

# Eye-Scope 100380A



Multi-Rate Eye-Scan, Rate Detection, and Q Factor Monitor

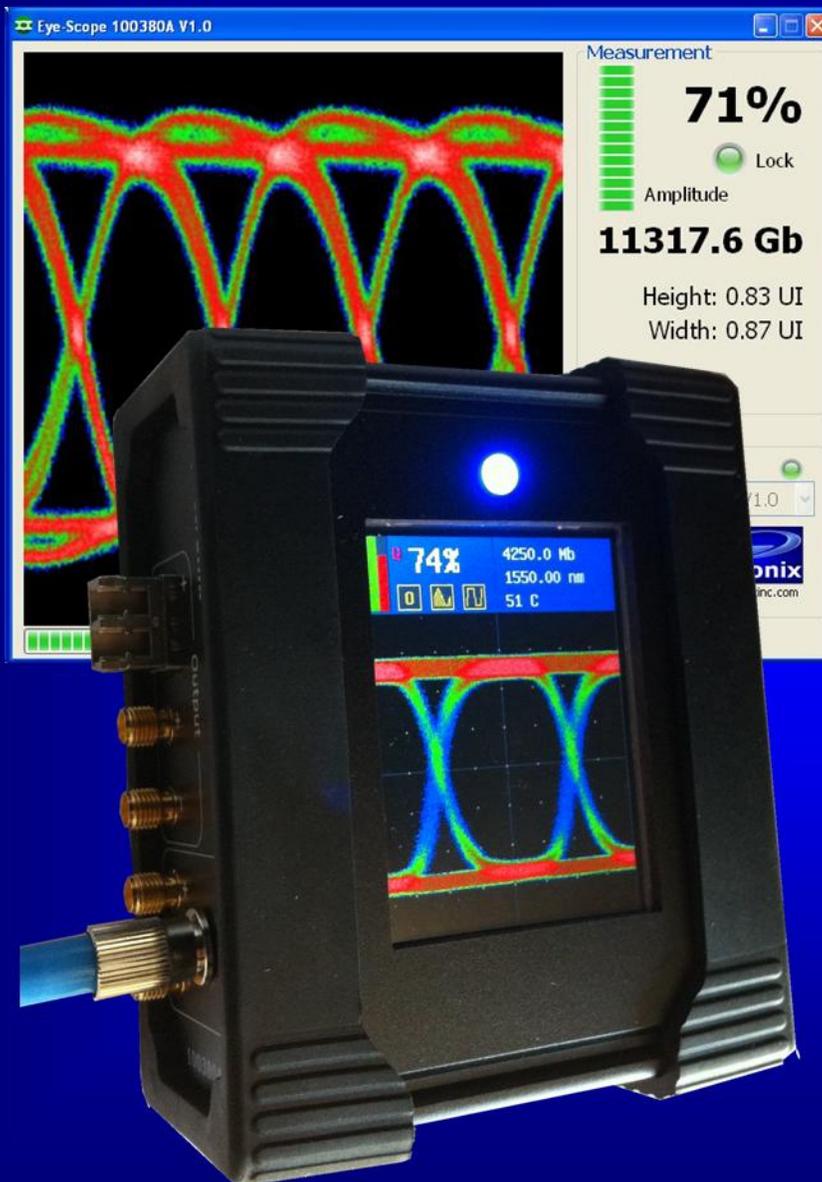
12.5Gb

Optical

Electrical

CDR

Low Cost



## Features:

- 622.08Mbps to 12.5Gbps
- Optical and Electrical Eye Scanning
- Automatic Bit Rate Measurement
- Adaptive Input Equalization
- Real-time Q Factor Measurement
- Stand-alone and Computer Controlled
- Color Touch Screen
- Internal CDR

## Applications:

- In-line Eye Quality Monitor
- Eye-Diagram Scanning
- O/E, E/O conversion
- Signal Identification
- Jitter Attenuation / Repeating
- Signal Equalization
- Wavelength / Media Conversion

## Overview

The Eye-Scope is a highly integrated, low cost instrument capable of measuring and displaying the “Q-factor” and eye-diagram of NRZ signals up to 12.5Gbps. The unit provides many features not found in higher priced units including both electrical and optical inputs and outputs, an internal CDR, and a color display allowing true stand-alone operation. Operation is simple: the unit automatically locks onto and displays the data rate and “Q-factor” of any valid input signal and pressing the touch screen will scan and display the eye-diagram. Electrical and SFP+ outputs are provided allowing in-line signal monitoring.

## Clock Recovery and Equalization

For maximum flexibility, the Eye-Scope provides both optical and electrical inputs selectable using the on screen controls. The selected input is routed to an adaptive equalization circuit with a variable gain amplifier which automatically optimizes the response for maximum eye opening.

An internal wideband clock recovery circuit allows the device to take measurements and capture eye diagrams without the need for an external clock either before the adaptive equalizer or after. The circuit continuously scans standard data rates between 622Mbps and 12.5Gbps, automatically locking onto and identifying the correct rate.

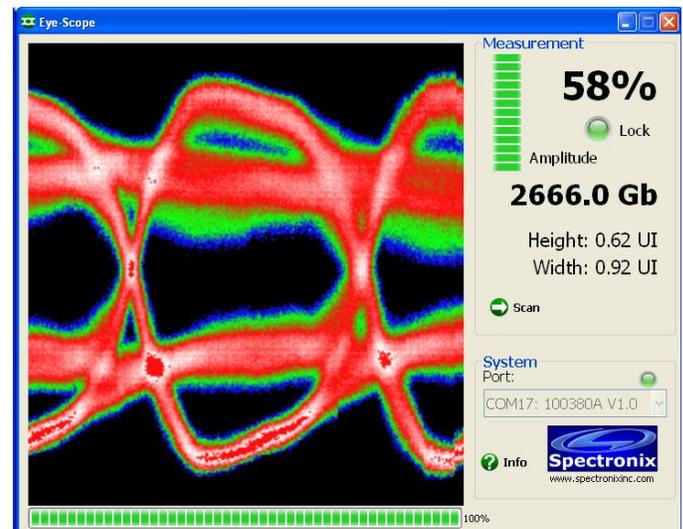
## Q Factor Measurements

Once lock has been achieved, a high speed eye scanning engine continuously scans the eye opening in both amplitude and phase. The Q factor is calculated and displayed as the ratio between the actual clear eye opening and maximum possible opening. The Q factor is measured and updated approximately twice per second making real-time signal quality measurements possible.

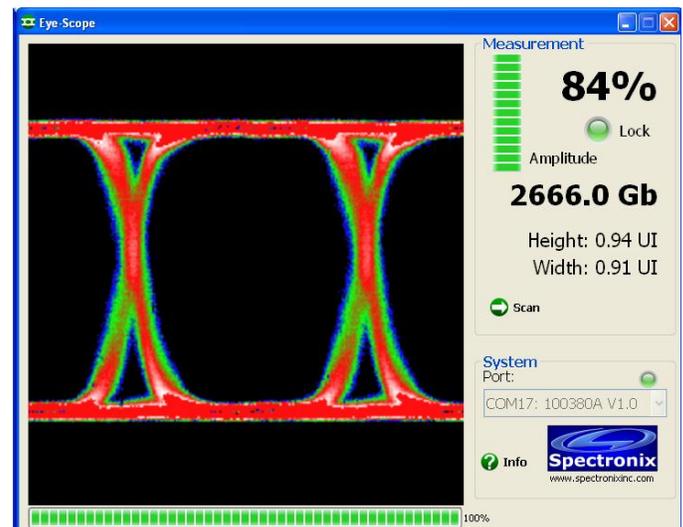
## Displaying an Eye Diagram

Under user command, the eye scanning engine can be used to capture and display a high resolution image of the eye. Scanning and storing a complete high resolution eye diagram takes less than 60 seconds. The eye

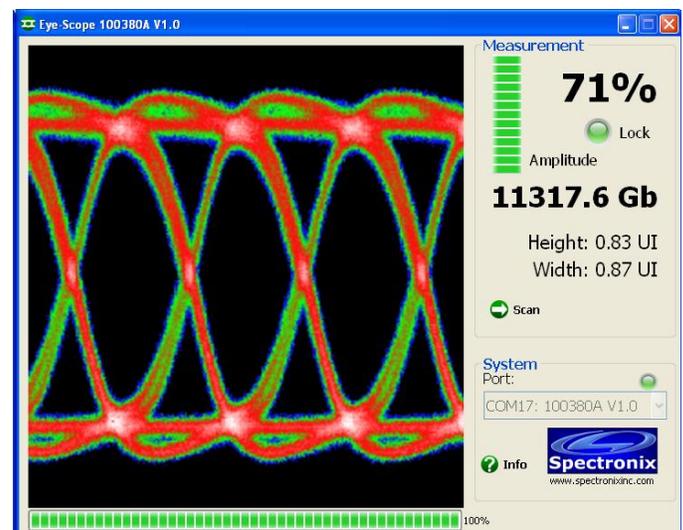
is automatically displayed on the color touch screen and can optionally be saved to a computer using the supplied software interface.



2.66Gbps, before the equalizer



2.66Gbps, after the equalizer



11.3Gbps, electrical

## Repeating and O/E, E/O Conversion

Data on the selected input, (optical or electrical), is retimed and retransmitted on both the SMA outputs and the user supplied SFP/SFP+ optical output. The unit will support any MSA compliant SFP or SFP+ transceiver; this allows the user to choose the correct wavelength and media type for their application. This function is useful for in-line signal monitoring, wavelength and media conversion, or to clean up jitter and amplify the signal before retransmission.



## Optional USB / Windows Software

The Eye-Scope can be operated independently or connected to a computer running Windows XP, Vista, 7, or 8 in order to capture and save the eye diagram image. The Eye-Scope uses a few simple commands over the USB port

allowing users to customize and automate operation by writing custom software applications.



## Ordering Information

Part Number	Description
100380A-LW	Eye-Scope, Long Wave Optical (1260 to 1620nm) Interface
100380A-SW	Short Wave Optical (830 to 870nm) Interface
100380A-WB	Eye-Scope, 15GHz Long Wave Optical Receiver

## Specifications

Parameter	Units	Typical Specifications
Supported Data Rates	Mbps	622.080, 1062.500, 1250.000, 2125.000, 2488.320, 2500.000, 2666.080, 4250.000, 9953.280, 10000.000, 10312.500, 10518.800, 10709.200, 11049.000, 11095.700, 11270.000, 11317.600, 12500.000
Electrical Input	mVpp	100 to 1200 differential, SMA
Electrical Output	mVpp	900 differential, SMA
Optical Input (LW option)		Multi Mode and Single Mode 1260 to 1620nm, FC connector, 7.5GHz, -15 to 0dBm
Optical Input (SW option)		Multi Mode and Single Mode 830 to 870nm, FC connector, 7.5GHz, -12 to 0dBm
Optical Input (WB option)		Single Mode 1260 to 1620nm, FC connector, 15GHz, -15 to 0dBm
Optical Output		SFP / SFP+ (user supplied)
Eye Scan Resolution	bits	256 vertical x 240 horizontal
Display		Color touch screen
Software Requirements		Windows XP, Windows 7, Windows 8 with USB port
Power Requirements		+5V, 2A max
Mechanical	Inches	1.2 x 4.3 x 3.2 with rubber bumpers

\* Rate detection only supported at 155.52Mbps