



All-in-One handheld optical fiber network test tool



Seven models offer different wavelength and dynamic range combinations

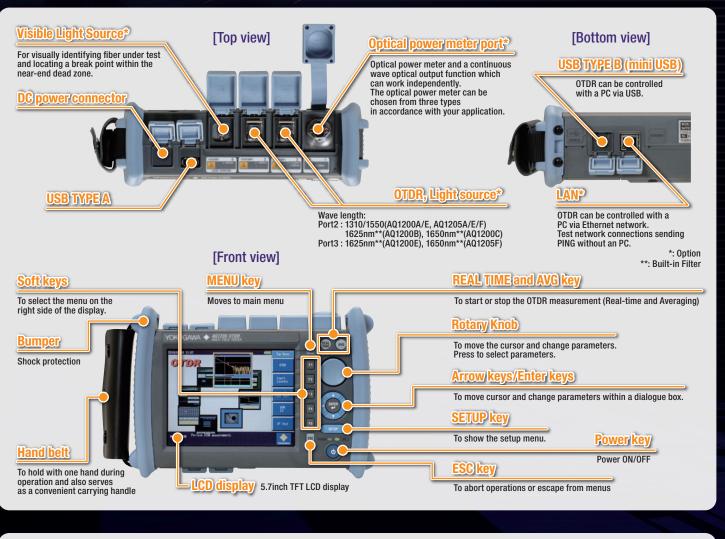
QUALITY INNOVATION FORESIGHT

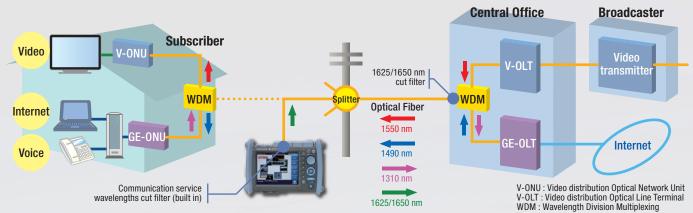
www.tmi.yokogawa.com Test & Measurement Instruments Bulletin AQ1200-13EN

Multifunctional Handhald OTDR Offering Powerful Test Features & Excellent

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. Designed with ease of use in mind to simplify field testing, improve work efficiency and ensure qualify results. Seven models are offered, each with unique wavelength(s) based on their specific application.





Operability

MULTI FIELD TESTER A01200

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 maintenance of live fibers.	
AQ1200C	1650 nm	A built-in cut filter isolates the maintenance wavelength from the communication wavelength in order to perform accurate measurements in live networks.	
AQ1200E	1310/1550 nm 1625 nm	These tri-wavelength models 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.	
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 up to 64 ports splitters.	
AQ1205E	1310/1550 nm 1625 nm	maintenance wavelength. Thus this model is ideal for use in both installation a maintenance applications.	
AQ1205F	1310/1550 nm 1650 nm		

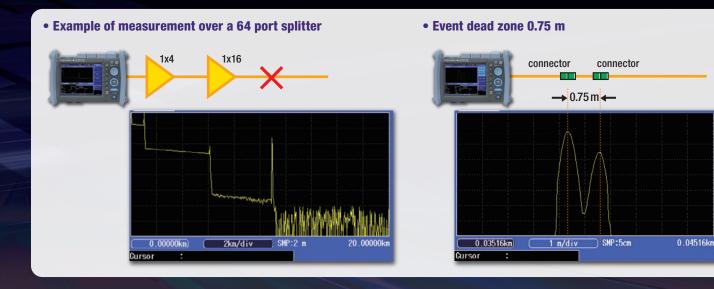
* : Please make sure that the measurement signal does not affect the communication services before use, by implementing a measurement wavelength cut filter in the line under test or otherwise.

PON Measurement Capability

In Passive Optical Network (PON) System 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 of 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.



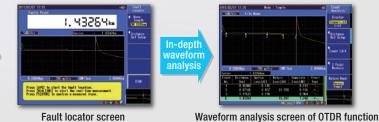
Fault locator



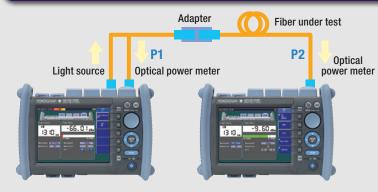
Find a fiber break point easily and rapidly

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 OTDR function.



Light Source & Optical Powermeter



Auto Loss Test*

Loss measurement with LS & OPM interlock

AQ1200's light source can transmit wavelength information, so that AQ1200's optical powermeter can make measurements at a right wavelength at the other end. Moreover, the AQ1200A's light source and optical powermeter can switch between two wavelengths (1310 and 1550 nm) automatically; therefore, the optical powermeter can make measurements at right wavelengths, changing the wavelength along with the light source.

Measurement result storage and report output

Measurement results can be saved in the internal storage or external USB storage media, and the measurement report can be generated in CSV format. * : /SLT or /HLT option is required to use this function.

1310 nm

splitter 1: N

PON Optical Powermeter*

1490 nm

WDM

Coupler

Manual Loss test using light source & optical powermeter *1,*2

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

Total fiber loss = P1 - P2 (dB)

High power measurement*2

Allow to measure the high power output of optical amplifier, which is 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.

Multicore Loss Test*

Work as Master & Slave 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

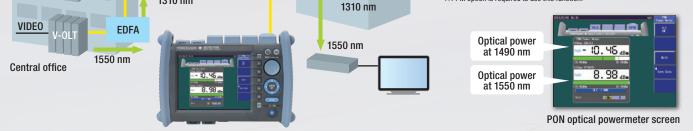


Multicore measurement result screen

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

Simultaneous 1490 & 1550 nm measurement

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



1490 nm

WDM

Coupler

DATA

VOICE

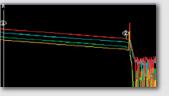
MULTI FIELD TESTER A01200

Trace Analysis Functions

For Evaluation of Multicore Fiber

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.



— Multi Trace Analysis

For Evaluation of Aged Deterioration

— Differential Trace Analysis

Displays the difference between two specified traces.

Makes it simple to check aged deterioration of fibers or connection points, or fluctuation in loss between fibers, and other phenomena.

Visible Light Source*

Visual fault location and Fiber identification



identify a single core out of multicore fiber and find a break point in a launch area visually. This feature works even when OTDR is in use, so that you can search for a next fiber to test, while OTDR is measuring one fiber. *:/VLS option is required to use this function.

The visible light source enables to

Visible light source screen

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

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.



Fiber end inspection

With a video fiber inspection prove

connected to USB interface, the AQ1200

screen to visually inspect scratches and

the internal memory or external USB

* : Recommended probe: DI-1000-B2 (Lightel)

storage media.

can show an image of the fiber end on the

dirtiness. The video image can be saved in

Video Fiber Inspection Probe

NUCCOLOR DA CALLER CALL

Fiber Inspection Probe screen

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.

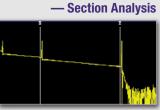
Connection loss in lines where optical fibers of differing backscatter coefficients are connected can differ depending on the

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

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.).



Multi Fiber Measurement Function



The Multi fiber measurement function automatically performs measurements and data-fi ling 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.

Remote Control Software

Remote Control using the same GUI

The AQ1200 can be remotely controlled from a personal computer (PC) through Ethernet* or USB interface.

The remote control software displays a front panel image of AQ1200 on PC, so you can control the AQ1200 with mouse in the same manner as operating the actual instrument.

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

IP Test*



IPv4 PING

For testing network connections by sending PING through the optional LAN interface, no need to bring a PC.

Variable frame length and transmission intervals

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

PING Test screen

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-0TDR and creates reports on a PC. The report creation wizard function makes this task simple. AQ1200 MFT-0TDR data can be easily loaded onto a PC using USB memory or storage function. (The AQ1200 MFT-0TDR is supported from software version 4.1. Please make sure of the version information before use.)

Trace Analysis

You can edit event search conditions, approximate curve line secngs, 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 ends of optical fiber.

Creating Reports

You can compile traces and measured values of trace files and creates a report. Reports can be created easily by just following the step-by-step instructions in the report wizard and saved in Excel or CSV format.

Functionality

Data format: .SOR (Bellcore), .SOR (Telcordia [AQ1200/AQ7275/AQ7270/AQ7260]), TRD(AQ7260), .TRB(AQ7250), .BMP(BMP), .CSV (Data CSV), .CSV (Event List CSV)

Report output: CSV file, XLS file, and print out

• PC requirements (Software and Hardware)

Software

OS: Microsoft Windows 2000, Microsoft Windows XP, Microsoft Windows Vista*, Windows 7 Excel: Microsoft Excel 2000 or later (when the XLS file output function is used)

Hardware

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 1024 × 768 pixels or better Disc drive: CD-ROM drive





Microsoft Windows 2000, Windows XP, Windows Vista and Windows 7 are registered trademarks or trademarks of Microsoft Corporation in the United States and other countries. The TM and $^{\circ}$ symbols are not used to indicate registered trademarks and trademarks in this document. (*) Microsoft Windows Vista is to be supported in Ver. 3.03 and later.

Comon Specifications

Horizontal Axis Parameters

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 accura	acy
	± 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.

OTDR Analysis Functions

Analysis functions Section analysis

Internal Memory

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

Display

Display	5.7 inch color TFT LCD
Total number of	of displayed pixels*
	640 (horizontal) × 480 (vertical) pixels
* · The I CD may co	ntain some pixels that are always ON or OFE (0.002% or fewer of all disr

* : 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

ote
memory.

File Formats

Read: SOR, SET (AQ7270/AQ7275/AQ1200) Write: SOR (Telcordia), SET, CSV, BMP, JPG, PNG

Specifications per Model

Model name	AQ1200A	AQ1200B*1	AQ1200C*1	AQ1200E*1	AQ1205A	AQ1205E*1	AQ1205F*1
	1310±20(typ)*2/	1625±10	1650±5*3, 1650±10*4	1310±20(typ)*2/	1310±20(typ)*2/	1310±20(typ)*2/	1310±20(typ)*2/
Managered wavelength (nm)	1550±20(typ)*2			1550±20(typ) ^{*2} ,	1550±20(typ)*2	1550±20(typ)*2,	1550±20(typ)*2,
Measured wavelength (nm)				1625±10		1625±20(typ)	1650±5 [∗] 3,
							1650±10*4
Optical Port		PORT2		PORT2, 3	PORT2	POR	T2, 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	4m/5m 7m		4m/5m, 7m	4m/5m	4m/5	m, 7m
Dynamic range(dB) (typ.)	34/32*5 33*5 34*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				I / Low	
Laser safety standard	Class 1 or Class 1M						

*1 : Pulse light output poert at 1625 nm and 1650 nm, +15 dB or less, built-in 1310 & 1550 nm cut filter. *2 : 25 nm is guaranteed

*3 : *4 : : At a point -20 dB from the pulse light output peakvalue (measured after 30 minutes or more form power-on at an ambient temperature of 23°C)

3. At a point 220 bit form the pulse light output peakvalue (measured after 30 minutes or more form 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, Guaranty value (dB); 32/30 (A01200A), 30 (A01200B), 30 (A01200C), 32/30, 30 (A01200E)
 *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, Guaranty value (dB); 30/38 (A01205A), 40/38, 36 (A01205E), 40/38, 30 (A01205F)

*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 uncless otherwise noted.

Specifications per Option

Light source & Optical powermeter option

	Option		Optical Power Meter (/SPM)	Standard (/SLT)	High Power (/HLT)	PON (/PPM)	Stabilized Light Source (/SLS)	
	Wavelength setting		850/1300/1310/1490/	1310/1490/1550 nm				
	wavelengui setui	y	or CWDM w	vavelength (1270 to 1610 nm, 1				
	Applicable fiber		S	SM (ITU-T G 652), GI (50/125 μm)				
	Power range	CW	+10 to -70 dBm		+27 to -50 dBm*3	+10 to -70 dBm ^{*1} , +27 to -50 dBm ^{*2}		
	r ower range	CHOP	+7 to	-60 dBm	+24 to -50 dBm*3			
Optical	Noise level		0.5 nW (-63	dBm, 1310 nm)	50 nW (-43 dBm, 1310 nm)	0.5 nW (-63 dBm, 1310 nm),		
Power						50 nW (-43 dBm, 1550 nm)		
meter	Uncertainty under standard co	onditions*4		±5% ±0.5 dB				
	Readout resolutio	n						
	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			1310/1550 ±0.25 nm (AQ1200A/E, AQ1205A/E/F), 1625 ±10 nm (A 1625 ±25 nm (A01205E), 1650 ±5 nm ⁻⁵ , 1650 ±10 nm ⁻⁶ (AQ1200(
Links	Optical output leve			-3 dBm ±1 dB				
Light				±0.05 dB (1310/1550 nm, AQ1200A/E, AQ1205A/E/F),				
source	Level stability*7			AQ1200B/C/E, AQ1205E/F)				
	Modulation mode			CW, 270 Hz, 1 kHz, 2 kHz				
	Applicable fiber			SM (ITU-T G.652)				
Memory	and logging functio	n		Measurement data storage: 10 to 1000 data, Logging interval: 0.5, 1, 2, 5, or 10 sec.			ec.	
Auto loss test function			Loss measurement with light source and optical					

*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

MULTI FIELD TESTER A01200

General Specifications

	Item	Specification	
	Storage temperature	-20 to 60°C	
Environmental	Operating	0 to 45°C (0 to 40°C when AC adapter is being used);	
conditions	temperature	(0 to 35°C when battery is being charged)	
	Humidity	20 to 85% RH (no condensation)	
Power requiren	nents	100 to 240 VAC, 50/60 Hz	
Battery pack		Run time: 6 hours ¹ , Recharge time: 5 hours ²	
Dimensions		217.5 (W) \times 157 (H) \times 74 (D) mm, excluding	
Dimensions		projections	
Mass		Approx. 1 kg, including battery pack	
	Laser safety	EN 60825-1:2014 Class 1*3, Class 1M (IEC60825-1:	
Compliant standards	Laser salely	2007, GB7247.1-2012)*4, 21CFR1040.10*5	
	Safety	EN61010-1	
	Emissions	EN61326-1 class A, EN55011 class A, group 1	
	Immunity	EN61326-1 Table 2 (for industrial locations)	
*1 . In anno manau	,	accords over 2 minutes, with no options installed in newer save	

: 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: 0N).

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



IEC60825-1:2007 GB72471-2012

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21CFR1040.10

EN 60825-1:2014

*3

Model and suffix code

Models	Suffix code		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	
	-HE			English	
	-HC	;		Chinese/English	
Language	-HN	1		Chinese	
	-HK			Korean/English	
	-HR			Russian/English	
	-	<u> </u>		UL/ CSA standard, 125 V	
	-1	F		VDE standard, 250 V	
	-1	R		Australian standard, 250 V	
Power cord	-Q			BS/Singaporean standard, 250 V	
	-H			Chinese standard, 250 V	
	-			Korean standard, 250 V	
	-1	-T		Taiwanese standard, 125 V	
	-1	N		Brazilian standard, 250 V	
		-USC		SC type	
Optical connect	or	-UFC		FC type	
		-ASC		SC/Angled-PC type	
		/SLT		Stabilized light source & Standard optical power meter	
light source &		/HLT		Stabilized light Source & High power optical power meter	
5	optical power meter		Λ	Light source & PON Power meter	
optical power meter		/SLS		Stabilized light source	
		/SPM		Standard optical power meter	
Visible light source /VLS		LS	Optical connector: 2.5¢ ferrule		
PON measurement*1 /PN			PON measurement mode		
Ethernet			/LAN	10BASE-T/100BASE-TX (PING test, Remote control)	
Shoulder belt /SB		/SB	Shoulder belt		

*1 : Only for AQ1200A. AQ1200B/C/E and AQ1205A/E/F come equipped this function.

The mode is optimized for PON measurement.



YOKOGAWA TEST & MEASUREMENT CORPORATION

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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)*1
755461 (FOI Optical powermeters)	-SFC	Ferrule adapter (φ2.5)*1
SU2005A	-SCC	Universal adapter (SC)
(For OTDR, LS and PON Power meter)	-FCC	Universal adapter (FC)
739874 (AC adapter)	-D	UL/CSA standard, 125 V
	-F	VDE standard, 250 V
	-R	Australian standard, 250 V
	-Q	BS/Singaporean standard, 250 V
	-H	Chinese standard, 250 V
	-P	Korean standard, 250 V
	-T	Taiwanese standard, 125 V
	-N	Brazilian standard, 250 V
739882		Battery pack (Spare)
B8070CY		Shoulder belt

Please be cautious of the connection, especially when emitting high power light.

Dimensions Unit : mm (approx.inch) The top panel Side The Front 157 6.18) 217.5 3.7 (0.15) Bottom

Application Software

Model	Suffix code	Descriptions
735070-	-EN	AQ7932 OTDR Emulation Software (Ver. 4.1 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.
 - https://tmi.yokogawa.com/

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