User's Manual

AQ6150/AQ6151 Optical Wavelength Meter Getting Started Guide

YOKOGAWA
Yokogawa Test & Measurement Corporation

IM AQ6150-02EN
7th 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 website.

http://tmi.yokogawa.com/

Thank you for purchasing the AQ6150/AQ6151 Optical Wavelength Meter. The AQ6150/AQ6151 is a high-speed wavelength measuring instrument for LD and LED light sources. This getting started guide primarily explains the handling precautions and basic operations of the AQ6150/AQ6151. To ensure correct use, please read this manual thoroughly before beginning operation. Keep this manual in a safe place for quick reference in the event that a question arises.

List of Manuals

The following manuals, including this one, are provided as manuals for the AQ6150/AQ6151. Please read all manuals.

Manual Title	Manual No.	Description
AQ6150/AQ6151 Optical Wavelength Meter User's Manual	IM AQ6150-01EN	The manual explains all the AQ6150/AQ6151 features other than the remote control features.
AQ6150/AQ6151 Optical Wavelength Meter Getting Started Guide	IM AQ6150-02EN	This guide. Provided as a printed manual. This guide explains the handling precautions, basic operations, and specifications of the AQ6150/AQ6151.
AQ6150/AQ6151 Optical Wavelength Meter Remote Control User's Manual	IM AQ6150-17EN	The manual explains the AQ6150/AQ6151 communication interface features and how to use them.

The "EN" in the manual number is the language code.
PDF files of all the manuals above are included in the accompanying manual CD.

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 contents of this manual without the permission of YOKOGAWA is strictly prohibited.

Trademarks

- Microsoft, Internet Explorer, MS-DOS, Windows, Windows NT, and Windows XP are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.
- Adobe and Acrobat are either registered trademarks or trademarks of Adobe Systems Incorporated.
- In this manual, the ® and TM symbols do not accompany their respective registered trademark or trademark names.
- Other company and product names are registered trademarks or trademarks of their respective holders.

7th Edition: October 2017 (YMI)

Revisions

- 1st Edition: December 2012
- 2nd Edition: September 2014
- 3rd Edition: January 2016
- 4th Edition: October 2016
- 5th Edition: November 2016
- 6th Edition: January 2017
- 7th Edition: October 2017

Checking the Contents of the Package

Unpack the box and check the contents before operating the instrument. 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.

AQ6150/AQ6151

Check that the product that you received is what you ordered by referring to the model name and suffix code given on the name plate on the rear panel.

MODEL	SUFFIX[1]		Specifications
AQ6150			Optical Wavelength Meter
AQ6151			Optical Wavelength Meter
Specifications	-10		Base model
Power cord[2]	-D		UL/CSA Standard power cord (Part No.: A1006WD) Maximum rated voltage: 125 V
	-F		VDE Standard power cord (Part No.: A1009WD) Maximum rated voltage: 250 V
	-Q		BS Standard power cord (Part No.: A1054WD) Maximum rated voltage: 250 V
	-R		AS Standard power cord (Part No.: A1024WD) Maximum rated voltage: 250 V
	-H		GB Standard power cord (Part No.: A1064WD) Maximum rated voltage: 250 V
	-N		NBR Standard power cord (Part No.: A1088WD) Maximum rated voltage: 250 V
Options		/FC	AQ9441 (FC) connector adapter[3]
		/SC	AQ9441 (SC) connector adapter[3]

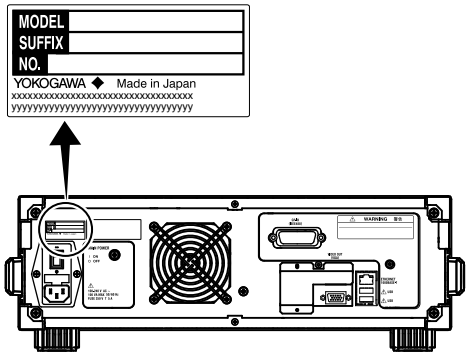
1 For products whose suffix code contains “Z,” an exclusive manual may be included. Please read it along with the standard manual.

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

3 Already attached to the optical input of the AQ6150/AQ6151 front panel.

No. (Instrument number)

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

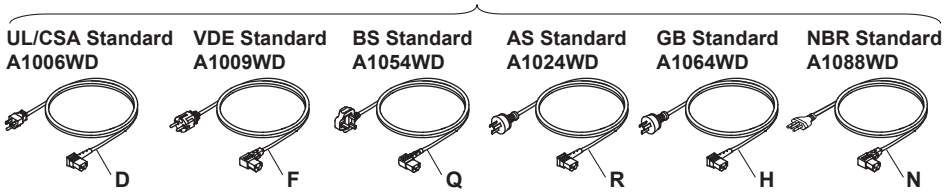


Standard Accessories

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

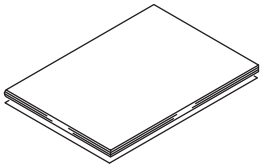
Item	Model	Quantity	Specifications
Power cord*	A1006WD	1	UL, CSA, and PSE standard
	A1009WD		VDE standard
	A1054WD		BS standard
	A1024WD		AS standard
	A1064WD		GB standard
	A1088WD		NBR standard
Rubber feet	A9088ZM	2	1 A9088ZM sheet
Manuals			
Printed Manuals	IM AQ6150-02EN	1	This guide.
	IM AQ6150-92Z1	1	The user's manual for China
	PM 113-01Z2	1	List of worldwide contacts
Manual CD	B8091YA	1	Contains PDFs of the user's manuals (For the types of manuals that CD contains, see Manual CD below.)

Power cord (one cord that matches the suffix code is included)*

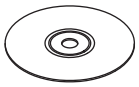


Rubber feet
A9088ZM

Manuals
• Printed Manuals



• Manual CD



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

Manual CD

The English folder in the manual CD contains the PDF files shown below. The CD also contains Japanese manuals.

File Name	Manual Title	Manual No.
Operation Manual.pdf	AQ6150/AQ6151 Optical Wavelength Meter User's Manual	IM AQ6150-01EN
Getting Started Guide.pdf	AQ6150/AQ6151 Optical Wavelength Meter Getting Started Guide	IM AQ6150-02EN
Remote Control.pdf	AQ6150/AQ6151 Optical Wavelength Meter Remote Control User's Manual	IM AQ6150-17EN

To view these user's manuals, you need Adobe Reader 5.0 or later.

WARNING

Never play this CD-ROM, which contains the user's manuals, in an audio CD player. Doing so may cause loss of hearing or speaker damage due to the large sounds that may be produced.

French

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.

Optional Accessories (Sold separately)

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

Item	Model	Min. Q'ty	Specifications
AQ9441 Connector Adapter	813917321-FCC	1	FC type
	813917321-SCC	1	SC type

Safety Precautions

This instrument is an IEC safety class I instrument (provided with a terminal for protective earth grounding).
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.

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.

Alternating current

ON (power)

OFF (power)

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.

Courant alternatif

Marche (alimentation)

Arrêt (alimentation)

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

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.

Use the Correct Power Supply
Before connecting the power cord, ensure that the source voltage matches the rated supply voltage of the instrument and that it is within the maximum rated voltage of the provided power cord.

Use the Correct Power Cord and Plug
To prevent the possibility of electric shock or fire, be sure to use the power cord supplied by YOKOGAWA. The main power plug must be plugged into an outlet with a protective earth terminal. Do not invalidate this protection by using an extension cord without protective earth grounding.
Additionally, do not use the power cord supplied with this instrument with another instrument.

Connect the Protective Grounding Terminal
Make sure to connect the protective earth to prevent electric shock before turning ON the power. The power cord that comes with the instrument is a three-prong type power cord. Connect the power cord to a properly grounded three-prong outlet.

Do Not Impair the Protective Grounding
Never cut off the internal or external protective earth wire or disconnect the wiring of the protective earth terminal. Doing so may result in electric shock or damage to the instrument.

Do Not Use When the Protection Functions Are Defective
Before using this instrument, check that the protection functions, such as the protective grounding and fuse, are working properly. If you suspect a defect, do not use the instrument.

Do Not Operate in an Explosive Atmosphere
Do not operate the 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. The inside of the instrument is dangerous because parts of it have high voltages.

Install or Use the Instrument in Appropriate Locations
- This instrument is designed to be used indoors. Do not install or use it outdoors.
- Install the instrument so that you can immediately remove the power cord if an abnormal or dangerous condition occurs.

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.

French

AVERTISSEMENT

Utiliser l’instrument aux seules fins pour lesquelles il est prévu
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.

Vérifier l’alimentation
Avant de brancher le cordon d’alimentation, vérifier que la tension source correspond à la tension d’alimentation nominale du AQ6150/AQ6151 et qu’elle est compatible avec la tension nominale maximale du cordon d’alimentation.

Utiliser le cordon d’alimentation et la fiche adaptés
Pour éviter les risques de choc électrique ou d’incendie, utilisez le cordon d’alimentation fourni par YOKOGAWA. La fiche doit être branchée sur une prise secteur raccordée à la terre. En cas d’utilisation d’une rallonge, celle-ci doit être impérativement reliée à la terre. Par ailleurs, n’utilisez pas le cordon d’alimentation fourni pour cet instrument avec un autre appareil.

Brancher la prise de terre
Avant de mettre l’instrument sous tension, penser à brancher la prise de terre pour éviter tout choc électrique. Le cordon d’alimentation livré avec l’instrument est doté de trois broches. Brancher le cordon d’alimentation sur une prise de courant à trois plots et mise à la terre.

Ne pas entraver la mise à la terre de protection
Ne jamais neutraliser le fil de terre interne ou externe, ni débrancher la borne de mise à la terre. Cela pourrait entraîner un choc électrique ou endommager l’instrument.

Ne pas utiliser lorsque les fonctions de protection sont défectueuses
Avant d’utiliser l’instrument, vérifier que les fonctions de protection, telles que le raccordement à la terre et le fusible, fonctionnent correctement. En cas de dysfonctionnement possible, ne pas utiliser l’instrument.

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.

Installer et utiliser l'instrument aux emplacements appropriés
- L'instrument est prévu pour une utilisation en intérieur. Ne pas l'installer, ni l'utiliser à l'extérieur.
- Installer l'instrument de manière à pourvoir immédiatement le débrancher du secteur en cas de fonctionnement anormal ou dangereux.

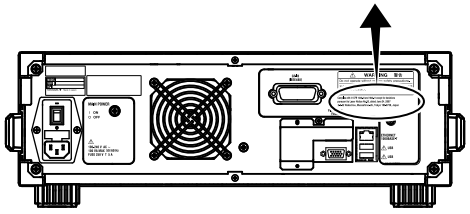
ATTENTION

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.

Safety Precautions for Laser Products

This instrument uses a laser light source. This instrument is a Class 1 laser product as defined by IEC60825-1 Safety of Laser Products—Part1: Equipment Classification, Requirements and User's Guide. In addition, this instrument complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 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 Nakachou, Musashino-shi, Tokyo 180-8750, Japan



- **Built-in Laser Information**

Item	AQ6150	AQ6151
Laser class	3R	3B
Max. output power	5 mW Max.	15 mV Max.
Wavelength	633 nm	633 nm
Pulse duration	CW	CW
Numerical aperture	Collimated	Collimated

AQ6150/AQ6151 does not have an optical output for lasers.

Sales in Each Country or Region

Waste Electrical and Electronic Equipment

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 of products in the EU, contact your local Yokogawa Europe B.V. office.
Do not dispose in domestic household waste.

EU Battery Directive

EU Battery 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: Lithium battery

You cannot replace batteries by yourself. When you need to replace batteries, contact your local Yokogawa Europe B.V. office.

Authorized Representative in the EEA

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

Conventions Used in This Manual

Notes

The notes and cautions in this manual 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 user's 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 damage to the instrument or user's data, and precautions that can be taken to prevent such occurrences.

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.

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

Notations Used in the Procedural Explanations

The contents of the procedural explanations are indicated using the following symbols, notations, and terminology.

Procedure Carry out the procedure according to the step numbers. All procedures are written under the assumption that you are starting operation at the beginning of the procedure, so you may not need to carry out all the steps in a procedure when you are changing the settings.

Explanation This section describes the setup items and the limitations regarding the procedures.

Characters and Terminology Used in Procedural Explanations

Panel Keys and Soft Keys

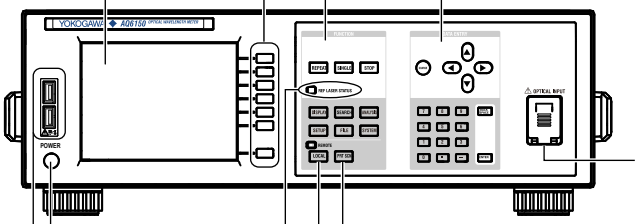
Bold alphanumeric characters in procedural explanations indicate panel keys that are used in the procedure and soft keys and menu items that appear on the screen.

Unit

k	Denotes 1000. Example: 12 kg, 100 kHz
K	Denotes 1024. Example: 459 KB (file size)

Contents

1.1 Front Panel



Display
Displays measured waveforms, measurement conditions, measured values, etc.

Soft key section
Control the functions that are assigned to soft keys, which appear on the right of the LCD display.

FUNCTION section
Set all features including measurement, setup, and display.

DATA ENTRY section
Enter measurement condition parameters and labels.

OPTICAL INPUT
Connect the optical input signal here.

PRT SCN key
Saves a screen capture

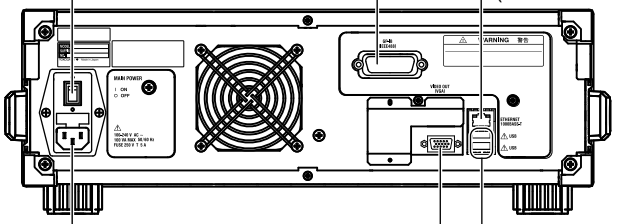
LOCAL key
Clears remote mode

REF LASER STATUS LED
Indicates the internal reference light source status

POWER switch
A switch for starting and stopping the AQ6150/AQ6151

USB port
Connect a USB storage medium, USB mouse, or USB keyboard.

1.2 Rear Panel



GP-IB connector
Use this connector to control the AQ6150/AQ6151 from a PC.

MAIN Power switch
Used to turn the main power ON/OFF.

ETHERNET port
Use this port to connect the AQ6150/AQ6151 to a network. (10/100/1000BASE-TX)

Power inlet
Connect the power cord.

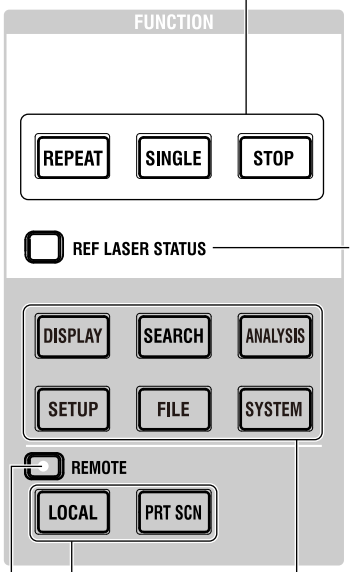
USB port
Connect a USB storage medium, USB mouse, or USB keyboard.

VIDEO OUT
Video signal (VGA) terminal
Use this terminal to view the AQ6150/AQ6151 screen on an external display.

1.3 Keys

FUNCTION Section

The FUNCTION section consists of three measurement control keys, six function keys, and two auxiliary keys. Pressing a function key shows the setup menur for the corresponding function on the right side of the screen.



Measurement control keys
Starts or stops measurement.

REPEAT	Starts repeat measurements. The key illuminates while the measurement is in progress. Measurement is repeated until you press STOP.
SINGLE	Starts a single measurement. The key illuminates while the measurement is in progress. Measurement automatically stops after one measurement.
STOP	Stops the measurement.

Internal reference light source status display
Indicates the operating status of the internal He-Ne laser.

Off	The laser is not being output. Measurement is not possible.
Blinking orange	Laser output is in preparation. This indicates the status until the laser output stabilizes. Measurement is not possible while the message “REF LASER STARTING” is displayed. If this status lasts approximately 5 minutes, the AQ6150/AQ6151 assumes that a malfunction has occurred and turns the LED red. When the AQ6150/AQ6151 is ready to measure, the message disappears. It takes approximately 1 minute for the laser output to stabilize. To make accurate measurements, wait for the laser output to stabilize.
Green	Normal status (stable laser output). Measurement is possible.
Orange	When the light source approaches its service life, the message “It is about time to plan for REF LASER replacement" appears. The operating time of the laser output has reached the replacement reference time (30000 hours). Measurement is possible, but replace the light source quickly.
Red	If a malfunction occurs, the message “REF LASER or interferometer is out of order. Please contact our sales representatives” appears. Measurement is not possible. For information on replacing the light source, contact your nearest YOKOGAWA dealer.

Auxiliary key
See section 1.1.

Remote control indicator
Illuminates in remote control mode.
See section 1.2 in the Remote Control User’s Manual, IM AQ6150-17EN.

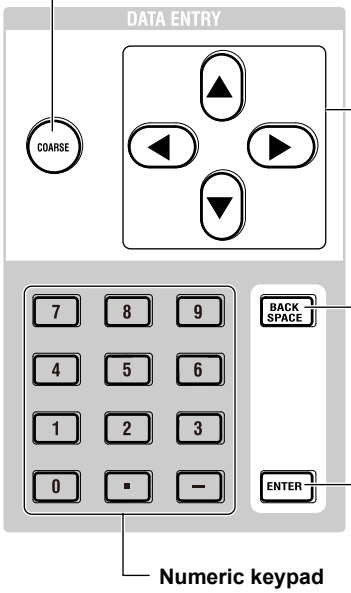
Function keys
Set measurement conditions, data saving and loading, etc.

DISPLAY	Displays a setup menu for selecting measurement screens and setting waveform display scales.
SEARCH	Displays a setup menu for searching measured peaks.
ANALYSIS	Displays a menu for performing drift measurements, FP-LD analysis, and data logging.
SETUP	Displays a setup menu for setting measurement conditions (type of light, detection threshold, unit, etc.)
FILE	Displays a setup menu for saving and loading measured data and settings from a USB storage device or internal memory.
SYSTEM	Displays a setup menu for setting network parameters, showing system information, setting the clock, and so on.

DATA ENTRY Section

You can enter various measurement parameters from the DATA ENTRY section.

You can use arrow keys and the numeric keypad to enter parameters.



COARSE key

Turn this key on to select the next higher digit or increases the step by which the value changes.
Each time you press the key, the setting toggles between on and off.
When set to on, the key illuminates.

Arrow keys

Increase or decrease values, move the cursor (up and down) in file lists, move the cursor (up, down, left, and right) in the character selection area of character input screens, enter numeric keypad values (left and right), and so on.

To increase a value: ▲ or ► key
To decrease a value: ▼ or ◄ key

BACK SPACE key

Press this key to erase the key before the cursor.
The last entered number (at the right end) is erased, and you can enter the correct number.
If you press BACK SPACE repeatedly and the numeric keypad input area becomes empty, the numeric keypad input area disappears.

ENTER key

Confirms the value that you have entered with the numeric keypad, in the parameter input window, or character input screen.

Numeric keypad

You can use the numeric keypad to enter values directly in parameter input windows.
If you press a soft key that has a parameter, the current value appears in a parameter value display area. If you press a key on the numeric keypad in this condition, the number that you selected appears in the area.
If the value that you enter with the numeric keypad is outside the allowed range, it is reset to the closest value within the range.

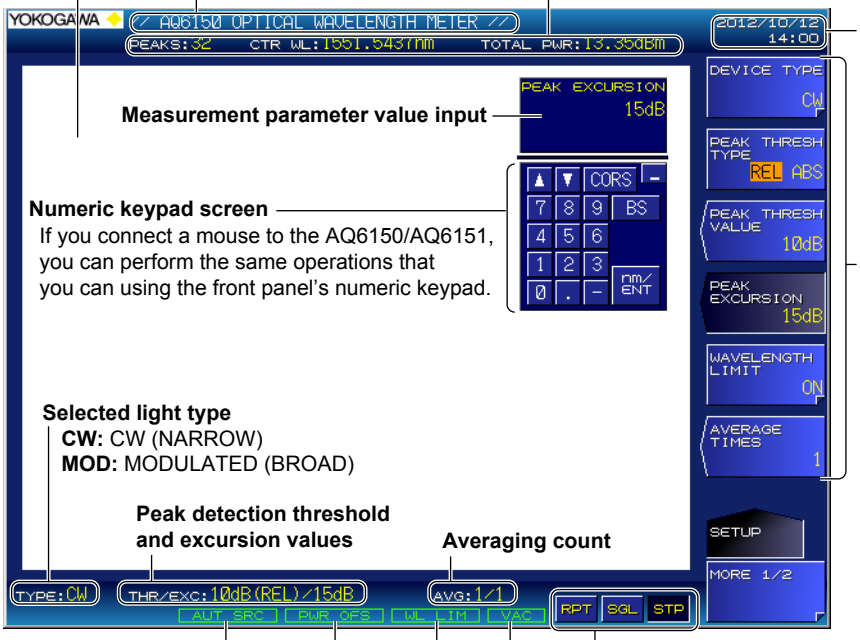
1.4 Screens

Main Screen

Measurement result display
Displays the peak window, peak list window, and spectrum window.
The display varies depending on the VIEW mode. Details are given later.

Label
You can display text of your choice using up to 52 characters.

Measurement summary
Displays the number of detected peaks (PEAKS), center wavelength (CTR WL), and total power (TOTAL PWR)



Measurement parameter value input

Numeric keypad screen
If you connect a mouse to the AQ6150/AQ6151, you can perform the same operations that you can using the front panel's numeric keypad.

Date and time

Setup menu

Selected light type
CW: CW (NARROW)
MOD: MODULATED (BROAD)

Peak detection threshold and excursion values

Averaging count

Illuminates when the auto peak search feature is on

Illuminates when the power offset is not zero
See section 2.6.

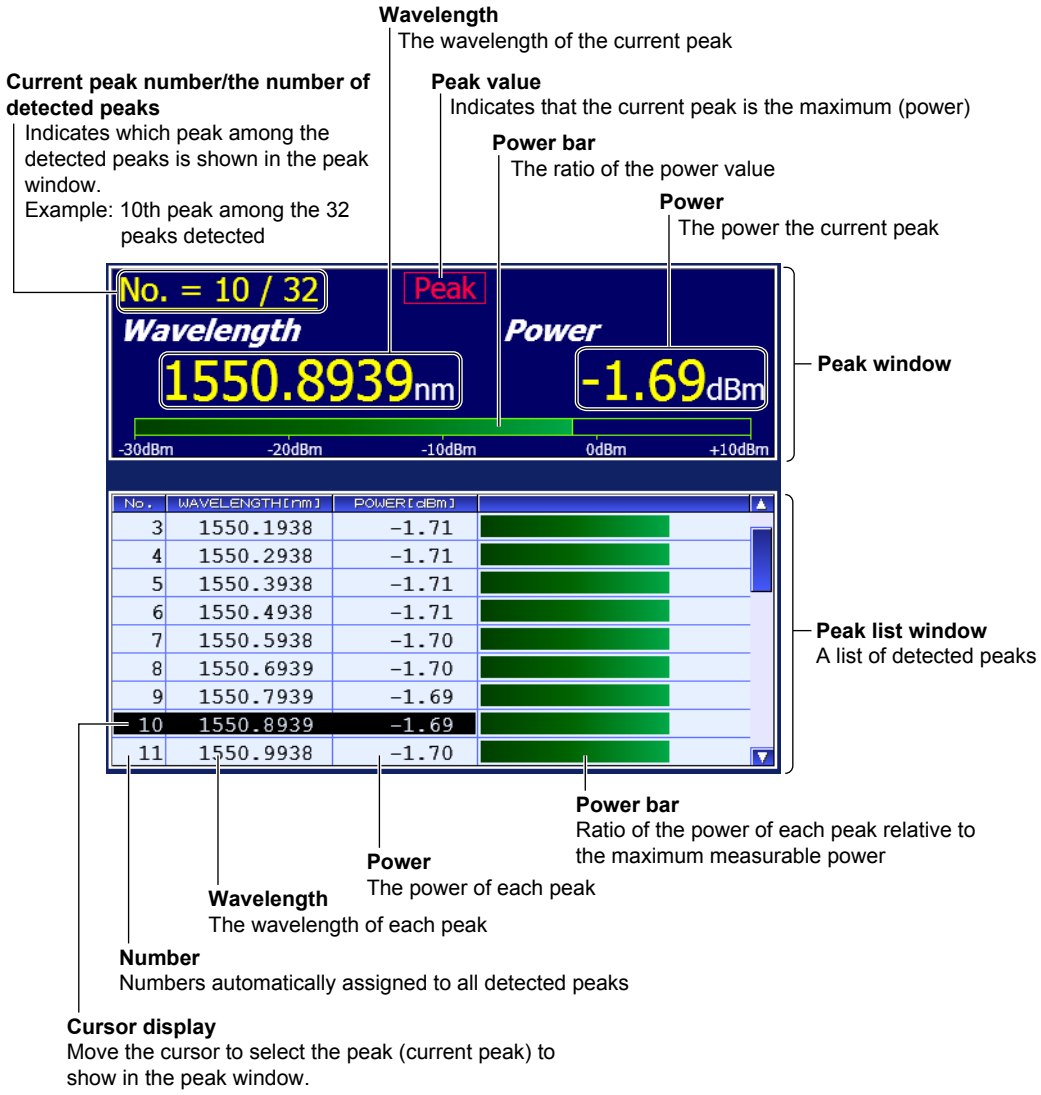
Measurement control keys
Indicates the state of the measurement control keys. If you connect a mouse to the AQ6150/AQ6151, you can click these keys to perform the same operations that you can using the front panel's measurement control keys.
RPT: Repeat measurement
SGL: Single measurement
STP: Stop measurement

Selected medium
VAC: Vacuum
AIR: Standard air

Illuminates when measurement wavelength range limit is on
See section 3.5 in the User's Manual, IM AQ6150-01EN.

Multi Peak Screen for Absolute Values

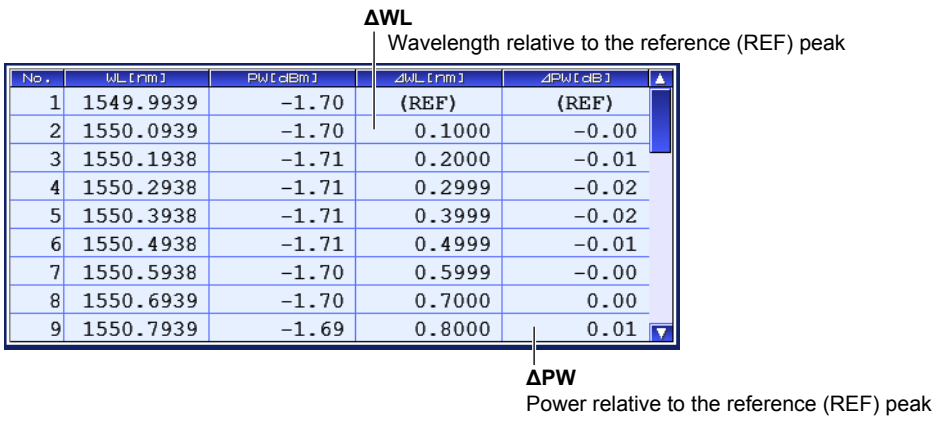
For the operating procedure, see section 4.2 in the User's Manual, IM AQ6150-01EN.



Multi Peak Screen for Relative Values

The peak window is the same as in the multi peak screen for absolute values, which is shown above.

For the operating procedure, see section 4.3 in the User's Manual, IM AQ6150-01EN.



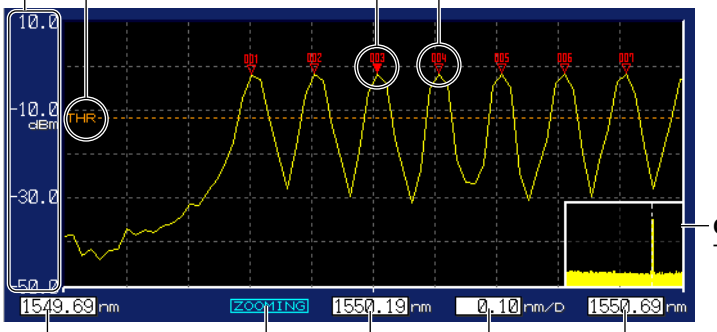
Single Peak Screen

Only the peak window is displayed. The displayed contents and features are the same as those of the multi peak screens.

For the operating procedure, see section 4.1 in the User's Manual, IM AQ6150-01EN.

Spectrum Window

For the operating procedure, see section 4.5 in the User's Manual, IM AQ6150-01EN.



Threshold
The peak detection threshold.
If the threshold is specified with a relative value, it is converted to an absolute value and displayed.

Moving marker (▼)
This marker appears on the current peak.
The marker is filled with a color.

Scale
Displays a power scale of absolute values

Fixed marker (▽)
A numbered marker that is automatically assigned during peak detection
The maximum number is 1024.

Overview window
The entire spectrum waveform

Start wavelength of the scale
The start wavelength of the display range

Stop wavelength of the scale
The stop wavelength of the display range

Wavelength per division

Center wavelength of the scale
The center wavelength of the display range

Zoom
Appears when the spectrum is being zoomed in on

2.1 Handling Precautions

Safety Precautions

If you are using this instrument for the first time, make sure to read “Safety Precautions” on pages vii to x.

Do Not Remove the Case

Do not remove the case from the instrument. Some sections inside the instrument have high voltages that are 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 and unplug the power cord. Then, contact your nearest YOKOGAWA dealer.

Do Not Damage the Power Cord

Nothing should be placed on top of the power cord, and it should be kept away from any heat sources. When removing the plug from the power outlet, do not pull on the cord. Pull from the plug. If the power cord is damaged, contact your nearest YOKOGAWA dealer. Refer to page iv for the part number when placing an order.

General Handling Precautions

Do Not Place Objects on Top of the Instrument

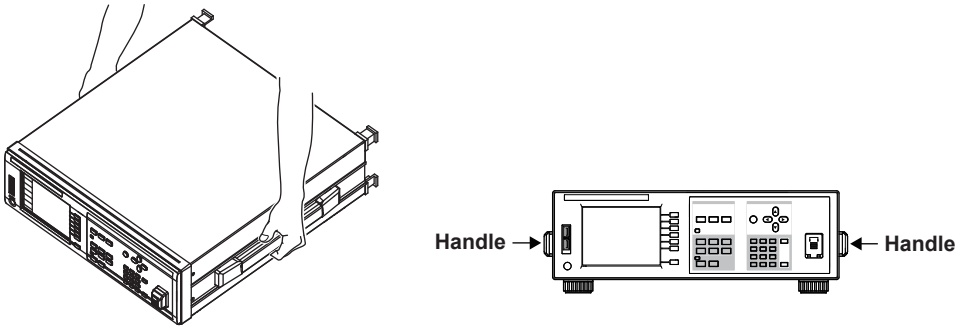
Never place objects such as other instruments or objects that contain water on top of the instrument. Doing so may damage the instrument.

Do Not Damage the LCD

Because the LCD is very vulnerable and can be easily scratched, do not allow any sharp objects near it.

When Carrying the Instrument

Be sure to turn off the power switch and remove the power cord and other connected cables before carrying the instrument. As indicated in the following figure, use both hands to firmly hold the handles when carrying the instrument.



When Cleaning the Instrument

When cleaning the case or the operation panel, first remove the power cord from the outlet, and then wipe with a dry, soft, clean cloth. Do not use chemicals such as benzene or thinner. Doing so may cause discoloring and deformation.

2.2 Installing the AQ6150/AQ6151

WARNING

- This instrument is designed to be used indoors. Do not install or use it outdoors.
- Install the instrument so that you can immediately remove the power cord if an abnormal or dangerous condition occurs.

CAUTION

- If you block the inlet holes on the bottom or the exhaust holes on the rear side of the instrument, the instrument will become hot and may break down. Also, high temperatures may shorten the service life of the internal reference light source (He-Ne laser).
- Do not place this instrument on top of another device that is emitting heat. If heat enters through the inlet holes on the bottom of the instrument, the instrument will become hot and may break down.

French

AVERTISSEMENT

- L’instrument est prévu pour une utilisation en intérieur. Ne pas l’installer, ni l’utiliser à l’extérieur.
- Installer l’instrument de manière à pourvoir immédiatement le débrancher du secteur en cas de fonctionnement anormal ou dangereux.

ATTENTION

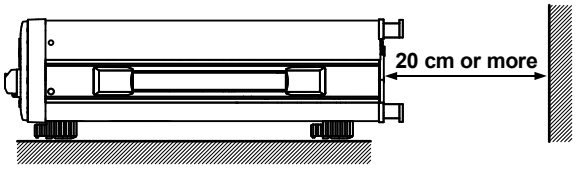
- Si vous bloquez les orifices d’entrée situés sous l’instrument ou les orifices de sortie arrière, l’instrument surchauffe et risque de tomber en panne. En outre, les températures élevées risquent d’écourter la durée de vie de la source lumineuse de référence interne (laser He-Ne).
- Ne pas placer cet instrument au dessus d’un autre dispositif qui émet de la chaleur. Si la chaleur pénètre à travers les orifices d’entrée situés au sous l’instrument, celui-ci se chauffera et pourrait tomber en panne.

Installation Conditions

Install the instrument in a place that meets the following conditions.

Well-Ventilated Location

There are inlet holes on the bottom side of the instrument. There are also exhaust holes on the rear side. To prevent internal overheating, allow for enough space around the instrument (see the figure below), and do not block the inlet and exhaust holes.



When connecting cables, allow for enough space, above and beyond the space shown in the figure above, to carry out the procedure.

Ambient Temperature and Humidity

Ambient temperature	5 to 35 °C
Ambient humidity	20 to 85% RH (no condensation)

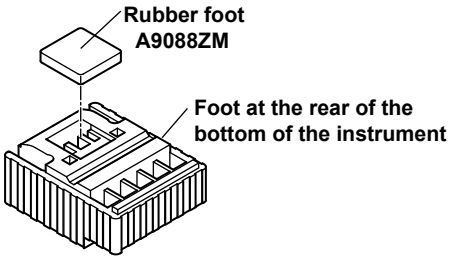
Note

Condensation may form when moving the instrument from a low temperature or humidity environment to a high temperature or humidity environment, or when there is a sudden change in temperature. In such cases, before you use the instrument, allow it to adjust to the ambient temperature.

If you transport the instrument in its packing box, to prevent condensation, allow it to adjust to the new ambient temperature before taking it out of the box.

Flat, Even Surface

Install the instrument on a stable surface that is level in all directions and that is not slippery. If you use the instrument in an unstable location or on a slippery surface, the instrument may fall off its platform or hit other devices due to the vibration that the instrument produces during operation.
If the instrument is installed in a horizontal position, the supplied rubber stoppers can be attached to the feet at the rear of the instrument to prevent the instrument from sliding.



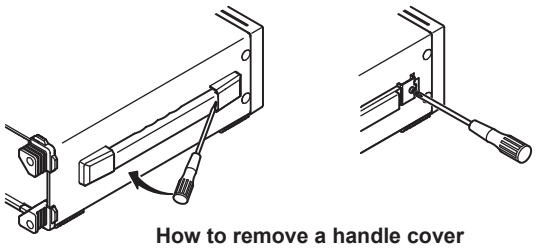
Rack Mounting

To rack-mount the instrument, use the separately sold rack mount kit.

Item		Model
Model 751535-E3	Rack mount kit (for mounting one AQ6150/AQ6151 on an EIA standard rack)	751535-E3
Model 751535-J3	Rack mount kit (for mounting one AQ6150/AQ6151 on a JIS standard rack)	751535-J3

An outline of the mounting procedure is given below. For detailed instructions, see the manual that is included with the rack mount kit.

1. Remove the handles from both sides of the instrument.
2. Remove the four feet from the bottom of the instrument.
3. Remove the four seals covering the rack mount attachment holes. The holes are on the sides of the instrument near the front.
4. Place seals over the feet and handle attachment holes.
5. Attach the rack mount kit to the instrument.
6. Mount the instrument on a rack.



How to remove a handle cover

Note

- When rack-mounting the instrument, allow at least 5 cm of space around the bottom panel inlet holes to prevent internal heating. Allow at least 20 cm around the rear panel exhaust holes.
- Make sure to provide adequate support from the bottom of the instrument. The support should not block the inlet and vent holes.
- Store the removed parts in a safe place.
- When rack-mounting the instrument, remove the feet from the rear of the instrument if they are coming into contact with the rack and are thus preventing you from rack-mounting the instrument. After you have rack-mounted the instrument, re-attach the feet to the rear of the instrument.
  In this case, be sure to attach the brackets to the instrument before you remove the feet from the rear of the instrument. If you don't, the instrument's cover may come loose and fall when you rack-mount the instrument.

Do Not Install the Instrument in the Following Kinds of Places

- Outdoors.
- In a location where flammable or explosive gasses, steam, or dust is present or a location in which explosion or fire may occur (dangerous location)
- In direct sunlight or near heat sources
- Where the instrument is exposed to water or other liquids.
- In an environment with excessive amounts of soot, steam, dust, or corrosive gas
- In an environment that is subject to large levels of mechanical vibration
- On an unstable surface

2.3 Connecting to the Power Supply and Turning the Power Switch On and Off

Before Connecting the Power Supply

Make sure to follow the warnings below when connecting the power supply. Failure to do so may cause electric shock or damage to the instrument.

WARNING

- Before connecting the power cord, ensure that the source voltage matches the rated supply voltage of the AQ6150/AQ6151 and that it is within the maximum rated voltage of the provided power cord.
- Connect the power cord after checking that the main power switch of the instrument is turned off.
- To prevent electric shock or fire, be sure to use the power cord for the instrument that is supplied by YOKOGAWA.
- Make sure to connect protective earth grounding to prevent electric shock. Connect the power cord to a three-prong power outlet with a protective earth terminal.
- Do not use an ungrounded extension cord. If you do, the instrument will not be grounded.
- If an AC outlet that conforms to the supplied power cord is unavailable and you cannot ground the instrument, do not use the instrument.

French

AVERTISSEMENT

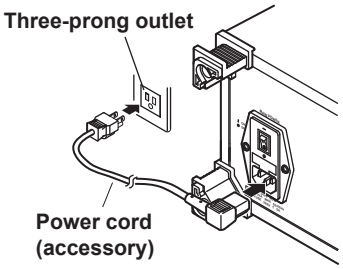
- Avant de brancher le cordon d'alimentation, vérifier que la tension source correspond à la tension d'alimentation nominale du AQ6150/AQ6151 et qu'elle est compatible avec la tension nominale maximale du cordon d'alimentation.
- Brancher le cordon d'alimentation après avoir vérifié que l'interrupteur d'alimentation principal de l'instrument est sur OFF.
- Pour éviter tout risque de choc électrique ou d'incendie, utiliser exclusivement le cordon d'alimentation fourni par YOKOGAWA et prévu pour l'instrument.
- Relier l'instrument à la terre pour éviter tout risque de choc électrique. Brancher le cordon d'alimentation sur une prise de courant à trois plots reliée à la terre.
- Toujours utiliser une rallonge avec broche de mise à la terre, à défaut de quoi l'instrument ne serait pas relié à la terre.
- En l'absence de prise secteur conforme au cordon d'alimentation et dans l'impossibilité de mettre l'instrument à la terre, ne pas utiliser l'instrument.

Connecting the Power Cord

1. Check that the MAIN POWER switch on the rear panel is off.
2. Connect the power cord plug to the power inlet on the rear panel.
3. Connect the other end of the cord to an outlet that meets the following conditions. Use a grounded three-prong outlet.

Item	
Rated supply voltage*	100 VAC to 240 VAC
Permitted supply voltage range	90 VAC to 264 VAC
Rated power supply frequency	50/60 Hz
Permitted supply frequency range	48 Hz to 63 Hz
Maximum power consumption	Approx. 150 VA

* This instrument can use a 100 V or a 200 V power supply. The maximum rated voltage differs according to the type of power cord. Before you use the instrument, check that the voltage supplied to it is less than or equal to the maximum rated voltage of the power cord provided with it (see page ii for the maximum voltage rating).



CAUTION

- When turning the power on, do not apply a high-output light source to the instrument. If you do, the optical section may be damaged.
- Do not operate the POWER or MAIN POWER switch during the initialization process. Doing so may damage the AQ6150/AQ6151.

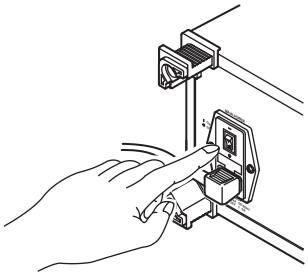
French

ATTENTION

- Lors de la mise sous tension, n'appliquez pas une source de lumière à haute performance à l'instrument. Si vous le faites, la section optique pourrait s'endommager.
- N'appuyez pas sur les interrupteurs POWER ou MAIN POWER pendant le processus d'initialisation. Cela pourrait endommager l'AQ6150/AQ6151.

Turning the Main Power Switch On

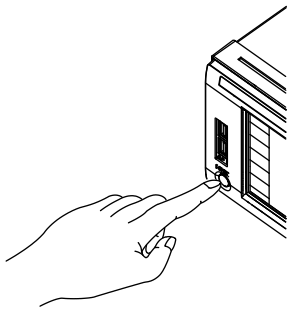
1. Flip the **MAIN POWER** switch on the rear panel to the ON (|) position.
   The POWER switch on the front panel illuminates in orange.



Turning the POWER Switch On

2. Press the **POWER** switch on the front panel.

The power switch color changes from orange to green. The operating system starts, and the AQ6150/AQ6151 starts initialization.



Operations Performed When the Power Is Turned On

When you turn on the power, an initialization screen automatically appears, and the internal checkup, reference light source, initialization procedures, and other procedures start. The progress of initialization is indicated at the bottom of the screen with indications from “STEP 1/6” to “STEP 6/6.” When the initialization finishes normally, the measurement result screen appears.

When the Power-on Operation Does Not Finish Normally

Turn off the power switch, and check that:

- The instrument is installed properly. See section 2.2, “Installing the Instrument.”
- The power cord is connected properly. See the previous page.

If the instrument still does not work properly, contact your nearest YOKOGAWA dealer for repairs. If an error occurs in the memory or some other part of the instrument during initialization, the AQ6150/AQ6151 will stop running with “STEP @/6”showing on the screen (where @ is a number between 1 and 6). If this occurs, repairs are necessary. Contact your nearest YOKOGAWA dealer immediately.

Note

The AQ6150/AQ6151 retains its current conditions such as which soft keys have been pressed. When you turn on the power, the AQ6150/AQ6151 returns to the conditions that it was in immediately before the power was turned off. The first time you turn on the power, the AQ6150/AQ6151 starts with its factory default conditions.

Turning the POWER Switch Off

CAUTION

When the AQ6150/AQ6151 is running, do not turn off the power with the MAIN POWER switch on the rear panel. If you do, the operating system configuration file will not be backed up, and the AQ6150/AQ6151 may be unable to start normally the next time you start it. Also, the operation of the internal interferometer may be impeded. Be sure to follow the procedure below to turn off the power switch.

French

ATTENTION

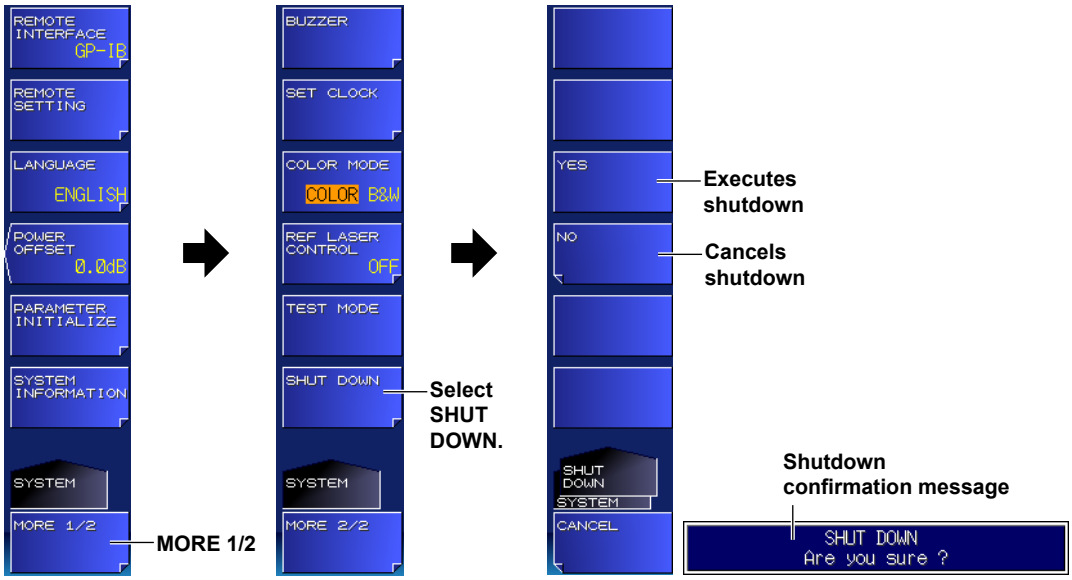
Lorsque l'AQ6150/AQ6151 est en marche, ne coupez pas l'alimentation avec l'interrupteur MAIN POWER situé sur le panneau arrière. Si vous le faites, le fichier de configuration du système d'exploitation ne sera pas sauvegardé, et l'AQ6150/AQ6151 pourrait être incapable de démarrer normalement au prochain démarrage. En outre, le fonctionnement de l'interféromètre interne pourrait être entravé. Veuillez à suivre la procédure ci-après pour mettre l'instrument hors tension.

1. Press the **POWER** switch on the AQ6150/AQ6151 front panel.
   A shutdown confirmation screen and YES and NO soft keys appear.
2. Press the **YES** soft key.
   The message "AQ6150 is shutting down Please wait....." appears, and the shutdown procedure begins.
   If you do not want to shut down, press the **NO** soft key.
   The previous setup menu will return.
3. After the POWER switch changes from green to orange, flip the **MAIN POWER** switch on the rear panel to the "O OFF" position.

You can also use the panel keys and soft keys to shut the AQ6150/AQ6151 down.

1. Press **SYSTEM**.
   System configuration setup menu appears.
2. Press the **MORE 1/2** soft key.
3. Press the **SHUT DOWN** soft key.
   A shutdown confirmation screen and YES and NO soft keys appear.

4. Press the **YES** soft key.
The shutdown procedure begins.



5. After the POWER switch changes from green to orange, flip the **MAIN POWER** switch on the rear panel to the “O OFF” position.

Note

If, for some reason, you cannot shut down the AQ6150/AQ6151 normally, you can hold the POWER switch down for approximately 4 seconds to force the AQ6150/AQ6151 into standby mode. The next time you start the AQ6150/AQ6151, the following message will appear. Press any key to clear this message.

The unit was not shutdown properly.
This might cause a hardware problem.
Please follow the shutdown procedure described in the manual.

If you perform this operation, the operating system configuration file will not be backed up, and the AQ6150/AQ6151 may be unable to start normally.

2.4 Attaching a Connector Adapter

Before using the AQ6150/AQ6151, attach an AQ9441 connector adapter, which is sold separately, to the AQ6150/AQ6151.

CAUTION

- When attaching or detaching a connector adapter, be sure not to damage the ferrule end face. Keep the connector adapter perpendicular with the ferrule and slowly insert or remove the adapter.
- If you shake the connector adapter to the left and right or force it into the connector, the ferrule or connector adapter may be damaged.
- Do not blow air into the OPTICAL INPUT. Doing so may cause dust and other foreign particles to enter the interferometer and degrade its performance.

French

ATTENTION

- Lors de la fixation ou du détachement de l'adaptateur d'un connecteur, veillez à ne pas endommager l'extrémité de la virole. Gardez l'adaptateur du connecteur perpendiculaire à la virole et insérez ou retirez lentement l'adaptateur.
- Éviter de faire pression sur l'adaptateur du connecteur ou de forcer pour l'insérer dans le connecteur, car cela pourrait endommager la virole ou l'adaptateur du connecteur.
- Ne pas souffler pas de l'air dans l'ENTRÉE OPTIQUE. Cela pourrait provoquer l'entrée de la poussière et d'autres particules étrangères dans l'interféromètre et dégrader ses performances.

Note

On models with the /FC option or /SC option, the connector adapter comes attached to the optical input of the AQ6150/AQ6151 front panel.

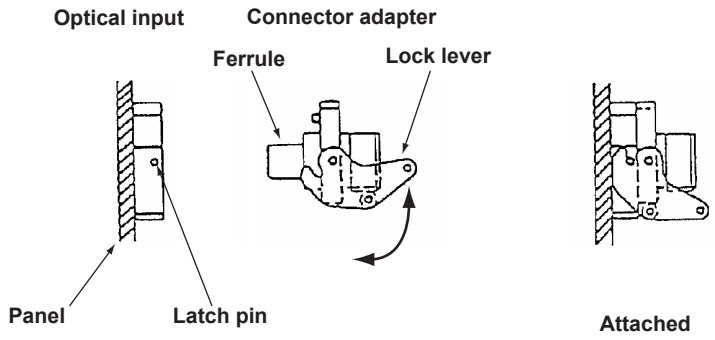
Procedure

Attachment Procedure

1. Check that the AQ6150/AQ6151 is turned off.
2. Open the optical connector cover on the AQ6150/AQ6151 front panel.
3. Clean the ferrule end of the optical input using a cotton swab moistened with a small amount of absolute alcohol.
4. Insert the connector adapter straight into the connector.
5. Press the connector adapter's lock lever down.
   The connector adapter is attached properly if the optical input's latch pins engage with the lock lever grooves.

Removal Procedure

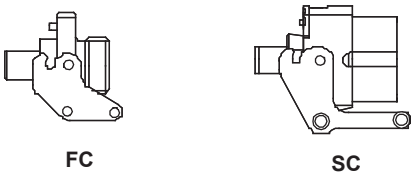
1. Check that the AQ6150/AQ6151 is turned off.
2. Turn the connector adapter's lock lever up.
   The lock lever lock will disengage.
3. Pull the connector adapter straight from the connector.
4. Close the optical connector cover.



Explanation

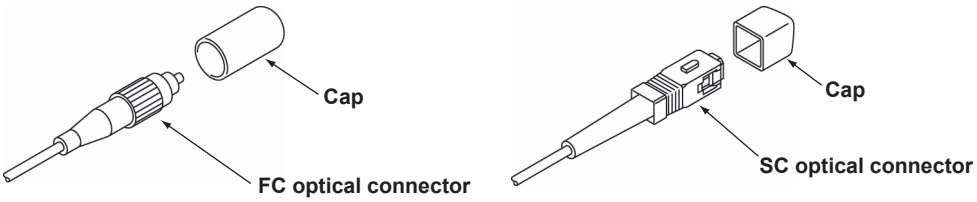
Connector Adapter Types

The connector adapter comes in two types.



Optical Connector Shapes

The optical connectors that you can use with the AQ6150/AQ6151 are the FC and SC types.



2.5 Connecting a Mouse, Keyboard, USB Storage Device

Connecting a Mouse

Compatible Mouse Devices

You can use mouse devices (with wheels) that are compliant with USB HID Class Version 1.1.

Connection Procedure

Connect a USB mouse to a USB port on the front or rear panel of the AQ6150/AQ6151.
Align the connector orientation with the port, and insert the connector straight into the port.

Note

- There are two USB ports on the front panel and two USB ports on the rear panel, but do not connect more than one mouse to the AQ6150/AQ6151.
- For instructions on how to use the mouse, see section 3.2.

Connecting a Keyboard

You can connect a keyboard to the AQ6150/AQ6151 and use it to enter file names, comments, and other items. The AQ6150/AQ6151 features and settings are mapped to the keys on the keyboard, so you can use the keyboard to perform the same operations that you can perform using the AQ6150/AQ6151 panel keys.

Compatible Keyboards

You can use a US 101 key USB keyboard.

Connection Procedure

Connect a USB keyboard to a USB port on the front or rear panel of the AQ6150/AQ6151.
Align the connector orientation with the port, and insert the connector straight into the port.

Note

- There are two USB ports on the front panel and two USB ports on the rear panel, but do not connect more than one keyboard to the AQ6150/AQ6151.
- For instructions on how to use the keyboard, see section 3.2.

Connecting a USB Storage Device

Compatible USB Storage Media

The AQ6150/AQ6151 supports USB memory devices and hard drives compliant with USB 1.1 or USB 2.0.
For more details, contact your nearest YOKOGAWA dealer.

Connection Procedure

Connect a USB memory device to a USB port on the front or rear panel of the AQ6150/AQ6151. Align the connector orientation with the port, and insert the connector straight into the port.

Removal Procedure

Be sure to follow the procedure below to remove a USB storage medium.

1. Press **FILE**.
   A file menu appears.
   Check whether the **REMOVE USB STORAGE** soft key is unavailable (dimmed).
   If it is, the USB storage medium can be removed.
2. If not (the **REMOVE USB STORAGE** soft key is available), press it.
   The REMOVE USB STORAGE soft key becomes unavailable (dimmed), and the USB storage medium can be removed.

Note

- If there are multiple connected USB storage devices, the AQ6150/AQ6151 detects only the one connected first. If there is a USB storage device already connected and you connect another, the AQ6150/AQ6151 will not detect it. If you remove the USB storage device that was connected first, the AQ6150/AQ6151 will not automatically detect the other one. If you want the AQ6150/AQ6151 to detect the other device, disconnect it once and reconnect it.
- For other notes, see the instruction manual supplied with the USB memory device.

2.6 Connecting an Optical Fiber

Connecting an Optical Fiber

WARNING

Do not look at the optical fiber laser light that you are measuring or point the laser at another person's eye. Doing so may cause eye damage or impair one's health.

CAUTION

- Do not apply light that is +18 dBm or greater to the optical connector of the AQ6150/AQ6151. Doing so may damage the optical components that are used inside the AQ6150/AQ6151.
- Connect the optical fiber after starting the AQ6150/AQ6151. Applying high-intensity light when the AQ6150/AQ6151 is starting can damage the optical components that are used inside it.
- Clean the connector end face of the optical fiber under measurement before connecting it to the AQ6150/AQ6151. If dust is adhered to the connector end face, it may damage the AQ6150/AQ6151 optical connector.

French

AVERTISSEMENT

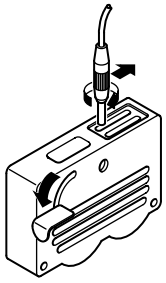
Ne regardez pas directement la lumière du laser à fibre optique et ne pointez pas le laser vers le yeux d'une tierce personne, pour ne pas provoquer de blessures ou de dommages oculaires.

ATTENTION

- Ne pas appliquer un signal de +18 dBm ou plus au connecteur optique de l'AQ6150/AQ6151. Cela pourrait endommager les composants optiques qui sont utilisés à l'intérieur de l'AQ6150/AQ6151.
- Brancher la fibre optique après le démarrage de l'AQ6150/AQ6151. L'application de la lumière à haute intensité lors du démarrage de l'AQ6150/AQ6151 pourrait endommager les composants optiques qui sont utilisés à l'intérieur.
- Nettoyer l'extrémité du connecteur de la fibre optique à mesurer avant de la connecter à l'AQ6150/AQ6151. Si la poussière est collée à l'extrémité du connecteur, elle pourrait endommager le connecteur optique de l'AQ6150/AQ6151.

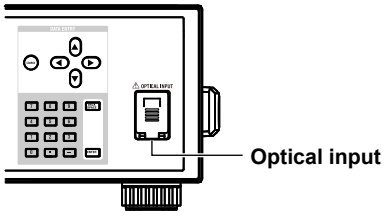
Cleaning the Optical Fiber End Face

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



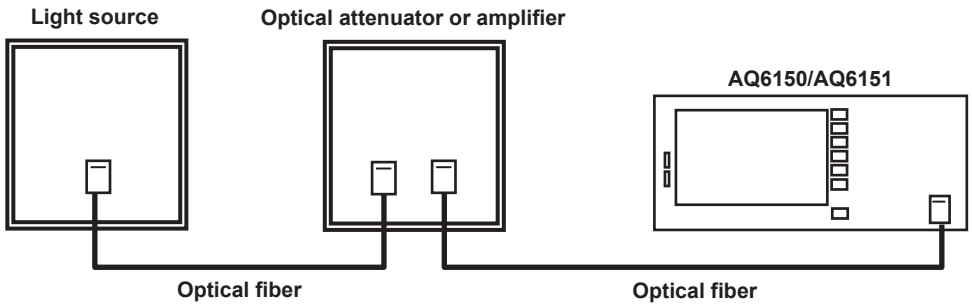
Note

- If you do not firmly press the connector end face of the optical fiber against the cleaner, the end face may not be cleaned completely.
- You can purchase an optical fiber connector cleaner from NTT-AT Corporation.
- The AQ6150/AQ6151 does not have a laser light output section, but light that is 1 nW or less in strength will leak from the front panel optical input (OPTICAL INPUT). This light is extremely weak, so there is no need to take safety measures. The AQ6150/AQ6151 does not emit harmful radiation during operation.



Connecting a Light Source, Optical Attenuator, or Optical Amplifier

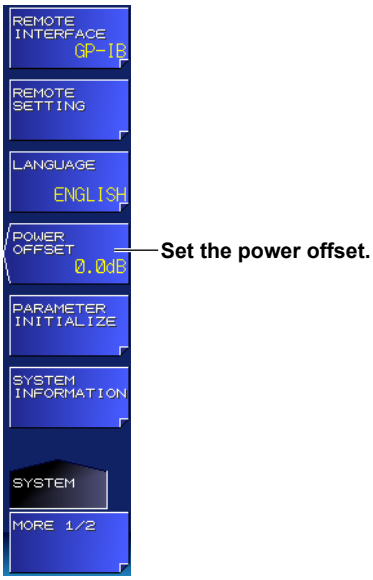
If you want to connect an optical attenuator or amplifier, insert it between the AQ6150/AQ6151 and the light source.



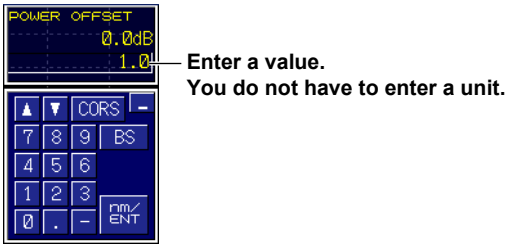
When Connecting an Optical Attenuator or Amplifier

If the power of light from the light source is outside the input range of the AQ6150/AQ6151, connect an optical attenuator or amplifier to adjust the power to within the rated input range of the AQ6150/AQ6151. In this case, set the power offset so that the power (optical input power) displayed on the AQ6150/AQ6151 matches the actual level.

1. Press **SYSTEM**.
   System condition setup menu appears.



2. Press the **POWER OFFSET** soft key.
   The screen for setting the power offset appears.
3. Enter the power offset value using the arrow keys or numeric keypad.



4. Press **ENTER**.
   The power offset value that you specified appears on the soft key.

For details on the power values that the AQ6150/AQ6151 displays, see section 1.4.

2.7 Setting the Clock

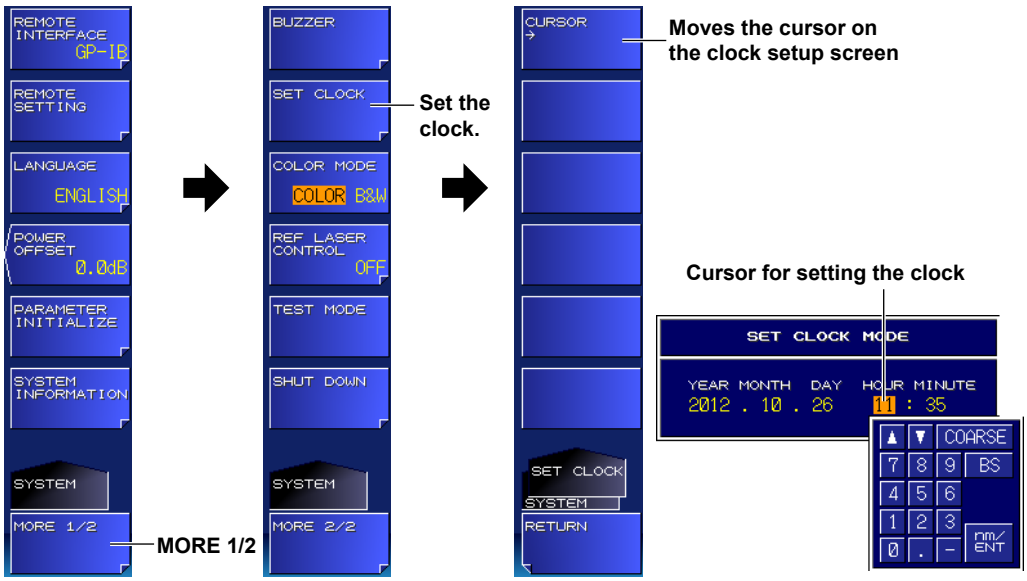
The AQ6150/AQ6151 displays the year, month, day, and time in the upper right of the screen. The time is used in timestamps when data is recorded.

Displaying the Clock Setup Screen

1. Press **SYSTEM**.
   System configuration setup menu appears.
2. Press the **MORE 1/2** soft key.
3. Press the **SET CLOCK** soft key.
   A setup menu and setup screen for setting the clock appear.

Setting the Clock

4. Press the **CURSOR** soft key.
   The cursor in the clock input area of the setup screen moves.
5. Move the cursor to the value that you want to set, and press **ENTER**.
   The screen for setting the value appears.
6. Enter the value using the arrow keys or numeric keypad.



7. Press **ENTER**.
   The clock in the upper right of the screen will be updated.

Finishing the Setup

8. Press the **RETURN** soft key.
   The setup menu returns to the previous display.

2.8 Recommended Part Replacement

YOKOGAWA guarantees the AQ6150/AQ6151 for the period and under the conditions of the product warranty.
The following are recommended replacement parts. For part replacement, contact your nearest YOKOGAWA dealer.

Part Name	Service Life
LCD backlight	Under normal conditions of use, approximately 50000 hours
Internal reference light source (He-Ne laser)	Under normal conditions of use, approximately 40000 hours

The following are consumable parts. We recommend replacing them at the following intervals. For part replacement, contact your nearest YOKOGAWA dealer.

Part Name	Service Life
Cooling fan	3 years
Backup battery (lithium battery)	5 years

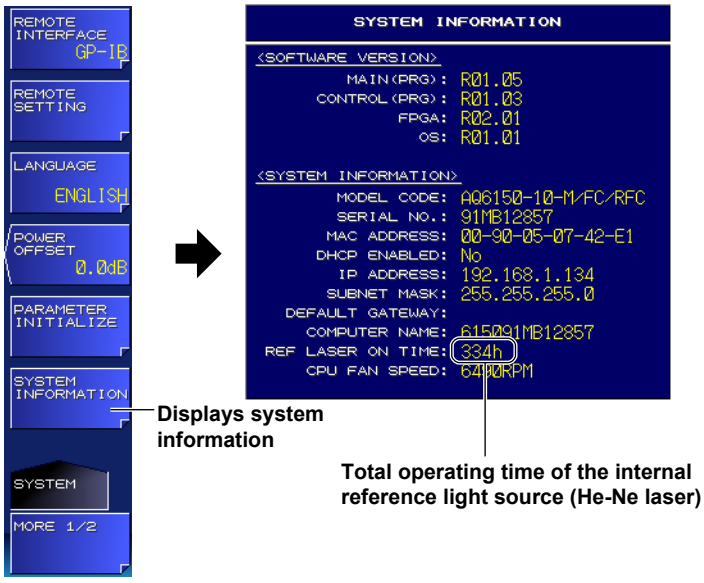
Replacement Period of the Internal Reference Light Source (He-Ne laser)

When the reference time (approx. 30000 hours) for replacing the internal reference light source elapses, the REF LASER STATUS LED on the front panel changes color. For details, see section 1.3. You can view the total operating time of the internal reference light source. It is the total of the times when the output of the internal reference light source has been on. However, the light source may reach its service life earlier than the reference time. See the notes of caution in the following sections.

- Section 2.2, “Installing the Instrument”
- Section 7.4, “Turning the Internal Reference Light Source (He-Ne laser) On and Off” in the User’s Manual, IM AQ6150-01EN.

Viewing the Total Operating Time of the Internal Reference Light Source

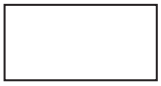
1. Press **SYSTEM**.
   System configuration setup menu appears.
2. Press the **SYSTEM INFORMATION** soft key.
   The system information appears.



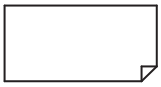
3.1 Soft Key Description

When you press a function key, the contents of the setup menu, which appears in the right side of the screen, change.
To help you understand how different soft keys work, the soft keys are displayed using different shapes that indicate their functions.

Shapes and Functionalities

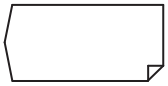


Normal soft key
Press to execute the function of the soft key.

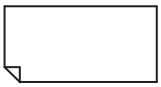


There is a next level.
Indicates that items related to the displayed item are available in the next level
Press to display the soft keys of the next level.

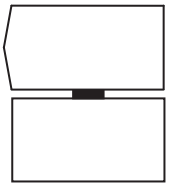
Displays a separate window
Press to display a separate window for entering a parameter value.



Displays the next level and a separate window
Press to display the next level and a separate window.

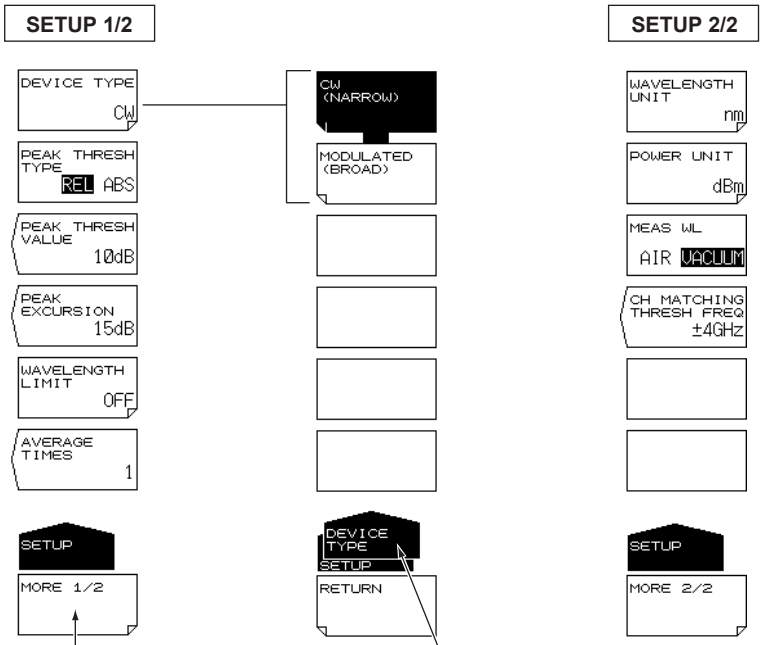


Soft key for returning to the previous level
Press to return to the soft keys of the previous level.



Selection soft key
Select a soft key from among the soft keys that are connected by black bands.
The selected soft key is highlighted.
In some cases, several soft keys may be connected.

Display Example



Indicates the setup menu hierarchy.
This example shows that a setup menu is available under DEVICE TYPE.
(This is for indication only; it is not an actual soft key.)

The SETUP setup menu is divided into two sections. This key switches the menu.
In some cases, this changes to a soft key for closing other windows.
In this example, pressing the MORE 1/2 soft key brings up the SETUP 2/2 setup menu, and the soft key changes to MORE 2/2.

Note

For the menu structure of the AQ6150/AQ6151, see appendix 1 in the User's Manual, IM AQ6150-01EN.

3.2 Mouse and Keyboard Operation

Mouse Operation

You can connect a mouse and use it to perform the same operations that you can perform with the AQ6150/AQ6151 keys. Also, by clicking a menu item, you can perform the same operation that you can perform by pressing the menu item's soft key. For details on connecting a mouse, see section 2.5.

Displaying the Top Menu

Right-click on the display. Front panel keys in the AQ6150/AQ6151 FUNCTION section appear.

REPEAT SINGLE STOP
DISPLAY SEARCH ANALYSIS
SETUP FILE SYSTEM
LOCAL PRT SCREEN

Selecting an Item

Click the item that you want to select. The setup menu for the item appears. The list of front panel keys disappears.
Before you click an item, if you click an area outside the front panel key list area, the list will disappear.

Selecting a Function on the Setup menu

Click the soft key that you want to select. The screen that would appear if you had pressed the soft key will appear.

External Keyboard Operation

The functions of the AQ6150/AQ6151 front panel keys are mapped to the keys on the keyboard, so you can use the keyboard to perform the same operations that you can perform using the AQ6150/AQ6151 panel keys.
For the panel key to keyboard key assignments, see the panel key assignment table below.
You can use the keyboard to enter labels, file names, and values.

Classification		Function	External Keyboard	Description
FUNCTION	Display settings	DISPLAY	[SHIFT]+[F1]	Display settings
	Analysis feature	SEARCH	[SHIFT]+[F2]	Search feature
		ANALYSIS	[SHIFT]+[F3]	FP-LD analysis, drift measurement, and data logging settings
	Measurement settings	SETUP	[SHIFT]+[F4]	Type of light, peak detection threshold, etc.
	Other	FILE	[SHIFT]+[F5]	File saving, loading, and operation
		SYSTEM	[SHIFT]+[F6}	System settings
Soft keys		F1 to F7	F1 to F7	Varies depending on the menu
Auxiliary key		PRT SCREEN	[SHIFT]+[P]	Screen copy
DATA ENTRY		Numeric keypad	0123456789.—	Numeric input
		BACK SPACE	Back space	Deletes one character
		ENTER	ENTER	Confirms the entry
		Arrow keys (▲▼◄►)	[↑], [↓], [←], [→]	Increment or decrement values, change items, and scroll lists
		COARSE	[ALT]+[N]	Switches coarse/fine encoder mode

3.3 Entering Values and Character Strings

Entering Values

Use the numeric keypad or arrow keys in the DATA ENTRY section. For a description of each key, see section 1.3.

1. Press a soft key that has a parameter.
   The current value appears in the measurement parameter input area.

Using the Numeric Keypad

2. Press a numeric key.
   A numeric keypad input area appears, and the value that you selected appears.
3. After entering the value, press **ENTER**.
   The value in the numeric keypad input area is reflected in the parameter input window, which updates the parameter value.

If you press the wrong key on the numeric keypad

4. Press **BACK SPACE**.
   The last number entered in the numeric keypad input area is erased, and you can enter the correct number.

Note

- If the value that you enter with the numeric keypad is outside the allowed range, it is reset to the closest allowed value.
- If you press BACK SPACE repeatedly and the numeric keypad input area becomes empty, the numeric keypad input area disappears.

Using the Arrow Keys

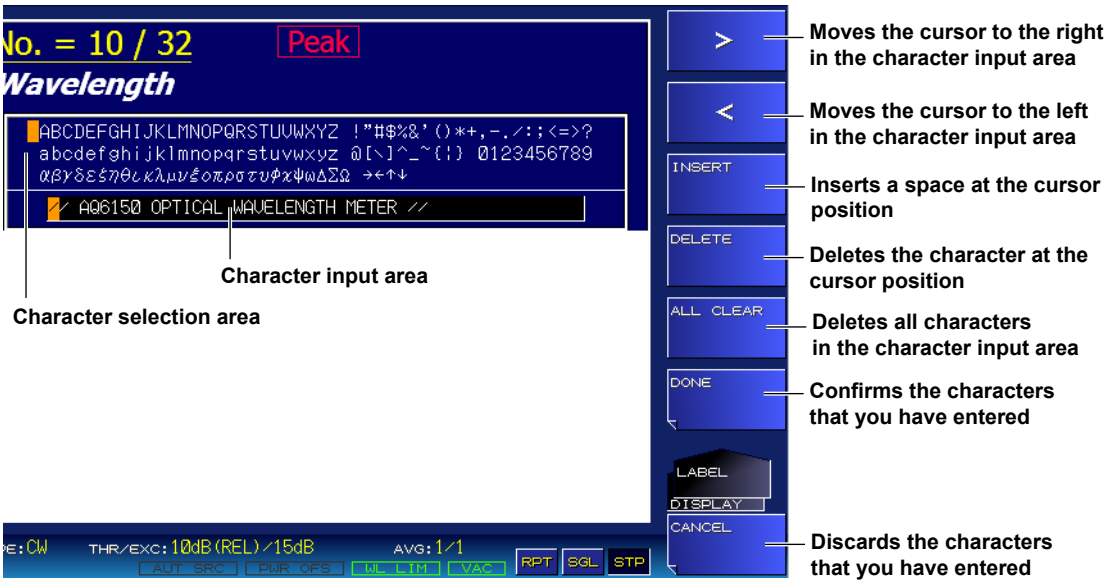
2. After step 1, press an arrow key.
   The current value changes.
3. Press **COARSE** to select the next higher digit or increase the step by which the value changes. Press it again to undo the operation.
   When COARSE is selected, the COARSE key illuminates.

Entering Character Strings

To enter character strings, you can use the soft keys in the character selection area that appears on the screen.

An example of how to enter a label is shown below.

1. Press **DISPLAY**.
   A display condition setup menu appears.
2. Press the **MORE 1/2** soft key.
3. Press the **LABEL** soft key.
   A setup menu and a character input screen for entering characters appear.



4. In the character selection area, move the cursor to the character that you want to enter. Use the arrow keys to move the cursor.
5. Press **ENTER**.
   The character that you select appears at the cursor in the character input area.
6. To move the cursor, insert a space, or delete a character in the character input area, press the corresponding soft key.
7. Press the **DONE** soft key.
   The entered character string is confirmed, and the entry is complete.

Note

- In addition to appearing when you press the DISPLAY key, the character string input screen also appears when you need to enter character strings, such as when you are entering the names of files you want to save.
- You can enter numbers directly from the numeric keypad.
- You can also use an external keyboard to enter values and character strings. For details on connecting an external keyboard, see section 2.5.

4.1 Optical and General Specifications

Item		Specifications	
		Model: AQ6150	**Model: AQ6151**
Applicable optical fiber		SM (ITU-T G.652)	
Wavelength	Wavelength range	1270 to 1650 nm	
	Wavelength accuracy[1]	±0.7 ppm (±1 pm at 1550 nm)	±0.2 ppm (±0.3 pm at 1550 nm)
	Minimum resolvable separation[4]	5 GHz (40 pm at 1550 nm, equal power lines input)	
	Display resolution	0.0001 nm	
Power	Power accuracy[2]	±0.5 dB (1550 nm, –10 dBm)	
	Linearity[2]	±0.3 dB (1550 nm, –30 dBm or higher input)	
	Polarization dependency[4]	±0.5 dB (1550 nm)	
	Display resolution	0.01 dB	
Maximum number of wavelengths		1024	
Minimum input power		–40 dBm (1270 to 1600 nm, single line input)	
		–30 dBm (1600 to 1650 nm, single line input)	
Maximum input power		+10 dBm (total of all lines)	
Safe maximum input power		+18 dBm (total of all lines)	
Return loss[4]		35 dB	
Measurement time[3]		0.3 s or less (per measurement)	
Functions	Measurement	Single, repeat, average, drift, data logging	
	Measurement condition setup	Average count, air/vacuum wavelength, device type (CW/modulated), measurement range	
	Display	Single wavelength, multi wavelength, delta, grid, spectrum (with zooming), wavelength axis units (wavelength (nm)/frequency (THz)/wave number (cm^{-1})), optical power units (dBm/mW/μW), center wavelength, total power, marker (up to 1024 points), label, power bar, warning messages, error messages, system information	
	Data analysis	Peak search, FP-LD analysis, drift analysis, data logging, WDM (OSNR) analysis	
	File	Saving/loading measured results (CSV), saving/loading setup parameters (binary), saving screen images (BMP), saving/loading logging data (binary and CSV)	
	Remote control	Interface selection (GP-IB/Ethernet), TCP/IP configuration, remote monitor	
	Others	Internal reference light source on/off, internal reference light source status LED, optical power offset, parameter initialization, firmware updating	
Display device		5.7 inch color LCD (640 x 480 dots)	
Data storage	Internal	256 MB or more	
	External	USB	
Interface		GP-IB, Ethernet, USB, VGA output	
Remote control		GP-IB, Ethernet	
Optical connector		FC/PC or SC/PC (AQ9441 Universal adapter)	
Warm-up time		60 minutes or more	
Power requirements		100 to 240 VAC, 50/60 Hz, approx. 100 VA	
Environmental Conditions		Optimal temperature: 10 to 30°C	
		Operating temperature: 5 to 35°C	
		Storage temperature: –10 to +50°C	
		Humidity: 20 to 85% RH (no condensation)	
Dimensions and mass		Approx. 426 (W) × 132 (H) × 450 (D) mm (excluding protrusions), approx. 11 kg	
Safety standards		Compliant standards EN61010-1 EN60825-1 Pollution degree 2[5]	

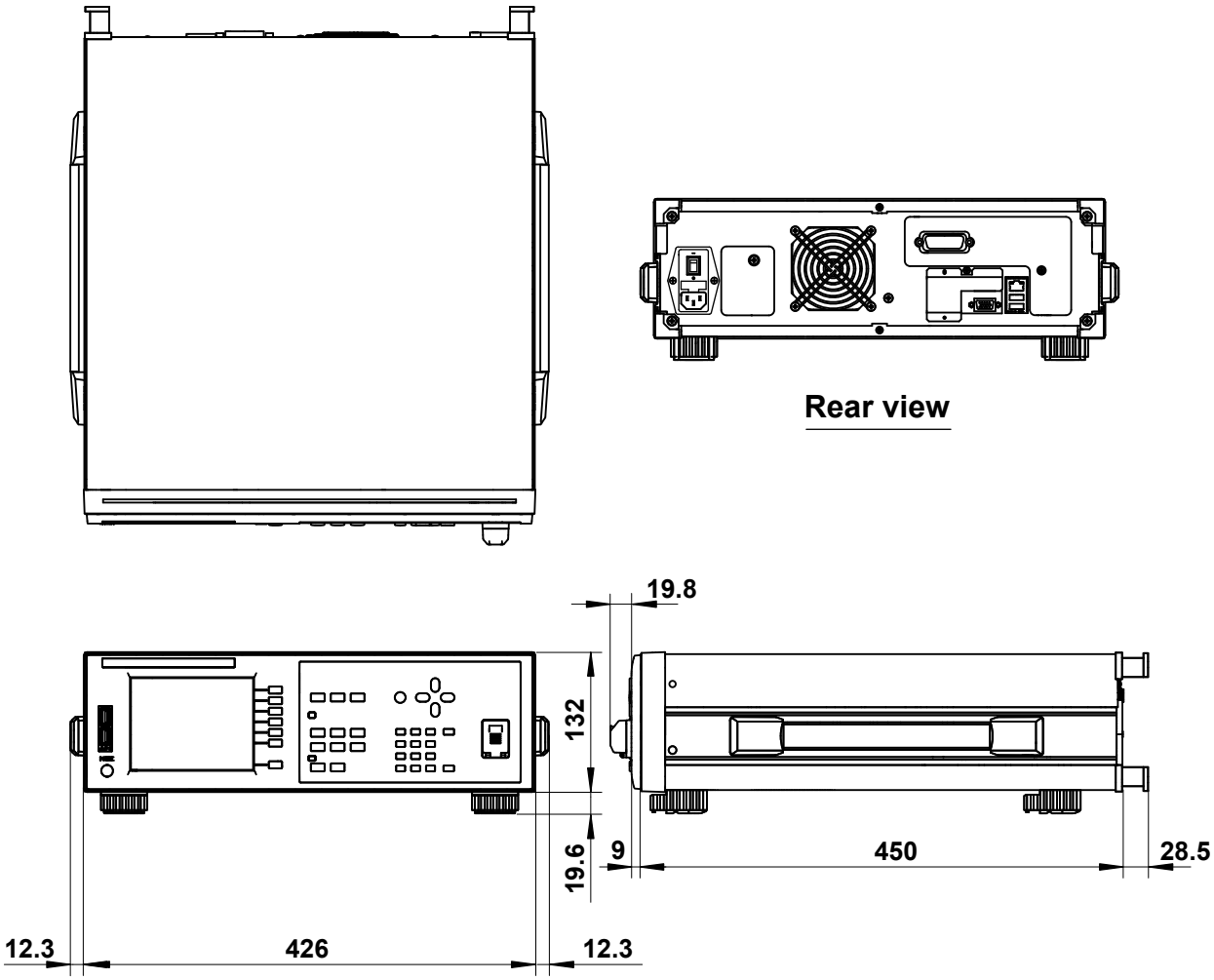
4.1 Optical and General Specifications

Item	Specifications	
	Model: AQ6150	**Model: AQ6151**
Emissions	Compliant standards EN61326-1 Class A EN55011 Class A, Group 1 EMC Regulatory Arrangement in Australia and New Zealand EN 55011 Class A, Group 1 Korea Electromagnetic Conformity Standard (한국 전자파적합성기준) EN61000-3-2 EN61000-3-3 This is a class A instrument designed for an industrial environment. Operation of this product in a residential area may cause radio interference in which case the user will be required to correct the interference.	
	Cable conditions • ETHERNET connector Use Ethernet cables that are 30 m or less in length. • VIDEO OUT connector Use a shielded D-sub 15-pin VGA cable that is 3 m or less in length. • USB interface Use USB peripherals (i.e. mouse) with shielded USB cables that are 3 m in length or less. • GP-IB connector Use a shielded GP-IB cable that is 3 m in length or less.	
Immunity	Compliant standard EN61326-1 Table 2 (for industrial environments)	
	Cable conditions The same as the cable conditions listed above for emissions.	
Environmental standard	Compliant Standard Monitoring and control instruments including industrial monitoring and control instruments.	

1 Line spectrum, CW, constant polarization during measurement, vacuum wavelength, input power –30 dBm or more, line separation 10 GHz or more in case of multi-line measurement, confidence level 3σ
2 Line spectrum, CW, excluding polarization effects
3 Number of detected peaks 128 or less
4 Typical
5 Pollution degree refers to the degree of adhesion of a solid, liquid, or gas which deteriorates withstand voltage or surface resistivity. Pollution Degree 1 applies to sealed space (with no pollution or only dry non-conductive pollution). Pollution Degree 2 applies to normal indoor atmospheres (with only non-conductive pollution).

4.2 External Dimensions

Unit: mm



Unless otherwise specified, tolerances are ±3% (however, tolerances are ±0.3 mm when below 10 mm).

Index