

AQ1200 MFT-OTDR

MULTI FIELD TESTER OTDR

**All-in-One
handheld optical fiber network test tool**



NEW LINE UP

3 Wavelength and High Dynamic Range Models

QUALITY  INNOVATION  FORESIGHT

Multifunctional Handheld OTDR

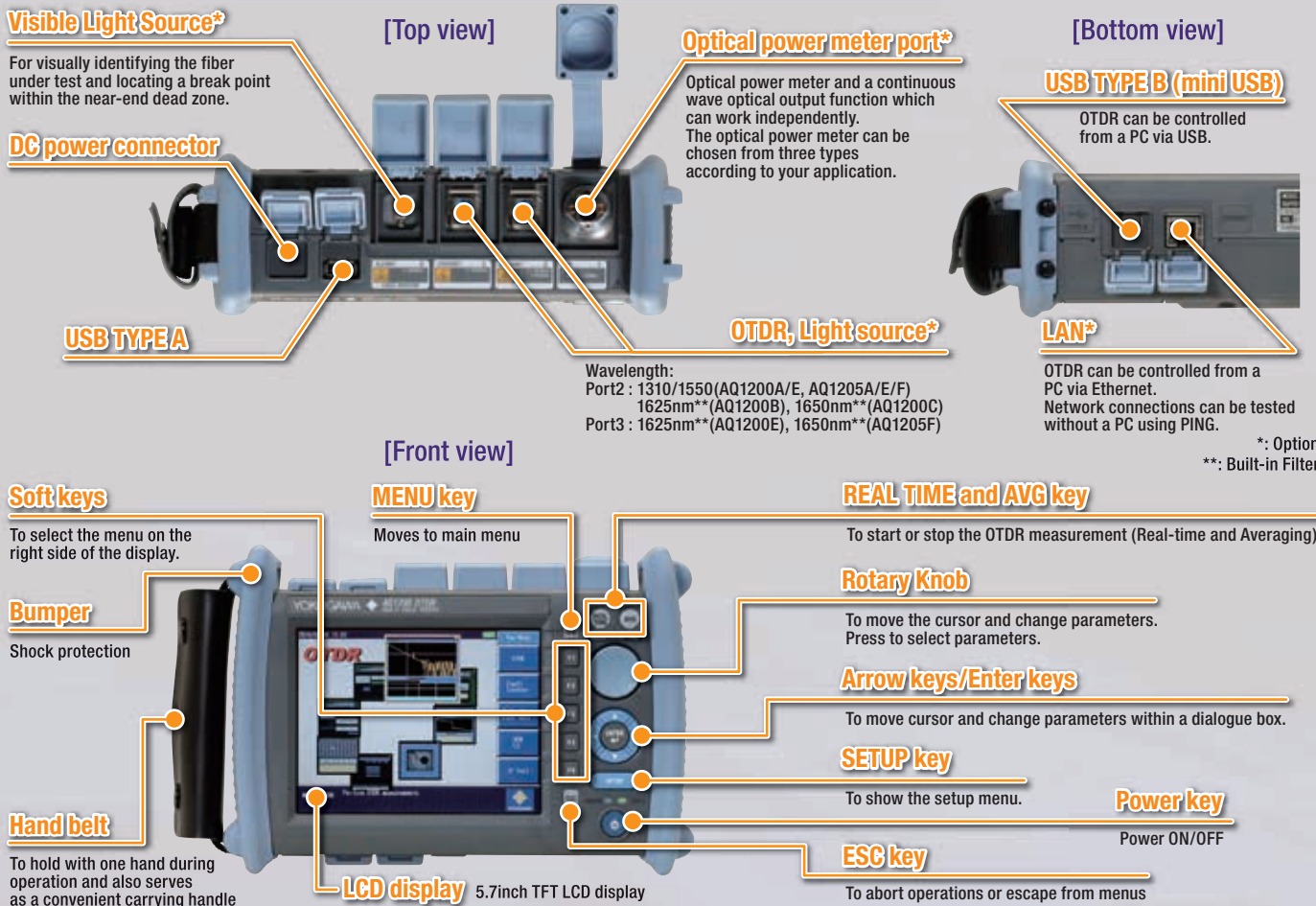
Offering Powerful Test Features & Excellent Operability

MULTI FIELD TESTER

MFT-OTDR AQ1200

Compact chassis yet fully equipped with field testing functions

The AQ1200 Multi Field Tester OTDR is a compact and lightweight handheld OTDR optimized for the installation and maintenance of optical fiber cables. It is designed with ease of use in mind to simplify field testing, improve work efficiency and ensure qualified results. Seven models are offered, each with unique wavelength(s) based on their specific application.



Product Lineup

AQ1200A	1310/1550 nm	Standard model with the same wavelengths used for communication services. Applicable for installation and maintenance.
AQ1200B	1625 nm	Models with a wavelength dedicated for the maintenance of live fibers. A built-in cut-off filter isolates the maintenance wavelength from the communication wavelength in order to perform accurate measurements in live networks.
AQ1200C	1650 nm	
NEW AQ1200E	1310/1550 nm 1625 nm	This tri-wavelength model has two ports. One port offers the communication wavelengths while the other port is dedicated for the maintenance wavelength. Thus this model is ideal for use in both installation and maintenance applications.
NEW AQ1205A	1310/1550 nm	This High dynamic range model can accurately measure the trace even after the splitter in a PON system. Thus this standard wavelength model is highly suited for high port count PON networks with splitters with up to 64 ports.
NEW AQ1205E	1310/1550 nm 1625 nm	These tri-wavelength models offer high dynamic range and have two ports. One port offers the communication wavelengths while the other port is dedicated for the maintenance wavelength. Thus this model is ideal for use in both installation and maintenance applications.
NEW AQ1205F	1310/1550 nm 1650 nm	The high dynamic range feature can accurately measure the trace even after the splitter in a PON system. Thus this is highly suited for high port count PON networks with splitters with up to 64 ports.

* : Please make sure that the measurement signal does not affect the communication services before use, e.g. by implementing a measurement wavelength cut-off filter in the line under test.

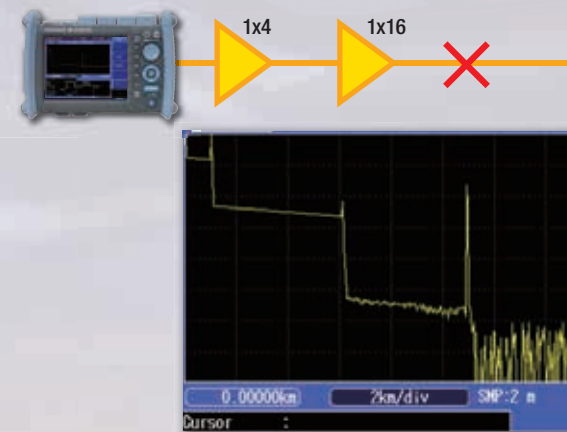
PON Measurement Capability

In Passive Optical Network (PON) Systems used in FTTH (Fiber To The Home), it is important to quickly and correctly find a fault in the drop cable that is installed after the splitter.

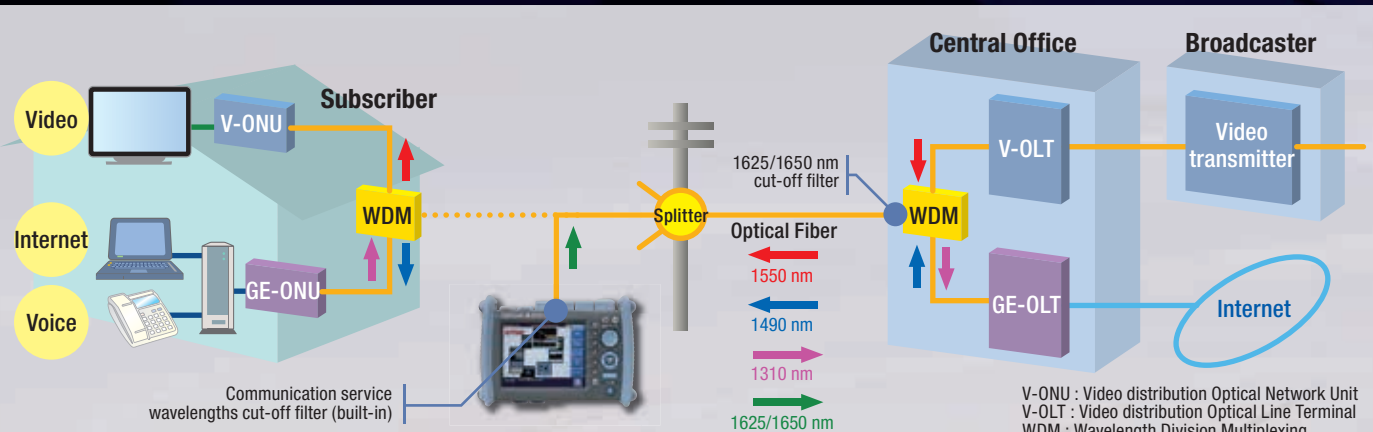
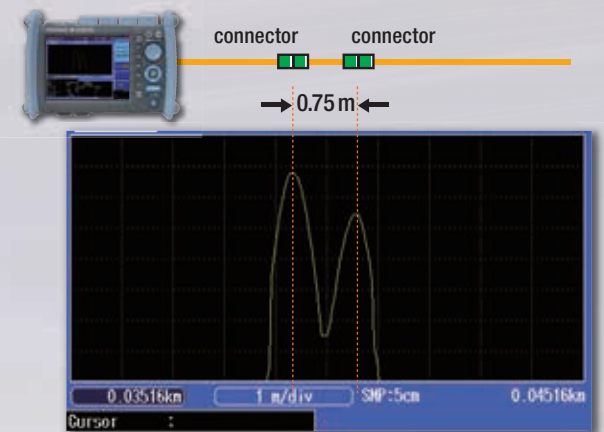
The AQ1200 MFT OTDR's PON measurement mode (*) is a mode optimized for the measurement of PON with a high-port-count optical splitter and can ensure a quality waveform even if there is a big loss in the optical splitter in the line.

With a short dead zone, the AQ1200 can distinguish connectors placed as closely as 0.75 m in FTTx, home or office networks.

• Example of measurement over a 64 port splitter



• Event dead zone 0.75 m



NEW Fault locator



Find a fiber break point easily and rapidly

Pressing one button initiates a measurement and event search and then clearly indicates the location of a fiber break. Waveform analysis can be done by simply switching over to the OTDR function.



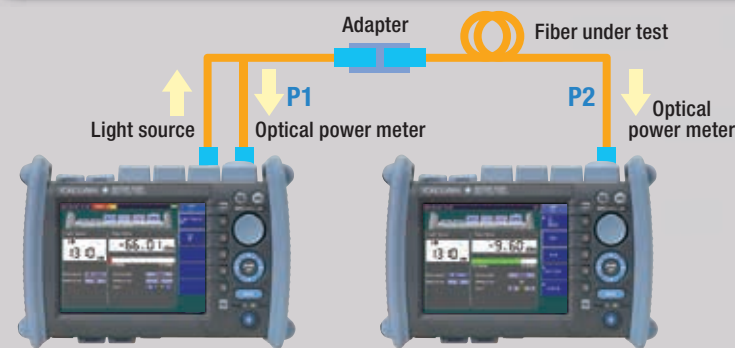
Fault locator screen

Select the structure



Waveform analysis screen of OTDR function

Light Source & Optical Power Meter



Manual loss test using light source & optical power meter^{*1,2}

After adjusting the optical output power (P1) at the end of launch fiber, measure the output power of fiber under test (P2).

$$\text{Total fiber loss} = P1 - P2 \text{ (dB)}$$

High power measurement^{*2}

Enables the measurement of the high power output of optical amplifiers, which are used for video services, such as CATV, and long distance transmission.

^{*1} : /SLT option is required to use this function. ^{*2} : /HLT option is required to use this function.

Auto Loss Test^{*}

Loss measurement with LS & OPM interlock

The AQ1200's light source can transmit wavelength information, so that the AQ1200's optical power meter can make measurements at the right wavelength at the other end. Moreover, the AQ1200A's light source and the optical power meter can automatically switch between two wavelengths (1310 and 1550 nm). Therefore, the optical power meter can make measurements at the correct wavelength, by changing the wavelength together with the light source.

Measurement result storage and report output

Measurement results can be saved in the internal storage or via USB, and the measurement report can be generated in CSV format.

^{*} : /SLT or /HLT option is required to use this function.

Multicore Loss Test^{*}

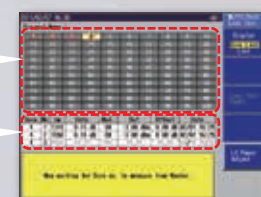
Master & Slave operation using the communication fiber

The master unit can share the project information, such as the core number table and measurement conditions, with the slave unit by sending them through the communication fiber in the cable under test.

^{*} : /SLT or /HLT option is required to use this function.

Core number table

Measurement result list



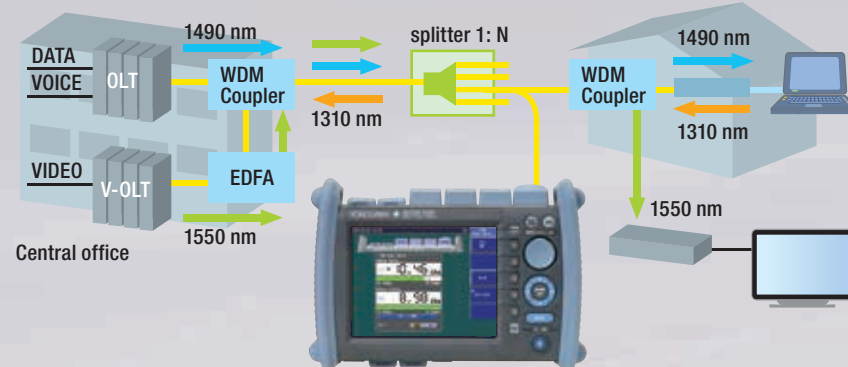
Multicore measurement result screen

PON Optical Power Meter^{*}

Simultaneous 1490 & 1550 nm measurement

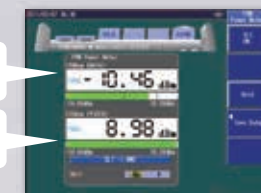
The PON power meter can measure the optical power both at 1490 nm and at 1550 nm simultaneously by separating those wavelengths.

Suitable tool for measuring the optical power of OLT and V-OLT. ^{*} : /PPM option is required to use this function.



Optical power at 1490 nm

Optical power at 1550 nm



PON optical power meter screen

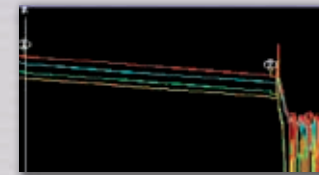
NEW Trace Analysis Functions

For the evaluation of multicore fiber

— Multi Trace Analysis

Up to four traces can be overlaid on the display for analysis and comparison.

This is useful for evaluating connection point locations and losses after installing multicore fibers.

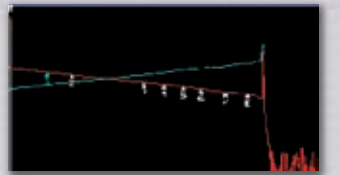


For accurate splice loss measurement by bi-directional testing

— 2 Way Trace Analysis

Merges the two traces measured from both directions and finds the correct splice loss.

The connection loss in lines where optical fibers of differing backscatter coefficients are connected, can differ depending on the direction. In such cases, you can accurately determine the loss by measuring in both directions and using an average.

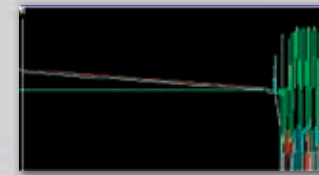


For age deterioration evaluation

— Differential Trace Analysis

Displays the difference between two specified traces.

Makes it easy to check the deterioration due to aging of fibers, or connection points, or the fluctuation in loss between fibers, and the other phenomena.

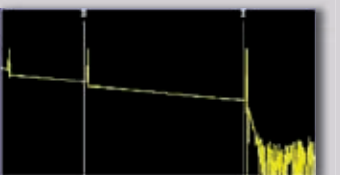


For the evaluation of total return loss

— Section Analysis

Finds the total return loss in specific portions of the fiber.

This type of evaluation is often requested because the multiple reflections from optical fiber networks can affect signal light from transmitters (cable TV etc.).



Visible Light Source^{*}

Visual fault location and fiber identification



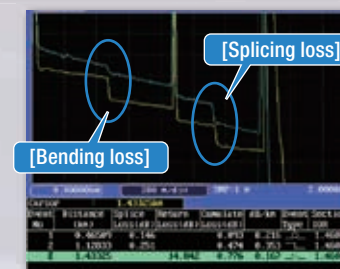
Visible light source screen

The visible light source enables the identification of a single core out of multicore fiber and visually find a break point in a launch area. This feature works even when OTDR is in use, so that you can search for the next fiber to test, while the OTDR is measuring another.

^{*} : /VLS option is required to use this function.

NEW Macro Bending Function (not available for the AQ1200B, AQ1200C)

If there is a bend in the optical fiber, the loss at longer wavelengths is higher at the location of the bend. This function uses this characteristic to locate macro bends by measuring the same line with multiple wavelengths.



Video Fiber Inspection Probe



Fiber inspection probe screen

Fiber end inspection

With a video fiber inspection probe connected to the USB interface, the AQ1200 can show an image of the fiber end on the screen to visually inspect for scratches and dirt. The video image can be saved in the internal memory via USB.

^{*} : Recommended probe: CI 1100 B YOK (Lightel)

IMPROVED Multi Fiber Measurement Function



The Multi Fiber Measurement Function automatically performs measurements and data-filing according to a pre-established file name table. At the worksite, you can execute it by simply selecting a fiber number in the table. The saved waveform can be easily shown in the preview

window by selecting the core number in the table. The OTDR Project File Editor, included in the AQ7932 Emulation Software saves a lot of time when creating file name tables. **Now with graphic pass/fail indication directly in the table.**

Remote Control Software

Remote control using the same GUI

The AQ1200 can be remotely controlled from a personal computer (PC) via Ethernet^{*} or a USB interface. The remote control software displays a front panel image of the AQ1200 on the PC, so you can control the AQ1200 with a mouse in the same manner as operating the actual instrument.

^{*} : /LAN option is required to use this function.

IP Test^{*}



PING Test screen

IPv4 PING

For testing network connections by sending a PING through the optional LAN interface without the need to use a PC. Variable frame length and transmission intervals.

^{*} : /LAN option is required to use this function.

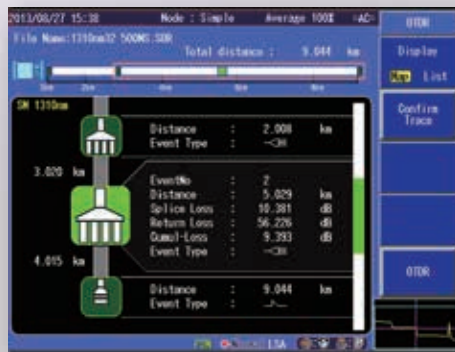
NEW Automatic Detection and Characterization of Events

• Event Mapper Function

The Event Mapper is a new function which automatically detects and characterizes events in the fiber under test. In a few seconds, events are displayed on the screen as easily recognizable icons together with their data. The position in the fiber of the detected event is clearly shown in the upper part of the display.



Icons describing the event type.



By clicking on an event icon, you can automatically zoom in on the relevant part of the OTDR trace.



ZOOM

Data Analysis and Report Creation Tool

• AQ7932 OTDR Emulation Software (sold separately)

The AQ7932 is an application software that performs analysis of trace data measured by the AQ1200 MFT-OTDR and creates reports on a PC. The report creation wizard makes this task simple. AQ1200 MFT-OTDR data can be easily loaded onto a PC using USB memory or the storage function.

(The AQ1200 MFT-OTDR is supported from software version 4.1. Please verify the version before use.)

Multiple European Language Menus

The AQ1200 is specifically designed to support European customers by providing a wide choice of languages. Thus a user can simply select their preferred display language and become productive in the shortest possible time.

Available languages: Chinese, Czech, Dutch, English, Finnish, French, German, Italian, Norwegian, Polish, Portuguese, Spanish, Swedish, Turkish.

Common Specifications

Horizontal Axis Parameters

Sampling resolution	5 cm, 10 cm, 20 cm, 50 cm, 1 m, 2 m, 4 m, 8 m, 16 m, 32 m, 1 cm (Min.)
Readout resolution	1 cm (Min.)
Number of sampled data	Up to 128,000 points (Firmware Rev2.01 or later)
Group refractive index	1.30000 to 1.79999 (in 0.00001 steps)
Unit of distance	km, kf or miles
Distance measurement accuracy	±1 m + Measurement distance × 2 × 10 ⁻⁵ ± sampling resolution Excluding IOR uncertainty

Vertical Axis Parameters

Vertical axis scale	0.2 dB/div, 0.5 dB/div, 1 dB/div, 2 dB/div, 5 dB/div, 7.5 dB/div
Readout resolution	0.001 dB (Min.)
Loss measurement accuracy	±0.05 dB/dB (When the measuring loss is 1 dB or less, the accuracy is within ±0.05 dB.)

OTDR Measurement Function

Distance measurement	Measures the length of the whole fiber and the distance between arbitrarily specified points with a readout resolution of 1 cm.
Loss measurement	Measures insertion loss, splice loss, splitter loss and fiber intrinsic loss between arbitrarily specified points, showing also the loss value per unit of length (dB/Km) of the analyzed section.
Return loss measurement	Measures the total return loss of the fiber and the return loss between arbitrarily specified points.

OTDR Analysis Functions

Analysis functions	Section analysis
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Internal Memory

Memory capacity	1000 waveforms or more Can store measured waveforms and measurement conditions
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Display

Display	5.7 inch color TFT LCD
Total number of displayed pixels*	640 (horizontal) × 480 (vertical) pixels

*: 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.

External Interface

USB	USB1.1 Type A and Type B, one each Type A: For external memory, external printer, and fiber inspection probe Type B (mini): For connecting to an external PC for remote control or access to the OTDR's internal memory.
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File Formats

File formats	Read: SOR, SET (AQ7270/AQ7275/AQ1200) Write: SOR (Telcordia), SET, CSV, BMP, JPG, PNG
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Specifications per Model

Model name	AQ1200A	AQ1200B ^{*1}	AQ1200C ^{*1}	AQ1200E ^{*1}	AQ1205A	AQ1205E ^{*1}	AQ1205F ^{*1}
Measured wavelength (nm)	1310±20(typ) ^{*2} / 1550±20(typ) ^{*2}	1625±10	1650±5 ^{*3} , 1650±10 ^{*4}	1310±20(typ) ^{*2} / 1550±20(typ) ^{*2} , 1625±10	1310±20(typ) ^{*2} / 1550±20(typ) ^{*2}	1310±20(typ) ^{*2} / 1550±20(typ) ^{*2} , 1625±20(typ)	1310±20(typ) ^{*2} / 1550±20(typ) ^{*2} , 1650±5 ^{*3} , 1650±10 ^{*4}
Optical Port	PORT2			PORT2, 3	PORT2	PORT2, 3	
Measured fiber				SM(ITU-T G.652)			
Distance range(km)	0.5, 1, 2, 5, 10, 20, 50, 100, 200, 300, 400, 512 ^{*11}			0.5, 1, 2, 5, 10, 20, 50, 100, 200, 300, 400, 512			
Pulse width(ns)	3, 10, 20, 50, 100, 200, 500, 1000, 2000, 5000, 10000, 20000 ^{*11}			3, 10, 20, 50, 100, 200, 500, 1000, 2000, 5000, 10000, 20000			
Event Dead zone (typ.) ^{*7}				0.75m ^{*8}			
Attenuation Dead zone (typ.) ^{*9}	4m/5m	7m		4m/5m, 7m	4m/5m	4m/5m, 7m	
Dynamic range(dB) (typ.)	34/32 ^{*5}	33 ^{*5}	34 ^{*5}	38/36, 36 ^{*5}	42/40 ^{*6}	42/40, 38 ^{*6}	42/40, 37 ^{*6}
Loss measurement accuracy	±0.05dB or ±0.05dB/dB						
Optical connector	Universal Adapter SC, FC						
Output power control ^{*10}	---	Normal / Low			---	Normal / Low	
Laser safety standard	Class 1M						

*1: Pulse light output port at 1625 nm and 1650 nm, +15 dB or less, built-in 1310 & 1550 nm cut filter.

*2: 25 nm is guaranteed

*3: At a point -20 dB from the pulse light output peakvalue (measured after 30 minutes or more from power-on at an ambient temperature of 23°C)

*4: At a point -60 dB from the pulse light output peakvalue (measured after 30 minutes or more from power-on at an ambient temperature of 23°C)

*5: SNR=1, Pulse width: 10 μs, measurement time: 3 minutes, When angled -PC connectors are used, each dynamic range decreases by 0.5 dB, Guaranteed value [dB]: 32/30 (AQ1200A), 30 (AQ1200B), 30 (AQ1200C), 32/30, 30 (AQ1200E)

*6: SNR=1, Pulse width: 20 μs, measurement time: 3 minutes, When angled -PC connectors are used, each dynamic range decreases by 0.5 dB, Guaranteed value [dB]: 40/38 (AQ1205A), 40/38, 36 (AQ1205E), 40/38, 30 (AQ1205F)

*7: Pulse width 3 ns, return loss: 55 dB or more

*8: 0.8 m is guaranteed

*9: Pulse width 10 ns, Return loss 55 dB or more, at a point where the backscatter level is within ±0.5 dB of the normal value.

*10: At 1625 nm and 1650 nm

*11: Firmware Rev2.01 or later

Note: Specifications are at 23°C ±2°C unless otherwise noted.

Specifications per Option

• Light source & optical power meter option

Optical power meter	Power meter type		Standard (/SLT)	High power (/HLT)	PON (/PPM)
	Wavelength setting		850/1300/1310/1490/1550/1625/1650 nm or 800 to 1700 nm (1 nm steps) or CWDM wavelength (1270 to 1610 nm, 20 nm step)		1310/1490/1550 nm
	Power range	CW	+10 to -70 dBm	+27 to -50 dBm ^{*3}	+10 to -70 dBm ^{*1} , +27 to -50 dBm ^{*2}
		CHOP	+7 to -60 dBm	+24 to -50 dBm ^{*3}	---
	Noise level		0.5 nW (-63 dBm, 1310 nm)	50 nW (-43 dBm, 1310 nm)	0.5 nW (-63 dBm, 1310 nm), 50 nW (-43 dBm, 1550 nm)
	Uncertainty under standard conditions ^{*4}		±5%		±0.5 dB
	Readout resolution		0.01		
Light source	Level unit		Absolute: dBm, mW, μW, nW Relative: dB		
	Modulation mode		CW, CHOP (270 Hz/1 kHz/2 kHz)		
	Average function		1, 10, 50, and 100 times		
	Wavelength (nm)		1310/1550 ±25 nm (AQ1200A/E, AQ1205A/E/F), 1625 ±10 nm (AQ1200B/E), 1625 ±25 nm (AQ1205E), 1650 ±5 nm ^{*5} , 1650 ±10 nm ^{*6} (AQ1200C, AQ1205F)		
	Optical output level (dBm)		-3±1		
	Level stability (dB) ^{*7}		±0.05 (1310/1550nm), ±0.15 (1625/1650nm)		
	Modulation mode		CW, 270 Hz, 1 kHz, 2 kHz		
Memory and logging function	Applicable fiber		SM (ITU-T G.652)		
	Memory and logging function		Measurement data storage: 10 to 1000 data, Logging interval: 0.5, 1, 2, 5, or 10 sec.		
	Auto loss test function		Loss measurement with light source and optical power meter interlock		---

*1: at 1310/1490 nm *2: at 1550 nm *3: 1300 to 1600 nm

*4: Power level: 100 μW(-10dBm); CW, Wavelength: 1310 ±20 nm (1550 nm ±10 nm for 1550 nm setting of /PPM), Spectral width: 10 nm or less (1310 nm), ambient temperature: 23 ±2°C, Optical fiber: SM (ITU-T G.652), Optical connector: FC/PC, Wavelength setting error: 0.5 nm or less, excluding aging (add 1% one year after calibration)

*5: At a point -20 dB from the pulse light output peak value (measured after 30 minutes or more from power-on, at ambient temperature of 23°C)

*6: At a point -60 dB from the pulse light output peak value (measured after 30 minutes or more from power-on, at ambient temperature of 23°C)

*7: Constant temperature within 23°C ±2°C; CW (15 min.)

• Visible light source (VLS) option

Optical connector	2.5 mm ferrule type
Center wavelength	650 nm ±20 nm
Optical output level	-3 dBm or more (peak)
Modulation mode	CHOP Approx. 2 Hz
Laser class	3R



• Ethernet interface option

Interface	10BASE T / 100BASE TX
Functions	PING test, PC remote control

General Specifications

Item		Specification
Environmental conditions	Storage temperature	-20 to 60°C
	Operating temperature	0 to 45°C (0 to 40°C when AC adapter is being used); (0 to 35°C when battery is being charged)
	Humidity	20 to 85% RH (no condensation)
Power requirements		100 to 240 VAC, 50/60 Hz
Battery pack		Run time: 6 hours ^{*1} , Recharge time: 5 hours ^{*2}
Dimensions		217.5 (W) × 157 (H) × 74 (D) mm, excluding projections
Mass		Approx. 1 kg, including battery pack
Compliant standards	Laser safety	Class 1 M (IEC 60825-1:2007) ^{*3} , 21CFR1040.10 ^{*4}
	Safety	EN61010-1
	Emissions	EN61326-1 class A, EN55011 class A, group 1
	Immunity	EN61326-1 Table 2 (for industrial locations)

^{*1} : In case measurement is performed for 30 seconds every 3 minutes, with no options installed, in power save mode (LCD brightness: Power save, Screen saving: ON).

^{*2} : at temperature of 23°C, power OFF

^{*3}



IEC 60825-1

^{*4}

Complies with 21 CFR 104.10 and 104.11 except for deviations pursuant to Laser Notice No.55 dated June 23, 2003. Tachibana R&D Inc. 2-5-3 Sakuragaoka, Tachikawa-shi, Tokyo, 190-8586, Japan. 21CFR1040.10

Model and suffix code

Models	Suffix code	Descriptions
AQ1200A		1310/1550 nm
AQ1200B		1625 nm
AQ1200C		1650 nm
AQ1200E		1310/1550, 1625 nm
AQ1205A		1310/1550 nm, High Dynamic Range
AQ1205E		1310/1550, 1625 nm High Dynamic Range
AQ1205F		1310/1550 nm High Dynamic Range, 1650 nm
Language	-HE	English/other European languages
	-HC	Chinese/English
	-HK	Korean/English
	-HR	Russian/English
Power cord	-D	UL/ CSA standard
	-F	VDE standard
	-R	AS standard
	-Q	BS, Singapore standard
	-H	GB standard, Complied with CCC
	-P	EK standard (S. Korea)
	-T	BSMI standard
	-N	Brazil standard
Optical connector	-USC	SC type
	-UFC	FC type
	-ASC	SC/Angled-PC type
Light source & optical power meter	/SLT	Stabilized light source & Standard optical power meter
	/HLT	Stabilized light Source & High power optical power meter
	/PPM	Light source & PON Power meter
Visible light source	/VLS	Optical connector: 2.5φ ferrule
PON measurement*	/PN	PON measurement mode
Ethernet	/LAN	10BASE T/100BASE TX (PING test, Remote control)
Shoulder belt	/SB	Shoulder belt

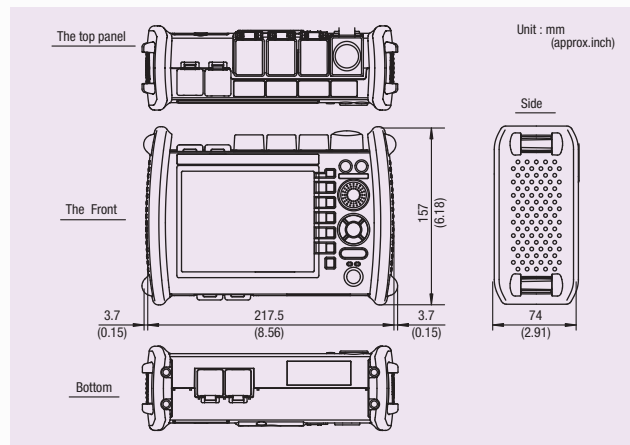
* : Only for AQ1200A, AQ1200B/C/E and AQ1205A/E/F come equipped this function. The mode is optimized for PON measurement.

Accessories (optional)

Model	Suffix code	Descriptions
SU2006A		Soft carrying case
735480 (For optical powermeters)	-SCC	Connector adapter (SC)
	-FCC	Connector adapter (FC)
735481 (For optical powermeters)	-LMC	Ferrule adapter (φ1.25)*
	-SFC	Ferrule adapter (φ2.5)*
SU2005A (For OTDR, LS and PON Power meter)	-SCC	Universal adapter (SC)
	-FCC	Universal adapter (FC)
739871	-D	UL/CSA standard
	-F	VDE standard
	-R	AS standard
	-Q	BS, Singapore standard
	-H	GB standard, Complied with CCC
	-P	EK standard (S. Korea)
	-T	BSMI standard
739882	-N	Brazil standard
		Battery pack (Spare)
B8070CY		Shoulder belt

* : The ferrule adapter has no mechanism to lock the connected fiber. Please be cautious of the connection, especially when emitting high power light.

Dimensions



Related Products

OTDR

AQ7275

Superior OTDR for Core, Metro, and Access networks



- Wide Range of Modules Available (9 models)
- World-class Short Dead Zone (0.8 m)
- High Dynamic Range (45 dB)
- Multi-core fiber measurement function to increase work efficiency

OLTS

AQ1100 MFT-OLTS

Light Source + Optical Power Meter



Light Sources (3 models)

SM1310/1550 nm SM1310/1550/1625 nm MM850/1300 nm and SM1310/1550 nm

Optical Power Meter Selections

Standard : +10 to -70 dBm
High power : +27 to -50 dBm
PON : 1490/1550 nm
Parallel measurement (split)

Application Software

Model	Suffix code	Descriptions
735070	-EN	AQ7932 OTDR Emulation Software (Ver4.1 or later) Display English

Yokogawa's Approach to Preserving the Global Environment

- Yokogawa's electrical products are developed and produced in facilities that have received ISO14001 approval.
- In order to protect the global environment, Yokogawa's electrical products are designed in accordance with Yokogawa's Environmentally Friendly Product Design Guidelines and Product Design Assessment Criteria.

NOTICE

- Before operating the product, read the user's manual thoroughly for proper and safe operation.
- If this product is for use with a system requiring safeguards that directly involve personnel safety, please contact the Yokogawa sales offices.

YOKOGAWA

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Subject to change without notice.

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