1021B](http://www.agilent.com/find/N1021B)

1. Use with 86100A/B/C or 86100D-ETR mainframe otherwise an external trigger cable (such as P/N 5062-6690) is required.

# Clock Recovery<sup>1</sup>

## 83496B-100 - Engineered for flexibility and performance

Electrical clock recovery module with phase noise analysis capability

Increase eye-mask and jitter measurement accuracy with breakthrough performance in clock recovery circuitry. 83496B Option 100 provides instrument grade clock recovery covering any rate from 50 Mb/s-14.2 Gb/s. Adjustable loop bandwidth for standards compliant measurements. Jitter spectrum and phase noise analysis on clock and data signals is available with 86100CU-400 PLL and jitter spectrum analysis software.

For more information:

[www.agilent.com/find/83496B](http://www.agilent.com/find/83496B)



## 83496B-101 - Engineered for industry standard compliance

Optical/electrical clock recovery module with phase noise analysis capability

- 750-1330 nm MMF
- 1250-1650 nm SMF

Clock recovery performance matches that of the 83496B-100 (above). Option H05 adds internal electrical splitters providing data and databar signals to front panel SMA connectors.

For more information:

[www.agilent.com/find/83496B](http://www.agilent.com/find/83496B)

## 86108A - Engineered for highest precision and accuracy

32 GHz dual channel electrical with integrated precision timebase and clock recovery

The 86108A Precision Waveform Analyzer has integrated clock recovery capability. For more information on the 86108A module, refer to the section on dual electrical modules.

For more information:

[www.agilent.com/find/86108A](http://www.agilent.com/find/86108A)

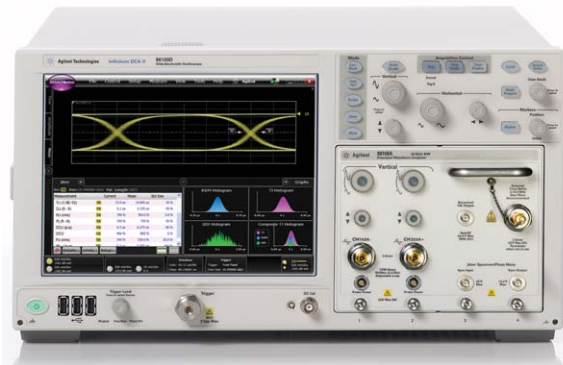


1. Use with 86100A/B/C or 86100D-ETR mainframe otherwise an external trigger cable (such as P/N 5062-6690) is required.

# Precision Timebase

## 86100D

The 86100D DCA-X wide-bandwidth oscilloscope uses a built-in timebase to acquire and display waveforms. While the standard timebase is sufficient for most applications, some high-speed measurements benefit from using the precision timebase capabilities of these modules. The precision timebase significantly reduces the scope's random jitter contribution and minimizes clock-data delay.



## 86107A

Precision timebase reference

Low oscilloscope jitter allows the true jitter performance of devices to be seen. The 86107A is used in tandem with any of the optical or electrical sampling modules to reduce mainframe trigger jitter below 100 fs. It is optionally configured to accept 10 G, 20 G, or 40 G input clock signals.

(Oscilloscope jitter can be driven to even lower levels when using the 86108A precision waveform analyzer).

For more information:

[www.agilent.com/find/86107A](http://www.agilent.com/find/86107A)

## 86108A

32 GHz dual channel electrical with integrated precision timebase and clock recovery

At less than 60 fs (typical), the 86108A provides the industry's lowest scope jitter. This means that the signal you see on the scope's display is not degraded by the scope itself. The 86108A can derive a clock from the test signal and internally feed the precision timebase section. Or an external timing reference can be provided to the precision timebase. Ultra-low jitter is achieved in either configuration.

For more information:

[www.agilent.com/find/86108A](http://www.agilent.com/find/86108A)



# Probes

## Active Probes

The DCA Series oscilloscopes are designed to work with all Agilent InfiniiMax probing systems. The InfiniiMax system is comprised of a probe amplifier (choose your bandwidth) and probe head (choose the interface/tip for your application). Probe adapters, to interface the probe to your DCA module, are also available.



## Probe Adapters

- InfiniiMax I active probes (1.5 to 7 GHz)
  - requires N1022B Probe Adapter to interface to the DCA
- InfiniiMax II active probes (10 to 13 GHz)
  - requires N1022B Probe Adapter to interface to the DCA
- InfiniiMax III active probes (16 to 30GHz)
  - requires N5477A Probe Adapter to interface to the DCA

InfiniiMax probes interface to DCA modules using a probe adapter.

- N1022B probe adapter is used for InfiniiMax I and II systems
- N5477A probe adapter is used for InfiniiMax III systems.

Probe power is supplied by the DCA module itself (a probe power connector(s) is available on some modules) or an 1143A external power supply.

## InfiniiMax III probe amplifiers

- N2803A 30 GHz probe amplifier
- N2802A 25 GHz probe amplifier
- N2801A 20 GHz probe amplifier
- N2800A 16 GHz probe amplifier

## InfiniiMax III probe heads

- N5439A InfiniiMax III ZIF probe head
- N5441A InfiniiMax III solder-in probe head
- N5444A InfiniiMax III 2.92mm/3.5mm/SMA head
- N5445A InfiniiMax III browser head
- N5448A InfiniiMax III 2.92mm head flex cable

## InfiniiMax III probe adapters

- N5442A Precision BNC adapter
- N5443A Performance verification and deskew fixture
- N5449A High-impedance probe
- N5477A Sampling scope adapter (use this adapter to interface with DCA modules)
- N5449 High impedance adapter

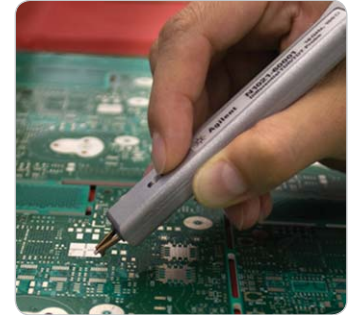


## Passive probes

- N1020A 6GHz Single-Ended Probe and positioner
- N1021B 18GHz Differential Probe Kit
- 54006A 6 GHz Passive Divider Probe Kit

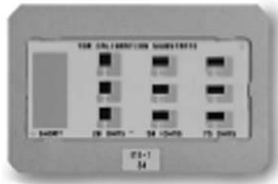


N1020A TDR probe –  
literature number 5968-4811E



N1021B 18GHz Differential Probe Kit

## Interfaces and Accessories



N1020A-K05 calibration  
substrate



N1024B TDR calibration kit



83480AK02 Static Protection  
Unit



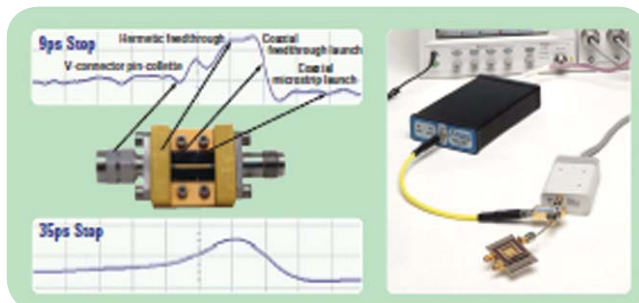
N9355CK01 DC coupled  
limiter

### Probes, adaptors and other interface kits

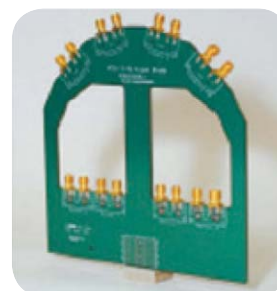
Other application-specific probe and interface kits are available from Agilent Technologies or its channel partners. See [www.agilent.com](http://www.agilent.com) or contact your local sales office for details.

### TDR/TDT Accessories

- Picosecond Pulse Labs (PSPL) Edge Accelerators (<9ps edge speed) [www.picosecond.com](http://www.picosecond.com)
- N1020A-K05 Calibration Substrate
- N1024B TDR Calibration Kit
- N9355CK01 DC coupled limiter
- 83480AK02 Static Protection Unit 9300-1308 ESD Heel strap
- 9300-1367 ESD Wrist strap
- 9300-1484 ESD Desk mat
- 9300-0980 ESD Wrist strap ground cord



Picosecond Pulse Labs 4020 Source Enhancements Module with  
86118A Remote Head for ultra-fast TDR measurements



Advanced TCA Tx/Rx SignalBlade™  
(F9 Systems –  
[www.f9-systems.com](http://www.f9-systems.com))

## Interfaces and Accessories

[www.agilent.com/find/parts](http://www.agilent.com/find/parts)

### DCA Accessories

- 11898A Extender module for plug-in modules
- 86101-60017 Filler panel
- 0960-2929 USB keyboard (included with 86100D)
- 1150-7913 USB mouse (included with 86100D)
- 0950-4990 External DVD Recorder Multi Format
- Kinesis Savant 2-action programmable foot switch P/N FS20A-USB-UL (<http://www.kinesis-ergo.com/>).
- 82351A PCIe™-GPIB Interface Card
- 86108-60013 Phase Adjusters
- N1000-40008 Front Impact Cover
- 86100-60156 Rack Mount Kit with Handles
- 86100-60157 Rack Mount Kit Without Handles



86108-60013 Phase Adjuster



Kinesis USB Foot Switch



11898A Extender Module

### Optical connector interfaces

Note: All optical modules come standard with an FC/PC connector adapter interface (81000FI) installed on all optical ports

- 81000 AI Diamond HMS-10 connector
- 81000 FI FC/PC connector adapter
- 81000 SI DIN connector adapter
- 81000 VI ST connector adapter
- 81000 KI SC Connector adapter



Optical connector interfaces available for DCA optical modules

### RF/Microwave accessories

- 11636B Power divider, DC to 26.5 GHz, APC 3.5 mm
- 11636C Power divider, DC to 50 GHz, 2.4 mm
- 11742A 45 MHz to 26.5 GHz DC blocking capacitor
- 11742A-K01 50 GHz DC blocking capacitor
- 8490D-020 2.4 mm 20 dB attenuator
- 8493C-020 3.5 mm 20 dB attenuator
- 11900B 2.4 mm (f-f) adapter
- 11901B 2.4 mm (f) to 3.5 mm (f) adapter
- 11901C 2.4 mm (m) to 3.5 mm (f) adapter
- 11901D 2.4 mm (f) to 3.5 mm (m) adapter
- 5061-5311 3.5 mm (f-f) adapter
- 1250-1158 SMA (f-f) adapter
- 1810-0118 3.5 mm 50 ohm termination
- 0960-0055 Short
- 1250-1666 SMA (f-f) adapter feedthru



11742A DC Blocking Capacitor



8490D Attenuator

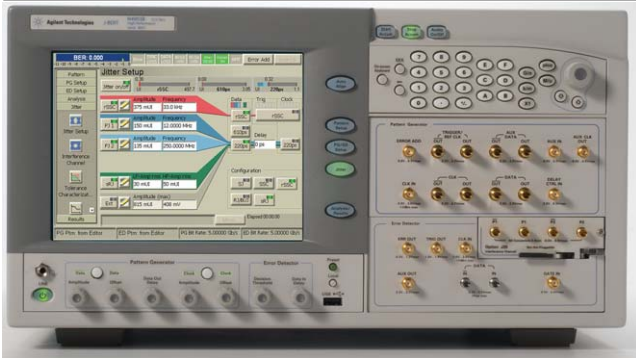


11636B DC to 26.5 GHz Power Divider

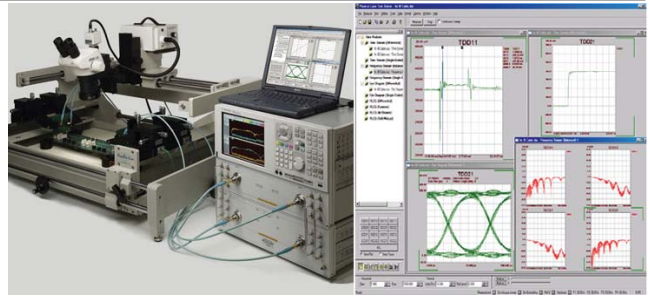


11636C DC to 50 GHz Power Divider

## Complementary Products



The N4903B J-BERT, in combination with the 86100D DCA-X, provides complete insight into the physical layer performance of your design.



The N1930B physical layer test system (PLTS) software provides confidence in your design through complete characterization and behavior model extraction of your device under test (DUT). It supports both TDR and VNA platforms from Agilent Technologies.



## Agilent Technologies Oscilloscopes

Multiple form factors from 20 MHz to >90 GHz | Industry leading specs | Powerful applications



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