Test&Measurement

YOKOGAWA

Smart and fully-featured OTDR

AQ1210 Series
Optical Time Domain Reflectometer

Precision Making

Bulletin AQ1210-01EN

Smart and fully-featured OTDR

›Compact body with long-lasting battery operation over 10 hours.

›5.7-inch LCD, multi-touch touchscreen and hard-key buttons.

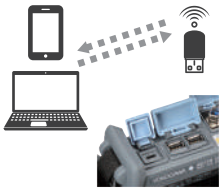
›Enhanced OTDR performance

The AQ1210 provides:

- Measurement of PON systems with up to 128 splits
- High-speed real-time measurement
- Smart mapper function
- Multi-fiber measurement
- Fiber Surface test function (Optional)

›Connectivity

Remote access is possible via WI-FI or ETHERNET connection.



OTDR lineup

Six models offer different wavelength and application combinations

Model	Number of wavelengths	Dynamic range (dB)				Test application		
		1310 (nm)	1550 (nm)	1625 (nm)	1650 (nm)	Installation	Maintenance	
							Dark	Live
AQ1210A	2	37	35			✓	✓	
AQ1215A	2	42	40			✓	✓	
AQ1210E	3	37	35	35		✓	✓	✓
AQ1215E	3	42	40	39		✓	✓	✓
AQ1215F	3	42	40		37	✓	✓	✓
AQ1216F	3	42	40		40	✓	✓	✓

Measurement applications

PON Optimized

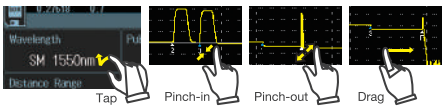
Excellent hardware performance and advanced analysis algorithm enable the AQ1210 to accurately characterize Passive Optical Networks (PON) through high-port-count splitters (up to 1 × 128)*.
The AQ1210 assists beginner/expert users in simply configuring OTDR measurement settings based on PON topology information for optimal results. Short event dead zone and high sampling resolution enable users to detect near-end location of connectors that are as close as 0.5 meters (<20 inches)*.

*AQ1215 models.

Fast and friendly functionality, all at your fingertips!

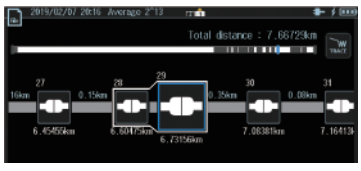
Dual-operation mode

Touchscreen and hard-key buttons
Tap, swipe, pinch or press. Choose between the high resolution 5.7-inch multi-touch capacitive touchscreen or the robust hard-key buttons in any combination desired. OTDR operations have never been easier!



Smart Mapper

Single button measurement. Comprehensive network characterization. Easy to read report
Measurement acquisitions with multiple pulse widths and smart-algorithm enable users to detect and comprehensively characterize network events by pressing one single button.
Simple, icon-based map view for easy interpretation of network events. Immediate PASS/FAIL judgment based on user-defined thresholds.
Easily toggled trace view for manual supplementary analysis.



Quick boot-up

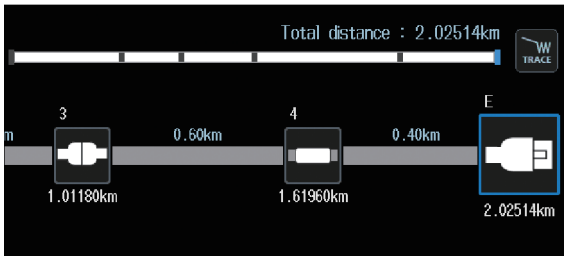
Under 10 seconds!
From completely OFF to measurement ready in under 10 seconds!

Long battery operation time

Over 10 hours!
No worrying about running out of battery power during your daily work. The AQ1210's high capacity Li-Ion polymer battery will last for 10 hours under the Telcordia standard conditions.

OTDR view mode

The OTDR view can be switched between the trace and the map by simply tapping the icon. The trace is a traditional view with an OTDR waveform and event markers, and the map is an icon-based view for easy interpretation of network events, which is also used for the Smart mapper function.



High-speed, high-performance real-time measurement

When detecting/identifying the position of a fiber end point or bend of an installed optical fiber network, a user, according to the operating environment, can choose among the two modes: the high-speed mode with less measuring time and the high accuracy mode that is capable of reproducing a high-quality waveform.

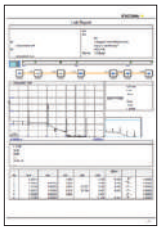
Multi-tasking

Enhancing productivity

Managed by a highly efficient operating system, multiple functions can be performed simultaneously.
Now, users can perform OTDR measurements on a particular fiber core while simultaneously checking the power level, connector surface quality and visible fiber ID/bending on three other fibers.

PDF reporting

Built-in post-processing software for generating OTDR reports in PDF format. Flexible configuration of report template to meet users' report requirements.



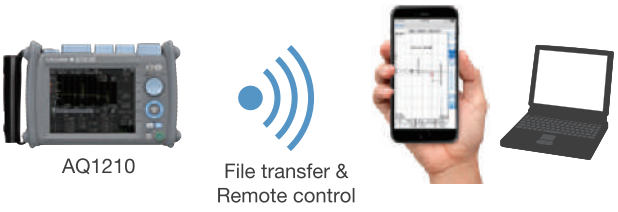
File transfer and remote control

File transfer

The AQ1210's data files can be transferred to a smartphone or tablet through Wi-Fi using a web browser or the OTDR data transporter, or a Windows™ PC through Wi-Fi or LAN using a web browser or the AQ7933 Emulation software.

Remote control

The AQ1210 can be controlled remotely by a smartphone or tablet using a web browser and by a Windows™ PC using a web browser, the AQ7933 Emulation software, or remote-control commands through Wi-Fi or LAN.



AQ1210

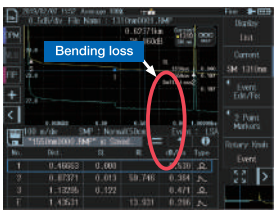
File transfer &
Remote control

Note. The USB connection is also available for the file transfer and remote control with a Windows™ PC. A USB-Wi-Fi dongle is required for Wi-Fi connection, and a USB-LAN adapter is required for LAN connection. Please consult with our sales representatives for details.

Convenient functionality for fast diagnosis of network problems

Macro bending detector

Macro bending events along a fiber under test can be identified and located automatically by OTDR measurements using multiple wavelengths trace comparison and event analysis based on user-defined thresholds.



Advanced trace analysis

- **Multi-trace analysis**
- **2-way trace analysis**
- **Differential trace analysis**
- **Section analysis (Return loss)**

Direct data saving

Simply pressing "Direct save" icon, measured data can be saved in SOR, PDF, or both formats according to users' prior selection.

Specifications

OTDR

Items		Specifications					
Model		**AQ1210A**	**AQ1215A**	**AQ1210E**	**AQ1215E**	**AQ1215F**	**AQ1216F**
Wavelength (nm)		1310 ±25/1550 ±25		1310 ±25/1550 ±25, 1625 ±10	1310 ±25/1550 ±25, 1625 ±25	1310 ±25/1550 ±25, 1650 ±5 *6	1310 ±25/1550 ±25, 1650 ±25
Number of optical ports		1		2 (Port 2: 1625 nm, including a filter)		2 (Port 2: 1650 nm, including a filter)	
Applicable fiber		SM (ITU-T G.652)					
Distance range (km)		0.1 to 256	0.1 to 512	0.1 to 256	0.1 to 512		
Pulse width (ns)		5 to 20000	3 to 20000	5 to 20000	3 to 20000		
Event dead zone (m) *1,*8		0.75	0.5	0.75	0.5		
Attenuation dead zone (m) *2,*8		4	2.5	4	2.5		
PON dead zone (m) *3		35	30	35	30		
Dynamic range (dB) *4,*8		37/35	42/40	37/35, 35	42/40, 39	42/40, 37	42/40, 40
Loss measurement accuracy *5		±0.05 dB/dB	±0.03 dB/dB	±0.05 dB/dB	±0.03 dB/dB		
Optical return loss measurement accuracy		±2 dB					
Number of sampling points		max. 256000					
Sampling resolution		min. 5 cm	min. 2 cm	min. 5 cm	min. 2 cm		
Minimum readout resolution		Horizontal axis: 1 cm, vertical axis: 0.001 dB					
Distance unit		km, mile, kft					
Distance measurement accuracy		± (0.75 m + measured distance × 2 × 10^{-5} + sampling resolution)					
Group refractive index		1.30000 to 1.79999 (0.00001 intervals)					
Optical connector		SC, FC, LC, or SC angled-PC					
OTDR function	Measurement items	Distance, loss, return loss, return loss between two arbitrary points, dB/km					
	Analysis	Multi-trace analysis, two-way trace analysis, differential trace analysis, section analysis, auto event search, pass/fail judgment, fiber surface test (option)					
	Other functions	Multi-fiber project, rerouted fiber comparison, work completion notice, smart mapper, remote control, web server, report generation					
Light source function	Output power	–3 dBm ±1 dB					
	Output power stability *7	±0.05 dB (1310 nm, 1550 nm), ±0.15 dB (1625 nm, 1650 nm)					
	Modulation mode	CW, 270 Hz, 1 kHz, 2 kHz					
	Optical output port	OTDR port					
Laser class		Class 1M (IEC 60825-1: 2007, GB 7247.1-2012), Class 1 (EN 60825-1: 2014)					
Display *9		5.7-inch color TFT LCD (resolution: 640 × 480, multi-touch capacitive touchscreen)					
Interfaces		USB 2.0 type-A × 2: USB mass storage device, fiber inspection probe, USB dongle (LAN, WLAN), USB 2.0 type-C × 1: DC power supply, storage, remote control					
Data storage	Storage	Internal: ≥1000 traces, external: USB storage					
	File format	Write: SOR, CSV, SET, SMP, BMP, JPG, report Read: SOR, SET, SMP					
Power requirements *10		USB power supply (Type-C), DC 5 V ±5%, max. 3 A					
Battery *8		Type: Lithium ion polymer Operation time: 10 hours or more (Telcordia GR-196-CORE Issue 2, September 2010), Recharge time: 5 hours (power-off state)					
Environmental conditions		Operating temperature: –10 to 50°C (10 to 35°C when charging the battery), operating humidity: 5 to 90%RH (non-condensing), storage temperature: –20 to 60°C, storage humidity: 0 to 90%RH (non-condensing), altitude: 4000 m, dust and drip protection: IP51 equivalent *12					
EMC *11	Emission	EN 61326-1 Class A, EN 55011 Class A Group1					
	Immunity	EN 61326-1 Table2					
Laser safety standard *11		EN 60825-1: 2014, IEC 60825-1: 2007, GB 7247.1-2012, FDA 21CFR1040.10 and 1040.11					
Environmental regulation standard		EN 50581					
Dimensions		Approx. 210 mm (W) × 148 mm (H) × 69 mm (D) (excluding projections)					
Weight		Approx. 1 kg (including battery)					

*1: Minimum pulse width, return loss: ≥55 dB, group refractive index: 1.5, at 1.5 dB below the unsaturated peak level.
*2: Pulse width: 10 ns, at 1310 nm, return loss: ≥55 dB, group refractive index: 1.5, at a point where the backscatter level is within ±0.5 dB of the normal level.
*3: Pulse width: 100 ns (AQ1210A, AQ1210E), 50 ns (AQ1215A, AQ1215E, AQ1215F, AQ1216F), at 1310 nm, for non-reflective fiber with a loss of 13 dB.
*4: Pulse width: 20000 ns, measurement time: 3 minutes, SNR=1, decrease by 0.5 dB with an angled-PC connector.
*5: ±0.05 dB for a loss of 1 dB or less.
*6: At 20 dB below the spectral peak of pulsed optical output, at 23°C, after 30 minutes warm up.
*7: Constant temperature, for 5 minutes after 5 minutes warm up.
*8: Typical.
*9: The LCD may contain some pixels that are always on or off (0.002% or fewer of all displayed pixels including RGB), but this is not indicative of a general malfunction.
*10: Require approx. 3 amperes for recharging during operation, approx. 2 amperes for recharging in power-off state.
*11: With Optical power meter and Visible light source option
*12: All the rids are being closed.

Ahmedabad, Bangalore, Bhopal, Chennai, (