

# DCA4201

## 10GHz Sampling Scope

Version 4.2





## Product Description

Semight Instruments DCA4201 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 DCA4201 is designed for mass production test applications. Its accuracy is as high as industry-standard sampling oscilloscope. Through different filter option configurations, it can simultaneously support 10G and other below 4 rates optical eye diagram tests. DCA4201 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 traditional sampling scope solution, which uses mainframe and modules to create a waveform analysis system, the DCA4201 is completely integrated instruments built in a small form factor.

The noise of the DCA4201 can be as low as 3μW, ensuring its low noise and high sensitivity. Its calibrated reference receiver (compliant to industry standard tolerances) is available for both multimode and single-mode signals at wavelengths from 750 to 1630 nm.

In order to get consistent result comparing with other Industry Standard DCA, DCA4201 support Extinction Ratio and Average Optical Power calibration, dark current self-calibration algorithms. It is not “MUST”, but it is especially valuable to compensate different testing instruments and make you get consistent result as the other Industry Standard solution.

The user interface of the DCA4201 is similar with the industry standard sampling oscilloscope. Users can run the DCA4201 software on a PC and easily control the DCA4201 through the LAN/USB interface.

## Key Features

- Fast Sampling Rate;
- Support Extinction Ratio Correction;
- Support Traditional Mask file;
- Flexible Combination of Different Filters, which can cover 1-11.3Gb/s Data Rate;
- Consistent Result similar as Industry Standard DCA;
- Support Hit Ratio Automatic Mask Margin Testing.

## Software function

The intuitive and simple interface GUI of the Semight Instruments DCA4201 makes it easy to configure the system, determine its reference frame and perform measurements. Built-in analysis functions are available to analyze the eye diagram and display all commonly used optical signal test parameters.



### 10G Optical Eye Diagram



## 10G Electrical Diagram



## Technical Specification

Optical Specifications	Wavelength Range	750nm~1650nm
	Calibrated Wavelengths (OE conversion gains)	850/1310/1550nm
	Filters	
	DCA4201-140	GPON, 1.244 Gb/s, 1 Gb Ethernet, 1.250 Gb/s, CPRI 1.229 Gb/s
	DCA4201-160	OC-48/STM-16 2.488 Gb/s, 2 Gb Ethernet 2.500 Gb/s, CPRI 2.458 Gb/s
	DCA4201-180	10Gb Ethernet LX-4 3.125 Gb/s, CPRI 3.072 Gb/s
	DCA4201-200	CPRI 6.144 Gb/s 6.25 Gb/s
	DCA4201-100	8×Fibre Channel, 8.500 Gb/s, OC-192/STM-64, 9.953 Gb/s, 10Gb Ethernet, 10.3125 Gb/s, 10×Fibre Channel, 10.51875 Gb/s, OC-192/STM-64 FEC, 10.664 Gb/s , OC- 192/STM-64 FEC, 10.709 Gb/s, 10Gb Ethernet with FEC, 11.0957 Gb/s, 10×Fibre Channel with FEC, 11.317 Gb/s
	Optical input	62.5/125um FC/UPC (single-mode/multi-mode)
	Optical sensitivity	-10 dBm
	Measurement consistency	Average power: $\pm 0.1$ dB Extinction Ratio: $\pm 0.1$ dB Mask Margin: $\pm 5\%$ (after calibration)
	Max Input (None-Destruction, Peak)	Max. 5 mW(+7 dBm)
	Max Input (Linearity)	Max. 0.5 mW(-3 dBm)
	Monitor Average Power Range	-20dBm to -3dBm
Electrical Specifications	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
		>24dB
Electrical Specifications	Electrical channel bandwidth	20GHz (Typ)
	Rise time (10%~90%)	20ps



	Max Input Amplitude		<1V
	RMS noise		<2mV (Typ)
	Electrical Sensitivity		24mV
	Impedance		50Ω
	Electrical input		2.92mm (Female)
	Reflection		10%
Trigger Specifications	Sampling system		Acquisition Mode: Sampling (Default), Envelop and Average 1350 points/Waveform, Accumulation Waveform Numbers: 25 waveforms to 10000
	Sensitivity		200mV
	Maximum trigger signal		<±1.5V
	Trigger Impedance		50Ω
General Specifications	Working Place		Indoor
	Working Condition		0°C ~ +50 °C, 30 % ~ 80 % Relative Humidity
	Storage		-30 °C ~ 70°C, 10 % ~ 90 % Relative Humidity
	Altitude		Operation: 0m to 2000m, Storage: 0m to 4600m
	Power		LINE: 100-240VAC, 50/60Hz, 250W FUSE: T3.15AL 250 VAC
	Warm-up time		After 30 minutes warm-up, ambient temperature changes less than ± 3 °C
	Dimensions		450*212*105mm(with foot pad/ handle)
	Weight		Net weight 5.0kg
	CE	EMC	2014/30/EU; EN 61326-1; CISPR 11: 2015+A1: 2016+A2: 2019; EN IEC 61000-3-2; EN 61000-3-3(Verification in progress )
		LVD	2014/35/EU: EUEN 61010-1(Verification in progress )
		RoHS	2011/65/EU: IEC62321-4, 5, 6, 7-1, 7-2, 8(Verification in progress )

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

## Ordering Information

DCA4201	Standard Mainframe
Bandwidth and Channel Options	
100	Single 10GHz Optical Channel (Default)
140/160/180/200	Add Low Data Rate Filters
EOC	Add Electrical Input Channel
Clock Recovery Option	
CR4201	1.244Gb/s~11.3Gb/s Clock Recovery



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## About Semight Instruments

Semight Instruments is a leading provider of global high-end test & measurement instrument and equipment. The company provides products and service to R&D, manufacture of high-speed communication, optical chip and semiconductor testing fields. Semight's testing instrument includes high-speed Bit Error Ratio Tester, Network Traffic Analyzer, broadband Sampling Oscilloscope, high-precision Wavelength Meter and digital Source Measure Unit. In addition, the company delivers optoelectronic hybrid ATE, laser chip burn-in system, laser chip tester, silicon photonics wafer tester, power chip tester, wafer level burn-in system, semiconductor parametric test system to domestic and international customers.

Semight Instruments adheres to the customer-centric, employee-based, innovation-driven, and continues to provide customer trustworthy, cost-effective and high-performance products and service.

Visit [www.semight.com](http://www.semight.com) for more information.

\*Product specifications and descriptions in this article can be changed without notice.