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Optical Time Domain Reflectometer AQ7270 OTDR



Short dead zone (0.8 m)

- Wide range of models available supporting FTTH to metro networks
- High performance & easy to use OTDR
- Bright & high contrast 8.4 inch LCD screen







- Powers-up quickly

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 (in 10 seconds or less) next job is ready. It's ready when you're ready!

38/35dB

34/30/32dB 34/32/28dB

40/38/35dB

22.5/24dB

34/32/22.5/24dB

1550/1625nm

850/1300nm

1310/1490/1550nm

1310/1550/1625nm

850/1300/1310/1550nm

SMF

MMF

MMF/SMF

3

2

4

Model	Descriptions
735020	1550 nm model for access networks and FTTH
735022	For installation and maintenance of access networks and FTTH
735023	For installation and maintenance of metro networks and access networks
735024	Supporting maintenance wavelength 1625nm
735025	Three-wavelength model for installation and maintenance of PON systems, supporting 1490 nm
735026	Three-wavelength model, supporting a maintenance wavelength of 1625nm
735028	High dynamic range three-wavelength model, supporting a maintenance wavelength of 1625nm
735029	Multimode fiber model for LAN maintenance
735030	Four-wavelength model for installation and maintenance of LAN and FTTH with support for both multimode and single mode fiber.

Easy of Operation, Supporting Beginners and Experts

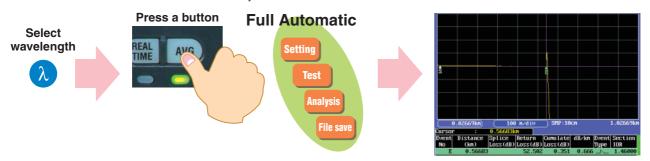
The worldwide spread of broadband services has stimulated the installation of optical fiber in metro and access networks, which in turn has increased the demand for portable and reliable test equipment to aid the installation and maintenance of these networks. Our new OTDR has been developed to address these challenges with particular aims of improving operability to boost work efficiency and cost-effectiveness. The AQ7270 carries forward the basic operation of its predecessors (the AQ7250 and AQ7260 OTDR), while adding a Detail mode for trained technicians with functions for setting of measurement conditions and performing manual measurements.

Automated Measurement Function Increases Working Efficiency!

Automatic Setting of Measurement Conditions -Full Auto Mode

Simply choose the measured wavelength, then press a button.

The AQ7270 automatically sets the optimal measurement conditions, performs measurement, performs event analysis, and saves data. Because you can save to a different file name each time you execute, measurement and accumulation of data is easy.



Measurement with Auto Wavelength Switching - Multi Wavelength Measurement Mode

Prepare multiple wavelengths to measure, then press a button.

Multi Wavelength Measurement is a mode in which multiple specified wavelengths from the same optical port are measured automatically in order. You can also specify to perform analysis or file saving as needed for each measurement.

Wavelength switches automatically





Macro's with Predefined Procedures - One Button Mode

Simply choose previously set measurement procedures, then press a button.

You can execute up to five saved measurement procedures in order. A batch of measurement procedures can be run directly from the main menu. Measurement and analysis conditions can be read from a file, making it easy to set up the measurement procedures.



Procedure 3 Measurement Procedures Execute directly from the main menu Procedure 2 Procedure 1 Procedure 1 Procedure 2 Procedure 3 One Settina Settina Settina Button Test Test Test Analysi Analysi Analysi **File** s

fiber plorer. AQ7270 OTDR

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Measurement Wizard –Assistance setting up measurements Displays detailed explanations of parameters in the measurement conditions setting menu, and gives guidelines for setting methods. This function assists unskilled users.

Trained users can enter settings freely in Detail mode.

ACTIVE LINE ALARM –Checking for communication light

Never disturb communication lines

There may be concern that technicians inputting the OTDR measurement signal into the communication line could cause communication errors. The live line alarm monitors the fiber's optical power level and diplays an alarm message if it detects optical power at or higher than a specified threshold level, in order to warn the technician not to mistakenly feed the signal into the communication line.

PLUG CHECK FUNCTION – Checking the connection with the OTDR

Never spoil measurements with poor connections or dirty plugs

The plug check function monitors the condition of the OTDR's optical input/output connectors and displays an alarm if the connection is not properly made. This function is useful for checking for damage, dirt, or other problems with optical plugs at the OTDR or on the fiber under test, and for helping technicians to remember to connect the fiber under test.

Detecting Abnormal Events – Fault Event Display Function

The fault event display function detects abnormal connection or reflection points and displays them. Of the events detected by the event detection function, abnormal events that cross a specified threshold value are highlighted in the event table and waveform display.

		Event	Distance	Splice	Keturn	Cumulate	dB∕kM	Event	Sect
		No	(km)	Loss(dB)	Loss(dB)	Loss(dB)		Type	IOR
		1	0.44564	-0.072		0.783	2.067		1.4
		2	0.84975	0.049	56.511	0.892	0.449		1.4
event	→I	*3	1.11207	0.206		1.037	0.366	_	1.4
		Ð	1.41085		<46.858	1.340	0.324		1.4

Analysis results with Fault Event Display

Fault

Measurement with Comparison to Reference Waveform – Trace Fix Function

You can freeze the display of one trace and overlap it with real time or averaged waveforms for comparison. This is useful to create a template when installing multicore fiber, or for checking aged deterioration during maintenance on existing fiber networks. In addition to the last-measured waveform, a waveform can be loaded from a file to be used as the reference waveform.

SETUP KEY –Jump to measurement condition setting menu With the new SETUP button on the front panel, it is easy to move to the measurement condition setting menu.



Measurement Wizard Menu

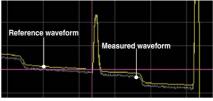




Plug Check Alarm Message



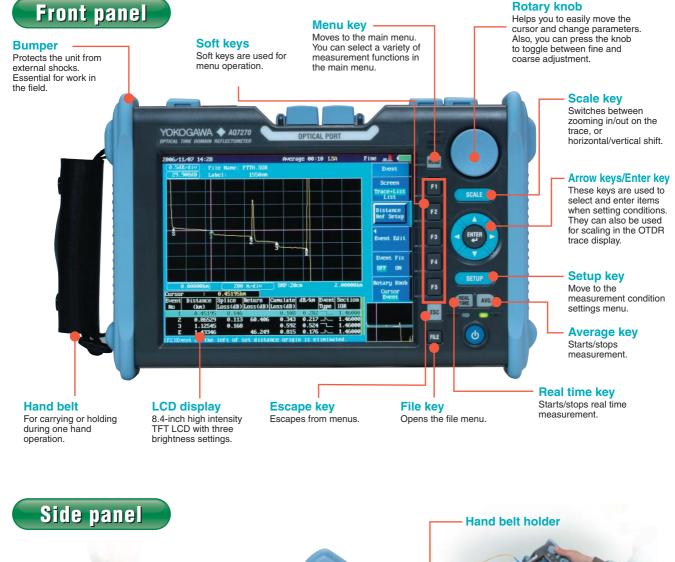
Fault Event Indication on the waveform



Trace Fix Function



Bright 8.4-Inch LCD Screen Easy to Operate with Rotary knob & Arrow Keys







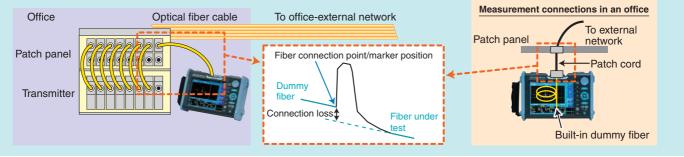


Key Functions

Built-in Dummy Fiber (Factory Option)

Excellent for detecting faults in fiber patch panels!

Fibers in offices frequently involve short distances between connectors. By using the dummy fiber, you can check whether there is any abnormal near-end connection loss. Also, by measuring the connection loss at the near-end connector, you can determine the total fiber loss including that of the connector.



Trace Analysis Functions

For Evaluation of Aged Deterioration

For 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 loss after installing multicore fiber.

-Differential Trace Analysis

Displays the difference between

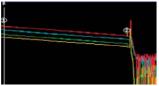
deterioration of fibers or connection

points, or fluctuation in loss between

two specified traces.

Makes it simple to check aged

fibers, and other phenomena



For Accurate Splice Loss Measurement by Bi-directional Testing —2 Way Trace Analysis

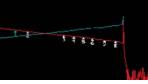
Merges the two traces measured from both directions and finds the correct splice loss.

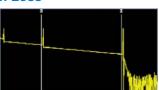
Connection loss in lines where optical fibers of differing backscatter coefficients are connected can differ depending on the direction. In such cases, you can accurately determine the loss by measuring in both directions and taking an average.

For 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.).





Smart File Function

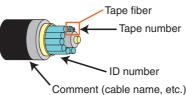
Because the AQ7270 makes it easy to differentiate between measured optical fibers—even complex ones—you can add arbitrary information to file names such as measured wavelength, ID number, tape number, or comments. You can also have the ID number or tape number automatically updated and saved after each measurement.

Trace data can be saved in SOR and CSV format. Also, you can save screenshots as BMP, JPG, or PNG files. TRB or TRD files saved on Yokogawa's previous AQ7250 and AQ7260 models can also be loaded.

File name setting screen

Nane Type	WL + Comment + No.	
ID No.	5	
Tape No.	a-d	
Connent	Yokogawa	
File Nane		
	1310nmYokogawa5a . SOR	
	1310nmYokogawa5a . SDR	

Concept of the file name structure



Automatic updating of file names





Language Selection

In addition to English (standard), you can select a display language of French, German, Chinese, Korean, Russian, and others.

USB Function

USB connectivity makes it more convenient to output to external memory or printers, and to set up communication. The AQ7270 comes standard with two USB1.1 compliant connector ports (Type A and Type B).

• Saving Files to USB Memory—Type A



Using USB memory or a USB hard disk, you can save large amounts of data. Also, you can easily transfer saved data to a PC or other device.



• Remotely Controlling the AQ7270 from a PC-Type B



The AQ7270 can be remotely controlled from an external PC by connecting a USB cable from one to the other.*



You can print screen images or measured data on USB printers.



• Accessing the AQ7270 Internal Memory from a PC-Type B



*: USB type A - type B cable required for remote control

You can easily access to internal memory with USB cable from a PC.*

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 the AQ7270 OTDR on a PC, and creates reports. The report creation wizard makes this task simple. AQ7270 OTDR data can be easily loaded onto a PC using USB memory or the communication interface.

Trace Analysis

You can edit event search conditions, approximate curve line settings, and other conditions, and then repeat the analysis. And now it is even easier to operate; simply click the function icon with the mouse.

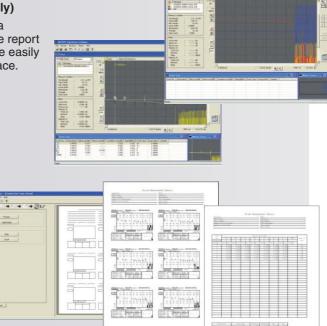
Analysis Functions

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

Creating Reports

Compiles trace and measured values from trace files and creates a report. Reports can also be created in Excel or CSV format. Reports are easy to create by following the step-by-step instructions in the report wizard.

Note Operating System: Microsoft Windows 2000, XP Excel: Microsoft Excel 2000, XP, 2003



Specifications

Common Specifications

Horizontal Axis Parameters

Sampling resolution

Readout resolution Number of sampled data Group refractive index Unit of distance Distance measurement accuracy

5 cm, 10 cm, 20 cm, 50 cm, 1 m, 2 m, 4 m, 8 m, 16 m, 32 m 1 cm (Min.) Up to 50,000 points 1.30000 to 1.79999 (in 0.00001 steps) km, kf, or miles

Offset error: ±1 m Scale error: Measured distance×2×10⁻⁵ Sampling error: ±1 sampling resolution

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

When the measuring loss is 1dB or less, the accuracy is within ± 0.05 dB

OTDR Measurement Function

Distance measurement	Displays up to eight digits of the relative one-way distance 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 two given points on the waveform.
Return loss measurement	Measures return loss and total return loss of a fiber cable or between two arbitrary points on the trace.

section analysis

OTDR Analysis Functions

Analysis functions

Internal Memory

Memory capacity

Can store measured waveforms, and measurement conditions

1000 waveforms or more

Multi trace analysis, 2 way trace

analysis, differential trace analysis,

Display

Display Total number of pixels*

8.4-inch color TFT LCD 640 (horizontal)×480 (vertical)

The LCD may contain some pixels that are always ON or always OFF (0.002% or fewer of all displayed pixels including RGB), and is not indicative of a general malfunction.

External Interface

USB

USB1.1 Type A and Type B, one each Type A: For external memory or external printer Type B: For connecting to an external

PC for remote control or access to the OTDR's internal memory.

Optical I/O port

Connector type

Number of port

SC (fixed), FC (fixed), SC universal adapter, FC universal adapter, No universal adapter (base) 1 or 2*

* Port 2 is only for model 735027 (1650nm), and Model 735030 (850nm/1300nm).

File Formats

File formats

Read: SOR, TRD, TRB, SET Write: SOR (Telcordia), SET, CSV, BMP, JPG, PNG

General Specifications

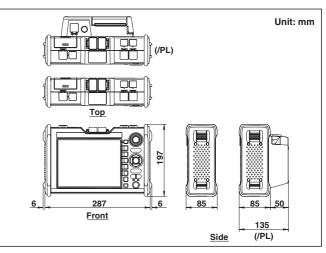
Laser safety standards	class 1 M (IEC60825-1:2001)
Safety standard	EN61010-1
Emission	EN61326 Class A
Immunity	EN61326 Annex A
Operating environment	0 to 45°C
Temperature	(0 to 35°C when charging the battery)
Humidity	85% RH or less (no condensation)
Storage temperature	-20 to 60°C
Battery	Operation time 6 hours ^{*1}
	Recharge time 5 hours*2
AC adapter	
Rated supply voltage	100 to 240 VAC
Rated supply frequency	50 to 60 Hz
Power consumption	Max 70 W
	(when battery charging, and optional printer printing)
Dimensions	(W) $287 \times (H) 197 \times (D) 85 \text{ mm}$ (not including projections or options)
Weight	Approx. 2.8 kg
-	(not including options)

*1 Measurement for 30 seconds in every 10 minutes, without any options, in power save mode (Full Auto 1minute).

*2 Ambient temperature of 23°C, power OFF



External Dimensions



fiber plorer. AQ7270 OTDR

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Specifications by Model

Single-mode Fiber 1 Wavelength Type				
Model	735020	735021 ^{*12}		
Wavelength	1550±25nm	1650 ± 5 nm $^{*1} \pm 10$ nm *2		
Applicable fiber	SM (ITU-T G.652)			
Distance range	500m, 1km, 2km, 5km, 10km, 20km,			
Distance range	50km, 100km, 200km, 300km, 400km			
Pulse width ^{*3}	3ns, 10ns, 20ns, 50ns, 100ns, 200ns,			
	500ns, 1us, 2us, 5us, 10us, 20us			
Dynamic range ^{*4}	32dB	30dB		
Event dead zone*5, 11	0.8m	0.8m		
Attenuation dead zone*6, 11	8m (typ)	12m (typ)		

Single-mode Fiber 2 Wavelength Type

Model	735022	735023	735024	
Wavelength	1310/1550±25nm	1310/1550±25nm	1550/1625±25nm	
Applicable fiber	SM (ITU-T G.652)			
Distance range	500m, 1km, 2km, 5km, 10km, 20km, 50km,			
Distance range	100km, 200km, 300km, 400km			
Pulse width ^{*3}	3ns, 10ns, 20ns, 50ns, 100ns, 200ns, 500ns,			
	1us, 2us, 5us, 10us, 20us			
Dynamic range ^{*4}	34/32dB	40/38dB	38/35dB	
Event dead zone*5, 11	0.8m	0.8m	0.8m	
Attenuation dead zone*6, 11	7/8m (typ)	7/8m (typ)	8/12m (typ)	

Single-mode Fiber 3 Wavelength Type

	5 7			
Model	735025	735026	735027 ^{*12}	735028
Wavelength	1310/1490/1550±25nm	1310/1550/1625±25nm	1310/1550±25nm 1650±5nm ^{*1} , ±10nm ^{*2}	1310/1550/1625±25nm
Applicable fiber	SM (ITU-T G.652)			
Distance range	500m, 1km, 2km, 5km, 10km, 20km, 50km, 100km, 200km, 300km, 400km			
Pulse width ^{*3}	3ns, 10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1us, 2us, 5us, 10us, 20us			
Dynamic range ^{*4}	34/30/32dB	34/32/28dB	34/32/30dB	40/38/35dB
Event dead zone ^{*5, 11}	0.8m	0.8m	0.8m	0.8m
Attenuation dead zone*6, 11	7/8/8m (typ)	7/8/12m (typ)	7/8/12m (typ)	7/8/12m (typ)

Multimode Fiber 2 Wavelength Type

Model	735029
Wavelength	850/1300±30nm
Applicable fiber	GI (50/125, 62.5/125µm)
Distance range	500m, 1km, 2km, 5km, 10km, 20km, 50km, 100km
Pulse width ^{*3, 7}	10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1us, 2us, 5us
Dynamic range ^{*8, 10}	22.5/24dB
Event dead zone*9, 10, 11	2m (typ)
Attenuation dead zone*6, 10, 11	7/10m (typ)

*1 At a point -20 dB from the pulse light output peak value (measured 30 min. or more after power ON,

At a point -20 as from the pulse neuro output peak value (measured 30 min. or more after power ON, ambient temperature of 23°C)
 At a point -60 dB from the pulse light output peak value (measured 30 min. or more after power ON, ambient temperature of 23°C)
 Pulse width setting range depends on the distance range.
 SNR=1, at pulse with 20 µs, distance range 200 km, sampling resolution 32 m, measurement time 3 minutes.
 Pulse width 3 ns, return loss 45 dB or more, at a point 1.5 dB below the peak value (not saturated).

Factory Installed Option Specifications

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

Printing method	Thermal line-dot
Dot density	576 dots/line
Paper width	80 mm
Operating environment	Temperature 5 to 35°C Humidity 10 to 80% RH (no condensation)
Storage temperature	-20 to 60°C
LAN function	10BASE-T/100BASE-TX (RJ-45) x1

Light Source Function (Option /LS)

Optical port Center wavelength Output level Output level stability Modulation frequency

OTDR optical I/O port OTDR's center wavelengths -5 dBm or more (at 23±2°C) ±1 dB (5 minutes) CW, 270 Hz

Multimode/Single-mode Fiber 4 Wavelength Type

Model	735	030
Wavelength	1310/1550±25nm	850/1300nm±30nm
Applicable fiber	SM (ITU-T G.652)	GI (50/125,62.5/125µm)
Distance range	500m, 1km, 2km, 5km, 10km, 20km, 50km, 100km, 200km, 300km,400km	500m, 1km, 2km, 5km, 10km, 20km, 50km, 100km
Pulse width ^{*3}	3ns, 10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1us, 2us, 5us, 10us, 20us	10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1us, 2us, 5us ^{*7}
Dynamic range	34/32dB*4	22.5/24dB ^{*8, 10}
Event dead zone	0.8m ^{*5, 11}	2m (typ) ^{*9, 10, 11}
Attenuation dead zone	7/8m (typ) ^{*11}	7/10m(typ) ^{*6, 10, 11}

*6 Pulse width 10 ns, return loss 45 dB or more, at a point where the backscatter level is within ±0.5 dB of the ⁶ Pulse width 10 hs, return loss 45 ub of more, at a point minor to be detected to the second s

Power Monitori	ng Function (/PM Option)
Ontical port	OTDB optical I/O port

Optical port	OTDR oplical I/O port
Measuring range ^{*1}	-50 to -5 dBm
Measurement accuracy ²	±0.5 dB

*1 CW light, wavelength 1310 nm, absolute max input level = 0 dBm (1 mW) *2 When inputting CW light, wavelength 1310 nm, -10 dBm, at $23\pm2^\circ$ C

Dummy Fiber (/DF Option) 0 per (ITU-T G.652)

Optical fiber	Single-mode fib
Length	approx. 100 m

* Dummy fiber option may cause the reduction of dynamic range (0.5dB or less).

Model and Suffix Codes

AQ7270 OTDR

	Option availability					
Model	/PM	/LS	/PL	/DF	/SB	Description
735020	0	0	0	0	0	AQ7270 OTDR 1550nm, 32dB
735021	_	0	0	0	0	AQ7270 OTDR 1650nm, 30dB
735022	0	0	0	0	0	AQ7270 OTDR 1310/1550nm, 34/32dB
735023	0	0	0	0	0	AQ7270 OTDR 1310/1550nm, 40/38dB
735024	0	0	0	0	0	AQ7270 OTDR 1550/1625nm, 38/35dB
735025	0	0	0	0	0	AQ7270 OTDR 1310/1490/1550nm, 34/30/32dB
735026	0	0	0	0	0	AQ7270 OTDR 1310/1550/1625nm, 34/32/28dB
735027	O*1	0	0	0	0	AQ7270 OTDR 1310/1550/1650nm, 34/32/30dB
735028	0	0	0	0	0	AQ7270 OTDR 1310/1550/1625nm, 40/38/35dB
735029	—	_	0	_	0	AQ7270 OTDR 850/1300nm, 22.5/24dB
735030	O*2	O*2	0	_	0	AQ7270 OTDR 850/1300/1310/1550nm, 22.5/24dB/34/32dB

*1 : Does not support the 1650nm port *2 : Does not support the 850/1300nm port \bigcirc : Available - : Not available

	Suffix Codes	Description
Optical	-SCC	SC type Connector
Connector	-FCC	FC type Connector
	-NON	No universal adapter
	-USC	Universal adapter (SC)
	-UFC	Universal adapter (FC)
Language	-HE	English
	-HC	Chinese/English
	-HK	Korean/English
	-HR	Russian/English
Power	-D	UL/CSA standard
Cord	-F	VDE standard
	-R	AS standard
	-Q	BS standard
	-H	GB standard, Complied with CCC
Options	/PM	Optical power monitor
	/LS	Light source
	/PL	Built-in printer, LAN
	/DF	Dummy fiber (SMF)
	/SB	Sholder belt

Example: 735023-USC-HE-D /PM /LS

AQ7270 OTDR 1310/1550nm, 40/38dB, with Universal adapter(SC), English version, with a UL/CSA standard power cord, with power monitor function and with Light source function

Standard Accessories

An AC adapter, a power cord, a battery pack, a hand belt, and a set of user's manual (CD-ROM)



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5 Bedok South Road, Singapore 469270 Phone: (65)-62419933, Fax: (65)-62412606

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Accessories (Optional)

Name	Model	Specifications
Soft carrying case	739860	
Battery pack	739880	
Universal adapter(SC)	SU2005A-SCC	SC type
Universal adapter(FC)	SU2005A-FCC	FC type
Printer roll paper	A9010ZP	80mmx25m
Shoulder belt	B8070CY	
AC adapter	739870-D	UL/CSA standard
	739870-F	VDE standard
	739870-R	AS standard
	739870-Q	BS standard
	739870-H	GB standard, Complied with CCC

Application software

Model	Suffix Codes	Specifications
735070		AQ7932 OTDR Emulation Software (Ver3.0 or later)
	-EN	English

Related Products

OTDR



High performance OTDR that also supports long-distance optical fiber cables, with high dynamic range of up to 45 dB.

Optical Powermeter



Compact, lightweight powermeter designed especially for absolute value measurements for FTTH/LAN work.

Microsoft, MS, and Windows are registered trademarks or trademarks of Microsoft Corporation in the US and other countries.

LD Light Source



Compact, lightweight 1310/1550 nm 2wavelength light source with 4 switches for easy, safe operation.

Optical Powermeter



Compact, light weight body. Using with a light source, it can measure optical loss. Measured values can be saved to internal memory, making on-site work more efficient.

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