

AQ7413 Low-Coherence Light Source Unit*

Center wavelength ¹	1550±40 nm 1310±50 nm
Spectrum bandwidth	140 nm or less (at 1550 nm) 100 nm or less (at 1310 nm)
Optical output level	-18 dBm or more (at 1550 nm) -16 dBm or more (at 1310 nm)
Optical fiber	SM (10/125 μm)
Optical connector	SC/PC (optical return loss of 40 dB or more)
Environmental conditions	Operating temperature 25±10°C Storage temperature -10 to +50°C Humidity 80% RH or less (no condensation)
Dimensions and mass	Approx. 200(W) x 100(H) x 450(D) mm, approx. 2.5 kg

* Specifications based on measurements taken after a one-hour warm-up period.

¹ At 25±3°C

AQ7414 ASE Light Source Unit*

Center wavelength ¹	1560±20 nm
Spectrum bandwidth	8 nm or more
Optical output level	+10 dBm or more
Optical fiber	SM (10/125 μm)
Optical connector	SC/PC (optical return loss of 40 dB or more)
Laser product safety standard ²	IEC60825-1 Class 3A 21CFR1040.10 Class IIIb
Environmental conditions	Operating temperature: 25±10°C Storage temperature: -10 to +50°C Humidity 80% RH or less (no condensation)
Dimensions and mass	Approx. 200(W) x 100(H) x 450(D)mm, approx. 2.5 kg

* Specifications based on measurements taken after a one-hour warm-up period.

¹ At 25±3°C

² From laser product safety standard label.



Option

AQ7410 optical cord

Reference fiber cord with SC/PC connector at each end (return loss of 40 dB or more)

Available lengths: 0.25, 0.5, 0.75, 1 and 2 meters

Specifications are subject to change without notice.

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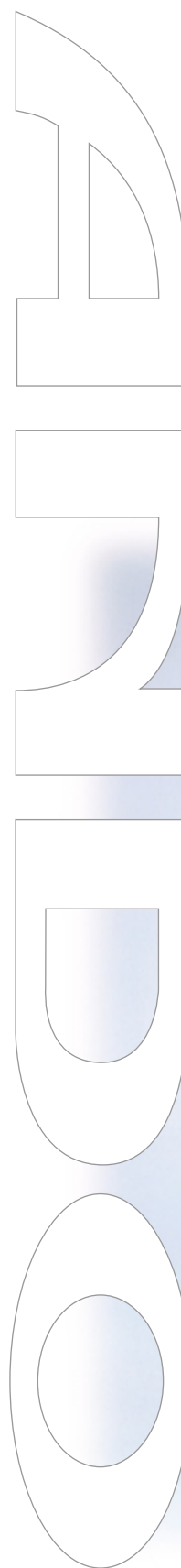
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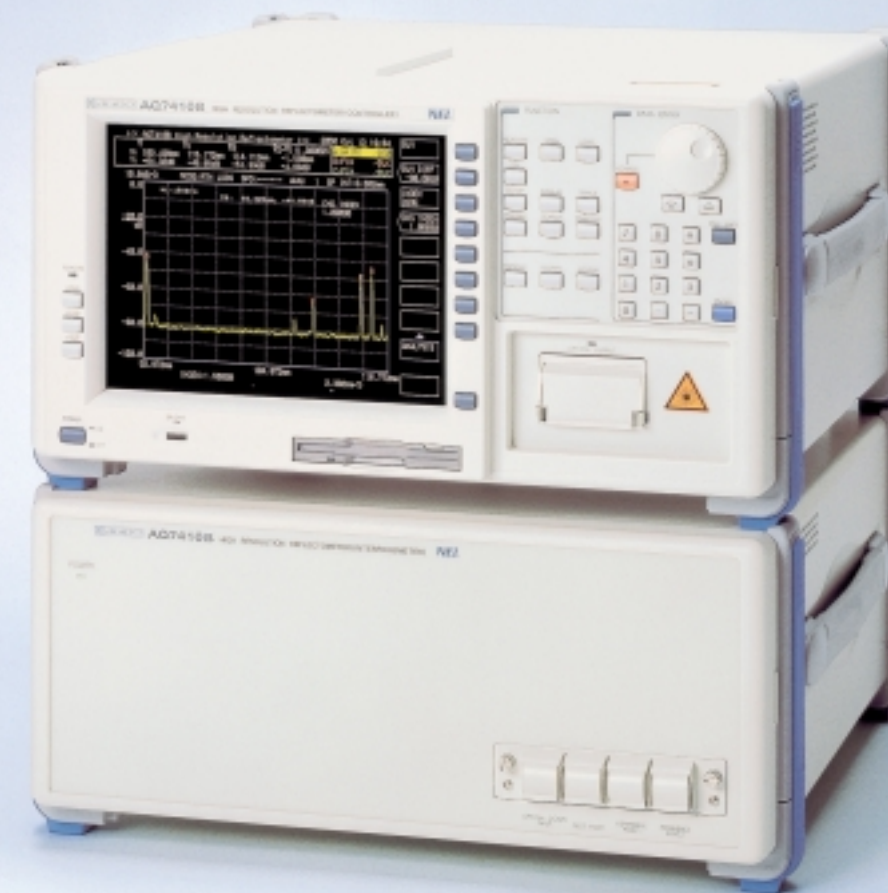
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High-Resolution Reflectometer AQ7410B

- 20 μm spatial resolution, 2000 mm distance measurement range
- High-resolution measurement of reflection in waveguides and optical modules



General

The AQ7410B high-resolution reflectometer is a Michelson interferometer based instrument for measuring internal reflection distribution of optical modules and devices.

With resolutions of 20 μm (AQ7413) and 65 μm (AQ7414), the AQ7410B offers the superior spatial analysis capability necessary for measuring multiple reflection points in optical modules and devices. The AQ7410B also features a long distance range, which allows the detection of reflection points without repeated reconnection of reference fibers.

Light Source Unit	Type
AQ7413 Low-Coherence Light Source Unit	High spatial resolution
AQ7414 ASE Light Source Unit	Wide return loss measurement range

Features

High spatial resolution

- 20 μm with AQ7413 unit
- 65 μm with AQ7414 unit

Long distance range suited to measuring optical modules

- Up to 2000 mm (refractive index conversion of the air)

High return loss measuring range

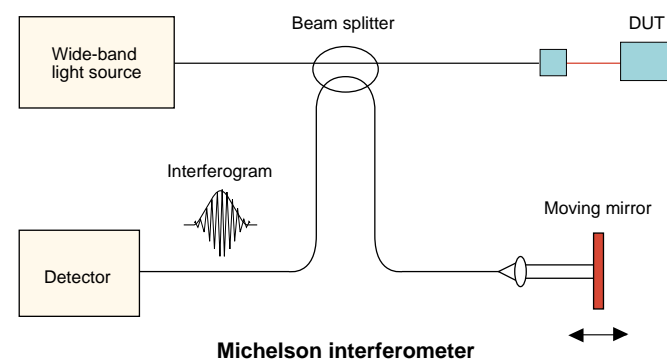
- 10 to 85 dB (using AQ7413 unit and wavelength of 1310 nm)
- 10 to 80 dB (using AQ7413 unit and wavelength of 1550 nm)
- 10 to 90 dB (using AQ7414 unit)

Specifications

AQ7410B High-Resolution Reflectometer

Optical fiber	SM (10/125 μm)
Distance range ¹	0 to 2000 mm
Spatial resolution	20 μm (with AQ7413 unit at 1310 nm) 20 μm (with AQ7413 unit at 1550 nm) ² 65 μm (with AQ7414 unit) ²
Sampling resolutions	0.002, 0.005, 0.01, 0.02, 0.05, 0.1, 0.2, 0.5 and 1 mm
Refractive index	1.00000 to 3.99999
Maximum number of sampling points	20001
Sweep speed ³	36 mm/sec (with AQ7413 unit set at 1310 nm) 43 mm/sec (with AQ7413 unit set at 1550 nm) 43 mm/sec (with AQ7414 unit)
Measurement range ⁴	10 to 85 dB (with AQ7413 unit set at 1310 nm) 10 to 80 dB (with AQ7413 unit set at 1550 nm) ² 10 to 90 dB (with AQ7414 unit) ^{2,5}
Level measurement accuracy ⁴	± 2.0 dB or less
Memory	Floppy disk 3.5-inch 2HD Internal memory 32 traces
Printer	Internal high-speed thermal printer
Display	9.4-inch color LCD (640 x 480 pixels)
Optical connector	SC/PC (optical return loss of 40 dB or more)
Power source	AC 100 to 200, 220 to 240 V, 50/60 Hz, 200 VA
Environmental conditions	Operating temperature $25 \pm 10^\circ\text{C}$ Storage temperature -10 to $+50^\circ\text{C}$ Humidity 80% RH or less (no condensation)
Dimensions and mass	Controller Approx. 425 (W) x 222 (H) x 450 (D) mm, approx. 15 kg Interferometer 425 (W) x 177 (H) x 450 (D) mm, approx. 28 kg
Accessories	Connector cord (3 ps) Optical fiber cord (SM fiber with SC connector at each end) Optical fiber cord for device under test and reference ports (0.75 m each, SM fiber with SC connector at each end) 1550 nm optical fiber cable Power cord (with 3/2 terminal conversion plug) Printer paper (2 rolls) Instruction manual

Measurement principle



The AQ7410B is a high-resolution optical low-coherence reflectometer based upon a Michelson interferometer.

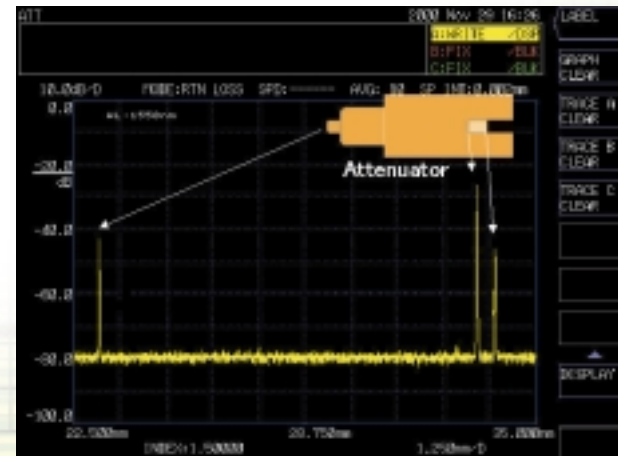
As shown in the diagram at left, a wide-band optical light source is launched into a beam splitter and divided into two. One part is incident into the DUT, while the other part is used as a local oscillator (LO) light via an optical delay line that consists of a moving mirror and a reflector.

The reflection from the DUT is combined with LO light, and the resulting interferogram is picked up by a detector when the two path lengths are equalized. The reflection point is obtained by precisely scanning the position of the moving mirror, while reflectivity is measured by the intensity of the interference signal.

Measurement examples



Return loss measurement of APD module



Return loss measurement of Optical Attenuator

- ¹ By refractive index conversion of the air.
- ² When connected with a special 1550 nm optical fiber cord.
- ³ When used with a sampling resolution of 0.01/0.02/0.05/0.1/0.5/1 mm.
- ⁴ When averaged over 10 times or more.
- ⁵ Optical return loss of 50 dB or more, measured at terminus.