

DCA6201

30/50GHz Sampling Scope

Version 2.9



Product Description

Semight Instruments DCA6201 sampling oscilloscope is based on equivalent-time sampling and reconstructed eye diagram technology, resulting in higher accuracy and better cost of measurement of high-speed optoelectronic digital signals. This is also recognized as the industry standard for verifying optical transmitter compliance to communications standards. The DCA6201 is designed for R&D and massive production test applications and supports NRZ/PAM4 signals testing. Optical channels include optical reference receivers for the common 20 to 53GBaud rates, and can simultaneously support up to 4 channels of eye diagram testing. DCA6201 also has a fast-tuning mode, in this mode, the extinction ratio and average power can be maintained at a refresh rate of 1Hz, thus greatly improving test efficiency and reducing test costs. Unlike the other Industry standard DCA solution, which uses host and modules to create a waveform analysis system, the DCA6201 is completely integrated instruments built in a small form factor.

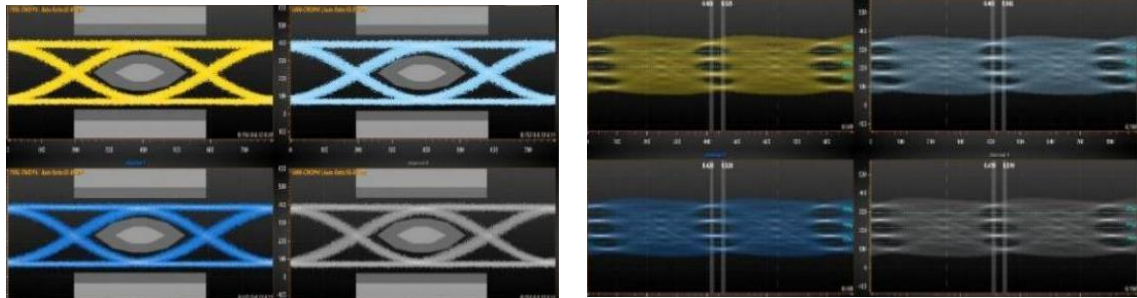
As a low-noise, high-sensitivity calibrated reference receiver (compliant to industry standard tolerances), DCA6201 support an extremely high dynamic range, both multimode and single-mode signals at wavelengths between 850 to 1650 nm (DCA6201-B30) . In order to get consistent result comparing with other Industry Standard sampling scope, DCA6201 support Extinction Ratio and Average Optical Power correction, dark current self-calibration algorithms. The user interface of the DCA6201 is similar as the industry standard sampling oscilloscope. Users can run the DCA6201 software on a PC and easily control the DCA6201 through the LAN/USB interface to support testing of the physical layer performance of 25G/50G/100G/200G/400G/800G optical transmission modules, optical cables and related components used in data centers, core networks/metro networks, 4G/5G mobile backhaul and 5G mobile fronthaul.

Key Features

- Efficient measurement: Support simultaneous measurement of all channels and parallel measurement;
- Multiple measurement functions: Meet the normal NRZ and PAM4 eye diagram test parameters;
- Automatic test: The remote command control mode is convenient and fast;
- Ensure accurate performance: High performance ensures test consistency;

Efficient measurement: Support simultaneous measurement of all channels and parallel measurement;

DCA6201 sampling oscilloscope can support multi-channel options, measuring four channels at one time

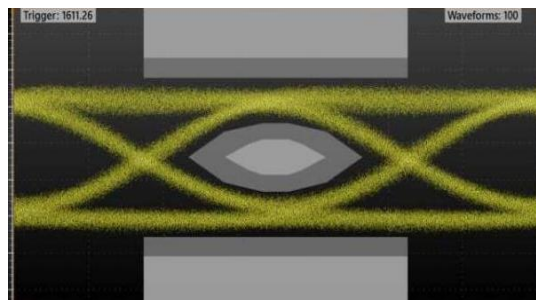


Multiple measurement functions: Meet the normal NRZ and PAM4 eye diagram test parameters;

DCA6201 sampling scope can support NRZ and PAM4 analysis.

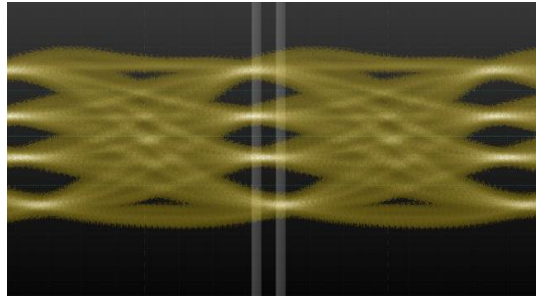
NRZ	PAM4
Average Power(dBm、 mW)	
Mask Margin (%)	
Extinction Ratio(dB)	
OMA(dBm、 mW)	
VECP (dB)	Average Power(dBm、 mW)
One Level、 Zero Level(μ W、 mV)	TDECQ、 Ceq (dB)
Eye Amplitude、	Noise Margin(μ W、 mV)
Eye Height(μ W、 mV)	Outer Extinction Ratio(dB)
Crossing (%)	Outer OMA(dBm、 μ W)
SNR	Linearity
Jitter P-P、 RMS(ps)	
Rise Time、 Fall Time(ps)	
Eye Width(ps)	

Automatic test: Get the required parameters quickly and conveniently



Automatic measurement of NRZ Mask Margin

Automatic Mask Margin is supported. In addition, the mask margin test only takes about 1 second, which enables high testing throughput for NRZ signals.



Automatic measurement of PAM4 TDECQ

No complex settings are required, and it is easy to capture the measurement results. High sensitivity oscilloscope supports high reproducibility measurement, and high-speed sampling rate shortens the time required for data acquisition and TDECQ analysis. It is helpful to improve the testing throughput for PAM4 signals..

Ensure accurate performance: High performance ensures test consistency

DCA6201 sampling scope has all the necessary performances for measuring 100G to 800G optical modules and optical devices used in optical modules.

Control connection

There are two ways to control the DCA6201 optical sampling scope:

- Connect the PC directly to DCA6201 via USB cable or LAN, and run the Semright DCA GUI software and user ATE (Automatic Test Equipment system software) on the PC simultaneously.
- PC1 is directly connected to DCA6201 via USB cable or LAN. Semright DCA GUI software is running on PC1, and then PC2 with user automated test software running is connected to PC1 via LAN. This eliminates most issues of compatibility between an existing test system PC and DCA6201 hardware.

Requirement for PC system configuration:

The following guidelines indicate the fundamental requirements for PC' s connected to DCA6201 and running the Semight DCA interface:

- Intel I5 processor or better
- 8GB memory
- Window7/Window10(64-bit)

The communication API between the system controller and PC is SCPI through LAN. It is important to note that there is no need to do any USB programming. This is all handled by the Semight DCA GUI software.

A reference clock, synchronous with the signal being tested, is required to trigger the DCA6201. If the device under test cannot provide the synchronous reference clock, user can use a clock recovery unit (Semight Instruments CR6256). Be sure that the input trigger range is 500MHz to 15GHz.

Software function

Semight sampling scope' s GUI is very intuitive and simple, making it easy to configure the system.



NRZ Eye Diagram



PAM4 Eye Diagram

Technical Specifications

		DCA6201-B30	DCA6201-B50	
Optical Specifications	Optical channel bandwidth	30 GHz	50 GHz (option IRC)	
	Fiber input	62.5/125 μm FC/UPC (single-mode/multi-mode)		
	Wavelength range	850 ~ 1650 nm		
	Calibrated Wavelengths (OE conversion gains)	850/1310/1550 nm		
	Filters		25.78 Gbps (25/50/100 Gb Ethernet)	53.125GBaud PAM4 53.125GBaud NRZ
			26.56 Gbps (400 Gb Ethernet)	49.7664G NRZ (50G PON)
		27.95 Gbps (OTU4)	24.8832G NRZ (50G PON)	
		28.05 Gbps (32× Fiber Channel)	12.4416G NRZ (50GPON)	

		26.5625Gbaud PAM4 28.9Gbaud PAM4	
Average power monitor accuracy		$\pm 5\%$ (after calibration)	
ADC resolution		14 Bit	
Optical sensitivity		-8 dBm	
Measurement consistency		Average Power: ± 0.1 dB, Extinction Ratio: ± 0.3 dB Mask Margin: $\pm 5\%$ (after calibration), TDECQ(PAM4 signal): ± 0.5 dB	
Max Input (None-Destruction, Peak)		Max. 5 mW (+7 dBm)	
Max Input (Linearity)		Max.1.25 mW (+1 dBm)	
Monitor Average Power Range		-20 dBm to +1dBm	
Average power monitor accuracy		Single-mode $\pm 5\% \pm 200$ nW \pm connector uncertainty	
		Multimode (characteristic) $\pm 10\% \pm 200$ nW \pm connector uncertainty	
		Due to variations in mode-filling conditions, the measured power in multimode fiber will vary more than the measured	

		power in single-mode fiber. For users needing the most accurate power measurements, use an optical power meter for multimode power measurements
	Input return loss	>23 dB
Electrical Specifications	Electrical channel bandwidth	33 GHz
	Input signal type	AC-coupled
	Input connector	2.92 mm female
	Dynamic range of input	500 mVp-p
	DC accuracy	3mV
	RMS noise	1.5mV (Typical)
	ADC resolution	14 Bit
	Max Input Amplitude	± 1 V
	Impedance	50 Ω
Mainframe Specifications	Sampling system	Acquisition Mode: Sampling (Default), Envelop and Average 2048 points/Waveform, Accumulation Waveform Numbers: 15 waveforms to unlimited
	Sensitivity	200 mV
	Maximum trigger	$< \pm 1.5$ V

	Input	
	Trigger Impedance	50 Ω
	Connector type	2.92 mm female
	Frequency Range	500M~15GHz
	Integrated temperature monitor	Support
	Remote control	Ethernet Socket (TCP Command)
	Test standards	Ethernet、SDH/SONET、OTN、InfiniBand、Fiber Channel
General Specifications	Working Place	Indoor
	Working Condition	10°C ~ +40 °C, 30 % ~ 80 % Relative Humidity
	Storage	-30 °C ~ 70 °C, 10 % ~ 90 % Relative Humidity
	Altitude	Operation: 0 m to 2000 m, Storage: 0 m to 4600 m
	Power	LINE: 100-240 VAC, 50/60 Hz, 250 W FUUSE: T3.15AL 250 VAC
	Warm-up time	After 30 minutes warm-up, ambient temperature changes less than ± 3 °C
	Calibration period	1 year
	Dimensions (mm)	450*212*105 (with foot pad/ handle)
	Weight	Net weight 5.0 kg

* Remarks: the test environment is 23 ± 5 °C

Ordering Information

Power cord, USB cable, Measurement Software and Drivers.

DCA6201	30G Optical Sampling Scope
Channel Options	
001	Single optical channel
004	Quad optical channel
E01	Single electrical channel
E04	Quad electrical channel
M02	Single optical, Single electrical channel
Wavelength Options	
009	single-mode
050	multimode and single-mode
Filter Options	
280	30 Gbaud filter
490	50 Gbaud PON filter
560	53 Gbaud filter
Bandwidth Options	
B30	30 GHz BW
B50	50 GHz BW (special option)
Signal Options	
NRZ	NRZ signal
PAM4	PAM4 signal
Pattern lock Options	
STD	standard, not support
PLK	Pattern lock trigger hardware
Impulse response Options	
STD	standard, not support
IRC	Impulse response correction
Other Options	
HPWR	High Power(only support single-mode fiber input)
50GPON	Test the 50G PON protocol specified signal (49.7664G/24.8832G/12.4416G)

Contact us

Mail

sales@semight.com

Address

No. 1508, Xiangjiang Road, Suzhou New District (SND), Jiangsu , China

Web

Visit www.semight.com for more information.

*This information is subject to change without notice.