
**User's
Manual**

**AQ1100A, AQ1100B, AQ1100D OLTS
Multi Field Tester
Operation Guide**

Thank you for purchasing the AQ1100A, AQ1100B, AQ1100D OLTS (Optical Loss Test Set) Multi Field Tester. This operation guide focuses on the handling precautions, basic operations, and specifications of the AQ1100A, AQ1100B, and AQ1100D.

List of Manuals

The AQ1100A, AQ1100B, and AQ1100D comes with the following manuals. Please keep them in a safe place.

Manual Title	Manual No.	Description
AQ1100A, AQ1100B, AQ1100D OLTS Multi Field Tester Operation Guide	IM AQ1100-02EN	This manual.
AQ1100A, AQ1100B, AQ1100D OLTS Multi Field Tester User's Manual (included in CD)	IM AQ1100-01EN	Explains all AQ1100A, AQ1100B, and AQ1100D features, except for the communication features, and how to use them.
AQ1100A, AQ1100B, AQ1100D OLTS Multi Field Tester Communication Interface User's Manual (included in CD)	IM AQ1100-17EN	Explains the features related to using communication commands to control the AQ1100A, AQ1100B, and AQ1100D.
739874 AC Adapter User's Manual	IM 739874-01EN	Explains the handling precautions for AC adapter.
739874 Precauciones de seguridad Меры предосторожности 이 기기의 안전한 사용을 위해	IM 739874-02Z4	Explains the handling precautions for AC adapter.
739874 本设备的安全使用注意事项 为了安全地使用本機器	IM 739874-02ZH	Explains the handling precautions for AC adapter.
Model 739882 Battery Pack (MFT) Handling Precautions	IM 739882-01EN	Explains the handling precautions for the battery pack.
AQ1100A, AQ1100B, AQ1100D OLTS Multi Field Tester User's Manual	IM AQ1100-92Z1	A manual for China.

* The "-EN" in the manual number is the language code.

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

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

Notes

- The contents of this manual are subject to change without prior notice as a result of continuing improvements to the instrument's performance and functionality. The figures given in this manual may differ from those that actually appear on your screen.
- Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, should you have any questions or find any errors, please contact your nearest YOKOGAWA dealer.
- Copying or reproducing all or any part of the content of this manual without the permission of YOKOGAWA is strictly prohibited.

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Revisions

November 2009	1st Edition
August 2013	2nd Edition
December 2015	3rd Edition
October 2017	4th Edition
December 2017	5th Edition
April 2019	6th Edition

Product Registration

Thank you for purchasing YOKOGAWA products.

YOKOGAWA provides registered users with a variety of information and services.

Please allow us to serve you best by completing the product registration form accessible from our homepage.

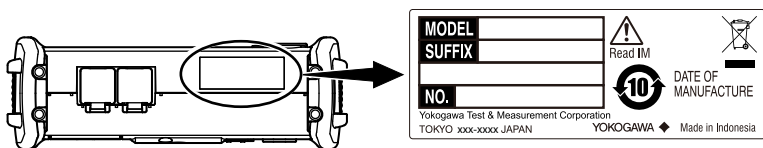
<http://tmi.yokogawa.com/>

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.

AQ1100A/AQ1100B/AQ1100D

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.



Model	Suffix Code	Description
AQ1100A		Light source wavelength: SM 1310 nm, SM 1550 nm
AQ1100B		Light source wavelength: SM 1310 nm, SM 1550 nm, SM 1625 nm
AQ1100D		Light source wavelength: GI 850 nm, GI 1300 nm, SM 1310 nm, SM 1550 nm
Power cord ⁴		Compliant Standard
		Maximum Rated Voltage
		Part No.
	-D	UL/CSA Standard
	-F	VDE Standard
	-R	Australian Standard
	-P	Korean Standard
	-Q	BS/Singaporean Standard
	-H	Chinese Standard

Model	Suffix Code	Description
Language	-HE	English
	-HC	Chinese/English
	-HK	Korean/English
	-HR	Russian/English
Power meter	-SPM	Standard
	-HPM	High input
	-PPN	PON (passive optical network); cannot be selected for the AQ1100B and AD1100D
Options		
Light source port connector ¹	/USC	SC universal adapter
	/UFC	FC universal adapter
	/ULC	LC universal adapter ²
	/ASC	SC connector or SC/APC connector, cannot be selected for the AD1100D ³
Visible light source	/VLS	2.5 mm ferrule connector.
Ethernet interface	/LAN	100BASE-TX/10BASE-T
Shoulder strap	/SB	—

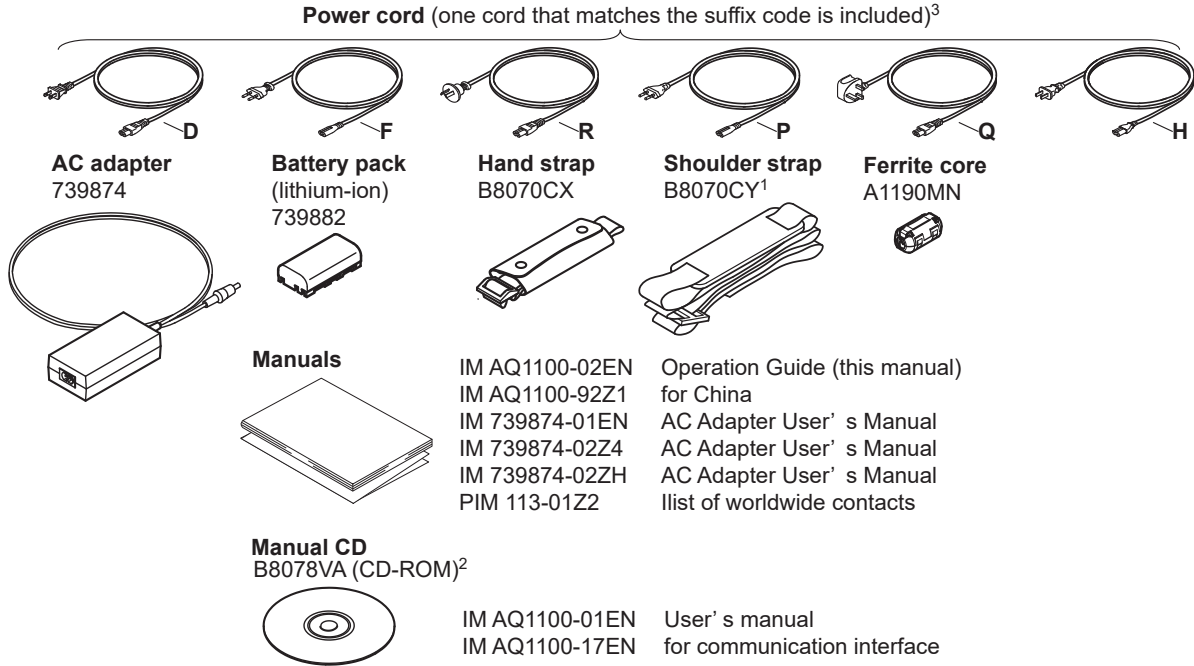
- 1 The universal adapter that you selected is attached to this instrument prior to shipping. In the case of the AQ1100D, the two universal adapters that you selected are attached to it.
If you selected the -PPN power meter suffix, the same universal adapter that you selected is attached to the optical power measurement (OPM) port.
- 2 If you selected the -SPM or -HPM power meter suffix, a 1.25 mm adapter is attached to OPM port.
- 3 If you selected the -SPM or -HPM power meter suffix, an SC connector is attached to the light source port. If you selected the -PPN power meter suffix, an SC/APC (SC angled physical contact) connector is attached to the light source port.
- 4 Make sure that the attached power cord meets the designated standards of the country and area that you are using it in.

No. (Instrument number)

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

Accessories

The instrument is shipped with the following accessories. Make sure that all accessories are present and undamaged.



1 Included with models that have the /SB option installed.

2 You can purchase the printed IM AQ1100-01EN and IM AQ1100-17EN manuals separately. Contact your nearest YOKOGAWA dealer to purchase a copy.

3 Make sure that the attached power cord meets the designated standards of the country and area that you are using it in.

Optional Accessories (Sold separately)

The following optional accessories are available for purchase separately. For information about ordering accessories, contact your nearest YOKOGAWA dealer.

Name	Model or Component Number	Notes
Soft carrying case	SU2006A	—
AC adapter	739874	—
Battery pack	739882	—
Shoulder strap	B8070CY	—
SC universal adapter	SU2005A-SCC	For products with /USC or /ASC suffix codes
FC universal adapter	SU2005A-FCC	For products with the /UFC suffix code
LC universal adapter	SU2005A-LCC	For products with the /ULC suffix code
SC connector adapter	735480-SCC	For optical power measurement (OPM) ports
FC connector adapter	735480-FCC	
Ferrule adapter (1.25Φ)	735481-LMC	

How to Use the CD-ROM (User's Manuals)

User's manuals are included on the CD-ROM in PDF format. To view these user's manuals, you need Adobe Reader 5.0 or later.

- User's Manual, IM AQ1100-01EN
- Communication Interface User's Manual, IM AQ1100-17EN

WARNING

Never play this CD-ROM on an audio CD player. Doing so may cause loss of hearing or speaker damage due to the large sounds that may be generated.

CD de manuels

AVERTISSEMENT

Ce CD contient les manuels d'utilisation. Ne jamais insérer ce CD dans un lecteur de CD audio. Cela pourrait entraîner une perte d'audition ou l'endommagement des enceintes en raison du volume potentiellement élevé des sons produits.

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 guide, 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.



Warning: handle with care. Refer to the user's manual or service manual. This symbol appears on dangerous locations on the instrument which require special instructions for proper handling or use. The same symbol appears in the corresponding place in the manual to identify those instructions.



Hazard, radiation of laser apparatus.



Direct current



Stand-by



Equipment protected throughout by double insulation or reinforced insulation

Failure to comply with the precautions below could lead to injury or death.

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.

Power Supply

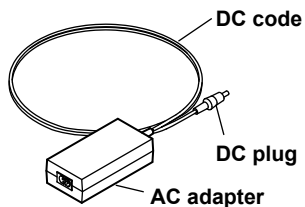
Make sure that the power supply voltage matches the AC adapter's rated supply voltage and that it does not exceed the maximum voltage range specified for the power cord.

Power Cord and AC Adapter

Only use the power cord and AC adapter that were included with this instrument. Do not use the power cord and AC adapter with other instruments.

- Do not bend or twist the power cord or AC adapter's DC cord numerous times.
- Do not bend the base of the AC adapter's DC cord or the base of the DC plug.
- Do not wrap the power cord or the AC adapter's DC cord around the AC adapter.

- Do not bundle the power cord or the AC adapter's DC cord too tightly.
- Do not use this instrument with the power cord or the AC adapter's DC cord in a bundled condition.
- When the power cord or AC adapter's DC cord is connected to the outlet or this instrument, do not move the AC adapter or this instrument.
- Do not carry the AC adapter while pulling on the power cord or the AC adapter's DC cord.
- Do not allow the power cord or the AC adapter's DC cord to be caught in doors, shelf doors, and so on.
- Do not alter, process, or repair the power cord or the AC adapter's DC cord. If a cord is damaged, contact your nearest YOKOGAWA dealer.
- Do not use this instrument with the AC adapter hanging in the air.



Battery Pack

Only use this instrument battery pack. Do not use this battery pack with other instruments. Only use this instrument to charge the battery pack. If the battery pack is still charging after 5 hours, stop charging it immediately. Your clothing may be damaged or you may be injured if you come in contact with the electrolyte due to fluid leakage or the battery pack exploding. Because the electrolyte may cause loss of eyesight, if it comes in contact with your eyes, immediately wash the affected area with clean water, and consult a doctor as soon as possible. When you change the battery pack, be sure to turn this instrument off, and detach the AC adapter power supply from this instrument. Failure to do so may lead to electric shock or other accidents. Do not throw the battery pack into fire or heat it. Such actions are dangerous as they may cause the battery pack to explode or the electrolyte to be sprayed about. Follow the additional handling precautions that are included in the battery pack's user's manual.

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.

Do Not Operate in an Explosive Atmosphere

Do not use this instrument 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.

CAUTION

Operating Environment Limitations

This product is a Class A (for industrial environments) product. Operation of this product in a residential area may cause radio interference in which case the user will be required to correct the interference.

About Storage Medium

Do not remove USB memory or turn off the power when the USB memory access indicator is blinking or when data is being saved or loaded from internal memory. Doing so may damage the storage medium (USB memory or internal memory) or corrupt its data.

French

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.

Alimentation

S'assurer que la tension d'alimentation correspond à la tension d'alimentation nominale de l'adaptateur CA et qu'elle ne dépasse pas la plage de tension maximale spécifiée pour le cordon d'alimentation.

Cordon d'alimentation et adaptateur CA

Utiliser uniquement le cordon d'alimentation et l'adaptateur CA fournis avec AQ1100A/AQ1100B/AQ1100D. Ne pas utiliser le cordon d'alimentation et l'adaptateur CA avec d'autres instruments.

- Ne pas plier la base du cordon CC ou la base de la fiche CC.
- Ne pas plier ou tordre plusieurs fois le cordon secteur ou le cordon CC.
- Ne pas entourer le cordon secteur ou le cordon CC autour de l'adaptateur CA.
- Pour ranger l'adaptateur CA, ne pas enrouler de manière trop serrée le cordon secteur ou le cordon CC.
- Ne pas utiliser l'adaptateur CA en enroulant le cordon secteur ou le cordon CC de manière serrée.
- Ne pas déplacer l'adaptateur CA ou l'instrument de mesure lorsque l'adaptateur est branché sur la prise de courant ou raccordé à l'instrument de mesure.
- Ne pas porter l'adaptateur CA tout en tirant sur le cordon CC.
- Veiller à ne pas coincer le cordon secteur ou le cordon CC dans une porte, une armoire, etc.
- Ne pas modifier, usiner ou réparer le cordon secteur ou le cordon CC. Si le cordon secteur ou le cordon CC est endommagé, contacter le revendeur YOKOGAWA le plus proche.
- Ne pas utiliser AQ1100A/AQ1100B/AQ1100D avec l'adaptateur CA flottant dans l'air.

Pack de batteries

Utiliser exclusivement le pack de batteries de AQ1100A/AQ1100B/AQ1100D. Ne pas utiliser ce pack de batteries avec d'autres instruments. Recharger le pack de batteries à l'aide de AQ1100A/AQ1100B/AQ1100D. uniquement. Si le pack de batteries est encore en charge au bout de 6 heures, interrompre la charge. Tout contact avec l'électrolyte échappé en raison d'une fuite ou d'une explosion du pack de batteries peut endommager les vêtements ou causer des blessures. L'électrolyte peut entraîner la cécité, par conséquent, en cas de contact avec les yeux, rincer immédiatement à l'eau et consulter un médecin dans les plus brefs délais. Lors du remplacement du pack de batteries, toujours mettre AQ1100A/AQ1100B/AQ1100D hors tension et débrancher l'adaptateur c.a. de AQ1100A/AQ1100B/AQ1100D. Le non-respect de cette consigne peut entraîner un choc électrique ou tout autre accident. Tenir le pack de batteries éloigné de toute source de chaleur et des flammes pour éviter le risque d'explosion du pack de batteries ou de déversement d'électrolyte. Respecter les consignes de manipulation supplémentaires fournies dans le manuel d'utilisation du pack de batteries.

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 non-utilisation.

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.

ATTENTION**Limitations relatives à l'environnement opérationnel**

Ce produit est un produit de classe A (pour environnements industriels). L'utilisation de ce produit dans un zone résidentielle peut entraîner une interférence radio que l'utilisateur sera tenu de rectifier.

A propos de Strage moyen

Lorsque l'AQ1100 génère de la lumière, la lumière est émise à travers les ports de source lumineuse. Ne pas débrancher les câbles de fibre optique connectés. Des lésions oculaires peuvent être causées si le faisceau lumineux pénètre l'oeil.

Safety Precautions for Laser Products

This instrument uses a laser light source. This instrument is a Class 1 and Class 3R laser product as defined by IEC60825-1:2007 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.

Laser Class 1 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.



Model	Laser Type	Class	Center Wavelength	Maximum Output Power ¹	Mode Field Diameter
AQ1100A	LD	1	1310 nm, 1550 nm	10 mW	9 μm
	LD ²	3R	650 nm	5 mW	9 μm
AQ1100B	LD	1	1310 nm, 1550 nm, 1625 nm	10 mW	9 μm
	LD ²	3R	650 nm	5 mW	9 μm
AQ1100D	LED	1	850 nm, 1300 nm	50 μW	50 μm (core diameter)
	LD	1	1310 nm, 1550 nm	10 mW	9 μm
	LD ²	3R	650 nm	5 mW	9 μm

1 Under single fault conditions.

2 Applies to models with the /VLS option.

Laser classes differ depending on the standard number and the year of the standard.

Take safety measures according to the laser class corresponding to standard number and year of the country or region that the instrument will be used in.

Waste Electrical and Electronic Equipment (WEEE), Directive



(This directive is only valid 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 instrumentation” product. Do not dispose in domestic household waste. When disposing products in the EU, contact your local Yokogawa Europe B. V. office.

Recycle Mark



Do not dispose together with normal garbage. To protect the environment, please dispose according to the recycling ordinances in your area.

Li-ion

New EU Battery Directive, DIRECTIVE



(This directive is valid only in the EU.)

Batteries are included in this product. This marking indicates they shall be sorted out and collected as ordained in the EU battery directive .

Battery type:

1. Lithium battery
You cannot replace batteries by yourself. When you need to replace batteries, contact your local Yokogawa Europe B.V.office.
2. lithium-ion battery
When you remove batteries from this product and dispose them, discard them in accordance with domestic law concerning disposal.

Take a right action on waste batteries, because the collection system in the EU on waste batteries are regulated.

For instructions on how to remove the battery pack, see section 11.7 in the user's manual (IM AQ1100-01EN, File Name: Features & Operation Manual.pdf).

Authorized Representative in the EEA

Yokogawa Europe B. V. is Authorized Representative of Yokogawa Test & Measurement Corporation in the EEA for this Product. To contact Yokogawa Europe B. V., see the separate list of worldwide contacts, PIM 113-01Z2.

Conventions Used in This Guide

Notes

The notes and cautions in this guide are categorized using the following symbols.



Improper handling or use can lead to injury to the user or damage to the instrument. This symbol appears on the instrument to indicate that the user must refer to the user's manual for special instructions. The same symbol appears in the corresponding place in the user's manual to identify those instructions. In the manual, the symbol is used in conjunction with the word "WARNING" or "CAUTION."

WARNING

Calls attention to actions or conditions that could cause serious or fatal injury to the user, and precautions that can be taken to prevent such occurrences.

CAUTION

Calls attention to actions or conditions that could cause light injury to the user or cause damage to the instrument or user's data, and precautions that can be taken to prevent such occurrences.

Note

Calls attention to information that is important for proper operation of the instrument.

References



This mark signifies a reference to the user's manual.

French

AVERTISSEMENT

Attire l'attention sur des gestes ou des conditions susceptibles de provoquer des blessures graves (voire mortelles), et sur les précautions de sécurité pouvant prévenir de tels accidents.

ATTENTION

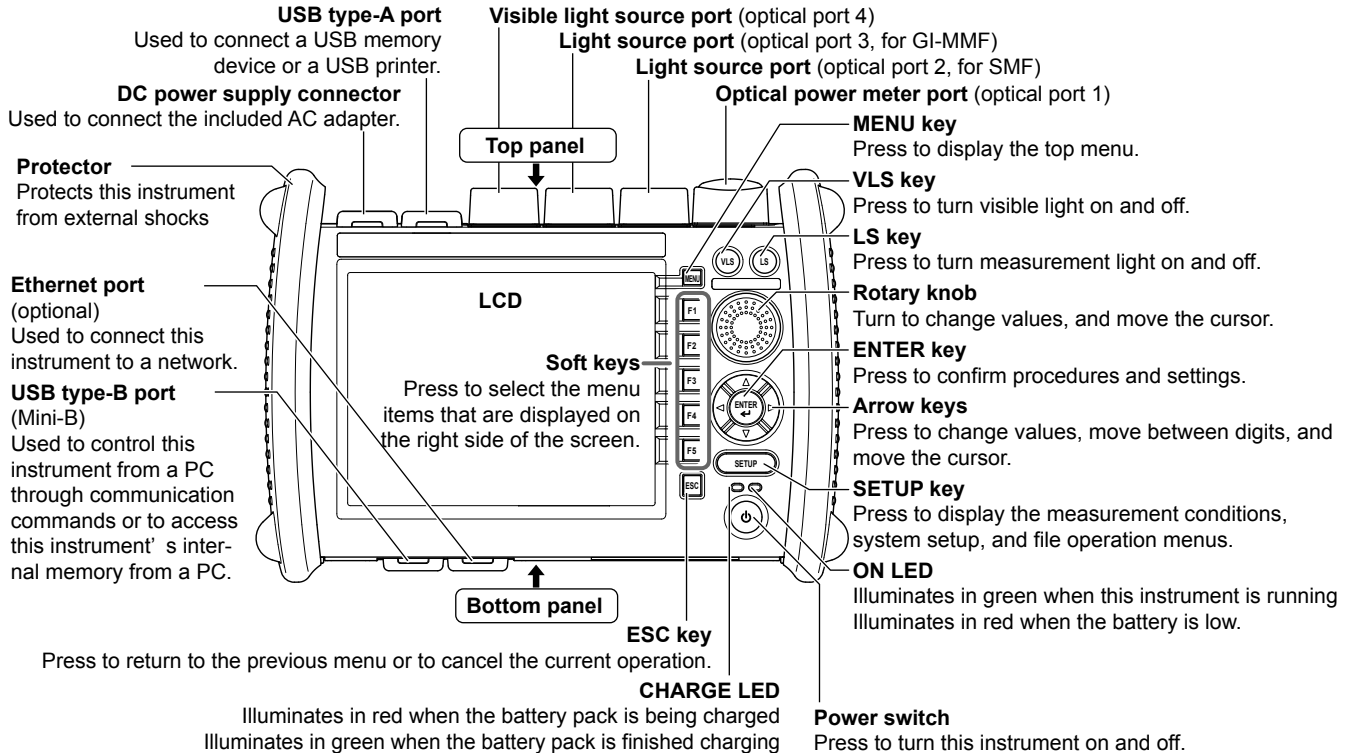
Attire l'attention sur des gestes ou des conditions susceptibles de provoquer des blessures légères ou d'endommager l'instrument ou les données de l'utilisateur, et sur les précautions de sécurité susceptibles de prévenir de tels accidents.

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Names and Functions of Parts

Front Panel



Making Preparations for Measurements

Operating Precautions

Safety Precautions

If you are using this instrument for the first time, make sure to thoroughly read “Safety Precautions,” on pages 7 and 8.

Do Not Remove the Case

Do not remove the case from the instrument. Doing so is extremely dangerous. For internal inspection and adjustment, contact your nearest YOKOGAWA dealer.

Unplug If Abnormal Behavior Occurs

If you notice smoke or unusual odors coming from the instrument, immediately turn off the power, unplug the power cord, and contact your nearest YOKOGAWA dealer.

Use the AC Adapter and Power Cord Correctly

Do not place objects on top of the AC adapter or power cord, and keep them away from heat sources. When removing the plug from the power outlet, do not pull on the cord. Pull from the plug. If the AC adapter or power cord is damaged, contact your nearest YOKOGAWA dealer. Refer to page 3 for the part number to use when placing an order.

General Handling Precautions

Do Not Place Objects on Top of the Instrument

Never place objects such as other instruments or objects that contain water on top of the instrument. Doing so may damage the instrument.

Do Not Subject the Inputs and Outputs to Mechanical Shock

If the I/O connectors or adapters are subjected to mechanical shock, they may be damaged. The instrument may not perform measurements correctly due to damage or deformation that is not visible to the naked eye.

Do Not Scratch the LCD

Because the LCD can be easily scratched, do not allow any sharp objects near it. Also, do not apply vibration or shock to it.

During Extended Periods of Non-Use

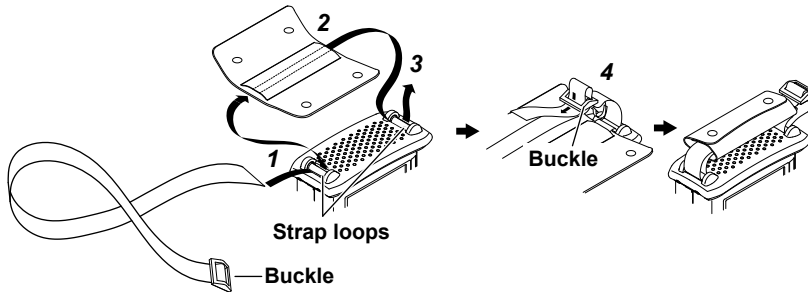
Unplug the power cord from the outlet. Remove the battery pack from the instrument.

When Carrying the Instrument

Remove the power cord and connecting cables. When carrying the instrument, grasp the protector or the attached strap firmly.

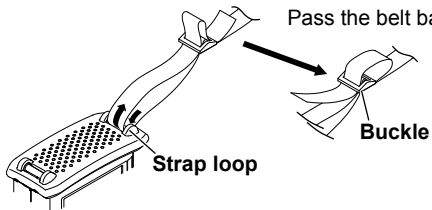
Attaching the Strap

Attaching the Hand Strap



1. Pass the hand strap through the loop on the lower-left side of this instrument.
2. Pass the hand strap through the hand strap cover.
3. Pass the hand strap through the loop on the upper-left side of this instrument.
4. Pass the strap through the buckle, and use the buttons to close the hand strap cover.

Attaching the Shoulder Strap



Pass the belt back through the buckle and tighten it.

Attach the strap to the loops on both the upper-left and upper-right sides of this instrument. These loops are also used when attaching the hand strap, but you cannot attach both the shoulder strap and the hand strap at the same time. Pass the shoulder strap through the loops and then the buckle as shown in the figure. In the same manner, attach the strap to the other side of this instrument.

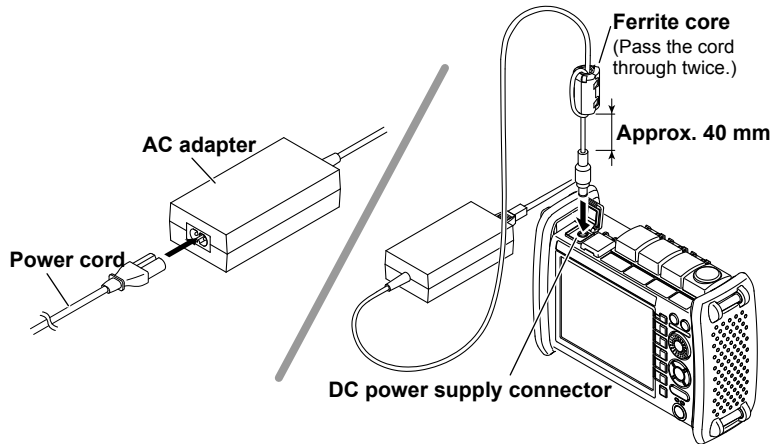
Connecting the Power Supply

Using the AC Adapter



WARNING

- Confirm that this instrument is off before you connect the power supply.
- Make sure that the power supply voltage matches the AC adapter's rated supply voltage and that it does not exceed the maximum voltage range specified for the power cord.
- Only use the AC adapter that was included with this instrument.
- Do not connect or disconnect the AC adapter while this instrument is on.
- If you are using this instrument for a long time with the AC adapter connected, remove the battery pack from this instrument.
- If an appropriate AC outlet for the supplied power cord is unavailable, do not use the instrument.



1. Connect the power cord to the AC adapter.
2. Connect the AC adapter's plug to this instrument's DC power supply connector.
3. Connect the power plug to an outlet.

If the DC power supply connector's cover comes off, bend the cover axle and reattach it.

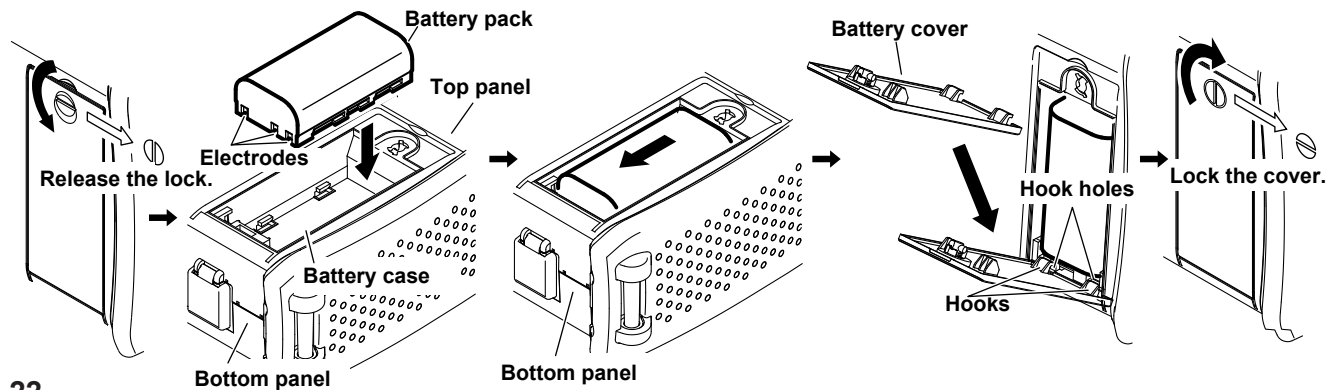
Using the Battery Pack



WARNING

- Do not connect or disconnect the battery pack while electricity is being supplied by the AC adapter.
- To prevent problems before they occur, periodically inspect the battery pack exterior to confirm that there is no damage such as cracks or deformations and to confirm that there is no fluid leakage.
- Use this instrument to charge the battery pack. Maintain the correct environmental conditions when the battery pack is charging. Failure to do so can cause fluid leakage, heating, smoke, explosions, or fire.
- Follow the handling precautions that are included in the battery pack's user's manual.

1. **Unlock and remove the battery cover.**
Insert a coin or screwdriver with a thickness that will not damage the lock slot into the lock slot, and release the lock.
2. **Insert the battery pack into the battery case, towards the top panel.**
Insert the battery pack so that its electrodes are near the bottom panel facing down. Make sure that the entire battery pack is inserted into the case securely.
3. **Pushing the battery pack towards the back of the case, pull it towards the bottom panel.**
4. **Close the battery cover.**
Attach the battery cover from the bottom panel side, making sure that the hooks on the cover enter into their holes on the case.
5. **Lock the battery cover.**



Note

Over Discharge and Long Periods of Storage

- If you do not use this instrument for an extended period of time with the battery pack connected to it, the battery pack may become over discharged. This shortens the service life of the battery pack. To avoid over discharging, if you will not use this instrument for one week or longer, charge the battery pack, remove it from this instrument, and store the battery pack away from direct sunlight in a location that has an ambient temperature of 10°C to 30°C.
- When you store the battery pack for six months or longer, to replace the power that has been lost through self discharge, recharge the battery using this instrument once every six months.
- Avoid storing the battery pack for an extended period of time when it is fully charged (after it has just been charged) or when it has no power left (when this instrument will not turn on). Storing the battery pack under these conditions will degrade its performance and reduce its longevity. It is better to store the battery pack when it is 40% to 50% charged. This is equivalent to the state the battery is in after you turn off this instrument and charge an empty battery for an hour at room temperature.
- Use this instrument to charge the battery pack prior to its first use or if it has not been used for an extended period of time.

Turning On the Power

Press the power switch on this instrument front panel. When this instrument starts normally, the ON indicator illuminates, and the top screen appears. For details on the top screen, see next page.

- If power is being supplied from the AC adapter and the battery pack is not connected, the CHARGE LED does not illuminate.
- When the battery is low, a warning message will appear.
- If the battery is low, use the AC adapter to connect this instrument to an electrical outlet, and charge the battery pack. The remaining battery power appears at the top of the screen.

ON LED
Green: Running
Red: Battery low

CHARGE LED
Red: Charging
Green: Finished charging

Remaining battery power indicator

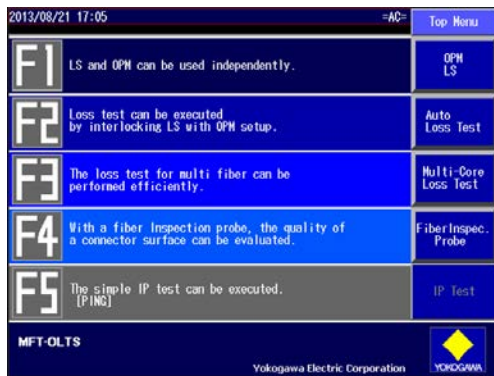
Green: Sufficiently full

Yellow: Half full

Red: Almost empty

When the ON LED lights in red, a warning message appears on the screen.

Top Screen When the AQ1100B/AQ1100B/AQ1100D Starts Normally



For details on the key operation of the top menu, see page 23.

When the Power-on Operation Does Not Finish Normally

Turn off the power switch, and check the following items.

- Is the AC adapter connected correctly? See page 15.
- Is the battery pack loaded correctly? See page 16.
- Are you holding down the power switch for at least 2 seconds?

If this instrument still does not work properly after checking these items, contact your nearest YOKOGAWA dealer for repairs.

Warm Up

To enable more accurate measurements, allow this instrument to warm up for at least 5 minutes after it is turned on.

Connecting Optical Fiber Cables



WARNING

- When this instrument generates light, light is emitted from the light source ports. Do not disconnect the connected optical fiber cables. Visual impairment may occur if the light enters the eye.
- Close the covers of any light source ports that do not have optical fiber cables connected to them. On models with two or more light source ports, visual impairment may occur if light that is mistakenly emitted from the wrong port enters the eye.



CAUTION

- Insert the optical fiber cable connectors slowly and straight into the optical ports. If you shake the connector to the left and right or force it into the port, the optical connector or optical port may be damaged.
- If you use optical connectors that do not meet the specifications, this instrument optical ports may be damaged. Use optical connectors that are approved or used by national or local telecom carriers and providers in your area.
- Use optical fiber cable connectors that conform to the included universal adapter and connector adapter (the universal adapter specified by the suffix code).

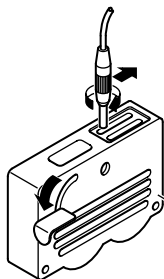
Using SC Angled Physical Contact Connectors (Suffix code /ASC)

- The SC angled physical contact connector's ferrule tip is angle-polished. Use optical fiber cables whose connectors are of the same type. Using a different type of connector may damage the connector end face.
- Do not use UFC and ULC universal adapters on /ASC ports. Doing so may damage this instrument optical ports or the optical fiber cable connectors.

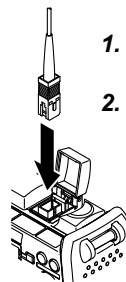
Making Preparations for Measurements

Clean the connector end face of the optical fiber cable before connecting it to the instrument. If dust is adhered to the connector end face, it may damage the instrument's optical port. If this happens, the instrument will not be able to make correct measurements.

1. Firmly press the connector end face of the optical fiber cable against the cleaning surface of the cleaner.
2. While pressing the end face against the cleaner, turn the cable once.
3. While pressing the end face against the cleaner, move the cable.
4. Repeat steps 1 to 3.



You can purchase an optical fiber connector cleaner from NTT-AT Corporation.

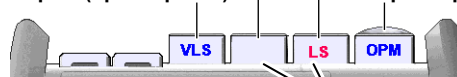


1. Open the optical port cover on the top panel.
2. Properly align the optical fiber cable's connector with the optical port, and insert the connector.

Note

The optical port that you have to connect to varies depending on the wavelength that you need to generate or the application of this instrument. This instrument indicates which port the light will be emitted from by indicating "LS" in an optical port illustration shown in the top section of the screen. Check that "LS" is indicated for the light source port that the optical fiber cable is connected to.

Light source port (optical port 3, for GI-MMF) Light source port (optical port 2, for SMF)
Visible light source port (optical port 4) Optical power meter port (optical port 1)

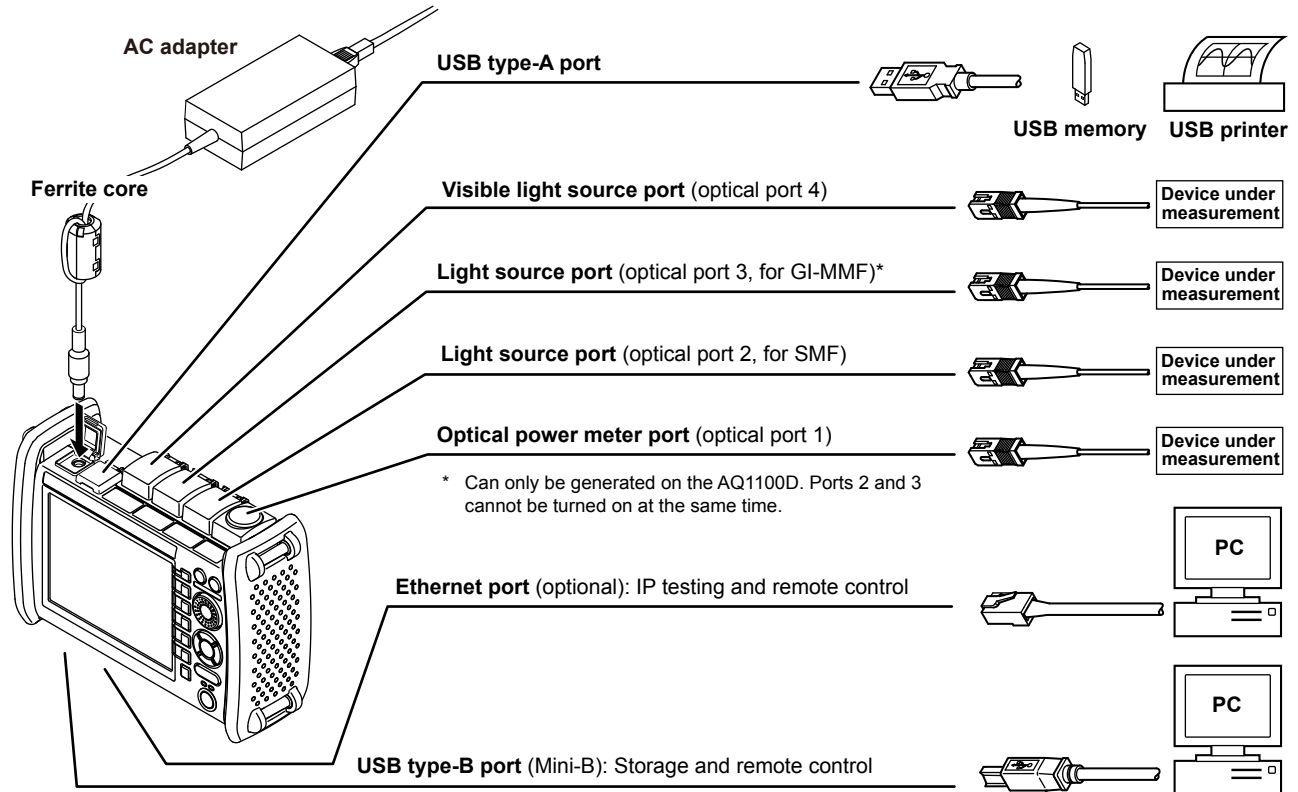


The light source port varies depending on the wavelength that you need to generate.

SM wavelength: "LS" is displayed under port 2.

GI wavelength: "LS" is displayed under port 3.

Connecting Peripheral Devices



Common Operations

To make this guide easier to read, we have omitted or simplified explanations of the kinds of operations listed below.

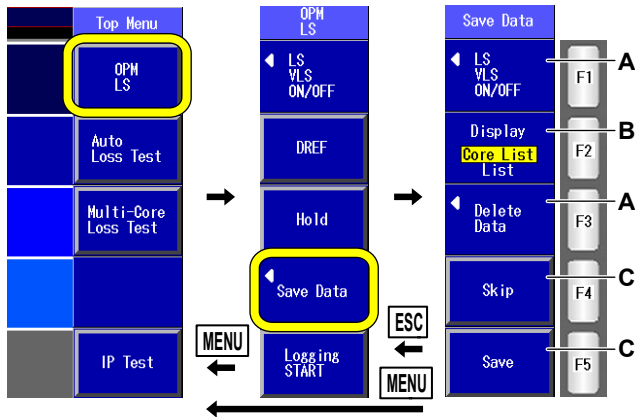
- Repetitive operations.
- Detailed operations for proceeding to the desired setup menu or dialog box and information about the accompanying screen changes.
- Setup items that users can configure if they have a general understanding of them.

Below, we will compare examples of detailed setup operation explanations with explanations that have been omitted or simplified.

Key Operations

First select a feature from this top menu, and then configure the feature or carry out the measurement that corresponds to the feature you have selected. We will use the process of moving from the top menu for models with -SPM or -HPM suffix codes to the Save Data menu as an example of key operations.

1. Press **MENU** to display the top menu.
2. Press the **OPM LS** soft key (**F1**) to display the OPM LS menu.
3. Press the **Save Data** soft key (**F4**) to display the Save Data menu.



Menu operation types A through C are listed below.

A: A selection menu appears when you press the soft key. When you press a soft key that corresponds to an item on the menu, the selected item is confirmed, or the action that corresponds to it is performed.

B: The selected setting switches each time you press the soft key.

C: When you press the soft key, the item that corresponds to it is confirmed, or the action that corresponds to it is performed.

To return to the previous menu, press **ESC**.
To return to the top menu, press **MENU**.

This procedure is simplified as shown on the following page.

In this guide, steps 1 through 3 listed on the previous page and the setup operations in the menu that follows them are written as shown below.

Setup Operation Example

1. Press **MENU** to display the top menu.
2. Press the **OPM LS** soft key and then the **Data Save** soft key to display the following screen.

The image shows a vertical menu with the following items and their corresponding instructions:

- Save Data**: This is the top menu item.
- LS WLS ON/OFF**: In the menu that appears, turn the light source or visible light source on or off.
- Display Core List List**: Set the list to show (Core List, List). The text "Core List" is highlighted in yellow.
- Delete Data**: In the menu that appears, execute the deletion of the selected data.
- Skip**: Executes skipping.
- Save**: Saves the data.

A large right-facing curly bracket groups the "Delete Data", "Skip", and "Save" options with the following text:

At this point, the soft key names are omitted, and the settings that the soft keys are used to configure and the actions that pressing them causes are explained. Options and ranges are listed afterwards.

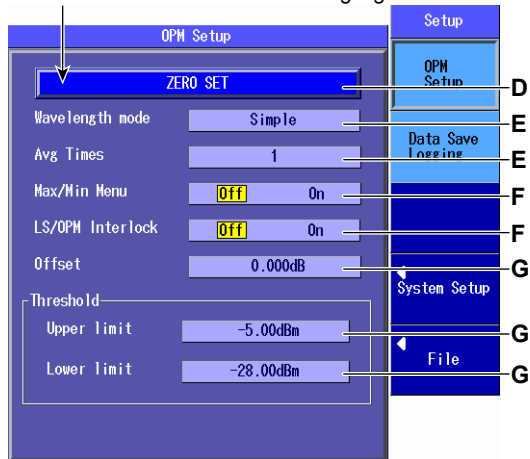
- Step numbers are used when there are many operations and when operations must be performed in different menus.
- The explanation for returning to the previous menu is omitted.

Rotary Knob and Arrow Key Operations

As an example of rotary knob and arrow key operations, we will use the dialog box that appears when you press the **OPM Setup** soft key.

1. Press the **OPM Setup** soft key to display the OPM Setup dialog box.
2. Use the **rotary knob** or the **arrow** keys to move the cursor to the item that you want to configure or execute. The item at the cursor location is highlighted.
3. Press **ENTER**.
 - Next, follow the instructions in the figure below that correspond to the type of item that you are configuring or executing.
 - In this guide, steps 2 and 3 listed above are indicated using the expression "using the **rotary knob** and **ENTER**."

The item at the cursor location is highlighted.



Setup operation types D through G are listed below.

- D:** Press **ENTER** to confirm the item or execute its corresponding action.
- E:** Press **ENTER** to display a menu. Turn the **rotary knob** or press the **up and down arrow** keys to move the cursor to the item that you want to select. Then press **ENTER** to select the item.
- F:** The selected setting switches each time you press **ENTER**.
- G:** Press **ENTER** to display a text box. Turn the **rotary knob** or press the **up and down arrow** keys to increase or decrease a number. To move between digits, press the **left and right arrow** keys. After you have entered a number, press **ENTER** to set the value to that number.

Example of menu for E



Example of text box for G



For setup operation types E and G, to reset the selected item to its previous settings, press **ESC**. To return to the top menu, press **MENU**.

This procedure is simplified as shown on the following page.

In this guide, steps 1 through 3 listed on the previous page and the setup operations in the menu that follows them are written as shown below.

Setup Operation Example

OPM Setup soft key to display the following screen.

The screenshot shows the OPM Setup menu with the following options and their explanations:

- ZERO SET**: Performs zero set
- Wavelength mode**: Set the wavelength mode (Simple, Detail, CWDM).
- Avg Times**: Set the average count (1, 10, 50, 100).
- Max/Min Menu**: Turns the display of the max/min value menu on and off
- LS/OPM Interlock**: Turns on and off the interlocking of the light source and optical power meter settings
- Offset**: Set the offset (–9.900 to 9.900 dB).
- Upper limit**: Set the upper threshold value (–80.00 to 40.00 dB).
- Lower limit**: Set the lower threshold value (–80.00 to 40.00 dB).

At this point, the settings that the items are used to configure and the actions that selecting them causes are explained. Options and ranges are listed afterwards.

- The explanations of rotary knob, arrow key, and ENTER key operations are omitted.
- The explanation of how to reset the selected item to its previous setting is omitted.
- The explanation for returning to the previous menu is omitted.

Setting the Date and Time

1. Press **MENU** to display the top menu.
2. Press **SETUP**.
3. Using the **rotary knob and ENTER**, select **Date & Time Set** to display the following screen.

Date & Time Set		
Date	Year	2010
	Month	1
	Day	18
Time	Hour	15
	Minute	10
	Second	28
Set		
Type	2009/11/25 12:00	

Set the year, month, and day.

Set the hour, minute, and second.

Set this instrument's date and time to the specified values.

The set date and time are displayed in the upper left of the screen.

Set the date and time display format (**Year/Month/Day Time, Day/Month/Year Time, Year. Month (name). Day Time**).

Year, Month, and Date

The year is displayed according to the Gregorian calendar. This instrument supports leap years.

Hour, Minute, and Second

The hour can be set to a value from 0 to 23.

Note

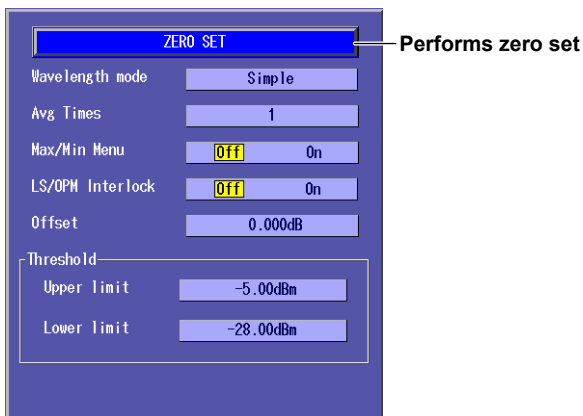
A display example of the date and time is shown in the "Type" box. This is not the actual date and time.

Optical Power Meter

Executing the Zero Set

Remove the optical fiber cables from this instrument and close the optical connector covers, or make sure that the power meter is not receiving any light, and then start the optical power meter zero set procedure.

1. Press **MENU** to display the top menu.
2. Press the **OPM LS** soft key, **SETUP**, and then the **OPM Setup** soft key to display the following screen.
The figure below shows the screen that appears on models with -SPM and -HPM suffix codes. On models with the -PPM suffix code, there is no "Wavelength mode" item.

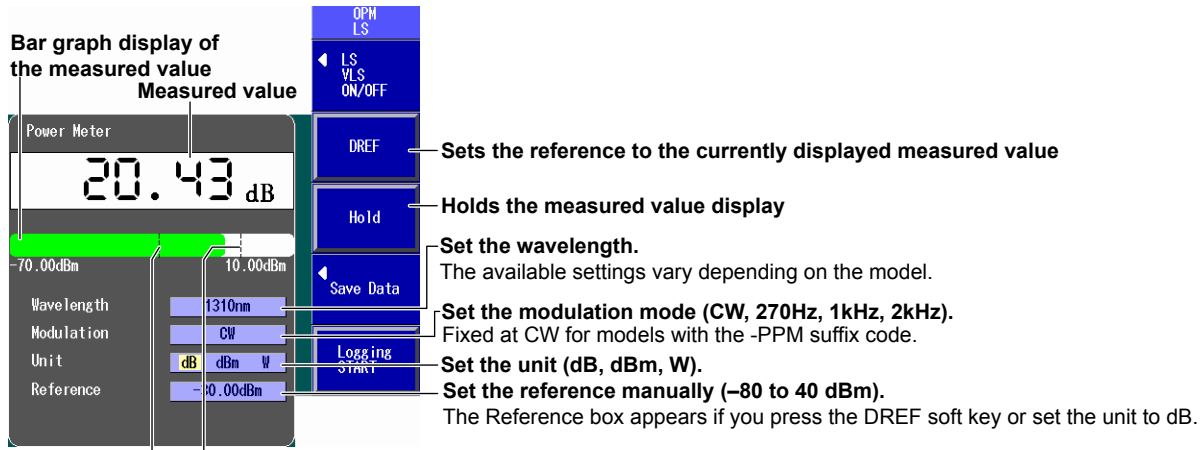


Perform zero set whenever necessary, such as after you have turned on the power or when the ambient temperature changes. Performing zero set adjusts the internal deviation of the optical power measurement section and enables you to obtain more accurate absolute optical power values.

Setting Measurement Conditions

● ● ● ►  section 3.2, “Setting Optical Power Measurement Conditions and Holding the Display” in the user’s manual

1. Press **MENU** to display the top menu.
2. Press the **OPM LS** soft key to display the following screen.



Bar graph display of the measured value
Measured value

Power Meter
20.43 dB

70.00dBm 10.00dBm

Wavelength 1310nm
Modulation CW
Unit dB dBm W
Reference -10.00dBm

OPM LS
LS VLS ON/OFF
DREF
Hold
Save Data
Logging Start

- DREF** — Sets the reference to the currently displayed measured value
- Hold** — Holds the measured value display
- Save Data** — Set the wavelength.
The available settings vary depending on the model.
- Logging Start** — Set the modulation mode (CW, 270Hz, 1kHz, 2kHz).
Fixed at CW for models with the -PPM suffix code.
- Logging Start** — Set the unit (dB, dBm, W).
Set the reference manually (–80 to 40 dBm).
The Reference box appears if you press the DREF soft key or set the unit to dB.

Lower threshold line Upper threshold line

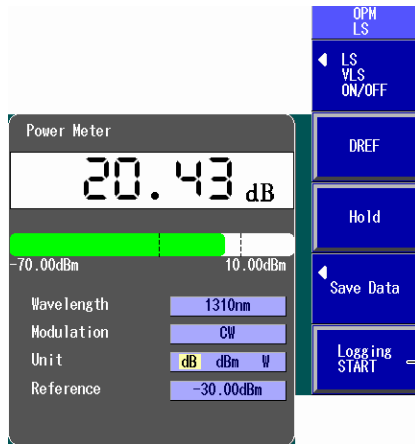
Lines showing the upper and lower threshold values

For details regarding these settings, see section 3.2 in the user’s manual.

Logging

● ● ● ▶  section 3.3, “Logging Measured Values and Saving Logged Results” in the user’s manual

1. Press **MENU** to display the top menu.
2. Press the **OPM LS** soft key to display the following screen.



Starts logging

Set the measurement interval and the log count in the detailed setup screen.* After the specified number of logs are recorded, a screen for saving the logged results appears (see following page).

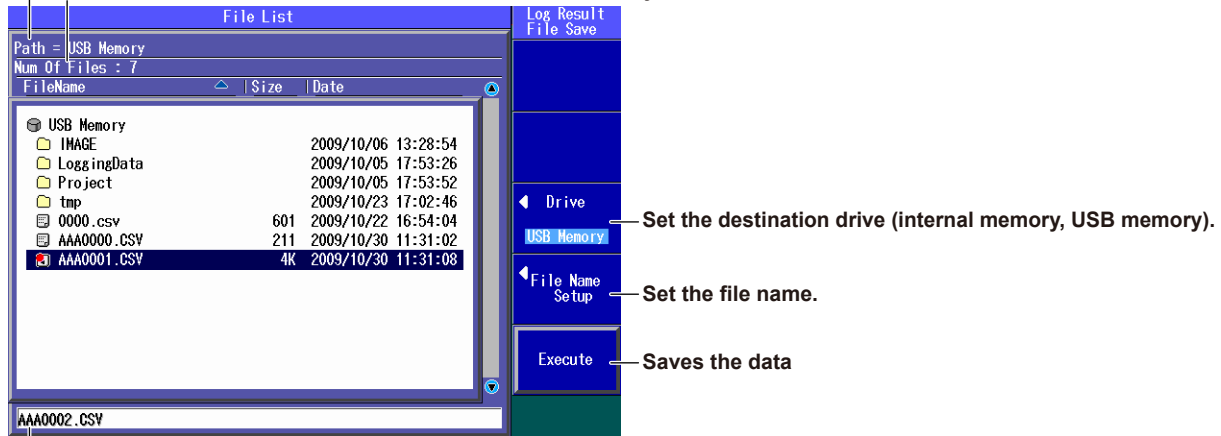
* When the screen shown above is displayed, press **SETUP** and then the **Data Save Logging** soft key to display the detailed setup screen.

For details regarding these settings, see section 3.3 in the user’s manual.

When logging is completed, the following screen for saving the logged results appears.

The path of the destination directory

The number of folders and files in the destination directory



The file name candidate for the next save operation

The logged results are saved in CSV format.

For details regarding file names, see section 9.2 in the user's manual.

Light Source

Producing Measurement Light

● ● ● ▶ 📖 section 5.1, “Producing Measurement Light” in the user’s manual



WARNING

When this instrument generates light, light is transmitted from the light source ports. Do not disconnect the connected optical fiber cables. Visual impairment may occur if the light enters the eye.

French

AVERTISSEMENT

N'enlevez pas un dispositif de mémoire USB et ne coupez pas l'alimentation électrique lorsque l'indicateur d'accès à la mémoire USB clignote ou lorsque les données sont en train d'être enregistrées ou chargées à partir d'une mémoire interne. Vous risqueriez d'endommager le support de stockage (mémoire USB ou mémoire interne) ou les données qu'il contient.

Light Source

1. Press **MENU** to display the top menu.
2. Press the **OPM LS** soft key to display the following screen.

The wavelength and modulation mode of the emitted light

The screenshot displays the 'OPM LS' screen. At the top, it shows 'Light Source' with 'CW' and '1310 nm'. Below this, 'Wave Length' is set to 'SH 1310nm' and 'Modulation' is set to 'CW'. A 'Power Meter' section shows '-10.01 dBm' with a green bar graph and a scale from -50.00dBm to 30.00dBm. At the bottom, 'Wave Length' is set to '1210nm', 'Modulation' is set to 'CW', and 'Unit' is set to 'dB dBm W'. A vertical menu on the right contains: 'OPM LS', 'LS VLS ON/OFF', 'DREF', 'Hold', 'Save Data', and 'Logging START'. Two callout boxes point to the 'Wave Length' and 'Modulation' settings.

Set the wavelength.

The available settings vary depending on the model.

Set the modulation mode.

The available settings vary depending on the model.

Turning the Light Source On and Off

Turn the light source on after you set the wavelength and the modulation mode.

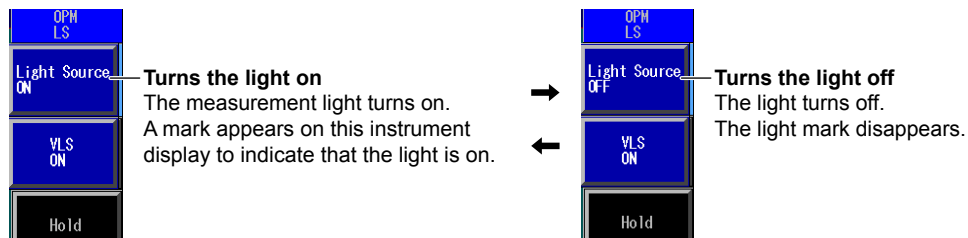
Pressing the LS Key

Press **LS** to turn on the measurement light. A mark appears on this instrument display to indicate that the light is on.

While the light is on, press **LS** to turn off the light. The light mark disappears.

Pressing the Soft Key

Press the **LS VLS ON/OFF** soft key to display the following menu.



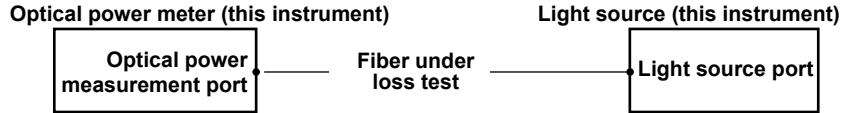
While the above menu is displayed, you can also turn the light on and off by pressing **LS**.

You can use an option to generate visible light.

For details regarding these settings, see sections 5.1 and 5.2 in the user's manual.

Auto Loss Testing

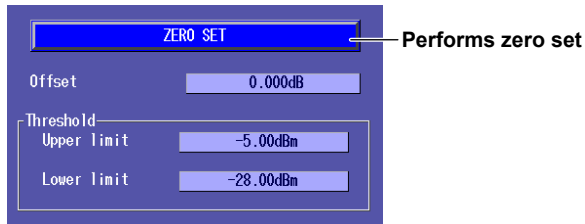
This section explains the auto loss testing procedure that is used to measure optical fiber and optical line degradation. This procedure uses this instrument as both a light source and an optical power meter.



Executing the Zero Set

Remove the optical fiber cables from this instrument and close the optical connector covers, or make sure that the power meter is not receiving any light, and then start the optical power meter zero set procedure.

1. Press **MENU** to display the top menu.
2. Press the **Auto Loss Test** soft key, **SETUP**, and then the **OPM Setup** soft key to display the following screen.

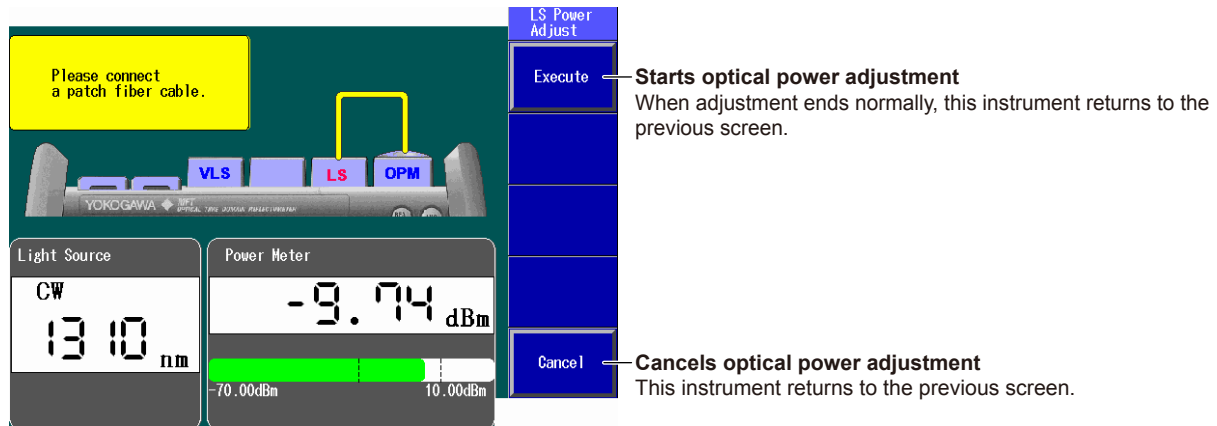


Perform zero set whenever necessary, such as after you have turned on the power or when the ambient temperature changes. Performing zero set adjusts the internal deviation of the optical power measurement section and enables you to obtain more accurate absolute optical power values.

Adjusting the Optical Power

Use a short optical fiber to connect a light source port to an optical power measurement port on the same instrument, and then perform optical power adjustment.

1. Press **MENU** to display the top menu.
2. Press the **Auto Loss Test** soft key, the **Function Select** soft key, and then the **Light Source** soft key.
3. Using the **rotary knob and ENTER**, select the wavelength at which you want to perform loss testing.
4. Using the **rotary knob and ENTER**, select LS Power Adjust to display the following screen.



Adjust the optical power of the light source as necessary. When you execute optical power adjustment, this instrument automatically identifies the optical power level and adjusts itself accordingly. Perform optical power adjustment on the light source.

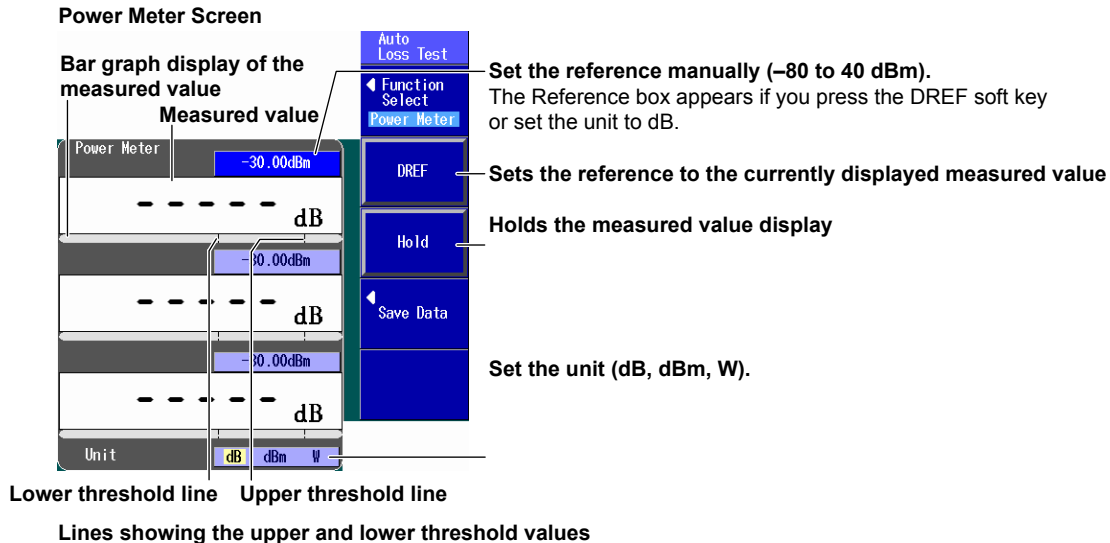
Connect a short optical fiber of a few meters or less in length. Make sure that the fiber is free from dirt, scratches, bends, and other potential causes of optical degradation.

Performing Auto Loss Testing

● ● ● ▶  section 6.2, "Performing an Auto Loss Test" in the user's manual

Configuring the Optical Power Meter

1. Press **MENU** to display the top menu.
2. Press the **Auto Loss Test** soft key, the **Function Select** soft key, and then the **Power Meter** soft key to display the following screen.



For details regarding these settings, see section 6.2 in the user's manual.

Configuring the Light Source

1. Press **MENU** to display the top menu.
2. Press the **Auto Loss Test** soft key, the **Function Select** soft key, and then the **Light Source** soft key to display the following screen.

When you start a loss test, this instrument generates wavelengths 1, 2, and 3 in order, and the current wavelength appears here.

Light Source

CW

Wavelength 1 SH 1310nm

Wavelength 2 OFF

Wavelength 3 OFF

LS Power Adjust

Power Meter

--- dBm

--- dBm

--- dBm

Auto Loss Test

Function Select

Light Source

Loss Test START

Executes the auto loss test
This instrument performs an optical power adjustment and then executes an auto loss test as explained below using the optical power meter settings from the previous page and the light source wavelength setting.

Set the wavelength.
The available settings vary depending on the model.

Performs an optical power adjustment (see page 39)

Performing Auto Loss Testing

Connect one end of the optical fiber or line that you want to perform loss testing on to the optical power measurement port of the power meter, and connect the other end to the light source port of the light source.

3. Press the **Loss Test START** soft key from the light source to perform the auto loss test. The light source generates, in order, the wavelengths that you specified for 1, 2, and 3. The optical power meter measures the optical power of the light that it receives.

Saving Data

- In the Power Meter screen of the optical power meter, press the **Save Data** soft key to display the following screen.

When “Display” is set to “Core List”

Check mark indicating that the data has been saved

Skipped core numbers are dimmed.

The core number that is set as the save destination is highlighted.

Core no.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Core	No	nm	Data	Mod.	Ref	Offset	Date
4	1	---	---	---	---	---	---/---:---
4	2	---	---	---	---	---	---/---:---
4	3	---	---	---	---	---	---/---:---

Save area

Power Meter				
Wave length	Modulation	Reference	Offset	Data
1310 nm	AUTO	-30.00 dBm	0.00 dB	20.25 dB
0 nm	AUTO	-30.00 dBm	0.00 dB	
0 nm	AUTO	-30.00 dBm	0.00 dB	

Data (measurement conditions and measured values)

Save Data — Use the rotary knob and the arrow keys to select a core number.

LS VLS ON/OFF

Display Core List List — Set the list to show (Core List, List).

Delete Data — Delete data.

Skip — Specify skipping.

Save — Save the data.

You can save up to three sets of data in the save area of the specified core.

For details regarding saving data, see sections 3.4 and 4.3 in the user's manual.

- Press **SETUP** and then the **File** soft key to display the file save screen. The loss test results are saved in CSV format. Follow the procedure in section 9.2 in the user's manual to carry out the file operation to save the data.

Specifications

Display

Item	Specification
Display	5.7-inch color TFT LCD* Display resolution: 640×480
LED indicators	ON LED, CHARGE LED

* The LCD may include a few defective pixels.

The LCD may contain some pixels that are always illuminated or that never illuminate. Please be aware that these are not defects.

Optical Power Meter

Item	Specification		
	Suffix Code -SPM (Standard)	Suffix Code -HPM (High input)	Suffix Code -PPM (PON)
Wavelength	Simple: 850 nm, 1300 nm, 1310 nm, 1490 nm, 1550 nm, 1625 nm, 1650 nm Fine: Range: 800 nm to 1700 nm in 1 nm steps CWDM: Range: 1270 nm to 1610 nm in 20 nm steps (the CWDM wavelength grid spacing)		1310 nm, 1490 nm, 1550 nm 1490 nm and 1550 nm are measured separately at the same time.
Power range	-70 dBm to +10 dBm (CW) -70 dBm to 7 dBm (CHOP)	-50 dBm to +27 dBm (CW) -50 dBm to 24 dBm (CHOP) ¹	-70 dBm to +10 dBm (1310 nm, 1490 nm) -50 dBm to +27 dBm (1550 nm)
Noise level	0.5 nW (-63 dBm, 1310 nm)	50 nW (-43 dBm, 1310 nm)	0.5 nW (-63 dBm, 1310 nm) 50 nW (-43 dBm, 1550 nm)
Uncertainty at reference conditions ²	±5%	±5%	±0.5 dB (10%)
Display resolution	0.01		
Modulation mode	CW, CHOP (270 Hz, 1 kHz, 2 kHz)		CW

1 Excluding 850 nm and 1650 nm.

2 Under the following conditions: the ambient temperature is 23°C ± 2°C, the modulation mode is CW, the wavelength is 1310 nm, the optical input power is 100 μW, and SM fiber optic cables are being used. The wavelength is 1550 nm on models with the -PPM suffix code. All other conditions are the same.

The ambient temperature is 23°C ± 2°C unless otherwise stated.

Specifications

Measurement Light

Item	Specification		
	Model AQ1100A	Model AQ1100B	Model AQ1100D
Optical connector	Select from the /USC, /UFC, and /ASC options		Select from the /USC, /UFC, and /ULC options
Center wavelength ¹	SM 1310 nm ± 25 nm SM 1550 nm ± 25 nm	SM 1310 nm ± 25 nm SM 1550 nm ± 25 nm SM 1625 nm ± 25 nm	GI 850 nm ± 30 nm GI 1300 nm ± 30 nm SM 1310 nm ± 25 nm SM 1550 nm ± 25 nm
Light emitter	LD		LED (GI), LD (SM)
LD spectral width ^{1,2}	< 5 nm (1310 nm) < 10 nm (1550 nm)	< 5 nm (1310 nm) < 10 nm (1550 nm, 1625 nm)	< 5 nm (1310 nm) < 10 nm (1550 nm)
LED spectral width ^{1,3}	—	—	40 nm (typical value; 850 nm) ⁴ 140 nm (typical value; 1300 nm) ⁴
Optical output level	-3 dBm ± 1 dBm		-20 dBm ± 1 dBm (850 nm, 1300 nm) -3 dBm ± 1 dBm (1310 nm, 1550 nm)
Level stability ⁵	±0.05 dB		±0.1 dB (850 nm, 1300 nm) ± 0.05 dB (1310 nm, 1550 nm)
Modulation mode	CW, CHOP (270 Hz, 1 kHz, 2 kHz) ⁶		
Compliant fiber	SM (ITU-T G.652)		GI (50/125 μm) SM (ITU-T G.652)
Laser class	1		

1 Under the following conditions: the ambient temperature is 23°C ± 2°C and the modulation mode is CW.

2 Under the following conditions: Rms 2σ and -20 dB.

3 Under the following condition: -3 dB envelope.

4 Typical values represent typical or average values. They are not strictly warranted.

5 The level is stable for 15 minutes when the ambient temperature is kept at a constant temperature within the range of 23°C ± 2°C.

6 850 nm and 1300 nm when the modulation mode is CW and CHOP (270 Hz).

The ambient temperature is 23°C ± 2°C unless otherwise stated.

Visible Light Source (/VLS option)

Item	Specification
Optical connector	2.5 mm ferrule type
Center wavelength	650 nm \pm 20 nm
Optical output level	(Peak value – 3 dBm) or more
Modulation mode	CHOP (2 Hz)
Compliant fiber	SM (ITU-T G.652)
Laser class	3R

The ambient temperature is 23°C \pm 2°C unless otherwise stated.

Functions

Item	Specification	
Optical power meter	Relative value display (DREF)	The reference is the displayed measured or a manually entered value.
	Units	Absolute value: dBm, mW, μ W, nW, pW Relative value: dB
	Average count	1, 10, 50, 100
	Offset	Range: –9.900 dB to 9.900 dB
	Threshold value	Range for the upper and lower limits: –80 dB to 40 dB
	Max/min value display	Show/hide
	Interlocking of light source and optical power meter settings	Interlock/do not interlock
	Hold	Holds the displayed measured values.
	Zero set	Adjusts the internal deviation of the optical power measurement section.
	Logging	Measurement interval: 500 ms, 1 s, 2 s, 5 s, 10 s. Measurement count: 10 to 1000
PON power meter (Applies to models with the -PPM suffix code)	<ul style="list-style-type: none"> Measures the optical power of each signal wavelength in the upstream direction from ONU to OLT and in the downstream direction from OLT to ONU. The relative value display, average count, offset, threshold value, hold, and zero set functions are the same functions as those that are used with the optical power meter. 	
Light source	Units Generates measurement light and visible light.	
Optical power adjustment	Use a short optical fiber to connect a light source port to an optical power measurement port on the same instrument, and this instrument automatically adjusts the optical power output level to its preset value.	

Specifications

Item	Specification
Loss test (Applies to models with -SPM or -HPM suffix codes)	Auto loss testing Uses this instrument as light source and optical power meter to measure optical degradation.
	Loop-back loss testing Performs a loss test that uses both the light source and optical power meter functions on one instrument.
Multicore loss testing (Applies to models with -SPM or -HPM suffix codes)	<p>Uses one instrument as an optical power meter master and another as a light source slave to measure the optical degradation of a multicore optical fiber.</p> <ul style="list-style-type: none"> • Use communication fiber to connect the master's light source port (port 2) and the slave's optical power measurement port (optical port 1). • Connect one end of the optical fiber that you want to measure for optical degradation to the master's optical power measurement port, connect the other end to the slave's light source port, and measure the optical power on the master. • By creating projects, you can enable the master and slave to share information.
IP test (Only on models with the /LAN option)	Performs a ping test to check the whether or not the network layer of an Ethernet LAN line is established.
Saving and loading data	<p>Measured data, setup data, and screen image data can be saved to the internal memory or to an external USB memory device.</p> <ul style="list-style-type: none"> • Saved measured data and setup data can be loaded. • File operations such as copying, deleting, and renaming and folder operations such as creating, copying, and deleting can be performed.
Printing	Screen images can be printed to a USB printer.*
Other functions	Functions such as the display language, beep, the start menu, the Mini-B USB port function, the screen color, power save mode, the network connection (/LAN option), and self-tests can be set up and executed.

* For information on compatible USB printers, contact your nearest YOKOGAWA dealer.

Storage

Item	Specification	
Internal memory	Memory size ¹	110 MB ²
USB port for connecting peripheral devices	Connector type	Type A connector (receptacle)
	Electrical and mechanical specifications	USB Rev. 1.1 compliant
	Supported transfer mode	Low speed mode (1.5 Mbps)
	Supported devices ³	Inkjet printers compatible with USB Printer Class Ver. 1.1 Mass storage devices compatible with USB Mass Storage Class Ver. 1.1
	Number of ports	1
	Power supply	5 V, Max 500 mA

1 The memory size may be changed.

2 This is the part of the memory in which the user can load and save data through file operations.

3 For information on devices that are supported, contact your nearest YOKOGAWA dealer.

PC Interface

Item	Specification	
USB port for PC connection	Connector type	Type B connector (Mini-B, receptacle)
	Electrical and mechanical specifications	USB Rev. 1.1 compliant
	Supported transfer mode	Low speed mode (1.5 Mbps)
	PC system requirements	PC must be running Windows Vista or Windows XP and must be equipped with USB ports.
	Number of ports	1

Specifications

Item	Specification	
Ethernet interface (/LAN option)	Connector type	RJ-45 connector
	Electrical and mechanical specifications	IEEE 802.3 compliant
	Transmission system	Ethernet (100BASE-TX/10BASE-T)
	Communication protocol	TCP/IP
	Supported services	DHCP and FTP server
Number of ports	1	

General Specifications

Item	Specification	
Storage environment	Ambient temperature	-20 to 60°C
	Ambient humidity	20 to 85%RH (no condensation)
	Elevation	3000 m or less
Operating environment	Ambient temperature	0 to 45°C (0 to 40°C when the AC adapter is in use); 0 to 35°C when charging the battery
	Ambient humidity	20 to 85%RH (no condensation)
	Elevation	2000 m or less
Warm-up time	5 minutes or more ¹	
Recommended calibration period	One year	
AC power supply	Rated supply voltage	100 to 240 VAC
	Permitted supply voltage range	90 to 264 VAC
	Rated supply frequency	50/60 Hz
	Permitted supply voltage frequency range	48 to 63 Hz
Battery pack	Run time: 6 hours ² . Charge time: 5 hours (at an ambient temperature of 23°C and when this instrument is off).	
External dimensions	217.5 (W) × 157 (H) × 74 (D) mm, excluding protrusions	
Weight	Approx. 1 kg, including the battery pack	
Installation position	Hand-held, horizontally or vertically oriented, and oriented on a slant with a stand. Stacking prohibited.	

¹ Excludes the optical output level stability.

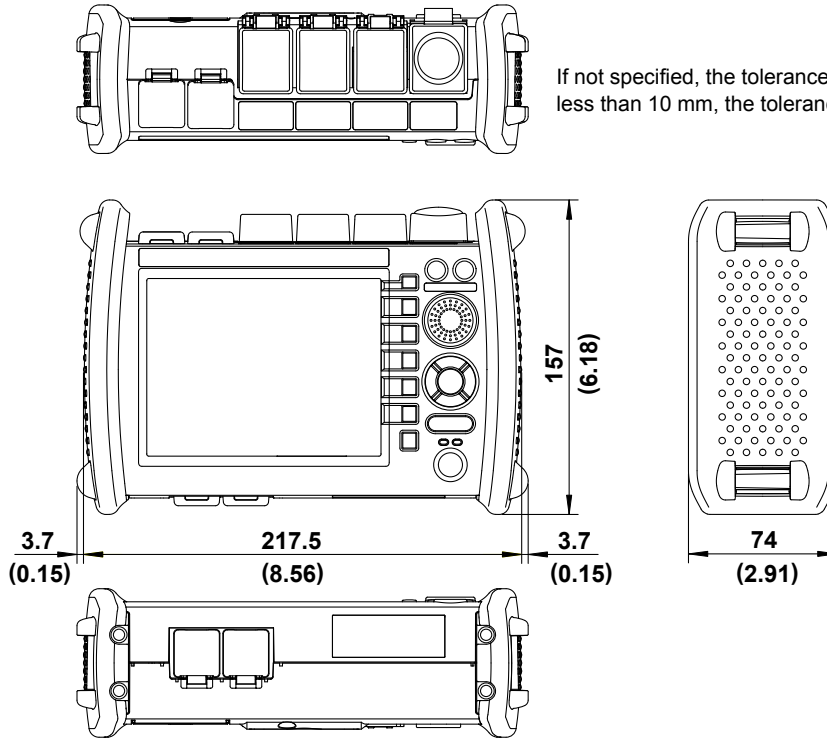
² When the LD light is on and the screen saver feature of Power Save mode has caused the display to turn off.

Item	Specification
Environmental protection	Uses lead-free soldering
Safety standard	Low-voltage directive Compliant standards EN61010-1
	Laser safety standard Compliant standards IEC 60825-1:2007, EN 60825-1:2014, GB 7247.1-2012 FDA 21 CFR 1040.10
Emissions	<p>Compliant standards</p> <p>EN61326-1 class A</p> <p>EN55011 class A, group 1</p> <p>EMC Regulatory Arrangement in Australia and New Zealand EN 55011 Class A, Group 1</p> <p>Korea Electromagnetic Conformity Standard (한국 전자파적합성기준)</p> <p>EN61000-3-2</p> <p>EN61000-3-3</p> <p>This product is a Class A (for industrial environments) product. Operation of this product in a residential area may cause radio interference in which case the user will be required to correct the interference.</p> <p>Cable conditions</p> <p>USB ports</p> <p> Use shielded cables. Use cables that are 3 m or less in length.</p> <p>Ethernet port</p> <p> Use Ethernet cables that are 30 m or less in length.</p> <p>DC power supply connector</p> <p> Pass the included AC adapter's power cord twice through the ferrite core* at approximately 40 mm from the DC power supply connector's end of the cable, and then connect the power cord to the DC power supply connector (see the figure on page 15).</p>
Immunity	<p>Compliant standards</p> <p>EN61326-1 Table 2 (for industrial locations)</p> <p>Cable conditions</p> <p> Same as the emission cable conditions.</p>

* TDK: ZCAT2035-0930A, YOKOGAWA: A1190MN.

Specifications

External Dimensions



Unit : mm
(approx. inch)

If not specified, the tolerance is $\pm 3\%$. However, in cases of less than 10 mm, the tolerance is ± 0.3 mm.