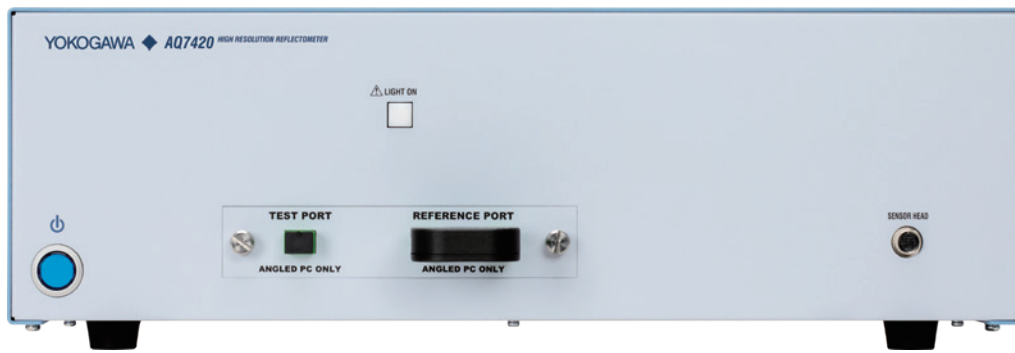


## High-Resolution Reflectometer AQ7420

# For Quality inspection of Optical connectors and Optical modules

### Detection of reflection position and measurement of reflection amount



The AQ7420 accurately detects the quantity and location of reflections within optical connectors and modules. It reveals microcracks that standard loss measurements might miss, helping to avoid unpredictable and potentially detrimental failures, which is especially valuable in demanding environments subject to movement, vibration, and thermal cycling. When paired with the optional sensor head unit, it can also measure insertion loss simultaneously, making the AQ7420 the ideal multi-purpose instrument for inspecting optical connectors and modules.

## Features

- Measurement distance: 100 mm (approx. 4 inches)
- Spatial resolution: 40  $\mu\text{m}$
- Spurious noise:  $-100$  dB avoids false (ghost) effects
- Simultaneous measurement of multiple reflection and Insertion loss

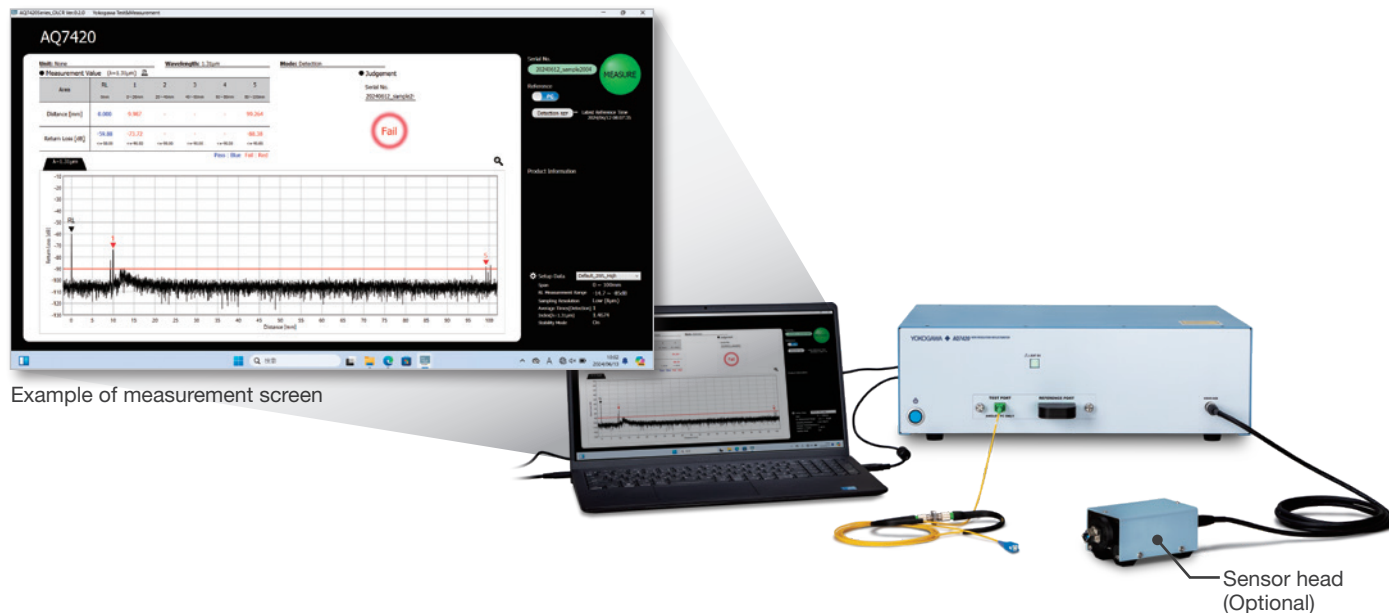
## Applications

- Detect microcracks in optical connectors used in critical communications infrastructures such as:
  - Datacenters
  - Cell Towers (FTTA)
  - Submarine fiber optic links
  - Space Sattelite links
- Precisely locate position and intensity of internal reflections in optical devices such as:
  - Silicon Photonics for Communications
  - TOSA/ROSA

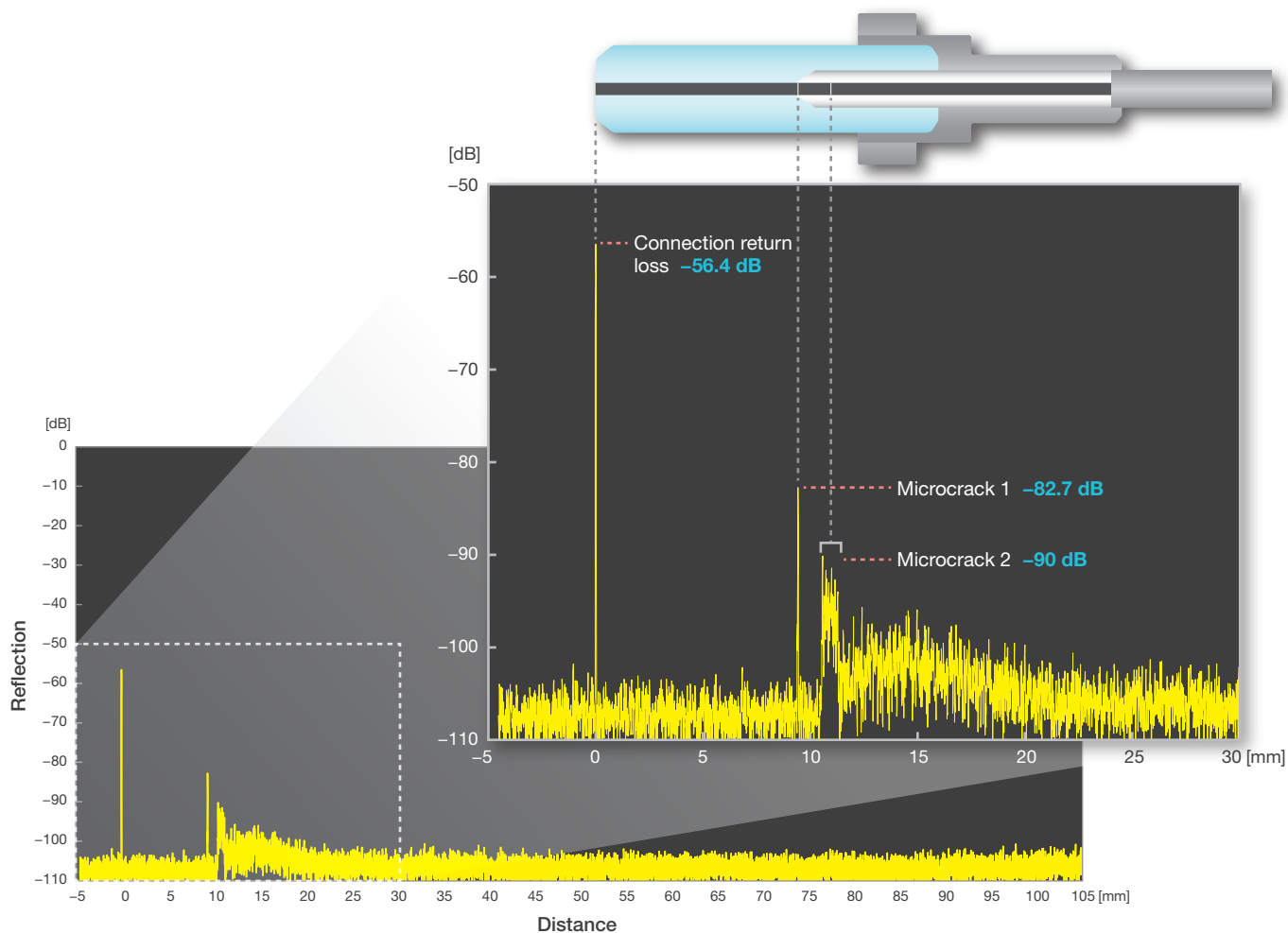


# Actual measurement Examples

Simultaneous measurement of breaks, cracks, losses, and reflections of optical connectors



Example of measurement screen



Measurement Example of microcracks in optical connectors (High sensitivity range)

# Specifications

## AQ7420 High-Resolution Reflectometer

Items	Specifications
Measurement wavelength	-13NN: 1310 nm, -1315: 1310 nm / 1550 nm
Measurement distance range <sup>*1</sup>	100 mm
Distance sampling resolution <sup>*1</sup>	1, 4, 8 μm
Spatial resolution <sup>*2, *3</sup>	40 μm or less
Distance measurement repeatability <sup>*4, *6</sup>	50 μm or less
Back reflection measurement range	Normal range: -14.7 to -85 dB, High sensitivity range: -50 to -100 dB
Back reflection measurement uncertainty <sup>*2, *5, *6, *7</sup>	Normal range: ±3 dB (-14.7 to -85 dB) High sensitivity range: ±3 dB (-50 to -90 dB), ±5 dB (-90 to -100 dB)
Spurious noise <sup>*8</sup>	Normal range: -85 dB or less <sup>*9</sup> High sensitivity range: -100 dB or less <sup>*10</sup>
Measurement time <sup>*11</sup>	Approx. 6 seconds
Applicable Optical fiber	SMF (ITU-T G.652)
Master cord	SMF (ITU-T G.652), FC/PC or SC/PC connector
Functions	By control software
Performance guarantee environment <sup>*12, *13</sup>	18 to 28°C, ±2°C after reference, 20 to 70%RH, no condensation
Operating environment	10 to 40°C, 20 to 70%RH (Below 28°C), 20 to 50%RH (Below 35°C), 20 to 35%RH or less (Below 40°C), no condensation
Storage environment	-10 to 50°C, 20 to 80%RH (Below 40°C), 20 to 40%RH (Below 50°C), no condensation
Power requirements	100 to 240 VAC, 50/60 Hz, 120 VA or less (AC adapter)
Dimensions and Mass <sup>*14</sup>	430 (W) × 132 (H) × 350 (D) mm (Excluding protector and handle), approx. 8 kg
Laser safety standards	EN 60825-1:2014+A11:2021, IEC 60825-1:2014, GB/T 7247.1-2023 Class 1
Recommended calibration period	1 year
Standard accessories	Master cord, Relay cord, FC adapter, Distance Adjustment cord, USB cable, Control software (CD), AC Adapter
Control software main functions	Optical return loss distribution waveform, The location of the reflection point, Optical reflection loss display, Judgement waveform scaling, Marker function, etc
Recommended PC <sup>*15</sup>	CPU: CORE i5, 2 GHz or more, 64 bit, OS: Windows11, RAM: 8 GB or more, Storage space: 1 GB or more, Display resolution: 1920 × 1080 dots or more, USB2.0 or higher

\*All specifications are after 1 hour of warm-up and REF under the measurement condition.

\*The product specification is when the wavelength is set to 1310 nm.

\*1 For a refractive index of 1.467 (from the tip of the attached optical fiber) \*2 Measurement distance 0 mm \*3 Half value width of reflected light pulse waveform. \*4 In the case of an air-conditioned room at a temperature of 23°C to 24°C, excluding the effect of optical fiber expansion due to temperature, when stability mode is ON. \*5 The return loss value may fluctuate by up to about 3 dB by moving the fiber. \*6 2 σ \*7 Averaging 1 time (-14.7 dB to -90 dB), 5 times averaging if smaller than -90 dB. \*8 Pseudo reflected waveform due to device-specific characteristics. \*9 When measuring pseudo reflected light amount -20 dB (0 mm position), averaging 5 times. \*10 When measuring pseudo reflected light amount -50 dB (0 mm position), averaging 5 times. \*11 Measurement distance 100 mm, distance measurement sample resolution 8 μm, high sensitivity range: -50 to -100 dB, averaging 1 time, varies depending on PC operating environment. \*12 No abrupt temperature change (±10°C/h). \*13 Specifications covered: Back reflection measurement uncertainty, distance measurement repeatability, spurious noise. \*14 Excluding accessories. \*15 A personal computer for control is not included. Please prepare a personal computer with recommended specifications or higher.



## AQ740023 Sensor Head

Items	Specifications
Measurement wavelength	1310 nm / 1550 nm <sup>*1</sup>
Insertion loss measurement range <sup>*1</sup>	0 to 10 dB
Insertion loss measurement uncertainty <sup>*2, *3</sup>	±0.02 dB
Applicable optical fiber	SMF (ITU-T G.652)
Connector adapter	FC or SC *LC connector, 2.5 dia. ferrule, and 1.25 dia. ferrule sold separately
Performance guarantee environment <sup>*4</sup>	18 to 28°C, ±2°C after reference, 20 to 70%RH, no condensation
Operating environment	10 to 40°C, 20 to 70%RH (Below 28°C), 20 to 50%RH (Below 35°C), 20 to 35%RH (Below +40°C), no condensation
Storage environment	10 to 50°C, 20 to 80%RH (Below 40°C), 20 to 40%RH (Below 50°C), no condensation
Power	Supplied by AQ7420 high-resolution reflectometer
Dimensions and Mass <sup>*5</sup>	60 (W) × 45 (H) × 100 (D) mm (excluding protrusions), Approx. 0.4 kg
Recommended calibration period	1 year
Standard accessories	Connector Adapter FC or SC, Adapter Cap, Cable (Special cable for AQ7420 connection)

\*This instrument is a dedicated sensor head that is driven and controlled by the AQ7420 high-resolution reflectometer.

\*All specifications are after 1 hour of warm-up and REF under the measurement condition.

\*1 Same as measurement wavelength of AQ7420. \*2 2 σ \*3 Within 5 minutes after reference temperature change ±1°C or less. \*4 No abrupt temperature change (±10°C/h).

\*5 Excluding accessories.

## Models and suffix codes

### AQ7420 High-Resolution Reflectometer

Models	Suffix codes	Descriptions
AQ7420		AQ7420 High-Resolution Reflectometer
	-13NN	Wavelength: 1310 nm
	-1315	Wavelength: 1310 nm and 1550 nm
	-FCM	AQ740091 FC/PC Master cord
	-SCM	AQ740091 SC/PC Master cord
	-D	UL/CSA standard, 125 V
	-F	VDE/Korean standard, 250 V
	-H	Chinese standard, 250 V
	-N	Brazilian standard, 250 V
	-Q	BS/Singaporean standard, 250 V
	-T	Taiwanese standard, 125 V

### AQ740023 Sensor Head

Models	Suffix codes	Descriptions
AQ740023		AQ740023 Sensor Head
	-FCC	AQ740081 Connector Adapter (FC)
	-SCC	AQ740081 Connector Adapter (SC)
	-L1	AQ742x Connection cable length: 1 m
	-L2	AQ742x Connection cable length: 2 m

### AQ740081 Connector Adapter

Models	Suffix codes	Descriptions
AQ740081		AQ740081 Connector Adapter
	-FCC	FC connector
	-SCC	SC connector
	-LCC	LC connector
	-LMC	Ferrule (1.25 dia.)
	-SFC	Ferrule (2.5 dia.)

### AQ740091 master Cord

Models	Suffix codes	Descriptions
AQ740091		AQ740091 master Cord
	-FCA	FC/Angled PC connector
	-FCM	FC master connector
	-SCM	SC master connector
	-LCM	LC master connector
	-MUM	MU master connector
	-PCC	PC polish
	-APC	Angled PC polish

### AQ740096 Distance Adjustment Cord

Models	Suffix codes	Descriptions
AQ740096		AQ740096 Distance Adjustment Cord
	-0000	0 mm
	-0500	500 mm
	-1000	1000 mm
	-1500	1500 mm
	-2000	2000 mm

The distance adjustment cord is used to adjust the starting position of the measurement. Please consult our sales representatives for code lengths that are not listed.



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