

AQ7275 OTDR

Optical Time Domain Reflectometer



- *Wide range of models available*
- *Supporting FTTH to core networks*
- *Short dead zone (0.75 m)*
- *High dynamic range (45 dB)*

Dead zone

0.75m

Dynamic range

45dB

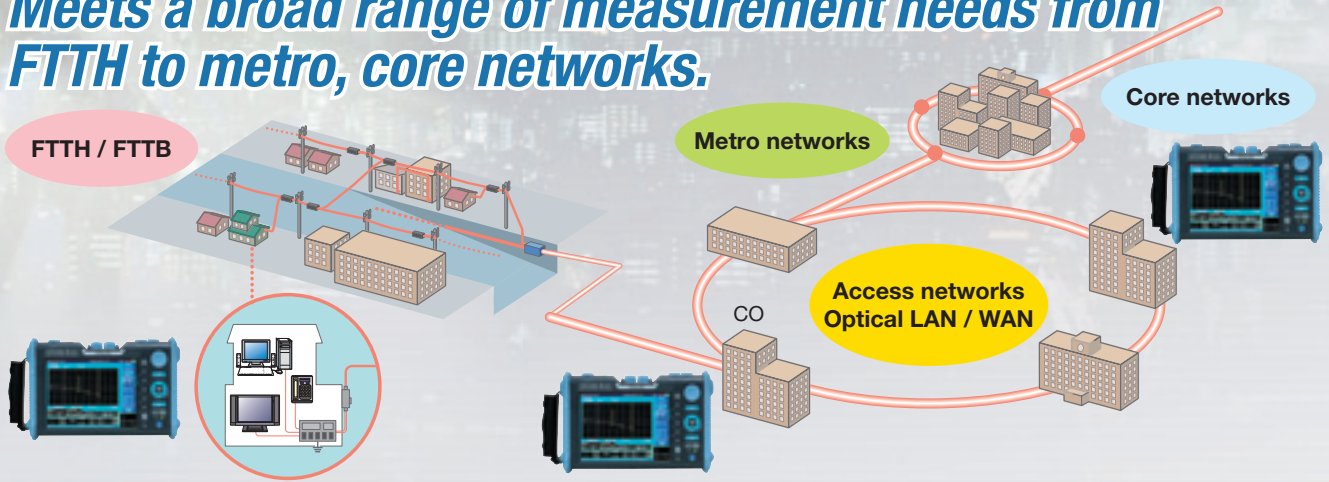
For more information, go to
tmi.yokogawa.com

Test & Measurement Instruments



Superior cost performance, easy to operate. Makes your work more efficient. —

Meets a broad range of measurement needs from FTTH to metro, core networks.



Event Dead Zone 0.75 m

The AQ7275's short event dead zone enables detection of closely spaced events in cables installed in offices and customer premises.



High Dynamic Range up to 45 dB

The high dynamic range model (735034) can achieve the dynamic range of 45 dB. This high dynamic range is effective in measuring a transmission line consisting of long fiber cables and a splitter with a large loss.



Quick Startup within 10 Seconds

Now measurements can be started quickly upon arrival at the site. 10 seconds to power-up from completely OFF to fully ON! With such a fast power-up time, battery life can be extended by turning the power off while not in use at the job site without any concern about the power-up time when the next job is ready. It's ready when you're ready!

Wide Range of Models Available

Applicable fiber	No. of Wavelength	Wavelength	Dynamic range (typ)	Model	Descriptions
SMF	1	1650nm	37dB	735031	1650nm model, supporting maintenance wavelength of 1650nm including 1310/1550nm cut filter.
	2	1310/1550nm	38/36dB	735032	Standard model for installation and maintenance of FTTH
	2	1310/1550nm	42/40dB	735033	Standard model for installation and maintenance of Metro and Access network
	2	1310/1550nm	45/43dB	735034	High dynamic range model for installation and maintenance of Core and Metro network
	3	1310/1490/1550nm	38/36/36dB	735035	3-wavelength model for PON system, supporting 1490nm
	3	1310/1550/1625nm	42/40/36 dB	735036	Three-wavelength model, supporting a maintenance wavelength of 1625nm including 1310/1550nm cut filter
	3	1310/1550/1650nm	42/40/37dB	735037	Three-wavelength model, supporting a maintenance wavelength of 1650nm including 1310/1550nm cut filter.
3	1310/1550/1625nm	42/40/38dB	735038	Three-wavelength model, supporting a maintenance wavelength of 1625nm	
MMF SMF	4	850/1300nm 1310/1550nm	42/40dB (SM) 25.5/26.5dB (50G)	735041	Four-wavelength model for installation and maintenance of LAN and FTTH with support for both multimode and single mode fiber. Dynamic range is specified when measuring 50G fiber.

AQ7275 OTDR

NEW

Convenient Data Management and Diagnostic Functions

NEW

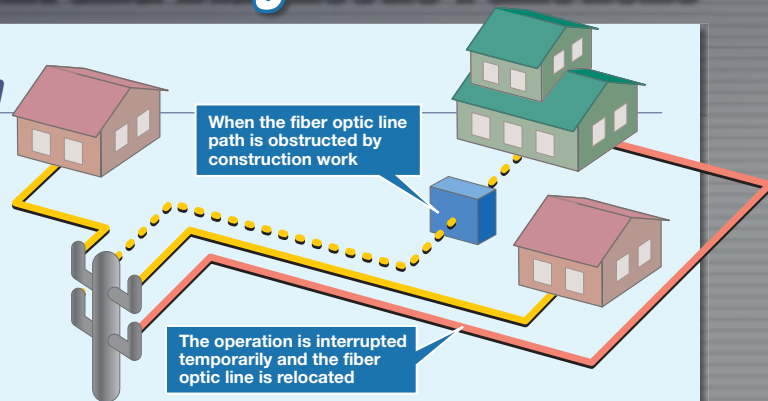
Multi Core Trace Comparison Function

Communication services must be interrupted when existing fiber optic cables are rerouted due to construction work of roads and buildings. This function minimizes the duration of the interruption by improving the efficiency of the rerouting work.

A waveform is measured before and after the work and compared against one another to determine a pass/fail condition using a user defined threshold criteria.

This function also enables the management of cores of a multicore fiber optic cable by number and color. This prevents the user from measuring a wrong core.

Numbers for measured cores are marked with check marks. This prevents the same core from being measured multiple times plus ensures no cores are overlooked.



Core numbers can be set in the measurement screen according to the names of the cores of a multi-core fiber optic cable.



The color scheme of cores of a multi-core cable varies depending on the manufacturer and the type of fiber cable. Three patterns are available by default. You can set any color scheme you like.



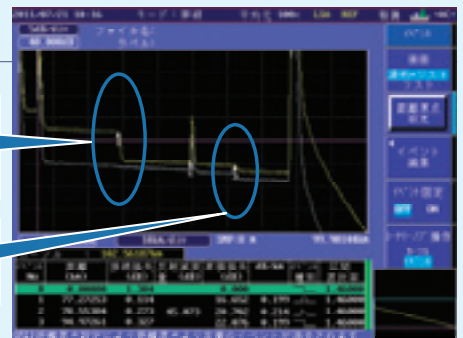
NEW

Macro Bending Function (not available for the 735031)

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

[Bending loss]
Loss is high when measured in the long wavelength region
Loss is low when measured in the short wavelength region

[Splicing loss]
Loss is the same when measured in both wavelength regions



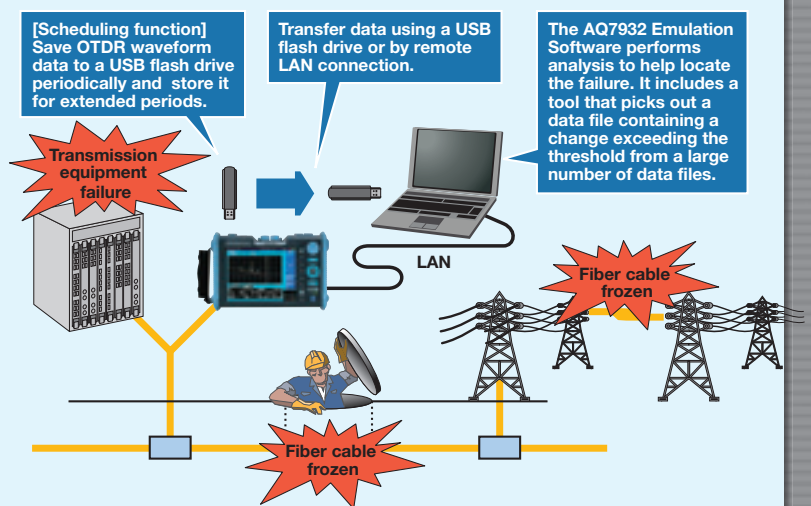
NEW

Scheduling Function

Fiber optic networks are known to be subject to seasonal failures such as one caused by freezing. Such failures are restored automatically after several minutes to several hours. Thus the failure cannot be located due to the temporary nature of the fault.

The scheduling function performs measurements automatically in the specified period and saves the measurement data automatically to an external USB flash drive. The AQ7932 Emulation Software on a PC is used to call up the data before and after the fault event from a large amount of data automatically saved to the USB flash drive, and analyze the chronological changes in the waveform to locate the failure.

In addition, the remote control software provides support for measurements using the scheduling function, by providing a function to transfer the data stored in the USB flash drive to the PC via a network cable; a tool that detects a data file containing a change exceeding the threshold from a large number of data files; and a tool that batch calculates losses between two points.



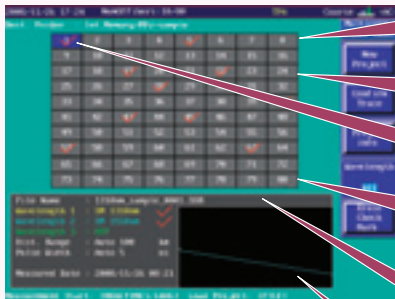
Increase Working Efficiency

Multi Fiber Measurement Function

The Multi fiber measurement function automatically performs measurements and data-filing according to a pre-established file name table. At worksite, you can execute it by simply selecting a fiber number in the table.

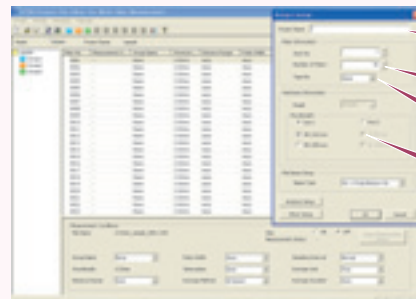
The saved waveform can be easily shown in the preview window by selecting the core number in the table.

The OTDR Project File Editor included in AQ7932 Emulation Software greatly saves time to create file name table.



Multi fiber measurement function menu

- Making a table for fibers to be tested.
- The fiber to be skipped can be selected.
- Any of the fibers can be selected to execute the measurement.
- The check-mark appears for the fiber that the measurement is completed.
- The file name is created for the selected fiber automatically.
- With the preview window, waveform can easily be confirmed.



OTDR Project File Editor menu on PC

- Comment (Location...)
- Number of core
- Tape ID
- Measuring conditions
- [Project File]
File name, Measuring conditions are stored as a table.

Measured Data Analysis and Report Creation Tool –AQ7932 OTDR Emulation Software (Sold Separately)

AQ7932 is application software that performs analysis of trace data measured by AQ7270 and AQ7275 OTDR on a PC, and creates reports. The report creation wizard function makes this task simple. AQ7270 and AQ7275 OTDR data can be easily loaded onto a PC using USB memory or storage function.

Trace Analysis

You can edit event search conditions, approximate curve line settings, and other analysis conditions, and repeat the analysis. Operation is also easy. Simply click the function icon.

Variety of Analysis Functions

Display up to eight traces on screen, and perform a variety of analyses including multi-trace analysis and differential trace analysis for comparing recent waveforms with old ones, and use the 2 way trace analysis function for analyzing average values of data measured from both directions in the optical fiber.

OTDR Project File Editor for Multi Fiber Measurement

By registering a comment, number of cores, Tape ID, wavelength, etc., the OTDR Project File Editor creates "File name table" called "Project". It can be used in combination with Multi fiber measurement function available on AQ7270 and AQ7275.

Creating Reports

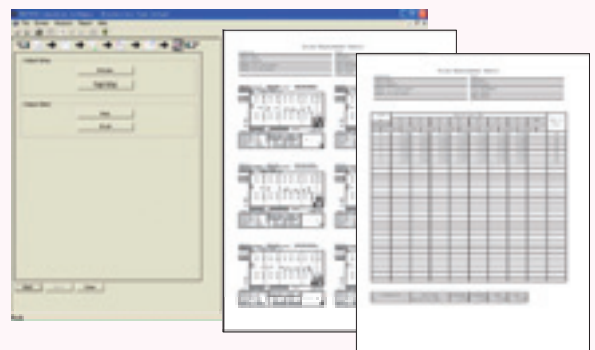
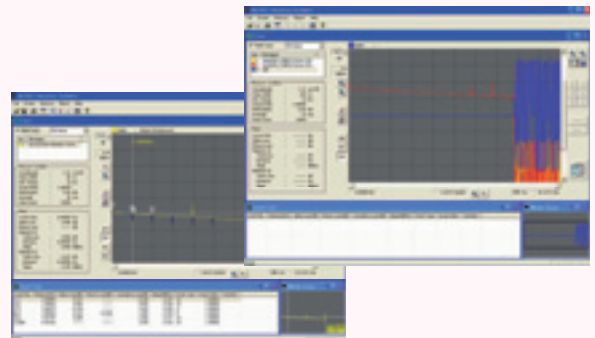
You can compile trace and measured values from trace files and creates a report. Reports can also be created in Excel and CSV formats. Reports can be created easily by just following the step-by-step instructions in the report wizard.

Functionality

File format: .SOR (Bellcore), .SOR (Telcordia [AQ7275, AQ7270, AQ7260]), .TRD (AQ7260), .TRB (AQ7250), .BMP (BMP), .CSV (Data CSV), .CSV (Event List CSV)
Report output format: Print output, CSV file, XLS file

Recommended Operating Environment (Software and Hardware)

- OS: Microsoft Windows XP, Microsoft Windows Vista *, Microsoft Windows 7
- Excel: Microsoft Excel 2000 or later (when the XLS file output function is used)
- PC: Clock speed: Environment in which the OS operates smoothly.
- HD capacity: 20 MB or more space required at the time of installation
- Memory capacity: 128 MB or more (256 MB or more recommended)
- Display: Resolution of 1024x768 pixels or better
- Disc drive: CD-ROM drive

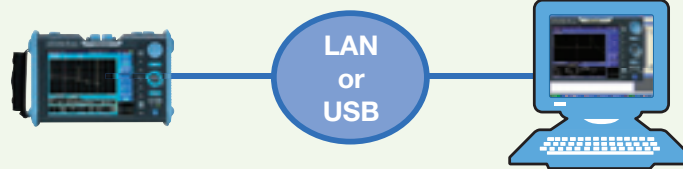


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(*) Microsoft Windows Vista is to be supported in Ver3.03 and later.

Support Remote Monitoring

Remote Control Software

OTDR can be remotely controlled from personal computer (PC) through Ethernet or the USB interface. The front panel image of connected OTDR is displayed on the screen of PC with remote control software, and OTDR can be controlled from PC by using the mouse by a similar sense of the operation of OTDR.



AQ7940 for Intermittent Disconnection Monitoring

AQ7940 Optical Fiber Monitoring Software is for detecting and monitoring intermittent disconnection of optical fiber which is connected to OTDR. OTDR is controlled by personal computer (PC) through Ethernet or USB interface. Intermittent disconnection (200ms or more) can be detected and measured trace by OTDR can be stored in PC. By using this software point of intermittent disconnection can be located.

More Value Added to OTDR – Wider Range of Optional Functions

Stabilized Light Source

This light source option can be used for measuring losses. It can also be used for optical fiber identification, because it is capable of outputting not only continuous wave (CW) light but also a 270-Hz modulated light.

* The stabilized light source option cannot be used for the 735041 (MMF).



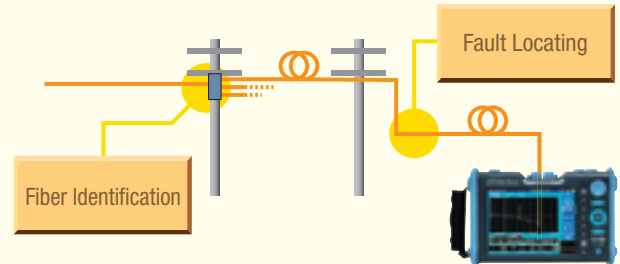
Fiber Identification

Loss Measurement

Visible Light Source

This option can be used for identifying the multicore fiber cable and visually checking for a failure. The adopting the connector connection method enables the visible light to reach greater distances with less light leakage.

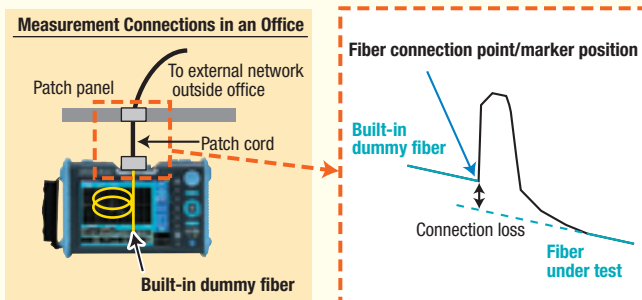
* The visible light source option cannot be applied for the 735036, 735037 and 735041.



Built-in Dummy Fiber

You can use the dummy fiber to effectively detect abnormal near-end connection loss.

* The dummy fiber option cannot be used for the 735041.
* The built-in dummy fiber is not attachable and removable.



Optical Power Monitor

This is useful for simply checking optical power when performing link loss testing or troubleshooting.

* The optical power monitor option cannot be used for the 735031 and 735041 (MMF).



Fiber Identification

Power Check

Angled-PC Connector

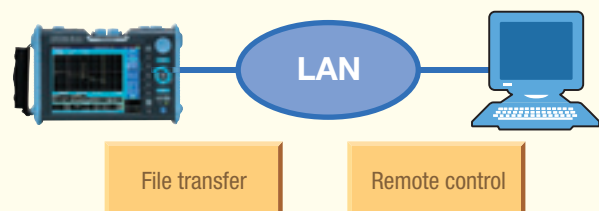
You can connect an optical fiber with an angled-PC connector directly to the OTDR. The angled PC is often used for CATV networks to reduce the influence of reflection.

External Large Capacity Battery

The operation time will triple that of a standard built-in battery.

Printer/LAN

Measured results can be printed on site. It makes it easy to attach waveforms and results to your report. Remote control and FTP (file transfer) via LAN is also possible.



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
Readout resolution	1 cm (Min.)
Number of sampled data	Up to 128,000 points
Group refractive index	1.30000 to 1.79999 (in 0.00001 steps)
Unit of distance	km, kf or miles
Distance measurement accuracy	Sum of the following 3 errors Offset error: ± 1 m Scale error: Measurement distance $\times 2 \times 10^{-5}$ Sampling error: ± 1 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	Displays up to eight digits of the relative one-way direction between two arbitrary points on the trace.
Loss measurement	Displays one-way loss in steps of 0.001 dB to a maximum of 5 digits. Displays the one-way loss, loss per unit length, and splice loss between any arbitrary points on the trace.
Return loss measurement	Measures return loss and total return loss of a fiber cable or between two arbitrary points on the trace.
Scheduling function	Performs measurements and saves results onto a USB storage in a user defined time frame and interval automatically.

OTDR Analysis Functions

Analysis functions	Multi trace analysis, 2 way trace analysis, differential trace analysis, 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	8.4-inch color TFT LCD, semi-transparent
Total number of displayed pixels*	640 (horizontal) \times 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 Type B: 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, TRD, TRB, SET (AQ7270/75) Write: SOR (Telcordia), SET, CSV, BMP, JPG, PNG
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General Specifications

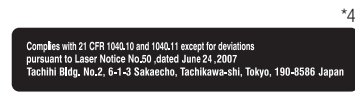
Operating environment	Temperature 0 to 45°C (0 to 35°C when charging the battery) Humidity 85% RH or less (no condensation)
Storage temperature	-20 to 60°C
Battery	Operation time 6 hours (18 hours with external large capacity battery)*1 Recharge time 5 hours *2
Rated power voltage	100 to 240 VAC
Rated supply frequency	50 to 60 Hz
Power consumption	Max 70 W (when charging battery and printing with optional printer)
Dimensions	(W) 287 \times (H) 197 \times (D) 85 mm (excluding projections or options)
Weight	Approx. 2.8 kg (excluding options)
Laser safety standards	Class 1 M (IEC 60825-1:2007)*3 21CFR1040.10*4
Safety standard	EN61010-1
Emission	EN61326-1 Class A EN55011 Class A Group 1
Immunity	EN61326-1 Table 2

*1 Measurement for 30 seconds in every 10 minutes without any options and in power save mode (Auto Power OFF 1 minute)

*2: Ambient temperature of 23°C, power OFF

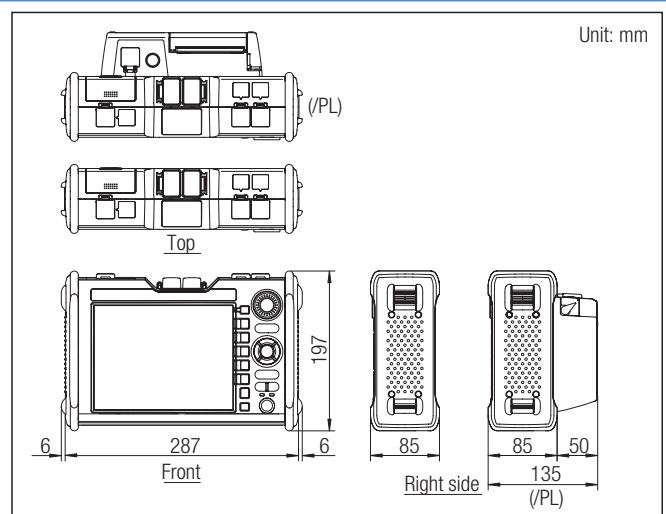


IEC 60825-1



21CFR1040.10

External Dimensions



Specifications by Model

Model	735031 *11	735032	735033	735034	735035
Wavelength *13	1650±5nm*1, ±10nm*2	1310/1550±25 nm	1310/1550±25 nm	1310/1550±25nm	1310/1490/1550±25nm
Applicable fiber	SM (ITU-T G.652)				
Distance range	500m, 1km, 2km, 5km, 10km, 20km, 50km, 100km, 200km, 300km, 400km, 512km				
Pulse width *3	3ns, 10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1µs, 2µs, 5µs, 10µs, 20µs				
Dynamic range (typ)	37 dB *4	38/36 dB *4	42/40 dB *4	45/43 dB *4	38/36/36 dB *4
Event dead zone (typ) *10	0.75 m *5	0.75 m *5	0.75 m *5	0.75 m *5	0.75 m *5
Attenuation dead zone (typ)*10	12 m *6	7/8 m *6	7/8 m *6	7/8 m *6	7/8/8 m *6

Model	735036 *11	735037 *11	735038	735041	
Wavelength *13	1310/1550±25 nm 1625±25 nm	1310/1550±25 nm 1650±5nm*1, ±10nm*2	1310/1550/1625±25 nm	1310/1550±25nm	850/1300±30nm
Applicable fiber	SM (ITU-T G.652)				GI (62.5/125µm, 50/125µm)
Distance range	500m, 1km, 2km, 5km, 10km, 20km, 50km, 100km, 200km, 300km, 400km, 512km				500m, 1km, 2km, 5km, 10km, 20km, 50km, 100km
Pulse width *3	3ns, 10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1µs, 2µs, 5µs, 10µs, 20µs				3ns, 10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1µs, 2µs, 5µs *8
Dynamic range (typ)	42/40/36 dB *4	42/40/37dB *4	42/40/38 dB *4	42/40 dB *4	25.5/26.5 dB (50/125µm) *8
Event dead zone (typ) *10	0.75 m *5	0.75 m *5	0.75 m *5	0.75 m *5	0.9 m *5
Attenuation dead zone (typ) *10	7/8/12 m *6	7/8/12 m *6	7/8/12 m *6	7/8 m *6	6/10 m *12

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

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

*3 Pulse width setting range depends on the distance range

*4 SNR:1, pulse width: 20 µs, distance range: 200 km, sampling resolution: 8 m, measurement time: 3 minutes. When built-in dummy fiber and angled-PC connector are used, each dynamic range decreases by 0.5 dB. Guaranty value [dB]: 30 (735031), 34/32 (735032), 40/38 (735033), 43/41 (735034), 34/30/32 (735035), 40/38/33 (735036), 40/38/30 (735037), 40/38/36 (735038), [SM] 40/38 [GI50/125] 21.5/23 [GI62.5/125] 22.5/24 (735041)

*5 Pulse width of 3 ns, return loss of 45 dB or more at a point 1.5 dB below the peak value (not saturated). Guaranty value is 0.8m

*6 Pulse width of 10 ns and return loss of 45 dB or more at a point where the backscatter level is within ±0.5 dB of the normal value

*7 Pulse width of 2 or 5 µs when the measured wavelength is 1300 nm

*8 SNR = 1 at pulse width of 500 ns (850 nm) and 1 µs (1300 nm), sampling resolution of 8 m, and measurement time of 3 minutes

*9 Pulse width of 3 ns and return loss of 40 dB or more at a point 1.5 dB below the peak value (not saturated). Guaranty value is 1.0m

*10 At group reflective index 1.5

*11 Pulse light output power at 1625 nm and 1650nm, 15dBm or less, built-in 1310/1550nm cut filter

*12 Pulse width of 10ns and return loss of 40dB or more at a point where the backscatter level is within ±0.5dB of the normal value

*13 Pulse width of 1 µs

Note: Specifications without any special remarks are assured at 23°C±2°C

Factory Installed Optional Specifications

Stabilized Light Source Function (/SLS option)

Optical connector	Shared with the OTDR (at the same port)
Center wavelength	OTDR's center wavelengths
Light output level	-5 dBm or more (at 23°C±2°C)
Output level stability	±0.1 dB (±0.15 dB for 1650 nm)
(Constant temperature for 5 minutes)	
Modulation frequency	CW, 270 Hz

* Unavailable for the 735041 (MMF)

Visible Light Source (/VLS option)

Optical connector	Port is not shared with the OTDR
Center wavelength	650 nm ± 20 nm
Light output level	Peak value -3 dBm or more
Modulation frequency	2 Hz
Laser safety standard	Class 3R

* Unavailable for the 735036, 735037 and 735041



Power Monitor Function (/PM option)

Optical connector	Shared with the OTDR (at the same port) (735036, 735037 : 1310/1550 nm port)
Measurement wavelength	1310, 1490, 1550, 1625, 1650 nm
Measurement range*1	-50 to -5 dBm
Measurement accuracy*2	± 0.5 dB

*1 CW light, absolute maximum input level 0 dBm (1 mW)

*2 CW light, wavelength 1310 nm, -10 dBm for input, 23°C±2°C

* Unavailable for the 735031 and 735041 (MMF)

PON measurement (/PN option)

Applicable models	735031, 735033, 735036, 735038
Dynamic range	25/25/23/19dB (typ) (1310nm/1550nm/1625nm/1650nm)

Applicable pulse width 50ns, 100ns, 200ns, 500ns, 1µs

* Dynamic range is for the 100ns of pulse width.

* At pulse widths not applicable to the PON option, the performance is equal to the standard model.

High Dynamic range (/DR option)

Applicable model	735032
Dynamic range (Guaranty)	36dB (1310nm) / 34dB (1550nm)

* SNR:1, pulse width: 20 µs, distance range: 200 km, sampling resolution: 8 m, measurement time: 3 minutes. When built-in dummy fiber and angled-PC connector are used, each dynamic range decreases by 0.5 dB

Built-in Printer/LAN Function (/PL option)

Printing method	Thermal line-dot
Dot density	576 dots/line
Paper width	80 mm
Operating environment	Temperature 0 to 40°C Humidity 10 to 80% RH (no condensation)
Storage temperature	-20 to 60°C
LAN function	10BASE-T/100BASE-TX (RJ-45) x1

Dummy Fiber (/DF option)

Optical fiber	SM (ITU-T G.652)
Optical fiber length	Approx. 100 m

* Dynamic range declines by 0.5 dB as a result of the addition of the fiber option.

* Unavailable for the 735041

Optical Time Domain Reflectometer AQ7275 OTDR

Model and Suffix Code

AQ7275 OTDR

Model	Option availability							Remarks
	Optical power monitor	Stabilized light source	Visible light source	PON measurement	High Dynamic range	Printer/LAN	Dummy fiber	
735031	—	√	√	√	—	√	√	1-port, SM1650nm, filter
735032	√	√	√	—	√	√	√	1-port, SM1310/1550 nm
735033	√	√	√	√	—	√	√	1-port, SM1310/1550 nm, High DR
735034	√	√	√	—	—	√	√	1-port, SM1310/1550 nm, Higher DR
735035	√	√	√	—	—	√	√	1-port, SM1310/1490/1550 nm
735036	√	√	—	√	—	√	√	2-port, SM1310/1550/1625 nm, filter
735037	√	√	—	—	—	√	√	2-port, SM1310/1550/1650 nm, filter
735038	√	√	√	√	—	√	√	1-port, SM1310/1550/1625 nm
735041	√*1	√*1	—	—	—	√	—	2-ports, MM850/1300 nm, SM1310/1550 nm

*1 : MMF is not supported.
 √ : Available.

	Suffix Codes	Description
Optical Connector	-SCC	SC type connector
	-FCC	FC type connector
	-NON	No universal adapter
	-USC	Universal adapter (SC)
	-UFC	Universal adapter (FC)
	-ASC	Angled-PC connector (SC) *2
Language	-HE	English
	-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	Korean standard
Options	/PM	Optical power monitor
	/SLS	Stabilized light source
	/VLS	Visible light source
	/PN	PON measurement
	/DR	High Dynamic range
	/PL	Built-in printer, LAN
	/DF	Dummy fiber (SMF)
	/SB	Shoulder belt

*2: An angled-PC connector cannot be used in the MM port of the 735040. -USC needs to be attached.

Example: 735033-USC-HE-D/PM/SLS

AQ7275 OTDR 1310/1550nm, high dynamic range, with SC universal adapter, English version, with a UL/CSA standard power cord, with optical power monitor function and with stabilized light source function.

Standard Accessories

Power cord, AC adapter, battery pack, hand belt, user's manual (CD-ROM), operation guide

Accessories (Sold Separately)

Name	Model	Specifications
Soft carrying case	739860	
Battery pack	739880	
External large capacity battery	739881	With battery case and connection cable
Universal adapter (SC)	SU2005A-SCC	SC type
Universal adapter (FC)	SU2005A-FCC	FC type
Printer roll paper	A90102P	80 mm x 25 m
Shoulder belt	B8070CY	
AC adapter	739870-D	UL/CSA standard
	739870-F	VDE standard
	739870-R	AS standard
	739870-Q	BS/Singapore standard
	739870-H	GB standard, Complied with CCC
	739870-P	Korean standard

Application Software

Model	Suffix Codes	Specifications
735070		AQ7932 Emulation Software (Ver3.0 or later)
	-EN	English
735071		AQ7940 Optical fiber Monitoring Software
	-EN	English/Japanese

Related Products

AQ1200 MFT-OTDR Multi Field Tester OTDR



All-in-One Handheld optical fiber network test tool

- OTDR
- Light source & Optical Powermeter
- Auto Loss Test
- Multicore Loss Testing
- Visible Light Source
- Fault Locator
- PING Test
- Video Fiber Inspection Probe ... etc

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)

YOKOGAWA

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