User's Manual

AQ1300/AQ1301 ETHERNET Multi Field Tester Operation Guide

YOKOGAWA
Yokogawa Test & Measurement Corporation

IM AQ1300-02EN
14th Edition

Thank you for purchasing the AQ1300/AQ1301 ETHERNT Multi Field Tester. This operation guide focuses on the handling precautions, basic operations, and specifications of the AQ1300/AQ1301.Use these manuals together with this operation guide.

List of Manuals

The AQ1300 and AQ1301 comes with the following manuals. Please keep them in a safe place.

Manual Title	Manual No.	Description
AQ1300/AQ1301 ETHERNET Multi Field Tester Operation Guide	IM AQ1300-02EN	This manual.
AQ1300 MFT10GbE Setup Software Installation Manual	IM AQ1300-62EN	Explains how to install AQ1300/AQ1301 setup software.
AQ1301 1G ETHERNET Multi Field Tester	IM AQ1301-92Z1	A manual for China.
AQ1300 10G ETHERNET Multi Field Tester	IM AQ1300-92Z1	A manual for China.
AQ1300/AQ1301 ETHERNET Multi Field Tester User's Manual (included in CD)	IM AQ1300-01EN	Explains all AQ1300/AQ1301 features, except for the communication features, and how to use them.
AQ1300/AQ1301 ETHERNET Multi Field Tester Communication Interface User's Manual (included in CD)	IM AQ1300-17EN	Explains the features related to using communication commands to control AQ1300/AQ1301.
AQ1300/AQ1301 Setup Software User's Manual (included in CD)	IM AQ1300-61EN	Explains how to use a PC to create AQ1300/AQ1301 setup files, display result files, and generate CSV files.
AQ1300 MFT10GbE ETHERNET Remote Control Window User's Manual (in CD)	IM AQ1300-63EN	Explains how to remotely control AQ1300/AQ1301 from a PC.
739874 AC Adapter User's Manual	IM 739874-01EN	Explains the handlling precautions for AC adapter.
739874 Precauciones de seguridad Меры предосторожности 이 기기의 안전한 사용을 위해	IM 739874-02Z4	Explains the handlling precautions for AC adapter.
739874 本设备的安全使用注意事项 為了安全地使用本機器	IM 739874-02ZH	Explains the handlling precautions for AC adapter.
Model 739882 Battery Pack (MFT) Handling Precautions	IM 739882-01EN	Explains the handlling precautions for the battery pack.
Model 739882 Battery Pack	IM 739882-92Z1	A manual for China.
Model 735454 Optical Transceiver Module	IM 735454-01EN	Explain the handling precautions of the 735454.

* The "-EN" and "-Z1" 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

14th Edition: April 2019 (YMI)

Notes

- **This manual (IM AQ1300-02EN 10th edition) applies to AQ1300/AQ1301 ETHERNET Multi Field Testers with firmware version R1.11.01.001 and later.**
  If you are using an older version, you will not be able to use all the features described in this manual. Check the firmware version of your product on the product information screen. For information on how to view the product information, see section 16.4 in the user's manual, IM AQ1300-01EN. For information on how to update the firmware, see section 16.5 in the user's manual, IM AQ1300-01EN.
- 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.
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Revisions

- November 2009 1st Edition
- November 2011 3rd Edition
- March 2013 5th Edition
- July 2016 10th Edition
- April 2018 13th Edition
- March 2010 2nd Edition
- June 2012 4th Edition
- August 2013 6th Edition
- October 2017 11th Edition
- April 2019 14th Edition
- June 2014 7th Edition
- December 2014 8th Edition
- November 2015 9th Edition
- December 2017 12th 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.

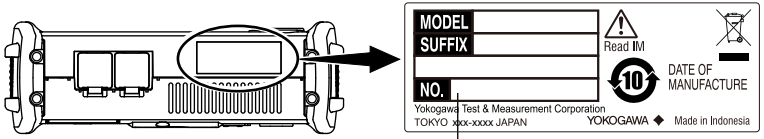
http://tmi.yokogawa.com/

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.

AQ1300/AQ1301

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.



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

Model	Suffix Code	Description		
AQ1300		MFT-10GbE		
AQ1301		MFT-1GbE		
Language	-HE	English		
	-HC	Chinese/English		
	-HK	Korean/English		
Power cord[3]		Compliant Standard	Maximum Rated Voltage	Part No.
	-D	UL/CSA Standard	125 V	A1068WD
	-F	VDE Standard	250 V	A1071WD
	-R	Australian Standard	250 V	A1070WD
	-P	Korean Standard	250 V	A1087WD
	-Q	BS/Singaporean Standard	250 V	A1069WD
	-H	Chinese Standard	250 V	A1076WD

Model	Suffix Code	Description
Options		
Optical power meter	/SPML	Standard optical power meter[1]
RFC 2544	/BM	RFC2544 Function[2]
XFP module[1]	/SR	10GBASE-SR XFP module
	/LR	10GBASE-LR XFP module
	/ER	10GBASE-ER XFP module
SFP module	/SX	1000BASE-SX SFP module
	/LX	1000BASE-LX SFP module
Shoulder strap	/SB	—

1 The AQ1301 is not applicable.

2 A standard specification on the AQ1301.

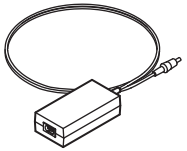
3 Make sure that the attached power cord meets the designated standards of the country and area that you are using it in.

Accessories

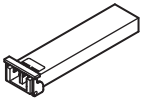
The instrument is shipped with the following accessories. Make sure that all accessories are present and undamaged.

Power cord (one cord that matches the suffix code is included)[5]

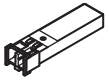
AC adapter
739874



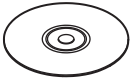
XFP module[2]



SFP module[3]

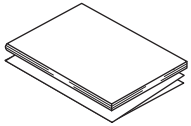


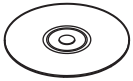
Application software CD
B8078WF
- Setup software
- Control window



Manuals

Printed manuals	Manual CD B8078VC[4]
IM AQ1300-02EN (This manual)	IM AQ1300-01EN
IM AQ1300-62EN	IM AQ1300-17EN
IM AQ1300-92Z1 or IM AQ1301-92Z1	IM AQ1300-61EN
IM 739874-01EN	IM AQ1300-63EN
IM 739874-02Z4	
IM 739874-02ZH	
IM AQ739882-01EN	
IM AQ739882-92Z1	
PIM113-01Z2	

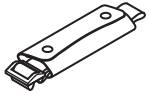




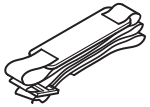
Battery pack
(lithium-ion)
739882

Ferrite core
A1190MN

Hand strap
B8070CX



Shoulder strap
B8070CY[1]



1 Included with models that have the /SB option installed.
2 Included with AQ1300/AQ1301 Series that have the /SR, /LR, or /ER option installed.
3 Included with models that have the /SX or /LX option installed.
4 You can purchase the printed manuals separately. Contact your nearest YOKOGAWA dealer to purchase a copy.
5 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	—
10GBASE-SR XFP module[1]	735454-SR	TRF2001FN-GA^{XXX} or FTLX8512D3BCL
10GBASE-LR XFP module[1]	735454-LR	TRF5016FN-GA^{XXX}, TRF5017FN-GA^{XXX}, or FTLX1413D3BCL
10GBASE-ER XFP module[1]	735454-ER	TRF7053FN-GA^{XXX} or FTLX1612M3BTL
1000BASE-SX SFP module	735454-SX	HNGEP-100
1000BASE-LX SFP module	735454-LX	HNGEP-200
SC connector adapter for optical power meters	735480-SCC	—
FC connector adapter for optical power meters	735480-FCC	—

1 Cannot be used with the AQ1301.

^{XXX} There is a case of change.

Note

The SFP module and XFP module are components of the AQ1300/AQ1301. As such, be sure to use the products that are listed under Options or Optional Accessories. If you use SFP or XFP modules that are not provided by YOKOGAWA, the AQ1300/AQ1301 functions and performance are not guaranteed. Additionally, using these modules voids your warranty.

Manual CD

WARNING

Never play the manual CD in 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.

The English folder of manual CD contains PDF files of the following manuals. The PDFs of the Japanese manuals are included in the manual CD. To view manuals, you need Adobe Reader 5.0 or later.

File Name	Manual Title	Manual No.
Features & Operation Manual.pdf	AQ1300/AQ1301 ETHERNET Multi Field Tester User's Manual	IM AQ1300-01EN
Communication Interface.pdf	AQ1300/AQ1301 ETHERNET Multi Field Tester Communication Interface User's Manual	IM AQ1300-17EN
MFT10GbE Setup Software.pdf	AQ1300 MFT10GbE Setup Software User's Manual	IM AQ1300-61EN
Remote Control Software.pdf	AQ1300/AQ1301 Remote Control Software User's Manual	IM AQ1300-63EN

Safety Precautions

This product is designed to be used by a person with specialized knowledge.
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.
This manual is an essential part of the product; keep it in a safe place for future reference. 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.

Direct current

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 direct

Stand-by

Equipment protected throughout by double insulation or reinforced insulation

Hazard, radiation of laser apparatus.

Veille

Équipement protégé par une double isolation ou une isolation renforcée

Danger : Appareil laser à rayonnement.

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.

Battery Pack

Only use the AQ1300/AQ1301 battery pack. Do not use this battery pack with other instruments. Only use the AQ1300/AQ1301 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 the AQ1300/AQ1301 off, and detach the AC adapter power supply from the AQ1300/AQ1301. 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.

Do Not Operate in an Explosive Atmosphere

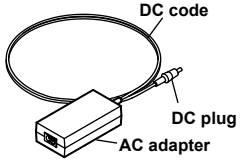
Do not use the AQ1300/AQ1301 in the presence of flammable gasses or vapors. Doing so is extremely dangerous.

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.

Power Cord and AC Adapter

- Only use the power cord and AC adapter that were included with the AQ1300/AQ1301. 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 the AQ1300/AQ1301 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 the AQ1300/AQ1301, do not move the AC adapter or the AQ1300/AQ1301.
- 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 the AQ1300/AQ1301 with the AC adapter hanging in the air.

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

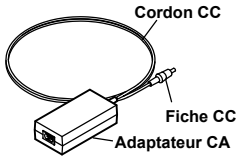
Ne pas utiliser l’instrument si son intégrité physique semble être compromise.

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 AQ1300/AQ1301. 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 AQ1300/AQ1301 avec l'adaptateur CA flottant dans l'air.

Pack de batteries

Utiliser exclusivement le pack de batteries de l'AQ1300/AQ1301. Ne pas utiliser ce pack de batteries avec d'autres instruments. Recharger le pack de batteries à l'aide de l'AQ1300/AQ1301 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 l'AQ1300/AQ1301 hors tension et débrancher l'adaptateur c.a. de l'AQ1300/AQ1301. 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.

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 Strage 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

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.

Support de stockage

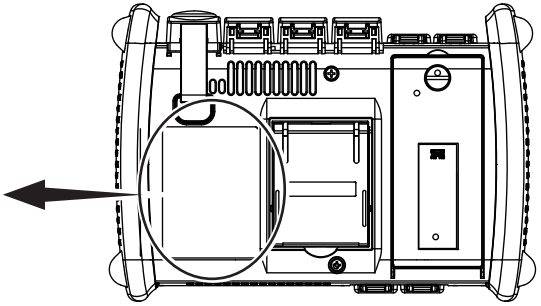
N'enlevez pas un dispositif de mémoire USB et ne coupez pas l'alimentation électrique lorsque l'indicateur d'accès à la mémoire USB clignote ou lorsque les données sont en train d'être enregistrées ou chargées à partir d'une mémoire interne. Vous risqueriez

d'endommager le support de stockage (mémoire USB ou mémoire interne) ou les données qu'il contient.

Safety Precautions for Laser Products

When optical transceiver module (XFP module or SFP module) is installed in the AQ1300 or AQ1301, AQ1300 or AQ1301 is a Class 1 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, 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007.

Laser Class 1 Label



Model (optical transceiver module)	Class	Center Wavelength	Maximum Output Power[1]	Beam Divergence (full angle at 1/e^2)	Pulse Duration and Repetition Rate	Supplier Code
735454-SR	1	850 nm	0.78 mW	23.1°	CW	TRF2001FN-GA^{XXX}
	1	850 nm	0.7 mW	20°	CW	FTLX8512D3BCL
735454-LR	1	1310 nm	15.6 mW	11.5°	CW	TRF5016FN-GA^{XXX}, TRF5017FN-GA^{XXX}, or FTLX1413D3BCL
735454-ER	1	1550 nm	10.0 mW	11.5°	CW	TRF7053FN-GA^{XXX} or FTLX1612M3BTL
735454-SX	1	850 nm	2.4 mW	23.1°	Pulse 625 MHz	HNGEP-100
735454-LX	1	1310 nm	3.0 mW	11.5°	Pulse 625 MHz	HNGEP-200

1 Under single fault conditions.
XXX There is a case of change.

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.

Sales in Each Country or Region

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 Annex I, 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.

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 15.6 in the user’s manual (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.

Recycle Mark

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

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.

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.

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.

French

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 proper operation of the instrument.

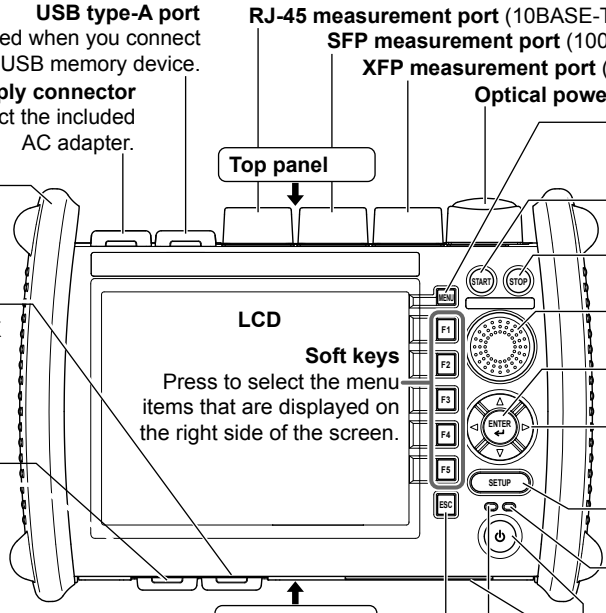
References

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

Contents

Names and Functions of Parts

Front Panel



USB type-A port
Used when you connect a USB memory device.

RJ-45 measurement port (10BASE-T, 100BASE-TX, 1000BASE-T)

SFP measurement port (1000BASE-SX/LX, 100BASE-FX)

XFP measurement port (10GBASE-SR/LR/ER)(supported by the AQ1300)

Optical power measurement port (OPM AQ1300 option)

DC power supply connector
Used to connect the included AC adapter.

MENU key
Press to display the top menu.

Protector
Protects the AQ1300/AQ1301 from external shocks

START key
Press to start measurement.

STOP key
Press to stop measurement.

RJ-45 LAN port
(for 10BASE-T/100BASE-TX remote control)
Used to connect the AQ1300/AQ1301 to a network and control it from a PC.

Soft keys
Press to select the menu items that are displayed on the right side of the screen.

Rotary knob
Turn to change values, and move the cursor.

ENTER key
Press to confirm procedures and settings.

Arrow keys
Press to change values, move between digits, and move the cursor.

USB type-B port
(Mini-B)
Used to control the AQ1300/AQ1301 from a PC or access the AQ1300/AQ1301 internal memory from a PC.

SETUP key
Press to display the top page of the setup menu.

ON LED
Illuminates in green when the AQ1300/AQ1301 is running Illuminates in red when the battery is low

ESC key
Press to return to the previous menu or to cancel the current operation.

Power switch
Press to turn the AQ1300/AQ1301 on and off.

CHARGE LED
Illuminates in red when the battery pack is being charged
Illuminates in green when the battery pack is finished charging

Fan
Cooling fan

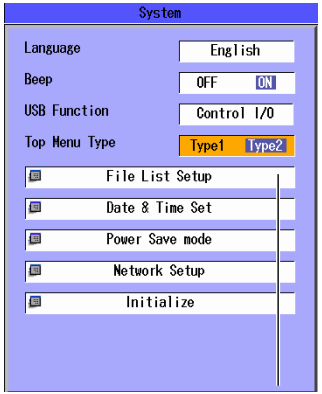
Display Screen

Top Menu Screen

This feature is supported in firmware version (FW Ver.) R1.08.01.001 and later.

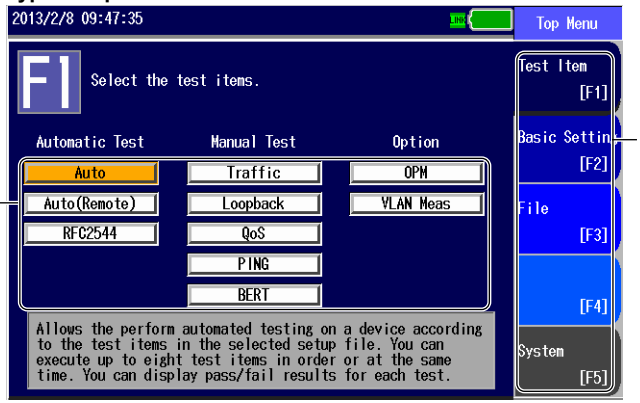
You can change the top menu display. For details, see section 13.6 in the user's manual.

1. Press **MENU** to display the top menu.
2. Press the **System** soft key and then the **System** soft key again.
3. Using the **rotary knob** and **ENTER**, set the top menu type to Type2.



Select the top menu type (Type1, Type2)

Type 2 Top Menu Screen



Configuration items are displayed on the soft keys.

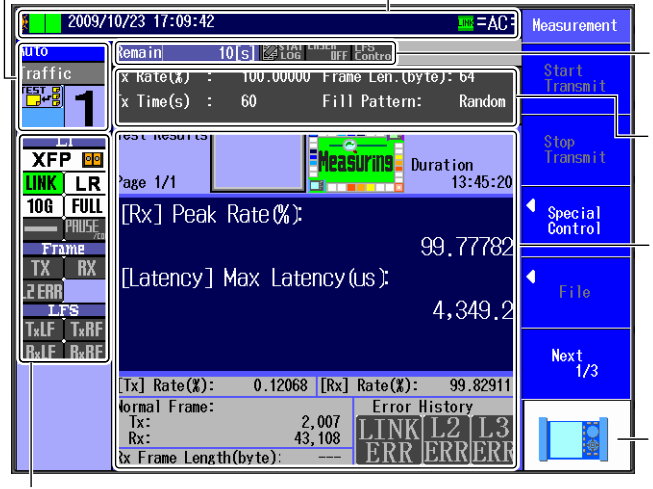
The figure above shows the F1 test item screen.

Use the rotary knob and ENTER to select the test item.

Screen during Measurement

Test information
(Test type, test mode, and test item execution status)

Title bar
(Simple optical power monitor, current time, selected setup file, link status, and power supply status indication)



Measurement status
(Tx time, logging statistics, optical output off control, and LFS control)

Summary (setting summary and address)

Test results
(Common items: pass/fail judgment, indication that measurement is in progress, measurement duration, Tx rate, Rx rate, number of normal frames, number of receive frames, and error history
Test-mode-specific items)

Remote control status

Link status
(L1: I/F type, module type, link, connection speed, duplex, MDI/MDI-X, and flow control
Frame: Tx, Rx, and ERROR
LFS: LF transmission, RF transmission, LF reception, and RF reception)
If the I/F type and the module type do not match, a red background is displayed.
If the AQ1300/AQ1301 detects a module that is not recommended, a yellow background is displayed.

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. Do Not Block the Inlet and Vent Holes.

Never place objects such as other instruments or objects that contain water on top of the instrument. In addition, there are inlet holes on the bottom panel and vent holes on the rear panel. Do not block these holes. 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

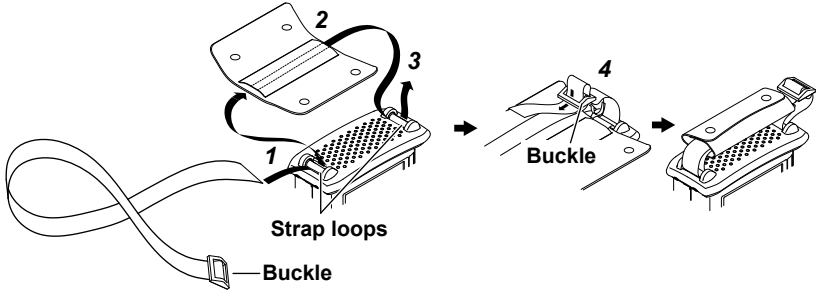
Unplug the power cord from the outlet, and remove the battery pack from the instrument.

When Carrying the Instrument

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

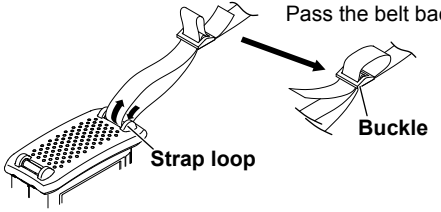
Attaching the Strap

Attaching the Hand Strap



1. Pass the hand strap through the loop on the lower-left side of the AQ1300/AQ1301.
2. Pass the hand strap through the hand strap cover.
3. Pass the hand strap through the loop on the upper-left side of the AQ1300/AQ1301.
4. Pass the strap through the buckle, and use the buttons to close the hand strap cover.

Attaching the Shoulder Strap



Attach the strap to the loops on both the upper-left and upper-right sides of the AQ1300. 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 the AQ1300.

Connecting the Power Supply

Using the AC Adapter

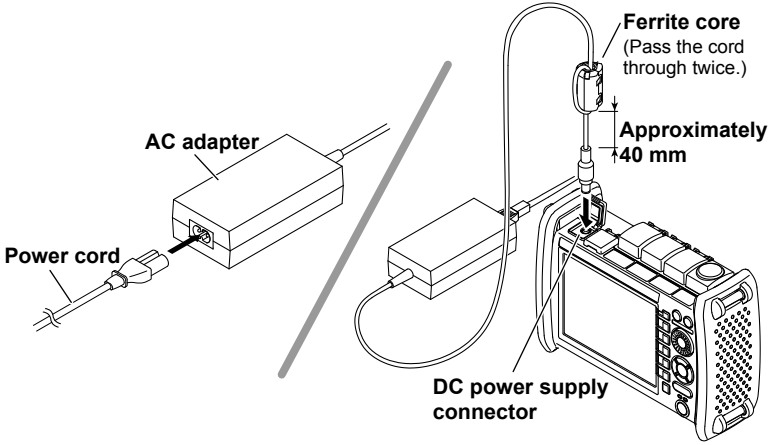
WARNING

- Confirm that the AQ1300/AQ1301 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 the AQ1300/AQ1301.
- Do not connect or disconnect the AC adapter while the AQ1300/AQ1301 is on.
- If you are using the AQ1300/AQ1301 for a long time with the AC adapter connected, remove the battery pack from the instrument.
- If an appropriate AC outlet for the supplied power cord is unavailable, do not use the instrument.

French

AVERTISSEMENT

- Vérifier que l'AQ1300/AQ1301 est hors tension avant de raccorder au secteur.
- Vérifier que la tension d'alimentation correspond à la tension d'alimentation nominale de l'adaptateur c.a. et qu'elle ne dépasse pas la plage de tension maximale spécifiée pour le cordon d'alimentation.
- Utiliser exclusivement l'adaptateur c.a. dédié pour l'instrument.
- Ne pas brancher, ni débrancher l'adaptateur c.a. pendant que l'AQ1300/AQ1301 est sous tension.
- Si l'AQ1300/AQ1301 est utilisé de manière prolongée avec l'adaptateur c.a., retirer le pack de batteries de l'AQ1300/AQ1301.
- N'utiliser l'instrument que si une prise secteur appropriée est disponible pour le branchement du cordon d'alimentation.



1. Connect the power cord to the AC adapter.
2. Connect the AC adapter's plug to the AQ1300/AQ1301 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 the AQ1300/AQ1301 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.

French

AVERTISSEMENT

- Ne pas installer, ni déposer le pack de batteries lorsque l'électricité est alimentée par l'adaptateur c.a.
- À titre préventif, inspecter régulièrement le boîtier extérieur du pack de batteries afin de déceler tout signe d'endommagement, comme l'apparition de fissures ou de déformations, et vérifier qu'il n'y a aucune fuite.
- Recharger le pack de batteries à l'aide de l'AQ1300/AQ1301. Respecter les consignes environnementales prescrites pour la recharge du pack de batteries, afin d'éviter les risques de fuite, de surchauffe, de fumée, d'explosion ou d'incendie.
- Respecter les consignes de manipulation indiquées dans le manuel d'utilisation du pack de batteries.

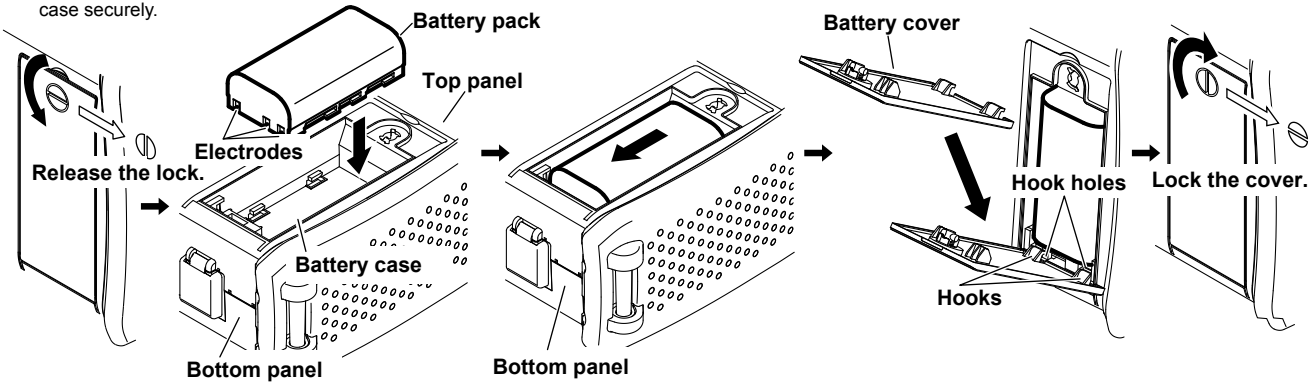
1. Unlock and remove the battery cover.
Insert a coin or screwdriver with a thickness that will not damage the lock slot into the lock slot, and release the lock.

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

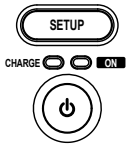
Over Discharge and Long Periods of Storage

- If you do not use the instrument for an extended period of time with the battery pack connected to the AQ1300/AQ1301, 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 the AQ1300/AQ1301 for one week or longer, charge the battery pack, remove it from the 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 the AQ1300/AQ1301 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 the AQ1300/AQ1301 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 the AQ1300/AQ1301 and charge an empty battery for an hour at room temperature.
- Use the AQ1300/AQ1301 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 the AQ1300/AQ1301 front panel. When the AQ1300/AQ1301 starts normally, the ON indicator illuminates, and the top menu appears. For details on the top menu, see page 19.

- 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 the AQ1300/AQ1301 to an electrical outlet, and charge the battery pack. The remaining battery power appears at the top of the screen.
- If you try to charge the battery pack right after running the AQ1300/AQ1301 off of battery power, the battery pack may not charge immediately.

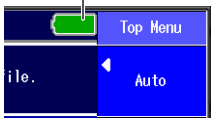


Power switch

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.

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 23.
- Is the battery pack loaded correctly? See page 24.
- Are you holding down the power switch for at least 2 seconds?

If the AQ1300/AQ1301 still does not work properly after checking these items, contact your nearest YOKOGAWA dealer for repairs.

Warm Up

To enable more accurate measurements, allow the AQ1300/AQ1301 to warm up for at least 5 minutes after it is turned on.

Installing Interface Modules

CAUTION

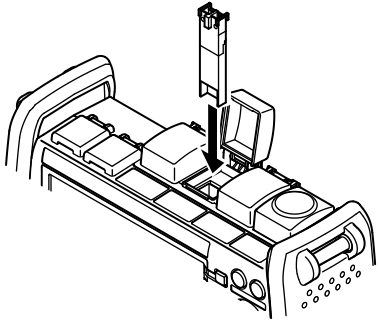
- Be extremely careful of static electricity when you install or remove XFP or SFP modules. Electrostatic discharges during the installation or removal of these modules may cause them to malfunction.
- Do not install or remove XFP or SFP modules while cables are connected to them. Doing so may damage the instrument.
- Do not install or remove XFP or SFP modules while the AQ1300/AQ1301 is performing measurements. Doing so may damage the instrument.

French

ATTENTION

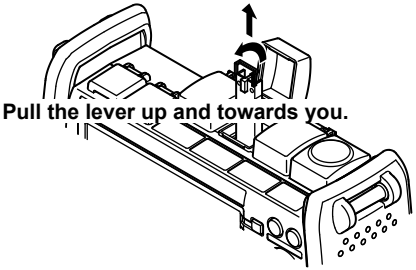
- Prendre garde à l'électricité statique lors de l'installation ou de la dépose des modules XFP ou SFP. Les décharges statiques qui se forment lors de l'installation ou de la dépose de ces modules peuvent provoquer leur dysfonctionnement.
- Ne pas installer ou déposer les modules XFP ou SFP si des câbles y sont branchés. Le cas échéant, un endommagement de l'équipement risquerait de se produire.
- Ne pas installer ou déposer les modules XFP ou SFP pendant que le dispositif AQ1300/AQ1301 procède à des mesures. Le cas échéant, un endommagement de l'équipement risquerait de se produire.

Installing an interface module (An SFP module in this example)



Align the XFP or SFP module with the matching installation guides and slowly insert the module into the instrument. Press firmly until the module is fully inserted into the connector shell.

Removing an interface module (An SFP module in this example)



Pull the lever that is at the top of the XFP or SFP module up and towards you, and slowly pull the module free of the connector shell and out of the instrument.

Connecting Optical Fiber Cables

WARNING

- If XFP or SFP modules are installed in the AQ1300/AQ1301, light is emitted from the source ports when the instrument is turned on. Do not disconnect the connected optical fiber cables. Visual impairment may occur if the light enters the eye.
- Close the covers of any measurement ports that do not have optical fiber cables connected to them. Visual impairment may occur if light that is mistakenly emitted from these ports 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, the AQ1300/AQ1301 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 match the universal adapters or connector adapters that are attached to the AQ1300/AQ1301 optical ports.

French

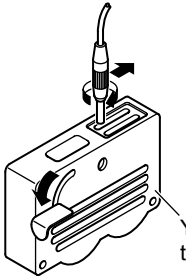
AVERTISSEMENT

- Si les modules XFP ou SFP sont installés dans le dispositif AQ1300/AQ1301, la lumière est émise par des ports de source lumineuse lors de la mise sous tension de l'instrument. Ne pas débrancher les câbles à fibre optique connectés. Des lésions oculaires peuvent être causées si le faisceau lumineux pénètre dans l'œil.
- Couvrir les caches des ports de mesure libres. Une déficience visuelle peut se produire si la lumière émise par erreur de ces ports pénètre dans l'œil.

ATTENTION

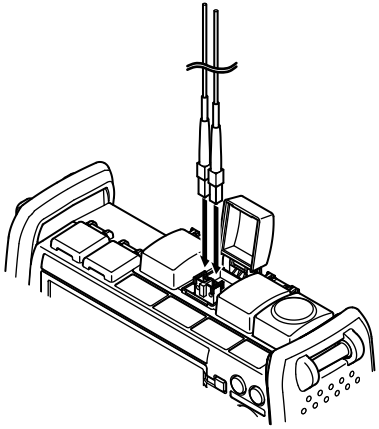
- Insérer les connecteurs de câbles à fibre optique délicatement et sans les incliner dans les ports optiques. Éviter de faire pression sur le connecteur ou de forcer pour l'insérer dans le port, car cela pourrait endommager le connecteur optique ou le port optique.
- Toujours utiliser des connecteurs optiques conformes aux spécifications, à défaut de quoi les ports optiques de l'AQ1300/AQ1301 pourraient être endommagés. Utiliser des connecteurs optiques homologués ou utilisés par les entreprises et les fournisseurs de services de télécommunications de votre région.
- Utiliser les connecteurs de câbles à fibre optique correspondant aux adaptateurs universels ou les adaptateurs de connecteurs reliés aux ports optiques AQ1300/AQ1301.

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.



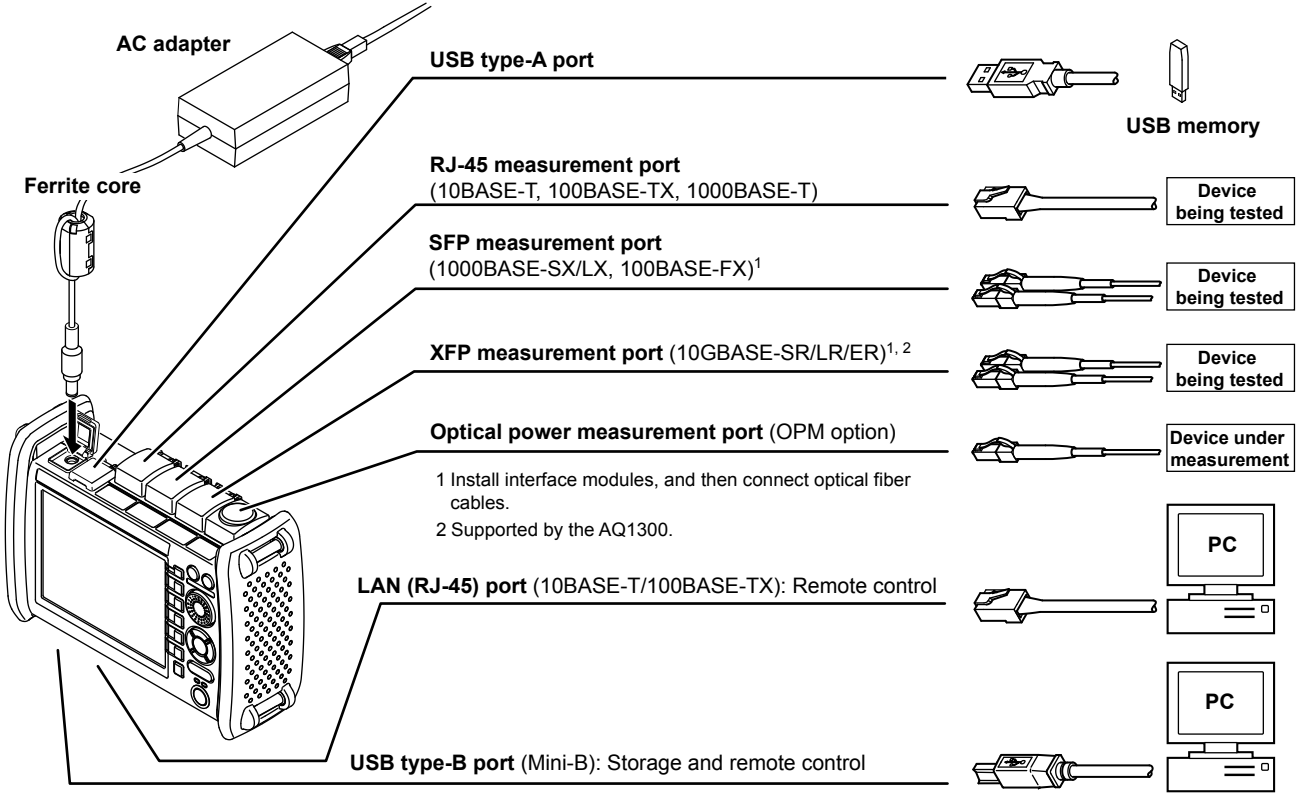
1. Firmly press the connector end face of the optical fiber cable against the cleaning surface of the cleaner.
2. While pressing the end face against the cleaner, turn the cable once.
3. While pressing the end face against the cleaner, move the cable.
4. Repeat steps 1 to 3.

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



1. Open the optical port (XFP, SFP, or OPM measurement port) cover on the AQ1300/AQ1301 top panel.
2. Properly align the optical fiber cable's connector with the optical port, and insert the connector.

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.

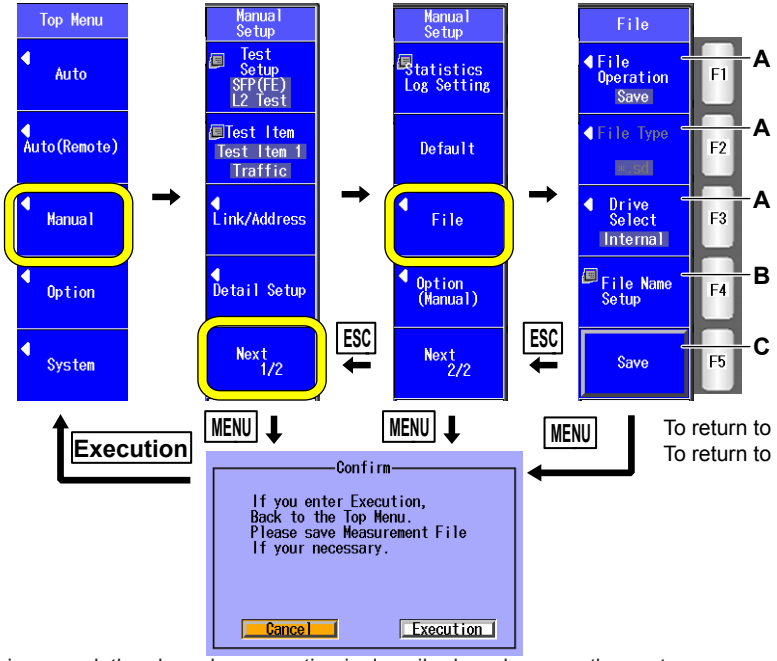
- Repetitive operations.
- Detailed operations for proceeding to the desired setup menu or dialog box and information about the accompanying screen changes.
- Setup items that users can configure if they have a general understanding of them.

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

Key Operations

We will use the process of moving from the top menu to the Save Data menu as an example of key operations.

1. Press **MENU** to display the top menu.
2. Press the **Manual** soft key (F3) to display the Manual Setup (1/2) menu.
3. Press the **Next 1/2** soft key (F5) to display the Manual Setup (2/2) menu.
4. Press the **File** soft key (F3) to display the File 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: A dialog box appears when 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.

In this manual, the above key operation is described as shown on the next page.

Setup Operation Example

1. Press **MENU** to display the top menu.
2. Press the **Manual** soft key, the **Next 1/2** soft key, and then the **File** soft key to display the following screen.

Set the action.

Select a drive (Internal, USB Memory).

Set the file name.

Saves the file

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.

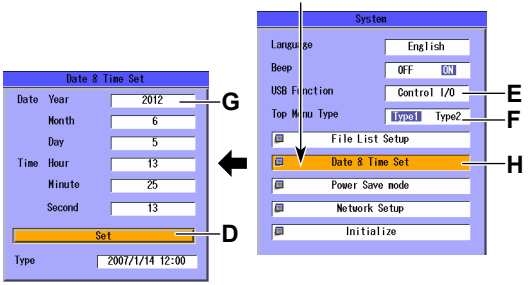
- Step numbers are used when there are many operations and when operations must be performed in different menus.
- The explanation for returning to the previous menu is omitted.

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 **System** soft key in the system setup.

1. Press the **System** soft key (F5) to display the System menu.
2. Press the **System** soft key to display the System Setup dialog box.
3. 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.
4. 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 3 and 4 listed above are indicated using the expression “using the **rotary knob** and **ENTER**.”

The item at the cursor location is highlighted.



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.

Setup operation types D through H 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.

Example of menu for **E**

F: The selected setting switches each time you press **ENTER**.

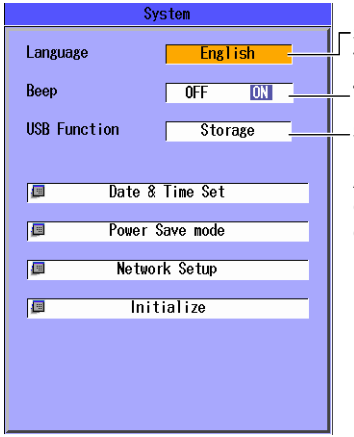
G: Press **ENTER** to display a text box. Turn the **rotary knob** or press the **up and down arrow** keys to increase or decrease a number. To move between digits, press the **left and right arrow** keys. After you have entered a number, press **ENTER** to set the value to that number.

Example of text box for **G**

H: Press **ENTER** to display a dialog box.

In this manual, the above key operations are described as shown on the next page.

System soft key and then the **System** soft key to display the following screen.



Set the display language.
The options that appear vary depending on the language specification.

Turns the beep on and off

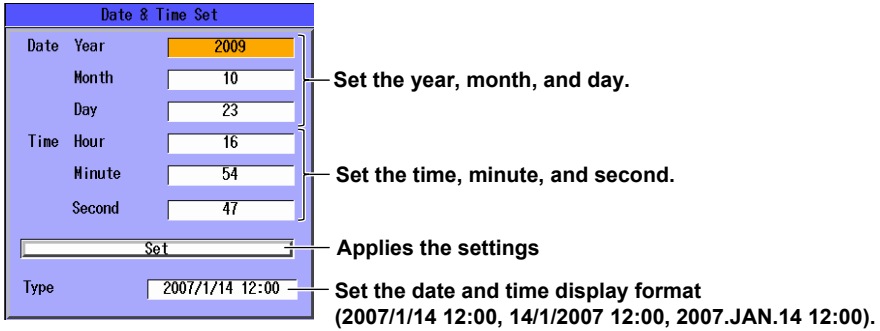
Set the USB function (Storage, Control I/O).

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 the **System** soft key and then the **System** soft key.
3. Using the **rotary knob** and **ENTER**, select **Date & Time Set** to display the following screen.



Year, Month, and Date

The year is displayed according to the Gregorian calendar. The AQ1300/AQ1301 supports leap years.

Hour, Minute, and Second

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

Type

You can specify how the date and time are displayed on the title bar.

2007/1/14 12:00: Year/Month (Number)/Day Hour:Minute:Second
14/1/2007 12:00: Day/Month (Number)/Year Hour:Minute:Second
2007.JAN.14 12:00: Year.Month (Abbreviated English).Day Hour:Minute:Second

Note

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

Setup

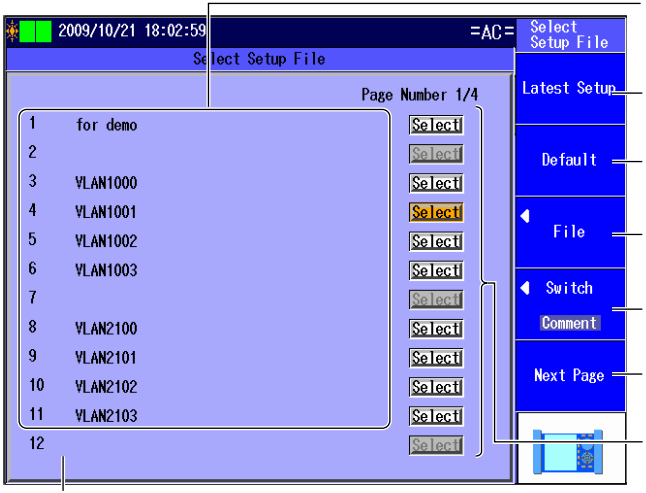
We will use the Auto mode settings as an example.

Selecting a Setup File

section 4.1, “Selecting a Setup File” in the user’s manual

Select Setup File Screen

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



Registered setup files
A comment or the file name (up to 30 characters) is displayed next to the number.

Latest setup

Default setup

Loads a file
Loads the selected setup file from the file list

Switches the setup file list display (Comment, File Name)

Switches the setup file list page (page numbers: 1/4-4/4)

Select a setup file.
Select a registered setup file from the setup file list.

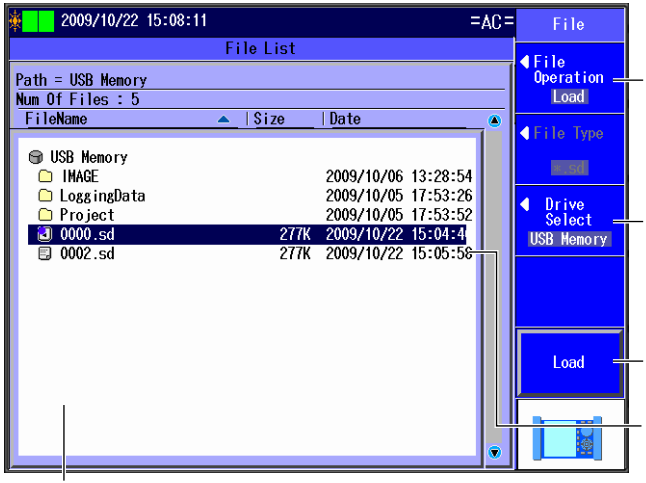
Setup file list
Appears when you have created a display management file using the setup software and sent it to the AQ1300/AQ1301

Note

In Auto and Auto(Remote) mode, to select a setup file, you can choose to use the latest setup, use the default setup, load a setup file from the file list, or select a setup file from the setup file list.

File Screen

File soft key to display the following screen.



Set Action to Load.

Select a drive (Internal, USB Memory).

Loads the file

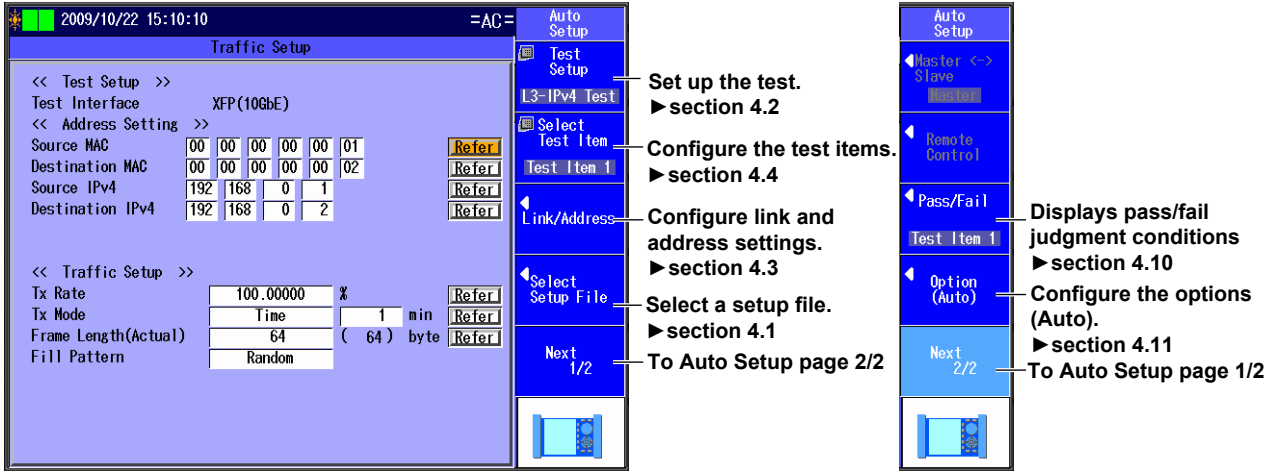
Select a setup file (.sd extension) to load.

File list

The files that you have created using the setup software or the AQ1300/AQ1301 appear.

Auto Setup Screen

The following screen appears when you select a setup file.



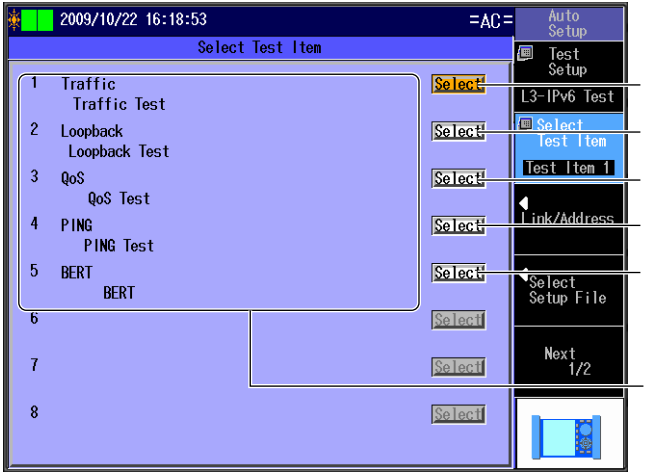
For details regarding these settings, see the corresponding section in the user's manual.

Configuring Test Items

●●●▶ section 4.4, “Configuring Test Items” in the user’s manual

1. Follow the “Selecting a Setup File” procedure to display the Auto Setup screen.
2. Press the **Select Test Item** soft key to display the following screen.

Example with the Default Settings



Traffic setup ►section 4.5

Loopback setup ►section 4.6

QoS setup ►section 4.7

PING setup ►section 4.8

BERT setup ►section 4.9

Registered test items
You can register up to eight items using the setup software.

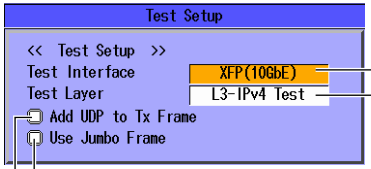
For details regarding these settings, see the corresponding section in the user’s manual.

Changing Parameters (When necessary)

Changing the Test Settings

Section 4.2, “Setting Up a Test” in the user’s manual

1. Follow the “Selecting a Setup File” procedure to display the Auto Setup screen.
2. Press the **Test Setup** soft key to display the following screen.



Set the test interface (XFP(10GbE), SFP(GbE), SFP(FE), RJ-45).
XFP is supported by AQ1300.

Set the test layer (L2 Test, L3-IPv4 Test, L3-IPv6 Test).

Select this check box to treat oversize frames like normal frames.

Select this check box to add UDP to Tx frames.
This setting can be selected when Test Layer is set to L3-IPv4 Test or L3-IPv6 Test.

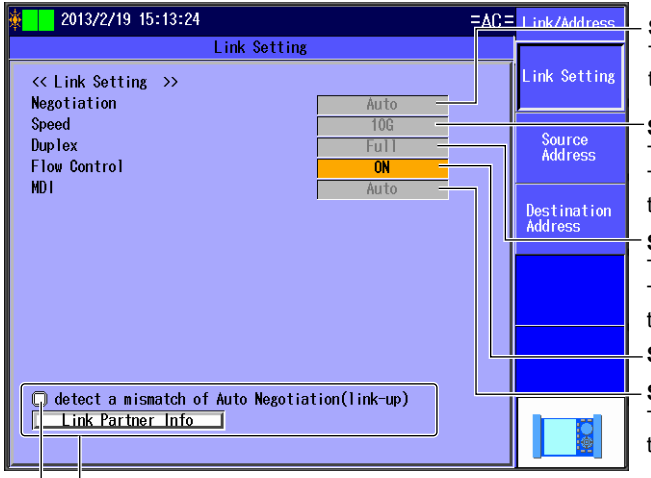
For details regarding these settings, see section 4.2 in the user’s manual.

Changing the Link and Address Settings

section 4.3, “Configuring Link and Address Settings” in the user’s manual

Link Setting Screen

1. Follow the “Selecting a Setup File” procedure to display the Auto Setup screen.
2. Press the **Link/Address** soft key and then the **Link Setting** soft key to display the following screen.



Set the negotiation (Auto, Manual).
This setting is valid when Test Interface is set to RJ-45 or SFP(GbE).

Set the speed (1G, 100M, 10M, Auto).
This setting is valid when Test Interface is set to RJ-45. The Auto setting for Speed is valid when Negotiation is set to Auto.

Set the duplex (FULL, HALF, Auto).
This setting is valid when Speed is set to 100M or 10M. The Auto setting for Duplex is valid when Negotiation is set to Auto.

Set the flow control (ON, OFF).

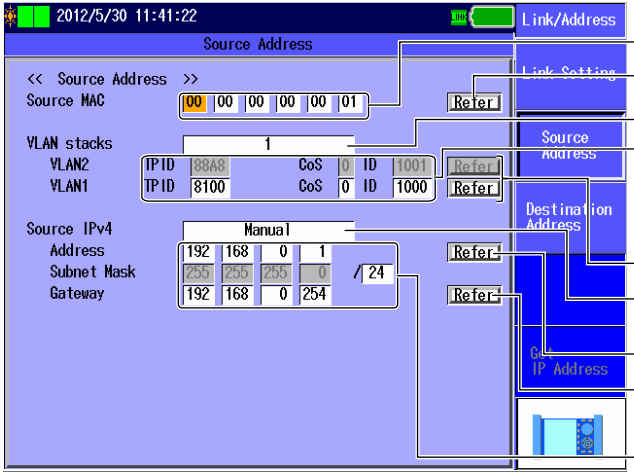
Set the MDI (MDI, MDI-X, Auto).
The Auto setting for MDI is valid when Negotiation is set to Auto.

This item appears when Test Interface is set to RJ-45 or SFP(GbE).

Select this check box to receive a notification when a mismatch is detected in the auto negotiation during link establishment.

Source Address Screen

Link/Address soft key and then the **Source Address** soft key to display the following screen.



Set the source MAC address

Refer to the MAC Address table.

Set the VLAN stack number (None, 1, 2).

Configure the VLAN settings (CoS: 0-7, ID: 0-4095, TPID: 0-ffff).
These settings are valid when VLAN stacks is set to 1 or 2.

Refer to the VLAN table.

Set IPv4 (Manual, DHCP).
This setting appears when Test Layer is set to L3-IPv4.

Refer to the IP Address table.

Refer to the gateway reference.

Set the source IPv4 address.
Set the subnet mask (1-31).
Set the gateway.
These settings are valid when IPv4 is set to Manual.

Set IPv6 (Manual, Stateless Address).
This setting appears when Test Layer is set to L3-IPv6.

Refer to the IP Address table.

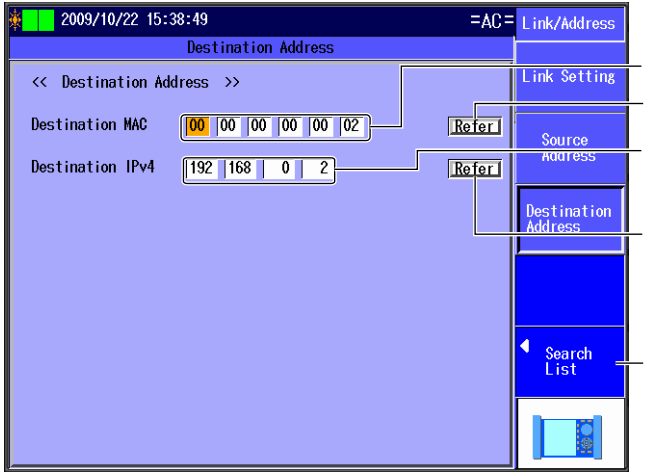
Set the source IPv6 address.
This setting is valid when IPv6 is set to Manual.

Select this check box when you want to manually set the router address.

The IPv6 prefix length and the IPv6 router address are displayed.

Destination Address Screen

Link/Address soft key and then the **Destination Address** soft key to display the following screen.



Set the destination MAC address.

Refer to the MAC Address table.

Set the destination IPv4 address.
This setting appears when Test Layer is set to L3-IPv4.

Refer to the IP Address table.

Select from the search list.

Set the destination IPv6 address.
This setting appears when Test Layer is set to L3-IPv6.

Refer to the IP Address table.

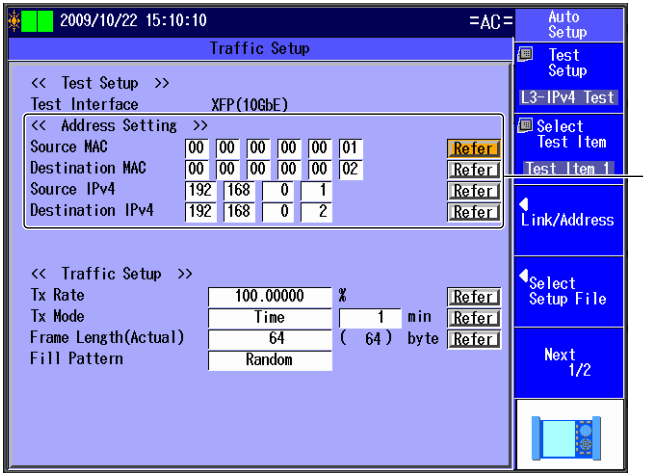
For details regarding these settings, see section 4.3 in the user's manual.

Note

Address Settings

In Auto and Auto(Remote) mode, you can set the source and destination MAC, IPv4, and IPv6 addresses in the test item screens.

Traffic Setup Example (L3-IPv4 Test)



You can also set the addresses in the test item screens.

Starting and Stopping Measurement

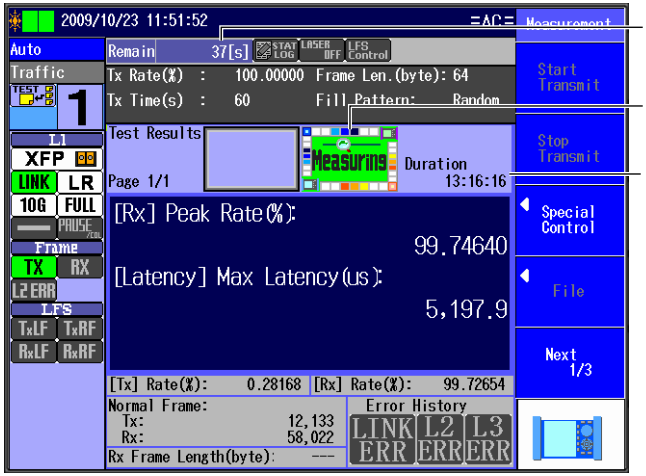
sections 4.11, “Configuring Options (Auto)” and 7.1, “Starting and Stopping Measurement” in the user’s manual

When Measurement and Transmission Control Are Synchronized

Starting Measurement

1. Follow the procedure in section 4.11 to synchronize measurement and transmission control.
2. Press **START** to display the following screen and start measurement and transmission.

Screen during Measurement (Traffic Test)



Remaining Tx time

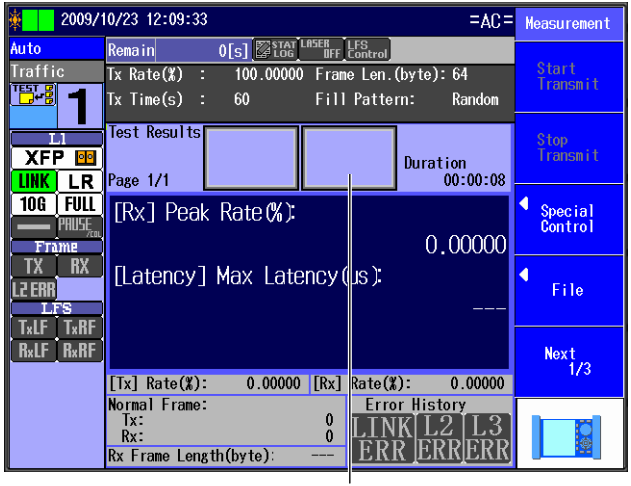
Indication that measurement is in progress

Measurement duration

When the transmission end conditions are met, the following screen appears, transmission stops automatically, and measurement finishes.

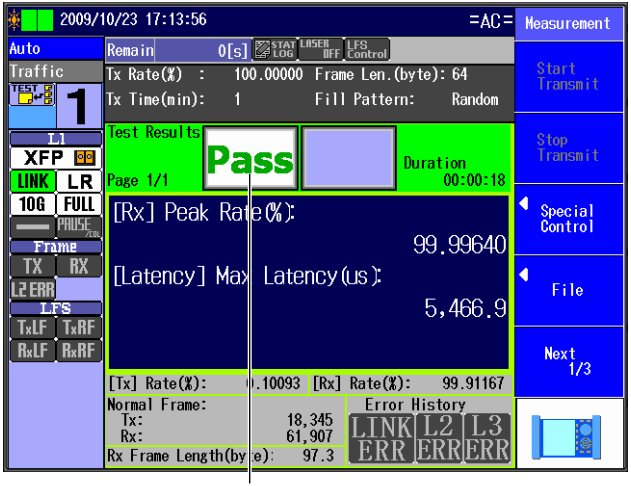
Screen after Measurement Has Finished (Traffic Test)

When Pass/Fail Judgment Is Not Performed



Indication that measurement has finished

When Pass/Fail Judgment Is Performed



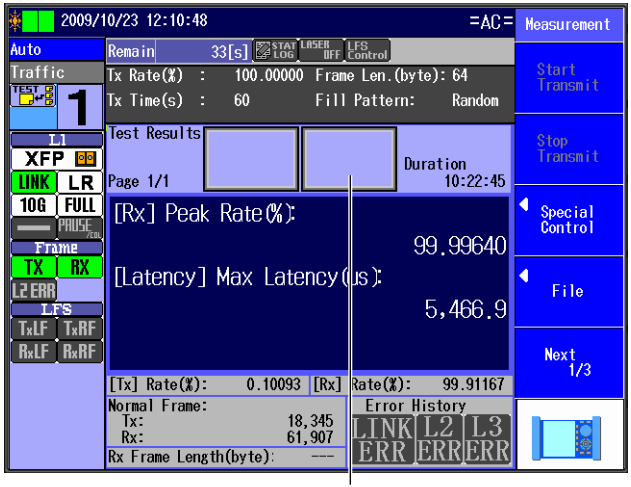
Pass/fail indication (Pass, Fail)

Stopping Measurement

3. Press **STOP** to display the following screen, stop transmission, and finish measurement.

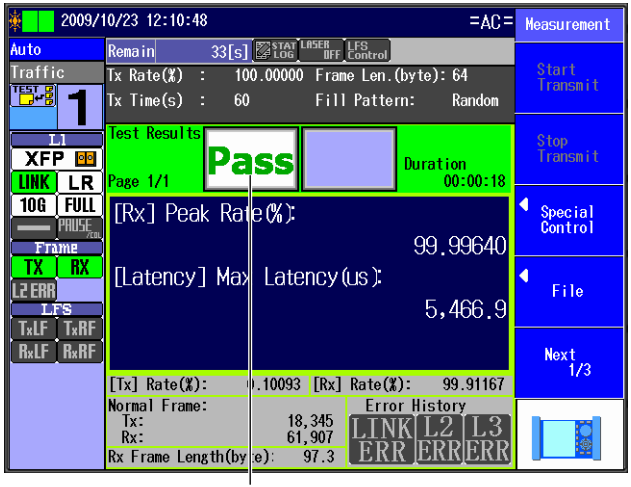
Screen after Measurement Has Been Stopped (Traffic Test)

When Pass/Fail Judgment Is Not Performed



Indication that measurement has finished

When Pass/Fail Judgment Is Performed



Pass/fail indication (Pass, Fail)

Note

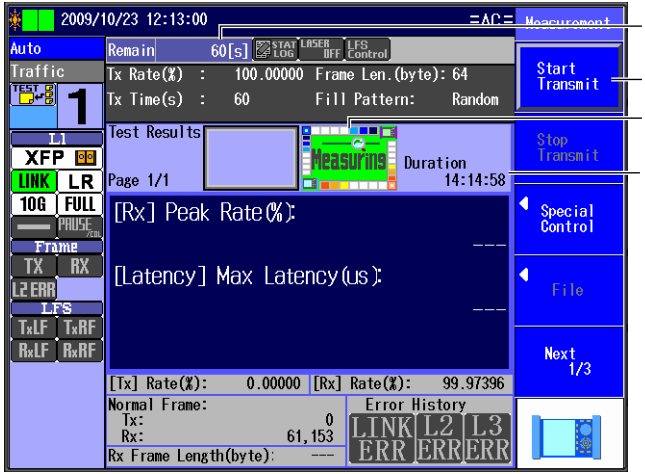
- When Auto(Remote) has been selected in the Test menu, measurement and transmission control are synchronized regardless of the measurement and transmission control synchronization setting.
- When Auto or Auto(Remote) has been selected in the Test menu, the test item Execution Type setting is set to Continue, and Continuance Confirmation is set to ON, a confirmation screen appears whenever a test item ends during measurement.
- If Auto or Auto(Remote) has been selected in the Test menu and the “Judge Pass or fail” check box is selected, the Pass/Fail Screen appears when measurement finishes.
- If you have enabled saving of the measured results file (.mr), it is saved automatically when measurement finishes.

When Measurement and Transmission Control Are Not Synchronized

Starting Measurement

1. Follow the procedure in section 4.11 to desynchronize measurement and transmission control.
2. Press **START** to display the following screen and start measurement.

Screen during Measurement (Traffic Test)



Remaining Tx time

Starts transmission

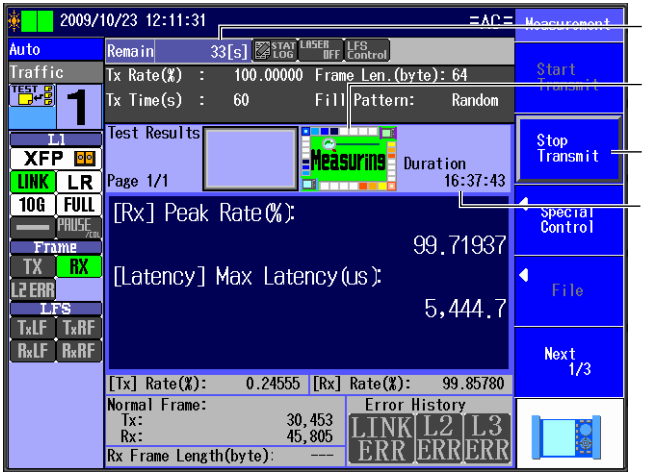
Indication that measurement is in progress

Measurement duration

Starting Transmission

3. Press the **Start Transmit** soft key to start transmission.

Screen during Measurement (Traffic Test)



Remaining Tx time

Indication that measurement is in progress

Stops transmission

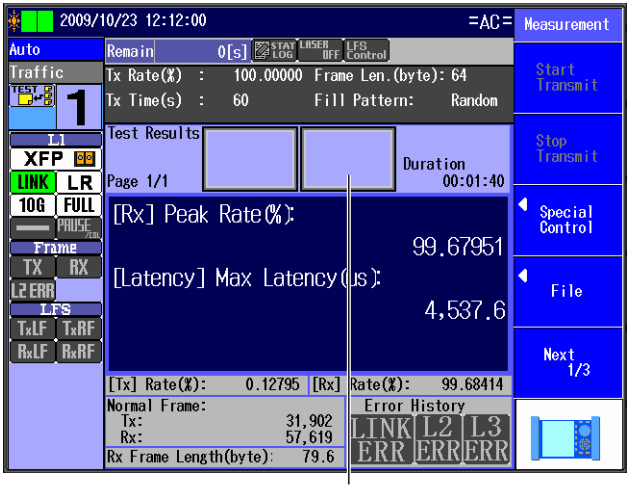
Measurement duration

When the transmission end conditions are met, transmission stops automatically.

4. Press **STOP** to display the following screen and stop measurement.

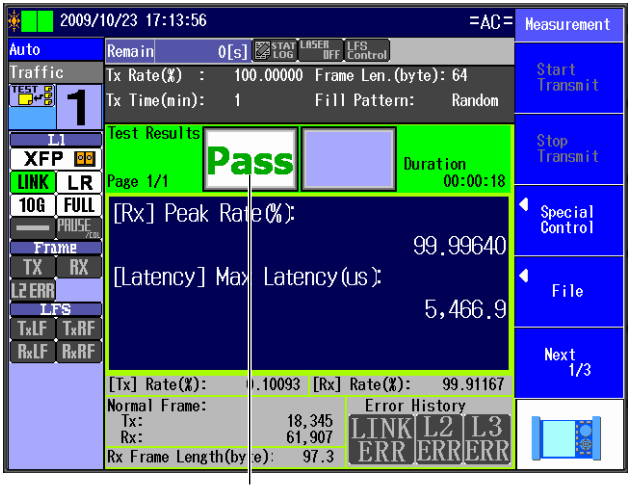
Screen after Measurement Has Finished (Traffic Test)

When Pass/Fail Judgment Is Not Performed



Indication that measurement has finished

When Pass/Fail Judgment Is Performed

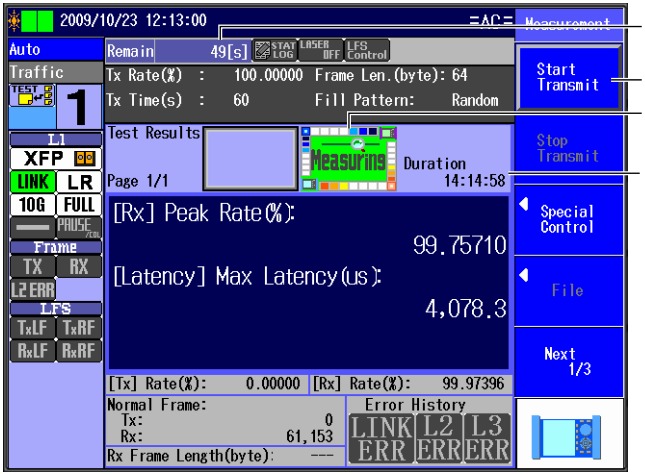


Pass/fail indication (Pass, Fail)

Stopping Transmission

4. Press the **Stop Transmit** soft key to display the following screen and stop transmission.

Screen after Transmission Has Been Stopped (Traffic Test)



Remaining Tx time

Starts transmission

Indication that measurement is in progress

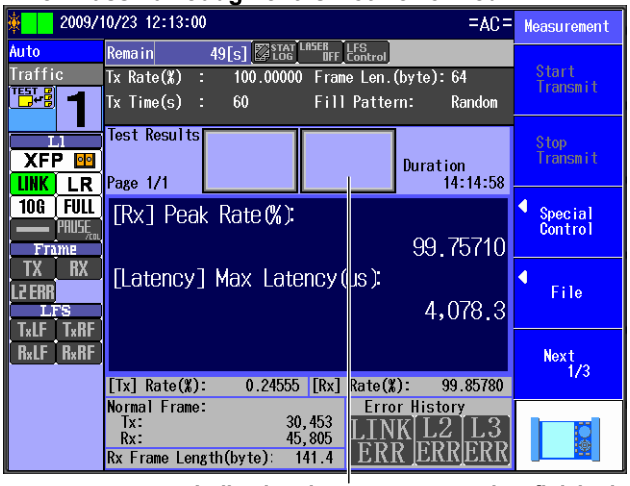
Measurement duration

Stopping Measurement

5. Press **STOP** to display the following screen and stop measurement.

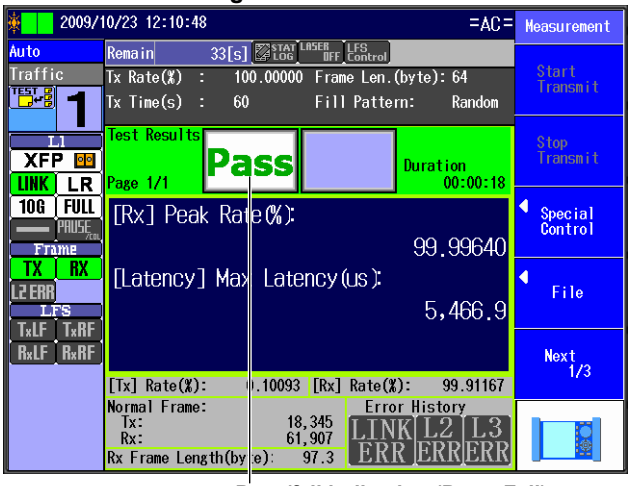
Screen after Measurement Has Finished (Traffic Test)

When Pass/Fail Judgment Is Not Performed



Indication that measurement has finished

When Pass/Fail Judgment Is Performed



Pass/fail indication (Pass, Fail)

Note

- If you press STOP without pressing the Stop Transmit soft key first, transmission and measurement are both stopped.
- When Auto(Remote) has been selected in the Test menu, measurement and transmission control are synchronized regardless of the measurement and transmission control synchronization setting.
- When Auto or Auto(Remote) has been selected in the Test menu, the test item Execution Type setting is set to Continue, and Continuance Confirmation is set to ON, a confirmation screen appears whenever a test item ends during measurement.
- If Auto or Auto(Remote) has been selected in the Test menu and the “Judge Pass or fail” check box is selected, the Pass/Fail Screen appears when measurement finishes.
- If you have enabled saving of the measured results file (.mr), it is saved automatically when measurement finishes.

Saving the Measured Results

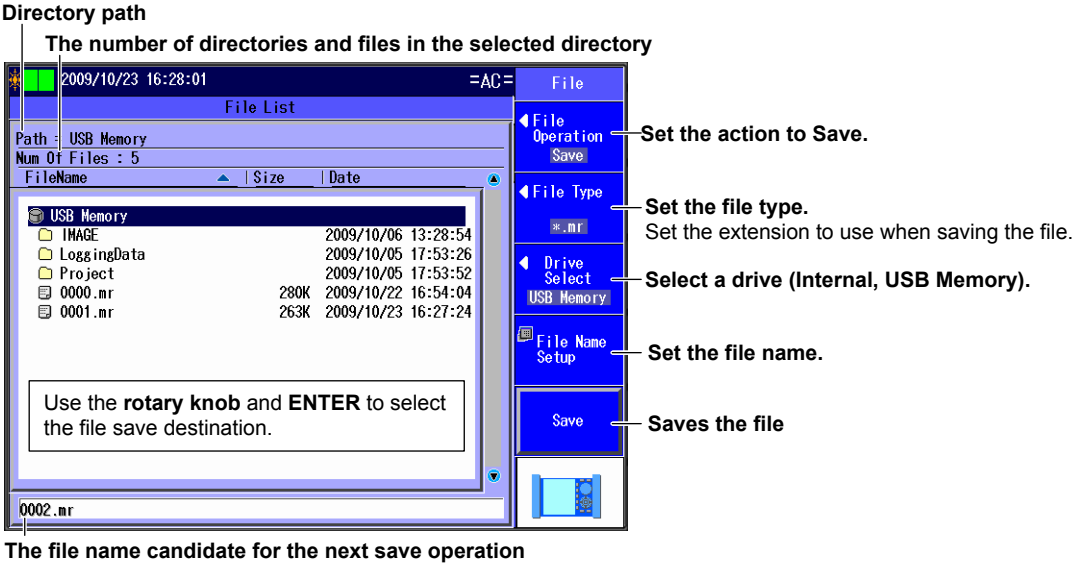
section 9.2, “Saving and Loading Data” in the user’s manual

Saving Files Automatically

If you have enabled saving of the measured results file (.mr), it is saved automatically when measurement finishes.
Files that are saved automatically are saved to the “result” folder in internal memory.

Manually Saving Files

1. Finish measurement.
2. Press the **File** soft key to display the following screen.



Specifications

Display

Item	Specification
Display	5.7-inch color TFT LCD*, Display resolution: 640 × 480
LED indicators	ON (power on/off indication) and CHARGE (charge state)

* The LCD may include a few defective pixels (within 6 ppm over the total number of pixels including RGB).
The LCD may contain some pixels that are always illuminated or that never illuminate. Please be aware that these are not defects.

Measurement Ports

Item	Specification
XFP measurement port[1]	
Interface	XFP module; 10GBASE-SR/10GBASE-LR/10GBASE-ER
Connection speed	Line: 10.3125 Gbit/s; Link: 10 Gbit/s
Duplex mode	Fixed to full duplex
Flow control	Can be turned on and off (Complies with IEEE 802.3x)
Rx clock measurement	Measurement range: –100 to +100 ppm; measurement resolution: 0.1 ppm; measurement accuracy: ±2 ppm
Tx frequency setting	Setting range: –100 to +100 ppm; setting resolution: 1 ppm; setting accuracy: ±2 ppm
Tx clock master/slave synchronization	Synchronizes the Tx clock to the Rx clock
LFS generation	Generation mode: Manual or Auto, Manual: Continuous transmission (start/stop), Auto: Automatic RF transmission upon link down detection or LF reception
Optical power monitor	Simple display of the optical power level (three-level display)
SFP measurement port	
Interface	SFP module; 1000BASE-SX/1000BASE-LX/100BASE-FX
Connection speed	Link: 1000 Mbit/s; Link: 100 Mbit/s
Duplex mode	Fixed to full duplex
Auto negotiation	Can be turned on and off (flow control negotiation only)
Flow control	Can be turned on and off (Complies with IEEE 802.3x)
Tx clock master/slave synchronization	Synchronizes the Tx clock to the Rx clock

Item	Specification
Rx clock measurement	Measurement range: –100 to +100 ppm; measurement resolution: 0.1 ppm; measurement accuracy: ±2 ppm
Tx frequency setting[2]	Setting range: –100 to +100 ppm; setting resolution: 1 ppm; setting accuracy: ±2 ppm
Optical power monitor[2]	Simple display of the optical power level (three-level display)
RJ-45 measurement port	
Interface	RJ-45; 10BASE-T/100BASE-TX/1000BASE-T
Connection speed	Link: 1000 Mbit/s, 100 Mbit/s, 10 Mbit/s
Duplex mode	Full duplex, half duplex (full duplex only with 1000BASE-T)
Auto negotiation	Can be turned on and off; variable advertisement (announcement of the AQ1300/AQ1301 abilities) level
Flow control	Can be turned on and off (Complies with IEEE 802.3x)
MDI/MDI-X	MDI (straight), MDI-X (cross), automatic
Rx clock measurement (Only available with 100BASE-TX)	Measurement range: –100 to +100 ppm; measurement resolution: 0.1 ppm; measurement accuracy: ±2 ppm
Tx frequency setting	Setting range: –100 to +100 ppm; setting resolution: 1 ppm; setting accuracy: ±2 ppm

1 Supported by the AQ1300
2 Except for 100BASE-FX

Test Menu

Item	Specification
Auto	Automatic testing using test scenarios
Auto(Remote)	Automatic testing using test scenarios that use remote control
Manual	Various tests and analyses that use sophisticated traffic generation
OPM (AQ1300 option)	Measurement of optical input power level using a dedicated port
RFC2544 (AQ1300 option)	Network device benchmark test performed in accordance with RFC2544
VLAN	Network VLAN trunk configuration test

Test Mode

Item	Specification
Traffic	Load generation, delay/IFG measurement, payload error measurement, and sequence error checks
QoS	8-channel QoS load generation and 8-channel QoS statistics
Ping	Supports 1 ms high-speed pings; traceroute
Loopback	MAC/IP level loopback
BERT	Loopback and two-way BERT tests by inserting PN patterns into frames

Transmission Feature

Item	Specification	
Traffic format	Constant, burst (when the test mode is Traffic)	
Rate settings	Unit	%, bits (minimum IFG: 48 bits but 72 bits for 10G; values exceeding 100% can only be specified when the unit is bits), or frame/s
	Resolution	0.00001%, 0.00001 bit, and 0.00001 frame/s
	Variable rate during transmission (variable per QoS channel during QoS transmission)	
Burst settings	Burst mode	When the number of frames is specified:1 to 65535 When the time is specified:1 µs to 1000 ms
	Burst interval	Range: 1 µs to 1 s Unit: ms (three decimal places)/µs
Transmission start/stop settings	Tx mode	Specify continuous, the number of frames, or the time
	Transmission start	Manual or synchronized (during inband remote control tests)
	Transmission stop	Manual When the number of frames is specified: 1 to 4294967295 frames When the time is specified: 1 s to 86400 s (in 1 s steps)

Item	Specification	
Frame settings	Up to 8 frames	
	Defined frame format	DIX, IEEE 802.3 (supports LLC/SNAP headers), IPv4, IPv6, IPX, UDP, TCP, IGMP, ICMP, ICMPv6, ARP, Pause, and EoMPLS Custom (no header or MAC header only) VLAN tag: 0 to 4 stacks MPLS label: 0 to 4 stacks
		E-OAM (ITU-T Y.1731, IEEE 802.1ag) and MAC in MAC (IEEE 802.1ah, EoE)
	Fixed frame length*	48 to 9999 bytes (the unit is bytes)
	Variable frame length*	Variable range: 64 to 9999 bytes (the unit is bytes); set the minimum and maximum frame length Variable mode: INC, DEC (for each byte), random (Automatic IPv4 header checksum correction)
Payload settings	FILL pattern	Random (PN15), all zeros, all ones, alternating, or 4 bytes of user-specified data
	Data definition	Data can be defined from the start of the frame to a maximum of 256 bytes
Field adjustment	Number of fields	1
	Field setting	MAC-DA, MAC-SA, VLAN-ID, VLAN-CoS, IPv4-ToS, IPv4-DSCP, IPv4-DA, IPv4-SA, IPv4-Protocol, IPv6-DA, IPv6-SA, IPv6-Traffic Class, IPv6-DSCP, IPv6-Next Header, L4-DP, and L4-SP
	Offset settings	Variable bit width: 1 to 32 bits Offset: Specify as 0 to 9998 bytes + 1 to 32 bits (the unit is bits) Variable mode: INC (for each bit) or random Range specification: Start and end values (hexadecimal or decimal)
Test tags	Test tag insertion (Only inserted when the test mode is Traffic or QoS)	Test ID, additional test data, frame ID, timestamp, sequence number, tag identifier, and tag length
Error addition feature	Static	FCS, symbol, under-size, and over-size errors
	Dynamic	FCS, symbol, sequence, payload, and bit errors

Item	Specification	
Transmission by QoS channel	Number of channels	Up to 8
	Rate setting	Unit: %
	Burst setting	Can only be specified on channel 1
	Fixed frame length*	48 to 9999 bytes (the unit is bytes)
	Variable frame length*	Variable range: 64 to 9999 bytes (the unit is bytes); set the minimum and maximum frame length Variable mode: INC, DEC (for each byte), random (Automatic IPv4 header checksum correction)
Laser on/off	Manual operation (on/off)	
Linkdown transmission continuation	On/off (only for 10G)	

*: If the interface is 100BASE-TX, the guaranteed operating range of the frame length is 48 to 2048 bytes.

Reception Feature

Item	Specification	
Reception specifications	Frame length*	48 to 9999 bytes
	Minimum IFG	5 bytes
Oversize	Range	65 to 10000 bytes
Base filter feature	Number of filters	2
	Method	Field specification and pattern filter
	Combination	AND/OR
	Frame pass condition	Match/Mismatch
	Offset settings	Offset: 0 to 255 bytes Bit/Mask Bit offset: 0 to 47 bits Bit width: 1 to 48 bits Comparison byte length: Maximum 6 bytes
Delay time and IFG measurement feature	Measurement resolution	100 ns
	Maximum measurement duration	Approx. 430 s

Item	Specification	
Payload error measurement feature	Detects errors using the CRC in the Tx frame payload	
BERT feature	BERT frame	Random pattern (PBRS15)
Sequence error check feature	Number of loss packets, number of reorder packets, number of duplicate packets, and max burst loss number	
QoS channel measurement feature	Number of channels	Up to 8 or up to 7 plus other
	QoS filter classification	Number of filters: 2 Method: Field specification and pattern filter Pattern setting: Can be set for each channel
	Pattern filter	Number of filters: 2 (conditions can be specified for each channel independently) Comparison and mask patterns: 1 to 4 bytes Offset specification: 0 to 255 bytes Two-filter combination: AND
	Per-channel measurement feature	Delay time and IFG measurement, payload error measurement, and sequence error checks
Pause feature	Stops transmission when a pause frame is received	

*: If the interface is 100BASE-TX, the guaranteed operating range of the frame length is 48 to 2048 bytes.

Loopback Feature

Item	Specification	
Target frame (Supports VLAN, two stacks)	Instrument's own ports or all ports (excluding layer 2 broadcast and multicast frames and any VLAN's that are not the instrument's VLAN—that do not have the same VLAN-ID or TPID)	
Field switching	L2 test	MAC address DA/SA
	L3 test	IP address DA/SA, TCP/UDP DstPORT/SrcPORT

Statistics Feature

Item	Specification	
Display table	Items can be selected	
Traffic, QoS, BERT	Common group	Acquisition time and measurement duration
	Link group	Link status, laser off count, linkdown count, Tx freq deviate (ppm), Rx freq deviate (ppm), LF send count, RF send count, LF detect count, and RF detect count, LF receve column count, RF receive column count, 66B sync loss count, 66B sync error count, 66B sync hi-ber count
	Tx group	Frame, byte, rate (%, fps, Bps*, and bps*), reply frame, error frame, CRC error, undersize error, oversize error, and symbol error
	Rx group	Frame, byte, rate (%, fps, Bps*, and bps*), peak rate (%, fps, and bps), average rate (%, fps, and bps), the number of pause frames, collision detection (only during half duplex), and error frame
	Rx error group	CRC error, undersize error, oversize error, alignment error, and symbol error
	Latency group	Max IFG (µs), min IFG (µs), avg IFG (µs), max packet latency (µs), min packet latency (µs), and avg packet latency (µs), max IFG (bit), min IFG (bit), avg IFG (bit)
	Sequence group	Loss packet, reorder packet, duplicate packet, and max burst loss
	Payload group	Payload error
QoS	Tx channel group (the same for all channels)	Frame, byte, and rate (%, fps, and bps)
	Rx channel group (the same for all channels)	Frame, byte, rate (%, fps, and bps), peak rate (%, fps, and bps), average rate (%, fps, and bps), max latency (µs), min latency (µs), avg latency (µs), loss packet, reorder packet, duplicate packet, max burst loss, and payload error
BERT	BERT group	Bit error rate, bit error count, bit error frame, BERT sync loss count, BERT target byte, and bit error insertion
Ping	Ping group	Test, loss, IP checksum error, ICMP checksum error, timeout, loss rate (%), max response time (ms), min response time (ms), and avg response time (ms)

* Bps stands for bytes/second and bps stands for bits/second.

Emulation Feature

Item	Specification	
IPv4 host (Supports VLAN, two stacks)	ARP reply	Reply target: Instrument's own ports, All addresses, or All VLAN/addresses
	Ping reply	Reply target: Instrument's own ports
	Automatic MAC address acquisition	Specify the target IP address
	Automatic IP address acquisition	Uses DHCP to acquire the instrument's IP address
	Automatic MAC generation	Generates own MAC address based on its own IP address and VLAN ID
IPv6 host (Supports VLAN, two stacks)	NDP reply	Reply target: Instrument's own ports
	Ping reply	Reply target: Instrument's own ports
	Automatic MAC address acquisition	Uses NDP to acquire the instrument's MAC address; specify the target IP address
	Address autoconfiguration	Uses stateless autoconfiguration to resolve the instrument's port and its IPv6 address
Ping test (Supports VLAN, two stacks)	Number of targets	1 host
	Frame length	IPv4: 64(+VLAN max. two stacks) to 9999 bytes IPv6: 84(+VLAN max. two stacks) to 9999 bytes
	Tx mode	Continuous, frames, or time Number of frames: 1 to 4294967295 Time: 1 s to 86400 s
	Transmission interval	1 ms, 10 ms, 100 ms, or 1 s
	Timeout	100 ms or 1 s
Traceroute (Supports VLAN, two stacks)	Reply	Reply target: Ping
	Packet	Type: Ping; max TTL: 1 to 64
	Traceroute test	Route information up to the destination and response time

Remote Control

Item	Specification	
Inband control feature	Communication ports	Measurement ports
	Remote test synchronous control	Master: The slave's operations, settings, and result display Slave: Controlled remotely from the master
	Remote measurement synchronous start control	Master: Starts measurement on the slaves Slave: Synchronizes the start of measurement with the master
	Searching for other devices	Lists other devices that are found on the same VLAN or network segment
	Address allocation of other devices	Automatically allocates IP addresses for other devices that are found on the same VLAN or network segment
Remote control GUI feature	Communication ports	Control port and USB port (Type B)
	The dedicated software (on Windows) provides a GUI that enables access to the instrument's features	
Ftp server feature	Communication ports	Control port and USB port (Type B)
Telnet remote control feature	Communication ports	Control LAN port
Time synchronization	Test mode	Auto(Remote)
	Target	Other (slave) instrument (AQ1300/AQ1301)
	Communication ports	Measurement Ports

Phase Test

Item	Specification
Number of test items that can be registered	Up to 8
Test item execution	In order or automatic

Test pass/fail results

Item		Specification
Pass/fail judgment	Traffic	L1 error: Linkdown detection or LF/RF reception L2 error: Error frame reception L3 error: Payload error detection or sequence error detection Incorrect number of bytes, incorrect number of frames, incorrect maximum Rx rate, incorrect average Rx rate, or incorrect maximum latency time

Item	Specification	
Pass/fail judgment	QoS	For each measurement port L1 error: Linkdown detection or LF/RF reception L2 error: Error frame reception L3 error: Payload error detection or sequence error detection Incorrect number of bytes, incorrect number of frames, incorrect maximum Rx rate, incorrect average Rx rate, or incorrect maximum latency time For each Rx QoS L3 error: Payload error detection or sequence error detection Incorrect number of bytes, incorrect number of frames, incorrect maximum Rx rate, incorrect average Rx rate, or incorrect maximum latency time
	Ping	Frame loss detection or maximum response timeout
	BERT	Bit error detection or there are no target bytes

Other features

Item	Specification
Logging feature	
Logging interval	1 s
Logging time	Up to 72 hours; overwrite or loop
Log items	Up to 4 items selectable
Status indication	
Title bar	Optical power monitor, remaining battery power, AC adapter connection status and link status
Link status indications	I/F type, link status, connection speed, duplex, MDI/MDI-X, pause/collision status, frame Tx/Rx status, error detection status, and LFS Tx/Rx status
Measurement status indications	Measurement status
Simple measurement settings display	Measurement settings summary and address
Inband control status indications	Slave or inband communication status
Beep generation	
Alarm	Notification when measurement completes or when an error occurs

Item	Specification	
File saving		
File save condition	Up to approximately 100 files in the same folder recommended	
File format	Measurement settings	Binary
	Measured results	Binary (the included setup software can be used to change the measured results to .csv files)
	Statistics log results	.csv
	Traceroute results	.csv
File management	Managed files	Setup file, Results file
	Control port	Control LAN port and USB port (Type B)
System update	Download the update file using the ftp server feature, and use it to update the system Specify the update file on the USB memory device, and use it to update the system	

Optical Power Meter (AQ1300 Option)

Item	Specification
Optical connector	1.25 Φ universal adapter (SC, FC)[1]
Wavelength	850, 1300, 1310, 1490, 1550, 1625, or 1650 nm
Power range	–70 dBm to +10 dBm (CW) and –70 dBm to +7 dBm (CHOP)
Noise level	0.5 nW (–63 dBm, 1310 nm)
Uncertainty at standard conditions[2]	±5%
Display resolution (dB)	0.01
Unit display	Absolute value: dBm, mW, µW, nW, pW Relative value: dB
Modulation mode	CW, CHOP (270 Hz, 1 kHz, 2 kHz)
Range switching	Automatic
Reference measurement (Ref)	Relative measurement with the displayed measured value as the reference and relative value measurement in relation to the standard setting
Average count	1, 10, 50, or 100 times

1 Depends on the connector adapter of optional accessories.

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 mW, and SM fiber optic cables are being used.

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

RFC2544 (An option on the AQ1300, standard on the AQ1301)

Item		Specification
Test items		Throughput, latency, frame loss rate, back to back, and packet jitter
Test environment	Test configuration	One-to-one configuration with the other AQ1300/AQ1301. The other device is fixed to Loopback Test mode.
	Supported interfaces	XFP[1], SFP, SFP-FE, and RJ-45
	Test layers	L2, L3-IPv4, and L3-IPv6
Link/address settings	Link settings	Negotiation (Auto or Manual), Speed (Auto, 10M, 100M, 1G, or 10G), Duplex (Auto, FULL, or HALF) Flow control (ON or OFF), MDI (Auto, MDI, or MDI-X)
	Source address settings	MAC address (manual or global), IPv4 address or IPv6 address (Manual, DHCP, or Stateless Address), VLAN (number of stacks, CoS values, and ID values), UDP Port Number
	Destination address settings	MAC address (manual, ARP, or NDP), IPv4 address or IPv6 address, Search list display of other devices
Common settings	Test information	Test name, customer name, operator name, and comment
	Test frame lengths	64, 128, 256, 512, 1024, 1280, and 1518 bytes 3 user-defined frame lengths (64 to 9999 bytes)
	Test frame settings	ToS, DSCP, and CoS values, Payload (Random, ALL1, or ALL0)
	Learning frame	When each test starts (the number of retries is fixed to 3)
	Address resolution	This is not performed for the L2 layer. This is performed for the L3-IPv4 and L3-LPv6 layers.
	Test operation	Select whether to stop testing when errors occur. Select whether to save the measurement results and whether to save the measurement log.
Common results display		List display of the status of all tests (status, progress, and pass/fail judgment) Display of transmission and reception rates, Number of transmitted and received frames Tx frame length, Average Rx frame length

Specifications

Item		Specification
Throughput test	Test duration	1 to 999 s
	Test rate	Initial rate: 0.01 to 100.00%, Minimum rate: 0.00 to 100.00%, Maximum rate: 0.01 to 100.00% Resolution: 0.01 to 100.00%, Acceptable loss: Enabled (0.00001 to 100.00000%) and disabled
	Number of trials	1 to 60
	Pass/fail judgment	Enable or disable; threshold value: 0.01 to 100.00%
	Results display	Setup summary display: Transmission rate, measurement frame length, test duration, and trial number Result values: Table of results for each frame length, Graph display of results: Line graph
Latency test	Test duration	1 to 999 s
	Test rate	Automatic: The throughput test result is used. Manual: 0.01 to 100.00%
	Number of trials	1 to 60
	Pass/fail judgment	Enable or disable; threshold value: 0.1 to 999999.9 µs
	Results display	Setup summary display: Transmission rate, measurement frame length, test duration, and trial number Result values: Table of results for each frame length Graph display of results: Line graph
Frame loss rate test	Test duration	1 to 999 s
	Test rate	Initial rate: 1 to 100% Step down rate: Off, 10%, or 20%
	Number of trials	1 to 60
	Pass/fail judgment	Enable or disable; threshold value: 0.01 to 100.00%
	Results display	Setup summary display: Transmission rate, measurement frame length, test duration, and trial number Result values: When the step down rate is turned off, a table of results for each frame length is displayed. When the step down rate is turned on, the results are displayed so that each page displays the results for a different frame length. Graph display of results: Line graph

Item		Specification
Back to back test	Test duration	1 to 999 s
	Number of trials	1 to 60
	Pass/fail judgment	Enable or disable Threshold value: 0 to 1486607143 frames
	Results display	Setup summary display: Transmission rate, measurement frame length, test duration, and trial number Result values: Table of results for each frame length Graph display of results: Line graph
Packet jitter test	Test duration	1 to 999 s
	Number of trials	1 to 60
	Test rate	Automatic: The throughput test result is used. Manual: 0.01 to 100.00%
	Measurement settings	Test window size: Test duration or 0.1, 0.5, 1, or 10 s Resolution: Auto or 0.05, 0.1, 0.5, 1.0, 2.5, or 5.0 ms Threshold value: 50th, 75th, or 90th percentile
	Pass/fail judgment	Enable or disable; threshold value: 0.05 to 300.00 ms
	Results display	Setup summary display: Transmission rate, measurement frame length, test duration, and trial number Result values: Table of results for each frame length Graph display of results: Line graph
File		Setup file: RFC2544 test setup file Results file: RFC2544 measurement results file (binary) RFC2544 measurement log file (text) * Created using the setup software

1 Supported by the AQ1300

VLAN Configuration Confirmation Feature

Item		Specification
Test items		Throughput, latency, frame loss rate, back to back, and packet jitter
Test environment	Test configuration	single AQ1300/AQ1301, or one-to-one configuration with the other AQ1300/AQ1301.
	Supported interfaces	XFP[1], SFP, SFP-FE, and RJ-45
	Test layers	L2, L3-IPv4, and L3-IPv6
Common features	VLAN ID definition file loading	TXT/CSV files
Transmission feature	Tx mode	Repeat count: 1 to 15
	Tx interval	1ms, 10ms, 100ms, or 1s
	Frame length	64 (+VLAN tag length) to 9999 bytes 74 to 9999 bytes for IPv6 testing
	VLAN stack	1 or 2
	Defined frame format	MAC, TYPE, IPv4, IPv6, UDP
	Tx VLAN ID	0 to 4095
Reception feature	Rx mode	Planned value comparison or monitor
	Display mode	Map/List
	Planned VLAN ID	0 to 4095
Statistics feature		measurement duration, Rx ID Success, Plan, Rx ID Fail, Rx ID Error
Test pass/fail results	Pass/fail judgment	Comparison with planned VLAN ID
File		Setup file: VLAN test setup file (binary) Results file: VLAN measurement result file (binary) VLAN ID definition file: VLAN ID list file (text or csv)

1 Supported by the AQ1300

E-OAM Test Feature

Item		Specification
Test items		Loopback (LB) Test, Continuity Check (CC) Test
Test environment	Test configuration	single AQ1300/AQ1301, or one-to-one configuration with the other AQ1300/AQ1301.
	Supported interfaces	XFP[1], SFP, SFP-FE, and RJ-45
	Test layers	L2
	Supported recommendation and standard	ITU-T Y.1731 or IEEE802.1ag
Link/address	Link	Negotiation (Auto or Manual), Speed (Auto, 10M, 100M, 1G, or 10G), Duplex (Auto, FULL, or HALF) Flow control (ON or OFF), MDI (Auto, MDI, or MDI-X)
	Source address	MAC address (manual or global), VLAN (number of stacks, CoS values, and ID values), MD Level
	Supported VLAN	2 stacks
	Destination address	MAC address (manual, ARP, or NDP), Search list display of other devices
Loopback Test	Number of targets	1 host
	Frame length	64 to 9999 bytes
	Tx mode	Specify Continuous, Number of frames, or Time Number of frames: 1 to 4294967295 Time: 1 to 1440 min (in 1 min steps)
	Test interval	1 ms, 10 ms, 100 ms, or 1 s
	Timeout	5 s
	Statistics feature	Measurement Duration, Send Count, Loss Count, Loss Rate, and Max/Min/Avg Response Time
	Emulation feature	Loopback Reply, Link Trace Reply

Item		Specification
Continuity Check Test	Number of MEP	Supported Multicast address [01:80:C2:00:00:30 + Domain Level]
	Frame length	93 bytes (VLAN: none), 97 bytes (VLAN: 1 stack), 101 Bytes (VLAN: 2 stacks)
	Transmission interval	100 ms, 1 s, 10 s, or 60 s
	Automatic add RDI flags feature	When detecting LOC, set RDI flags automatically
	Status feature	CCM transmission status, CCM reception status, LOC detection status, and RDI addition/detection status
	Statistics feature	CCM/RDI Tx count, CCM/RDI Rx count, LOC detected count, and Through CCM count
	Automatic Dmain name acquisition	Domain name of Tx CCM frame apply first Rx CCM frame's
	Rx CCM Frame information indication feature	Indicate Rx CCM Frame information Destination MAC address, Source MAC address, MEP ID, or Transmission interval
	Display result items	Source MAC address, Terminal MEP(MEP or MIP)
Link trace feature	The number of results display	Up to 64 (LTRframe First-come-first-served basis)
	Display result items	Source MAC address, Terminal MEP (MEP or MIP)
	Emulation feature	Link Trace Reply
	Destination MAC address setting feature	Destination MAC address is set MAC address of selected entry from result list
Multicast Loopback feature	The number of results display	Up to 64 (LBRframe First-come-first-served basis)
	Display result items	Source MAC address, Response Time
	Destination MAC address setting feature	Destination MAC address is set MAC address of selected entry from result list

1 Supported by the AQ1300

Y.1564 Test Feature

Item		Specification
Test items	Service Configuration Test	CIR Configuration Test, EIR Configuration Test, Traffic Policing Test, CBS Configuration Test, EBS Configuration Test
	Service Performance Test	Service Performance Test
Test environment	Test configuration	Stand-alone (Single AQ1300/AQ1301), Dual test set (One-to-one configuration with the other AQ1300/AQ1301)
	Direction	Loopback Testing (Master <- -> LOOPBACK), One-way Testing (Master -> Slave), One-way Testing (Slave -> Master), Two-way Testing(Master <- -> Slave)
	Supported interfaces	XFP[1], SFP, SFP-FE, and RJ-45
	Test layers	L2, L3-IPv4, and L3-IPv6
Link/address settings	Link settings	Negotiation (Auto or Manual), Speed (Auto, 10M, 100M, 1G, or 10G), Duplex (Auto, FULL, or HALF) Flow control (ON or OFF), MDI (Auto, MDI, or MDI-X)
	Source address settings	MAC address (manual or global), IPv4 address or IPv6 address (Manual, DHCP, or Stateless Address), VLAN (number of stacks, CoS values, and ID values), UDP Port Number
	Destination address settings	MAC address (manual, ARP, or NDP), IPv4 address or IPv6 address, Search list display of other devices
Common settings	Test information	Test name, customer name, operator name, and comment
	Test duration	Service Configuration Test : 1 to 60 seconds Service Performance Test : 15minutes, 2hours, 24hours, User setting(1 to 4,320minutes)
	Common settings of CIR Configuration Test	Number of steps : 1 to 7 steps Starting rates : 10 to 90%
	Unit setting	Unit of test rate : IR, UIR, % Frame delay variation Measurement Setting : Previous Frame, Min. Threshold, User(0.000 to 1.000s)

Specifications

Item		Specification
Service setting	Number of Service	1 to 8 Services
	Service Type	Data, Voice (G.711, G.729, G723.1), Video (SDTV (MPEG2), HDTV (MPEG2), HDTV (MPEG4))
	Payload Pattern	Random, ALL 0, ALL 1, 0/1 alt.
	Frame length	64 byte, 128 byte, 256 byte, 512 byte, 1024 byte, 1280 byte, 1518 byte, MTU, USER, EMIX MTU : 64 to 9000 byte USER : 64 to 9000 byte EMIX : Select up to five from the following. 64, 128, 256, 512, 1024, 1280, 1518 byte, MTU, USER
	Color	Green : CoS (0 to 7), ToS (0 to 7), DSCP (0 to 63) Yellow : CoS (0 to 7), ToS (0 to 7), DSCP (0 to 63)
	SLA	CIR : 0 to 10000 Mbps EIR : 0 to 10000 Mbps FLR : 0.00000 to 100.00000% FD : 0.001 to 10000.000 ms FDV : 0.001 to 10000.000 ms FDV[%ile] : 100, 99.9, 90, 75% ile * %ile : Percentile CBS : 0 to 1,000 Kbyte EBS : 0 to 1,000 Kbyte AVAIL : 0.000 to 100.000%
Statistics Feature	CIR Configuration Test EIR Configuration Test Traffic Policing Test	Test duration, pass/fail judgment, IR (Min, Mean, Max), FL (Count, FLR), FTD (Min, Mean, Max), FDV (Min, Mean, Max)
	CBS Configuration Test EBS Configuration Test	Test duration, pass/fail judgment, FL (Count, FLR), FTD (Min, Mean, Max), FDV (Min, Mean, Max)
	Service Performance Test	Pass/fail judgment, IR (Min, Mean, Max), FL (Count, FLR), FTD (Min, Mean, Max), FDV (Min, Mean, Max), AVAIL
File		Setup file : Y.1564 test setup file Results file : Y.1564 measurement results file (binary) Y.1564 measurement results file (CSV/PDF) *Created using the setup software

1 Supported by the AQ1300

Storage

Item		Specification
Internal memory	Memory size[1]	2 GB[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]	Mass storage device compatible with USB Mass Storage Class Ver. 1.1
	Number of ports	1
	Power supply	5 V, up to 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 7, Windows Vista or Windows XP and must be equipped with USB ports.
	Number of ports	1
RJ-45 LAN port	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 or XFP 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 (when performing OPM measurements)	
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: Approximately 1 hour (when continuously testing using 10GBASE-LR of the AQ1300); Approximately 2 hour (when continuously testing using 1000BASE-LX of the AQ1301) Charge time: Approximately 5 hours (at an ambient temperature of 23°C and when the is off).	
External dimensions	217.5 (W) × 157 (H) × 74 (D) mm, excluding protrusions	
Weight	Approximately 1.3 kg, including the battery pack	
Installation position	Hand-held, horizontally oriented, vertically oriented, and oriented on a slant through use of a stand. Stacking prohibited.	
Environmental protection	Uses lead-free soldering	
Safety standard	Low-voltage directive	Compliant standard EN61010-1
	Laser safety standard	Compliant standard IEC 60825-1:2007, EN 60825-1:2014, GB 7247.1-2012

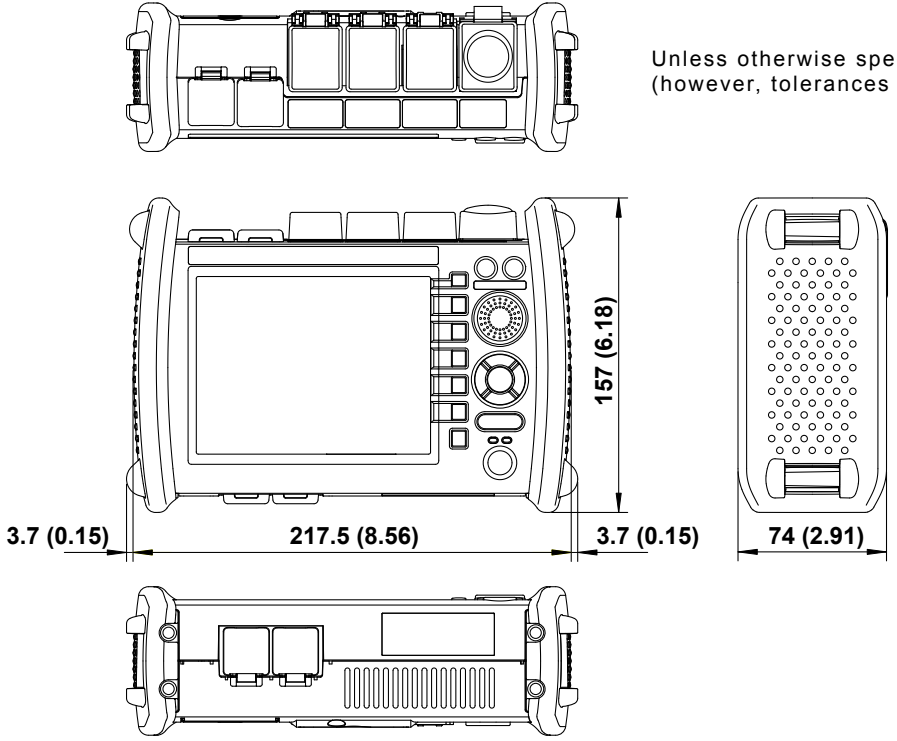
Item	Specification
Emissions	Compliant standards EN61326-1 class A EN55011 class A, group 1 EMC Regulatory Arrangement in Australia and New Zealand EN 55011 Class A, Group 1 Korea Electromagnetic Conformity Standard (한국 전자파적합성기준) EN61000-3-3 This product is a Class A (for industrial environments) product. Operation of this equipment in a residential area may cause radio interference in which case users will be required to correct the interference. Cable conditions USB port Use shielded cables. Use cables that are 3 m or less in length. Ethernet port Use Ethernet cables that are 30 m or less in length. Use a shielded cable to connect to the RJ-45 measurement port. DC power supply connector 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 23).
Immunity	Compliant standard EN61326-1 Table 2 (for use in industrial locations) Cable conditions Same as the emission cable conditions.

* TDK: ZCAT2035-0930A, YOKOGAWA: A1190MN

External Dimensions

Unit: mm (approx. inches)

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



Memo

Memo