YOKOGAWA

AQ8603
Optical Fiber Strain Analyzer

This product is developed and manufactured by Yokogawa Electric Co., Ltd. in collaboration with Nippon Telegraph and Telephone Corporation.

Measuring the strain distribution in the fiber axial direction from one end.

**Optical fibers have become indispensable for information infrastructure
to support today's information-oriented society. Due to this background, expectations for optical fiber quality control is higher than ever.
On the other hand, research of optical fiber sensing technology to utilize optical fiber as sensors is increasing.
The AQ8603 Optical Fiber Strain Analyzer can measure the strain distribution in the optical fiber axial direction from one end by utilizing both Brillouin scattering light detecting technology and OTDR technology.**

■ Strain measurement accuracy: 0.003%

- Measuring the strain distribution with this high accuracy enables a full understanding of the exact conditions of strain.

■ Repeatability: < 0.02%

- The AQ8603's stable repeatability (less than 0.02%) makes strain monitoring available.

■ Measurement distance resolution : 1m

- Narrow sections of strain can be detected with a resolution of 1 m.

Bulletin AQ8603-00E

Optical Fiber Strain Analyzer

AQ8603

Specifications

Specifications		Display 10.4-inch color LCD 800×600 dots SVGA					
LCD screen	Measurement waveform	Strain distributions, Brillouin scattering spectrum, Brillouin scattering distribution (1 trace and 3D)					
	Measurement conditions	Measurement frequency, distance range optical pulse width, average times, etc.					
	Measurement result	Cursor distance, two points distance, difference of strain at two points, waveform of difference at strain					
Horizontal axis	Distance range	1, 2, 5, 10, 20, 40, 80km					
	Shift	0 to distance range					
	Readout resolution	Min. 5cm					
	Sampling points	Max. 20,000 points					
	Refractive index setting	1.00000 to 1.99999, 0.00001 step					
	Distance accuracy	$\pm(2.0\times10^{-5}\times$measurement distance (m) + 0.2m + 2×sample resolution (m))					
	Distance scale	km, mile. kf					
Vertical axis	Display range	-6 to +6% (or -60,000 to +60,000με)					
	Vertical scale	Strain distribution : 0.001, 0.002, 0.005, 0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1.0, 2.0%					
		Brillouin spectrum : 1.0, 2.0, 5.0, 10.0 dB					
	Readout resolution	0.0001%					
	Strain scale	%, με					
Wavelength		1.55μm band					
Measurement frequency range		9.9 to 11.9 GHz					
Measurement frequency span		1, 2, 5, 10, 20, 50 MHz					
Average time setting		2^{10} to 2^{24}					
Strain measurement range [1]		-1.5 to +1.5% (typ.)					
Pulse width		10 ns	20 ns	50 ns	100 ns	200 ns	
Distance resolution (m)		1	2	5	11	22	
Dynamic range (dB) [2]		2	6	10	13	15	at strain accuracy±0.004% (2σ)
		—	—	8	11	13	at strain accuracy±0.003% (2σ)
Strain measurement accuracy [3]		±0.004% (2σ) (±0.01%)		±0.003% (2σ) (±0.005%)			
Repeatability [4]		<0.04%	<0.02%				
Memory		3.5-inch floppy disk, Internal hard disk (5 GB or more)					
Interface	Keyboard	PS/2 connector					
	Mouse	PS/2 connector					
	VGA	15-pin D-sub connector (SVGA)					
	GP-IB	Compatible IEEE-488					
	Serial port	9-pin D-sub connector					
Optical connector		FC-SPC (or SC-SPC) [5]					
Printer		Internal high speed printer					
Power requirements		AC100 to 240 V 50/60 Hz 200 VA					
Environmental conditions		Operational temperature: 10 to 40°C, humidity: 85% RH or less (no condensation)					
		Storage temperature: 0 to 50°C					
Dimensions and mass		Approx. 445(W)×249(H)×495(D) mm, approx. 20kg					
Accessories		Instruction manual×1, power code×1, mouse×1, printer paper×2					
Laser class		Class 1M; IEC60825-1(2001)					

1) At single-mode (SM) fiber compatible ITU-T G.652.
2) Measurement conditions: Average times 2^{14}, frequency sweep span 10 MHz (5 MHz, at pulse width 100 ns or 200 ns), optical fiber loss of the standard deviation (2σ) of 100 consecutive data on strain distribution waveform of UV covered SM fibers with unstrained condition is within strain measurement accuracy (±0.003 % or 0.004%).
3) Measurement conditions: Average times 2^{14}, frequency sweep span 10 MHz (5 MHz, at pulse width 100 ns or 200 ns), standard deviation (2σ) of 100 consecutive data on strain distribution waveform of UV covered SM fibers with unstrained condition. The values in ( ) are noise peak width on strain distribution waveform (sample value).
4) Measurement conditions: Average times 2^{14}, frequency sweep span 10 MHz (5 MHz, at pulse width 100 ns or 200 ns), change width of 10 consecutive data of any distance on strain distribution waveform of UV covered SM fibers with unstrained condition.
5) Optical connector SC-SPC is a factory option

Model and Suffix Code

Product	Model	Suffix Code	Note
AQ8603 Optical Fiber Strain Analyzer	813919500		
		-1	Power Voltage100 to 120 V
		-5	Power Voltage200 to 240 V
		-D	UL–3P Power Cord
		-F	CEE–C7 Power Cord
		-G	SAA–3P Power Cord
		-H	BS3Pcircle Power Cord
		-M	JIS3P Power Cord (with 3 to 2 Adaptor)
		-Q	BS3Psquare Power Cord
		/CE	CE Marking
		/SCC	SC Connector

Note

Pursuant to the Foreign Exchange and Foreign Trade Control Law, Japanese government approval may be required to export this product from Japan.
The information presented in this bulletin is subject to change without notice due to performance and quality improvements.

YOKOGAWA

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