

Thank you for purchasing the AQ7280 series units and modules.

To ensure correct use, please read this manual thoroughly before beginning operation. For details on the functions and performance, see the AQ7280 OTDR User's Manual (IM AQ7280-01EN/-02EN).

In addition to this manual, the following nine kinds of manuals are provided for the AQ7280 series units and modules. Please read all manuals.

Manual Title	Manual No.	Description
AQ7280 OTDR User's Manual (included in CD)	IM AQ7280-01EN	Explains all AQ7280 features, except for the communication features, and how to use them.
AQ7280 OTDR Getting Started Guide	IM AQ7280-02EN	This guide focuses on the handling precautions, basic operations, and specifications of the AQ7280.
AQ7280 OTDR Communication Interface User's Manual (included in CD)	IM AQ7280-17EN	Explains the features related to using communication commands to control the AQ7280.
Model 739883 Battery Pack Handling Precautions	IM 739883-01EN	Explains the handling precautions for the battery pack.
Precautions Concerning the AQ7280 Series Units and Modules	IM AQ7280-71EN	This manual. This is included with AQ7280 series units and modules. It explains the handling precautions of the units, modules and lists the package contents.
AQ7280 OTDR User's Manual	IM AQ7280-92Z1	A document for China.
Model AQ7282A, AQ7283A, AQ7284A, AQ7285A, AQ7283E, AQ7283F, AQ7282G, AQ7283H, AQ7284H, AQ7283J, AQ7283K, AQ7282M OTDR unit User's Manual	IM AQ7282A-92Z1	A document for China.
AQ2780, AQ2781, AQ2780V, AQ2781V Optical Power Meter Module User's Manual	IM AQ2780-92Z1	A document for China.
AQ4780 Visible Light Source Module User's Manual	IM AQ4780-92Z1	A document for China.

The "EN" and "Z1" in the manual numbers are the language codes.

Contact information of Yokogawa offices worldwide is provided on the following sheet.

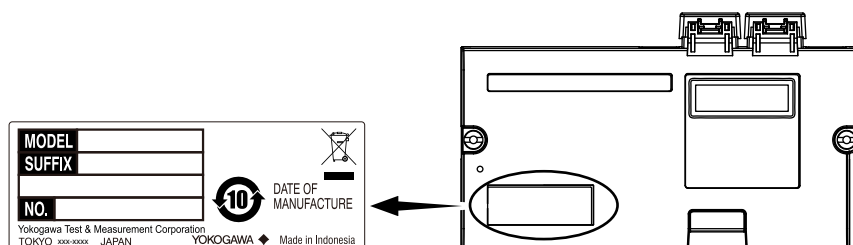
Document No.	Description
PIM 113-01Z2	List of worldwide contacts

Checking the Package Contents

After receiving the product and opening the package, check the items described below. If the wrong items have been delivered, if items are missing, or if there is a problem with the appearance of the items, contact your nearest YOKOGAWA dealer.

Check that the product that you have received is the same product that you ordered. For reference, the model name, suffix code, and specifications of the products are listed below.

OTDR unit



Model	Suffix ²	Description	AQ7280 Mainframe's Compatible Firmware version
AQ7282A		2WL 1310/1550 nm	38/36 dB
AQ7283A		2WL 1310/1550 nm	42/40 dB
AQ7284A		2WL 1310/1550 nm	46/45 dB
AQ7285A		2WL 1310/1550 nm	50/50 dB
AQ7283E		3WL 1310/1550, 1625 nm (1625 nm port is equipped with a built-in filter)	42/40, 40 dB
AQ7283F		3WL 1310/1550, 1650 nm (1650 nm port is equipped with a built-in filter)	42/40, 40 dB
AQ7282G		3WL 1310/1490/1550 nm	38/36/36 dB
AQ7283H		3WL 1310/1550/1625 nm	40/40/39 dB
AQ7284H		3WL 1310/1550/1625 nm	46/45/44 dB
AQ7283J		4WL 1310/1383/1550/1625 nm	42/39/40/40 dB
AQ7283K		4WL 1310/1490/1550/1625 nm	42/38/40/40 dB
AQ7282M		2WL 850/1300 nm (MM)	25/27 dB
Connector Adapter ¹	-USC	Universal adapter (SC)	
	-UFC	Universal adapter (FC)	
	-ULC	Universal adapter (LC)	
	-ASC	Universal adapter (Angled-PC SC) ³	
	-NUA	No universal adapter	-
Options	/PC	Power Checker ^{3, 4}	1.01 and later
	/SLS	Stabilized Light Source ⁵	1.01 and later ⁶

1 The connectors that you select are attached to the OTDR ports prior to shipping.

2 For products whose suffix code contains "Z," an exclusive manual may be included. Please read it along with the standard manual.

3 Not applicable to AQ7282M.

4 Not applicable to the port 2 of AQ7283E and AQ7283F.

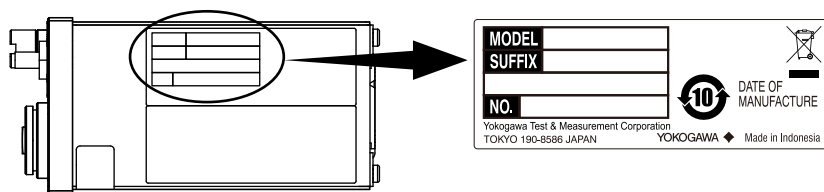
5 Not applicable for 1383 nm of AQ7283J.

6 AQ7282M is supported on firmware version 2.01 and later.

• Accessories

Name	Q'ty	Notes
Manuals	-	IM AQ7280-71EN (This manual.) PIM113-01Z2 (List of worldwide contacts) IM AQ7282A-92Z1

Optical power meter module (OPM module)



Model	Suffix ²	Description	
AQ2780		OPM module	Power range: -70 dBm to +10 dBm (CW)
AQ2781		High Power OPM module	Power range: -50 dBm to +27 dBm (CW)
AQ2780V		OPM & VLS module	Power range: -70 dB to +10 dBm (CW) with Visible Light Source (Connector: ϕ 2.5 Ferrule)
AQ2781V		High Power OPM & VLS module	Power range: -50 dBm to +27 dBm (CW) with Visible Light Source (Connector: ϕ 2.5 Ferrule)
Connector Adapter ¹	-SCC	Universal adapter (SC)	
	-FCC	Universal adapter (FC)	
	-LMC	Ferrule adapter (ϕ 1.25)	

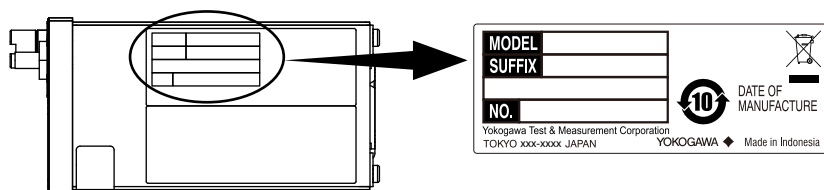
1 The connectors that you select are attached to the OPM ports prior to shipping.

2 For products whose suffix code contains "Z," an exclusive manual may be included. Please read it along with the standard manual.

• Accessories

Name	Q'ty	Notes
Manuals	–	IM AQ7280-71EN (This manual.) PIM113-01Z2 (List of worldwide contacts) IM AQ2780-92Z1

Visible light source module (VLS module)



Model	Suffix ¹	Description
AQ4780		VLS module Visible Light Source (Connector: ϕ 2.5 Ferrule)

1 For products whose suffix code contains "Z," an exclusive manual may be included. Please read it along with the standard manual.

• Accessories

Name	Q'ty	Notes
Manuals	–	IM AQ7280-71EN (This manual.) PIM113-01Z2 (List of worldwide contacts) IM AQ4780-92Z1

No. (Instrument number)

When contacting the dealer from which you purchased the instrument, please tell them the instrument number.

Safety Precautions

The general safety precautions described herein must be observed during all phases of operation. If the instrument is used in a manner not specified in this manual, the protection provided by the instrument may be impaired. YOKOGAWA assumes no liability for the customer's failure to comply with these requirements.

The following symbols are used on this instrument.



Handle with care. To protect the instrument and its users, refer to the explanation in the User's Manual or Service Manual.



Laser radiation hazard

French



Avertissement : À manipuler délicatement. Toujours se reporter aux manuels d'utilisation et d'entretien. Ce symbole a été apposé aux endroits dangereux de l'instrument pour lesquels des consignes spéciales d'utilisation ou de manipulation ont été émises. Le même symbole apparaît à l'endroit correspondant du manuel pour identifier les consignes qui s'y rapportent



Danger : Appareil laser à rayonnement.

Safety Precautions of the Units and Modules

The following precautions must be observed when handling the modules. YOKOGAWA assumes no liability for the customer's failure to comply with these requirements. For details on the installation/removal procedure and the specifications of the units and modules, see the AQ7280 OTDR Getting Started Guide (IM AQ7280-02EN).



WARNING

Use the Instrument Only for Its Intended Purpose

This optical measuring instrument is designed to measure the optical characteristics of light sources and evaluate their performance. Do not use this instrument for anything other than as an optical measuring instrument.

Check the Physical Appearance

Do not use the instrument if there is a problem with its physical appearance.

Laser Beam

Do not look directly or indirectly into the laser beam or at a specular reflection of the beam without protective equipment. Do not aim the laser beam at the eye. The laser beam may cause blindness or damage to your eyes. Attach the cover to the optical connector when it is not in use. Turn the power OFF when you are cleaning the AQ7280.

Connecting Optical Fiber Cables

Use optical fiber cable connectors that conform to the included universal adapter and connector adapter (the universal adapter specified by the suffix code).

Apply Correct Signals to the Optical Connectors

Do not apply light that is -5 dBm or greater to the OTDR unit optical connectors (PORT1 and PORT2). Doing so may damage the OTDR unit.

Do not apply light that is $+10$ dBm or greater to the OPM module (AQ2780, AQ2780V). Do not apply light that is $+27$ dBm or greater to the OPM module (AQ2781, AQ2781V). Doing so may damage the OPM module.

Do Not Operate in an Explosive Atmosphere

Do not use the instruments in the presence of flammable gasses or vapors. Doing so is extremely dangerous.

Do Not Remove the Covers or Disassemble or Alter the Instrument

Only qualified YOKOGAWA personnel may remove the covers and disassemble or alter the instrument.



AVERTISSEMENT

Utiliser l'instrument aux seules fins prévues

Cet instrument de mesure optique est prévu pour mesurer les caractéristiques optiques des sources lumineuses et évaluer leur performance. Ne pas utiliser cet instrument à d'autres fins que celles de mesure optique.

Inspecter l'apparence physique

Ne pas utiliser l'instrument si son intégrité physique semble être compromise.

Faisceau laser

Ne pas fixer directement ou indirectement le faisceau laser, ni la réflexion spéculaire du faisceau en l'absence d'équipement de protection. Ne pas orienter le faisceau laser en direction des yeux. Le faisceau laser peut entraîner la cécité ou causer des lésions oculaires. Recouvrir le connecteur optique à l'aide du cache pendant les périodes de nonutilisation. Mettre l'AQ7280 HORS tension pendant son nettoyage.

Connexion des câbles à fibre optique

Utiliser des connecteurs de câbles à fibre optique conformes à l'adaptateur universel fourni (adaptateur universel indiqué par le suffixe).

Envoyer les signaux corrects aux connecteurs optiques

Ne pas appliquer de signal de -5 dBm ou plus aux connecteurs optiques de l'unité OTDR (série AQ7282) (PORT1 et PORT2).

Cela pourrait endommager l'unité OTDR. Ne pas appliquer de signal de $+10$ dBm ou plus au module OPM (AQ2780, AQ2780V). Ne pas appliquer de signal de $+27$ dBm ou plus au module OPM haute puissance (AQ2781, AQ2781V). Cela pourrait endommager le module OPM.

Ne pas utiliser dans un environnement explosif

Ne pas utiliser l'instrument en présence de gaz ou de vapeurs inflammables. Cela pourrait être extrêmement dangereux.

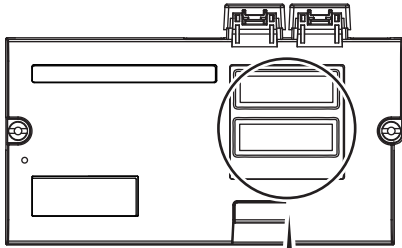
Ne pas retirer le capot, ni démonter ou modifier l'instrument

Seul le personnel YOKOGAWA qualifié est habilité à retirer le capot et à démonter ou modifier l'instrument. Certains composants à l'intérieur de l'instrument sont à haute tension et par conséquent, représentent un danger.

Safety Precautions for Laser Products

This instrument uses a laser light source. This instrument is a Class 1M laser product as defined by IEC60825-1 Safety of Laser Products—Part1: Equipment Classification and Requirements. In addition, this instrument complies with 21 CFR 1040.10 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007.

OTDR unit (AQ7284A, AQ7285A, AQ7284H, AQ7283J, AQ7283K)



**INVISIBLE LASER RADIATION
DO NOT VIEW DIRECTLY WITH
OPTICAL INSTRUMENTS
CLASS 1M LASER PRODUCT
(IEC 60825-1:2007)**

**INVISIBLE LASER RADIATION
AVOID DIRECT EYE EXPOSURE
CLASS 3R LASER PRODUCT
(IEC 60825-1:2007)**

MAX OUTPUT	PULSE DURATION	WAVELENGTH
500 mW	≤ 20 μs	1310 ± 25 nm

Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No.50, dated June 24, 2007
2-9-32 Nakacho, Musashino-shi, Tokyo 180-8750, Japan

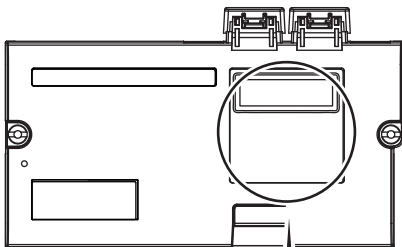
Laser Class 1M Label

Using an optical instrument, such as a loupe, magnifying glass, or microscope, when observing the laser beam from a distance of less than 100 mm may cause eye injury.

Laser Class 3R Label

Avoid direct eye exposure.

OTDR unit (AQ7282A, AQ7283A, AQ7283E, AQ7283F, AQ7282G, AQ7283H)



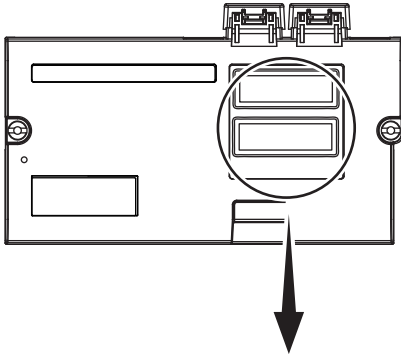
**INVISIBLE LASER RADIATION
DO NOT VIEW DIRECTLY WITH
OPTICAL INSTRUMENTS
CLASS 1M LASER PRODUCT
(IEC 60825-1:2007)**

Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No.50, dated June 24, 2007
2-9-32 Nakacho, Musashino-shi, Tokyo 180-8750, Japan

Laser Class 1M Label

Using an optical instrument, such as a loupe, magnifying glass, or microscope, when observing the laser beam from a distance of less than 100 mm may cause eye injury.

OTDR unit (AQ7282M)



**INVISIBLE LASER RADIATION
DO NOT VIEW DIRECTLY WITH
OPTICAL INSTRUMENTS
CLASS 1M LASER PRODUCT
(IEC 60825-1:2007)**

**INVISIBLE LASER RADIATION
AVOID DIRECT EYE EXPOSURE
CLASS 3R LASER PRODUCT
(IEC 60825-1:2007)**

MAX OUTPUT	PULSE DURATION	WAVELENGTH
400mW	$\leq 1\mu\text{s}$	$850 \pm 30\text{ nm}$

Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No.50, dated June 24, 2007
2-9-32 Nakacho, Musashino-shi, Tokyo 180-8750, Japan

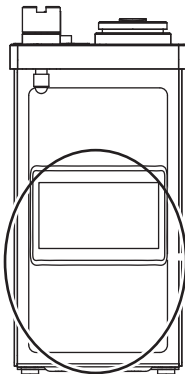
Laser Class 1M Label

Using an optical instrument, such as a loupe, magnifying glass, or microscope, when observing the laser beam from a distance of less than 100 mm may cause eye injury.

Laser Class 3R Label

Avoid direct eye exposure.

OPM module (AQ2780V, AQ2781V)



Laser Class 3R Label

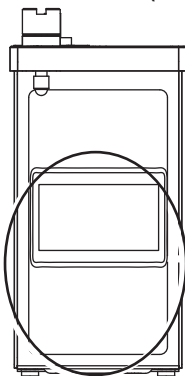
Avoid direct eye exposure.

**VISIBLE LASER RADIATION
AVOID DIRECT EYE EXPOSURE
CLASS 3R LASER PRODUCT
(IEC 60825-1:2007)**

MAX OUTPUT	5mW
PULSE DURATION	CW
WAVELENGTH	$650 \pm 20\text{ nm}$

Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No.50, dated June 24, 2007
2-9-32 Nakacho, Musashino-shi, Tokyo 180-8750, Japan

VLS module (AQ4780)



Laser Class 3R Label

Avoid direct eye exposure.

**VISIBLE LASER RADIATION
AVOID DIRECT EYE EXPOSURE
CLASS 3R LASER PRODUCT
(IEC 60825-1:2007)**

MAX OUTPUT	5mW
PULSE DURATION	CW
WAVELENGTH	$650 \pm 20\text{ nm}$

Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No.50, dated June 24, 2007
2-9-32 Nakacho, Musashino-shi, Tokyo 180-8750, Japan

OTDR unit

Model	Class	Center Wavelength	Maximum Output Power ¹	Mode Field Diameter	Beam Divergence
AQ7282A	1M	1310nm/1550nm	CW: 50mW@1310nm/1550nm PULSE: 200mW@1310nm/1550nm PULSE width: 20µs@1310nm/1550nm, Duty: ≤ 3.0%	9µm	11.5°
AQ7283A	1M	1310nm/1550nm	CW: 50mW@1310nm/1550nm PULSE: 200mW@1310nm/1550nm PULSE width: 20µs@1310nm/1550nm, Duty: ≤ 3.0%	9µm	11.5°
AQ7284A	3R	1310nm	CW: 140mW@1310nm/1550nm PULSE: 500mW@1310nm/1550nm PULSE width: 20µs@1310nm/1550nm, Duty: ≤ 3.0%	9µm	11.5°
	1M	1550nm			
AQ7285A	3R	1310nm	CW: 140mW@1310nm/1550nm PULSE: 500mW@1310nm/1550nm PULSE width: 20µs@1310nm/1550nm, Duty: ≤ 3.0%	9µm	11.5°
	1M	1550nm			
AQ7283E	1M	1310nm/1550nm, 1625nm	CW: 50mW@1310nm/1550nm, 1625nm PULSE: 200mW@1310nm/1550nm, 1625nm PULSE width: 20µs@1310nm/1550nm, 1625nm, Duty: ≤ 3.0%	9µm	11.5°
AQ7283F	1M	1310nm/1550nm, 1650nm	CW: 50mW@1310nm/1550nm/1650nm PULSE: 200mW@1310nm/1550nm/1650nm PULSE width: 20µs@1310nm/1550nm/1650nm, Duty: ≤ 3.0%	9µm	11.5°
AQ7282G	1M	1310nm/1490nm/1550nm	CW: 50mW@1310nm/1490nm/1550nm PULSE: 200mW@1310nm/1490nm/1550nm PULSE width: 20µs@1310nm/1490nm/1550nm, Duty: ≤ 3.0%	9µm	11.5°
AQ7283H	1M	1310nm/1550nm/1625nm	CW: 50mW@1310nm/1550nm/1625nm PULSE: 200mW@1310nm/1550nm/1625nm PULSE width: 20µs@1310nm/1550nm/1625nm, Duty: ≤ 3.0%	9µm	11.5°
AQ7284H	3R	1310nm	CW: 140mW@1310nm/1550nm/1625nm PULSE: 500mW@1310nm/1550nm/1625nm PULSE width: 20µs@1310nm/1550nm/1625nm, Duty: ≤ 3.0%	9µm	11.5°
	1M	1550nm/1625nm			
AQ7283J	3R	1310nm	CW: 140mW@1310nm/1383nm/1550nm/1625nm PULSE: 500mW@1310nm/1383nm/1550nm/1625nm PULSE width: 20µs@1310nm/1383nm/1550nm/1625nm, Duty: ≤ 3.0%	9µm	11.5°
	1M	1383nm/1550nm/1625nm			
AQ7283K	3R	1310nm	CW: 140mW@1310nm/1490nm/1550nm/1625nm PULSE: 500mW@1310nm/1490nm/1550nm/1625nm PULSE width: 20µs@1310nm/1490nm/1550nm/1625nm, Duty: ≤ 3.0%	9µm	11.5°
	1M	1490nm/1550nm/1625nm			
AQ7282M	3R	850nm	CW: 400mW@850nm/1300nm PULSE width: 1µs@850nm, Duty: ≤ 2.5%	50µm	23.1°
	1M	1300nm	PULSE width: 5µs@1300nm, Duty: ≤ 1.2%		

1 Under single fault conditions.

OPM/VLS module

Model	Class	Center Wavelength	Maximum Output Power ¹	Mode Field Diameter	Beam Divergence
AQ2780V	3R	650nm	CW: 5mW	9µm	11.5°
AQ2781V	3R	650nm	CW: 5mW	9µm	11.5°
AQ4780	3R	650nm	CW: 5mW	9µm	11.5°

1 Under single fault conditions.

Waste Electrical and Electronic Equipment (WEEE), Directive



(This directive is valid only in the EU.)

This product complies with the WEEE directive marking requirement. This marking indicates that you must not discard this electrical/electronic product in domestic household waste.

Product Category

With reference to the equipment types in the WEEE directive, this product is classified as a "Monitoring and control instruments" product.

When disposing products in the EU, contact your local Yokogawa Europe B.V. office.

Do not dispose in domestic household waste.

Authorized Representative in the EEA

Yokogawa Europe B.V. is the authorized representative of Yokogawa Meters & Instruments Corporation for this product in the EEA. To contact Yokogawa Europe B.V., see the separate list of worldwide contacts, PIM 113-01Z2.