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**User's  
Manual**

**AQ1300/AQ1301 ETHERNET  
Multi Field Tester**

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Thank you for purchasing the AQ1300/AQ1301 ETHERNET Multi Field Tester. This user's manual explains the features, operating procedures, and handling precautions of the AQ1300/AQ1301. To ensure correct use, please read this manual thoroughly before operation. Keep this manual in a safe place for quick reference in the event that a question arises. This manual is one of five AQ1300/AQ1301 manuals. Please read all the manuals.

## List of Manuals

Manual Title	Manual No.	Description
AQ1300/AQ1301 ETHERNET Multi Field Tester Operation Guide	IM AQ1300-02EN	This guide focuses on the handling precautions, basic operations, and specifications of the AQ1300/AQ1301.
AQ1300/AQ1301 ETHERNET Multi Field Tester User's Manual (included in CD)	IM AQ1300-01EN	This manual. It explains all the AQ1300/AQ1301 features and how to use them.
AQ1300/AQ1301 ETHERNET Multi Field Tester Communication Interface User's Manual (included in CD)	IM AQ1300-17EN	The manual explains the AQ1300 communication interface features and instructions on how to use them.
AQ1300 MFT10GbE Setup Software User's Manual (included in CD)	IM AQ1300-61EN	This manual explains how to use a PC to create AQ1300/AQ1301 setup files, display result files, and generate CSV files.
AQ1300/AQ1301 Remote Control Software User's Manual (in CD)	IM AQ1300-63EN	This manual explains how to remotely control the AQ1300/AQ1301 from a PC.

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

## Notes

- **This manual (IM AQ1300-01EN 7th edition) applies to AQ1300/AQ1301 ETHERNET Multi Field Testers with firmware version R1.10.01.001 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 15.4. For information on how to update the firmware, see section 15.5.

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

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## Revisions

1st Edition: November 2009  
2nd Edition: March 2010  
3rd Edition: October 2010  
4th Edition: June 2012  
5th Edition: March 2013  
6th Edition: June 2014  
7th Edition: September 2015  
8th Edition: July 2016  
9th Edition: October 2017

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# Conventions Used in This Manual

## Notes

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



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

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### **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.

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### **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

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### **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.

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### **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.

## Symbols and Conventions Used in Procedural Explanations

The contents of the procedural explanations are indicated using the following symbols.

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### **Procedure**

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

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### **Explanation**

This section describes the setup items and the limitations regarding the procedures. It may not give a detailed explanation of the feature. For a detailed explanation of the feature, see chapter 1.

## Character Notations

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### **Hard Key Names and Soft Key Names in Bold Characters**

Indicate panel keys that are used in the procedure and soft keys and menu items that appear on the screen.

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## Unit

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k Denotes 1000. Example: 12 kg, 100 kHz

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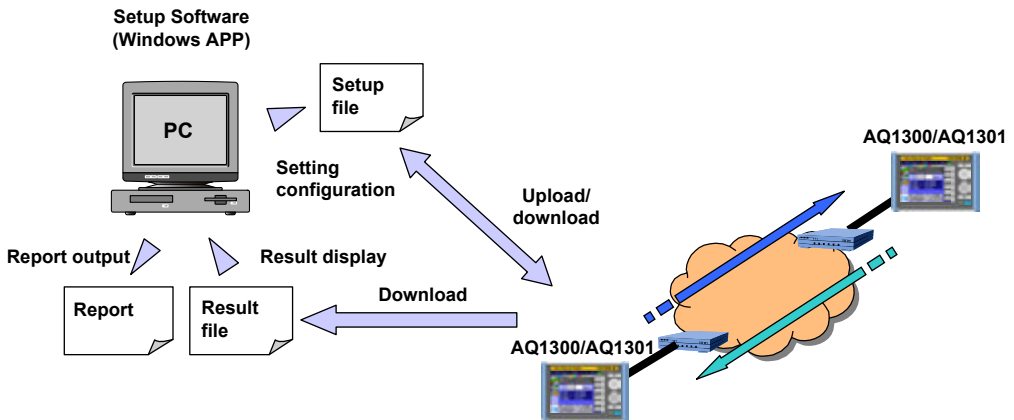
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# 1.1 Interaction between the Setup Software and the AQ1300/AQ1301

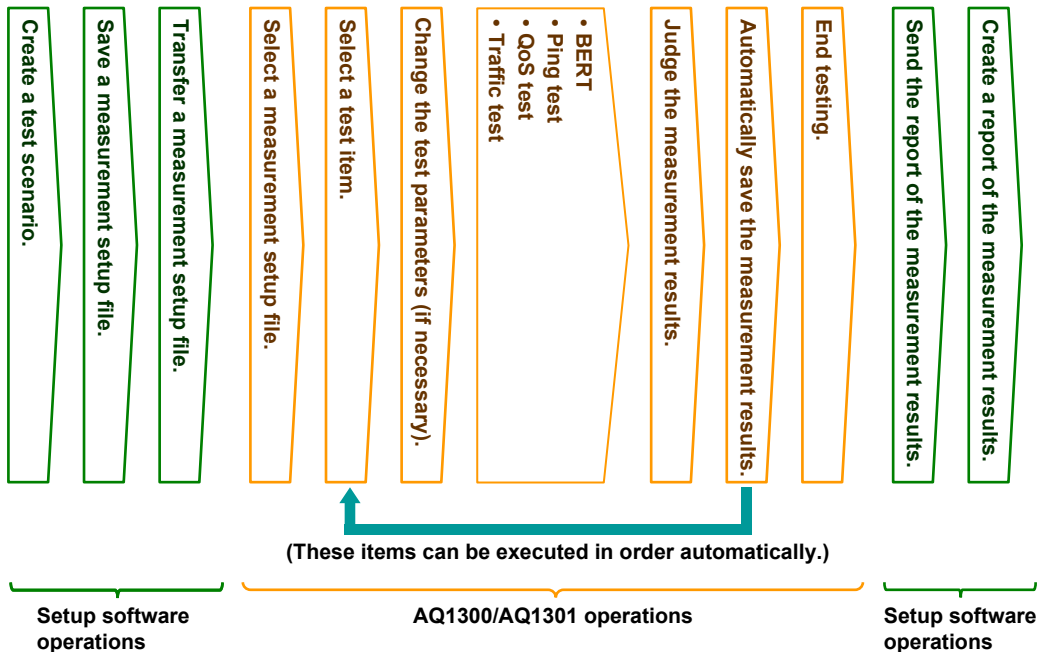
Create a test scenario with the setup software PC application, and then save the scenario to a setup file. Upload the saved setup file to the AQ1300/AQ1301 (AQ1300 and AQ1301), and then use the test scenario to perform a test. The test results are saved to a result file. Use the PC to download the result file, and then use the setup software to print a report.

You can upload and download files using the Ethernet (FTP), USB storage media, and USB memory.



- After loading a setup file, begin measurement simply by pressing START.
- You can also change the parameters based on the loaded settings.

### Operation Example (for Auto Mode)



For details about the setup software, see the *Setup Software User's Manual*, IM AQ1300-61EN.

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## 1.2 Test Menu (Top Menu)

### Auto

Select Auto to perform automatic testing on a device according to the test items in the selected setup file. You can execute up to eight test items in order or at the same time. You can display pass/fail results for each test and automatically save the measurement results to a file.

You can configure setup files and test items using the setup software, which runs on Windows PC.

### Auto(Remote)

Select Auto(Remote) to use a master device to perform automatic testing of a remote slave device according to the test items in the selected setup file. You can execute up to eight test items in order or at the same time. You can display pass/fail results for each test and automatically save the measurement results to a file.

Because the master device controls the slave device remotely, a single person can perform the tests. The slave device can be configured remotely, and its measurements can be collected by the master device.

You can configure setup files and test items using the setup software, which runs on Windows PC.

### Manual

Select Manual to perform manual testing on a device using a single test item in the selected setup file. You can generate traffic and perform analysis in greater detail than you can when you select Auto or Auto(Remote).

You can configure setup files and test items using the setup software, which runs on Windows PC.

### OPM (AQ1300 Option)

Select OPM to measure optical input power using the optical power meter.

### RFC2544 (AQ1300 Option)

An automated test function in conformity with RFC2544, the standard benchmarking methodology for a performance examination of Ethernet service and network systems.

- Throughput: Maximum frame transfer rate without frame loss.
- Latency: Delay time of a frame
- Frame loss rate: Incidence rate of frame loss with excess traffic.
- Back-to back: Maximum burst value not causing a frame loss.
- Packet jitter: Variation of latency

### VLAN Test

The VLAN Test is used to check the VLAN trunk configuration. You can compare the VLAN ID list that you plan to receive with the actual received VLAN ID list. The VLAN Test consists of transmission, reception, analysis, and result display and storage features.

### E-OAM Test

Ethernet Operation, Administration and Maintenance (hereafter referred to as E-OAM) tests can be performed in compliance with the ITU-T Y.1731 Recommendation and IEEE802.1ag Standard.

This is supported in firmware version R1.10.01.001 and later.

- CC (continuity check) test: Connection check between network devices
- LB (loop back) test: Response check between network devices
- LT (link trace): Link check between network devices

## System

Select System to configure the AQ1300/AQ1301 system settings.

Language, Beep, USB Function, Date & Time Set, Power Save mode, Network Setup, Factory Setting, Product Info. display, Selftest, Version Up

## Y.1564 Test

An automated test function in conformity with ITU-T Y.1564, the standard benchmarking methodology for a performance examination of Ethernet service and network systems.

- IR step test  
Measurement of information rate (IR), frame loss (FL), frame transfer delay (FTD), frame delay variation (FDV)
- Burst size test  
Measurement of frame loss (FL), frame transfer delay (FTD), frame delay variation (FDV)
- Service performance test  
Measurement of information rate (IR), frame loss (FL), frame transfer delay (FTD), Frame delay variation (FDV), availability (AVAIL)

---

## 1.3 Test Modes

### Traffic Test Mode

In this mode, you generate traffic and measure the network throughput by defining a single Tx frame and specifying the frame length and Tx rate.

When the other device is in Loopback Test mode, you can perform latency measurement.

### Loopback Test Mode

In this mode, the source and target addresses of received frames are reversed, and the frames are sent back to their source. The AQ1300/AQ1301 takes statistics of the received frames.

Testing is performed with the other device set to Traffic Test, QoS Test, or BERT mode.

### QoS Test Mode

In this mode, you can generate QoS measurement traffic and measure the network QoS performance by defining a Tx frame with up to eight channels of QoS parameters and specifying the frame length and Tx rate. The AQ1300/AQ1301 takes statistics of each individual QoS channel.

When the device under test is in Loopback Test mode, you can perform latency measurement on individual QoS channels.

### PING Test Mode

In this mode, you can verify layer 3 connectivity. You can ping a single host at intervals of 1 s or less (1 ms minimum).

You can also use traceroute testing to check the route to the target (the other device).

### BERT Mode

In this mode, bit error rate testing is performed. The AQ1300/AQ1301 inserts a pseudo-random pattern (PN15) into the payload of the Tx frame and checks whether or not bit errors are occurring between itself and the other device.

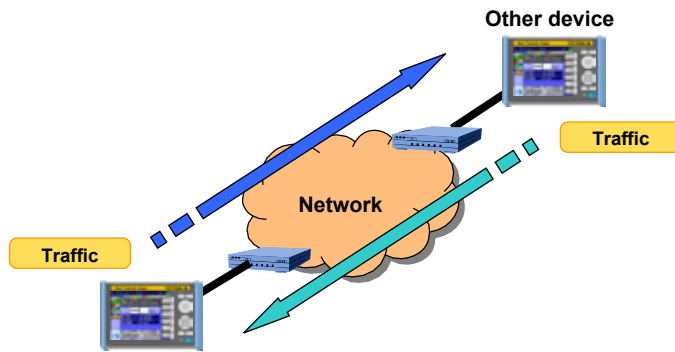
The other device must be set to BERT mode or Loopback Test mode.

## 1.4 Test Configurations

The test configurations in which the AQ1300/AQ1301 can be used are listed below.

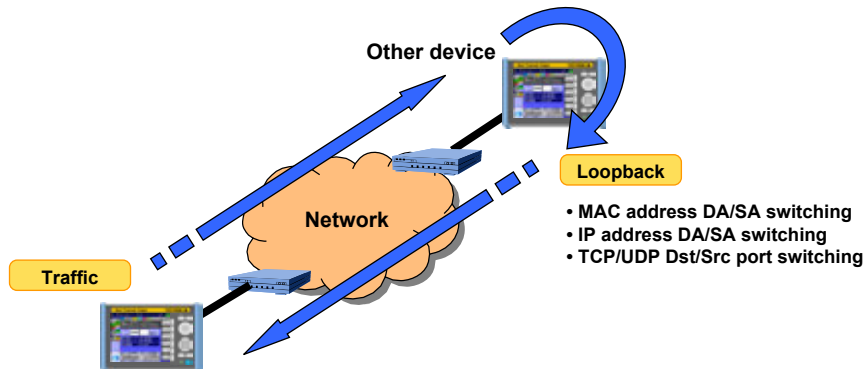
### Two-Way Traffic Test

The AQ1300/AQ1301 and the other device measure the network throughput by sending and receiving traffic between themselves.



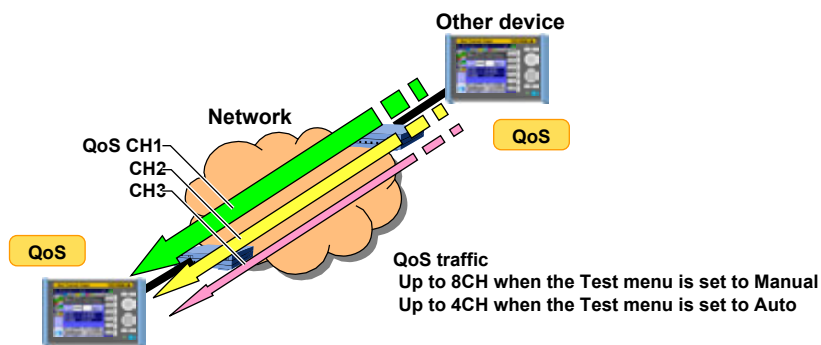
### Loopback Traffic Test (Latency measurement)

The other device is set to Loopback Test mode so that the AQ1300/AQ1301 receives the traffic that it sends, and the AQ1300/AQ1301 measures the network round-trip latency.



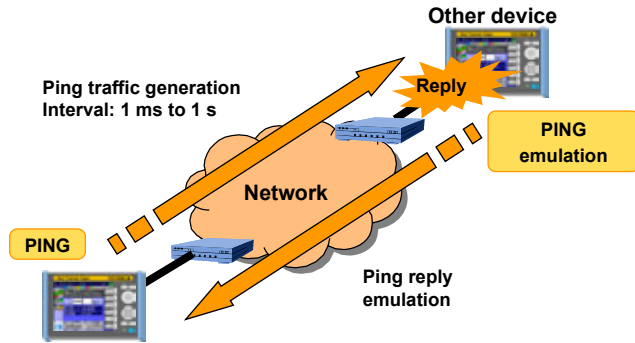
### QoS Test

The AQ1300/AQ1301 measures the network QoS performance by sending and receiving up to eight channels of QoS traffic.



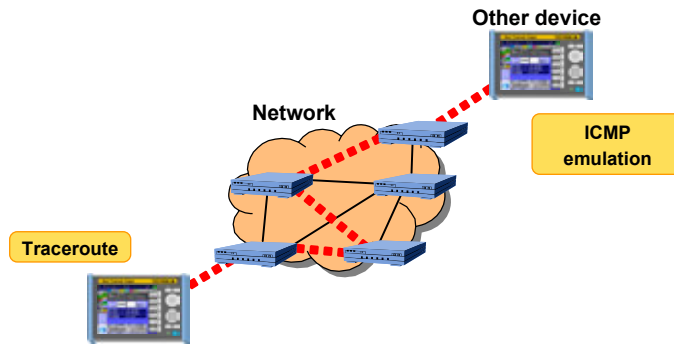
### Ping Test

The AQ1300/AQ1301 verifies layer 3 connectivity.



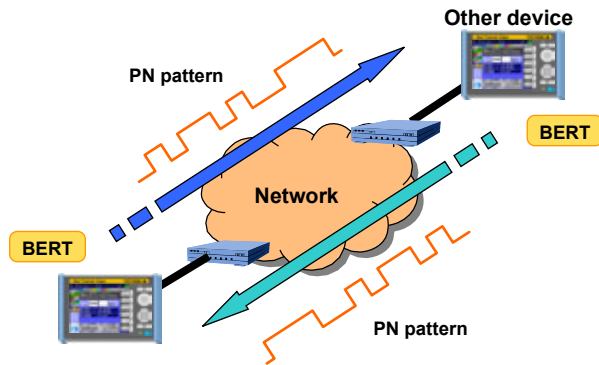
### Traceroute Test

You can also use traceroute testing to check the route to the target (the other device).



### BERT Test

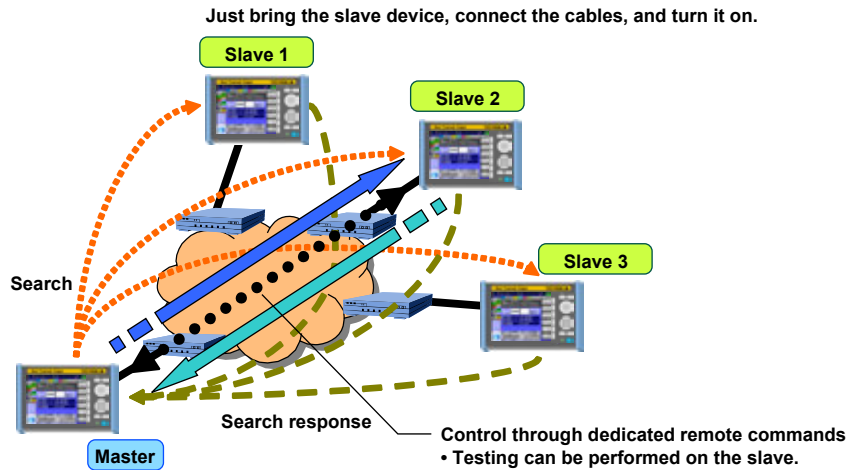
The AQ1300/AQ1301 performs a bit error rate test.



## Inband Remote

This is the test configuration for an Auto(Remote) test.

You can use dedicated remote commands to perform testing on the slave, change settings, and acquire measurement results. Because the slave device can be controlled remotely, a single person can perform this test.



The master can control the slaves remotely through the measured connection.

- Searching for slaves: The AQ1300 can search for up to 64 slaves.
- Controlling slaves: The AQ1300 can only control one slave at a time.

## 1.5 Layer 1 Control

### Tx Clock Master/Slave Synchronization

When Manual has been selected in the Test menu and the interface is XFP or SFP, you can select the Tx clock source.

Tx Clock Source

Internal CLK: The internal clock is used.

Received CLK: The AQ1300/AQ1301 synchronizes with the Rx line signal.

### Rx Clock Measurement

When the interface is XFP, SFP, or RJ-45 100BASE-TX, you can measure the frequency deviation of the Rx clock.

Link State	Measurement Result Display
Linkdown	"---" is displayed.
Linkup	The frequency deviation of the Rx clock is displayed [ppm].

When the interface is RJ-45, the AQ1300/AQ1301 cannot measure the frequency deviation of the Rx clock for 1000BASE-T or 10BASE-T connections. To measure the frequency deviation of the Rx clock through the RJ-45 interface, use a 100BASE-TX connection.

### LF and RF Transmission and Detection

When the interface is XFP, because the AQ1300/AQ1301 supports the notification of physical layer failures through LFS (link fault signaling), it can transmit and detect LF (local fault) and RF (remote fault) signals.

The AQ1300/AQ1301 can transmit LF and RF signals consecutively (start/stop).

Also, when Manual has been selected in the Test menu, the AQ1300/AQ1301 can automatically send an RF signal upon linkdown detection or LF signal reception.

### RxLF (Local Fault reception)

Detection: Four or more sequence columns that indicate LF at an interval less than 128 columns.

Sequence columns that indicate RF must not be received during this period.

Clear: When sequence columns that include LFs are not received 128 times.

### RxRF (Remote Fault reception)





Detection: Four or more sequence columns that indicate RF at an interval less than 128 columns.

Sequence columns that indicate LF must not be received during this period.

Clear: When sequence columns that include RFs are not received 128 times.

### Simple Optical Power Monitor

When the interface is XFP or SFP, the AQ1300/AQ1301 can monitor the received optical power level and indicate it using three levels.

Indication	Colors	Description
	Black and black	When the RJ-45 interface is being used or when the XFP or SFP interface is being used and the interface module is not installed
	Red and black	When the level of received light is too low
	Green and green	When the level of received light is appropriate
	Red and red	When the level of received light is too high



## Turning the Optical Output Off and On

When the interface is XFP or SFP, you can turn the optical output (laser) off and on. You can force the link of the device under test down or up.

## Linkdown Transmission Continuation

When Manual has been selected in the Test menu and the interface is XFP, you can choose to continue or stop transmission during linkdown detection.

## Sync Loss Detection of 66 Bits Blocks

When the interface is XFP, the AQ1300/AQ1301 detects the condition when the signal reception changes from a block sync (block lock) state of 66 bits blocks to a loss of sync (block lock loss) state as defined in IEEE802.3. When a sync loss of 66 bits blocks is detected, the link is disconnected. This feature is supported in firmware version (FW Ver.) R1.08.01.001 and later.

## 66B Sync Error Detection

When the interface is XFP, the AQ1300/AQ1301 detects 66 bits blocks whose sync header (2 bits) is except 00 or 11 when signal reception is in a sync (block lock) state as defined in IEEE802.3. This feature is supported in firmware version (FW Ver.) R1.08.01.001 and later.

## 66B Sync hi-ber Detection/Clear

When the interface is XFP, the AQ1300/AQ1301 detects and clears 66B Sync hi-ber on the basis of the following conditions when signal reception is in a sync (block lock) state as defined in IEEE802.3. This feature is supported in firmware version (FW Ver.) R1.08.01.001 and later.

Detection: When 16 or more sync headers (2 bits) set to 00 or 11 are detected in a 125  $\mu$ s window when signal reception is in a sync (block lock) state as defined in IEEE802.3.

Clear: When less than 16 sync headers (2 bits) that are not set to 01 or 10 are detected in a 125  $\mu$ s window when signal reception is in a sync (block lock) state as defined in IEEE802.3.

### Note

IEEE802.3 defines the sync (block lock) state of 66 bits blocks as follows:

Detection: When 64 consecutive sync headers (2 bits) set to 01 or 10 are received correctly.

Clear: When 16 sync headers (2 bits) that are not set to 01 or 10 are detected within 64 sync headers in a sync (block lock) state.

## Link Setting Acquisition

If the interface is SFP(GbE) or RJ-45, this feature is used to check the link settings of the DUT (the device on the user side). You can acquire and display link setting information of the other device connected to the AQ1300/AQ1301 or the DUT connected to the AQ1300/AQ1301 on the slave side as well as the status of the differences in the negotiation settings. In addition, you can check the UTP cable condition and display the results.

## 1.6 Transmission Features

### Transmission Load Configuration

When the test mode is Traffic Test, QoS Test, or BERT, you can set the transmission load by setting the Tx rate and the Tx mode.

When the mode is Traffic Test or BERT, you can define a single frame. In QoS test mode, you can define up to eight frames and assign them to the various transmission channels.

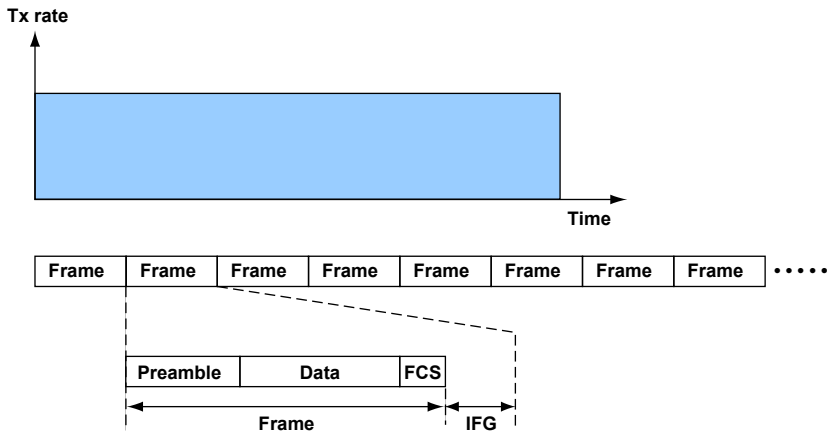
#### Tx Rate Settings

##### Traffic Format

When Manual has been selected in the Test menu, you can select a traffic format.

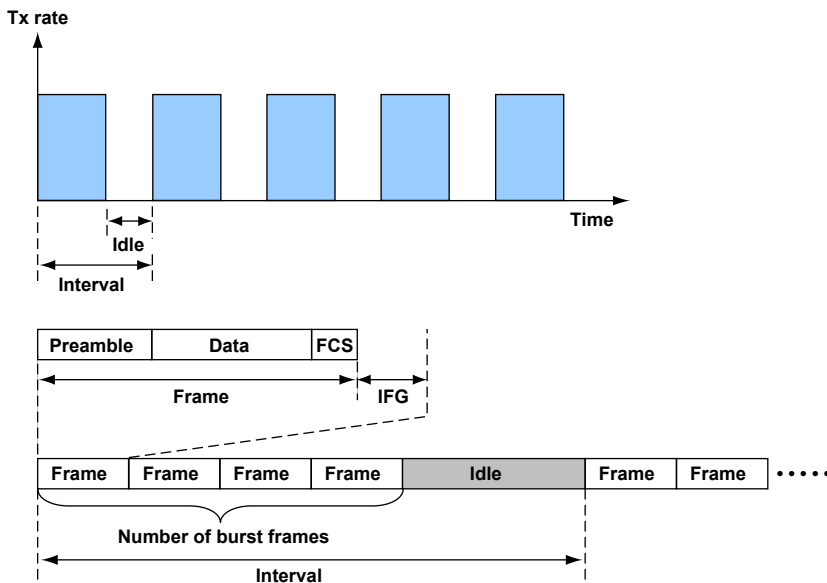
##### Constant

When the traffic format is Constant, frames are sent continuously at a constant interval. You can change the interframe gap (IFG) by changing the Tx rate.



##### Burst

When the traffic format is Burst, frames are transmitted in bursts: frame transmission starts and stops repeatedly at a specified interval. You can change the interframe gap (IFG) by changing the Tx rate. You can specify the number of Tx frames in the burst interval by setting Burst Number, and you can specify the interval of repetition by setting Interval.



If the burst transmission interval determined by the value you set for Burst Number is greater than the value you set for Interval, the AQ1300/AQ1301 will transmit frames at a constant rate without any idle condition.

### **Tx Rate**

#### **When the Mode is Traffic Test or BERT**

When Manual has been selected in the Test menu, you can set the Tx rate as a percentage or in units of bits or fps. You can only set values that exceed 100% in units of bits. When Test Interface is set to SFP(FE), you cannot set values that exceed 100%.

You can only set values as percentages when Auto or Auto(Remote) has been selected in the Test menu.

### **Note**

When the you set the Tx rate in bits, specify the number of bits in the IFG.

#### **In QoS Test Mode**

Regardless of the Test menu, you can only set the Tx rate as a percentage.

### **Tx Mode Settings**

#### **Continuous**

In this mode, frames are transmitted continuously. After you start transmission, it continues until you stop it.

#### **Frames**

In this mode, a specified number of frames is transmitted. After you start transmission, the specified number of frames is sent, and then transmission is stopped automatically.

#### **Tx Time**

In this mode, frames are transmitted for a specified period of time. After you start transmission, it continues for the specified period of time and is then stopped automatically.

## Tx Frame Definition

For the Tx frame definition, in addition to basic frame editing, you can also set the payload, variable field setting, error addition, etc.

### Frame Editing

When Manual has been selected in the Test menu, you can edit the following frames.

- When the test layer is L2: MAC+TYPE
- When the test layer is L3-IPv4: MAC+TYPE+IPv4  
MAC+TYPE+IPv4+UDP
- When the test layer is L3-IPv6: MAC+TYPE+IPv6  
MAC+TYPE+IPv6+UDP

The fields and settings that you can edit are listed below.

Field		Setting
MAC	Destination	Manual, the same as Destination Setting
	Address value format	**_**_**_**_**_**
	Source	Manual, the same as Source Setting
	Address value format	**_**_**_**_**_**
VLAN	Flag use	Used, Source Address
	VLAN stacks	None, 1, 2
	VLAN-[1-2]TPID	0x0000-0xFFFF
	VLAN-[1-2]CoS	0-7
	VLAN-[1-2]CFI	0-1
	VLAN-[1-2]VLANID	0-4095
IPv4	Destination address	Manual, the same as Destination Setting
	Address value format	*** **.* **.* **.*
	Source address	Manual, the same as Source Setting
	Address value format	*** **.* **.* **.*
	ToS/DS(DSCP)	Manual, IPv4-ToS, IPv4-DSCP
	Service type value	0x00-0xFF (manual), 0-7 (IPv4-ToS), 0-63 (IPv4-DSCP)
	Protocol	0-255 (when Frame Structure is MAC+TYPE+IPv4)
IPv6	Destination address	Manual, the same as Destination Setting
	Address value format	****.****.****.****.****.****.****.****
	Source address	Manual, the same as Source Setting
	Address value format	****.****.****.****.****.****.****.****
	ToS/DS(DSCP)	0x00-0xFF (manual), 0-7 (IPv6-TrafficClass), 0-63 (IPv6-DSCP)
	NextHeader	0-255 (when Frame Structure is MAC+TYPE+IPv6)
UDP	Destination port number	0 to 65535
	Source port number	0 to 65535

When Auto or Auto(Remote) has been selected in the Test menu, the frame structures are fixed as indicated below, and frames cannot be edited.

Test Layer	Add UDP to Tx Frame	
	OFF	ON
L2	MAC+TYPE	—
L3-IPv4	MAC+TYPE+IPv4	MAC+TYPE+IPv4+UDP
L3-IPv6	MAC+TYPE+IPv6	MAC+TYPE+IPv6+UDP

You can use the setup software to create the following frames for manual testing. For details see the *Setup Software User's Manual*, IM AQ1300-61EN.

L2 Protocol Type	L2/L3 Tags	L3 Protocol Type	L4 Protocol Type	Notes
DIX/IEEE802.3	Mac in Mac (IEEE802.1ah/ EoE, B-Tag) VLAN Tag (4 stacks) MPLS/EoMPLS (4 stacks)	IPv4	UDP	IPv4 multicast is supported.
			TCP	
			IGMP	
			ICMP	
		IPv6	UDP	
			TCP	
			IGMP	
			ICMP	
		ICMPv6		
		IPX	—	
E-OAM	ITU-T			
IEEE				
Pause	Mac in	—	—	
ARP	Mac (IEEE802.1ah/ EoE, B-Tag) VLAN Tag (4 stacks)	—	—	
ECP	EoE VLAN Tag	—	—	
Custom (with MAC)	—	—	—	
Custom (without MAC)	—	—	—	

## Payload Settings

### User-Defined Data

You can use the setup software to attach a specified data sequence to the payload areas of the various protocols. You can enter data sequences into payload areas of up to 256 bytes that include the protocol headers. A fill pattern is inserted after the user-defined data.

### Fill Pattern

You can insert a fill pattern into the payload areas of the various protocols.

AQ1300/AQ1301	ALL0, ALL1, 0/1 alt., Random, Manual (4 bytes)
Setup software	Random, manual (4 bytes)

### Variable Field

You can change the specified field when Manual has been selected in the Test menu and the test mode is Traffic Test. There are two methods for changing a field: field specification, in which you select a field directly, and offset specification, in which you set the offset, bit offset, and variable bit width manually.

- Variable fields: 1
- Variable mode: Increment/random
- Variable size: Maximum width of 32 bits

### Variable Frame Length

You can change the frame length when Manual has been selected in the Test menu and the test mode is Traffic Test, QoS Test, or BERT. You can change a single frame when the mode is Traffic Test or BERT. In QoS Test mode, you can change field lengths by channel.

- Variable mode: Increment/decrement/random
- Variable range: 64 to 9999 bytes

When Test Interface is set to SFP(FE), the sending and receiving of frames that exceed 2048 bytes in length is outside of the AQ1300/AQ1301 guaranteed operating range.

### Automatic Checksum Calculation

This feature guarantees the L3 header checksum when Manual has been selected in the Test menu, field variation is enabled, and the variable field has been set to a field within the L3 header checksum (IPv4 header) computation range.

**Test Tags**

When you are using two AQ1300/AQ1301 in a two-way or loopback test configuration, you can attach test tags for analysis to the Tx frames.

Test tags are inserted immediately before the Tx frame FCS.

Test tags can be inserted when the test mode is Traffic Test or QoS Test.

When Auto or Auto(Remote) has been selected in the Test menu, test tags are always inserted.

When Manual has been selected in the Test menu, you can select whether or not to insert test tags.

<b>Preamble</b>	<b>Data</b>	<b>Test tags</b>	<b>FCS</b>
<b>8 bytes</b>	<b>Arbitrary</b>	<b>16 bytes</b>	<b>4 bytes</b>

**Inserted Data**

The following data is inserted into test tags.

<b>Data Type</b>	<b>Description</b>
Test ID	The IDs of the AQ1300/AQ1301 and the test item
Additional test data	For status notification and exchanging test setup information
Frame ID	The frame (QoS channel) number
Timestamp	Latency measurement data is inserted here.
Sequence number	A sequence number is inserted here.
Payload check CRC	A CRC for the payload
Tag identifier	A fixed identifier that indicates that the data is a tag.
Tag length	Tag field length in units of 2 bytes (for expansion)

**Timestamp**

The timestamp (time data) is inserted into a (32-bit) field in the test tag. If the other device is in Loopback Test mode, you can use the timestamp to measure the latency.

**Sequence Number**

By inserting a sequence number into a (32-bit) field in a test tag and then sending the frame, the AQ1300/AQ1301 can check for sequence errors between itself and the other device.

When the test mode is Traffic Test, the same sequence number is inserted for all ports. When the test mode is QoS test, sequence numbers are inserted separately for each channel.

**Payload Check CRC**

By computing a (16-bit) CRC of the Tx frame payload, inserting the result into a test tag field, and then sending the frame, the AQ1300/AQ1301 can check for payload errors between itself and the other device.

**PN Pattern**

By inserting a pseudo-random pattern (PN15) into the fill pattern data area of a Tx frame payload and then sending the Tx frame to the other device, the AQ1300/AQ1301 can perform a BER measurement to check for device errors.

**Error Addition**

The AQ1300/AQ1301 can add the following errors to the frames that it sends.

CRC errors, symbol errors, sequence errors, payload errors, bit errors, undersize errors,\* oversize errors\*

\* Set the Tx frame length.

### Transmitting by QoS Channel

When Manual has been selected in the Test menu and the test mode is QoS test, you can specify different frames, frame lengths, and transfer rates for each channel and send the frames separately. When Auto or Auto(Remote) has been selected in the Test menu and the test mode is QoS test, you can specify different QoS values, frame lengths, and transfer rates for each channel and send the frames separately.

When Manual has been selected in the Test menu, you can select up to eight QoS channels; when Auto or Auto(Remote) has been selected in the Test menu, you can select up to four.

---

## 1.7 Reception Features

### Base Filter

You can use the base filter to specify the conditions for selecting the received frames to take statistics from.

You can set the base filter when Manual has been selected in the Test menu and the test mode is Traffic Test, QoS Test, or BERT.

There are two filter types that you can choose from: field filtering, in which you select the field of the protocol that you want take statistics of, and offset filtering, in which you set the filter location and pattern.

There are two base filters. You can combine them and set whether to take the statistics of frames that pass or do not pass through them.

### QoS Channel Measurement

When Manual has been selected in the Test menu, you can measure up to eight QoS channels (classes) separately; when Auto or Auto(Remote) has been selected in the Test menu, you can measure up to four. By taking statistics for different flows, you can evaluate the priority control of a network device. The QoS filter operates on the frames that pass through the base filters.

You can use the QoS filter when Manual has been selected in the Test menu and the test mode is QoS Test.

There are two filter types that you can choose from: field filtering, in which you select the field of the protocol that you want take statistics of, and offset filtering, in which you set the filter location and pattern.

There are two QoS filters, and the AQ1300/AQ1301 takes the statistics of the frames that pass through them.

### Latency Measurement

If you set the other device to Loopback Test mode, the AQ1300/AQ1301 can insert a timestamp in a Tx frame and measure the latency by determining the difference between the timestamp and the time that the frame comes back.

### Gap Measurement

The AQ1300/AQ1301 measures the maximum, minimum, and average gaps (IFGs) between packets. The values are displayed both in  $\mu$ s and bits.

---

#### **Note**

Frames whose length is between 48 and 9999 bytes can be received. Frames whose length exceeds 9999 bytes are detected as oversized frames.

When Test Interface is set to SFP(FE), frames whose length is between 48 and 2048 bytes are guaranteed to be received.

---



## Sequence Measurement

The AQ1300/AQ1301 monitors the sequence numbers inserted in frames and takes sequence error statistics for loss packets, maximum burst loss, reorder packets, and duplicate packets.

When the test mode is Traffic Test, all the ports are measured together. When the test mode is QoS test, the channels are measured separately.

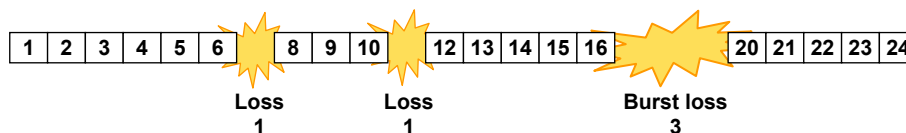
### Detected Sequence Errors

Detected Error Type	Error Description
Loss Packet	The total number of lost frames
Max Burst Loss	The maximum number of consecutive frames that have been lost
Reorder Packet	The total number of frames that have been received out of the order that they were sent in
Duplicate Packet	The number of received frames that have been received again

### Sequence Error Detection Examples

#### Loss Packet

Frames that were sent but not received are counted as loss packets. The Loss Packet number represents the total number of loss packets.

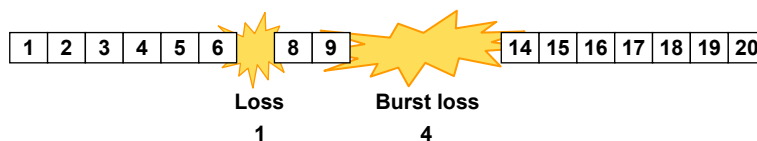


#### Note

- Burst loss packets are also counted as loss packets.
- Reorder packets are not counted as loss packets.

#### Max Burst Loss

Consecutive frames that the AQ1300/AQ1301 is unable to receive are counted as burst loss packets. The Max Burst Loss number represents the maximum burst loss value.



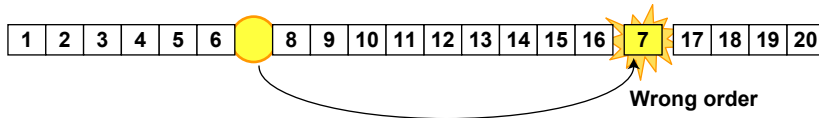
#### Note

- Reorder packets do not affect the measurement of the maximum burst loss.

**1.7 Reception Features**

**Reorder Packet**

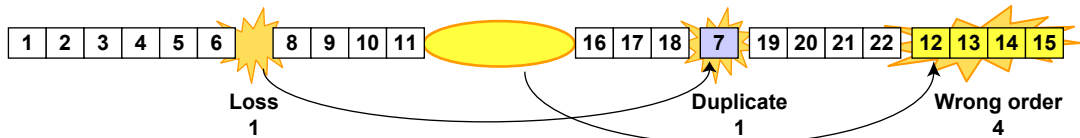
Frames that are received out of the order that they were sent in are counted as reorder packets. The Reorder Packet number represents the total number of reorder packets.



Loss Packet: 0  
 Max Burst Loss: 0  
 Reorder Packet: 1  
 Duplicate Packet: 0

**Note**

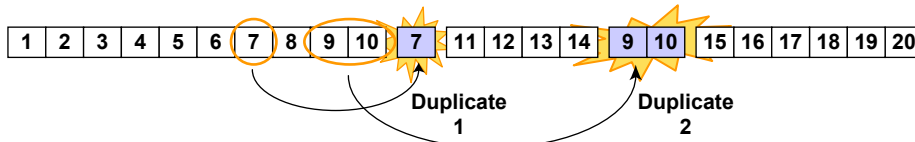
- Reorder packets are detected from the previous loss packet or burst loss packet area.
- Reordered frames that are from two or more losses or burst loss areas before are counted as duplicate packets.



Loss Packet: 1  
 Max Burst Loss: 1  
 Reorder Packet: 4  
 Duplicate Packet: 1

**Duplicate Packet**

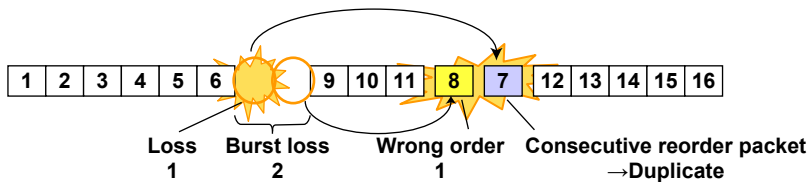
Frames that are received more than once are counted as duplicate packets. The Duplicate Packet number represents the total number of duplicate packets.



Loss Packet: 0  
 Max Burst Loss: 0  
 Reorder Packet: 0  
 Duplicate Packet: 3

**Note**

All consecutive reorder packets after the first are counted as duplicate packets.



Loss Packet: 1  
 Max Burst Loss: 2  
 Reorder Packet: 1  
 Duplicate Packet: 1

## Payload Error Measurement

Using the (16-bit) payload CRC data in fields in Rx frame test tags, the AQ1300/AQ1301 can check for payload errors between itself and the other device.

## BER Measurement

By inserting a pseudo-random pattern (PN15) into the fill pattern data area of a Tx frame payload and then sending the Tx frame to the other device, the AQ1300/AQ1301 can perform a BER measurement to check for device errors.

### Condition for Synchronization

A sync loss state changes to a synchronized state when a matching PN pattern of 32 bits or more is detected in the payload.

### Condition for Sync Loss

A synchronized state changes to a sync loss state when an error of 50 bits or more is detected within 128 bits.

### Note

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The bytes that undergo BER measurement include the first 32 bits that result in synchronization.

---

## Pause

When Flow Control is set to ON and the AQ1300/AQ1301 detects a pause frame, it will stop transmission until the pause time passes.

## Collision Detection

When the interface is RJ-45 10BASE-T or 100BASE-TX and half duplex is selected, the AQ1300/AQ1301 detects collisions.

- Frames that are received when a collision is detected are considered invalid and are not used in statistics.
- Late collisions (collisions that occur after a string of 512 bits that includes the preamble have been sent) are treated as collisions.

## 1.8 Statistics

### List of Statistics

Group Name	Display	Display Digits	Condition
Common	Acquisition Time	YYYY/MM/DD hh:mm:ss	
	Measurement Duration	hh:mm:ss	
Link	Link Status	Up to 22 characters	
	Laser Off Count	16-digit integer	XFP or SFP interface
	Linkdown Count	16-digit integer	
	Tx Freq Deviate(ppm)	+/- sign and 1 digit after the decimal point	
	Rx Freq Deviate(ppm)	+/- sign and 1 digit after the decimal point	When the interface is XFP, SFP, or RJ-45 100BASE-TX
	LF Send Count	16-digit integer	When the interface is XFP
	RF Send Count	16-digit integer	
	LF Detect Count	16-digit integer	
	RF Detect Count	16-digit integer	
	LF receive column count	16-digit integer	When the interface is XFP.
	RF receive column count	16-digit integer	Supported in firmware version (FW Ver.) R1.08.01.001 and later.
	66B sync loss count	16-digit integer	
	66B sync error count	16-digit integer	
	66B sync hi-ber count	16-digit integer	
Tx	Frame	16-digit integer	
	Byte	16-digit integer	
	Rate(%)	5 digits after the decimal point	
	Rate(fps)	10-digit integer	
	Rate(Bps)*	10-digit integer	
	Rate(bps)*	10-digit integer	
	Reply Frame	10-digit integer	
	Error Frame	16-digit integer	
	CRC Error	16-digit integer	
	Undersize Error	16-digit integer	
	Oversize Error	16-digit integer	
	Symbol Error	16-digit integer	
Rx:	Frame	16-digit integer	
	Byte	16-digit integer	
	Rate(%)	5 digits after the decimal point	
	Rate(fps)	10-digit integer	
	Rate(Bps)*	10-digit integer	
	Rate(bps)*	10-digit integer	
	Peak Rate(%)	5 digits after the decimal point	
	Peak Rate(fps)	10-digit integer	
	Peak Rate(bps)	10-digit integer	
	Average Rate(%)	5 digits after the decimal point	
	Average Rate(fps)	10-digit integer	
	Average Rate(bps)	10-digit integer	
	PAUSE Frame	16-digit integer	
	Collision Detect	16-digit integer	When the interface is RJ-45
Error Frame	16-digit integer		
Rx Error	CRC Error	16-digit integer	
	Undersize Error	16-digit integer	
	Oversize Error	16-digit integer	
	Alignment Error	16-digit integer	When the interface is RJ-45
	Symbol Error	16-digit integer	

Group Name	Display	Display Digits	Condition
Latency	Max IFG(us)	Integer part: 10 digits, fractional part: 1 digit	
	Min IFG(us)	Integer part: 10 digits, fractional part: 1 digit	
	Avg IFG(us)	Integer part: 10 digits, fractional part: 1 digit	
	Max IFG(bit)	Integer part: 16 digits	
	Min IFG(bit)	Integer part: 16 digits	
	Avg IFG(bit)	Integer part: 16 digits	
	Max Latency(us)	Integer part: 10 digits, fractional part: 1 digit	
	Min Latency(us)	Integer part: 10 digits, fractional part: 1 digit	
Sequence	Avg Latency(us)	Integer part: 10 digits, fractional part: 1 digit	
	Loss Packet	16-digit integer	When the mode is Traffic Test or QoS Test
	Reorder Packet	16-digit integer	
	Duplicate Packet	16-digit integer	
Max Burst Loss	10-digit integer		
Payload Error	Payload Error	13-digit integer	
Tx Channel (1 to 8)	Frame	16-digit integer	When the mode is QoS Test
	Byte	16-digit integer	
	Rate(%)	5 digits after the decimal point	
	Rate(fps)	10-digit integer	
	Rate(bps)	10-digit integer	
Rx Channel (1 to 8)	Frame	16-digit integer	
	Byte	16-digit integer	
	Rate(%)	5 digits after the decimal point	
	Rate(fps)	10-digit integer	
	Rate(bps)	10-digit integer	
	Peak Rate(%)	5 digits after the decimal point	
	Peak Rate(fps)	10-digit integer	
	Peak Rate(bps)	10-digit integer	
	Average Rate(%)	5 digits after the decimal point	
	Average Rate(fps)	10-digit integer	
	Average Rate(bps)	10-digit integer	
	Max Latency(us)	Integer part: 10 digits, fractional part: 1 digit	
	Min Latency(us)	Integer part: 10 digits, fractional part: 1 digit	
	Avg Latency(us)	Integer part: 10 digits, fractional part: 1 digit	
	Loss Packet	16-digit integer	
	Reorder Packet	16-digit integer	
	Duplicate Packet	16-digit integer	
Max Burst Loss	10-digit integer		
Payload Error	13-digit integer		
BERT	Bit Error Rate ( $\times E-12$ )	Integer part: 13 digits, fractional part: 1 digit	When the mode is BERT
	Bit Error Count	16-digit integer	
	Bit Error Frame	16-digit integer	
	Sync Loss Count	16-digit integer	
	BERT Target Byte	16-digit integer	
	Bit Error Insertion	10-digit integer	
PING	Send	16-digit integer	When the mode is PING Test
	Loss Count	16-digit integer	
	ARP Error	Disable	
	IPv4 Checksum Error	16-digit integer	
	ICMP Checksum Error	16-digit integer	
	Timeout	16-digit integer	
	Loss Rate(%)	Integer part: 3 digits, fractional part: 1 digit	
	Max Response Time(ms)	Integer part: 3 digits, fractional part: 3 digits	
	Min Response Time(ms)	Integer part: 3 digits, fractional part: 3 digits	
	Avg Response Time(ms)	Integer part: 3 digits, fractional part: 3 digits	

\* Bps: Byte/s, bps: bit/s

## E-OAM Test Statistics

Group Name	Display	Display Digits	Conditions
LoopBack(LB)	Test Count	16-digit integer	When the mode is LB test
	Loss Count	16-digit integer	
	Loss Rate	Integer part: 3 digits, fractional part: 1 digit	
	Max Response Time(ms)	Integer part: 3 digits, fractional part: 3 digits	
	Min Response Time(ms)	Integer part: 3 digits, fractional part: 3 digits	
	Avg Response Time(ms)	Integer part: 3 digits, fractional part: 3 digits	
	Link Down Count	16-digit integer	
	CRC Error	16-digit integer	
	Undersize Error	16-digit integer	
	Alignment Error	16-digit integer	
	Symbol Error	16-digit integer	
Continuity Check(CC)	Tx CCM count	16-digit integer	When the mode is CC test
	Tx RDI count	16-digit integer	
	Rx CCM count	16-digit integer	
	Rx RDI count	16-digit integer	
	LOC detected count	16-digit integer	
	Through CCM count	16-digit integer	
	UnExpected MEP count	16-digit integer	
	Mismerge count	16-digit integer	
	Unexpected MEG Level count	16-digit integer	
	Unexpected Period count	16-digit integer	
	Link Down Count	16-digit integer	
	CRC Error	16-digit integer	
	Undersize Error	16-digit integer	
	Alignment Error	16-digit integer	
	Symbol Error	16-digit integer	

## Common Group

### Acquisition Time

The time when the screen was last updated is displayed (YYYY/MM/DD hh:mm:ss).

### Measurement Duration

The amount of time that has elapsed since the start of testing (statistics) is displayed (to the second; hh:mm:ss).

## Link Group

### Link Status

The port UP/DOWN link status is displayed. When the status is UP, the connection speed and MDI status are displayed.

IF	Display
RJ-45	Linkdown-Unfixed, Linkdown-Straight, Linkdown-Cross 10M-FULL-Straight, 10M-FULL-Cross, 10M-HALF-Straight, 10M-HALF-Cross 100M-FULL-Straight, 100M-FULL-Cross, 100M-HALF-Straight, 100M-HALF-Cross 1000M-FULL-Straight, 1000M-FULL-Cross
SFP	Linkdown 1000M-FULL
XFP	Linkdown 10G-FULL

### Laser Off Count

Indicates the number of times the laser has been turned off

### Linkdown Count

Indicates the number of linkdown detections

**Tx Freq Deviate(ppm)**

Indicates the frequency deviation of the Tx clock

**Rx Freq Deviate(ppm)**

Indicates the frequency deviation of the Rx clock

**LF Send Count and RF Send Count**

Indicate the number of sent LFs and RFs

**LF Detect Count and RF Detect Count**

Indicate the number of detected LFs and RFs

**LF Column Count and RF Column Count**

Indicate the number of detected LF sequence column and RF sequence column. You can check the status of reception frequency does not lead to detection LFS. This feature is supported in firmware version (FW Ver.) R1.08.01.001 and later.

**66B Sync Loss Count**

Indicates the number of times the AQ1300/AQ1301 detected signal reception changes from a sync (block lock) state to a loss of sync (block lock loss) state as defined in IEEE802.3.

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

**66B Sync Error Count**

Indicates the number of times the AQ1300/AQ1301 detected blocks whose sync header (2 bits) is 00 or 11 when signal reception is in a sync (block lock) state as defined in IEEE802.3.

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

**66B Sync hi-ber Count**

Indicates the number of times the AQ1300/AQ1301 detected 16 or more sync headers (2 bits) set to 00 or 11 in a 125  $\mu$ s window when signal reception is in a sync (block lock) state as defined in IEEE802.3.

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

**Tx Group****Frame**

Indicates the number of frames that have been transmitted normally

**Byte**

Indicates the number of bytes in the frames that have been transmitted normally

**Rate(%)**

Indicates the data transmission rate (as a percentage)

**Rate(fps)**

Indicates the number of frames that have been transmitted normally in a single second

**Rate(Bps)**

Indicates the number of bytes in the frames that have been transmitted normally in a single second

**Rate(bps)**

Indicates the number of bits in the frames that have been transmitted normally in a single second

**Reply Frame**

Indicates the total number of emulation reply frames that have been transmitted  
ARP/PING/PING6/NA

### **Error Frame**

Indicates the total number of frames that have been sent with a CRC, undersize, oversize, or symbol error

### **CRC Error**

Indicates the number of frames that have been sent with a CRC error attached to FCS

### **Undersize Error**

Indicates the number of transmitted frames that have been larger than 17 bytes but smaller than 64 bytes (not including the preamble but including the FCS)

### **Oversize Error**

Indicates the number of transmitted frames whose size has been at or above the user-defined oversize value (not including the preamble but including the FCS)

### **Symbol Error**

Indicates the number of frames that have been sent with an error code attached to them

## **Rx Group**

### **Frame**

Indicates the number of frames that have been received normally

### **Byte**

Indicates the number of bytes in the frames that have been received normally

### **Rate(%)**

Indicates the data reception rate (as a percentage)

### **Rate(fps)**

Indicates the number of frames that have been received normally in a single second

### **Rate(Bps)**

Indicates the number of bytes in the frames that have been received normally in a single second

### **Rate(bps)**

Indicates the number of bits in the frames that have been received normally in a single second

### **Peak Rate**

Indicates the highest rate detected during measurement (as a percentage, in fps, or in bps)

### **Average Rate**

Indicates the average rate (as a percentage, in fps, or in bps) within the period during measurement from the first normally received frame until the last normally received frame\*

\* However, the data in the first and last 100 ms of the period is not included in the average rate calculation.

### **PAUSE Frame**

Indicates the number of pause frames that have been received

### **Collision Detect**

Indicates the number of collisions that have occurred  
Collision Detect is only valid when Duplex is set to Half.

### **Error Frame**

Indicates the total number of received frames that have had a CRC, undersize, oversize, alignment, or symbol error



## Rx Error Group

### CRC Error

Indicates the number of frames in which FCS errors were detected.

The AQ1300/AQ1301 detects errors by comparing the CRC values calculated from the received frames to the FCS (Frame Check Sequence) values in the received frames.

### Undersize

Indicates the number of undersized frames.

An error occurs when a received frame is shorter than 64 bytes (excluding the preamble but including the FCS).

- If the interface is XFP, frames shorter than 48 bytes will not be detected.
- If the interface is SFP or RJ-45, frames shorter than 18 bytes will not be detected.

### Oversize

Indicates the number of oversized frames.

When a received frame is longer than the frame length that user defined (excluding the preamble but including the FCS), a received frame is considered oversized.

When Manual has been selected in the Test menu, you can set the oversized frame length on the Manual Setup screen. The factory default value is 1519 byte.

When Auto or Auto(Remote) has been selected in the Test menu and "Use Jumbo Frame" has not been selected, frames that are longer than 1518 + the value set for "VLAN stacks" in the source settings × 4 bytes are considered oversized.

### Alignment Error

Indicates the number of alignment error frames.

An error occurs when a received frame's length is not in units of bytes and a FCS value is incorrect (CRCError).

An error will not occur if the FCS value is correct, even if a received frame's length is not in units of bytes. Alignment errors are valid only for 10M and 100M connections.

### Symbol Error

Indicates the number of received frames that contain symbol errors.

An error occurs when any of the following conditions is detected:

- If there are codes that cannot be encoded.  
Errors are not detected if the interface is RJ-45 (10M connection).
- If the end value of a received frame is incorrect.
- If a link fault signaling (LFS) exists in a received frame.  
(Interface type: XFP)

## Latency Group

### Max IFG (μs and bit)

Indicates the maximum interframe gap in terms of time and bits.

### Min IFG (μs and bit)

Indicates the minimum interframe gap in terms of time and bits.

### Avg IFG (μs and bit)

Indicates the average interframe gap in terms of time and bits.

### Max Latency (μs)

Indicates the maximum difference between a frame's timestamp and the time that it was received

### Min Latency (μs)

Indicates the minimum difference between a frame's timestamp and the time that it was received

### **Avg Latency (µs)**

Indicates the average difference between a frame's timestamp and the time that it was received

## **Sequence Group**

### **Loss Packet**

Indicates the total number of frames that have been lost. This is enabled when two or more sequence measurement source frames are received.

### **Reorder Packet**

Indicates the total number of frames that have been received out of the order that they were sent in. This is enabled when two or more sequence measurement source frames are received.

### **Duplicate Packet**

Indicates the number of received frames that have been received again. This is enabled when two or more sequence measurement source frames are received.

### **Max Burst Loss**

Indicates the maximum number of consecutive frames that have been lost. This is enabled when two or more sequence measurement source frames are received.

## **Payload Group**

### **Payload Error**

Indicates the number of errors that have been detected in the received payloads. Payload error detection is enabled when at least one sequence measurement source frame is received.

The AQ1300/AQ1301 detects errors by comparing the CRC values calculated from the payload in received frames to the CRC values for payload checking that is included in the received frames.

## **CH1 to CH8 Tx Groups**

### **Frame**

For each QoS channel, this item indicates the number of frames that have been transmitted from the port normally

### **Byte**

For each QoS channel, this item indicates the number of bytes in the frames that have been transmitted normally

### **Rate(%)**

Indicates the data transmission rate (as a percentage) for each QoS channel

### **Rate(fps)**

For each QoS channel, this item indicates the number of frames that have been transmitted normally in a single second

### **Rate(bps)**

For each QoS channel, this item indicates the number of bits in the frames that have been transmitted normally in a single second

## **CH1 to CH8 Rx Groups**

### **Frame**

For each QoS channel, this item indicates the number of frames that have been received normally

### **Byte**

For each QoS channel, this item indicates the number of bytes in the frames that have been received normally

**Rate(%)**

Indicates the data reception rate (as a percentage) for each QoS channel

**Rate(fps)**

For each QoS channel, this item indicates the number of frames that have been received normally in a single second

**Rate(bps)**

For each QoS channel, this item indicates the number of bits in the frames that have been received normally in a single second

**Peak Rate**

Indicates the highest rate detected during measurement (as a percentage, in fps, or in bps) for each QoS channel

**Average Rate**

For each QoS channel, this item indicates the average rate within the period during measurement (as a percentage, in fps, or in bps) from the first normally received frame until the last normally received frame\*

\* However, the data in the first and last 100 ms of the period is not included in the average rate calculation.

**Max Latency(us)**

For each QoS channel, this item indicates the maximum difference between a frame's timestamp and the time that it was received

**Min Latency(us)**

For each QoS channel, this item indicates the minimum difference between a frame's timestamp and the time that it was received

**Avg Latency(us)**

For each QoS channel, this item indicates the average difference between a frame's timestamp and the time that it was received

**Loss Packet**

For each QoS channel, this item indicates the total number of frames that have been lost. This is enabled when two or more sequence measurement source frames are received.

**Reorder Packet**

For each QoS channel, this item indicates the total number of frames that have been received out of the order that they were sent in. This is enabled when two or more sequence measurement source frames are received.

**Duplicate Packet**

For each QoS channel, this item indicates the number of received frames that have been received again. This is enabled when two or more sequence measurement source frames are received.

**Max Burst Loss**

For each QoS channel, this item indicates the maximum number of consecutive frames that have been lost. This is enabled when two or more sequence measurement source frames are received.

**Payload Error**

For each QoS channel, this item indicates the number of errors that have been detected in the received payloads. This is enabled when one or more payload error measurement source frames are received.

## BERT Group

### Bit Error Rate

Indicates the bit error rate ( $E^{-12}$ ). This is enabled when the AQ1300/AQ1301 synchronizes with the received frame at least once (when the BERT target byte is not zero).

### Bit Error Count

Indicates the number of bit errors detected during synchronization. This is enabled when the AQ1300/AQ1301 synchronizes with the received frame at least once (when the BERT target byte is not zero). The AQ1300/AQ1301 detects errors by comparing the CRC values calculated from the payload in received frames to the CRC values for payload checking that is included in the received frames.

### Bit Error Frame

Indicates the number of received frames that contain a bit error. This is enabled when the AQ1300/AQ1301 synchronizes with the received frame at least once (when the BERT target byte is not zero).

### Sync Loss Count

Indicates the number of sync loss occurrences. This is enabled when the AQ1300/AQ1301 synchronizes with the received frame at least once (when the BERT target byte is not zero).

### BERT Target Byte

Indicates the number of synchronized bytes that have been received

### Bit Error Insertion

Indicates the number of inserted bit errors

## PING Group

### Test Count

Indicates the number of sent ping frames

### Loss Count

Indicates the number of failed ping attempts

### ARP Error

Indicates the number of failed ping attempts that resulted from ARP address resolution failures. In the firmware version R1.07 and later, this item is always disabled because the address resolution is executed before measurement.

### IPv4 Checksum Error

Indicates the number of failed ping attempts that resulted from IPv4 header checksum errors

### ICMP Checksum Error

Indicates the number of failed ping attempts that resulted from ICMP checksum errors

### Timeout

Indicates the number of timeouts

### Loss Rate(%)

Indicates the percentage of frames that have been lost as a result of timeouts

### Max Response Time(ms)

Indicates the maximum response time

### Min Response Time(ms)

Indicates the minimum response time

### Avg Response Time(ms)

Indicates the average response time

## LoopBack (LB) Group

### Test Count

Indicates the number of sent LBM frames

### Loss Count

Indicates the number of failed attempts

### Loss Rate

Indicates the percentage of frames that have been lost as a result of timeouts

### Max Response Time(ms)

Indicates the maximum response time

### Min Response Time(ms)

Indicates the minimum response time

### Avg Response Time(ms)

Indicates the average response time

### Link Down Count

Indicates the number of link-down detections

### CRC Error

Indicates the number of CRC error frames that have been received

### Undersize Error

Indicates the number of undersize frames (less than 64 bytes) that have been received

### Alignment Error

Indicates the number of alignment error frames that have been received

### Symbol Error

Indicates the number of symbol error frames that have been received

## Continuity Check (CC) Group

### Tx CCM Count

Indicates the number of sent CCM frames

### Tx RDI Count

Indicates the number of sent RDI frames

### Rx CCM Count

Indicates the number of received CCM frames

### Rx RDI Count

Indicates the number of received RDI frames

### LOC Detected Count

Indicates the number of LOC (loss of continuity) detections

This is detected when three consecutive CCM frames cannot be received from the other network device (MEP).

### **Through CCM Count**

Indicates the number of received CCM frames whose maintenance domain level (MD level) is higher than the MD level of the AQ1300/AQ1301

### **Unexpected MEP Count**

Indicates the number of unexpected MEP detections

This is detected when the maintenance domain level (MD level) and domain name in the received CCM frame are correct but the MEP ID of the other network device (MEP) is different from the “target MEP ID.” The domain name is either Short MA Name (IEEE802.1ag standard) or MEG ID (ITU-T Y1731 recommendation).

### **Mismerge Count**

Indicates the number of mismerge detections

This is detected when the maintenance domain level (MD level) in the received CCM frame is correct but the domain name is not.

### **Unexpected MEG Level Count**

Indicates the number of unexpected MEG level detections

This is detected when the maintenance domain level in the received CCM frame is less than the MD level of the AQ1300/AQ1301.

### **Unexpected Period Count**

Indicates the number of unexpected period detections

This is detected when the maintenance domain level (MD level), domain name, and MEP ID in the received CCM frame are correct but the transmission interval of the other network device (MEP) is different from that of the AQ1300/AQ1301.

### **Link Down Count**

Indicates the number of link-down detections

### **CRC Error**

Indicates the number of CRC error frames that have been received

### **Undersize Error**

Indicates the number of undersize frames (less than 64 bytes) that have been received

### **Alignment Error**

Indicates the number of alignment error frames that have been received

### **Symbol Error**

Indicates the number of symbol error frames that have been received

## 1.9 Emulation

### IPv4 Host

#### ARP Reply

To perform address resolution, the AQ1300/AQ1301 sends an ARP reply when it receives an ARP request.

When you enable ARP replying, it is always enabled regardless of the test mode setting, filter condition, or measurement or transmission condition.

When Auto or Auto(Remote) has been selected in the Test menu, ARP replying is always enabled and set to "Source Address only."

When Manual has been selected in the Test menu and the test layer is L3-IPv4, you can configure ARP replying using the emulation settings.

#### ARP Requests That Are Not Answered

The AQ1300/AQ1301 will not send an ARP reply in response to the following kinds of ARP requests.

- ARP requests with a LLC/SNAP header attached (only ARP requests that conform to the DIX specification are supported)
- ARP requests with an MPLS label attached
- ARP requests that are counted as errors, except for payload and sequence errors
- ARP requests that are received at the same time that a linkdown occurs
- ARP requests that are received at the same time that a collision occurs
- ARP requests whose packet lengths are less than 63 bytes, greater than 1519 bytes (greater than 1523 when there is one VLAN stack or greater than 1527 when there are two VLAN stacks), or greater than the oversize threshold.
- ARP requests with three or more VLAN stacks.

#### VLAN Tag Handling

The AQ1300/AQ1301 sends ARP replies in response to ARP requests with VLAN tags attached.

#### ARP Requests with Test Tags

The AQ1300/AQ1301 sends ARP replies in response to ARP requests with test tags attached.

#### ARP Reply Transmission Conditions

- If a collision occurs while an ARP reply is being sent, it is resent.
- If an ARP request is received while transmission is paused, an ARP reply is sent after transmission is resumed.
- If transmission is paused and the AQ1300/AQ1301 is waiting to send an ARP reply and a normal test frame, after transmission resumes, the AQ1300/AQ1301 will send the ARP reply first and then the normal test frame.
- Replies are not sent for ARP requests that are received before the transmission of the current ARP reply has finished.
- If a linkdown occurs immediately after an ARP request is received, the AQ1300/AQ1301 will not send a reply to that request.

#### Ping Reply

The AQ1300/AQ1301 sends a ping reply when it receives a ping request.

When you enable ping replying and the test mode is not Loopback Test, ping replying is always enabled regardless of the test mode setting, filter condition, or measurement or transmission condition.

When Auto or Auto(Remote) has been selected in the Test menu, ping replying is always enabled.

When Manual has been selected in the Test menu and the test layer is L3-IPv4, you can configure ping replying by specifying the emulation settings.

### **Ping Requests That Are Not Answered**

The AQ1300/AQ1301 will not send a ping reply in response to the following kinds of ping requests.

- Ping requests with an LLC/SNAP header attached (only ping requests that conform to the DIX specification are supported)
- Ping requests with an MPLS label attached
- Ping requests that are counted as errors, except for payload and sequence errors
- Ping requests that are received at the same time that a linkdown occurs
- Ping requests that are received at the same time that a collision occurs
- Ping requests whose packet lengths are less than 63 bytes, greater than 10000 bytes, or greater than the oversize threshold.
- IP fragmented ping requests
- Ping requests with three or more VLAN stacks.

### **VLAN Tag Handling**

The AQ1300/AQ1301 sends ping replies in response to ping requests with VLAN tags attached.

### **Ping Reply Transmission Conditions**

- If a collision occurs while a ping reply is being sent, it is resent.
- If a ping request is received while transmission is paused, a ping reply is sent after transmission is resumed.
- If transmission is paused and the AQ1300/AQ1301 is waiting to send a ping reply and a normal test frame, after transmission resumes, the AQ1300/AQ1301 will send the ping reply first and then the normal test frame.
- Replies are not sent for ping requests that are received before the transmission of the current ping reply has finished.
- If a linkdown occurs immediately after a ping request is received, the AQ1300/AQ1301 will not send a reply to that request.

## **Automatic MAC Address Acquisition**

In automatic MAC address acquisition, the AQ1300/AQ1301 uses ARP processing to automatically obtain the MAC address of the device under test (DUT) and then uses that address as the frame destination MAC address.

### **Automatic MAC Address Acquisition Conditions**

- When automatic acquisition is enabled, ARP acquisition is performed with the specified target host (IP address) at the start of measurement. If the target host is not in the same segment as the AQ1300/AQ1301, ARP acquisition is performed with the default gateway. (Acquisition is performed before measurement starts. Afterwards, the statistics are cleared and measurement starts.)
- The AQ1300/AQ1301 waits for a reply after it sends an ARP packet. The timeout value is 1 second. The AQ1300/AQ1301 will try again after timing out.
- The acquired MAC address is cleared at the start of the next test.
- If the MAC address increment feature is enabled, it has priority.
- If the variable field feature is enabled, it has priority.

### **Ignored ARP Replies**

The following ARP replies are not recognized as ARP replies when they are received.

- ARP replies with an LLC/SNAP header attached (only ARP replies that conform to the DIX specification are supported)
- ARP replies with an MPLS label attached
- ARP replies that are counted as errors, except for payload and sequence errors
- ARP replies that are received at the same time that a linkdown occurs



- ARP replies that are received at the same time that a collision occurs
- ARP replies whose packet lengths are less than 63 bytes, greater than 1519 bytes (greater than 1523 when there is one VLAN stack or greater than 1527 when there are two VLAN stacks), or greater than the oversize threshold.
- ARP replies with three or more VLAN stacks.

## Automatic IP Address Acquisition (DHCP)

In automatic IP address acquisition, the AQ1300/AQ1301 requests an address from the DHCP server and then uses the acquired IPv4 address as the source IPv4 address.

## Multi Host

If the test menu is set to Manual and the test layer is IPv4, this feature automatically generates multiple MAC addresses from the VLAN ID or IP address information and make the AQ1300/AQ1301 emulate multiple hosts in the VLAN.

- Returns ARP replies as a multi host.
- Automatically performs ARP acquisition of frame destination MAC addresses for each QoS channel in QoS test mode. This feature also automatically generates frame source MAC addresses.
- Automatically configures Rx QoS filters for each QoS channel in QoS test mode.

## IPv6 Host

### NDP Reply

In NDP (Neighbor Discovery Protocol) replying, the AQ1300/AQ1301 resolves the address by sending an NA (Neighbor Advertisement) when it receives an NS (Neighbor Solicitation). When you enable NDP, it is always enabled regardless of the test mode setting, filter condition, or transmission condition. When Auto or Auto(Remote) has been selected in the Test menu, NDP replying is always enabled. When Manual has been selected in the Test menu and the test layer is L3-IPv6, you can configure NDP replying by specifying the emulation settings.

### NSs That Are Not Answered

The AQ1300/AQ1301 will not send an NA in response to the following kinds of NS.

- NSs with an LLC/SNAP header attached (only NSs that conform to the DIX specification are supported)
- NSs with an MPLS label attached
- NSs that are counted as errors, except for payload and sequence errors
- NSs that are received at the same time that a linkdown occurs
- NSs that are received at the same time that a collision occurs
- NSs whose packet lengths are less than 81 bytes, greater than 10000 bytes, or greater than the oversize threshold.
- NSs with three or more VLAN stacks.

### VLAN Tag Handling

The AQ1300/AQ1301 sends NAs in response to NSs with VLAN tags attached.

### NDP Requests with Test Tags

The AQ1300/AQ1301 sends NDP replies in response to NDP requests with test tags attached.

### NA Transmission Conditions

- If a collision occurs while an NA is being sent, it is resent.
- If an NS is received while transmission is paused, an NA is sent after transmission is resumed.
- If transmission is paused and the AQ1300/AQ1301 is waiting to send an NA, an insert frame, and a normal test frame, after transmission resumes, the AQ1300/AQ1301 will send the insert frame, the NA, and then the normal test frame.
- NAs are not sent for NSs that are received before the transmission of the current NA has finished.
- If a linkdown occurs immediately after an NS is received, the AQ1300/AQ1301 will not send a reply to that request.

### Ping6 Reply

In Ping6 replying, the AQ1300/AQ1301 sends a ping6 reply (ICMPv6 echo reply) when it receives a ping6 request (ICMPv6 echo request).

When you enable ping6 replying and the test mode is not Loopback Test, ping replying is always enabled regardless of the test mode setting, filter condition, or transmission condition.

When Auto or Auto(Remote) has been selected in the Test menu, ping6 replying is always enabled.

When Manual has been selected in the Test menu and the test layer is L3-IPv6, you can configure ping6 replying by specifying the emulation settings.

### Ping6 Requests That Are Not Answered

The AQ1300/AQ1301 will not send a ping6 reply in response to the following kinds of ping6 requests.

- Ping6 requests with an LLC/SNAP header attached (only ping6 requests that conform to the DIX specification are supported)
- Fragmented ping6 requests.
- Ping6 requests with an MPLS label attached
- Ping6 requests that are counted as errors, except for payload and sequence errors
- Ping6 requests that are received at the same time that a linkdown occurs
- Ping6 requests that are received at the same time that a collision occurs
- Ping6 requests whose packet lengths are less than 81 bytes, greater than 1519 bytes (greater than 1523 when there is one VLAN stack or greater than 1527 when there are two VLAN stacks), or greater than the oversize threshold.
- Ping6 requests with three or more VLAN stacks.

### VLAN Tag Handling

The AQ1300/AQ1301 sends ping6 replies in response to ping6 requests with VLAN tags attached.

### Ping6 Reply Transmission Conditions

- If a collision occurs while a ping6 reply is being sent, it is resent.
- If a ping6 request is received while transmission is paused, a ping6 reply is sent after transmission is resumed.
- If transmission is paused and the AQ1300/AQ1301 is waiting to send a ping6 reply and a normal test frame, after transmission resumes, the AQ1300/AQ1301 will send the ping6 reply first and then the normal test frame.
- Replies are not sent for ping6 requests that are received before the transmission of the current ping6 reply has finished.
- If a linkdown occurs immediately after a ping6 request is received, the AQ1300/AQ1301 will not send a reply to that request.

## Stateless Address Autoconfiguration

In stateless address autoconfiguration, the AQ1300/AQ1301 sends a router solicitation message to the router and uses the router advertise message that it receives to set the source IPv6 address.

### Ignored RAs

The following RAs are not recognized as RAs when they are received.

- RAs with an MPLS label attached
- RAs with an LLC/SNAP header attached (only RAs that conform to the DIX specification are supported)
- RAs that are counted as errors
- RAs that are received at the same time that a linkdown occurs
- RAs that are received at the same time that a collision occurs
- RAs whose packet lengths are less than 81 bytes, greater than 1519 bytes (greater than 1523 when there is one VLAN stack or greater than 1527 when there are two VLAN stacks), or greater than the oversize threshold.
- RAs with three or more VLAN stacks.

## Automatic MAC Address Acquisition through NDP

In automatic MAC address acquisition through NDP, the AQ1300/AQ1301 uses NDP (neighbor discovery protocol) message processing at the start of testing to automatically obtain the MAC address of the IPv6 target host and then uses that address as the frame destination MAC address.

### Automatic MAC Address Acquisition Conditions

- When automatic acquisition is enabled, MAC address acquisition through NDP is performed with the specified target host (IP address) at the start of measurement. If the target host is not in the same segment as the AQ1300/AQ1301 from the prefix length, MAC acquisition is performed with the IPv6 router.  
(Acquisition is performed before measurement starts. Afterwards, the statistics are cleared and measurement starts.)
- The AQ1300/AQ1301 waits for a reply after it sends an NS (neighbor solicitation) packet. The timeout value is 1 second. The AQ1300/AQ1301 will try again after timing out.
- The acquired MAC address is cleared at the start of the next test.
- If the MAC address increment feature is enabled, it has priority.
- If the variable field feature is enabled, it has priority.

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## 1.10 Ping and Traceroute Testing

### Ping Test

You can perform IPv4/IPv6 ping testing.

- Destination: A single host
- Interval: 1 ms, 10 ms, 100 ms, 1 s
- Tx Mode: Frames, Time, Continuous
- Frame Length

IPv4: 64 (+up to two VLAN stacks) to 9999 bytes

IPv6: 84 (+up to two VLAN stacks) to 9999 bytes

#### Unsupported Ping Frames

- IEEE802.3 ping frames
- Fragmented ping frames
- Ping frames with an MPLS label attached
- Ping frames with three or more VLAN stacks.

### Traceroute Test

You can perform IPv4 (ICMP) or IPv6 (ICMPv6) traceroute testing.

- Destination: A single host

#### Unsupported Ping Frames

- IEEE802.3 ping frames
- Ping frames whose frame length is not 64 bytes (+VLAN tag)
- Ping frames with an MPLS label attached
- Ping frames with three or more VLAN stacks.
- Tests with more than 64 hops

## 1.11 Logging Statistics

When Manual has been selected in the Test menu, you can log statistics on the AQ1300/AQ1301. The logged data is saved to a CSV file.

- Logging interval: 1 s
- Logging time: Specify the time in seconds up to 4 hours (14400 seconds), or select 12, 24, 48, or 72 hours.
- End settings: Stop, Overwrite
- Maximum number of log items: 4

End Setting	Description
Stop	Logging stops after the logging time has passed.
Overwrite	After the logging time has passed, old logs are overwritten by new logs.

### Note

You can save logged statistics to a specific file name by opening the Measurement menu, selecting File, selecting File Name Setup, and then specifying a file name.

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## 1.12 Simple Test Creation and Execution

### Test Item Registration

When Auto or Auto(Remote) has been selected in the Test menu, you can perform different tests (test modes) according to a test scenario that you have created in the setup software.

The test modes that have been registered in the test scenario are referred to as test items.

You can configure test items using the setup software. You can save up to eight test modes (test items) to a single test scenario file.

You can execute tests by loading the setup file that you created with the setup software onto the AQ1300/AQ1301 and selecting the configured test items.

### Consecutive Test Item Execution

You can execute registered test items consecutively.

For consecutive test item execution, you can set the starting test number, the interval between test items, and whether or not to display a confirmation message when a test item has finished.

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## 1.13 Displaying Test Pass/Fail Results

When Auto or Auto(Remote) has been selected in the Test menu, you can display the pass/fail results of measurement.

You can set the pass/fail conditions in the setup software for each test mode.

You can only use the AQ1300/AQ1301 to display the pass/fail conditions, not to set them. You can set whether or not to perform pass/fail judgment.

For details about the pass/fail conditions, see the *Setup Software User's Manual*, IM AQ1300-61EN.

## 1.14 File

The AQ1300/AQ1301 and the setup software use the following files.

File Type	File Format	Extension	AQ1300/AQ1301 (AQ1300 and AQ1301)		Setup Software	
			Save	Load	Save	Load
Setup file	Binary	.sd	Yes	Yes	Yes	Yes
Management file	Binary	.dmf	No	Yes	Yes	Yes
Statistical result file	Binary	.mr	Yes	Yes	No	Yes
Statistic log file	Text	.csv	Yes	No	No	Yes
VLAN ID definition file	Text	.csv or .txt	No	Yes	No	Yes

### Setup File

A measurement setup file. You can register up to eight test items on a single setup file.

The type of setup file that you can save varies depending on what you select in the Test menu.

You cannot load a setup file that was created for a different Test menu option.

### Management File (Display management file)

A file for managing the display of setup files. You can save four pages with 12 measurement setup files each.

The management file name is fixed at "disManage.dmf".

### Statistical Result File

A file of the measured results or the measured statistical results. You can save the results of one test to a single statistical result file.

You can also automatically save a statistical result or a statistical result file whenever a test finishes.

### Statistic Log File

When Manual has been selected in the Test menu, you can save up to four statistical items to a statistic log file.

You can also automatically save a statistic log file whenever a test finishes.

### VLAN ID Definition File

VLAN ID definition files (csv format; .csv or .txt extension) created in advance can be loaded into the VLAN ID list of VLAN tests.

#### Note

- You can save a setup file to a specific file name by opening the Setup menu, selecting File, selecting File Name Setup, and then specifying a file name.
- You can save a statistical result file or statistic log file to a specific file name by opening the Measurement menu, selecting File, selecting File Name Setup, and then specifying a file name.



## 1.15 Optical Power Measurement (AQ1300 Option)

On models with the /SPML option, when OPM has been selected in the Test menu, you can measure optical power.

Wavelength range	850, 1300, 1310, 1490, 1550, 1625, 1650 nm
Measurement range	-60 to +10 dBm
Modulation mode	CW, 270 Hz, 1 kHz, 2 kHz You can select the modulation frequency of the incident rays from a list. You can also select CW (continuous).
Unit	dB, dBm, W
Reference	You can make the displayed measured value the reference and display subsequent measured values as relative values.
Zero Set	You can adjust the internal deviation of the optical power measurement section and obtain more accurate absolute optical power values.
Average Count	You can display averaged measured values.
Max/Min Value Display	You can display the maximum and minimum measured values.
Offset	You can add a specified value (the offset value) to measured optical power values.
Threshold Value	You can set upper and lower threshold values and determine whether or not the measured values fall within them.

## 1.16 RFC2544 Measurement (AQ1300 Option)

RFC2544 was published by the IETF. This document contains evaluation methods (benchmark tests) for measuring the processing capabilities of network devices.

The AQ1300/AQ1301 can perform the following measurements contained in RFC2544. The test configuration that you need to use for these measurements is Loopback Traffic Test, in which the other device is set to Loopback Test mode.

- Throughput
- Latency
- Frame loss rate
- Back to back

For each measurement, the length of transmit and receive frames is changed automatically to retrieve a measured value. Then, the processing capability for each frame length is displayed on a graph. In addition to the features listed above, the AQ1300/AQ1301 can measure the frame signal delay variations when these frame signals travel across the network.

- Delay variations (packet jitter)

### Throughput Measurement

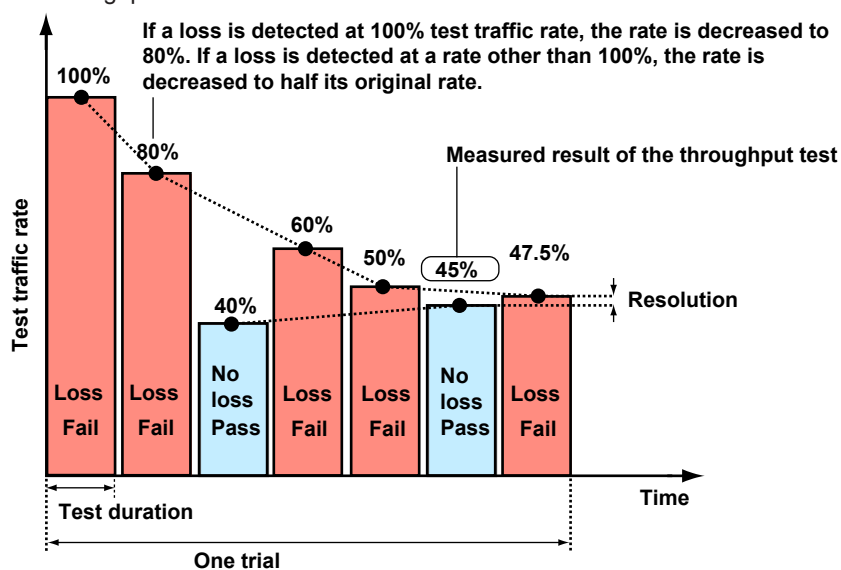
The throughput measurement measures the maximum amount of traffic (rate) that a network device can transmit without losing frame signals. In this measurement, a fixed number of frame signals are transmitted (at the initial rate) over the specified measurement time (the test duration).

During the test duration, if a loss is detected, the rate is automatically decreased. The AQ1300/AQ1301 performs another measurement to detect whether a loss occurs at this new rate. If a loss is detected, the same operations are repeated. These operations are repeated until the rate is decreased to the specified minimum rate.

During the test duration, if no losses are detected, the rate is automatically increased. The AQ1300/AQ1301 performs another measurement to detect whether a loss occurs at this new rate. If no losses are detected, the same operations are repeated. These operations are repeated until the rate is increased to the specified maximum rate.

These rate increasing and decreasing operations are repeated until the difference (the resolution) between the rates when a loss was detected and when no losses were detected reaches a value that is equal to or less than the specified value. The series of operations from the start of measurement to the point where the rate converges to this specified value is a single measurement (a trial).

The specified number of trials are measured, and the average of the rates at the end of each trial is the throughput value.



For the test configuration, see “Two-Way Traffic Test” in section 1.4.

**Test Duration**

This is the length of one measurement for detecting losses.

**Number of Trials**

The number of times that the AQ1300/AQ1301 will perform the series of operations from the start of measurement to the point where the rate converges to the specified value. In one trial, frame signals of the preset frame lengths are used to perform the loss detection measurements. The throughput is the average of the values from all the trials.

**Initial Rate**

The traffic rate that is used when the throughput measurement starts.

**Minimum Rate**

This is the lower limit for the rate. The rate is decreased automatically whenever a loss is detected. This is the minimum traffic rate that is used to converge the throughput measurement.

**Maximum Rate**

This is the upper limit for the rate. The rate is increased automatically when no losses are detected. This is the maximum traffic rate that is used to converge the throughput measurement.

**Resolution**

This is the range that is used to converge the throughput measurement. When the difference between the rates when a loss was detected and when no losses were detected falls within the resolution range, the AQ1300/AQ1301 concludes the throughput measurement.

**Acceptable Loss**

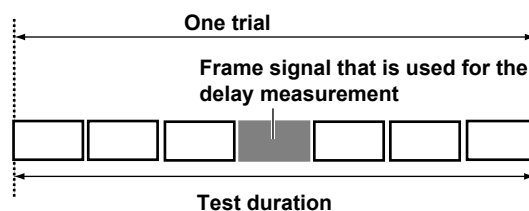
This threshold value specifies the percentage of a frame signal that can be lost without a loss being detected.

**Pass/Fail Judgment**

You can perform pass/fail judgments by setting the throughput threshold on the AQ1300/AQ1301 in advance. If the value falls below the threshold, a fail judgment occurs.

**Latency Measurement**

In the latency measurement, the AQ1300/AQ1301 measures the delay when a network device transmits frame signals. In this measurement, a fixed number of frame signals are transmitted (at the test rate) over the specified measurement time (the test duration). These frame signals are looped back by the other device. The delay of the intermediate frame signal from the fixed number of frame signals is measured.

**Transmission and Reception of Frame Signals**

**Selecting the Way That Measured Results Are Displayed**

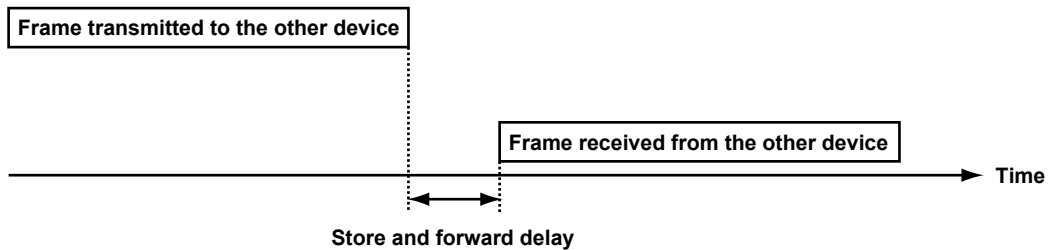
There are two transmission methods that can be used depending on the other network device. You can select the method that the AQ1300/AQ1301 displays measured results with that is suitable for the other device.

For the different transmission methods, the delay measurement method differs as shown in the following figures.

- Store&Forward:  
The delay of frame signals transmitted in the store and forward method is displayed.
- Cut Through:  
The delay of frame signals transmitted in the cut through method is displayed.

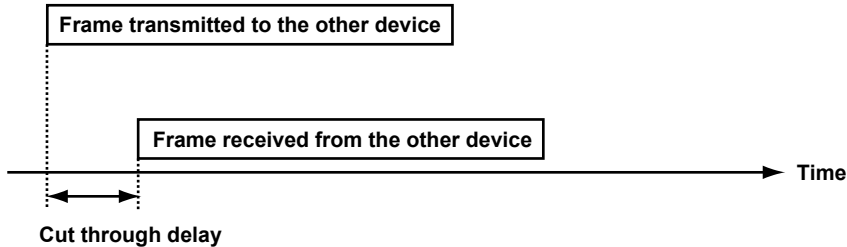
**Store and Forward Method**

The time from when the last bit of the frame signal is received at the input port to when the first bit of the frame signal is transmitted from the output port is measured as the delay.



**Cut Through Method**

The time from when the first bit of the frame signal is received at the input port to when the first bit of the frame signal is transmitted from the output port is measured as the delay.



**Test Duration**

This is the time that frame signals are transmitted for during a single delay measurement.

**Number of Trials**

The number of times that delays are measured. For each trial, the delay measurement is performed for the time specified by the test duration. In one trial, frame signals of the preset frame lengths are used to perform the delay measurements. The delay is the average of the values from all the trials.

**Test Rate**

The traffic rate that the AQ1300/AQ1301 uses to measure the delay. You can change the test rate value. If you have already performed the throughput measurement, you can set the traffic rate to the measured throughput result.

**Pass/Fail Judgment**

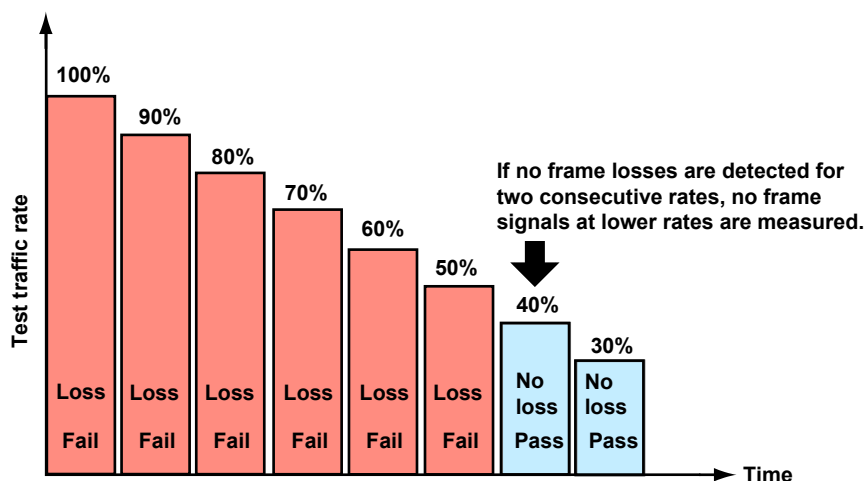
You can perform pass/fail judgments by setting the delay threshold on the AQ1300/AQ1301 in advance. If the value exceeds the threshold, a fail judgment occurs.

## Frame Loss Rate Measurement

In the frame loss rate measurement, frame signals are transmitted to the network device at a traffic rate that exceeds the frame signal transfer capability of the network device, and the frame loss rate is measured for each frame length.

In this measurement, the frame loss rate is measured while the rate is continually stepped down from the initial rate that the measurement started at until losses are no longer detected.

The series of operations from the start of measurement to the finding of the rate at which losses are no longer detected is a single measurement (a trial).



The frame loss rate is computed using the following equation.

$$\text{Frame loss rate (\%)} = \frac{\text{Number of input frames} - \text{number of output frames}}{\text{Number of input frames}} \times 100$$

### Test Duration

This is the time that frame signals are transmitted for during a frame loss rate measurement at a single rate.

### Number of Trials

The number of times that the AQ1300/AQ1301 will perform the series of operations from the start of measurement to the point where the rate at which losses are no longer detected is found. In one trial, frame signals of the preset frame lengths are used to perform the frame loss rate measurements. The frame loss rate is the average of the values from all the trials.

### Initial Rate

The traffic rate that is used when the frame loss rate measurement starts.

### Step Down

After the measurement starts, the AQ1300/AQ1301 continually detects for losses while it automatically decreases the traffic rate by the specified step. Measurement is stopped automatically when a rate is found at which losses are no longer detected.

### Pass/Fail Judgment

You can perform pass/fail judgments by setting the frame loss rate threshold (the rate's upper limit) on the AQ1300/AQ1301 in advance. If the value exceeds the threshold, a fail judgment occurs.

### Back to Back Measurement

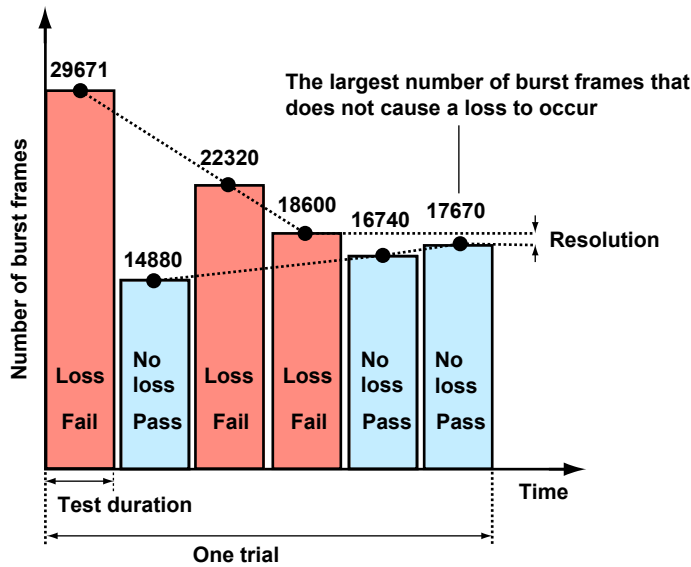
In the back to back measurement, the maximum burst size (number of consecutive frames) that a network device can transmit without losing frame signals is measured. In this measurement, a burst of frame signals (a group of consecutive frame signals) is transmitted over the specified measurement time (the test duration).

During the test duration, if a loss is detected, the number of burst frames is automatically decreased. The AQ1300/AQ1301 performs another measurement to detect whether a loss occurs with this new number of burst frames. If a loss is detected, the same operations are repeated.

During the test duration, if no losses are detected, the number of burst frames is automatically increased. The AQ1300/AQ1301 performs another measurement to detect whether a loss occurs with this new number of burst frames. If no losses are detected, the same operations are repeated.

These operations that increase and decrease the number of burst frames are repeated until the difference (the resolution) between the number of burst frames when a loss was detected and when no losses were detected reaches a value that is equal to or less than the specified value.

The series of operations from the start of measurement to the point where the number of burst frames converges to the specified value is a single measurement (a trial). The traffic rate is fixed to 100%.



#### Test Duration

This is the length of one measurement for detecting losses.

#### Number of Trials

The number of times that the AQ1300/AQ1301 will perform the series of operations from the start of measurement to the point where the number of burst frames converges to the specified value. In one trial, frame signals of the preset frame lengths are used to perform the loss detection measurements.

The number of burst frames is the average of the values from all the trials.

#### Resolution

This is the range that is used to converge the back to back measurement. When the difference between the number of burst frames when a loss was detected and when no losses were detected falls within the resolution range, the AQ1300/AQ1301 concludes the back to back measurement.

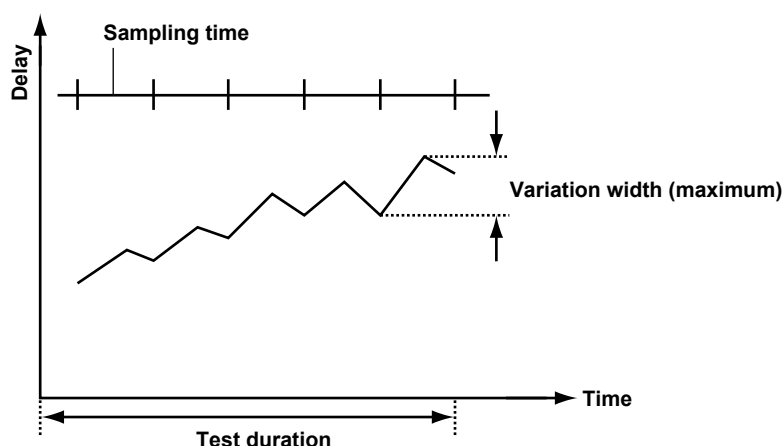
#### Pass/Fail Judgment

You can perform pass/fail judgments by setting the threshold on the number of burst frames (the lower limit on the number of frames) on the AQ1300/AQ1301 in advance. If the value falls below the threshold, a fail judgment occurs.

## Delay Variation (Packet Jitter) Measurement

In the delay variation measurement, the AQ1300/AQ1301 measures the delay variations when a network device transmits frame signals. In this measurement, a fixed number of frame signals are transmitted (at the test rate) over the specified measurement time (the test duration). The AQ1300/AQ1301 then measures the frame signal delay in units of the specified test window size.

The maximum variation width and minimum variation width of the delays are measured per sampling period. For each sampling period, the largest and smallest values are selected as the measured results for the sampling period and are displayed on a graph. Additionally, the statistically processed variation widths of each sampling period are displayed on the graph as percentile variations.



### Test Duration

This is the length of one measurement for measuring delay variations.

### Number of Trials

The number of times that delay variations are measured. For each trial, the delay variation measurement is performed for the time specified by the test duration. In one trial, frame signals of the preset frame lengths are used to perform the delay variation measurements.

The delay variation is the average of the values from all the trials.

### Test Rate

The traffic rate that the AQ1300/AQ1301 uses to measure the delay variation. You can change the test rate value. If you have already performed the throughput measurement, you can set the traffic rate to the measured throughput result.

### Test Window Size (Sampling Time)

The AQ1300/AQ1301 measures frame signal delay variations in units of the specified length of time.

### Resolution

This is the percentile variation value's measurement resolution. The variation value measurement ranges for all the resolutions are shown below.

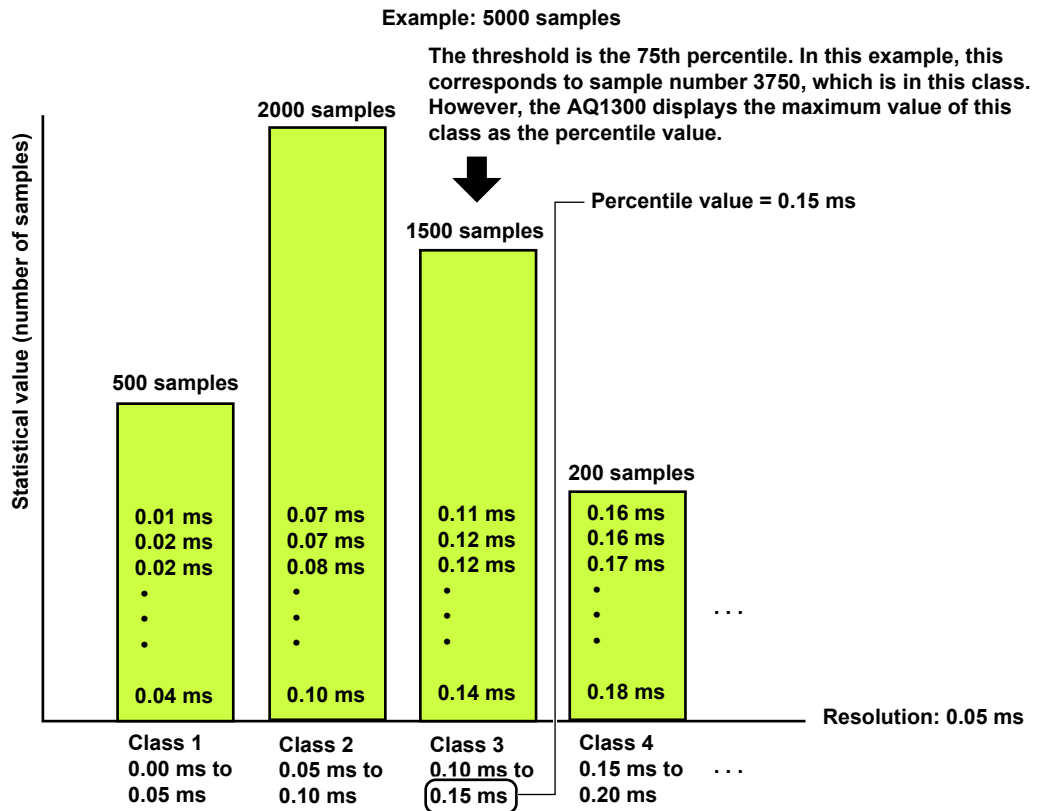
Resolution	Measurement Range
0.05 ms	0 ms to 3.00 ms
0.1 ms	0 ms to 6.00 ms
0.5 ms	0 ms to 30.00 ms
1.0 ms	0 ms to 60.00 ms
2.5 ms	0 ms to 150.00 ms
5.0 ms	0 ms to 300.00 ms

If you set Resolution to Auto, the AQ1300/AQ1301 statistically processes the frame signal delay that was sampled during the preliminary measurement, which was done before the start of the test, and automatically sets the resolution to the most appropriate value.

**Calculation Criterion for Result**

The AQ1300/AQ1301 uses this setting to select the variation value from the statistically processed values. During statistical processing, the value that you specified with the measurement resolution specifies the class interval, and the size of the statistically processed values is split into 60 classes. The AQ1300/AQ1301 sets the percentile value to the largest value that is within the class that contains the value that corresponds to the threshold value.

- Example of the 75th percentile: In a single period of the test duration, 5000 values (statistically processed values) were measured. Starting from the first measurement, the value that corresponds to 75% is measurement number 3750. Each class contains a certain number of statistically processed values, and the percentile value is set to the largest value within the class that contains measurement number 3750.



**Pass/Fail Judgment**

You can perform pass/fail judgments by setting the delay variation threshold (the variation value's upper limit) on the AQ1300/AQ1301 in advance. If the value exceeds the threshold, a fail judgment occurs.



## 1.17 VLAN Test

The VLAN Test is used to check the VLAN trunk configuration. You can compare the VLAN ID list that you plan to receive with the actual received VLAN ID list. Then, you can display the results or save them to a file.

### Transmission

The AQ1300/AQ1301 transmits VLAN ID frames according to the VLAN ID list set on the AQ1300 using up to 4096 VLAN IDs. A VLAN ID definition file can also be loaded into the VLAN ID list.

#### Transmittable Frame Formats

- When the test layer is L2:           MAC+TYPE(0x00)
- When the test layer is L3-IPv4:   MAC+TYPE+IPv4  
  MAC+TYPE+IPv4+UDP
- When the test layer is L3-IPv6:   MAC+TYPE+IPv6  
  MAC+TYPE+IPv6+UDP

### Reception and Analysis

The AQ1300/AQ1301 compares the list of the VLAN IDs that are planned to be received with the actual received VLAN IDs and displays the result. You can edit VLAN ID lists on the AQ1300/AQ1301 or load VLAN ID definition files into the VLAN ID list.

#### Display Format

Map or list

The comparison results are displayed in different colors: Rx ID success (green), Rx ID fail (yellow), and RX ID error (red).

### Saving Result Files

Received and analyzed result files can be saved in the AQ1300/AQ1301 in binary format (.mr extension). Saved result files can be uploaded to a Windows PC with the Setup Software.

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## 1.18 Telnet Remote Control

The AQ1300/AQ1301 can be controlled remotely as a Telnet server. This feature is supported in auto test or auto(remote) test modes. For details, see the Communication Interface User's Manual, IM AQ1300-17EN.

## 1.19 E-OAM Test

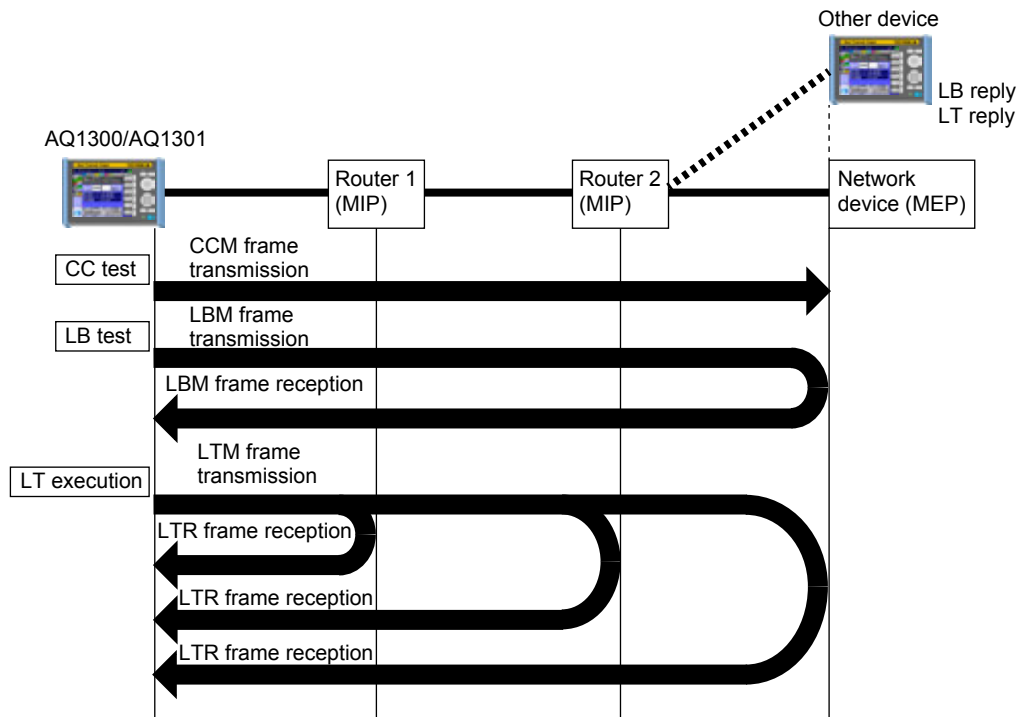
The AQ1300/AQ1301 is equipped with an Ethernet OAM (Ethernet operation, administration and maintenance; hereafter referred to as E-OAM) function that complies with the ITU-T Y.1731 Recommendation and IEEE802.1ag Standard. The following tests can be performed.

- CC (continuity check) test
- LB (loop back) test, multicast LB execution
- LT (link trace) execution

### Overview of the E-OAM Test

The E-OAM test checks the connection of network devices that are connected to a network segment configured with an E-OAM router. In this test, the AQ1300/AQ1301 sends E-OAM frames and checks whether response frames are returned from devices connected at the far end of the network (MEP; maintenance end point) or routers connected in the middle of the network (MIP; maintenance intermediate point).

Moreover, another AQ1300/AQ1301, functioning as an emulator, can be connected in place of the other network device (MEP) and return response frames to the AQ1300/AQ1301 on the transmitting end.

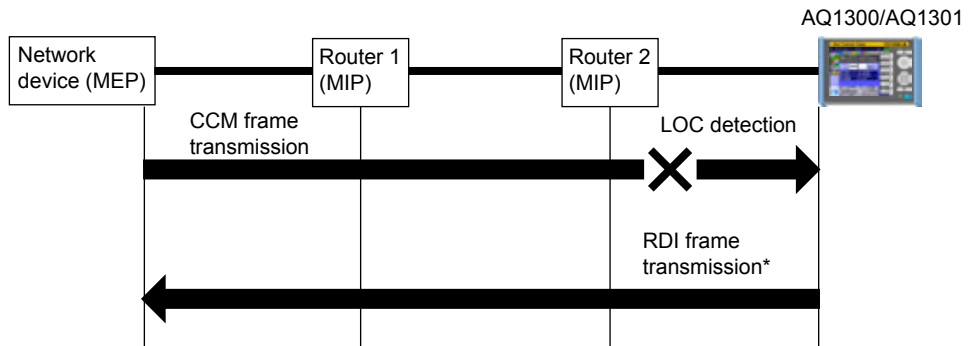


### CC test

CC (Continuity Check) is a test in which CCM frames (Continuity Check Message) are sent periodically to a device (MEP) at the far end of the network in order to check whether the route to the device is connected. You can set the transmission interval to 100 ms, 1 s, 10 s, or 60 s. When the route is disconnected (LOC: loss of continuity detection), an RDI (remote defect indication) frame is transmitted to the network device at the destination address.

**When LOC Is Detected**

When a loss of continuity is detected (CCM frame is not received), if the auto RDI transmission is enabled on the AQ1300/AQ1301, an RDI frame is sent to the network device at the destination address.



\* RDI frames refer to periodically sent CCM frames with the RDI bit set to on.

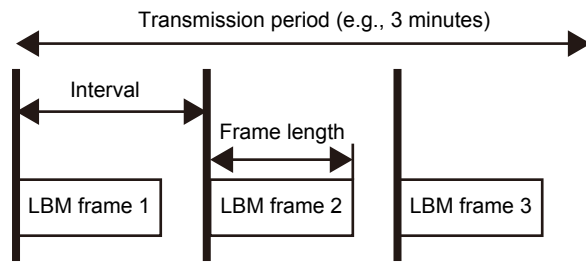
**LB Test**

LB (Loop Back) is a test in which LBM (loopback message) frames are sent to a device (MEP) at the far end of the network to check whether LBR (loopback reply) frames are returned from the device.

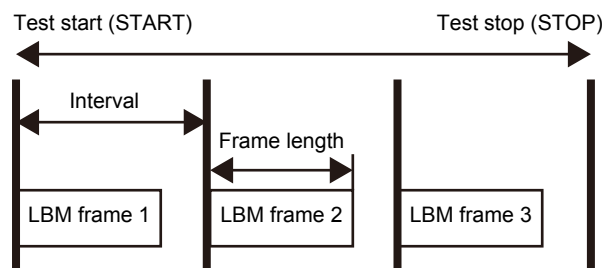
**LB Test Mode**

Set the length of the LB test.

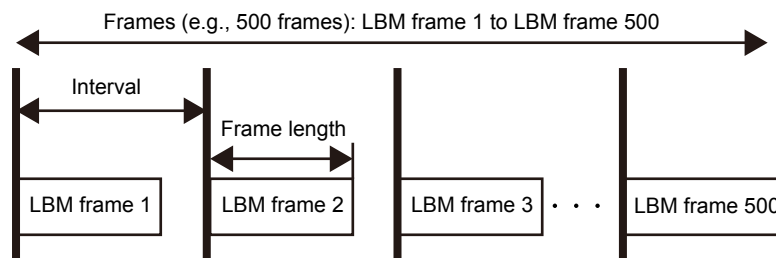
Tx mode: Time



Tx mode: Continue



Tx mode: Frames



### LB Reply

If LB reply is enabled in the AQ1300/AQ1301 emulation settings, when an LBM frame addressed to the AQ1300/AQ1301 is received, an LBR frame is sent to the network device at the destination address.

### LT Execution

LT (link trace) can be used to send LTM frames to a device (MEP) at the far end of the network and check whether LTR (link trace reply) frames are returned from all the routers in the middle receiving the LTM (link trace message) frames. The MAC addresses of routers and network devices that responded are listed in the AQ1300/AQ1301 measurement screen.

### Multicast LB Execution

Multicast LB (loop back) can be used to send multicast LBM frames to network devices connected to the same network segment and receive LBR frames from them. The MAC addresses of network devices that responded are listed in the AQ1300/AQ1301 measurement screen.

## 1.20 Y.1564 Test

Y.1564 is a ITU-T recommendation that defines the procedure for measuring the processing capability of Ethernet services.

It can be used to measure the communication traffic processing capability for a given network bandwidth setting and verify the effect of traffic congestion on the circuit.

The AQ1300/AQ1301 can perform the following measurements contained in ITU-T Y.1564:

- IR step test
- Burst size test
- Service performance test

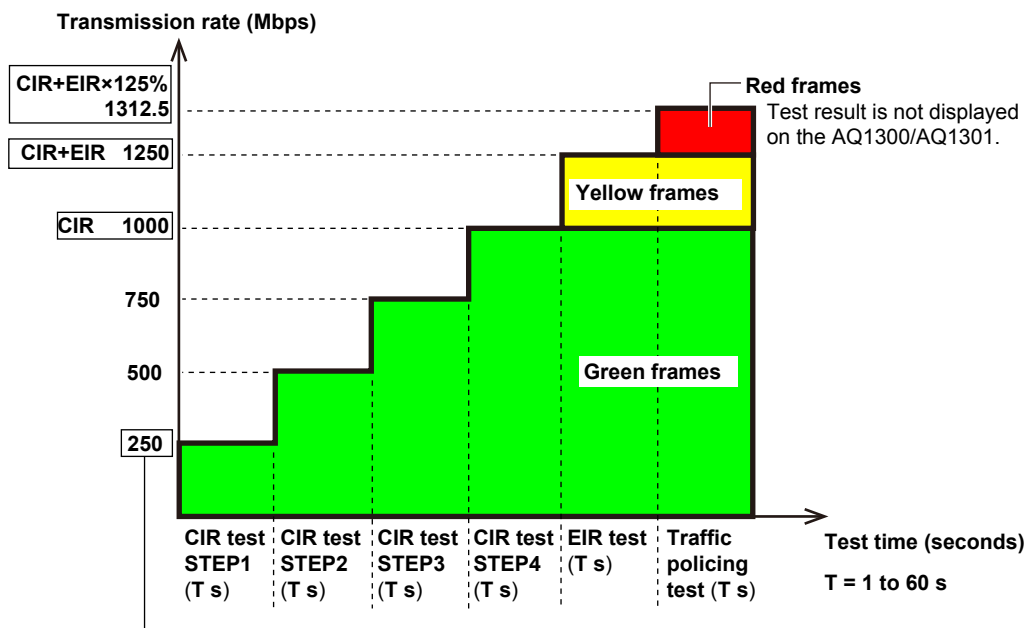
### IR Step Load Test (IR test)

In an IR step load test, frame signals are sent to network devices while increasing the traffic rate in steps to measure the following parameters:

- Information rate (IR)
- Frame loss (FL)
- Frame transfer delay (FTD)
- Frame delay variation (FDV)

In a single measurement, up to eight service circuits can be measured in order.

#### Example of IR step load (per service)



#### Minimum rate (CIR × %): 25%

The Tx rate when the minimum rate of CIR test is set to 25% is 250 Mbps, which is one-fourth the CIR Tx rate (1000 Mbps).

#### Service setting example (SLA)

Enter the CIR and EIR regions for each service (service numbers 1 to 8) on the AQ1300/AQ1301, and set the Tx rate.

CIR: 1000 Mbps

EIR: 250 Mbps

Green and yellow frames are sent when colors are assigned (CoS, ToS, DSCP).

Red frames are sent automatically during traffic policing tests. When colors are assigned, red frames correspond to the region where the EIR value of yellow frames sent at 125% the EIR rate is exceeded.

### CIR Test (STEP1 to STEPn)

Traffic within the committed information rate is sent for the specified time (T seconds), and the Tx rate is increased in steps (STEP1 to STEP n). Traffic parameters (IR, FL, FTD, FDV) are measured in each step.

You can set up to seven steps.

### EIR Test

Traffic at the summed rate of the committed information rate (CIR) and excess information rate (EIR) is sent for the specified time (T seconds).

When colors (green and yellow) are assigned to frames, green frames are sent at the CIR rate and yellow frames at the EIR rate. Traffic parameters (IR, FL, FTD, FDV) are measured for each frame (green, yellow, and total).

When colors are not assigned to frames (OFF), traffic parameters are measured for Total.

### Traffic policing Test

Traffic at the summed rate of the committed information rate (CIR) and 125% the excess information rate ( $EIR \times 125\%$ ) is sent for the specified time (T seconds).

When colors (green and yellow) are assigned to frames, green frames are sent at the CIR rate and yellow frames at 125% the EIR rate. Traffic parameters (IR, FL, FTD, FDV) are measured for each frame (green, yellow, and total).

When colors are not assigned to frames (OFF), traffic parameters are measured for Total.

Note that red frame assignment and measurement result display are not available. Red frames correspond to the portion of traffic that exceeds the EIR.

- **Margin (M)**

If necessary, you can set a margin on the upper limit of the excess information rate for policing tests.

Red frames correspond to the portion of traffic that exceeds this margin.

Example: For the Tx rate of "CIR+EIR 1250 Mbps" on the previous page, if the margin (M) is set to 10.000 Mbps, red frames correspond to the portion of traffic that exceeds 1260 Mbps.

## Burst Size Test (BS TEST)

In a burst size test, burst frame signals (consecutive frame signals) are periodically sent to a network device to measure the following parameters.

The AQ1300/AQ1301 automatically calculates the burst transmission period from the specified burst size (CBS, EBS) and frame length.

- Frame loss (FL)
- Frame transfer delay (FTD)
- Frame delay variation (FDV)

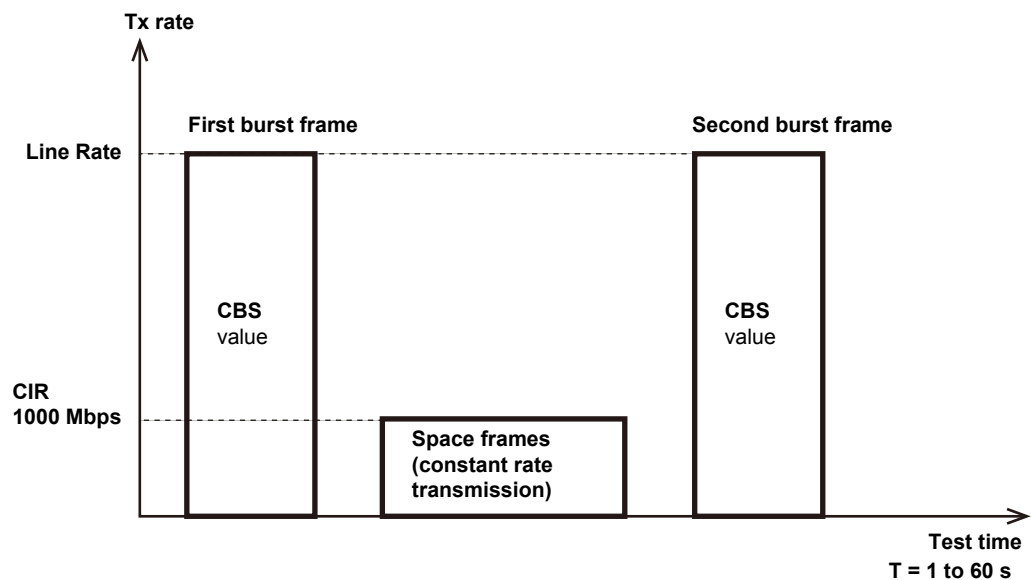
In a single measurement, up to eight service circuits can be measured in order.

### CBS Test (Committed Burst Size)

Burst frame signals corresponding to the specified CBS value are sent. When transmission is complete, frame signal transmission is stopped for a given time. Then, traffic is resumed at the specified committed information rate (CIR). When the transmission at the CIR rate for a given time is complete, frame signal transmission is stopped for a given time.

This operation is repeated to measure the parameters (FL, FTD, FDV) of burst frame traffic for the specified time (T seconds).

Example of CBS test (per service)





**EBS Test (Excess Burst Size)**

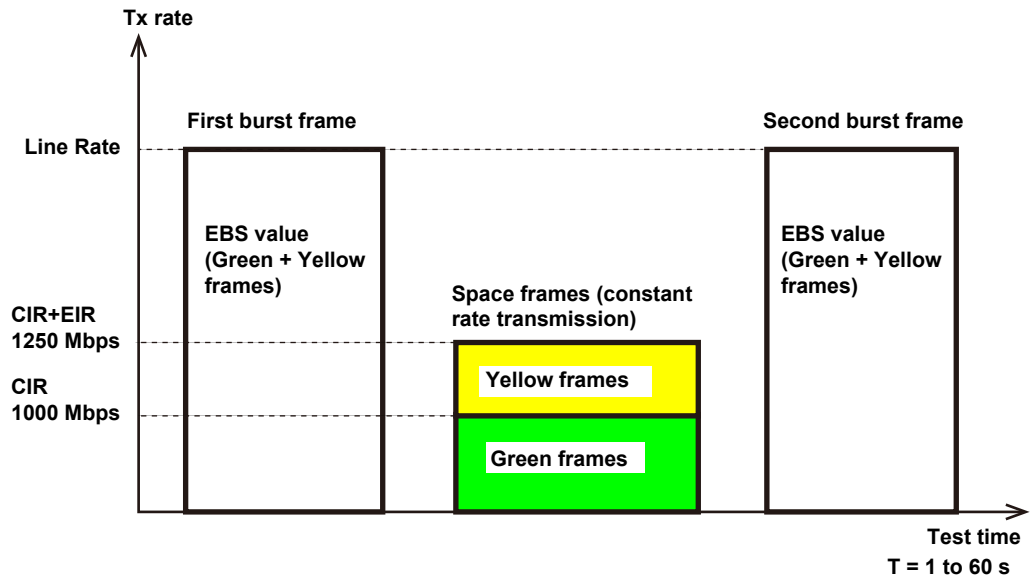
Burst frame signals corresponding to the specified EBS value are sent. When transmission is complete, frame signal transmission is stopped for a given time. Then, traffic is resumed at the summed rate of the committed information rate (CIR) and excess information rate (EIR).

When colors (green and yellow) are assigned to frames, green frames are sent at the CIR rate and yellow frames at the EIR rate.

When the transmission at the CIR+EIR rate for a given time is complete, frame signal transmission is stopped for a given time.

This operation is repeated to measure the parameters (FL, FTD, FDV) of burst frame traffic for the specified time (T seconds).

Example of EBS test (per service)



### Service performance test

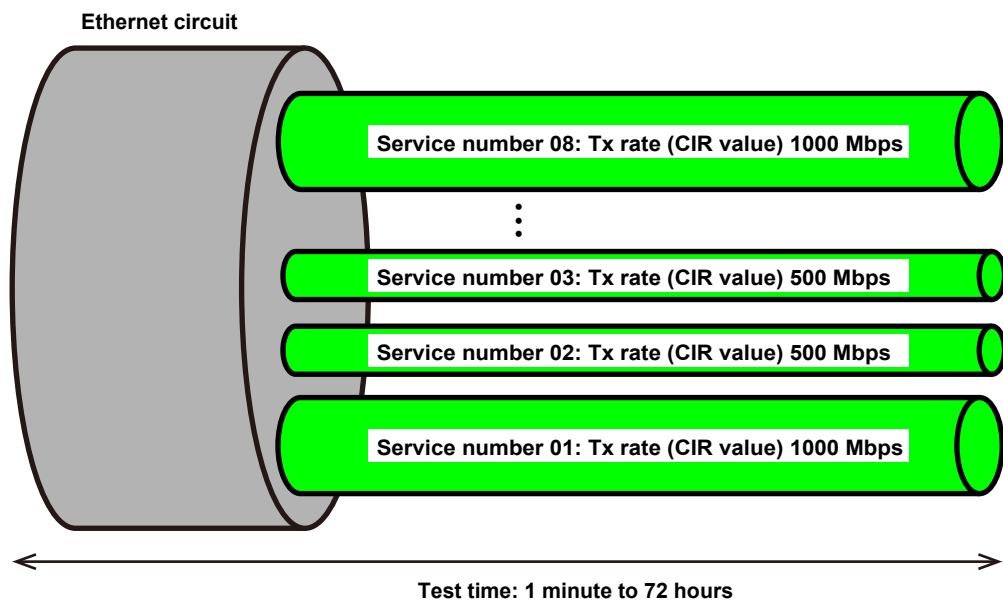
In a service performance test, frame signals at the committed information rate (CIR) for all service circuits (up to eight) are sent simultaneously to a network device to measure the following parameters:

- Information rate (IR)
- Frame loss (FL)
- Frame transfer delay (FTD)
- Frame delay variation (FDV)
- Availability (AVAIL)

Indicates the percentage of time (seconds) in which there are no critical errors when service circuits are in a usable state.

In a single measurement, up to eight service circuits can be measured simultaneously.

#### Example of service performance test



# 2.1 Measurement Screens (Common Items)

This section explains the common items in the measurement screens.

### Screen during Measurement

**Test information**      **Title bar**

2009/10/23 17:09:42      AC

**Measurement status**

**Summary**

**Test results**

**Error History**

LINK L2 L3  
1      0      over

Number of detected errors (0 to 999)

“over” is displayed when the number of detected errors exceeds 999.

**Link status**      **Remote control status**

### Screen after Measurement Has Finished (In Auto or Auto(Remote) mode without pass/fail judgment or in Manual mode)

2009/10/23 17:10:58      AC

**Test Results**

**Error History**

LINK L2 L3  
ERR ERRERR

### Screen after Measurement Has Finished (In Auto or Auto(Remote) mode with pass/fail judgment)

2009/10/23 17:13:56      AC

**Test Results**

**Pass/fail indication (Pass, Fail)**

**Pass**





**Error History**

LINK L2 L3  
ERR ERRERR

## Title Bar

### Simple Optical Power Monitor

When the interface is XFP or SFP, the AQ1300/AQ1301 can monitor the received optical power level and indicate it using three levels.

Indication	Colors	Description
	Black and black	When the RJ-45 interface is being used or when the XFP or SFP interface is being used and the interface module is not installed
	Red and black	When the level of received light is too low
	Green and green	When the level of received light is appropriate
	Red and red	When the level of received light is too high

If you are using optical modules that are not recommended on an AQ1300/AQ1301 whose firmware version is R1.05.01.001 or later, black and black is displayed.

### Current Time

The current time is displayed (YYYY/MM/DD hh:mm:ss).

### Selected Setup File

When Auto or Auto(Remote) has been selected in the Test menu, the comment or file name that has been specified by the setup file selection is displayed.

When Manual has been selected in the Test menu, the file name is displayed.



Displayed characters: Up to 30

### Note

When Auto(Remote) has been selected in the Test menu and the screen is sent from the master to the slave, "Send Screen Image" appears on the slave.





### Link Status Indication

The link status is indicated.

Indication	Color	Description
	Blue	Linkdown
	Green	Linkup



### Power Supply Status Indication

The power supply status is indicated.

Indication	Color	Description
	—	The AC adapter is being used.
	Green	The battery is sufficiently full.
	Yellow	The battery is about half full.
	Red	The battery is almost empty.

## Test Information

The test type, mode, and item execution status are indicated.

Information Type	Indication	Description
Test type	Auto	Auto mode
	Auto (RMT)	Auto(Remote) mode
	Manual	Manual mode
Test mode	Traffic	Traffic mode
	Loopback	Loopback mode
	QoS	QoS test mode
	PING	PING test mode
	BERT	BERT mode
Test item execution status		The test type is Auto or Auto(Remote), and Execution Type is set to Single.
		The test type is Auto or Auto(Remote), and Execution Type is set to Continue.
	1 to 8	The number of the test item that is currently being executed or is currently selected. The number blinks when the test item is being executed.

## Link Status Indications

The link status is indicated.

Category	Status Name	Status Indication	Description
L1	I/F type	XFP	The XFP interface is selected.
		SFP	The SFP interface is selected.
		RJ-45	The RJ-45 interface is selected.
	Module type	SR	The I/F type is XFP, and the module type is SR.
		LR	The I/F type is XFP, and the module type is LR.
		ER	The I/F type is XFP, and the module type is ER.
		SX	The I/F type is SFP(GbE), and the module type is SX.
		LX	The I/F type is SFP(GbE), and the module type is LX.
		FX	The I/F type is SFP(FE), and the module type is FX.
		—	The I/F type is RJ-45.
	Link	?	No module is installed, or the module that is installed is unsupported.
		LINK (gray)	Linkdown
	Connection speed	LINK (green)	Linkup
		LINK (yellow)	Auto negotiation configuration mismatch
		?	The connection speed has not been confirmed (because of a linkdown or some other reason).
	Duplex	10M	10 Mbps
		100M	100 Mbps
		1G	1 Gbps
		10G	10 Gbps
	MDI/MDI-X	?	The duplex has not been confirmed (because of a linkdown or some other reason).
		FULL	Full duplex
		HALF	Half duplex
	Flow control	—	An optical interface is selected.
		?	Whether the interface is MDI or MDI-X has not been confirmed (because of a linkdown or some other reason).
		MDI	MDI interface
		MDI-X	MDI-X interface
	Frame	PAUSE/COL (red)	A PAUSE frame is being received, or a collision that is currently taking place has been detected.
		PAUSE/COL (orange)	A PAUSE frame has been received, or a collision has been detected.
		PAUSE/COL (grey)	No PAUSE frames have been received, and no collisions have been detected.
	LFS	TX	TX (green)
TX (gray)			Frames are not being sent.
TX (red)			Frames are not being sent.
RX		RX (green)	Frames are being received.
		RX (gray)	Frames are not being received.
		RX (red)	Frames are not being received.
ERROR	L2 ERR (red)	An L2 error frame is being received.	
	L2 ERR (orange)	An L2 error frame has been received.	
	L2 ERR (gray)	No L2 error frames have been received.	
LFS	LF transmission	Tx-LF (red)	An LF signal is being sent.
		Tx-LF (gray)	No LF signals have been or are being sent
	RF transmission	Tx-RF (red)	An RF signal is being sent.
		Tx-RF (gray)	No RF signals have been or are being sent
	LF reception	Rx-LF (red)	An LF signal is being received.
		Rx-LF (orange)	An LF signal has been received.
		Rx-LF (red)	No LF signals have been received.
	RF reception	Rx-RF (red)	An RF signal is being received.
		Rx-RF (orange)	An RF signal has been received.
		Rx-RF (gray)	No RF signals have been received.

## 2.1 Measurement Screens (Common Items)

### Measurement Status Indications

The measurement status is indicated.

Status Name	Status Indication	Description
Tx time	The remaining Tx time/ number of frames	The remaining time is indicated in seconds. The remaining number of frames is indicated by a number from 0 to 99999999.
Statistic logging	STAT LOG (gray)	Statistic logging is stopped.
	STAT LOG (blue)	Statistic logging is in progress.
Optical output off control	LASER OFF (gray)	The laser is not off.
	LASER OFF (red)	The laser is off.
LFS control	LFS Control (gray)	LF and RF signals are not being sent.
	LFS Control (red)	LF and RF signals are being sent.

### Summary

A summary of the settings is displayed, or the addresses are displayed.








- Summary: A summary of representative settings is displayed. For details, see section 2.2.
- Address: The source and destination MAC and IP addresses are displayed.

For information about switching between the summary and the address display, see section 7.6.

### Remote Control Status Indications

The remote control status is indicated.

Except for the unconnected status, all the statuses are for when the test type is Auto(Remote).

Status Name	Status Indication	Description
Unconnected		• A test type other than Auto(Remote) is selected.
Disconnected -Master settings/results		• The test type is Auto(Remote). • The remote control status is "disconnected." • The settings and results for the master are displayed.
Disconnected -Slave settings/results		• The test type is Auto(Remote). • The remote control status is "disconnected." • The settings and results for the slave are displayed.
Connected No slave statistic errors -Master control		• The test type is Auto(Remote). • The remote control status is "connected." • The slave has no statistic errors. • The settings, results, and controls are all for the master's ports.
Connected Slave statistic errors -Master control		• The test type is Auto(Remote). • The remote control status is "connected." • The slave has statistic errors. • The settings, results, and controls are all for the master's ports.
Connected No slave statistic errors -Slave control		• The test type is Auto(Remote). • The remote control status is "connected." • The slave has no statistic errors. • The settings, results, and controls are all for the slave's ports.
Connected Slave statistic errors -Slave control		• The test type is Auto(Remote). • The remote control status is "connected." • The slave has statistic errors. • The settings, results, and controls are all for the slave's ports.

### Test Result Indications

#### Common Items

#### Pass/Fail Indication

This indication appears when the test type is Auto or Auto(Remote) and you have chosen to perform pass/fail judgment.

- Pass: The results meet the requirements.
- Fail: The results do not meet the requirements.

**Measurement Indication**

“Measuring” appears while measurement is being performed.

**Measurement Duration Indication**

The measurement duration is indicated in the following format: hh:mm:ss.

**Transmission and Reception Rates**

During measurement, the transmission and reception rates are indicated (as percentages).

**Normal Frames**

The number of normal frames that have been sent and received during the measurement period is indicated.

**Received Frame Length**

The average frame length of the frames that have been received during measurement is indicated.

**Error History**

During measurement, link errors, L2 errors (L2 frame errors), and L3 errors (payload errors, sequence errors, etc.) are detected and displayed.

Display Item	Indication	Description
LINK	LINK (gray)	No linkdowns have been detected during measurement.
	LINK (red)	If even one linkdown is detected during measurement, the indication becomes red and display the number of detected errors. “over” is displayed when the number of detected errors exceeds 999.
L2	L2 (gray)	During measurement, no frames have been received with any of the following errors. <ul style="list-style-type: none"> <li>• CRC errors</li> <li>• Undersize errors</li> <li>• Oversize errors</li> <li>• Symbol errors</li> <li>• Alignment errors</li> </ul>
	L2 (red)	During measurement, if even one frame is received with any of the following errors, the indication becomes red and display the number of detected errors. “over” is displayed when the number of detected errors exceeds 999. <ul style="list-style-type: none"> <li>• CRC errors</li> <li>• Undersize errors</li> <li>• Oversize errors</li> <li>• Symbol errors</li> <li>• Alignment errors</li> </ul>
L3	L3 (gray)	During measurement, no frames have been received with any of the following errors. <ul style="list-style-type: none"> <li>• Bit errors</li> <li>• Sequence errors</li> <li>• Payload errors</li> </ul>
	L3 (red)	During measurement, if even one frame is received with any of the following errors, the indication becomes red and display the number of detected errors. “over” is displayed when the number of detected errors exceeds 999. <ul style="list-style-type: none"> <li>• Bit errors</li> <li>• Sequence errors</li> <li>• Payload errors</li> </ul>

The number of detected errors is cleared when:

- Measurement is started
- Setup data is loaded
- You log in to the AQ1300/AQ1301

**Test-Mode-Specific Items**

Different measurement items are displayed for different test modes. For details, see section 2.2.

## 2.2 Measurement Screens (Test-mode-specific items)

This section explains the test-mode-specific items in the measurement screens.

### Traffic Test

**Summary**  
(Tx rate; Tx time, frames, or elapsed time; frame length, fill pattern)

**Test-mode-specific indications**  
(Rx rate, packet latency)

Tx Rate(%)	100.00000	Frame Len.(byte)	64
Tx Time(s)	60	Fill Pattern	Random
[Rx] Peak Rate(%)	99.77782		
[Latency] Max Latency(us)	4,349.2		
[Tx] Rate(%)	0.12068	[Rx] Rate(%)	99.82911
Normal Frame:			
Tx:	2,007		
Rx:	43,108		
Rx Frame Length(byte)	---		

### Loopback Test

**Summary (loopback target)**

**Test-mode-specific indications (none)**

[Tx] Rate(%)	0.25990	[Rx] Rate(%)	99.87450
Normal Frame:			
Tx:	28,685		
Rx:	39,775		
Rx Frame Length(byte)	---		

### QoS Test

**Summary (Tx rate for each channel)**

**Test-mode-specific indications**  
(Rx rate for each channel)

CH1(%)	25.00000	CH2(%)	10.00000	CH3(%)	5.00000
CH4(%)	30.00000	CH5(%)	---	CH6(%)	---
CH7(%)	---	CH8(%)	---		
Rx QoS channel	Maximum				
CH1 Rate(%)	99.96096				
CH2 Rate(%)	99.81826				
CH3 Rate(%)	99.97057				
CH4 Rate(%)	99.75878				
CH5 Rate(%)	---				
CH6 Rate(%)	---				
CH7 Rate(%)	---				
CH8 Rate(%)	---				
[Tx] Rate(%)	0.06227	[Rx] Rate(%)	99.81543		
Normal Frame:					
Tx:	8,624				
Rx:	37,222				
Rx Frame Length(byte)	---				



**PING Test**

Seq.No.	Round Trip Time(ms)	Length	TTL
20	<1	62	44
19	<1	69	67
18	<1	74	49
17	<1	63	55
Latest	<1	92	63

Additional data shown: [Tx] Rate(%) 0.26927, [Rx] Rate(%) 99.87973, Normal Frame Tx: 7,901, Rx: 49,939, Error History: LINK L2 L3 ERR ERRERR.

**Summary**  
(destination IP address, Tx interval, number of frames)

**Test-mode-specific indications**  
(loss count, sequence number, round trip time, packet length, TTL)

**BERT**

Test Results: [BERT] Bit Error Rate: 1,252.9 E-12, [BERT] Bit Error Count: 17,437, [BERT] BERT Target Byte: 20,416.

Additional data shown: [Tx] Rate(%) 0.28433, [Rx] Rate(%) 99.82327, Normal Frame Tx: 22,646, Rx: 36,832, Error History: LINK L2 L3 ERR ERRERR.

**Summary**  
(Tx rate; Tx time, frames, or elapsed time; frame length)

**Test-mode-specific indications**  
(bit error rate, bit error, BERT target byte)

## 2.2 Measurement Screens (Test-mode-specific items)

### Summary

A summary of the settings is displayed, or the addresses are displayed.

- Summary: Representative settings are displayed.

Test Mode	Displayed Items
Traffic Test	Tx rate; Tx time (when Tx Mode is set to Time), number of frames (when Tx Mode is set to Frames), or elapsed time (when Tx Mode is set to Continuous); frame length; fill pattern
Loopback Test	Loopback target
QoS Test	Tx rate for each channel
PING Test	Destination IP address, Tx interval, Tx time (when Tx Mode is set to Time), number of frames (when Tx Mode is set to Frames), or elapsed time (when Tx Mode is set to Continuous)
BERT	Tx rate; Tx time (when Tx Mode is set to Time), number of frames (when Tx Mode is set to Frames), or elapsed time (when Tx Mode is set to Continuous); frame length

- Address: The source and destination MAC and IP addresses are displayed.

For information about switching between the summary and the address display, see section 7.6.

### Test-Mode-Specific Indications

A summary of the test results is displayed.

Test Mode	Displayed Items
Traffic Test	Maximum Rx rate (% , fps, bps), maximum packet latency (us) Average Rx rate (% , fps, bps), average packet latency (us)
Loopback Test	None
QoS Test	Maximum Rx rates for each channel (% , fps, bps) Average Rx rates for each channel (% , fps, bps) Current Rx rates for each channel (% , fps, bps)
PING Test	Loss count, sequence number, round trip time, packet length, TTL
BERT	Bit error rate, bit error, BERT target byte

### Explanations of PING Test Mode Items

Indication	Description
Loss Count	Indicates the number of failed ping attempts
Seq. No.	Indicates the sequence number.
Round Trip Time(ms)	Indicates the round trip time in ms. <1: Indicates a value of less than 1 ms Value: The value in ms Timeout: Indicates a timeout
Length	Indicates the packet length.
TTL	Indicates the TTL.

# 3.1 Key, Rotary Knob, and Arrow Key Operations

This chapter explains key, rotary knob, and arrow key operations and the ways that they are explained throughout the rest of the manual.

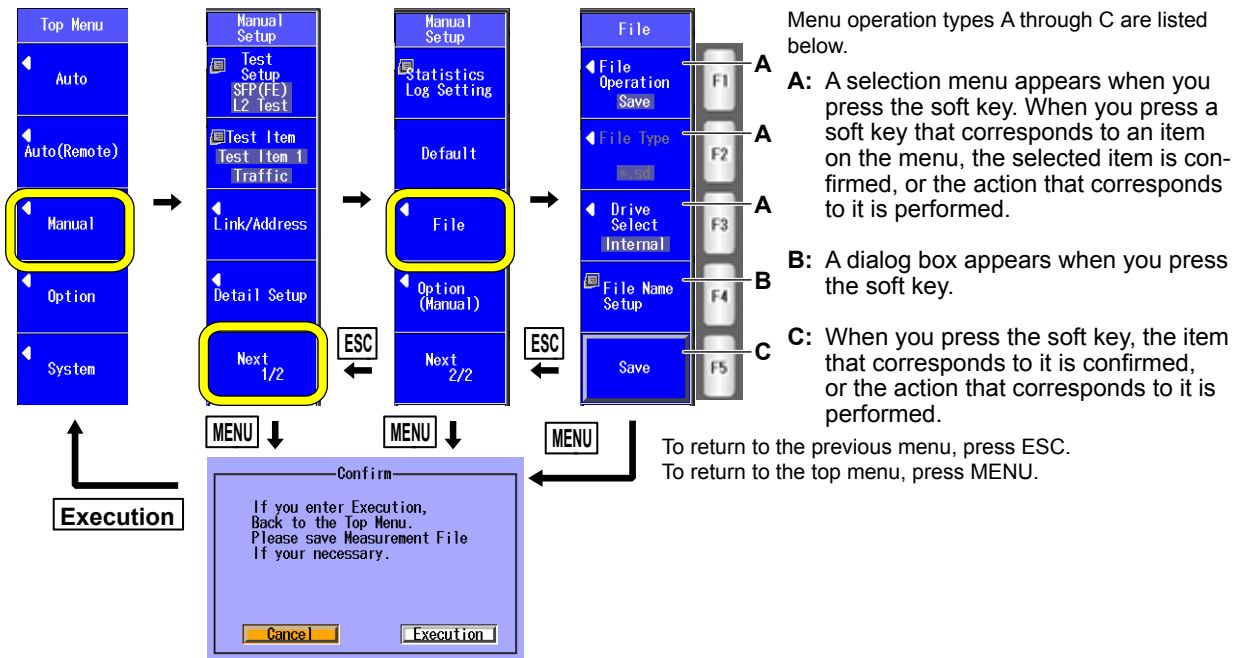
To make this manual easier to read, we have abbreviated or simplified explanations of the kinds of operations listed below.

- 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.

## Key Operations

The examples below explain the process for turning on the power, waiting for the top menu to appear, and then opening the File menu.

1. Press the **Manual** soft key (F3) to display the Manual Setup (1/2) menu.
2. Press the **Next 1/2** soft key (F5) to display the Manual Setup (2/2) menu.
3. Press the **File** soft key (F3) to display the File menu.



### Note

- If you press MENU to return to the top menu, the settings that you have configured up to that point are saved as the latest setup.
- If you changed the top menu display type, key operations are different. For details, see the explanation in section 13.6.
- If you have not changed the settings and have not performed any measurements, the confirmation message that appears when you press MENU will not appear.
- If you press ESC on the first page of a setup menu (Auto, Auto(Remote), Manual, Option, or System), the AQ1300/AQ1301 will operate in the same manner as when MENU is pressed.

### 3.1 Key, Rotary Knob, and Arrow Key Operations

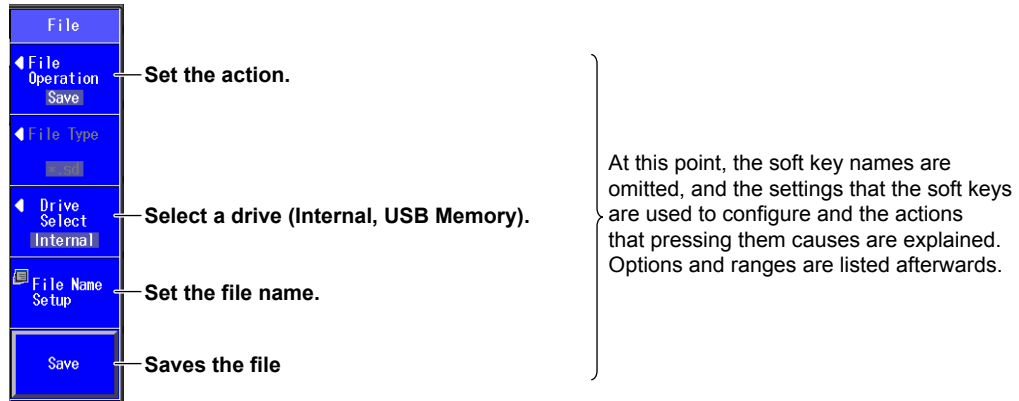
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#### About the Explanations in this Manual

In this manual, steps 1 through 3 listed previously and the setup operations in the menu that follows them are written as shown below.

#### Setup Operation Example

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



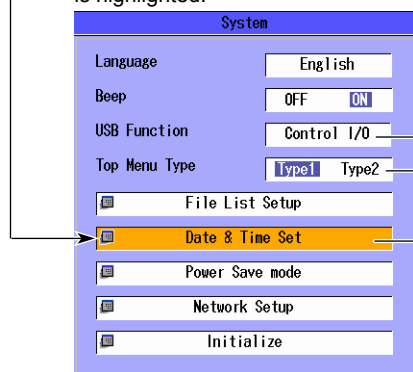
- Step numbers are used when there are many operations and when operations must be performed in different menus.
- The explanation for returning to the previous menu is omitted.

## Rotary Knob and Arrow Key Operations

This section explains how to operate a menu and the operations to perform when a setup dialog box appears. As an example, we will use the dialog box that appears when you press the **System** soft key and then the **System** softkey 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 manual, 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.



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



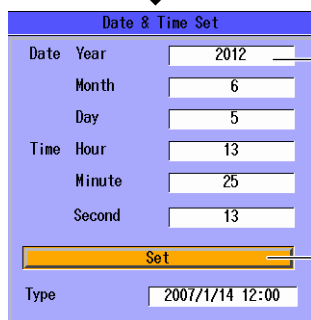
**F:** The selected setting switches each time you press **ENTER**.

**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



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



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

### 3.1 Key, Rotary Knob, and Arrow Key Operations

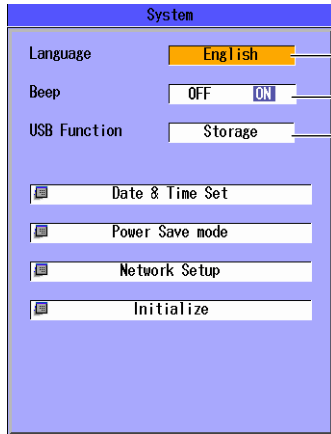
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#### About the Explanations in this Manual

In this manual, steps 1 through 4 listed previously and the setup operations in the menu that follows them are written as shown below.

#### Setup Operation Example

Press the **OPM** soft key and then the **Setup** 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.

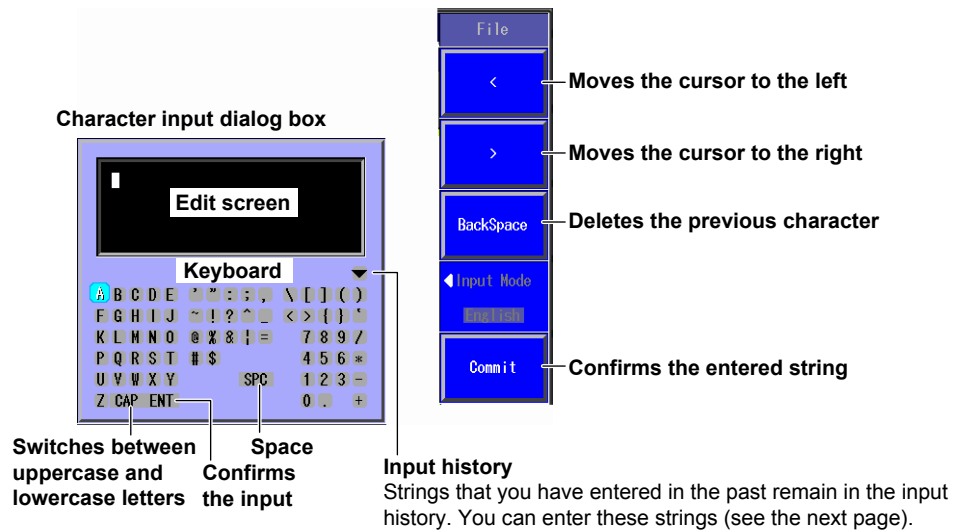
## 3.2 Entering Strings

After you have selected a setup item and pressed ENTER, a character input dialog box will appear if it is necessary. This section explains the operations that you can perform after the dialog box appears.

### Entering Strings

1. Using the **rotary knob** and **ENTER**, enter a string. The string that you entered appears in the edit screen.
2. Press the various soft keys to edit the string as necessary.
3. After you have finished entering and editing the string, press the **Commit** soft key to confirm the string that you entered and close the character input dialog box. The string is applied to the relevant item.

You can also confirm the string by moving the cursor to **ENT** on the displayed keyboard and then pressing **ENTER**.

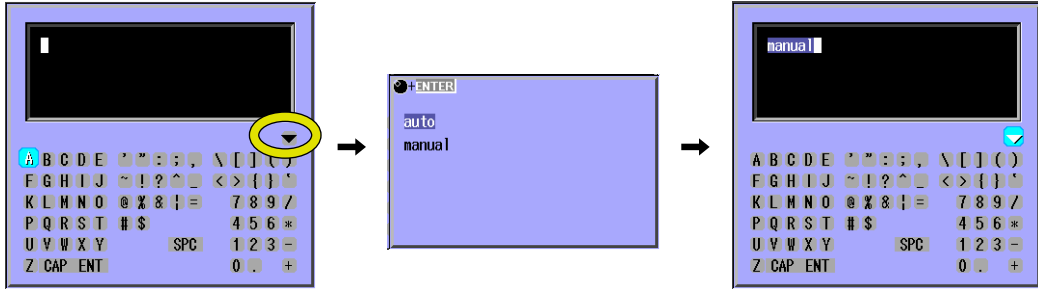


### Note

If there is a limit to the length of the string, you will not be able to enter characters after the limit is reached.

### Entering Strings from the History

1. Using the **rotary knob** and **ENTER**, select ▼ to display the input history screen.
2. Using the **rotary knob** and **ENTER**, choose the string that you want to enter. The string appears in the edit screen.



---

#### Note

Entered strings are saved to the input history when you confirm them. Up to 30 strings can be saved. Newer strings appear at the top of the input history.

---



# 4.1 Selecting a Setup File

## Procedure

### Select Setup File Screen

Press the **Auto** soft key to display the following screen.

The screenshot shows the 'Select Setup File' screen. The main area contains a list of files with their IDs and names, and a 'Select' button for each. The right-hand side has a menu with several options: 'Select Setup File', 'Latest Setup', 'Default', 'File', 'Switch', 'Comment', and 'Next Page'. A small device icon is at the bottom right.

- Registered setup files**  
A comment or file name appears next to each number.
- Latest setup**
- Default setup**
- Load a file.**  
Load a 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 to 4/4)**

**Setup file list**

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

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

**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

Press the **File** soft key to display the following screen.

The screenshot shows the 'File List' screen. The top part shows 'Path = USB Memory' and 'Num Of Files : 5'. Below is a table with columns for File Name, Size, and Date. The right-hand side has a menu with options: 'File', 'File Operation', 'File Type', 'Drive Select', and 'Load'. A small device icon is at the bottom right.

- Set Action to Load.**
- Select a drive (Internal, USB Memory).**
- Loads the selected file**

**File list**

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

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

## 4.1 Selecting a Setup File

### Auto Setup Screen

The following screen appears when you select a setup file.

The screenshot shows the 'Auto Setup' screen with the following configuration options:

- Test Setup**
  - Test Interface: XFP(10GbE)
  - Address Setting
    - Source MAC: 00 00 00 00 00 01
    - Destination MAC: 00 00 00 00 00 02
    - Source IPv4: 192 168 0 1
    - Destination IPv4: 192 168 0 2
- Traffic Setup**
  - Tx Rate: 100.00000 %
  - Tx Mode: Time 1 min
  - Frame Length(Actual): 64 ( 64 ) byte
  - Fill Pattern: Random

The right-hand navigation menu includes the following items:

- Auto Setup
- Test Setup (Set up the test. ▶ section 4.2)
- L3-IPv4 Test
- Select Test Item (Configure the test items. ▶ section 4.4)
- Test Item 1
- Link/Address (Configure link and address settings. ▶ section 4.3)
- Select Setup File (Select a setup file. ▶ section 4.1)
- Next 1/2 (To Auto Setup page 2/2)

The bottom navigation menu includes the following items:

- Auto Setup
- Master <-> Slave
- Remote Control
- Pass/Fail (Displays pass/fail judgment conditions ▶ section 4.10)
- Test Item 1
- Option (Auto) (Configure the options (Auto). ▶ section 4.11)
- Next 2/2 (To Auto Setup page 1/2)

**Explanation****Latest Setup**

Select this item to use the setup that was displayed previously.

**Default Setup**

Select this item to return to the default setup.

In the default setup, the following test items are selected.

- 1 Traffic Test
- 2 Loopback Test
- 3 QoS Test
- 4 PING Test
- 5 BERT

**File**

Select this item to load a setup file (with an .sd extension) from the file list.

Select this item when you want to load a setup file that is not in the setup file list.

To create a setup file, you can use the setup software and send the file to the AQ1300/AQ1301, or you can save the settings on the AQ1300/AQ1301.

**Setup File Selection**

To select a registered setup file, use the setup file list.

You can register up to 48 setup files to the setup file list (4 pages with 12 files per page).

A comment or file name is displayed for each of the registered setup files in the setup file list.

The setup file list is updated when you open the Select Setup File screen after you have created a display management file and setup files with the setup software and sent the files to the AQ1300/AQ1301.

For details, see the *Setup Software User's Manual*, IM AQ1300-61EN.

**Note**

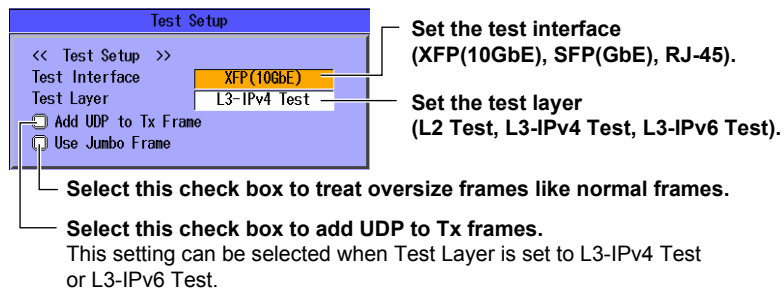
- The AQ1300/AQ1301 can only display the setup file list if the display management file that you created using the setup software (disManage.dmf) and the setup (.sd) files that it refers to are saved to the /setup directory in the AQ1300/AQ1301.  
Example:    /setup/disManage.dmf  
              /setup0000.sd  
              /setup0001.sd  
              :  
              :
- When you are performing automatic testing, you can only select setup files that are used for automatic testing.

## 4.2 Setting Up a Test

### Procedure

#### Test Setup Screen

Follow the procedure in section 4.1 to display the Auto Setup screen. Press the **Test Setup** soft key to display the following screen.



### Explanation

#### Test Interface

Specify which test interface to use.

- XFP (10GbE): Select this option to use the 10GBASE-R measurement port.
- SFP (GbE): Select this option to use the 1000BASE-X measurement port.
- SFP (FE): Select this option to use the 100BASE-FX measurement port. This interface is supported by firmware version R1.05.01.001 or later.
- RJ-45: Select this option to use the 10BASE-T/100BASE-TX/1000BASE-T measurement port.

#### Test Layer

Set the layer to test.

- L2 Test: Select this option to test layer 2.
- L3-IPv4 Test: Select this option to test layer 3 according to the IPv4 protocol.
- L3-IPv6 Test: Select this option to test layer 3 according to the IPv6 protocol.

#### Add UDP to Tx Frame

Select whether or not to add UDP to Tx frames. You can configure this setting when the test layer is L3-IPv4 or L3-IPv6.

#### Use Jumbo Frame

Select whether or not to treat oversize frames like normal frames.

- Selected: Frames with lengths of 64 to 9999 bytes are treated as normal frames.
- Cleared: Frames whose size is above 1518 + the value set for "VLAN stacks" in the source settings × 4 are considered oversized.

## 4.3 Configuring Link and Address Settings

### Procedure

#### Link Setting Screen

Follow the procedure in section 4.1 to display the Auto Setup screen.

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).

Detect a mismatch of Auto-nego settings(at link-up)

Select this check box to automatically detect mismatches in the auto negotiation during link establishment.

#### Link Setting Acquisition

**Executes link setting information acquisition**  
Acquires the link setting information of the other device connected to the AQ1300/AQ1301

**Applies link settings**  
Applies the acquired other device's link settings to the AQ1300/AQ1301. You can execute this when the measurement interface is RJ-45 or SFP(GbE) and the acquisition status is Finish.

**Status (Preparing, Finish, Fail)**

**Cable type (Straight, Cross)**  
This setting is valid when Test Interface is set to RJ-45.

**Returns to the link setting screen**

**Result of link setting information acquisition**

- **Negotiation (Auto, Manual)**
- **Speed (1G, 100M, 10M)**  
Appears when Test Interface is set to RJ-45
- **Duplex (Full, Half, --- (when negotiation is set to manual))**  
Appears when Test Interface is set to RJ-45
- **MDI (MDI, MDI-X)**  
Appears when Test Interface is set to RJ-45

**UTP Cable Status**  
Indicates the UTP cable status as follows.  
(Normal, The cable may be defective, It is two-pair cable)

### 4.3 Configuring Link and Address Settings

#### Source Address Screen

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

**Source Address**

Source MAC: 00 00 00 00 00 01

VLAN stacks: 1

VLAN2: TP ID 88A8, CoS 0, ID 1001

VLAN1: TP ID 8100, CoS 0, ID 1000

Source IPv4: Manual

Address: 192 168 0 1

Subnet Mask: 255 255 255 0 /24

Gateway: 192 168 0 254

**Callouts:**

- Link Setting: Set the source MAC address.
- Refer: Refer to the MAC Address table.
- Source Address: Set the VLAN stack number (None, 1, 2). These settings are valid when VLAN stacks is set to 1 or 2.
- Destination Address: Refer to the VLAN table.
- Refer: Set IPv4 (Manual, DHCP). This setting appears when Test Layer is set to L3-IPv4.
- Refer: Refer to the IP Address table.
- Refer: Refer to the gateway reference.
- Refer: Set the source IPv4 address. Set the subnet mask (1-31). Set the gateway. These settings are valid when IPv4 is set to Manual.

Source IPv6: Manual

Address: FE80 0000 0000 0000

IPv6 Router:  Set Router Address manually

Prefix Length: 64

Address: FE80 0000 0000 0000

**Callouts:**

- Refer: Set IPv6 (Manual, Stateless Address). This setting appears when Test Layer is set to L3-IPv6.
- Refer: Set the source IPv6 address. This setting is valid when IPv6 is set to Manual.
- Refer: Refer to the IP Address table.
- Refer: Select this check box when you want to manually set the router address.
- Refer: View and set the IPv6 prefix length and the IPv6 router address.

#### MAC Address Table

Press **Refer** next to the MAC address to display the following screen.

MACアドレステーブル

送信元アドレス	1	00-00-00-00-00-01	選択
送信元MAC	2	00-00-00-00-00-02	選択
	3	00-00-00-00-00-03	選択
VLAN段数	4	00-00-00-00-00-04	選択
VLAN1	5	00-00-00-00-01-01	選択
VLAN2	6	00-00-00-00-02-02	選択
	7	00-00-00-00-03-03	選択
送信元IPv4	8	00-00-00-00-04-04	選択
アドレス	9	NoEntry	
ネットマスク	10	NoEntry	
ゲートウェイ	11	NoEntry	
	12	NoEntry	
	13	NoEntry	
	14	NoEntry	
	15	NoEntry	
	16	NoEntry	

**Callouts:**

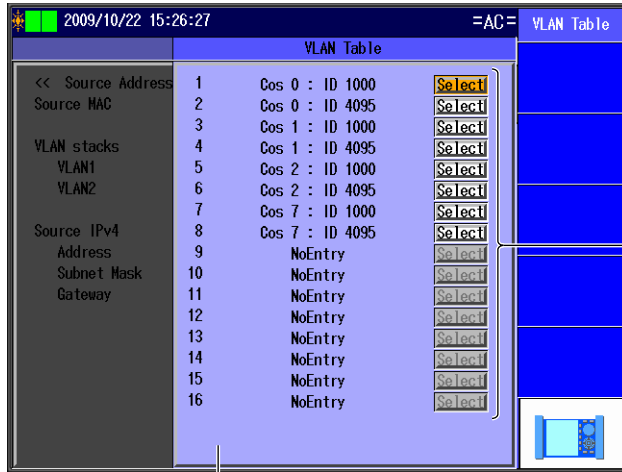
- グローバルアドレス: Select a global MAC address.
- 自動(ARP): Select the source MAC address from the MAC Address table.

#### MAC Address Table

Use the setup software to create this table.

**VLAN Table**

Press **Refer** next to a VLAN address to display the following screen.



Select the VLAN CoS and ID from the VLAN table.

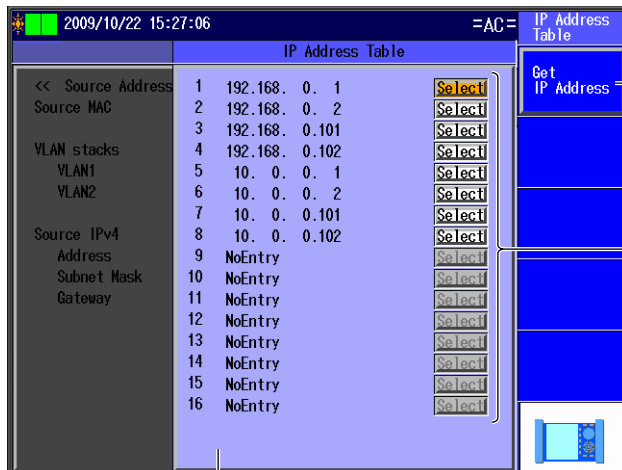
**VLAN table**

Use the setup software to create this table.

**IP Address Table**

Press **Refer** next to an IP address to display the following screen.

**IPv4**



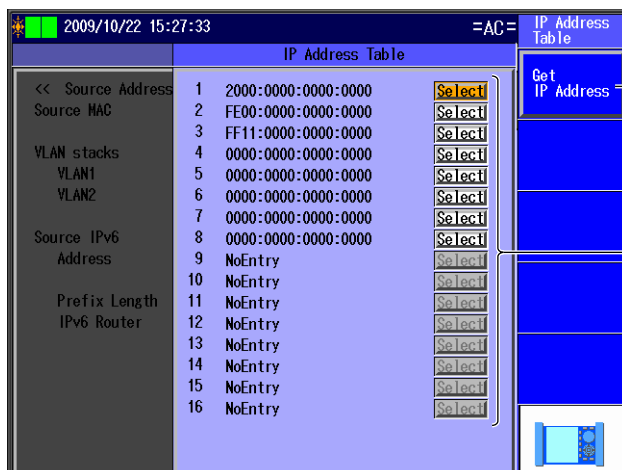
Press this soft key to automatically acquire an IP address. When you press this soft key, the AQ1300/AQ1301 acquires an IPv4 address through DHCP.

Select the source IPv4 address from the IP Address table.

**IP Address table**

Use the setup software to create this table.

**IPv6**



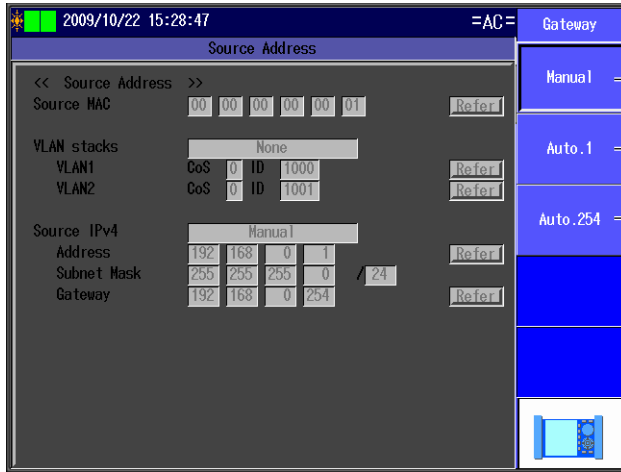
Press this soft key to automatically acquire an IP address. When you press this soft key, the AQ1300/AQ1301 acquires an IPv6 address through stateless autoconfiguration.

Select the source IPv6 address from the IP Address table.

### 4.3 Configuring Link and Address Settings

#### Gateway

Press **Refer** next to the gateway address to display the following screen.



Select to set the gateway manually.

Select to automatically set the gateway to xxx.xxx.xxx.1.

Select to automatically set the gateway to xxx.xxx.xxx.254.



## Destination Address Screen

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

The screenshot shows the 'Destination Address' screen with the following fields and soft keys:

- Destination MAC:** 00 00 00 00 00 02. Callout: Set the destination MAC address. Refer to the MAC Address table.
- Destination IPv4:** 192 168 0 2. Callout: Set the destination IPv4 address. This setting appears when Test Layer is set to L3-IPv4. Refer to the IP Address table.
- Destination IPv6:** FE80 0000 0000 0000 0000 0000 0000 0002. Callout: Set the destination IPv6 address. This setting appears when Test Layer is set to L3-IPv6. Refer to the IP Address table.
- Soft Keys:** Link/Address, Link Setting, Source address, Destination Address, Search List.

## Search List

Press the **Search List** soft key to display the following screen.

The screenshot shows the 'Search List' screen with a table of devices:

Host Name	SerialNo	Version
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		

Soft keys on the right: Search other device, Switch, SerialNo+Ver, Next Page.

↓ Search for other devices

The screenshot shows the 'Search List' screen after a search, displaying the following table:

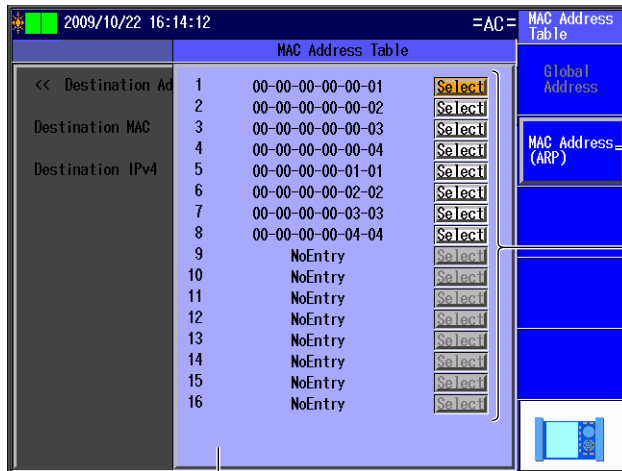
Host Name	SerialNo	Version
1	mitaka	SN0000001 6.0.134.10
2	yokohama	SN0000002 5.1.133.11
3	fukuoka	SN0000003 4.2.132.12
4	sapporo	SN0000004 3.3.131.13
5	kofu	SN0000005 2.4.130.14
6	kanazawa	SN0000006 1.5.129.15
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		

Soft keys on the right: Search other device, Switch, SerialNo+Ver, Addr Type (MAC Address), Next Page.

### 4.3 Configuring Link and Address Settings

#### MAC Address Table

Press **Refer** next to the MAC address to display the following screen.



Press this soft key to automatically acquire the destination MAC address. When the test layer is L3-IPv4, MAC Address (ARP) appears. When the test layer is L3-IPv6, MAC Address (NDP) appears.

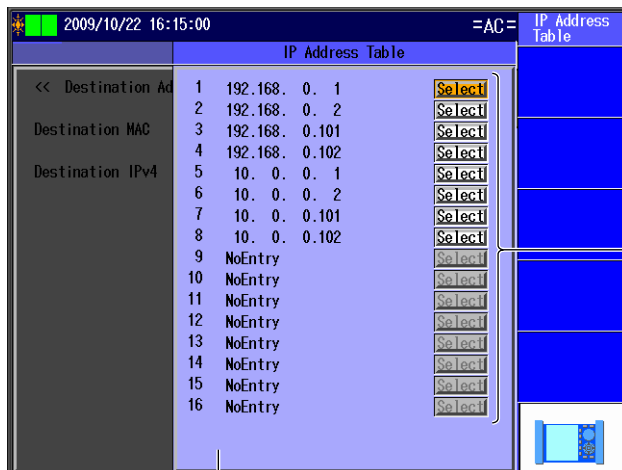
Select the destination MAC address from the MAC Address table.

**MAC Address table**  
Use the setup software to create this table.

#### IP Address Table

Press **Refer** next to an IP address to display the following screen.

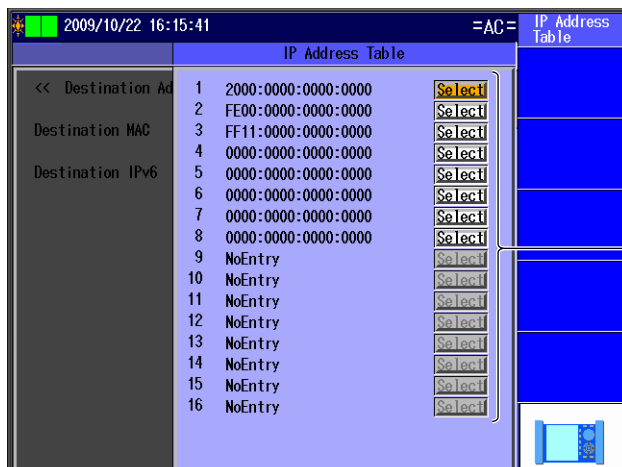
##### IPv4



Select the destination IPv4 address from the IP Address table.

**IP Address table**  
Use the setup software to create this table.

##### IPv6



Select the destination IPv6 address from the IP Address table.

**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)**

The screenshot shows the 'Traffic Setup' window with the following details:

- Test Interface: XFP(10GbE)
- Address Setting:
 

Source MAC	00	00	00	00	00	01
Destination MAC	00	00	00	00	00	02
Source IPv4	192	168	0	1		
Destination IPv4	192	168	0	2		
- Tx Rate: 100.00000 %
- Tx Mode: Time 1 min
- Frame Length(Actual): 64 ( 64 ) byte
- Fill Pattern: Random

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

**Explanation****Link Setting Screen****Negotiation**

Select whether or not to use auto negotiation. This setting is valid when Test Interface is set to RJ-45 or SFP(GbE).

- Auto: The link between the AQ1300/AQ1301 and the device that it is connected to is configured automatically through auto negotiation.
- Manual: The link must be configured manually.

**Speed**

When Test Interface is set to RJ-45, you can set the link speed.

- 1G: A 1 Gbit/s 1000BASE-T connection is used.
- 100M: A 100 Mbit/s 100BASE-TX connection is used.
- 10M: A 10 Mbit/s 10BASE-T connection is used.
- Auto: The link speed is set automatically. This setting is valid when Negotiation is set to Auto.

**Note**

When Test Interface is set to XFP(10GbE), the link speed is fixed at 10G. When Test Interface is set to SFP(GbE), the link speed is fixed at 1G. When Test Interface is set to SFP(FE), the link speed is fixed at 100M.

**Duplex**

You can set the communication mode for when Speed is set to 100M or 10M. This setting is valid when Test Interface is set to RJ-45.

- FULL: Full duplex communication
- HALF: Half duplex communication
- Auto: The AQ1300/AQ1301 chooses full or half duplex automatically. This setting is valid when Negotiation is set to Auto.

**Note**

When Test Interface is set to XFP(10GbE), or SFP(GbE), or SFP(FE), or when it is set to RJ-45 and Speed is set to 1G, the duplex mode is fixed at FULL.

### 4.3 Configuring Link and Address Settings

---

#### Flow Control

You can enable or disable flow control.

- ON: Flow control is enabled.
- OFF: Flow control is disabled.

#### MDI

You can set the measurement port to straight or crossover mode. This setting is valid when Test Interface is set to RJ-45.

- MDI: Straight
- MDI-X: Cross
- Auto: The AQ1300/AQ1301 switches between straight and crossover mode automatically (this setting is valid when Negotiation is set to Auto).

#### Link Setting Acquisition

If the interface is SFP(GbE) or RJ-45, you can acquire and display link setting information of the other device (DUT; the device on the user side) connected to the AQ1300/AQ1301.

- **Acquired Link Setting Information**

- Negotiation: Auto, Manual
- Speed: 1G, 100M, 10M
- Duplex: Full, half, --- (when negotiation is set to manual)
- MDI: MDI, MDI-X

The AQ1300/AQ1301 acquires the speed, duplex, and MDI when Test Interface is set to RJ-45.

- **Acquisition Status**

The acquisition status of the other device's link setting information is indicated as follows:  
Preparing, Finish, Fail

- **UTP Cable Type**

When the measurement interface is RJ-45, select which type of UTP cable you are using.  
Straight, Cross

- **UTP Cable Status**

Indicates the UTP cable status as follows.  
Normal, The cable may be defective. It is two-pair cable

- **Applying Link Settings**

You can apply the acquired other device's link settings to the AQ1300/AQ1301. You can do this when the measurement interface is RJ-45 or SFP(GbE) and the acquisition status is Finish.

- **Auto Detection of Auto Negotiation Configuration Mismatch**

If the "Detect a mismatch of Auto-nego settings" check box on the link setting screen is selected and the auto negotiation configuration between the AQ1300/AQ1301 and the other device is not matched, the background of "LINK" in the link status area of the measurement screen (see section 2.1) turns yellow.

Detection occurs at the following times.

- When a setup file is loaded (including when logged in)
- When link settings are changed
- When link changes from link-down to link-up

## Source Address Screen

### Source MAC Address

Set the source MAC address. You can refer to the MAC Address table to set the address.

### VLAN Stacks

Set the number of VLAN stacks.

- None: No VLAN stacks.
- 1: One VLAN stack.
- 2: Two VLAN stacks.

### VLAN1 and VLAN2

Set the CoS (Class of Service) and VLAN-ID for 1 or 2 VLAN stacks. You can refer to the VLAN table to set the values.

- CoS: 0 to 7
- ID: 0 to 4095
- TPID: 0 to FFFF (supported in firmware version (FW Ver.) R1.08.01.001 and later)

### IPv4

Select whether to specify the source IPv4 address manually or to acquire and set it automatically through DHCP. This setting is valid when Test Layer is set to L3-IPv4 Test.

- Manual: You must set the source IPv4 address manually.
- DHCP: When you press Get IP Address, the AQ1300/AQ1301 acquires and sets the source IPv4 address using DHCP.

### Source IPv4 Address, Subnet Mask, and Gateway

Set the source IPv4 address, subnet mask, and gateway when IPv4 is set to Manual. You can refer to the IP Address table and the gateway reference to configure the settings.

- Subnet Mask: 1 to 31

### IPv6

Select whether to specify the source IPv6 address manually or to specify it through stateless autoconfiguration using the RA from an IPv6 router. This setting is valid when Test Layer is set to L3-IPv6 Test.

- Manual: You must set the source IPv6 address manually.
- Stateless Address: When you press Get IP Address, the AQ1300/AQ1301 autoconfigures the source IPv6 address.

### Source IPv6 Address

Set the source IPv6 address when IPv6 is set to Manual. You can refer to the IP Address table to set the address.

### IPv6 Router Address

You can automatically acquire the router address or set it manually.

- Automatic: Clear the Set Router Address manually check box. The IPv6 prefix length and router address that have been acquired automatically are displayed.
- Manual: Select the Set Router Address manually check box. You can manually set the prefix length and router address.

### 4.3 Configuring Link and Address Settings

---

#### MAC Address Table

Select the source MAC address from the MAC Address table.

- Global Address: You can set the source MAC address to a global address.

#### VLAN Table

Select the VLAN CoS and ID from the VLAN table.

#### IP Address Table

Select the source IP address from the IP Address table.

- Get IP Address: Press this soft key to get the IP address. The AQ1300/AQ1301 will acquire an IP address, using DHCP when the test layer is L3-IPv4 or stateless autoconfiguration when the test layer is L3-IPv6.

#### Gateway

Set the gateway.

- Manual: Select this option to set the gateway manually.
- Auto.1: Select this option to set the gateway to xxx.xxx.xxx.1.
- Auto.254: Select this option to set the gateway to xxx.xxx.xxx.254.

## Destination Address Screen

#### Destination MAC Address

Set the destination MAC address. You can refer to the MAC Address table to set the address.

#### IPv4

Set the destination IPv4 address. This setting is valid when Test Layer is set to L3-IPv4 Test. You can refer to the IP Address table or select Search List to set the address.

#### IPv6

Set the destination IPv6 address. This setting is valid when Test Layer is set to L3-IPv6 Test. You can refer to the IP Address table or select Search List to set the address.

#### Search List

Select the address of the other device (the destination address) from the search list.

#### Searching for Other Devices

When you select Search other Device, the AQ1300/AQ1301 searches for other devices (AQ1300 or AQ1301) on the same VLAN or network segment and displays the results in the search list.

#### Switching the Display

You can switch between different search list displays.

- SerialNo+Ver: The equipment name, serial number, and version are displayed.
- Test Setup: The equipment name, test interface, and test layer are displayed.
- Status+MAC: The equipment name, status, and MAC address are displayed.
- IPv4/IPv6: The equipment name and IP address are displayed.
- Master Addr: The device name and master address (MAC or IP address) are displayed.

#### Note

---

You can check the equipment name and serial number of the AQ1300/AQ1301 in the system settings.

---

### Address Type

You can switch the address type that is displayed when Switch is set to Master Addr.

- MAC address
- IP address

### MAC Address Table

Select the destination MAC address from the MAC Address table.

- MAC Address (ARP): When the test layer is L3-IPv4, press this soft key to automatically acquire the destination MAC address.
- MAC Address (NDP): When the test layer is L3-IPv6, press this soft key to automatically acquire the destination MAC address.

### IP Address Table

Select the destination IP address from the IP Address table.

### Note

---

All the tables are created on the setup software. For details, see the *Setup Software User's Manual*.

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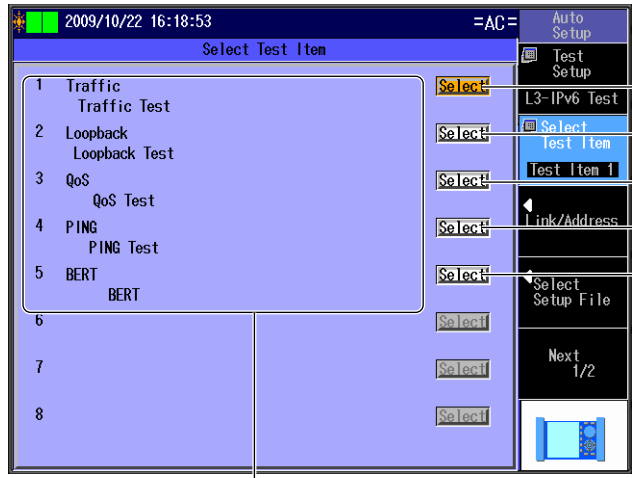
## 4.4 Configuring Test Items

### Procedure

#### Select Test Item Screen

Follow the procedure in section 4.1 to display the Auto Setup screen.  
Press the **Select Test Item** soft key to display the following screen.

#### Example with the Default Settings



The screenshot shows the "Select Test Item" screen with a list of test items and their corresponding setup sections:

- 1 Traffic Traffic Test → Traffic setup ► section 4.5
- 2 Loopback Loopback Test → Loopback setup ► section 4.6
- 3 QoS QoS Test → QoS setup ► section 4.7
- 4 PING PING Test → PING setup ► section 4.8
- 5 BERT BERT Test → BERT setup ► section 4.9

Other visible options include "L3-IPv6 Test", "Select Test Item", "Test Item 1", "Link/Address", "Select Setup File", and "Next 1/2".

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

### Explanation

Select the test item to execute.

You can register up to eight test items using the setup software. For details, see the *Setup Software User's Manual*.



# 4.5 Configuring a Traffic Test

## Procedure

### Traffic Setup Screen

Follow the procedure in section 4.4 to display the Traffic Setup screen.

The screenshot shows the Traffic Setup screen with the following configuration details:

- Test Interface:** XFP(10GbE)
- Address Setting:** Source MAC (00:00:00:00:00:01), Destination MAC (00:00:00:00:00:02), Source IPv6 (FE80:0000:0000:0000), Destination IPv6 (FE80:0000:0000:0000).
- Traffic Setup:** Tx Rate (100.00000 %), Tx Mode (Time), Frame Length(Actual) (64), Fill Pattern (Random).

Callouts from the right side of the image point to specific fields:

- Set the Tx rate (0.00001-100.00000%).** Points to the Tx Rate field.
- Set the Tx mode (Continuous, Frames, Time).** Points to the Tx Mode field.
- Set the (actual) frame length (For L2 and L3-IPv4: No VLAN stacks: 64 (64)-9999 (9999) bytes, 1 VLAN stack: 64 (68)-9999 (9999) bytes, 2 VLAN stacks: 64 (72)-9999 (9999) bytes. For L3-IPv6: No VLAN stacks: 74 (74)-9999 (9999) bytes, 1 VLAN stack: 74 (78)-9999 (9999) bytes, 2 VLAN stacks: 74 (82)-9999 (9999) bytes). If you do not select Use Jumbo Frame in the Test Setup and you specify an oversize frame length, the actual frame length will be displayed as "OVER."** Points to the Frame Length(Actual) field.
- Set the time (1-1440 minutes).** This setting appears when Tx Mode is set to Time. Points to the Tx Mode field.
- Refer to the Tx Rate table.** Points to the Tx Rate field.
- Refer to the Tx Time table.** Points to the Tx Mode field.
- Refer to the Frame Length table.** Points to the Frame Length(Actual) field.
- Set the fill pattern (ALL0, ALL1, 0/1 alt., Random).** Points to the Fill Pattern field.
- Set the number of frames (1-4294967295).** This setting appears when Tx Mode is set to Frames. Refer to the Frame Length table. Points to the Tx Mode field.
- Set the frame length (64-9999) (For L2 and L3-IPv4: No VLAN stacks: 64 (64)-9999 (9999) bytes, 1 VLAN stack: 64 (68)-9999 (9999) bytes, 2 VLAN stacks: 64 (72)-9999 (9999) bytes. For L3-IPv6: No VLAN stacks: 74 (74)-9999 (9999) bytes, 1 VLAN stack: 74 (78)-9999 (9999) bytes, 2 VLAN stacks: 74 (82)-9999 (9999) bytes). This setting appears when frame length is set to variable.** Points to the Frame Length(Actual) field.
- Set the step (+1, -1, Random).** This setting appears when frame length is set to variable. Points to the Step field.

## 4.5 Configuring a Traffic Test

### Tx Rate Table

Press **Refer** next to the Tx rate to display the following screen.

Item	Tx Rate	Action
1	100.00000	Select
2	80.00000	Select
3	60.00000	Select
4	50.00000	Select
5	40.00000	Select
6	30.00000	Select
7	10.00000	Select
8	5.00000	Select
9	NoEntry	Select
10	NoEntry	Select
11	NoEntry	Select
12	NoEntry	Select
13	NoEntry	Select
14	NoEntry	Select
15	NoEntry	Select
16	NoEntry	Select

Select a Tx rate from the Tx Rate table.

### Tx Time Table

Press **Refer** next to the Tx time to display the following screen.

Item	Tx Time	Action
1	1	Select
2	3	Select
3	5	Select
4	7	Select
5	10	Select
6	20	Select
7	30	Select
8	60	Select
9	NoEntry	Select
10	NoEntry	Select
11	NoEntry	Select
12	NoEntry	Select
13	NoEntry	Select
14	NoEntry	Select
15	NoEntry	Select
16	NoEntry	Select

Select a Tx time from the Tx Time table.

### Frame Length Table

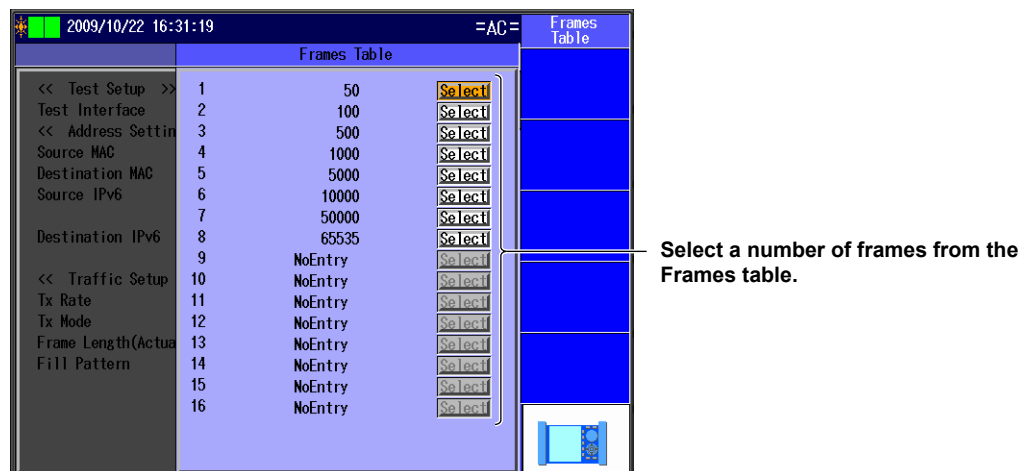
Press **Refer** next to the frame length to display the following screen.

Item	Frame Length	Action
1	64	Select
2	128	Select
3	256	Select
4	512	Select
5	1024	Select
6	1518	Select
7	65	Select
8	66	Select
9	NoEntry	Select
10	NoEntry	Select
11	NoEntry	Select
12	NoEntry	Select
13	NoEntry	Select
14	NoEntry	Select
15	NoEntry	Select
16	NoEntry	Select

Select a frame length from the Frame Length table.

### Frames Table

Press **Refer** next to the number of frames to display the following screen.



### Note

All the tables are created on the setup software.

## Explanation

### Traffic Setup Screen

#### Tx Rate

Set the Tx rate.

Range: 0.00001 to 100.00000%

#### Tx Mode

Set the Tx mode.

- **Continuous:** In this mode, frames are transmitted continuously. After you start transmission, it continues until you stop it.
- **Frames:** In this mode, a specified number of frames is transmitted. After you start transmission, the specified number of frames is sent, and then transmission is stopped automatically.
- **Time:** In this mode, frames are transmitted for a specified period of time. After you start transmission, it continues for the specified period of time and is then stopped automatically.

#### Tx Time

When Tx Mode is set to Time, set the Tx time.

Range: 1 to 1440 minutes

#### Frames

When Tx Mode is set to Frames, set the number of frames.

Range: 1 to 4294967295

#### Frame Length (Actual)

Set the Tx frame length. The actual frame length that corresponds to the length you set is also displayed.

VLAN	L2, L3-IPv4	L3-IPv6
None	64 (64) to 9999 (9999) bytes	74 (74) to 9999 (9999) bytes
1 stack	64 (68) to 9999 (9999) bytes	74 (78) to 9999 (9999) bytes
2 stacks	64 (72) to 9999 (9999) bytes	74 (82) to 9999 (9999) bytes

## 4.5 Configuring a Traffic Test

---

### Variable Frame Length Screen

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

#### Range

Set the frame length adjustment range.

Range: 64 to 9999 bytes

#### Step

Set the frame length adjustment step.

- +1: The length is adjusted within the specified range in steps of +1.
- -1: The length is adjusted within the specified range in steps of -1.
- Random: The length is adjusted within the specified range randomly.

#### Note

---

If you do not select Use Jumbo Frame in the Test Setup, the actual frame length will be displayed as "OVER" when (1) there are no VLAN stacks and you specify a value greater than 1519 bytes, (2) there is one VLAN stack and you specify a value greater than 1523, or (3) there are two VLAN stacks and you specify a value greater than 1527.

---

#### Fill Pattern

Specify the fill pattern to insert into the payload area.

- ALL0: All zeros
- ALL1: All ones
- 0/1: Alternating zeros and ones
- Random: A random pattern

#### Tx Rate, Tx Time, Frames, and Frame Length Tables

You can refer to the Tx Rate, Tx Time, Frames, and Frame Length tables to configure the settings.

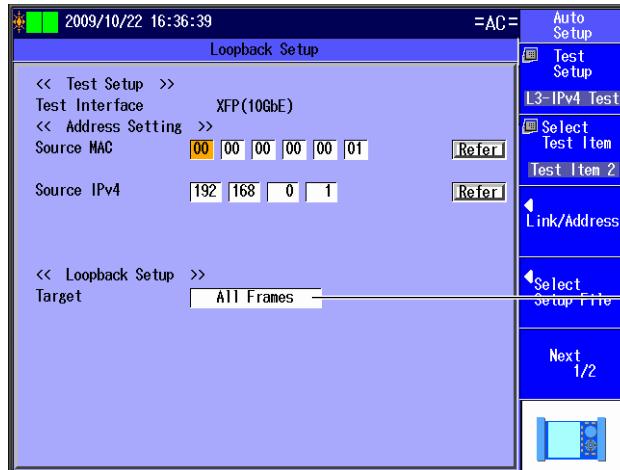
All the tables are created on the setup software. For details, see the *Setup Software User's Manual*.

## 4.6 Configuring a Loopback Test

### Procedure

#### Loopback Setup Screen

Follow the procedure in section 4.4 to display the Loopback Setup screen.



Set the loopback target frames (Source Address, All Frames).

### Explanation

#### Loopback Target Frame

Set the loopback target frames.

- Source Address: Only frames from the source address are looped back.
- All Frames: All frames are looped back.

#### Note

If you select Add UDP to Tx Frame in the Test Setup, you can switch the L4 port number (TCP, UDP Dst Port, Src Port).

# 4.7 Configuring a QoS Test

## Procedure

### QoS Setup Screen

Follow the procedure in section 4.4 to display the QoS Setup screen.

**Set the Tx mode** (Continuous, Frames, Time).

**Set the QoS test type** (Frame\_ID, VLAN-ID, VLAN-CoS (when there are VLAN stacks), IPv4-ToS, IPv4-DSCP (when the test layer is L3-IPv4), IPv6-TrafficClass, IPv6-DSCP (when the test layer is L3-IPv6), L4-DP, L4-SP (when UDP is selected)).

**Set the time** (1-1440 minutes). This setting appears when Tx Mode is set to Time.

**Refer to the Tx Time table** ► section 4.5

**Refer to the QoS Value table.**

**Set the rates** (0.00000-100.00000%).

**Set the fill pattern** (ALL0, ALL1, 0/1 alt., Random).

**Set the (actual) frame length\*** (For L2 and L3-IPv4:  
 No VLAN stacks: 64 (64)-9999 (9999) bytes  
 1 VLAN stack: 64 (68)-9999 (9999) bytes  
 2 VLAN stacks: 64 (72)-9999 (9999) bytes  
 For L3-IPv6:  
 No VLAN stacks: 74 (74)-9999 (9999) bytes  
 1 VLAN stack: 74 (78)-9999 (9999) bytes  
 2 VLAN stacks: 74 (82)-9999 (9999) bytes).

**Set the QoS values.**  
 This setting is valid when QoS Field is set to any option other than Frame\_ID (VLAN-ID: 0-4095, VLAN-CoS: 0-7, IPv4-ToS: 0-7, IPv4-DSCP: 0-63, IPv6-TrafficClass: 0-7, IPv6-DSCP: 0-63, L4-DP: 0-65535, L4-SP: 0-65535).

**Select the QoS channels to use.**

\* If you do not select Use Jumbo Frame in the Test Setup and you specify an oversize frame length, the actual frame length will be displayed as "OVER."

**Set the number of frames** (1-4294967295). This setting appears when Tx Mode is set to Frames.

**Refer to the Frames table.** ► section 4.5

### QoS Value Table

Press **Refer** above the QoS values to display the following screen.

**Next Page** — To the next page

**Prev. Page** — To the previous page

**Select the QoS values that you want to use from the QoS Value table.**

**QoS Value table (1-16)**  
 Use the setup software to create this table.

Value	Frame Length	Rate	Select
<input checked="" type="checkbox"/> CH1	7 64 byte	25.00000 %	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> CH2	5 64 byte	25.00000 %	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> CH3	3 64 byte	25.00000 %	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> CH4	1 64 byte	25.00000 %	<input checked="" type="checkbox"/>

Value	Frame Length	Rate	Select
<input type="checkbox"/> CH1	2 48 byte	20.00000 %	<input type="checkbox"/>
<input checked="" type="checkbox"/> CH2	3 48 byte	30.00000 %	<input checked="" type="checkbox"/>
<input type="checkbox"/> CH3	4 48 byte	40.00000 %	<input type="checkbox"/>
<input type="checkbox"/> CH4	5 50 byte	50.00000 %	<input type="checkbox"/>

**Explanation****QoS Setup Screen****Selecting the QoS Channels to Use**

You can select up to four QoS channels.

**QoS Field**

Select the type of QoS test.

Test Type	Test Layer			Description	Notes
	L2	L3-IPv4	L3-IPv6		
Frame_ID	Yes	Yes	Yes	The frame number for each QoS channel	
VLAN-ID	Yes	Yes	Yes	The VLAN ID The data in the VLAN tag in the MAC frame	When there are VLAN stacks
VLAN-CoS	Yes	Yes	Yes	The VLAN Class of Service The user priority field data in the VLAN tag in the MAC frame	
IPv4-ToS	No	Yes	No	The IPv4 Type of Service The ToS field data in the IPv4 header (IP Precedence)	
IPv4-DSCP	No	Yes	No	The IPv4 DiffServ Code Point The DS (DiffServ) field data in the IPv4 header	
IPv6-TrafficClass	No	No	Yes	The IPv6 Traffic Class The Traffic Class field data in the IPv6 header	
IPv6-DSCP	No	No	Yes	The IPv6 DiffServ Code Point The DS (DiffServ) field data in the IPv6 header	
L4-DP	No	Yes	Yes	The L4 destination port The Destination Port field data in the L4 header	When UDP is selected
L4-SP	No	Yes	Yes	The L4 source port The Source Port field data in the L4 header	

**QoS Value**

Set the QoS value. This setting valid when QoS Field is set to any option other than Frame\_ID.

Test Type	Range
VLAN-ID	0 to 4095
VLAN-CoS	0 to 7
IPv4-ToS	0 to 7
IPv4-DSCP	0 to 63
IPv6-TrafficClass	0 to 7
IPv6-DSCP	0 to 63
L4-DP	0 to 65535
L4-SP	0 to 65535

**Rate**

Set the QoS Tx rate.

The total for the four QoS channels must be below 100%.

Range: 0.00000 to 100.00000%

**Tx Mode, Frame Length (Actual), Tx Time Table, and Frames Table**

These are the same as the settings for a traffic test. For details, see section 4.5.

**QoS Value Table**

You can refer to the table to select the QoS values.

The table is created on the setup software. For details, see the *Setup Software User's Manual*.

# 4.8 Configuring a Ping Test

## Procedure

### PING Setup Screen

Follow the procedure in section 4.4 to display the PING Setup screen.

When Test Layer Is Set to L3-IPv4 Test or L3-IPv6 Test

The screenshot shows the PING Setup screen with the following fields and callouts:

- Test Interface:** FP(10GbE)
- Address Setting:**
  - Source MAC: 00 00 00 00 00 01
  - Destination MAC: 00 00 00 00 00 02
  - Source IPv4: 192 168 0 1
  - Destination IPv4: 192 168 0 2
- PING Setup:**
  - Destination IPv4:  Use Destination Address, 192 168 0 2
  - Source IPv4:  Use Source Address
  - Interval: 1ms
  - Tx Mode: Time (3 min)
  - Frame Length(Actual): 64 (64 byte)

Callouts from the right side of the screen:

- Select this check box to use the destination IPv4 or IPv6 address from the address settings.
- Set the destination IPv4 or IPv6 address. This setting is valid when the "Use Destination Address" check box is cleared.
- Refer to the IP Address table. ▶ section 4.3
- The source IPv4 or IPv6 address from the address settings is used
- Set the transmission interval (1ms, 10ms, 100ms, 1s).
- Set the Tx Mode (Continuous, Frames, Time).
- Refer to the Tx Time table.
- Refer to the Frame Length table. ▶ section 4.5
- Set the time (1-1440 minutes). This setting appears when Tx Mode is set to Time.

Set the (actual) frame length

VLAN Stacks	Test Layer	
	L3-IPv4	L3-IPv6
None	64(64)-9999(9999) byte	84(84)-9999(9999) byte
1	64(68)-9999(9999) byte	84(88)-9999(9999) byte
2	64(72)-9999(9999) byte	84(92)-9999(9999) byte

Close-up of the Tx Mode and Frame Length settings:

- Interval: 1ms
- Tx Mode: Frames (10000)
- Frame Length(Actual): 64 (64) byte

Callouts from the right side:

- Set the number of frames (1-4294967295). This setting appears when Tx Mode is set to Frames.
- Refer to the Frames table. ▶ section 4.5

When Test Layer Is Set to L2 Test or L3-IPv6 Test

Close-up of the Destination IPv4 and Source IPv4 settings:

- Destination IPv4:  Use Destination Address, 192 168 0 2
- Source IPv4 Address: 192 168 0 1
- Subnet Mask: 255 0 0 0
- Gateway: 0 0 0 0

Callouts from the right side:

- The destination IPv4 address.
- Source IPv4 address.
- Subnet mask (1-31).
- Gateway.



**Explanation****PING Setup Screen****When Test Layer Is Set to L3-IPv4 Test or L3-IPv6 Test****Destination IPv4 or IPv6 Address****“Use Destination Address” Check Box (Always selected)**

The destination IPv4 or IPv6 address in the address settings is used (fixed). To specify a different destination IPv4 address, clear this check box.

**Source IPv4 or IPv6 Address**

The source IPv4 or IPv6 address from the address settings is used (fixed).

**When Test Layer Is Set to L2 Test**

Each address is set automatically from the MAC address.

Destination IPv4 address:

10.lower three bytes of the destination MAC address

Source IPv4

Address: 10.lower three bytes of the source MAC address

Netmask: 255.0.0.0 (fixed)

Gateway: 0.0.0.0 (fixed).

**Transmission Interval**

Set the interval at which to send ping requests.

1 ms, 10 ms, 100 ms, 1 s

The timeout value is 1 second.

**Tx Mode, Frame Length (Actual), Tx Time Table, Frames Table, and Frame Length Table**

These are the same as the settings for a traffic test. For details, see section 4.5.

## 4.9 Configuring a BERT

### Procedure

#### BERT Setup Screen

Follow the procedure in section 4.4 to display the BERT Setup screen.

The screenshot shows the BERT Setup screen with the following settings and callouts:

- Test Interface:** XFP(10GbE)
- Address Setting:** Source MAC (00:00:00:00:00:01), Destination MAC (00:00:00:00:00:02), Source IPv4 (192.168.0.1), Destination IPv4 (192.168.0.2)
- BERT Setup:** Tx Rate (100.00000 %), Tx Mode (Time), Frame Length(Actual) (64 byte)
- Callouts:**
  - Set the Tx rate (0.00001-100.00000%).
  - Set the Tx mode (Continuous, Frames, Time).
  - Set the (actual) frame lengths\* (For L2 and L3-IPv4: No VLAN stacks: 64 (64)-9999 (9999) bytes, 1 VLAN stack: 64 (68)-9999 (9999) bytes, 2 VLAN stacks: 64 (72)-9999 (9999) bytes; For L3-IPv6: No VLAN stacks: 74 (74)-9999 (9999) bytes, 1 VLAN stack: 74 (78)-9999 (9999) bytes, 2 VLAN stacks: 74 (82)-9999 (9999) bytes).
  - Set the time (1-1440 minutes). This setting appears when Tx Mode is set to Time.
  - Refer to the Tx Rate table. Refer to the Tx Time table. Refer to the Frame Length table. ▶ section 4.5

\* If you do not select Use Jumbo Frame in the Test Setup and you specify an oversize frame length, the actual frame length will be displayed as "OVER."

The close-up screenshot shows the following settings:

- Tx Rate:** 100.00000 %
- Tx Mode:** Frames
- Frame Length(Actual):** 64 (64) byte
- Callouts:**
  - Set the number of frames (1-4294967295). This setting appears when Tx Mode is set to Frames.
  - Refer to the Frames table. ▶ section 4.5

### Explanation

#### BERT Setup Screen

**Tx Rate, Tx Mode, Frame Length (Actual), Tx Rate Table, Tx Time Table, Frames Table, and Frame Length Table**

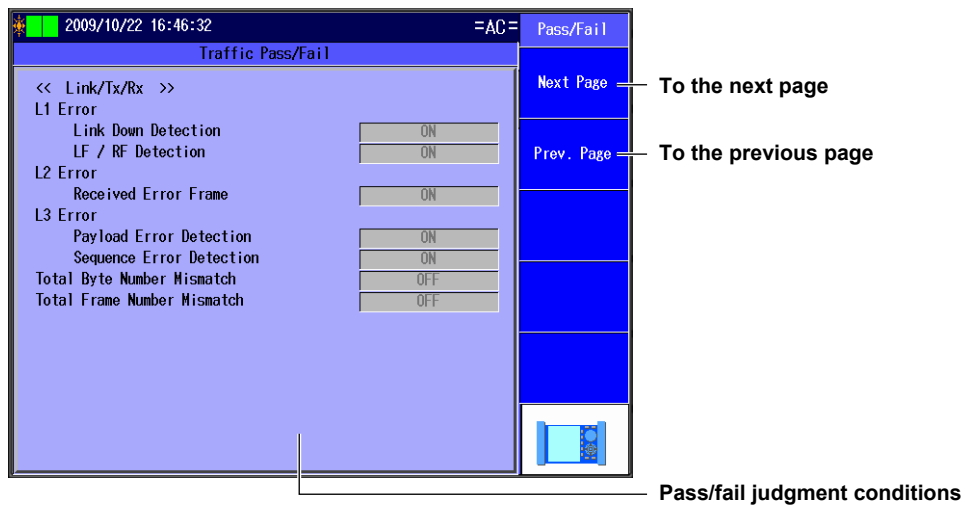
These are the same as the settings for a traffic test. For details, see section 4.5.

## 4.10 Displaying Pass/Fail Judgment Conditions

### Procedure

#### Pass/Fail Screen

Follow the procedure in section 4.1 to display the Auto Setup screen.  
Press the **Pass/Fail** soft key to display the following screen.



### Explanation

You can display the pass/fail judgment conditions of the selected test items.

The pass/fail conditions are created on the setup software. For details, see the *Setup Software User's Manual*.

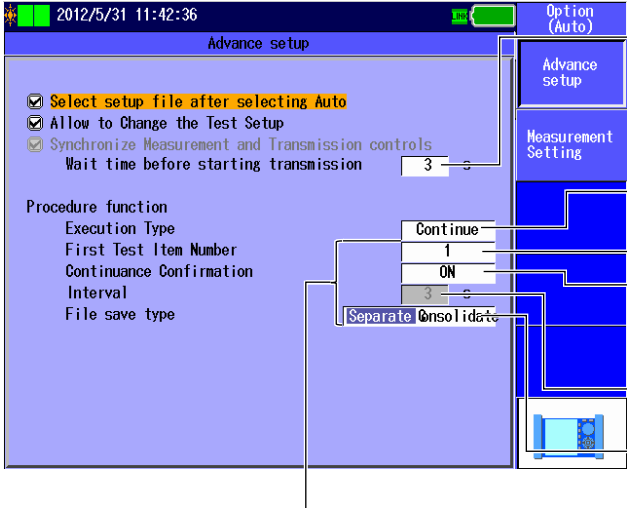
## 4.11 Configuring Options (Auto)

### Procedure

#### Advance Setup Screen

Follow the procedure in section 4.1 to display the Auto Setup screen.

Press the **Option (Auto)** soft key and then the **Advance setup** soft key to display the following screen.



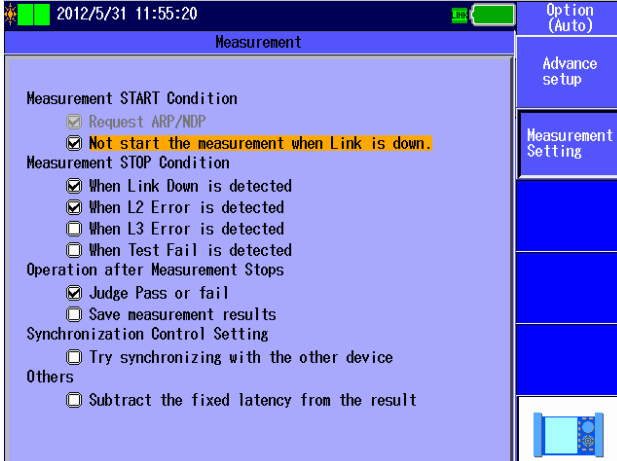
The screenshot shows the 'Advance setup' screen with the following settings and callouts:

- Wait time before starting transmission:** 3. Callout: Set the interval between the pressing of START and the start of transmission (1 to 10 s). This setting is valid when the "Synchronize Measurement and Transmission controls" check box is selected.
- Execution Type:** Continue. Callout: Set the test item execution type (Single, Continue).
- First Test Item Number:** 1. Callout: Set the starting test number (1-8).
- Continuance Confirmation:** ON. Callout: Select whether or not to check before proceeding to the next test item whenever a test item has finished (ON, OFF).
- Interval:** 3. Callout: Set the interval between test items (1-10 s).
- File save type:** Separate. Callout: Method for saving continuance test result files (Separate, Consolidate).

These settings are valid when Execution Type is set to Continue.

#### Measurement Screen

Press the **Option (Auto)** soft key and then the **Measurement Setting** soft key to display the following screen.



The screenshot shows the 'Measurement' screen with the following settings:

- Measurement START Condition:**
  - Request ARP/NDP
  - Not start the measurement when Link is down.
- Measurement STOP Condition:**
  - When Link Down is detected
  - When L2 Error is detected
  - When L3 Error is detected
  - When Test Fail is detected
- Operation after Measurement Stops:**
  - Judge Pass or fail
  - Save measurement results
- Synchronization Control Setting:**
  - Try synchronizing with the other device
- Others:**
  - Subtract the fixed latency from the result

**Explanation****Advance Setup Screen****Select setup file after selecting Auto**

Select whether or not to display the Select Setup File screen after you select Auto or Auto(Remote) in the Test Menu.

- Selected: The Select Setup File screen is displayed.
- Cleared: The Select Setup File screen is not displayed. The Test Item 1 screen appears. The previous settings are automatically selected.

**Allow to Change the Test Setup**

Select whether or not to allow the Test Setup screen settings to be changed.

- Selected: The Test Setup screen settings can be changed.
- Cleared: The Test Setup screen settings cannot be changed.

**Synchronize Measurement and Transmission controls**

Select whether or not to start transmission when the START key is pressed.

- Selected: Transmission is started when the START key is pressed. Also, measurement is stopped when transmission finishes.
- Cleared: Transmission is not started when the START key is pressed.

**Wait time before starting transmission**

Set the interval between when the START key is pressed and when transmission is started and between when transmission finishes and when measurement is stopped. This setting is valid when the "Synchronize Measurement and Transmission controls" check box is selected.

Range: 1 to 10 s

**Procedure function****Execution Type**

Select whether to execute a single test item or to execute test items consecutively.

Single: The test item specified in the Select Test Item screen is executed.

Continue: The test items in the Select Test Item screen are executed consecutively.

**First Test Item Number**

Specify the test item number to start at when Execution Type is set to Continue. The test items after the selected test item number are executed.

Range: 1 to 8

**Continuance Confirmation**

Select whether or not to confirm that you want to proceed before proceeding to the next test item whenever a test item has finished. This setting is valid when Execution Type is set to Continue.

- ON: Whenever a test item has finished, you must confirm that you want to proceed before the AQ1300/AQ1301 will proceed to the next test item.
- OFF: Whenever a test item has finished, the AQ1300/AQ1301 will proceed to the next test item without confirmation.

**Interval**

Set the interval between test items for when Execution Type is set to Continue.

Range: 1 to 10 s

### Method for saving continuance test result files

You can save each test item of a continuous test to separate files or save multiple test items to a single file.

- Single: Each test item is saved to a separate file. This is the conventional method.
- Bundle: Selected test items are saved to a single file.

### Note

---

- Files cannot be loaded into the setup software when the firmware version is older than R1.08.01.001, regardless of whether Single or Bundle is selected.
  - If a continuous test is stopped in the middle of execution (as a result of an error or pressing of the STOP key), the test results up to that point are saved.
- 

## Measurement Screen

### Measurement START Condition

#### Request ARP/NDP

For ARP (IPv4) and NDP (IPv6) destination MAC addresses, select whether or not to use an ARP or NDP request to acquire the MAC address when the START key is pressed. This setting is valid when the test layer is L3-IPv4 or L3-IPv6.

- Selected: An ARP/NDP request is sent.
- Cleared: An ARP/NDP request is not sent.

#### Not start the measurement when Link is down

Select whether or not to start measurement when the START key is pressed and a linkdown is detected.

- Selected: Measurement is not started when a linkdown is detected.
- Cleared: Measurement starts even when a linkdown is detected.

### Measurement STOP Condition

#### When Link Down is detected

Select whether or not to stop measurement when a linkdown is detected during measurement.

- Selected: Measurement is stopped when a linkdown is detected.
- Cleared: Measurement is not stopped even when a linkdown is detected.

#### When L2 Error is detected

Select whether or not to stop measurement when an L2 error is detected during measurement.

- Selected: Measurement is stopped when an L2 error is detected.
- Cleared: Measurement is not stopped even when an L2 error is detected.

#### When L3 Error is detected

Select whether or not to stop measurement when an L3 error is detected during measurement.

- Selected: Measurement is stopped when an L3 error is detected.
- Cleared: Measurement is not stopped even when an L3 error is detected.

#### When Test Fail is detected

Select whether or not to stop continuance test when a test fail judgment is detected during continuance test. This feature is supported in firmware version (FW Ver.) R1.08.01.001 and later.

- Selected: Continuance test is stopped when a test fail judgment is detected.
- Cleared: Continuance test is not stopped even when a test fail judgment is detected.

## Operation after Measurement Stops

### Judge Pass or fail

Select whether or not to perform pass/fail judgment after measurement finishes.

- Selected: Pass/fail judgment is performed after measurement finishes.
- Cleared: Pass/fail judgment is not performed after measurement finishes.

### Save measurement results

Select whether or not to save the measurement results to a file after measurement finishes. When Execution Type is set to Continue, the AQ1300/AQ1301 saves the measurement results to a file whenever a test item finishes.

- Selected: The measurement results are saved to a file when measurement finishes.
- Cleared: The measurement results are not saved to a file when measurement finishes.

## Synchronization Control Setting

### Try synchronizing with the other device

Select whether or not to try synchronizing with the other device (the address specified as the destination address) when the START or STOP key is pressed. When the START or STOP key is pressed, the AQ1300/AQ1301 sends a measurement start or stop packet to the other device at the destination address.

You can select this option in Auto mode. The AQ1300/AQ1301 is already synchronized with the other device in Auto(Remote) mode.

- Selected: The AQ1300/AQ1301 tries to synchronize with the other device.
- Cleared: The AQ1300/AQ1301 does not try to synchronize with the other device.

### Note

When you are performing BERT test, the AQ1300/AQ1301 does not send measurement stop packets.

## Others

### Subtrac the fixed latency from the result

During latency measurement, the fixed delay that occurs in the other device during loopback is subtracted from the measured results. The subtracted results are displayed as measurement results. If the measured value is less than the fixed delay, 0.00  $\mu$ s is displayed.

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

- Selected: The fixed delay is subtracted from the measured values.
- Cleared: The fixed delay is not subtracted from the measured values.

Fixed delay value based on the interface

Interface	Delay
XFP	1.0 $\mu$ s
SFP (GbE)	1.4 $\mu$ s
SFP (FE)	12 $\mu$ s
RJ-45 (1000M)	1.6 $\mu$ s
RJ-45 (100M)	11 $\mu$ s
RJ-45 (10M)	108 $\mu$ s

# 5.1 Selecting a Setup File

## Procedure

### Select Setup File Screen

Press the **Auto(Remote)** soft key to display the following screen.

**Registered setup files**  
A comment or file name appears next to each number.

**Latest Setup**  
Latest setup

**Default**  
Default setup

**File**  
Load a file.  
Load a setup file from the file list.

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

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

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

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

Number	File Name	Select
1	for demo	Select
2		Select
3	VLAN1000	Select
4	VLAN1001	Select
5	VLAN1002	Select
6	VLAN1003	Select
7		Select
8	VLAN2100	Select
9	VLAN2101	Select
10	VLAN2102	Select
11	VLAN2103	Select
12		Select

### 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

Press the **File** soft key to display the following screen.

**File List**

Path = USB Memory  
Num Of Files : 5

FileName	Size	Date
USB Memory		
IMAGE		2009/10/06 13:28:54
LoggingData		2009/10/05 17:53:26
Project		2009/10/05 17:53:52
0000.sd	277K	2009/10/22 15:04:41
0002.sd	277K	2009/10/22 15:05:56

**File Operation Load**  
Set Action to Load.

**File Type**

**Drive Select**  
Select a drive (Internal, USB Memory).

**Load**  
Loads the selected file

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

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



### Explanation

#### Latest Setup

Select this item to use the setup that was displayed previously.

#### Default Setup

Select this item to return to the default setup.

In the default setup, the following test items are selected.

- 1 Traffic Test [M] <=> [S] Traffic Test
- 2 Traffic Test [M] <=> [S] Loopback Test
- 3 QoS Test [M] <=> [S] QoS Test
- 4 QoS Test [M] <=> [S] Loopback Test
- 5 PING Test [M] <=> [S] PING Test

#### Note

---

You cannot perform a BERT in Auto(Remote) mode.

---

#### File

Select this item to load a setup file (with an .sd extension) from the file list.

Select this item when you want to load a setup file that is not in the setup file list.

To create a setup file, you can use the setup software and send the file to the AQ1300/AQ1301, or you can save the settings on the AQ1300/AQ1301.

#### Setup File Selection

To select a registered setup file, use the setup file list.

You can register up to 48 setup files to the setup file list (4 pages with 12 files per page).

A comment or file name is displayed for each of the registered setup files in the setup file list.

The setup file list is updated when you open the Select Setup File screen after you have created a display management file and setup files with the setup software and sent the files to the AQ1300/AQ1301.

For details, see the *Setup Software User's Manual*, IM AQ1300-61EN.

#### Note

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- The AQ1300/AQ1301 can only display the setup file list if the display management file that you created using the setup software (disManage.dmf) and the setup (.sd) files that it refers to are saved to the /setup directory in the AQ1300/AQ1301.

Example: /setup/disManage.dmf  
          /setup0000.sd  
          /setup0001.sd  
          :

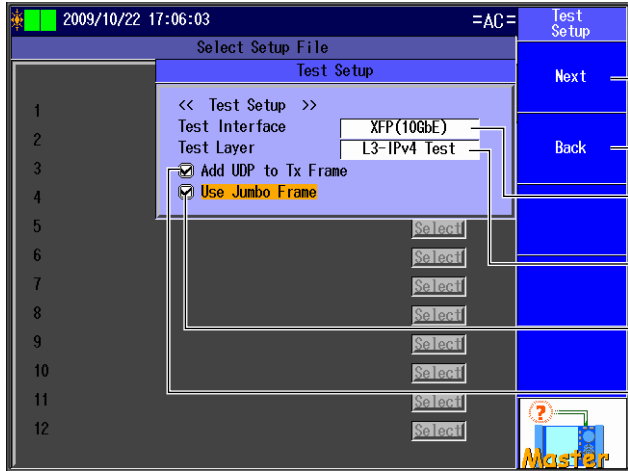
- When you are performing automatic(remote control) testing, you can only select setup files that are used for automatic(remote control) testing.
-

## 5.2 Setting Up a Test

### Procedure

#### Test Setup Screen

Follow the procedure in section 5.1 and then select a setup file to display the following screen.



The screenshot shows a 'Test Setup' dialog box with the following fields and options:

- Test Interface:** XFP(10GbE)
- Test Layer:** L3-IPv4 Test
- Add UDP to Tx Frame
- Use Jumbo Frame

Below these fields are several 'Select' buttons. On the right side of the dialog, there are 'Next' and 'Back' buttons. The 'Next' button is highlighted in blue.

Annotations on the right side of the screenshot:

- Next:** Configure the link settings. ► section 5.3
- Back:** Select a setup file ► section 5.1
- Test Interface:** Set the test interface (XFP(10GbE), SFP(GbE), RJ-45).
- Test Layer:** Set the test layer (L2 Test, L3-IPv4 Test, L3-IPv6 Test).
- Add UDP to Tx Frame:** Select this check box to treat oversize frames like normal frames.
- Use Jumbo Frame:** 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.

### Explanation

#### Test Interface

Specify which test interface to use.

- XFP (10GbE): Select this option to use the 10GBASE-R measurement port.
- SFP (GbE): Select this option to use the 1000BASE-X measurement port.
- SFP (FE): Select this option to use the 100BASE-FX measurement port. This interface is supported by firmware version R1.05.01.001 or later.
- RJ-45: Select this option to use the 10BASE-T/100BASE-TX/1000BASE-T measurement port.

#### Test Layer

Set the layer to test.

- L2 Test: Select this option to test layer 2.
- L3-IPv4 Test: Select this option to test layer 3 according to the IPv4 protocol.
- L3-IPv6 Test: Select this option to test layer 3 according to the IPv6 protocol.

#### Add UDP to Tx Frame

Select whether or not to add UDP to Tx frames. You can configure this setting when the test layer is L3-IPv4 or L3-IPv6.

#### Use Jumbo Frame

Select whether or not to treat oversize frames like normal frames.

- Selected: Frames with lengths of 64 to 9999 bytes are treated as normal frames.
- Cleared: Frames whose size is above 1518 + the value set for "VLAN stacks" in the source settings × 4 are considered oversized.

## 5.3 Configuring Link Settings

### Procedure

#### Link Setting Screen

Follow the procedure in section 5.2 and then select a test setup to display the following screen.

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

Detect a mismatch of Auto-nego settings(at link-up)

Select this check box to automatically detect mismatches in the auto negotiation during link establishment.

**Master Setting**  
Configure master settings. ▶ section 5.4

**Slave Setting**  
Configure slave settings. ▶ section 5.5

**Back**  
Configure the test settings. ▶ section 5.2

**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.

#### Link Setting Acquisition

**Executes link setting information acquisition**  
Acquires the link setting information of the other device connected to the AQ1300/AQ1301

**Applies link settings**  
Applies the acquired other device's link settings to the AQ1300/AQ1301. You can execute this when the measurement interface is RJ-45 or SFP(GbE) and the acquisition status is Finish.

**Status (Preparing, Finish, Fail)**

**Cable type (Straight, Cross)**  
This setting is valid when Test Interface is set to RJ-45.

**Returns to the link setting screen**

**UTP Cable Status**  
Indicates the UTP cable status as follows. (Normal, The cable may be defective. It is two-pair cable)

**Result of link setting information acquisition**

- Negotiation (Auto, Manual)**
- Speed (1G, 100M, 10M)**  
Appears when Test Interface is set to RJ-45
- Duplex (Full, Half, --- (when negotiation is set to manual))**  
Appears when Test Interface is set to RJ-45
- MDI (MDI, MDI-X)**  
Appears when Test Interface is set to RJ-45

**Explanation**

Configure the link settings.

**Negotiation**

Select whether or not to use auto negotiation. This setting is valid when Test Interface is set to RJ-45 or SFP(GbE).s

- Auto: The link between the AQ1300/AQ1301 and the device that it is connected to is configured automatically through auto negotiation.
- Manual: The link must be configured manually.

**Speed**

When Test Interface is set to RJ-45, you can set the link speed.

- 1G: A 1 Gbit/s 1000BASE-T connection is used.
- 100M: A 100 Mbit/s 100BASE-TX connection is used.
- 10M: A 10 Mbit/s 10BASE-T connection is used.
- Auto: The link speed is set automatically. This setting is valid when Negotiation is set to Auto.

**Note**

When Test Interface is set to XFP(10GbE), the link speed is fixed at 10G. When Test Interface is set to SFP(GbE), the link speed is fixed at 1G. When Test Interface is set to SFP(FE), the link speed is fixed at 100 M.

**Duplex**

You can set the communication mode for when Speed is set to 100M or 10M. This setting is valid when Test Interface is set to RJ-45.

- FULL: Full duplex communication
- HALF: Half duplex communication
- Auto: The AQ1300/AQ1301 chooses full or half duplex automatically. This setting is valid when Negotiation is set to Auto.

**Note**

When Test Interface is set to XFP(10GbE), SFP(GbE), or SFP(FE), or when it is set to RJ-45 and Speed is set to 1G, the duplex mode is fixed at FULL.

**Flow Control**

You can enable or disable flow control.

- ON: Flow control is enabled.
- OFF: Flow control is disabled.

**MDI**

You can set the measurement port to straight or crossover mode. This setting is valid when Test Interface is set to RJ-45.

- MDI: Straight
- MDI-X: Cross
- Auto: The AQ1300/AQ1301 switches between straight and crossover mode automatically (this setting is valid when Negotiation is set to Auto).

**Link Setting Acquisition**

If the interface is SFP(GbE) or RJ-45, you can acquire and display link setting information of the other device (DUT; the device on the user side) connected to the AQ1300/AQ1301. For details, see section 4.3.

## 5.4 Configuring the Master Settings

### Procedure

These are the procedures for configuring the AQ1300/AQ1301 when it is the master in Auto(Remote) mode.

### Source Address Screen

Follow the procedure in section 5.3 and then press the **Master Setting** soft key to display the following screen.

The screenshot shows the 'Source Address' configuration screen. The top status bar displays '2012/5/31 14:46:53'. The screen is divided into several sections:

- Source MAC:** A field containing '00 100 100 100 00 01'.
- VLAN stacks:** A dropdown menu set to '1'. Below it, two tables are shown:
 

VLAN2	IP ID	8100	CoS	0	ID	100
VLAN1	IP ID	8100	CoS	0	ID	1000
- Source IPv4:** A dropdown menu set to 'Manual'. Below it, three fields are shown:
 

Address	192	168	0	1
Subnet Mask	255	255	255	0
Gateway	192	168	0	254

On the right side, there is a vertical menu with buttons: 'Next', 'Back', and 'Get IP Address'. Below these are several 'Refer!' buttons pointing to other screens. A 'Master' button is at the bottom right.

Callouts from the right side of the image point to the following elements:

- Source MAC address.
- VLAN stack number (None, 1, 2).
- 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. ▶ section 4.3
- Refer to the MAC Address table. ▶ section 4.3
- Next button: Configure the destination address settings.
- Back button: Configure the link settings. ▶ section 5.3
- Get IP Address button: Set IPv4 (Manual, DHCP). This setting appears when Test Layer is set to L3-IPv4.
- Refer! buttons: Refer to the IP Address table. ▶ section 4.3
- Refer! buttons: Refer to the gateway reference. ▶ section 4.3
- Refer! button: Set the source IPv4 address. Set the subnet mask (1-31). Set the gateway. These settings are valid when IPv4 is set to Manual.

The screenshot shows the 'Source IPv6' configuration screen. The top status bar displays '2012/5/31 14:46:53'. The screen is divided into several sections:

- Source IPv6:** A dropdown menu set to 'Manual'. Below it, two fields are shown:
 

Address	FE80	0000	0000	0000
	0000	0000	0000	0001
- IPv6 Router:** A dropdown menu set to 'Manual'. Below it, a checkbox labeled 'Set Router Address manually' is checked. Below the checkbox, two fields are shown:
 

Prefix Length	64
Address	FE80 0000 0000 0000
	0000 0000 0000 0000

On the right side, there is a vertical menu with buttons: 'Refer!' and 'Refer!'. A 'Master' button is at the bottom right.

Callouts from the right side of the image point to the following elements:

- Source IPv6 (Manual, Stateless Address). This setting appears when Test Layer is set to L3-IPv6.
- Source IPv6 address. This setting is valid when IPv6 is set to Manual.
- Refer to the IP Address table.
- Set Router Address manually checkbox: Select this check box when you want to manually set the router address.
- Prefix Length and IPv6 Router Address: View and set the IPv6 prefix length and the IPv6 router address.

## Destination Address Screen

Press the **Next** soft key to display the following screen.

**Destination Address**

2009/10/22 17:09:36

<< Destination Address >>

Destination MAC: 00 00 00 00 00 02

Destination IPv4: 192 168 0 2

Destination IPv6: FE80 0000 0000 0000 0000 0000 0000 0002

Annotations:

- MAC Address: Set the destination MAC address. Refer to the MAC Address table. ▶ section 4.3
- Search List: Select from the search list.
- Manual Setting: Manual Setting. This soft key is valid when you have selected a destination address from the search list.
- Connect: Connect to the other device.
- Back: Configure the source address settings. Refer to the IP Address table. ▶ section 4.3
- Destination IPv4: Set the destination IPv4 address. This setting appears when Test Layer is set to L3-IPv4.
- Destination IPv6: Set the destination IPv6 address. This setting appears when Test Layer is set to L3-IPv6. Refer to the IP Address table. ▶ section 4.3

## Search List

Press the **Search List** soft key to display the following screen.

**Search List**

2009/10/22 17:10:16

Host Name	SerialNo	Version
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		

Annotations:

- Search other device: Search for other devices. When you press this soft key, the AQ1300/AQ1301 searches for other devices (AQ1300 or AQ1301) on the same network segment.
- Switch: Switches the search list display (SerialNo+Ver, Test Setup, Status+MAC, IPv4/IPv6, Master Addr)
- Addr Type: Set the address type (MAC Address, IP Address). This setting appears when Switch is set to Master Addr.
- Next Page: Select the address of the other device (the destination address) from the search list. To the next page (1 to 16, 17 to 32, 33 to 48, 49 to 64)

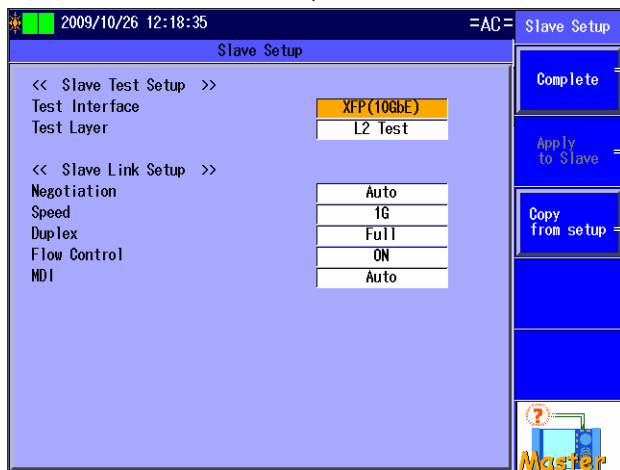
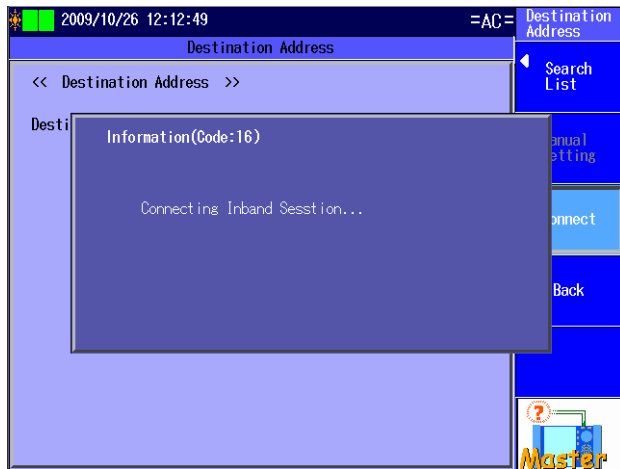
**Search for other devices**

2009/10/22 15:39:51

Host Name	SerialNo	Version
1	mitaka	SN0000001 6.0.134.10
2	yokohama	SN0000002 5.1.133.11
3	fukuoka	SN0000003 4.2.132.12
4	sapporo	SN0000004 3.3.131.13
5	kofu	SN0000005 2.4.130.14
6	kanazawa	SN0000006 1.5.129.15
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		

## Connect Screen

Press the **Connect** soft key to display the following screen.



**Select when you don't want to change the slave settings.**

Pressing this soft key will open the Auto Setup screen.

**Select to apply the currently displayed settings to the slave.**

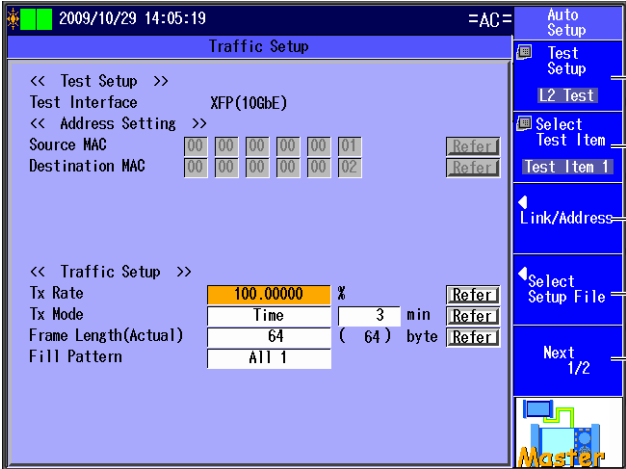
You must perform remote reconnection after you press this key.

**Select to copy the slave data on the master.**

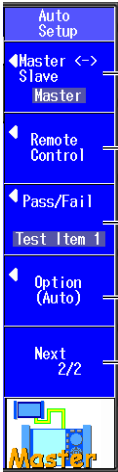
You must press "Apply to Slave" after you press this key.

### Auto Setup Screen

Press the **Complete** soft key to display the following screen.



- Set up the test. ▶ section 4.2
- Configure the test items. ▶ section 4.4
- Configure link and address settings. ▶ section 4.3
- Select a setup file. ▶ section 5.1
- To Auto Setup page 2/2



- Switch between the master and slave. ▶ section 5.6
- Remote control ▶ section 5.7
- Displays pass/fail judgment conditions ▶ section 4.10.
- Configure the options (Auto). ▶ section 4.11
- To Auto Setup page 1/2

#### Note

Except for the “Master <-> Slave” and “Remote Control” soft keys, the settings for the Auto Setup screen in Auto(Remote) mode are the same as the settings in Auto mode. When you want to change the settings, refer to the explanations for the settings in Auto mode.



### Explanation

#### Source Address Screen

##### Source MAC Address

Set the source MAC address. You can refer to the MAC Address table to set the address.

##### VLAN Stacks

Set the number of VLAN stacks.

- None: No VLAN stacks.
- 1: One VLAN stack.
- 2: Two VLAN stacks.

##### VLAN1 and VLAN2

Set the CoS (Class of Service) and VLAN-ID for 1 or 2 VLAN stacks. You can refer to the VLAN table to set the values.

- CoS: 0 to 7
- ID: 0 to 4095
- TPID: 0 to FFFF (supported in firmware version (FW Ver.) R1.08.01.001 and later)

##### IPv4

Select whether to specify the source IPv4 address manually or to acquire and set it automatically through DHCP. This setting is valid when Test Layer is set to L3-IPv4 Test.

- Manual: You must set the source IPv4 address manually.
- DHCP: When you press Get IP Address, the AQ1300/AQ1301 acquires and sets the source IPv4 address using DHCP.

##### Source IPv4 Address, Subnet Mask, and Gateway

Set the source IPv4 address, subnet mask, and gateway when IPv4 is set to Manual. You can refer to the IP Address table and the gateway reference to configure the settings.

- Subnet Mask: 1 to 31

##### IPv6

Select whether to specify the source IPv6 address manually or to specify it through stateless autoconfiguration using the RA from an IPv6 router. This setting is valid when Test Layer is set to L3-IPv6 Test.

- Manual: You must set the source IPv6 address manually.
- Stateless Address: When you press Get IP Address, the AQ1300/AQ1301 autoconfigures the source IPv6 address.

##### Source IPv6 Address

Set the source IPv6 address when IPv6 is set to Manual. You can refer to the IP Address table to set the address.

##### IPv6 Router Address

You can automatically acquire the router address or set it manually.

- Automatic: Clear the Set Router Address manually check box. The IPv6 prefix length and router address that have been acquired automatically are displayed.
- Manual: Select the Set Router Address manually check box. You can manually set the prefix length and router address.

##### MAC Address Table

Select the source MAC address from the MAC Address table.

- Global Address: You can set the source MAC address to a global address.

**VLAN Table**

Select the VLAN CoS and ID from the VLAN table.

**IP Address Table**

Select the source IP address from the IP Address table.

- Get IP Address: Press this soft key to get the IP address. The AQ1300/AQ1301 will acquire an IP address, using DHCP when the test layer is L3-IPv4 or stateless autoconfiguration when the test layer is L3-IPv6.

**Gateway**

Set the gateway.

- Manual: Select this option to set the gateway manually.
- Auto.1: Select to automatically set the gateway to xxx.xxx.xxx.1.
- Auto.254: Select to automatically set the gateway to xxx.xxx.xxx.254.

**Destination Address Screen****Destination MAC Address**

Set the destination MAC address. You can refer to the MAC Address table to set the address.

**IPv4**

Set the destination IPv4 address. This setting is valid when Test Layer is set to L3-IPv4 Test. You can refer to the IP Address table or select Search List to set the address.

**IPv6**

Set the destination IPv6 address. This setting is valid when Test Layer is set to L3-IPv6 Test. You can refer to the IP Address table or select Search List to set the address.

**Search List**

Select the address of the other device (the destination address) from the search list.

**Searching for Other Devices**

When you select Search other Device, the AQ1300/AQ1301 searches for other devices (AQ1300 or AQ1301) on the same VLAN or network segment and displays the results in the search list.

**Switching the Display**

You can switch between different search list displays.

- SerialNo+Ver: The equipment name, serial number, and version are displayed.
- Test Setup: The equipment name, test interface, and test layer are displayed.
- Status+MAC: The equipment name, status, and MAC address are displayed.
- IPv4/IPv6: The equipment name and IP address are displayed.
- Master Addr: The device name and master address (MAC or IP address) are displayed.

**Note**

You can check the equipment name and serial number of the AQ1300/AQ1301 in the system settings.

**Setting the Address Type**

You can switch the address type that is displayed when Switch is set to Master Addr.

- MAC address
- IP address

**Manual Setting**

Press this soft key to cancel the selection that you made in the search list and enter the destination address manually. This soft key is valid when you have selected a destination address from the search list.

## 5.4 Configuring the Master Settings

---

### Connect

Press this soft key to connect to the other device.

### MAC Address Table

Select the destination MAC address from the MAC Address table.

- MAC Address (ARP): When the test layer is L3-IPv4, press this soft key to automatically acquire the destination MAC address.
- MAC Address (NDP): When the test layer is L3-IPv6, press this soft key to automatically acquire the destination MAC address.

### IP Address Table

Select the destination IP address from the IP Address table.

### Note

---

All the tables are created on the setup software. For details, see the *Setup Software User's Manual*.

---

## Connect Screen

The AQ1300/AQ1301 will connect remotely to the other device with the specified destination address. After the connection, you can use the test interface to control the other device remotely.

### Slave Setup

Complete: Press this soft key when you do not need to change the slave settings. Pressing this soft key will open the Auto Setup screen.

Apply to Slave: Press this soft key to apply the currently displayed test and link settings to the slave. You must perform remote reconnection after you press this key.

Copy from setup: Press this soft key to use the slave data on the master to configure the setup items. You must press "Apply to Slave" after you press this key.

### Note

---

After the connection is established, you cannot change the source and destination addresses.

---

## Auto Setup Screen

In this screen, you can change the master's settings (select test items and setup files), switch between the master and slave settings, perform remote control, display pass/fail judgments, and configure the options (Auto).

### Note

---

- Except for the "Master <-> Slave" and "Remote Control" soft keys, the settings for the Auto Setup screen in Auto(Remote) mode are the same as the settings in Auto mode. When you want to change the settings, refer to the explanations for the settings in Auto mode.
  - You cannot change the test setup or link address settings from the Auto Setup screen in Auto(Remote) mode. To change the settings, return to the top menu.
-

## 5.5 Configuring the Slave Settings

### Procedure

These are the procedures for configuring the AQ1300/AQ1301 when it is the slave in Auto(Remote) mode.

### Source Address Screen

Follow the procedure in section 5.3 and then press the **Slave Setting** soft key to display the following screen.

The screenshot shows the 'Source Address' configuration screen. It includes sections for 'VLAN stacks' (VLAN2 and VLAN1), 'Source IPv4' (Address, Subnet Mask, Gateway), and 'Source IPv6' (Address, IPv6 Router, Prefix Length, Address). A 'Slave Execution' soft key is visible on the right side of the screen.

**Slave Execution**  
Configure the link settings. ▶ section 5.3

**Back**  
VLAN settings  
Automatically configured on the basis of the connected network environment

**Get IP Address**  
IPv4 setting  
(Manual, DHCP, Alloc From Master)  
This setting appears when Test Layer is set to L3-IPv4.  
Configure the source address settings. ▶ section 5.4

**Slave ?**  
IPv6 setting  
(Manual, Stateless, Alloc From Master)  
This setting appears when Test Layer is set to L3-IPv6.  
Configure the source address settings. ▶ section 5.4

### Slave Execution

The screenshot shows the 'Slave Execution' screen. It displays traffic statistics (Tx Rate, Tx Time, Frame Len, Fill Pattern) and test results (Rx Peak Rate, Latency Max, Tx/Rx Rate, Normal Frame, Rx Frame Length). A 'Release' soft key is visible on the right side of the screen.

**Release**  
Press this soft key to exit the slave (connection standby) state. Pressing this soft key will open the top menu.

### Explanation

When you press the Slave Execution soft key, the AQ1300/AQ1301 enters into slave (connection standby) mode. The AQ1300/AQ1301 enters into slave mode when the master connects to it.

#### Source MAC Address, VLAN Stacks, and VLAN1 and VLAN2

These are the same as the settings for the master. See section 5.4.

#### IPv4

Select whether to specify the source IPv4 address manually, acquire and set it automatically through DHCP, or assign it from the master. This setting is valid when Test Layer is set to L3-IPv4 Test.

- Manual: You must set the source IPv4 address manually.
- DHCP: When you press Get IP Address, the AQ1300/AQ1301 acquires and sets the source IPv4 address using DHCP.
- Alloc From Master: The master automatically provides the AQ1300/AQ1301 with a source IPv4 address.

#### Source IPv4 Address, Subnet Mask, and Gateway

These are the same as the settings for the master. See section 5.4.

#### IPv6

Select whether to specify the source IPv6 address manually, specify it through stateless autoconfiguration using the RA from an IPv6 router, or assign it from the master. This setting is valid when Test Layer is set to L3-IPv6 Test.

- Manual: You must set the source IPv6 address manually.
- Stateless Address: When you press Get IP Address, the AQ1300/AQ1301 autoconfigures the source IPv6 address.
- Alloc From Master: The master automatically provides the AQ1300/AQ1301 with a source IPv6 address.

#### Source IPv6 Address and IPv6 Router Address

These are the same as the settings for the master. See section 5.4.

#### MAC Address, VLAN, and IP Address Tables

These are the same as the settings for the master. See section 5.4.

#### Note

- In an Auto(Remote) test, if the slave unit is set to perform automatic loopback, the frames that control the other device (the inband control frames) are also used in the calculation of statistics.
- When the AQ1300/AQ1301 is displaying the top menu, it is in slave (connection standby) mode. When the master connects to the AQ1300/AQ1301, the AQ1300/AQ1301 enters into slave mode and displays the slave execution screen.

When the AQ1300/AQ1301 is in slave mode, even if you change the AQ1300/AQ1301 link or address settings from the master, they will not be saved as the latest setup.

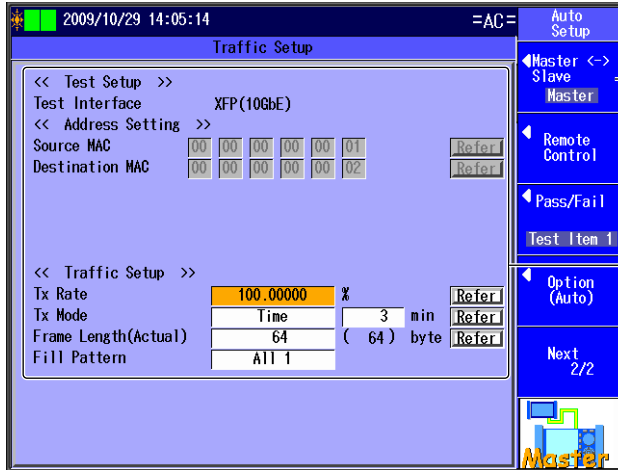
---

## 5.6 Switching between the Master and Slave Settings

### Procedure

Follow the procedure in section 5.4 to display the Auto Setup screen.

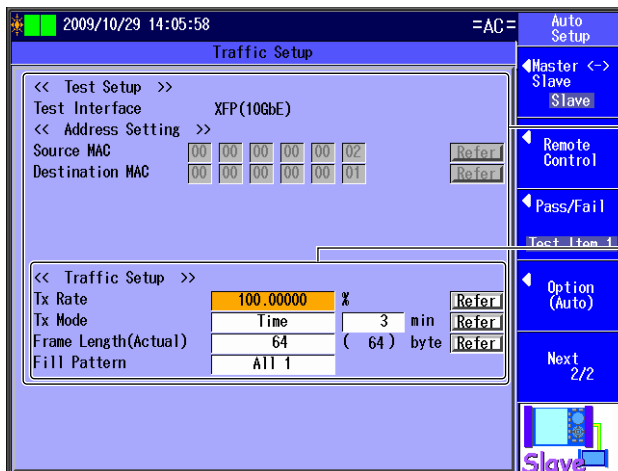
Press the **Master <-> Slave** soft key to switch between the displays of the master and slave settings.



Switch between the master and slave (Master, Slave).

Press this soft key to switch between the displays of the master and slave settings. The settings that appear are the test, address, and test item settings.

Setting indications for the master



Setting indications for the slave

Items whose settings can be changed

### Explanation

#### Master <-> Slave

Press this soft key to switch between the displays of the master and slave settings. The settings that appear are the test, address, and test item settings. For details about the test item settings, see section 4.4.

#### Note

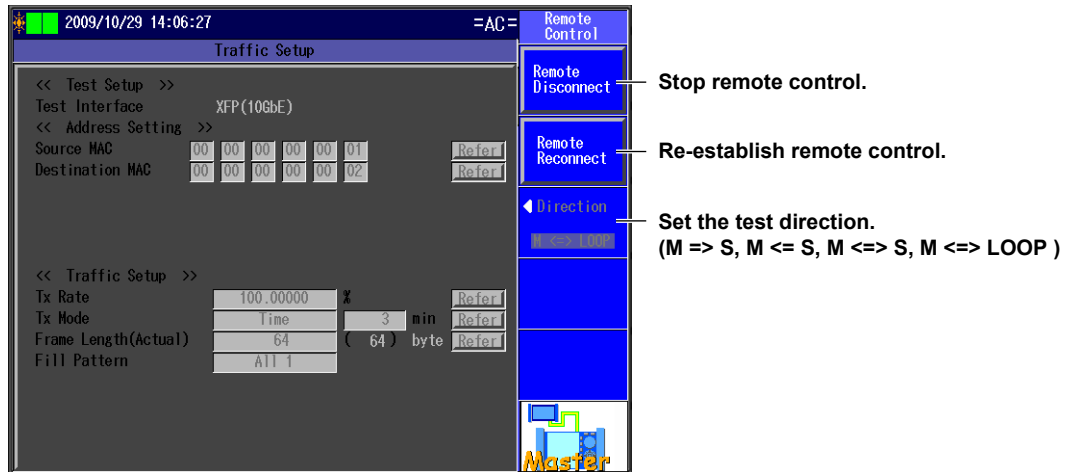
You can change the test item settings when you are displaying the slave settings.

## 5.7 Controlling the Other Device Remotely

### Procedure

Follow the procedure in section 5.4 to display the Auto Setup screen.

Press the **Remote Control** soft key to display the following screen.



### Explanation

#### Remote Disconnect

Press this soft key to stop remote control from the master. When you press this key, the remote communication between the master and the slave through the test interface is cut off.

#### Remote Reconnect

Press this soft key after the remote connection has been cut off to reconnect from the master. When you press this key, the remote communication between the master and the slave through the test interface is re-established.

#### Direction

In Auto(Remote) mode, you can specify the direction in which remote testing is performed.

#### Non-Loopback Testing

- M => S: Testing is performed in the direction of the master to the slave.
- M <= S: Testing is performed in the direction of the slave to the master.
- M <=> S: Testing is performed in both directions: from the master to the slave and from the slave to the master.

#### Loopback Testing

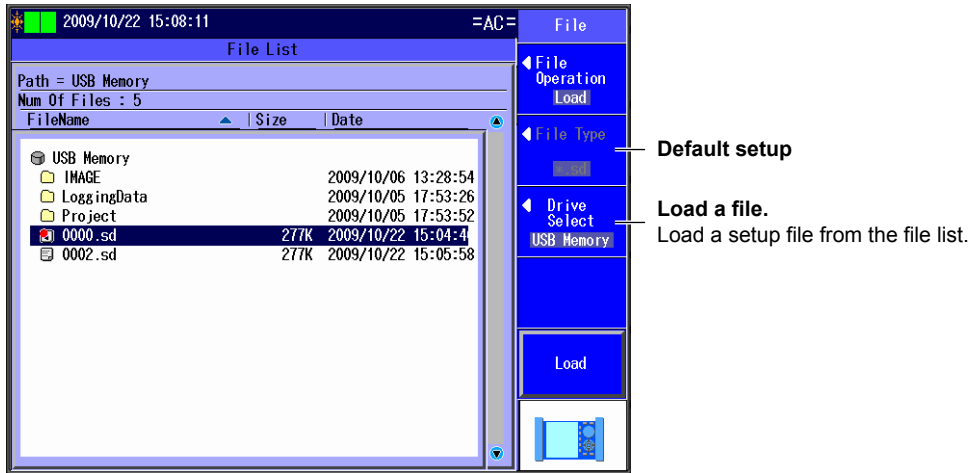
- M <=> LOOP: When the slave is set to Loopback Test mode, the direction setting is fixed at M <=> LOOP.

# 6.1 Selecting a Setup File

## Procedure

### Manual Setup Screen

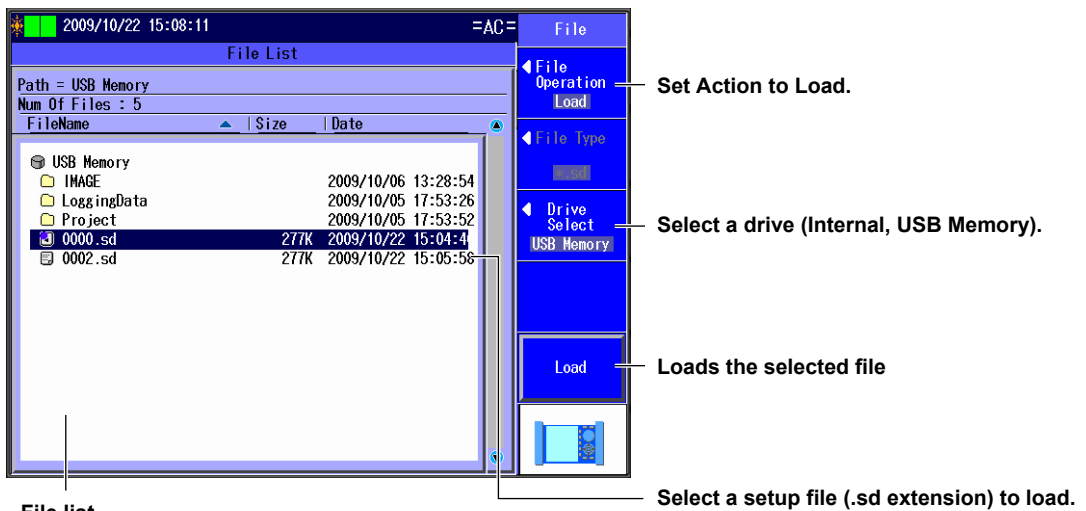
Press the **Manual** soft key and then the **Next 1/2** soft key to display the following screen.



**Default setup**  
**Load a file.**  
 Load a setup file from the file list.

### File Screen

Press the **File** soft key to display the following screen.



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

## Explanation

### Default Setup

Select this item to return to the default setup.

### File

Select this item to load a setup file (with an .sd extension) from the file list.

To create a setup file, you can use the setup software and send the file to the AQ1300/AQ1301, or you can save the settings on the AQ1300/AQ1301.

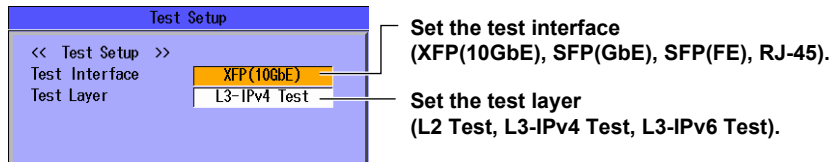


## 6.2 Setting Up a Test

### Procedure

#### Test Setup Screen

Press the **Manual** soft key and then the **Test Setup** soft key to display the following screen.



### Explanation

#### Test Interface

Specify which test interface to use.

- XFP (10GbE): Select this option to use the 10GBASE-R measurement port.
- SFP (GbE): Select this option to use the 1000BASE-X measurement port.
- SFP (FE): Select this option to use the 100BASE-FX measurement port.  
This interface is supported by firmware version R1.05.01.001 or later.
- RJ-45: Select this option to use the 10BASE-T/100BASE-TX/1000BASE-T measurement port.

#### Test Layer

Set the layer to test.

- L2 Test: Select this option to test layer 2.
- L3-IPv4 Test: Select this option to test layer 3 according to the IPv4 protocol.
- L3-IPv6 Test: Select this option to test layer 3 according to the IPv6 protocol.

## 6.3 Configuring Link and Address Settings

### Procedure

#### Link Setting Screen

Press the **Manual** soft key, the **Link/Address** soft key, and then the **Link Setting** soft key to display the following screen.

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

**Select this check box to continue transmission while the link is down.** This setting is valid when Test Interface is set to XFP(10GbE).

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

**Advertisement**  
This setting is valid when Test Interface is set to SFP(GbE) or RJ-45 and Negotiation is set to Auto.

**Link Setting screen (this screen)**

**Source Address Screen**

**Emulation Setting Screen**

**Destination Address Screen**

**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.

**Set the RF response (Auto, Manual).**  
This setting is valid when Test Interface is set to XFP (10GbE).

**Set the Tx clock source (Internal CLK, Received CLK).**  
This setting is valid when Test Interface is set to XFP (10GbE) or SFP(GbE).

**Select this check box to automatically detect mismatches in the auto negotiation during link establishment.**

#### Link Setting Acquisition

**Executes link setting information acquisition**  
Acquires the link setting information of the other device connected to the AQ1300/AQ1301

**Applies link settings**  
Applies the acquired other device's link settings to the AQ1300/AQ1301. You can execute this when the measurement interface is RJ-45 or SFP(GbE) and the acquisition status is Finish.

**Status (Preparing, Finish, Fail)**

**Cable type (Straight, Cross)**  
This setting is valid when Test Interface is set to RJ-45.

**Returns to the link setting screen**

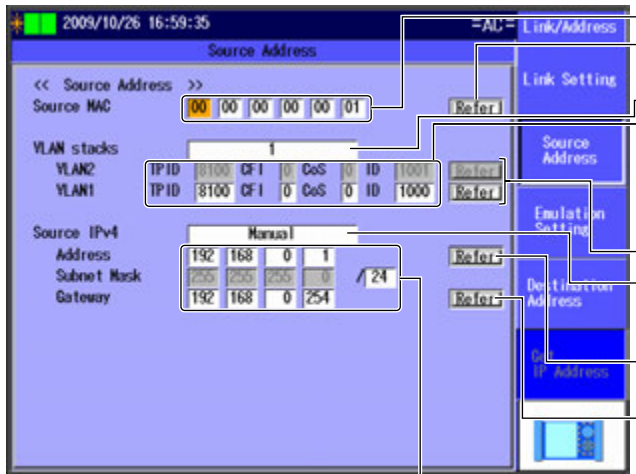
**UTP Cable Status**  
Indicates the UTP cable status as follows. (Normal, The cable may be defective. It is two-pair cable)

**Result of link setting information acquisition**

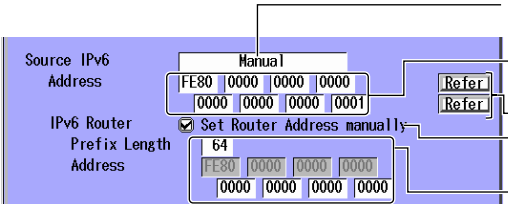
- **Negotiation (Auto, Manual)**
- **Speed (1G, 100M, 10M)**  
Appears when Test Interface is set to RJ-45
- **Duplex (Full, Half, --- (when negotiation is set to manual))**  
Appears when Test Interface is set to RJ-45
- **MDI (MDI, MDI-X)**  
Appears when Test Interface is set to RJ-45

### Source Address Screen

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



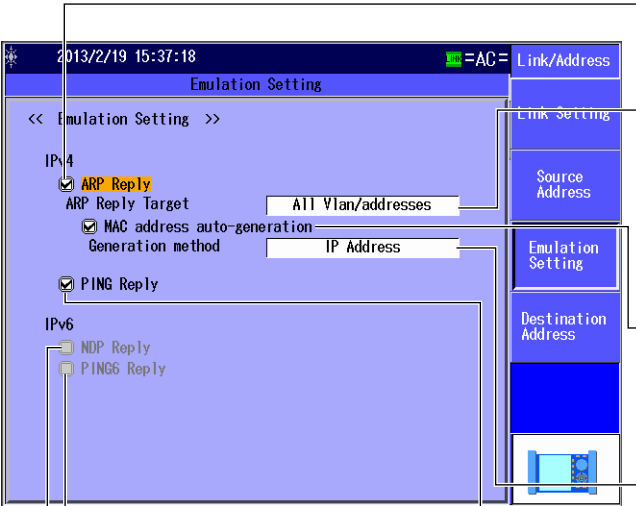
- Set the source MAC address. Refer to the MAC Address table. ▶ section 4.3
- Set the VLAN stack number (None, 1, 2). Configure the VLAN settings (TPID: 0-FFFF, CFI: 0-1, CoS: 0-7, ID: 0-4095). These settings are valid when VLAN stacks is set to 1 or 2.
- Refer to the VLAN table. ▶ section 4.3
- Set IPv4 (Manual, DHCP). This setting appears when Test Layer is set to L3-IPv4.
- Refer to the IP Address table. ▶ section 4.3
- Refer to the gateway reference. ▶ section 4.3
- 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.
- Set the source IPv6 address. This setting is valid when IPv6 is set to Manual.
- Refer to the IP Address table.
- Select this check box when you want to manually set the router address.
- View and set the IPv6 prefix length and the IPv6 router address.

### Emulation Setting Screen

Press the **Manual** soft key, the **Link/Address** soft key, and then the **Emulation Setting** soft key to display the following screen.



- Select this check box to perform ping6 replying. This setting is valid when Test Layer is set to L3-IPv6.
- Select this check box to perform NDP replying. This setting is valid when Test Layer is set to L3-IPv6.

- Select this check box to perform ARP replying. This setting is valid when Test Layer is set to L3-IPv4.
- Set the ARP reply target (Source Address only, All addresses, All Vlan/addresses)
  - This setting is valid when Test Layer is set to L3-IPv4.
  - You can select the All Vlan/addresses options when VLAN stacks of the Source Address setting is set to 1 or 2.
- Select this check box to automatically generate MAC addresses.
  - This setting is valid when Test Layer is set to L3-IPv4.
  - You can select this when ARP reply is selected.
- Set the MAC address generation method (IP Address, VLAN ID).
  - This setting is valid when Test Layer is set to L3-IPv4.
  - You can select the VLAN ID option when ARP reply target is set to All Vlan/addresses.
- Select this check box to perform ping replying. This setting is valid when Test Layer is set to L3-IPv4.

## Destination Address Screen

Press the **Manual** soft key, the **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. ▶ section 4.3

**Set the destination IPv4 address.**  
This setting appears when Test Layer is set to L3-IPv4.  
Refer to the IP Address table. ▶ section 4.3

**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. ▶ section 4.3

## Search List

Press the **Search List** soft key to display the following screen.

**Search for other devices.**  
When you press this soft key, the AQ1300/AQ1301 searches for other devices (AQ1300 or AQ1301) on the same network segment.

↓ Search for other devices

**Area of the search list that changes when you switch the display**

**Switches the search list display (SerialNo+Ver, Test Setup, Status+MAC, IPv4/IPv6, Master Addr)**

**Set the address type (MAC Address, IP Address).**  
This setting appears when Switch is set to Master Addr.

**Select the address of the other device (the destination address) from the search list.**

**To the next page (1 to 16, 17 to 32, 33 to 48, 49 to 64)**

**Explanation**

**Link Setting Screen**

**Negotiation**

Select whether or not to use auto negotiation. This setting is valid when Test Interface is set to RJ-45 or SFP(GbE).

- Auto: The link between the AQ1300/AQ1301 and the device that it is connected to is configured automatically through auto negotiation.
- Manual: The link must be configured manually.

**Advertisement**

The connection types that can be offered are advertised when Test Interface is set to SFP(GbE) or RJ-45 and Negotiation is set to Auto.

Advertisement	SFP	RJ-45
1000M-FULL	No	Yes
100M-FULL, 100M-HALF	No	Yes
10M-FULL, 10M-HALF	No	Yes
Flow(Sym), Flow(Asym)	Yes	Yes

**Speed**

When Test Interface is set to RJ-45, you can set the link speed.

- 1G: A 1 Gbit/s 1000BASE-T connection is used.
- 100M: A 100 Mbit/s 100BASE-TX connection is used.
- 10M: A 10 Mbit/s 10BASE-T connection is used.
- Auto: The link speed is set automatically. This setting is valid when Negotiation is set to Auto.

**Note**

---

When Test Interface is set to XFP(10GbE), the link speed is fixed at 10G. When Test Interface is set to SFP(GbE), the link speed is fixed at 1G. When Test Interface is set to SFP(FE), the link speed is fixed at 100M

---

**Duplex**

You can set the communication mode for when Speed is set to 100M or 10M. This setting is valid when Test Interface is set to RJ-45.

- FULL: Full duplex communication
- HALF: Half duplex communication
- Auto: The AQ1300/AQ1301 chooses full or half duplex automatically. This setting is valid when Negotiation is set to Auto.

**Note**

---

When Test Interface is set to XFP(10GbE), SFP(GbE), or SFP(FE), or when it is set to RJ-45 and Speed is set to 1G, the duplex mode is fixed at FULL.

---

**Flow Control**

You can enable or disable flow control.

- ON: Flow control is enabled.
- OFF: Flow control is disabled.

**MDI**

You can set the measurement port to straight or crossover mode. This setting is valid when Test Interface is set to RJ-45.

- MDI: Straight
- MDI-X: Cross
- Auto: The AQ1300/AQ1301 switches between straight and crossover mode automatically (this setting is valid when Negotiation is set to Auto).

**RF Response Setting**

You can select whether or not to automatically respond with an RF when Test Interface is set to XFP(10GbE) and a linkdown is detected or an LF is received.

- Auto: The AQ1300/AQ1301 automatically responds with an RF.
- Manual: The AQ1300/AQ1301 does not automatically respond with an RF.

**Continuing to Transmit while the Link Is Down**

When Test Interface is set to XFP(10GbE), you can specify whether to continue or stop transmission after a linkdown is detected.

- Selected: Transmission continues when a linkdown is detected.
- Cleared: Transmission stops when a linkdown is detected.

**Tx Clock Source Setting**

Specify the Tx clock source for when Test Interface is set to XFP(10GbE) or SFP(GbE).

When Test Interface is set to SFP(FE) or RJ-45, the Tx clock source is fixed to the internal clock.

- Internal CLK: The internal clock is used.
- Received CLK: The AQ1300/AQ1301 synchronizes with the Rx line signal.

When Test Mode is set to Loopback Test, if Test Interface is set to XFP(GbE) or SFP(GbE), the AQ1300/AQ1301 uses the received clock regardless of the Tx clock source setting.

**Link Setting Acquisition**

If the interface is SFP(GbE) or RJ-45, you can acquire and display link setting information of the other device (DUT; the device on the user side) connected to the AQ1300/AQ1301. For details, see section 4.3.

**Source Address Screen****Source MAC Address**

Set the source MAC address. You can refer to the MAC Address table to set the address.

**VLAN Stacks**

Set the number of VLAN stacks.

- None: No VLAN stacks.
- 1: One VLAN stack.
- 2: Two VLAN stacks.

**VLAN1 and VLAN2**

Set the TPID (Tag Protocol Identifier), CFI (Canonical Format Indicator), CoS (Class of Service), and VLAN-ID for when there are one or two VLAN stacks. You can refer to the VLAN table to set the values.

- TPID: 0 to FFFF
- CFI: 0 or 1
- CoS: 0 to 7
- ID: 0 to 4095

**IPv4**

Select whether to specify the source IPv4 address manually or to acquire and set it automatically through DHCP. This setting is valid when Test Layer is set to L3-IPv4 Test.

- Manual: You must set the source IPv4 address manually.
- DHCP: When you press Get IP Address, the AQ1300/AQ1301 acquires and sets the source IPv4 address using DHCP.

**Source IPv4 Address, Subnet Mask, and Gateway**

Set the source IPv4 address, subnet mask, and gateway when IPv4 is set to Manual. You can refer to the IP Address table and the gateway reference to configure the settings.

- Subnet Mask: 1 to 31

**IPv6**

Select whether to specify the source IPv6 address manually or to specify it through stateless autoconfiguration using the RA from an IPv6 router. This setting is valid when Test Layer is set to L3-IPv6 Test.

- Manual: You must set the source IPv6 address manually.
- Stateless Address: When you press Get IP Address, the AQ1300/AQ1301 autoconfigures the source IPv6 address.

## 6.3 Configuring Link and Address Settings

---

### Source IPv6 Address

Set the source IPv6 address when IPv6 is set to Manual. You can refer to the IP Address table to set the address.

### IPv6 Router Address

You can automatically acquire the router address or set it manually.

- Automatic: Clear the Set Router Address manually check box. The IPv6 prefix length and router address that have been acquired automatically are displayed.
- Manual: Select the Set Router Address manually check box. You can manually set the prefix length and router address.

### MAC Address Table

Select the source MAC address from the MAC Address table.

- Global Address: You can set the source MAC address to a global address.

### VLAN Table

Select the VLAN CoS and ID from the VLAN table.

### IP Address Table

Select the source IP address from the IP Address table.

- Get IP Address: Press this soft key to get the IP address. The AQ1300/AQ1301 will acquire an IP address, using DHCP when the test layer is L3-IPv4 or stateless autoconfiguration when the test layer is L3-IPv6.

### Gateway

Set the gateway.

- Manual: Select this option to set the gateway manually.
- Auto.1: Select this option to set the gateway to xxx.xxx.xxx.1.
- Auto.254: Select this option to set the gateway to xxx.xxx.xxx.254.

## Emulation Setting Screen

### ARP Reply

Select whether or not to send ARP replies to ARP requests when the test layer is L3-IPv4.

- Selected: ARP replies are sent.
- Cleared: ARP replies are not sent.

### ARP Reply Target Setting

When the test layer is L3-IPv4 and ARP Reply is selected, you can specify the ARP reply target frames.

- Source Address only: The AQ1300/AQ1301 will send ARP replies to ARP requests that are directed at the source address.
- All addresses: The AQ1300/AQ1301 will send ARP replies to ARP requests, regardless of the address that they are directed at.
- All Vlan/addresses: The AQ1300/AQ1301 will send ARP replies to ARP requests that are directed at all VLAN ID/addresses. You can select this option when the VLAN stacks in the source address settings is set to 1 or 2.

### Automatically Generating MAC Addresses

If the test layer is L3-IPv4, set whether to automatically generate its own port's MAC address that is included in ARP replies.

- Selected: The MAC address is automatically generated. You can select this check box when the ARP reply check box is selected.
- Cleared: The MAC address is not automatically generated. The source MAC address is used in ARP replies.

### Setting the MAC Address Generation Method

If the test layer is L3-IPv4 and the "MAC address auto-generated" check box is selected, set the MAC address generation method.

- IP Address: The MAC address is generated automatically from the IP address. The request IP address (4 bytes) of the received ARP request frame is included in the lowest four bytes of the source MAC address.
- VLAN ID: The MAC address is generated automatically from the VLAN ID. The outer VLAN ID value (12 bits) of the received ARP request frame is included in the lowest 12 bits of the source MAC address. You can select this option when ARP Reply is set to All Vlan/addresses.

### PING Reply

Select whether or not to send ping replies to ping requests when the test layer is L3-IPv4.

- Selected: Ping replies are sent.
- Cleared: Ping replies are not sent.

When the test mode is set to Loopback, ping replies are not sent.

### NDP Reply

Select whether or not to send an NA (NDP reply) when an NS is received and the test layer is L3-IPv6.

- Selected: NDP replies are sent.
- Cleared: NDP replies are not sent.

### PING6 Reply

Select whether or not to send ping6 replies to ping6 requests when the test layer is L3-IPv6.

- Selected: Ping6 replies are sent.
- Cleared: Ping6 replies are not sent.

When the test mode is set to Loopback, ping6 replies are not sent.



### Destination Address Screen

#### Destination MAC Address

Set the destination MAC address. You can refer to the MAC Address table to set the address.

#### IPv4

Set the destination IPv4 address. This setting is valid when Test Layer is set to L3-IPv4 Test. You can refer to the IP Address table or select Search List to set the address.

#### IPv6

Set the destination IPv6 address. This setting is valid when Test Layer is set to L3-IPv6 Test. You can refer to the IP Address table or select Search List to set the address.

#### Search List

Select the address of the other device (the destination address) from the search list.

#### Searching for Other Devices

When you select Search other Device, the AQ1300/AQ1301 searches for other devices (AQ1300 or AQ1301) on the same VLAN or network segment and displays the results in the search list.

#### Switching the Display

You can switch between different search list displays.

- SerialNo+Ver: The equipment name, serial number, and version are displayed.
- Test Setup: The equipment name, test interface, and test layer are displayed.
- Status+MAC: The equipment name, status, and MAC address are displayed.
- IPv4/IPv6: The equipment name and IP address are displayed.
- Master Addr: The device name and master address (MAC or IP address) are displayed.

#### Note

---

You can check the equipment name and serial number of the AQ1300/AQ1301 in the system settings.

---

#### Setting the Address Type

You can switch the address type that is displayed when Switch is set to Master Addr.

- MAC address
- IP address

#### MAC Address Table

Select the destination MAC address from the MAC Address table.

- MAC Address (ARP): When the test layer is L3-IPv4, press this soft key to automatically acquire the destination MAC address.
- MAC Address (NDP): When the test layer is L3-IPv6, press this soft key to automatically acquire the destination MAC address.

#### IP Address Table

Select the destination IP address from the IP Address table.

#### Note

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All the tables are created on the setup software. For details, see the *Setup Software User's Manual*.

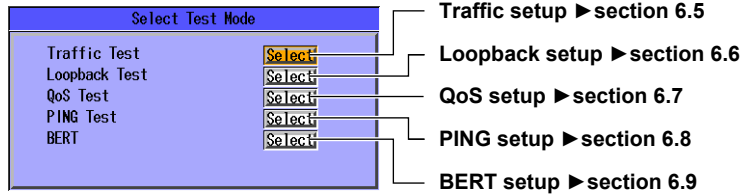
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## 6.4 Selecting a Test Mode

### Procedure

#### Select Test Mode Screen

Press the **Manual** soft key and then the **Test Item** soft key to display the following screen.



### Explanation

Select a test mode.

When you select a test mode, its setup screen will appear.

## 6.5 Configuring a Traffic Test

### Procedure

#### Traffic Setup Screen

Follow the procedure in section 6.4 to display the Traffic Setup screen.

#### Tx Setting Screen

Press the **Detail Setup** soft key and then the **Tx Setting** soft key to display the following screen.

The screenshot shows the Tx Setting screen with the following fields and callouts:

- Frame structure indication**: Points to the 'Traffic' header.
- Configure the frame settings.**: Points to the 'Tx Setting' soft key.
- Set the frame length (48-9999 bytes).**: Points to the 'Frame Length' field.
- Actual frame length indication**: Points to the '(Actual Length)' label.
- Select this check box to adjust the frame length.**: Points to the 'Frame Length' checkbox.
- Configure the frame length settings.**: Points to the 'Contents' field.
- Contents**: Points to the 'Contents' field.
- Configure field adjustment.**: Points to the 'Field' checkbox.
- Target field**: Points to the 'Target Field' field.
- Select this check box to adjust field settings.**: Points to the 'Field' checkbox.
- Set the payload check offset (Use Tx Frame setting, Manual).**: Points to the 'Payload Check Offset Setting' field.
- Set the offset (byte 0-255).**: Points to the 'Offset' field.
- This setting is valid when Manual is selected.**: Points to the 'Offset' field.

#### Frame Setting Screen

Press **Detail** next to Frame Structure.

Press the **Basic Setting** soft key to display the following screen.

#### Frame Setting (Basic setting) Screen

The screenshot shows the Frame Setting (Basic setting) screen with the following fields and callouts:

- Set the frame structure (MAC+TYPE, MAC+TYPE+IPv4, MAC+TYPE+IPv4+UDP, MAC+TYPE+IPv6, MAC+TYPE+IPv6+UDP).**: Points to the 'Frame Structure' field.
- Select this check box to refer to the source address for the VLAN settings.**: Points to the 'Refer to Source Address for the VLAN Setting' checkbox.
- Set the VLAN stack number (None, 1, 2).**: Points to the 'VLAN stacks' field.
- This setting is valid when the "Refer to Source Address for the VLAN Setting" check box is cleared.**: Points to the 'VLAN stacks' field.
- Set the frame length (48-9999 bytes).**: Points to the 'Frame Length' field.
- Actual frame length indication**: Points to the '(Actual Length)' label.
- Set the fill pattern (ALL0, ALL1, 0/1 alt., Random, Manual).**: Points to the 'Fill Pattern' field.
- Set the pattern value (0-FFFFFFF).**: Points to the 'Fill Pattern' field.
- This setting is valid when Manual is selected.**: Points to the 'Fill Pattern' field.
- Configure error addition (Unused, CRC Error, Symbol Error).**: Points to the 'Error Addition' field.

Press the **MAC** soft key to display the following screen.

#### Frame Setting (MAC) Screen

**Set the source MAC address (Manual, Source Setting).**

This setting is valid when Source MAC is set to Manual.

**Set the destination MAC address (Manual, Destination Setting).**

This setting is valid when Destination MAC is set to Manual.

Press the **VLAN** soft key to display the following screen.

#### Frame Setting (VLAN) Screen

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

#### Note

The VLAN soft key is valid in the following situations.

- When the number of VLAN stacks specified in the basic settings is one or two.
- When the "Refer to Source Address for the VLAN Setting" check box is selected in the basic settings and the number of VLAN stacks set for the source address is one or two.

## 6.5 Configuring a Traffic Test

Press the **IP** soft key to display the following screen.

### Frame Setting (IPv4) Screen

**Set the source IPv4 address (Manual, Source Setting).**

This setting is valid when Source IPv4 is set to Manual.

**Set the destination IPv4 address (Manual, Destination Setting).**

This setting is valid when Destination IPv4 is set to Manual.

**Set the ToS/DS (DSCP) (Manual, IPv4-ToS, IPv4-DSCP).**

**Value**  
(Manual: 0-FF, IPv4-ToS: 0-7, IPv4-DSCP: 0-63)

**Set the protocol (0-255).**

This setting is valid when Frame Structure is set to MAC+TYPE+IPv4.

### Frame Setting (IPv6) Screen

**Set the source IPv6 address (Manual, Source Setting).**

This setting is valid when Source IPv6 is set to Manual.

**Set the destination IPv6 address (Manual, Destination Setting).**

This setting is valid when Destination IPv6 is set to Manual.

**Set the ToS/DS (DSCP) (Manual, IPv6-TrafficClass, IPv6-DSCP).**

**Value**  
(Manual: 0-FF, IPv6-TrafficClass: 0-7, IPv6-DSCP: 0-63)

**Set the next header (0-255).**

This setting is valid when Frame Structure is set to MAC+TYPE+IPv6.

### Note

The IP soft key is valid when Frame Structure is set to MAC+TYPE+IPv4, MAC+TYPE+IPv4+UDP, MAC+TYPE+IPv6, or MAC+TYPE+IPv6+UDP.

Press the **UDP** soft key to display the following screen.

#### Frame Setting (UDP) Screen

Set the source port number (0-65535).

Set the destination port number (0-65535).

#### Note

The UDP soft key is valid when Frame Structure is set to MAC+TYPE+IPv4+UDP or MAC+TYPE+IPv6+UDP.

#### Variable Frame Length Screen

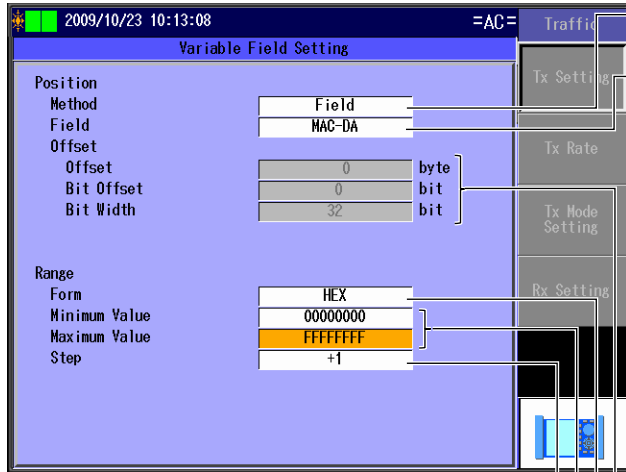
Press **Detail** next to Frame Length to display the following screen.

Set the adjustment range (64-9999 bytes).

Set the adjustment step (+1, -1, Random).

**Variable Field Setting Screen**

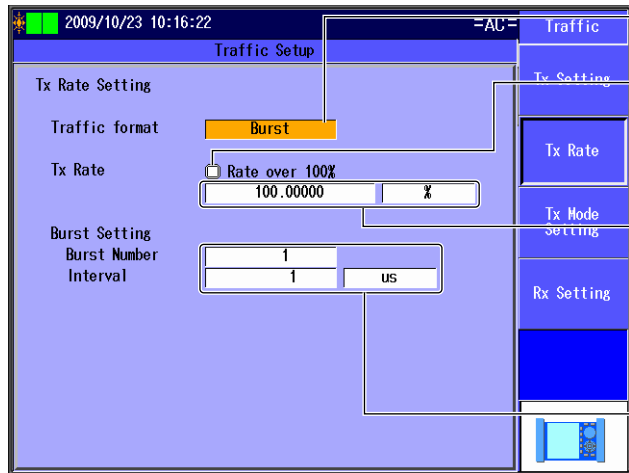
Press **Detail** next to Field to display the following screen.



- Set the method (Field, Offset).**
- Set the field.**  
This setting is valid when Method is set to Field.  
**(MAC-DA, MAC-SA, VLAN-ID, VLAN-CoS, IPv4-ToS, IPv4-DSCP, IPv4-DA, IPv4-SA, IPv4-Protocol, IPv6-DA, IPv6-SA, IPv6-TrafficClass, IPv6-DSCP, IPv6-NextHeader, L4-DP, L4-SP)**  
The items that you can set vary depending on how the settings in the Tx Setting screen and the frame structure and VLAN settings in the Frame Setting screen are configured.
- Set the offset.**  
This setting is valid when Method is set to Offset.  
**Offset (0-9998 bytes)**  
**Bit offset (0-31 bits)**  
**Bit width (1-32 bits)**
- Set the input format (DEC, HEX).**
- Set the upper and lower limits of the adjustment range (DEC: 0-4294967295, HEX: 0-FFFFFFFF).**  
The range varies depending on the specified bit width.
- Set the adjustment step (+1, Random).**

**Tx Rate Screen**

Press the **Detail Setup** soft key and then the **Tx Rate** soft key to display the following screen.



- Set the traffic format (Constant, Burst).**
- Select this check box to send frames at rates that exceed 100% of the Tx rate (when this check box is selected, the Tx rate can only be set in bits).**
- Set the Tx rate**  
(when Frame Length is set to 64 bytes and Test Interface is set to XFP).  
**Percentage range: 0.00001-100.00000**  
**Bit range: 72-9999999424**  
**fps range: 1.00000-14880952.38095 fps**
- Set the unit (% , bit, fps).**
- Set the burst number (1-65535).**
- Set the interval (1-1000000 us, 1-1000 ms).**
- Set the unit (us, ms).**  
These settings are valid when the traffic format is "Burst."

## Tx Mode Setting Screen

Press the **Detail Setup** soft key and then the **Tx Mode Setting** soft key to display the following screen.

**Set the Tx mode (Continuous, Frames, Time).**

**Set the number of frames (1-4294967295).**  
This setting appears when Tx Mode is set to Frames.

**Set the time (1-86400 s).**  
This setting appears when Tx Mode is set to Time.

## Rx Setting Screen

Press the **Detail Setup** soft key and then the **Rx Setting** soft key to display the following screen.

**Set the oversize threshold (65-10,000 bytes).**

**Select this check box to detect payload errors.**

**Set the offset (Match to Tx Setting, Manual).**

**Set the offset byte (byte 0-255).**  
This setting is valid when offset is set to Manual.

**Set the frames to take statistics of (Test Frame Only, All Frames).**

**Frame structure indication**  
Configure the frame settings.

**Set the Rx base filter methods.**  
Configure the Rx base filter.

**Set the frame pass condition (Match, Mismatch).**

**Set how Rx base filters 1 and 2 are combined (AND, OR).**

**Select a check box to use the corresponding Rx base filter.**



## 6.5 Configuring a Traffic Test

### Frame Setting Screen

Press **Detail** next to Frame Structure to display the following screen.

The screenshot shows the 'Frame Setting' screen with the following configuration:

- Frame Structure:** MAC+TYPE+IPv4+UDP
- Refer to Source Address for the VLAN Setting:**
- VLAN stacks:** None
- Tx Setting:** Traffic
- Tx Rate:** (empty)
- Tx Mode Setting:** (empty)
- Rx Setting:** (empty)
- Filter2:** Filter2
- Combination:** AND
- Offset:** (empty)
- Condition:** Match

Annotations on the right side of the screen provide instructions:

- Set the frame structure (MAC+TYPE, MAC+TYPE+IPv4, MAC+TYPE+IPv4+UDP, MAC+TYPE+IPv6, MAC+TYPE+IPv6+UDP).**
- Select this check box to refer to the source address for the VLAN settings.**
- Set the VLAN stack number (None, 1, 2). This setting is valid when the "Refer to Source Address for the VLAN Setting" check box is cleared.**

### Note

The AQ1300/AQ1301 will receive the type of frames specified by the Frame Structure setting.

### Rx Base Filter Setting Screen

Press **Detail** next to a filter to display the following screen.

The screenshot shows the 'Rx Base Filter Setting' screen with the following configuration:

- Method:** Offset
- Field:** MAC-DA
- Offset:** 0 byte
- Bit/Mask:** 0 bit
- Bit Offset:** 32 bit
- Width in bits:** 32 bit
- Pattern Form:** HEX
- Pattern:** 00 00 00 00

Annotations on the right side of the screen provide instructions:

- Set the method (Field, Offset).**
- Set the field.** This setting is valid when Method is set to Field. (MAC-DA, MAC-SA, VLAN-ID, VLAN-CoS, IPv4-ToS, IPv4-DSCP, IPv4-DA, IPv4-SA, IPv4-Protocol, IPv6-DA, IPv6-SA, IPv6-TrafficClass, IPv6-DSCP, IPv6-NextHeader, L4-DP, L4-SP) The items that you can set vary depending on how the settings in the Rx Setting screen and the frame structure and VLAN settings in the Frame Setting screen are configured.
- Set the offset.** This setting is valid when Method is set to Offset. **Offset (0-255 bytes).**
- Bit/Mask**
  - Bit offset (0-47 bits)**
  - Bit width (1-48 bits)**
 This setting appears when Bit/Mask is set to Bit.
- Set the input format (DEC, HEX, IPv4).**
- Set the pattern.**

A detailed view of the Bit/Mask section is shown below:

- Bit/Mask:** Mask
- Length:** 4 byte
- Mask Pattern:** FF FF FF FF

Annotation for this section: **Set the byte length (1-6 bytes) and the master pattern.** This setting appears when Bit/Mask is set to Mask.

**Explanation****Tx Setting Screen****Tx Frame Setting****Frame Structure**

The specified frame structure is displayed.

**Detail**

Press to configure the Tx frame settings in the Frame Setting screen.

**Frame Length and Actual Length**

Set the Tx frame length. The actual frame length that corresponds to the length you set is also displayed. For details, see the Frame Setting (basic setting) screen.

Range: 48 to 9999 bytes

**Variable Setting****Frame Length**

Select whether or not to adjust the frame length.

- Selected: The frame length is adjusted.
- Cleared: The frame length is not adjusted.

**Detail**

Press to adjust the frame length in the Variable Frame Length screen.

**Contents Indication**

The frame length adjustment that you have specified is indicated next to contents.

**Field**

Select whether or not to adjust the field settings.

- Selected: The field settings are adjusted.
- Cleared: The field settings are not adjusted.

**Detail**

Press to adjust the field settings in the Variable Field Setting screen.

**Target Field Indication**

The field adjustment type that you have specified is indicated next to Target Field.

**Payload Check Offset Setting****Offset**

You can specify the offset from the start of the payload frame.

- Use Tx Frame setting: The offset is based on the start of the Tx frame payload.
- Manual: You must set the offset manually.

**Offset Setting**

When you have chosen to specify the offset manually, you can specify a value within the following range.

Range: 0 to 255 bytes

**Note****Cautions about Manual Offset**

When the payload offset is set behind the test tag of the Tx frame, payload checking may not work properly.

### Frame Setting (Basic setting) Screen

#### Frame Structure

Set the Tx frame structure.

MAC+TYPE

MAC+TYPE+IPv4

MAC+TYPE+IPv4+UDP

MAC+TYPE+IPv6

MAC+TYPE+IPv6+UDP

#### Note

---

- In Manual mode, regardless of the test layer specified in the test setup, the frames of the type specified by the Frame Structure setting are sent.
  - If you use the frame builder in the setup software and create a frame whose structure does not match one of those listed above, the frame structure is indicated as "Unknown."
  - After you change from an unknown frame structure to another frame structure, you cannot return to the unknown frame structure.
- 

#### Refer to Source Address for the VLAN Setting

Select whether or not to refer to the source address for the VLAN settings.

- Selected: The AQ1300/AQ1301 refers to the source address for the VLAN settings.
- Cleared: The AQ1300/AQ1301 does not refer to the source address for the VLAN settings.

#### VLAN Stacks

When the "Refer to Source Address for the VLAN Setting" check box is cleared, set the number of VLAN stacks.

- None: No VLAN stacks.
- 1: One VLAN stack.
- 2: Two VLAN stacks.

#### Note

---

If you use the setup software to specify three or more VLAN stacks, the frame structure is indicated as "Unknown" on the AQ1300/AQ1301.

---

#### Frame Length and Actual Length

Set the Tx frame length.

Range: 48 to 9999 bytes

The actual frame length that corresponds to the length you set is also displayed. When the "Refer to Source Address for the VLAN Setting" check box is selected, the actual frame length changes according to the number of VLAN stacks specified for the source address.

1 VLAN stack: +4 bytes

2 VLAN stacks: +8 bytes

#### Fill Pattern

Specify the fill pattern to insert into the payload area.

- ALL0: All zeros
- ALL1: All ones
- 0/1: Alternating zeros and ones
- Random: A random pattern
- Manual: A user-specified pattern

#### Pattern Value

When Fill Pattern is set to Manual, specify the pattern value.

Range: 0 to FFFFFFFF

### Error Addition

Select whether or not to add errors to Tx frames.

- Unused: Errors are not added to Tx frames.
- CRC Error: CRC errors are added to Tx frames.
- Symbol Error: Symbol errors are added to Tx frames.

### Frame Setting (MAC) Screen

#### Source MAC Address

Set the source MAC address.

- Manual: You must set the source MAC address manually.
- Source Setting: The MAC address specified in the source address settings is used.

#### Source MAC Address Value

Set the MAC address when Source MAC is set to Manual.

#### Destination MAC Address

Set the destination MAC address.

- Manual: You must set the destination MAC address manually.
- Destination Setting: The MAC address specified in the destination settings is used.

#### Destination MAC Address Value

Set the MAC address when Destination MAC is set to Manual.

### Frame Setting (VLAN) Screen

#### VLAN1/VLAN2

Set the TPID (Tag Protocol Identifier), CFI (Canonical Format Indicator), CoS (Class of Service), and VLAN-ID for when there are VLAN stacks.

- TPID: 0 to FFFF
- CFI: 0 or 1
- CoS: 0 to 7
- ID: 0 to 4095

### Note

The VLAN soft key is valid in the following situations.

- When the number of VLAN stacks specified in the basic settings is one or two.
- When the "Refer to Source Address for the VLAN Setting" check box is selected in the basic settings and the number of VLAN stacks set for the source address is one or two.

### Frame Setting (IPv4) Screen

#### Source IPv4 Address

Set the source IPv4 address.

- Manual: You must set the source IPv4 address manually.
- Source Setting: The IPv4 address specified in the source settings is used.

#### Source IPv4 Address Value

Set the IPv4 address when Source IPv4 is set to Manual.

## 6.5 Configuring a Traffic Test

---

### Destination IPv4 Address

Set the destination IPv4 address.

- Manual: You must set the destination IPv4 address manually.
- Destination Setting: The IPv4 address specified in the destination settings is used.

### Destination IPv4 Address Value

Set the IPv4 address when Destination IPv4 is set to Manual.

### ToS/DS (DSCP)

Set the IPv4 ToS/DS (DSCP).

- Manual: Set the ToS/DS (DSCP) manually.
- IPv4-ToS: Set the IPv4-ToS.
- IPv4-DSCP: Set the IPv4-DSCP.

### Value

Set the IPv4 ToS/DS (DSCP) value.

- Manual: 0 to FF
- IPv4-ToS: 0 to 7
- IPv4-DSCP: 0 to 63

### Protocol

Set the protocol value for when Frame Structure is set to MAC+TYPE+IPv4.

Range: 0 to 255

### Frame Setting (IPv6) Screen

#### Source IPv6 Address

Set the source IPv6 address.

- Manual: You must set the source IPv6 address manually.
- Source Setting: The IPv6 address specified in the source settings is used.

#### Source IPv6 Address Value

Set the IPv6 address when Source IPv6 is set to Manual.

#### Destination IPv6 Address

Set the destination IPv6 address.

- Manual: You must set the destination IPv6 address manually.
- Destination Setting: The IPv6 address specified in the destination settings is used.

#### Destination IPv6 Address Value

Set the IPv6 address when Destination IPv6 is set to Manual.

### ToS/DS (DSCP)

Set the IPv6 ToS/DS (DSCP).

- Manual: Set the ToS/DS (DSCP) manually.
- IPv6-TrafficClass: Set the IPv6-TrafficClass.
- IPv6-DSCP: Set the IPv6-DSCP.

**Value**

Set the IPv6 ToS/DS (DSCP) value.

- Manual: 0 to FF
- IPv6-TrafficClass: 0 to 7
- IPv6-DSCP: 0 to 63

**Next Header**

Set the next header for when Frame Structure is set to MAC+TYPE+IPv6.

Range: 0 to 255

**Note**

---

The IP soft key is valid when Frame Structure is set to MAC+TYPE+IPv4, MAC+TYPE+IPv4+UDP, MAC+TYPE+IPv6, or MAC+TYPE+IPv6+UDP.

---

**Frame Setting (UDP) Screen****Source Port#**

Set the source port number.

Range: 0 to 65535

**Destination Port#**

Set the destination port number.

Range: 0 to 65535

**Note**

---

The UDP soft key is valid when Frame Structure is set to MAC+TYPE+IPv4+UDP or MAC+TYPE+IPv6+UDP.

---

**Variable Frame Length Screen****Range**

Set the frame length adjustment range.

Range: 64 to 9999 bytes

**Step**

Set the frame length adjustment step.

- +1: The length is adjusted within the specified range in steps of +1.
- -1: The length is adjusted within the specified range in steps of -1.
- Random: The length is adjusted within the specified range randomly.

**Variable Field Setting Screen****Method**

Select the field adjustment method.

- Field: Specify a field.
- Offset: Specify an offset.

## 6.5 Configuring a Traffic Test

### Field

Set the fields to adjust when Type is set to Field.

Field	Frame Structure*					Description	Notes
	MAC	IPv4	UDP(v4)	IPv6	UDP(v6)		
MAC-DA/MAC-SA	Yes	Yes	Yes	Yes	Yes	The least significant four bytes of the source/destination MAC address are adjusted.	
VLAN-ID	Yes	Yes	Yes	Yes	Yes	The VLAN ID	When there are VLAN stacks
VLAN-CoS	Yes	Yes	Yes	Yes	Yes	The VLAN Class of Service	
IPv4-ToS	No	Yes	Yes	No	No	The IPv4 Type of Service The most significant three bits of the ToS field are adjusted.	
IPv4-DSCP	No	Yes	Yes	No	No	The IPv4 DiffServ Code Point The most significant six bits of the ToS field are adjusted.	
IPv4-DA/IPv4-SA	No	Yes	Yes	No	No	The source/destination IPv4 address	
IPv4-Protocol	No	Yes	Yes	No	No	The IPv4 protocol	
IPv6-DA/IPv6-SA	No	No	No	Yes	Yes	The least significant four bytes of the source/destination IPv6 address are adjusted.	
IPv6-TrafficClass	No	No	No	Yes	Yes	The IPv6 Traffic Class The most significant three bits of the ToS field are adjusted.	
IPv6-DSCP	No	No	No	Yes	Yes	The IPv6 DiffServ Code Point The most significant six bits of the ToS field are adjusted.	
IPv6-NextHeader	No	No	No	Yes	Yes	The IPv6 NextHeader	
L4-DP/L4-SP	No	No	Yes	No	Yes	The L4 Dst/Src Port	When UDP is selected

- \* MAC:           MAC+TYPE
- IPv4:        MAC+TYPE+IPv4
- UDP(v4):    MAC+TYPE+IPv4+UDP
- IPv6:        MAC+TYPE+IPv6
- UDP(v6):    MAC+TYPE+IPv6+UDP

### Offset Setting

Set the fields to adjust when Type is set to Offset.

#### Offset

Select the field adjustment offset.

Range: 0 to 9998 bytes

#### Bit Offset

Select the field adjustment bit offset.

Range: 0 to 31 bits

#### Bit Width

Select the field adjustment bit width.

Range: 1 to 32 bits

### Form

Select the field adjustment value input format.

- DEC:   The value input format is decimal.
- HEX:   The value input format is hexadecimal.

### Minimum and Maximum Values

Set the field adjustment value range.

When Type is set to Offset: 0 to 4294967295 (DEC) or 0 to FFFFFFFF (HEX)

The range varies depending on the specified bit width.

When Type is set to Field:

Field	Range	
	DEC	HEX
MAC-DA/MAC-SA*	0 to 4294967295	0 to FFFFFFFF
VLAN-ID	0 to 4095	0 to FFF
VLAN-CoS	0 to 7	0 to 7
IPv4-ToS	0 to 7	0 to 7
IPv4-DSCP	0 to 63	0 to 3f
IPv4-DA/IPv4-SA	0 to 4294967295	0 to FFFFFFFF
IPv4-Protocol	0 to 255	0 to FF
IPv6-TrafficClass	0 to 7	0 to 7
IPv6-DSCP	0 to 63	0 to 3f
IPv6-DA/IPv6-SA*	0 to 4294967295	0 to FFFFFFFF
IPv6-NextHeader	0 to 255	0 to FF
L4-DP/L4-SP	0 to 65535	0 to FFFF

\* The least significant 32 bits are adjusted.

### Step

Select the field adjustment step.

- +1: The length is adjusted within the specified range in steps of +1.
- Random: The length is adjusted within the specified range randomly.

## Tx Rate Screen

### Traffic Format

Set the traffic format to use when sending frames.

- Constant: Frames are sent at a constant rate.
- Burst: Frames are sent in bursts. (Frame transmission starts and stops repeatedly at a specified interval.)

### Tx Rate

#### Rate over 100%

Select whether or not to send frames at rates that exceed 100% of the Tx rate.

- Selected: Frames are sent at rates that exceed 100% of the Tx rate.
- Cleared: Frames are not sent at rates that exceed 100% of the Tx rate.

When the "Rate over 100%" check box is selected, the Tx rate can only be set in bits.

When Test Interface is set to SFP(FE), this setting is fixed to off, and you cannot select this check box to send frames at rates that exceed 100% of the Tx rate.

#### Tx Rate Value

Set the Tx rate value.

When Frame Length is set to 64 bytes and Test Interface is set to XFP(10GbE).

- Percentage range: 0.00001 to 100.00000%
- Bit range: 72 to 9999999424 bits
- fps range: 1.00000 to 14880952.38095 fps

#### Unit

Set the Tx rate unit.

%, bit, fps



### **Burst Setting**

These settings are valid when the traffic format is “Burst.”

#### **Burst Number**

Specify the number of burst frames.

Range: 1 to 65535

#### **Interval**

Set the interval.

1 to 1000000 us, 1 to 1000 ms

#### **Unit Setting**

Set the unit of the interval.

us, ms

## **Tx Mode Setting Screen**

### **Tx Mode**

Set the Tx mode.

- **Continuous:** In this mode, frames are transmitted continuously. After you start transmission, it continues until you stop it.
- **Frames:** In this mode, a specified number of frames is transmitted. After you start transmission, the specified number of frames is sent, and then transmission is stopped automatically.
- **Time:** In this mode, frames are transmitted for a specified period of time. After you start transmission, it continues for the specified period of time and is then stopped automatically.

### **Frames**

When Tx Mode is set to Frames, set the number of frames.

Range: 1 to 4,294,967,295

### **Tx Time**

When Tx Mode is set to Time, set the Tx time.

Range: 1 to 86400 s

## **Rx Setting Screen**

### **Oversize Threshold**

Set the threshold for determining oversize frames.

Range: 65 to 10000 bytes

### **Detect Payload Error**

Select whether or not to detect payload errors.

- **Selected:** Payload errors are detected.
- **Cleared:** Payload errors are not detected.

### **Offset**

You can specify the offset from the start of the payload frame.

- **Match to Tx Setting:** The offset is based on the source setting.
- **Manual:** You must set the offset manually.

### **Offset Byte Setting**

Specify the offset byte for when Offset is set to Manual.

Range: Byte 0 to 255

### Target Frame Setting

Set which frames to take statistics of.

- Test Frame Only: Statistics are only taken for test frames.
- All Frames: Statistics are taken for all frames.

### Rx Base Filter Setting

#### Frame Structure

The specified frame structure is displayed.

#### Note

The AQ1300/AQ1301 will receive the type of frames specified by the Frame Structure setting.

#### Detail

Press to configure the Rx frame settings in the Frame Setting screen.

#### Filter 1 and 2

Specify the Rx base filters that you want to use.

- Selected: The Rx base filter is used.
- Cleared: The Rx base filter is not used.

The selected Rx base filter type is displayed.

#### Detail

Press to configure the Rx base filter settings in the Rx Base Filter Setting screen.

#### Combination

Set the combination condition for Rx base filters 1 and 2.

- AND: The conditions of the Rx base filters are combined using AND logic.
- OR: The conditions of the Rx base filters are combined using OR logic.

#### Condition

Select the type of frame to allow to pass through the Rx base filters. The AQ1300/AQ1301 takes the statistics of the frames that pass through the filters.

- Match: Frames that match the filter conditions pass through the filters.
- Mismatch: Frames that do not match the filter conditions pass through the filters.

### Frame Setting Screen

#### Frame Structure, Refer to Source Address for the VLAN Setting, and VLAN Stacks

These settings are the same as the settings in the Frame Setting (Basic setting) screen. For details, see the Frame Setting (basic setting) screen.

### Rx Base Filter Setting Screen

#### Method

Set the Rx base filter method.

- Field: Specify a field.
- Offset: Specify an offset.

#### Field

Set the Rx base filter when Type is set to Field.

The settings that you can specify are the same as the ones that you can specify in the Variable Field Setting screen. For details, see the Variable Field Setting screen.

## 6.5 Configuring a Traffic Test

---

### Offset Setting

Set the Rx base filter when Type is set to Offset.

### Offset

Set the Rx base filter offset.

Range: 0 to 255 bytes

### Bit/Mask

Set the pattern comparison method for when the Rx base filter method is offset.

- **Bit:** The Rx data is compared using the specified bit offset, width, and comparison pattern. Comparison occurs within the specified bit width.
- **Mask:** The Rx data is compared using the specified comparison byte length, mask pattern, and comparison pattern. Only areas where the mask pattern bit is 1 are compared.

### Bit Offset

Set the Rx base filter bit offset. This setting is valid when Bit/Mask is set to Bit.

Range: 0 to 47 bits

### Width in bits

Set the Rx base filter width in bits. This setting is valid when Bit/Mask is set to Bit.

Range: 1 to 48 bits

### Length

Set the Rx base filter comparison byte length. This setting is valid when Bit/Mask is set to Mask.

Range: 1 to 6 bytes

### Mask Pattern

Set the Rx base filter mask pattern. This setting is valid when Bit/Mask is set to Mask.

### Form

Select the field adjustment value input format.

- **DEC:** The value input format is decimal.
- **HEX:** The value input format is hexadecimal.
- **IPv4:** The value input format is IPv4.

### Pattern

Set the Rx base filter comparison pattern.

## 6.6 Configuring a Loopback Test

### Procedure

#### Loopback Setup Screen

Follow the procedure in section 6.4 to display the Loopback Setup screen. Press the **Detail Setup** soft key to display the following screen.

The screenshot shows the 'Loopback Setup' screen with the following elements:

- Target:** A text input field containing 'Source Address'.
- Swap L4 Port#(TCP/UDP):** A checked checkbox.

Annotations on the right side of the screenshot:

- Line 1: Points to the 'Source Address' field. Text: **Set the loopback target frames (Source Address, All Frames).**
- Line 2: Points to the 'Swap L4 Port#(TCP/UDP)' checkbox. Text: **Select this check box to also switch the L4 port number. This setting is valid when the test layer is L3-IPv4 or L3-IPv6.**

### Explanation

#### Loopback Target Frame

Set the loopback target frames.

- **Source Address:** Only frames from the source address are looped back.
- **All Frames:** All frames are looped back.

#### Swap L4 Port#(TCP/UDP)

Select whether or not to switch the L4 port number (TCP/UDP Dst Port/Src Port) when the test layer is L3-IPv4 or L3-IPv6 and the MAC or IP address changes between DA and SA.

- **Selected:** The L4 port number is switched.
- **Cleared:** The L4 port number is not switched.

#### Switched Items for Each Layer

Switched Item	L2 Test	L3-IPv4/L3-IPv6 Test	
		Swap L4 Port#(TCP/UDP)	
		Cleared	Selected
MAC address DA/SA	Yes	Yes	Yes
IP address DA/SA	No	Yes	Yes
TCP/UDP Dst/Src Port	No	No	Yes

#### Note

When the test layer is L3-IPv4 or L3-IPv6, if you set the loopback target frame to All Frames, loopback processing is carried out under the assumption that the received frames have a frame structure that matches that of the test layer.

Be careful when you use the AQ1300/AQ1301 in an environment where many different types of frame structures are mixed together.

## 6.7 Configuring a QoS Test

### Procedure

#### QoS Setup Screen

Follow the procedure in section 6.4 to display the QoS Setup screen.

#### Tx Frame Setting Screen

Press the **Detail Setup** soft key and then the **Tx Frame Setting** soft key to display the following screen.

**Select the QoS channels that you want to send.**

**Frame length and actual length indications**  
**Configure frame length adjustment.**  
 ▶ section 6.5

**Set the Tx rate (0.00000-100.00000%).**

**Set the CH1 Tx rate.**

**Frame structure indication**  
**Configure the frames.**

**Total Tx rate indication**

**Set the payload check offset (Use Tx CH1 setting, Manual).**

**Set the offset (byte 0-255).**  
 This setting is valid when Manual is selected.

Channel	Frame Length (Actual)	Tx Rate	Frame Setting
CH1	64 ( 68 )	10.00000	IPv4
CH2	64 ( 68 )	0.00000	IPv4
CH3	64 ( 68 )	0.00000	IPv4
CH4	64 ( 68 )	0.00000	IPv4
CH5	64 ( 68 )	0.00000	IPv4
CH6	64 ( 68 )	0.00000	IPv4
CH7	64 ( 68 )	0.00000	IPv4
CH8	64 ( 68 )	0.00000	IPv4

Total Rate: 10.00000 %

Payload Check Offset Setting: Offset Use Tx CH1 setting 38 byte

#### CH1 Tx Rate Setting Screen

Press Detail under Tx Rate. The following screen appears.

**Set the traffic format (Constant, Burst).**

**Set the Tx rate (0.00001-100.00000%).**  
 This setting is valid when the traffic format is set to Constant.

**Set the burst (Burst Number, Burst Time).**  
 This setting is valid when the traffic format is set to Burst.

**Set the burst number (1-65535).**  
 This setting is valid when Burst Setting is set to Burst Number.

**Set the burst time (1-1000000 us, 1-1000 ms).**  
 This setting is valid when Burst Setting is set to Burst Time.

**Set the interval (1-1000000 us, 1-1000 ms).**

Tx Rate Setting

Traffic format: Burst

Tx Rate: 100.00000 %

Burst Setting: Burst Number 10000

Burst Time: 10000 us

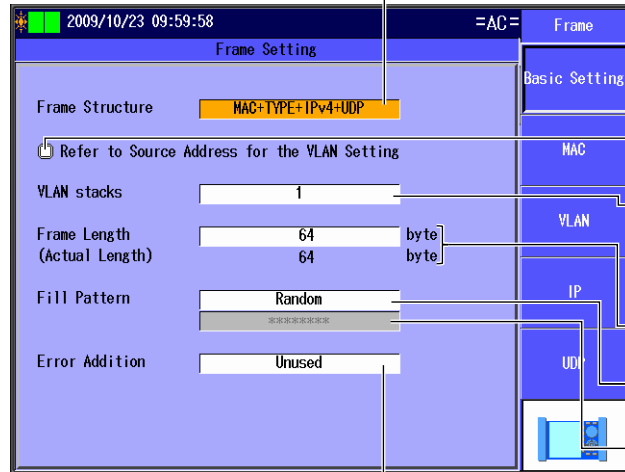
Interval: 10000 us

### Frame Setting Screen

Press **Detail** next to Frame Structure.

Press the **Basic Setting** soft key to display the following screen.

#### Frame Setting (Basic setting) Screen



Set the frame structure (MAC+TYPE, MAC+TYPE+IPv4, MAC+TYPE+IPv4+UDP, MAC+TYPE+IPv6, MAC+TYPE+IPv6+UDP).

Select this check box to refer to the source address for the VLAN settings.

Set the VLAN stack number (None, 1, 2). This setting is valid when the "Refer to Source Address for the VLAN Setting" check box is cleared.

Set the frame length (48-9999 bytes). Actual frame length indication

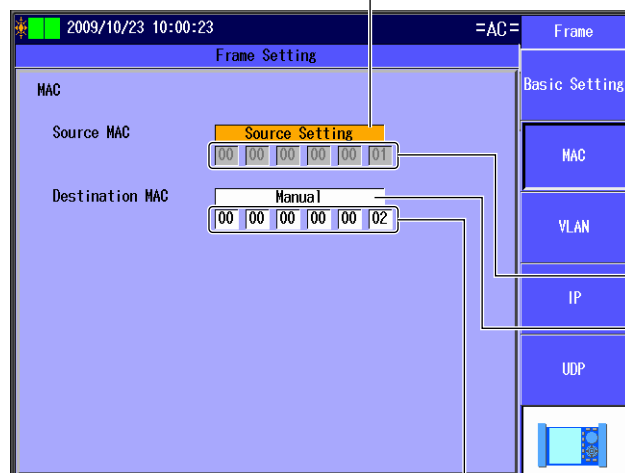
Set the fill pattern (ALLO, ALL1, 0/1 alt., Random, Manual).

Set the pattern value (0-FFFFFFF). This setting is valid when Manual is selected.

Configure error addition (Unused, CRC Error, Symbol Error).

Press the **MAC** soft key to display the following screen.

#### Frame Setting (MAC) Screen



Set the source MAC address (Manual, Source Setting, Generate from IP, Generate from VLAN ID).

- You can select the Generate from IP option when Frame Structure on the Frame Setting (Basic setting) Screen includes the IPv4 header.
- You can select the Generate from VLAN ID option when VLAN Stacks on the Frame Setting (Basic setting) Screen is set to 1 or 2.

This setting is valid when Source MAC is set to Manual.

Set the destination MAC address (Manual, Destination Setting, Refer to ARP)

You can select the Refer to ARP option when Frame Structure on the Frame Setting (Basic setting) Screen includes the IPv4 header.

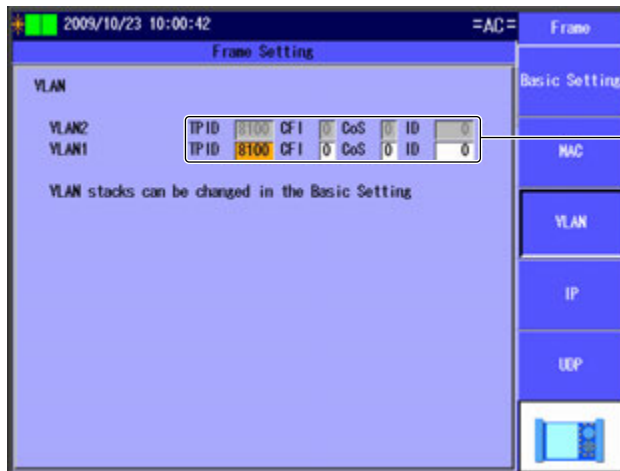
However, the VLAN stacks in the frame structure and the VLAN stacks in the source address settings must be the same.

This setting is valid when Destination MAC is set to Manual.

## 6.7 Configuring a QoS Test

Press the **VLAN** soft key to display the following screen.

### Frame Setting (VLAN) Screen



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

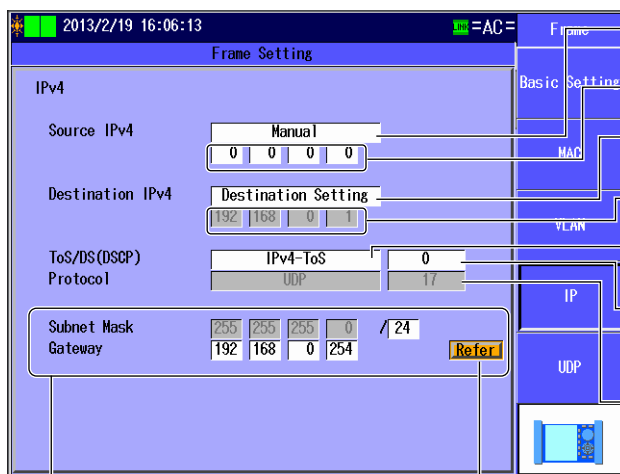
### Note

The VLAN soft key is valid in the following situations.

- When the number of VLAN stacks specified in the basic settings is one or two.
- When the “Refer to Source Address for the VLAN Setting” check box is selected in the basic settings and the number of VLAN stacks set for the source address is one or two.

Press the **IP** soft key to display the following screen.

### Frame Setting (IPv4) Screen



Set the source IPv4 address (Manual, Source Setting).

This setting is valid when Source IPv4 is set to Manual.

Set the destination IPv4 address (Manual, Destination Setting).

This setting is valid when Destination IPv4 is set to Manual.

Set the ToS/DS (DSCP) (Manual, IPv4-ToS, IPv4-DSCP).

Value (Manual: 0-FF, IPv4-ToS: 0-7, IPv4-DSCP: 0-63)

Set the protocol (0-255).

This setting is valid when Frame Structure is set to MAC+TYPE+IPv4.

Refer to the gateway reference. ► section 4.3

You can set the following items when Destination MAC on the Frame (MAC) screen is set to Refer to ARP and Source IPv4 on this screen is set to Manual.

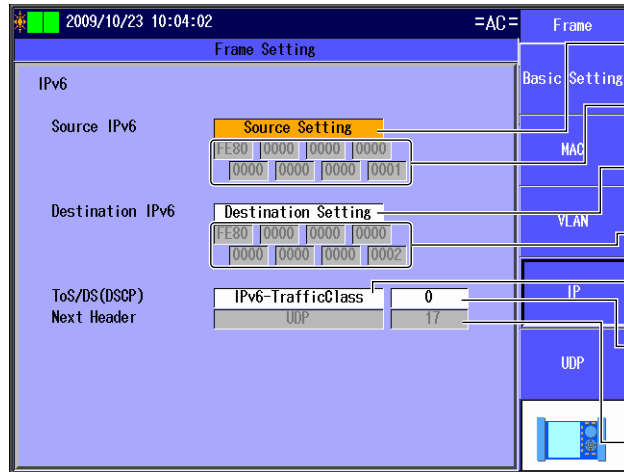
Set the subnet mask (1-31).

Set the gateway.

### Note

The IP soft key is valid when Frame Structure is set to MAC+TYPE+IPv4, MAC+TYPE+IPv4+UDP, MAC+TYPE+IPv6, or MAC+TYPE+IPv6+UDP.

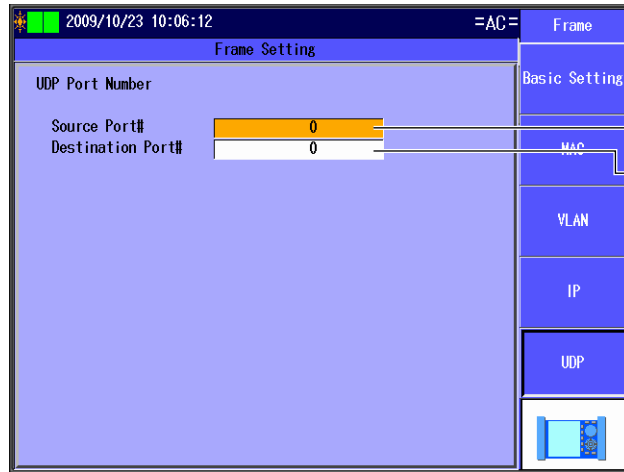
**Frame Setting (IPv6) Screen**



- Set the source IPv6 address (Manual, Source Setting).**  
This setting is valid when Source IPv6 is set to Manual.
- Set the destination IPv6 address (Manual, Destination Setting).**  
This setting is valid when Destination IPv6 is set to Manual.
- Set the ToS/DS (DSCP) (Manual, IPv6-TrafficClass, IPv6-DSCP).**  
Value (Manual: 0-FF, IPv6-TrafficClass: 0-7, IPv6-DSCP: 0-63)
- Set the next header (0-255).**  
This setting is valid when Frame Structure is set to MAC+TYPE+IPv6.

Press the **UDP** soft key to display the following screen.

**Frame Setting (UDP) Screen**



- Set the source port number (0-65535).**
- Set the destination port number (0-65535).**

**Note**

The UDP soft key is valid when Frame Structure is set to MAC+TYPE+IPv4+UDP or MAC+TYPE+IPv6+UDP.



## Tx Mode Setting Screen

Press the **Detail Setup** soft key and then the **Tx Mode Setting** soft key to display the following screen.

**Tx Mode Setting**

Tx Mode: Time

Frames: 60

Tx Time: 60 s

**Callouts:**

- Tx Frame Setting:** Set the Tx mode (Continuous, Frames, Time).
- Tx Mode Setting:** Set the number of frames (1-4294967295). This setting appears when Tx Mode is set to Frames.
- Rx QoS Setting:** Set the time (1-86400 s). This setting appears when Tx Mode is set to Time.
- Rx Setting:** (No specific text provided for this callout).

## Rx QoS Setting Screen

Press the **Detail Setup** soft key and then the **Rx QoS Setting** soft key to display the following screen.

**Rx QoS Setting**

Rx QoS Setting: Manual

Classification Type: VLAN-ID

Channel ID: CH1-ID

Frame Structure: IPv4, IPv4-ToS, Offset

QoS Filter1, QoS Filter2

ID Pattern: QoS Pattern1, QoS Pattern2

Form: CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8

Use CH8 as Other Channel

**Callouts:**

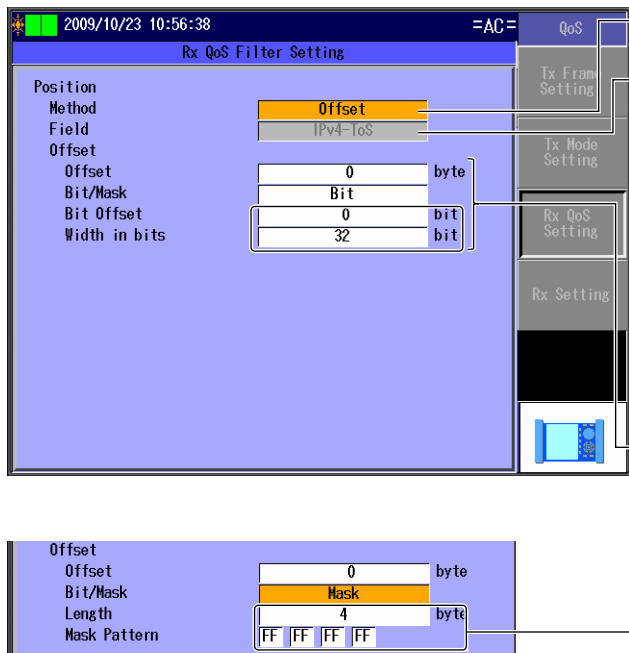
- Classification Type:** Set the Rx QoS (Classify by Frame ID, Classify by Tx Frame, Manual). Channel ID and ID pattern settings are invalid when Classify by Frame ID or Classify by Tx Frame is specified.
- Tx Frame Setting:** Set the classification type. Valid when the Rx QoS is set to "Classify by Tx Frame"
- Tx Mode Setting:** Select the QoS filters to use.
- Rx QoS Setting:** Frame structure indication. Configure the frames. ▶ section 6.5
- Rx Setting:** QoS test type indication. Configure the Rx QoS filters.
- Rx Setting:** Set QoS patterns 1 and 2. Specify the settings for the selected QoS fill patterns.
- Rx Setting:** Set the input format (DEC, HEX). Set the QoS pattern values.
- Rx Setting:** Select this check box to use CH8 as the Other channel.
- Rx Setting:** Select the QoS channels that you want to receive.

### Note

The AQ1300/AQ1301 will receive the type of frames specified by the Frame Structure setting.

### Rx QoS Filter Setting Screen

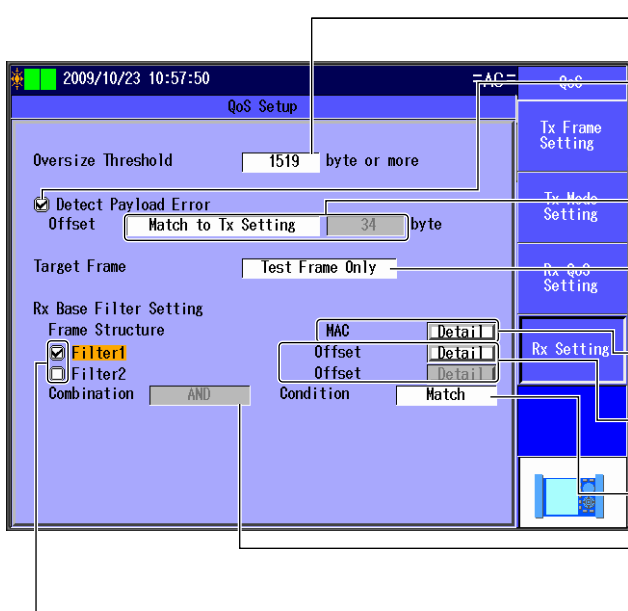
Press **Detail** next to an Rx QoS filter to display the following screen.



- Set the method (Field, Offset).**
- Set the field.**  
This setting is valid when Method is set to Field.  
**(VLAN-ID, VLAN-CoS, IPv4-ToS, IPv4-DSCP, IPv6-TrafficClass, IPv6-DSCP, L4-DP, L4-SP)**  
The items that you can select vary depending on how the frame structure and VLAN settings in the Rx QoS Setting screen are configured.
- Set the offset.**  
This setting is valid when Method is set to Offset.  
**Offset (0-255 bytes).**
- Bit/Mask**  
**Bit offset (0-31 bits)**  
**Bit width (1-32 bits)**  
This setting appears when Bit/Mask is set to Bit.
- Set the byte length (1-4 bytes) and the master pattern.**  
This setting appears when Bit/Mask is set to Mask.

### Rx Setting Screen

Press the **Detail Setup** soft key and then the **Rx Setting** soft key to display the following screen.



- Set the oversize threshold (65-10000 bytes).**
- Select this check box to detect payload errors.**
- Set the offset (Match to Tx Setting, Manual).**  
**Set the offset byte (byte 0-255).**  
This setting is valid when offset is set to Manual.
- Set the frames to take statistics of (Test Frame Only, All Frames).**
- Frame structure indication**  
Configure the frames. ▶ section 6.5
- Set the Rx base filter methods.**  
Configure the Rx base filters. ▶ section 6.5.
- Set the frame pass condition (Match, Mismatch).**
- Set how Rx base filters 1 and 2 are combined (AND, OR).**
- Select a check box to use the corresponding Rx base filter.**

#### Note

The AQ1300/AQ1301 will receive the type of frames specified by the Frame Structure setting.

**Explanation**

**Tx Frame Setting Screen**

**QoS Channels**

Select the QoS channels that you want to send.  
CH1 to CH8

**Frame Length (Actual)**

The frame lengths and actual frame lengths of the Tx QoS channels are displayed.

**Detail**

Press to adjust the frame length in the Variable Frame Length screen. For details, see section 6.5.

**Payload Check Offset Setting**

You can specify the offset from the start of the payload frame. For details, see section 6.5.

**Tx Rate**

Set the Tx rates of the Tx QoS channels.  
Range: 0.00000 to 100.00000%

**Total Rate**

The total of the Tx rates of the Tx QoS channels is displayed.

**CH1 Tx Rate**

You can set the Tx frame format to Burst for CH1.

• **Traffic Format**

Set the traffic format for transmitting frames.

- Constant: Frames are transmitted at a constant rate.
- Burst: Frames are transmitted in bursts. (The process of transmitting frames for a certain duration and stopping transmission is repeated.)

• **Tx Rate**

Set the Tx rate. This setting is valid when the traffic format is set to Constant.  
Range: 0.00001 to 100.00000 %

• **Burst Setting**

This setting is valid when the traffic format is set to Burst. Set the burst as a burst number or burst time.

Burst Number	Burst Time
Range: 1 to 65535 frames	Range: 1 to 1000000 us, 1 to 1000 ms

• **Interval**

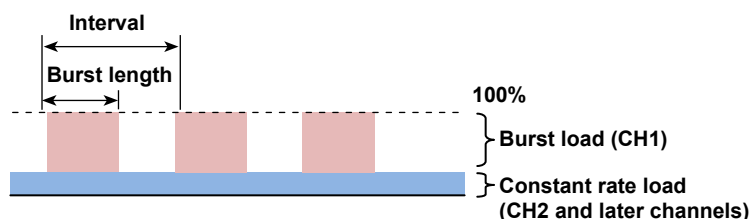
Set the interval.  
Range: 1 to 1000000 us, 1 to 1000 ms

• **Unit**

Set the interval unit.  
us, ms

**Note**

- Settings that would cause the total Tx rate of QoS channels to exceed 100% are not allowed. If CH1 is set to burst transmission, the TX rate of CH1 is automatically adjusted so that the total of all channels do not exceed 100%.



- Burst transmission cannot be specified on CH2 or later channels.

**Frame Settings**

Set the Tx frame on the frame setting screen.

- Frame Setting (Basic setting) Screen**  
This screen is the same as that of the traffic test. For details, see section 6.5.
- Frame Setting (MAC) Screen**

**Source MAC Address**

Set the source MAC address.

- Manual Set the source MAC address manually.
- Source Setting The MAC address in the source address setting is used.
- Generate from IP The source MAC address is generated from the IP address. You can select this item when Frame Structure on the Frame Setting (Basic setting) Screen includes the IPv4 header.
- Generate from VLAN ID The source MAC address is generated from the VLAN ID. You can select this item when VLAN Stacks on the Frame Setting (Basic setting) Screen is set to 1 or 2.

**Source MAC Address Value**

Set the source MAC address when Source MAC set to Manual.

**Destination MAC Address**

Set the destination MAC address.

- Manual Set the destination MAC address manually.
- Destination Setting The MAC address in the destination address setting is used.
- Refer to ARP ARP acquisition is used to obtain the destination MAC address. You can select this item when Frame Structure on the Frame Setting (Basic setting) Screen includes the IPv4 header.

**Destination MAC Address Value**

Set the destination MAC address when Destination MAC set to Manual.

- Frame Setting (VLAN) Screen**  
This screen is the same as that of the traffic test. For details, see section 6.5.
- Frame Setting (IPv4) Screen**  
For details on the source IPv4 address, source IPv4 address value, destination IPv4 address, destination IPv4 address value, ToS/DS (DSCP) setting, and protocol, see section 6.5.

**Subnet Mask and GateWay**

You can set the subnet mask and gateway when Destination MAC on the Frame (MAC) screen is set to Refer to ARP and Source IPv4 on this screen is set to Manual.

**Subnet Mask**

Range 1 to 31

**Gateway**

- Manual Select this option to set the gateway manually.
- Auto.1 Select this option to set the gateway to xxx.xxx.xxx.1.
- Auto.254 Select this option to set the gateway to xxx.xxx.xxx.254.

- Frame Setting (IPv6) Screen**  
This screen is the same as that of the traffic test. For details, see section 6.5.
- Frame Setting (UDP) Screen**  
This screen is the same as that of the traffic test. For details, see section 6.5.

## Tx Mode Setting Screen

### Tx Mode

Set the Tx mode.

- **Continuous:** In this mode, frames are transmitted continuously. After you start transmission, it continues until you stop it.
- **Frames:** In this mode, a specified number of frames is transmitted. After you start transmission, the specified number of frames is sent, and then transmission is stopped automatically.
- **Time:** In this mode, frames are transmitted for a specified period of time. After you start transmission, it continues for the specified period of time and is then stopped automatically.

### Frames

When Tx Mode is set to Frames, set the number of frames.

Range: 1 to 4,294,967,295

### Tx Time

When Tx Mode is set to Time, set the Tx time.

Range: 1 to 86400 s

## Rx QoS Setting Screen

The Rx frames that pass through the Rx base filter are tested.

### Rx QoS Setting

Set how to classify the Rx frames for QoS identification.

- **Classify by Frame ID:** QoS identification is performed on the Rx frames on the basis of the frame ID.
- **Classify by Tx Frame:** QoS identification is performed on the Rx frames on the basis of the Rx filter frame structure, enabled filters, fields, and other settings that are aligned with the Tx frame settings of the Tx channel.
- **Manual:** QoS identification is performed on the Rx frames on the basis of the specified channel ID and ID patterns.

#### Classification Type

If “Classify by Tx Frame” is specified, set the classification conditions. Based on the specified conditions, field values are extracted from the Tx frames of each QoS channel, and Rx QoS filters are automatically configured.

MAC-DA	MAC-SA	VLAN1-ID	VLAN1-CoS	VLAN2-ID	VLAN2-CoS	IPv4-DA
IPv4-SA	IPv4-ToS	IPv4-DSCP	IPv6-DA	IPv6-SA	IPv6-TrafficClass	IPv6-DSCP
L4-DP(IPv4)	L4-SP(IPv4)	L4-DP(IPv6)	L4-DP(IPv6)			

### Note

---

If you select the “Remove Test Tag from Test Frame” check box in the Option (Manual) Advance setup, frame ID classification may not work properly.

---

### Channel ID

- **Frame Structure**

The frame structure specified in the Frame Setting screen is displayed.

#### Detail

Press to configure the Rx QoS channel frame settings in the Frame Setting screen. For details, see section 6.5.

- **QoS Filter 1 and 2**

Specify the QoS filters that you want to use.

- Selected: The QoS filter is used.
- Cleared: The QoS filter is not used.

The specified QoS test type is displayed.

**Detail**

Press to configure the Rx QoS filter settings in the Rx QoS Filter Setting screen.

**Pattern**

- **QoS Pattern1 and Pattern2**

Specify the settings for the selected QoS fill patterns.

**Note**

When QoS Filter 1 and 2 are selected, statistics are performed on the AND of QoS patterns 1 and 2.

- **QoS Channels**

Select the QoS channels that you want to receive.

CH1 to CH8

- **Form**

Set the input format for QoS pattern values.

- DEC: The value input format is decimal.
- HEX: The value input format is hexadecimal.

- **Setting the QoS Pattern Values**

Set the QoS pattern values.

When Type is set to Offset: 0 to 4294967295 (DEC) or 0 to FFFFFFFF (HEX)

The range varies depending on the specified bit width and comparison byte length.

When Type is set to Field:

Field	Range	
	DEC	HEX
VLAN-ID	0 to 4095	0 to FFF
VLAN-CoS	0 to 7	0 to 7
IPv4-ToS	0 to 7	0 to 7
IPv4-DSCP	0 to 63	0 to 3F
IPv6-TrafficClass	0 to 7	0 to 7
IPv6-DSCP	0 to 63	0 to 3F
L4-DP/L4-SP	0 to 65535	0 to FFFF

- **Use CH8 as Other Channel**

Select whether or not to use CH8 as the Other channel.

- Selected: CH8 is used as the Other channel.
- Cleared: CH8 is not used as the Other channel.

**Note**

When the "Use CH8 as Other Channel" check box is selected, frames that do not meet the conditions for other channels are assigned to CH8.

## 6.7 Configuring a QoS Test

### Rx QoS Filter Setting Screen

- **Method**

Set the Rx QoS filter method.

- Field: Specify a field.
- Offset: Specify an offset.

- **Field**

Set the Rx QoS filter when Type is set to Field.

Field	Frame Structure*					Description	Notes
	MAC	IPv4	UDP(v4)	IPv6	UDP(v6)		
VLAN-ID	Yes	Yes	Yes	Yes	Yes	The VLAN ID	When there are VLAN stacks
VLAN-CoS	Yes	Yes	Yes	Yes	Yes	The VLAN Class of Service	
IPv4-ToS	No	Yes	Yes	No	No	The IPv4 Type of Service	
IPv4-DSCP	No	Yes	Yes	No	No	The IPv4 Diffserv Code Point	
IPv6-TrafficClass	No	No	No	Yes	Yes	The IPv6 Traffic Class	
IPv6-DSCP	No	No	No	Yes	Yes	The IPv6 Diffserv Code Point	
L4-DP/L4-SP	No	No	Yes	No	Yes	The L4 Dst/Src Port	When UDP is selected

\* MAC: MAC+TYPE

IPv4: MAC+TYPE+IPv4

UDP(v4): MAC+TYPE+IPv4+UDP

IPv6: MAC+TYPE+IPv6

UDP(v6): MAC+TYPE+IPv6+UDP

- **Offset Setting**

Set the Rx QoS filter when Type is set to Offset.

#### Offset

Set the Rx QoS filter offset.

Range: 0 to 255 bytes

#### Bit/Mask

Set the pattern comparison method for when the Rx QoS filter method is offset.

- Bit: The Rx data is compared using the specified bit offset, width, and comparison pattern.
- Mask: The Rx data is compared using the specified comparison byte length, mask pattern, and comparison pattern. Only areas where the mask pattern bit is 1 are compared.

#### Bit Offset

Set the Rx QoS filter bit offset. This setting is valid when Bit/Mask is set to Bit.

Range: 0 to 31 bits

#### Width in bits

Set the Rx QoS filter width in bits. This setting is valid when Bit/Mask is set to Bit.

Range: 1 to 32 bits

#### Length

Set the Rx QoS filter comparison byte length. This setting is valid when Bit/Mask is set to Mask.

Range: 1 to 4 bytes

#### Mask Pattern

Set the Rx QoS filter mask pattern. This setting is valid when Bit/Mask is set to Mask.

## Rx Setting Screen

### Oversize Threshold

Set the threshold for determining oversize frames.

Range: 65 to 10,000 bytes

### Detect Payload Error

Select whether or not to detect payload errors.

- Selected: Payload errors are detected.
- Cleared: Payload errors are not detected.

### Note

---

If you select the “Remove Test Tag from Test Frame” check box in the Option (Manual) Advance setup, the AQ1300/AQ1301 will be unable to detect payload errors.

---

- **Offset**

Set the payload error offset.

- Match to Tx Setting: The offset is based on the source setting.
- Manual: You must set the offset manually.

- **Offset Byte Setting**

Specify the offset byte for when Offset is set to Manual.

Range: Byte 0 to 255

### Target Frame Setting

Set which frames to take statistics of.

- Test Frame Only: Statistics are only taken for test frames.
- All Frames: Statistics are taken for all frames.

### Note

---

When you are using an Rx base filter, statistics are taken of the frames that pass through the filter.

---

### Rx Base Filter Setting

- **Frame Structure**

The specified frame structure is displayed.

#### Detail

Press to configure the Rx frame settings in the Frame Setting screen. For details, see section 6.5.

- **Filter 1 and 2**

Select whether or not to use Rx base filters 1 and 2.

- Selected: The Rx base filter is used.
- Cleared: The Rx base filter is not used.

The selected Rx base filter type is displayed.

#### Detail

Press to configure the Rx base filter settings in the Rx Base Filter Setting screen. For details, see section 6.5.



## 6.7 Configuring a QoS Test

---

- **Combination**

Set the combination condition for Rx base filters 1 and 2.

- AND: The conditions of the Rx base filters are combined using AND logic.
- OR: The conditions of the Rx base filters are combined using OR logic.

- **Condition**

Select the type of frame to allow to pass through the Rx base filters.

- Match: Frames that match the filter conditions pass through the filters.
- Mismatch: Frames that do not match the filter conditions pass through the filters.

## 6.8 Configuring a Ping Test

### Procedure

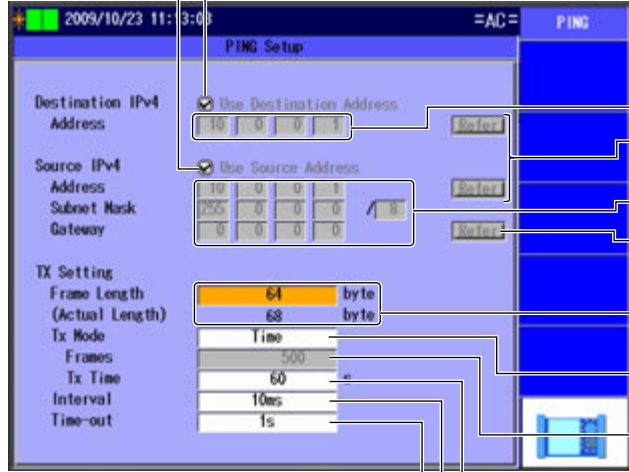
#### PING Setup Screen

Follow the procedure in section 6.4 to display the PING Setup screen.

Press the **Detail Setup** soft key to display the following screen.

**Fixed this check box to use the source IPv4 address from the address settings.**

When Test Layer is set to L3-IPv6, the source IPv6 address is always used (no check box appears).



The screenshot shows the PING Setup screen with the following settings and callouts:

- Destination IPv4 Address:** 10.0.0.1. Callout: **Select this check box to use the destination IPv4 or IPv6 address from the address settings.** This setting is valid when the test layer is L3-IPv4 or L3-IPv6.
- Source IPv4 Address:** 10.0.0.1. Callout: **Set the destination IPv4 or IPv6 address.**
- Subnet Mask:** 255.0.0.0. Callout: **Refer to the IP Address table. ▶ section 4.3**
- Gateway:** 0.0.0.0. Callout: **The source IPv4 or IPv6 address.**
- TX Setting:**
  - Frame Length (Actual Length):** 64 byte. Callout: **Refer to the gateway reference. ▶ section 4.3**
  - Actual frame length indication (64 to 9999 bytes):** 68 byte.
  - Tx Mode:** Time. Callout: **Set the frame length (64 to 9999 bytes).**
  - Frames:** 500. Callout: **Actual frame length indication (64 to 9999 bytes)**
  - Tx Time:** 60 ms. Callout: **Set the Tx Mode (Continuous, Frames, Time).**
  - Interval:** 10ms. Callout: **Set the number of frames (1-4294967295).**
  - Time-out:** 1s. Callout: **This setting appears when Tx Mode is set to Frames.**

### Explanation

#### Destination IPv4 or IPv6 Address

Set the destination IPv4 or IPv6 address.

#### “Use Destination Address” Check Box

When the test layer is L3-IPv4 or L3-IPv6, select this check box to use the destination IPv4 or IPv6 address from the address settings. To specify a different destination IPv4 or IPv6 address, clear this check box.

## 6.8 Configuring a Ping Test

---

### Source IPv4 or IPv6 Address

Set the source IPv4 or IPv6 address, the subnet mask (1 to 31), and the gateway.

### When Test Layer Is Set to L2 Test

Each address is set automatically from the MAC address.

Destination IPv4 address:

10.lower three bytes of the destination MAC address

Source IPv4

Address: 10.lower three bytes of the source MAC address

Netmask: 255.0.0.0 (fixed)

Gateway: 0.0.0.0 (fixed).

### TX Setting

#### Frame Length and Actual Length

Set the Tx frame length. The actual frame length that corresponds to the length you set is also displayed.

VLAN	L2 and L3-IPv4	L3-IPv6
None	64(64) to 9999(9999) bytes	84(84) to 9999(9999) bytes
1	64(68) to 9999(9999) bytes	84(88) to 9999(9999) bytes
2	64(72) to 9999(9999) bytes	84(92) to 9999(9999) bytes

### Tx Mode

Set the Tx mode.

- Continuous: In this mode, frames are transmitted continuously. After you start transmission, it continues until you stop it.
- Frames: In this mode, a specified number of frames is transmitted. After you start transmission, the specified number of frames is sent, and then transmission is stopped automatically.
- Time: In this mode, frames are transmitted for a specified period of time. After you start transmission, it continues for the specified period of time and is then stopped automatically.

### Frames

When Tx Mode is set to Frames, set the number of frames.

Range: 1 to 4,294,967,295

### Tx Time

When Tx Mode is set to Time, set the Tx time.

Range: 1 to 86400 s

### Transmission Interval

Set the interval at which to send ping requests.

1 ms, 10 ms, 100 ms, 1 s

### Timeout

Specify the ping timeout period.

100 ms, 1 s

## 6.9 Configuring a BERT

### Procedure

#### BERT Setup Screen

Follow the procedure in section 6.4 to display the BERT Setup screen.

#### Tx Setting Screen

Press the **Detail Setup** soft key and then the **Tx Setting** soft key to display the following screen.

**Frame structure indication**

**Configure the frames. ▶ section 6.5**

**Set the frame length (48-9999 bytes). Actual frame length indication**

**Select this check box to adjust the frame length.**

**Configure frame length adjustment. ▶ section 6.5**

**Contents**

#### Tx Rate Screen

Press the **Detail Setup** soft key and then the **Tx Rate** soft key to display the following screen.

**Set the traffic format (Constant, Burst).**

**Select this check box to send frames at rates that exceed 100% of the Tx rate (when this check box is selected, the Tx rate can only be set in bits).**

**Set the Tx rate (when Frame Length is set to 64 bytes and Test Interface is set to XFP). (Percentage range: 0.00001-100.00000 Bit range: 72-9999999424 fps range: 1.00000-14880952.38095 fps).**

**Set the unit (% , bit, fps).**

**Set the burst number (1-65535).**

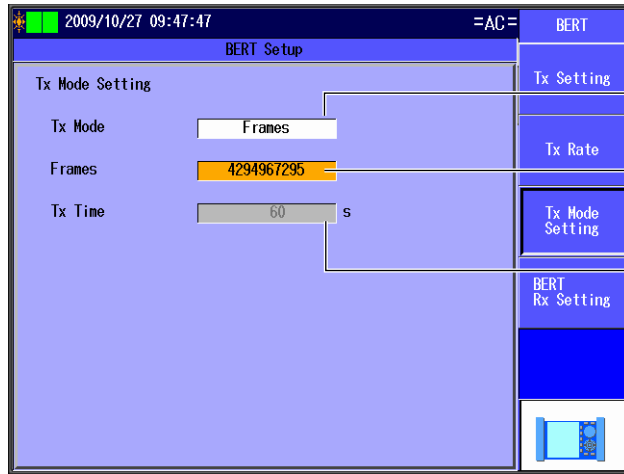
**Set the interval (1-1000000 us, 1-1000 ms).**

**Set the unit (us, ms).**

These settings are valid when the traffic format is "Burst."

### Tx Mode Setting Screen

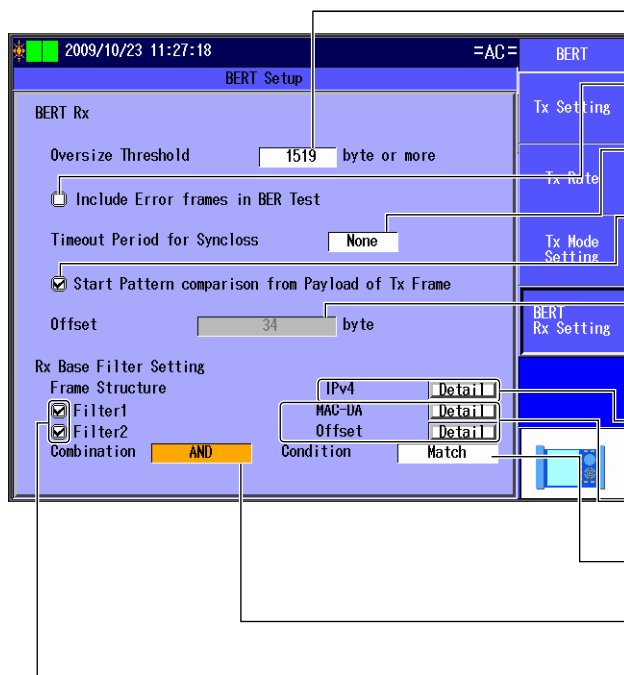
Press the **Detail Setup** soft key and then the **Tx Mode Setting** soft key to display the following screen.



- Set the Tx mode (Continuous, Frames, Time).**
- Set the number of frames (1-4294967295).**  
This setting appears when Tx Mode is set to Frames.
- Set the time (1-86400 s).**  
This setting appears when Tx Mode is set to Time.

### BERT Rx Screen

Press the **Detail Setup** soft key and then the **Bert Rx Setting** soft key to display the following screen.



- Set the oversize threshold (65-10000 bytes).**
- Select this check box to include error frames in the BERT.**
- Set the timeout period for detecting sync loss (None, 2s).**
- Select this check box to set the Tx frame payload as the comparison location.**
- Set the offset (byte 0-255).**  
This setting is valid when the "Start Pattern comparison from Payload of Tx Frame" check box is cleared.
- Frame structure indication**  
**Configure the frames. ▶ section 6.5**
- Set the Rx base filter methods.**  
**Configure the Rx base filters. ▶ section 6.5.**
- Set the frame pass condition (Match, Mismatch).**
- Set how Rx base filters 1 and 2 are combined (AND, OR).**
- Select a check box to use the corresponding Rx base filter.**

**Explanation****Tx Setting Screen****Tx Frame Setting****Frame Structure**

The specified frame structure is displayed.

**Detail**

Press to configure the Tx frame settings in the Frame Setting screen. For details, see section 6.5.

**Frame Length and Actual Length**

Set the Tx frame length. The actual frame length that corresponds to the length you set is also displayed. For details, see the Frame Setting (basic setting) screen in section 6.5.

Range: 48 to 9999 bytes

**Variable Setting****Frame Length**

Select whether or not to adjust the frame length.

- Selected: The frame length is adjusted.
- Cleared: The frame length is not adjusted.

**Detail**

Press to adjust the frame length in the Variable Frame Length screen. For details, see section 6.5.

**Contents Indication**

The frame length adjustment that you have specified is indicated next to contents.

**Tx Rate Screen****Traffic Format**

Set the traffic format to use when sending frames.

- Constant: Frames are sent at a constant rate.
- Burst: Frames are sent in bursts. (Frame transmission starts and stops repeatedly at a specified interval.)

**Tx Rate****Rate over 100%**

Select whether or not to send frames at rates that exceed 100% of the Tx rate.

- Selected: Frames are sent at rates that exceed 100% of the Tx rate.
- Cleared: Frames are not sent at rates that exceed 100% of the Tx rate.

When the "Rate over 100%" check box is selected, the Tx rate can only be set in bits.

**Tx Rate Value**

When Frame Length is set to 64 bytes and Test Interface is set to XFP(10GbE).

- Percentage range: 0.00001 to 100.00000%
- Bit range: 72 to 9999999424 bits
- fps range: 1.00000 to 14880952.38095 fps

**Unit**

Set the Tx rate unit.

%, bit, fps

### **Burst Setting**

These settings are valid when the traffic format is "Burst."

#### **Burst Number**

Specify the number of burst frames.

Range: 1 to 65535

#### **Interval**

Set the interval.

1 to 1000000 us, 1 to 1000 ms

#### **Unit Setting**

Set the unit of the interval.

us, ms

## **Tx Mode Setting Screen**

### **Tx Mode**

Set the Tx mode.

- **Continuous:** In this mode, frames are transmitted continuously. After you start transmission, it continues until you stop it.
- **Frames:** In this mode, a specified number of frames is transmitted. After you start transmission, the specified number of frames is sent, and then transmission is stopped automatically.
- **Time:** In this mode, frames are transmitted for a specified period of time. After you start transmission, it continues for the specified period of time and is then stopped automatically.

### **Frames**

When Tx Mode is set to Frames, set the number of frames.

Range: 1 to 4,294,967,295

### **Tx Time**

When Tx Mode is set to Time, set the Tx time.

Range: 1 to 86400 s

## **BERT Rx Screen**

### **Oversize Threshold**

Set the threshold for determining oversize frames.

Range: 65 to 10000 bytes

### **Include Error frames in BER Test**

Select whether or not to include error frames in the BERT.

- **Selected:** Error frames are included in the BERT.
- **Cleared:** Error frames are not included in the BERT.

### **Timeout Period for Syncloss**

Specify the timeout period for determining sync loss.

- **None:** No timeout period is set.
- **2s:** A timeout period of 2 s is set.

**Start Pattern comparison from Payload of Tx Frame**

Select whether or not to set the Tx frame payload as the comparison location.

- Selected: The Tx frame payload is set as the comparison location.
- Cleared: The Tx frame payload is not set as the comparison location. You must set the payload comparison location as an offset value.

**Offset**

You must set the payload comparison location as an offset value.

Range: Byte 0 to 255

**Rx Base Filter Setting****Frame Structure**

The specified frame structure is displayed.

**Detail**

Press to configure the Rx frame settings in the Frame Setting screen. For details, see section 6.5.

**Filter 1 and 2**

Select whether or not to use Rx base filters 1 and 2.

- Selected: The Rx base filter is used.
- Cleared: The Rx base filter is not used.

The selected Rx base filter type is displayed.

**Detail**

Press to configure the Rx base filter settings in the Rx Base Filter Setting screen. For details, see section 6.5.

**Combination**

Set the combination condition for Rx base filters 1 and 2.

- AND: The conditions of the Rx base filters are combined using AND logic.
- OR: The conditions of the Rx base filters are combined using OR logic.

**Condition**

Select the type of frame to allow to pass through the Rx base filters.

- Match: Frames that match the filter conditions pass through the filters.
- Mismatch: Frames that do not match the filter conditions pass through the filters.



## 6.10 Configuring the Statistics Log

### Procedure

#### Statistics Log Setting Screen

Press the **Manual** soft key, the **Next 1/2** soft key, and then the **Statistics Log Setting** soft key to display the following screen.

The screenshot shows the 'Statistics Log Setting' screen. It includes the following elements and callouts:

- Execute Logging:** A checked checkbox. Callout: "Select this check box to execute logging."
- Execute Long Logging (Generating ZIP file):** A radio button option.
- Max Logging time:** A text field containing '14400'. Callout: "Set the maximum logging time (1-14400 s)."
- End Setting:** A text field containing 'Stop'. Callout: "Set the end setting (Stop, Overwrite)."
- Save a statistic log after the measurement:** A checked checkbox.
- File:** A radio button option. Callout: "Select this check box to log using current values (appears when the group is set to Latency or CH1-8 RX)."
- Option (Manual):** A radio button option. Callout: "Set the statistics log items."
- Statistics Item Set:** A table with columns 'Group' and 'Item'. It lists four items: Latency (Max IFG(us)), CH1 Rx (Frame), Tx (Rate(%)), and Tx (Rate(fps)). Each item has a 'Detail' button next to it. Callout: "Select the items that you want to log the statistics of (up to four items)."
- Next 2/2:** A soft key at the bottom right.

#### Statistics Item Set

Press **Detail** next to the statistics log item that you want to set to display the following screen.

The screenshot shows the 'Statistics Item Set' screen. It includes the following elements and callouts:

- Group:** A text field containing 'Latency'. Callout: "Set the group."
- Item:** A text field containing 'Max IFG(us)'. Callout: "Set the item."

### Explanation

#### Execute Logging

Select whether or not to execute logging.

- Selected: Logging is executed.
- Cleared: Logging is not executed.

#### Max Logging time

Set the maximum logging time.

Range: 1 to 14400 s

#### End Setting

Specify what to do after the maximum logging time has been exceeded.

- Stop: Logging is stopped. When the maximum logging time has been exceeded, logging stops.
- Overwrite: Old logs are overwritten by new logs.

**Save a statistic log after the measurement**

Set whether to automatically save statistical results.

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

- Selected: The statistical log file will be saved. Selecting the Execute Logging check box will automatically select this check box.
- Cleared: The statistical log file will not be saved.

**Note**

You cannot set this feature if the Save measurement results and Statistics Log check box on the measurement screen in section 6.11 is selected.

**Statistics Log Items**

You can log statistics for up to four items.

**Statistics Item Set**

Set the statistics log item by group and item.

For information about the items that you can specify, see section 1.8.

**Current Values of Statistical Items**

Statistics logs can be recorded using the current values of statistical items of each second.

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

- Selected: Statistics logs are recorded using current values.
- Cleared: Statistics logs are recorded using maximum values during the logging time. This is the conventional method.

The statistical items that are logged using current values are listed below.

Group Name	Statistical Item
Latency	Max IFG( $\mu$ s, bit)
	Min IFG( $\mu$ s, bit)
	Avg IFG( $\mu$ s, bit)
	Max Latency( $\mu$ s)
	Min Latency( $\mu$ s)
	Avg Latency( $\mu$ s)
Rx Channel (1 to 8)	Max Latency( $\mu$ s)
	Min Latency( $\mu$ s)
	Avg Latency( $\mu$ s)

The word "Current" is attached to the item names in the statistical log files (CSV format).

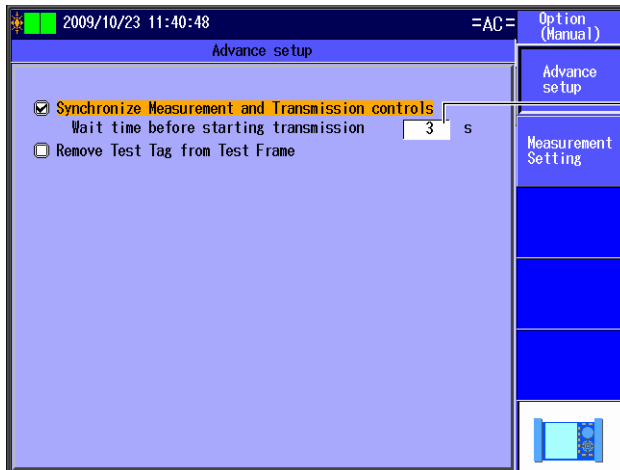
Start Time	2012/4/1 09:00
Time (YY/MM/DD/hh/mm:ss)	Latency:[Current] Max IFG ( $\mu$ s)
2012/4/1 09:00::00	0
2012/4/1 09:00::01	1
2012/4/1 09:00::02	0

## 6.11 Configuring Options (Manual)

### Procedure

#### Advance Setup Screen

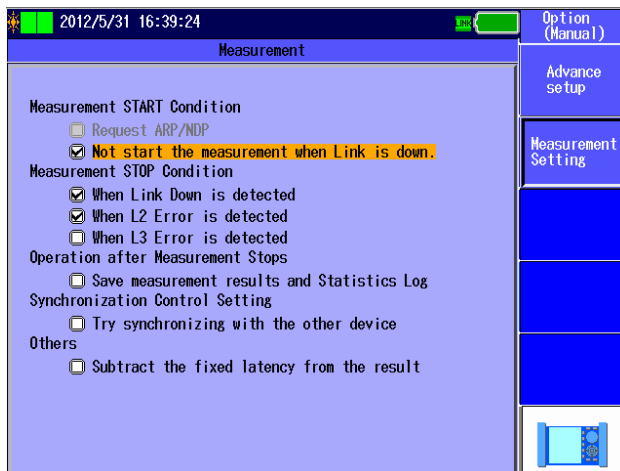
Press the **Manual** soft key, the **Next 1/2** soft key, the **Option (Manual)** soft key, and then the **Advance setup** soft key to display the following screen.



Set the interval between the pressing of **START** and the start of transmission (1-10 s).

#### Measurement Screen

Press the **Manual** soft key, the **Next 1/2** soft key, the **Option (Manual)** soft key, and then the **Measurement Setting** soft key to display the following screen.



**Explanation****Advance Setup Screen****Synchronize Measurement and Transmission controls**

Select whether or not to start transmission when the START key is pressed.

- Selected: Transmission is started when the START key is pressed. Also, measurement is stopped when transmission finishes.
- Cleared: Transmission is not started when the START key is pressed.

**Wait time before starting transmission**

Set the interval between when the START key is pressed and when transmission is started and between when transmission finishes and when measurement is stopped. This setting is valid when the “Synchronize Measurement and Transmission controls” check box is selected.

Range: 1 to 10 s

**Remove Test Tag from Test Frame**

When the test mode is Traffic Test or QoS Test, you can send test frames without test tags.

- Selected: The test tags are removed from test frames.
- Cleared: The test tags are not removed from test frames.

**Note**

If you select the “Remove Test Tag from Test Frame” check box, the following operations may not work properly.

- Payload error detection
- Sequence error measurement
- Latency measurement
- Frame ID classification in QoS measurement

**Measurement Screen****Measurement START Condition****Request ARP/NDP**

For ARP (IPv4) and NDP (IPv6) destination MAC addresses, select whether or not to use an ARP or NDP request to acquire the MAC address when the START key is pressed. This setting is valid when the test layer is L3-IPv4 or L3-IPv6.

- Selected: An ARP/NDP request is sent.
- Cleared: An ARP/NDP request is not sent.

**Not start the measurement when Link is down**

Select whether or not to start measurement when the START key is pressed and a linkdown is detected.

- Selected: Measurement is not started when a linkdown is detected.
- Cleared: Measurement starts even when a linkdown is detected.

**Measurement STOP Condition****When Link Down is detected**

Select whether or not to stop measurement when a linkdown is detected during measurement.

- Selected: Measurement is stopped when a linkdown is detected.
- Cleared: Measurement is not stopped even when a linkdown is detected.

**When L2 Error is detected**

Select whether or not to stop measurement when an L2 error is detected during measurement.

- Selected: Measurement is stopped when an L2 error is detected.
- Cleared: Measurement is not stopped even when an L2 error is detected.

### When L3 Error is detected

Select whether or not to stop measurement when an L3 error is detected during measurement.

- Selected: Measurement is stopped when an L3 error is detected.
- Cleared: Measurement is not stopped even when an L3 error is detected.

### Operation after Measurement Stops

#### Save measurement results and Statistics Log

Select whether or not to save the measurement results and the statistics log to a file after measurement finishes. The statistics log is only saved to a file when the “Execute Logging” check box is selected.

- Selected: The measurement results and the statistics log are saved to a file when measurement finishes.
- Cleared: The measurement results and the statistics log are not saved to a file when measurement finishes.

### Note

---

The measurement results and the statistics log are saved to the directory that you specify in the File Name Setup in the Measurement menu with the same file name but different extensions.

Example            When the file name is test\_0001  
                         Statistical result file: test\_0001.mr  
                         Statistical log file: test\_0001.csv

---

### Synchronization Control Setting

#### Try synchronizing with the other device

Select whether or not to try synchronizing with the other device (the address specified as the destination address) when the START or STOP key is pressed. When the START or STOP key is pressed, the AQ1300/AQ1301 sends a measurement start or stop packet to the other device at the destination address.

- Selected: The AQ1300/AQ1301 tries to synchronize with the other device.
- Cleared: The AQ1300/AQ1301 does not try to synchronize with the other device.

### Note

---

When you are performing BERT test, the AQ1300/AQ1301 does not send measurement stop packets.

---

### Others

#### Subtrac the fixed latency from the result

During latency measurement, the fixed delay that occurs in the other device during loopback is subtracted from the measured results. The subtracted results are displayed as measurement results. If the measured value is less than the fixed delay, 0.00  $\mu$ s is displayed.

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

- Selected: The fixed delay is subtracted from the measured values.
- Cleared: The fixed delay is not subtracted from the measured values.

Fixed delay value based on the interface

Interface	Delay
XFP	1.0 $\mu$ s
SFP (GbE)	1.4 $\mu$ s
SFP (FE)	12 $\mu$ s
RJ-45 (1000M)	1.6 $\mu$ s
RJ-45 (100M)	11 $\mu$ s
RJ-45 (10M)	108 $\mu$ s

# 7.1 Starting and Stopping Measurement

## Procedure

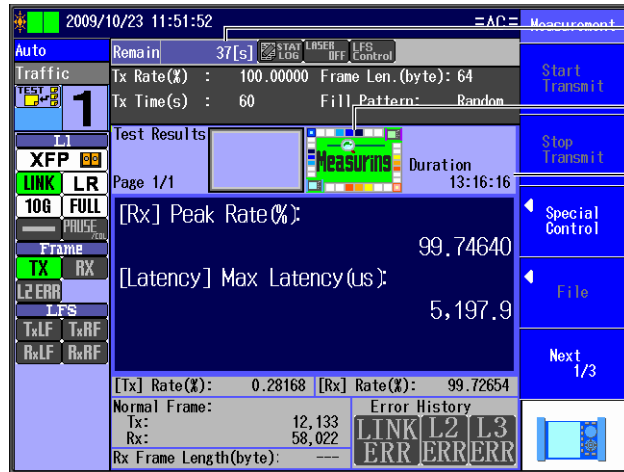
### When Measurement and Transmission Control Are Synchronized

Follow the procedure in section 4.11 or 6.11 to synchronize measurement and transmission control.

#### Starting Measurement

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
- Special Control
- File
- Next 1/3

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

#### Screen after Measurement Has Finished (Traffic Test)



- Remaining Tx time
- Indication that measurement has finished
- Measurement duration
- Special Control
- File
- Next 1/3

## 7.1 Starting and Stopping Measurement

### Stopping Measurement

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

#### Screen after Measurement Has Been Stopped (Traffic Test)

Remaining Tx time

Indication that measurement has finished

Measurement duration

### 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.

## When Measurement and Transmission Control Are Not Synchronized

Follow the procedure in section 4.11 or 6.11 to desynchronize measurement and transmission control.

### Starting Measurement

Press **START** to display the following screen and start measurement.

#### Screen during Measurement (Traffic Test)

Remaining Tx time

Starts transmission

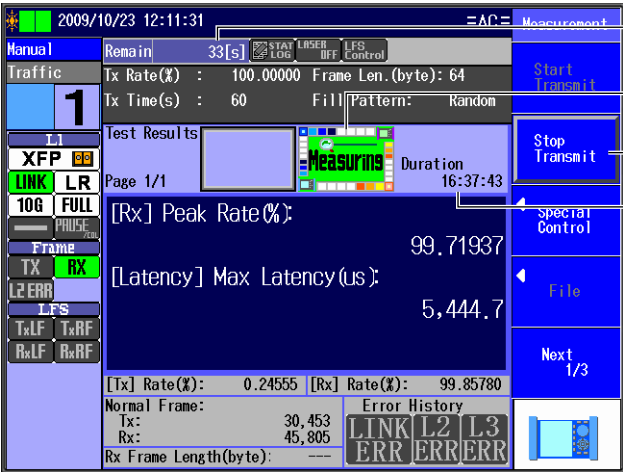
Indication that measurement is in progress

Measurement duration

Starting Transmission

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

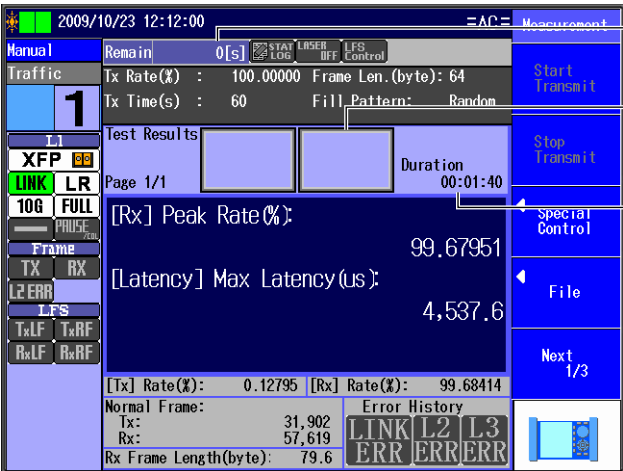
Screen during Measurement (Traffic Test)



Remaining Tx time  
 Indication that measurement is in progress  
 Stops transmission  
 Measurement duration

When the transmission end conditions are met, transmission stops automatically.  
 Press **STOP** to display the following screen and stop measurement.

Screen after Measurement Has Finished (Traffic Test)



Remaining Tx time  
 Indication that measurement has finished  
 Measurement duration



## 7.1 Starting and Stopping Measurement

### Stopping Transmission

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

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

#### Screen after Measurement Has Been Stopped (Traffic Test)

Remaining Tx time

Indication that measurement has finished

Measurement duration

### 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.

## When Auto or Auto(Remote) Has Been Selected, Execution Type Is Set to Continue, and Continuance Confirmation Is Enabled

Follow the procedure in section 4.11 to set the test item Execution Type setting to Continue and Continuance Confirmation to ON.

During measurement, whenever a test item finishes, the following screen appears.



Executes the next test item

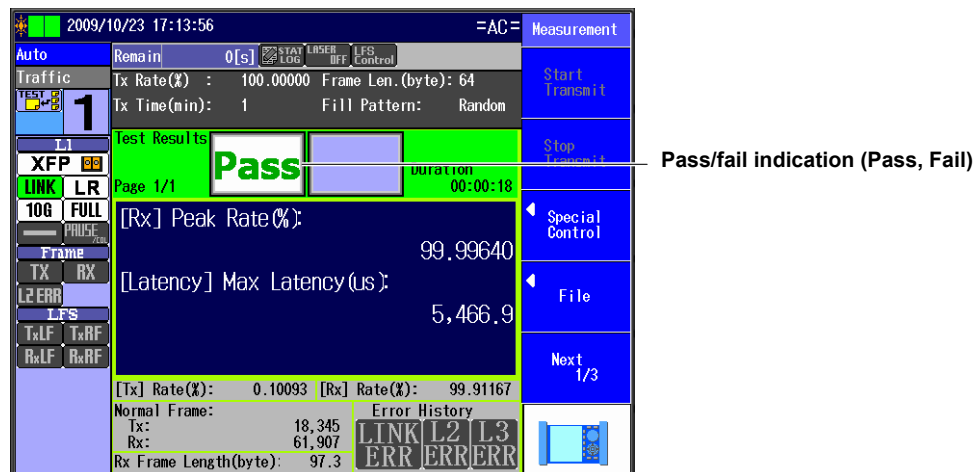
### Note

- To stop measurement without proceeding to the next test item, press STOP.
- When the test item Execution Type setting is set to Continue and Continuance Confirmation is set to OFF, the confirmation screen will not appear.

## Performing Pass/Fail Judgment When Auto or Auto(Remote) Has Been Selected

Follow the procedure in section 4.11 to select the “Judge Pass or fail” check box.

After measurement finishes, the following screen appears.



Pass/fail indication (Pass, Fail)

### Note

The Pass/Fail screen appears after measurement finishes. It will not appear if you just stop transmission.

### Explanation

#### When Measurement and Transmission Control Are Synchronized

Start and stop measurement this way when you want to perform measurement and transmission at the same time.

START key: Press this key to start measurement and transmission.

STOP key: Press this key to stop transmission and finish measurement.

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

#### 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 Measurement and Transmission Control Are Not Synchronized

Start and stop measurement this way when you want to perform measurement and transmission separately.

START key: Press this key to start measurement.

Start Transmit soft key: Press this soft key to start transmission.

Stop Transmit soft key: Press this soft key to stop transmission.

STOP key: Press this key to stop measurement.

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

#### Note

---

If you press STOP without pressing the Stop Transmit soft key first, transmission and measurement are both stopped.

---

#### When Auto or Auto(Remote) Has Been Selected, Execution Type Is Set to Continue, and Continuance Confirmation Is Enabled

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.

#### Performing Pass/Fail Judgment When Auto or Auto(Remote) Has Been Selected

This indication appears when the test type is Auto or Auto(Remote) and you have chosen to perform pass/fail judgment.

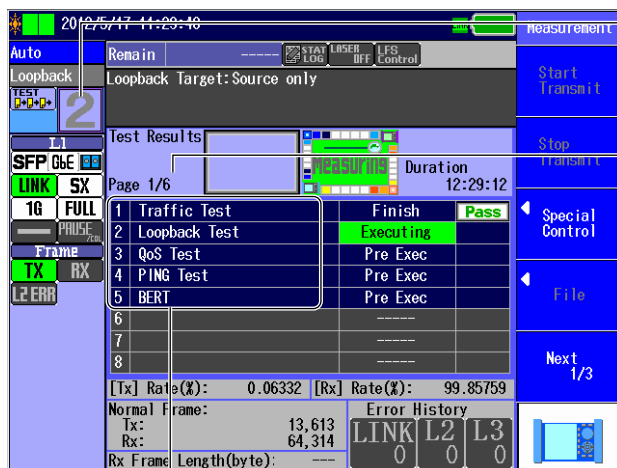
- Pass: The results meet the requirements.
- Fail: The results do not meet the requirements.

## Displaying Test Results in Auto or Auto(Remote) Mode When the Test Item Execution Type Is Continue

During continuous test item execution, results of tests that have been completed can be displayed.

1. Follow the procedure in section 4.4 to set the test items to execute.
2. Follow the procedure in section 4.11 to set the test item execution type to Continue.
3. Start measurement. The following screen appears.

Test Result Page (Page 1)



**The number of the test item being executed**

In this example, number 2, which indicates the loopback test, is displayed.

**Test result display page**

Page 1 displays a list of test items.

Page 2 and subsequent pages display the test results of the test items.

In the left example, five test items are displayed.

The first test, traffic test, is complete, and the test result is "Pass."

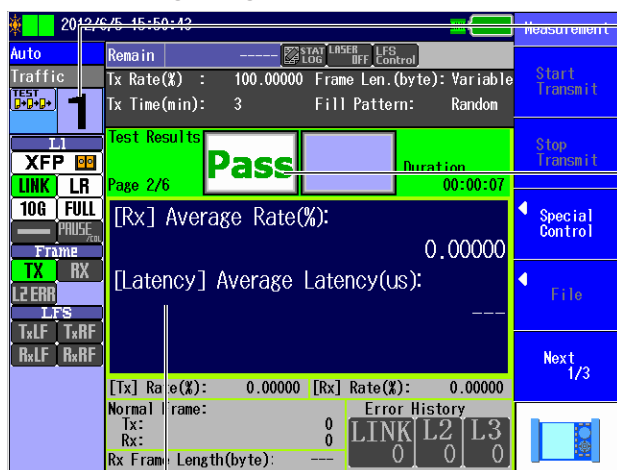
The second test, loopback test, is in progress.

Test items to execute (list)

Use the **up and down arrow keys** to change the displayed test result page.

Test result pages are in the same order as the test items in the list.

Test Result Page (Page 2 and later)



**The number of the displayed test result**  
In this example, number 1, which indicates the traffic test, is displayed.

The number blinks if the test item is being executed.

**Pass/fail indication (Pass, Fail)**

This does not appear when the test item is being executed.

Test results

This example shows the test results of the traffic test.

### Note

A list of test items is always displayed on the first page.

## 7.2 Performing L1 Control

### Procedure

L1 control is valid when Test Interface is set to XFP(10GbE) or SFP(GbE).

Press the **Special Control** soft key and then the **L1 Control** soft key to display the following screen.

#### Example when Test Interface Is Set to XFP(10GbE)

The screenshot shows the L1 Control interface with the following data:

- Header:** 2011/6/10 14:30:12, L1 Control
- Traffic:** Tx Rate(%) : 100.00000, Frame Len.(byte): 64, Tx Time(min): 3, Fill Pattern: Random
- Test Results:** Duration 17:58:16, Page 1/1
- Performance:** [Rx] Average Rate(%) : 99.71138, [Latency] Average Latency(us) : 6,483.5
- Rate Summary:** [Tx] Rate(%) : 0.00000, [Rx] Rate(%) : 99.79831
- Normal Frame:** Tx: 0, Rx: 45,401
- Rx Frame Length(byte):** ---
- Error History:** LINK L2 L3 (all 0)

Control buttons and their functions:

- Laser OFF Execution:** Executes or releases Laser OFF
- Send LF Start:** Starts or stops LF transmission
- Send RF Start:** Starts or stops RF transmission
- Transmit Frequency:** Changes the transmission frequency (Note: These settings are valid when Test Interface is set to XFP(10GbE).)

### Explanation

#### Laser OFF Execution and Release

- **Laser OFF Execution:** When you press the Laser OFF Execution soft key, it changes to the Laser OFF Release soft key, and the laser is turned off.
- **Laser OFF Release:** When you press the Laser OFF Release soft key, it changes to the Laser OFF Execution soft key, and the laser is turned on.

#### Send LF Start and Stop

- **Send LF Start:** When you press the Send LF Start soft key, it changes to the Send LF Stop soft key, and LFs are sent.
- **Send LF Stop:** When you press the Send LF Stop soft key, it changes to the Send LF Start soft key, and LF transmission is stopped.

#### Send RF Start and Stop

- **Send RF Start:** When you press the Send RF Start soft key, it changes to the Send RF Stop soft key, and RFs are sent.
- **Send RF Stop:** When you press the Send RF Stop soft key, it changes to the Send RF Start soft key, and RF transmission is stopped.

#### Note

- You can perform L1 control regardless of whether transmission is in progress or stopped.
- Send LF and RF Start and Stop are valid when Test Interface is set to XFP(10GbE).
- LF and RF transmission are exclusive. If you start LF transmission during RF transmission, RF transmission will stop. If you start RF transmission during LF transmission, LF transmission will stop.

**Changing the Transmission Frequency**

You can change the transmission frequency in the range of  $\pm 100$  ppm.

Resolution: 1 ppm

Accuracy:  $\pm 2$  ppm

**Note**

---

- While frames are being sent, you cannot change the transmission frequency.
  - When the 1000BASE-T (RJ-45) interface is in use, the AQ1300/AQ1301 may not be able to send or receive frames normally when it is configured as follows:
    - The test type is set to Manual mode, the transmission IFG is set less than 96 bytes, and the Tx frame length is set to 1526 or greater.
-

## 7.3 Changing the Tx Rate

### Procedure

Follow the procedure in section 7.1 to start measurement and transmission for a traffic, QoS, or BER test.

Press the **Special Control** soft key and then the **Tx Rate Change** soft key to display the following screen.

#### Example When a QoS Test Is Being Performed

The screenshot shows the 'Tx Rate Change' screen. At the top, it displays the date and time '2009/10/23 13:34:12'. Below this, there are several soft keys: 'Manual', 'Remain 3[s]', 'STAY LOG', 'LASER OFF', and 'LFS Control'. The 'QoS' section shows channel rates: CH1(%) 25.00000, CH2(%) 10.00000, CH3(%) 5.00000, CH4(%) 30.00000, CH5(%) ---, CH6(%) ---, CH7(%) ---, and CH8(%) ---. A 'Test Results' section shows 'Page 1/1' and 'Duration 09:52:01'. A table titled 'Rx QoS channel' lists rates for CH1 through CH8, with a 'Maximum' column. The 'Tx Rate' is set to '25.00000%'. A 'Default' button is visible at the bottom right. Callouts on the right side of the screen point to the 'Target' and 'Tx Rate' settings, explaining their functions.

Rx QoS channel	Maximum
CH1 Rate(%)	99.86825
CH2 Rate(%)	99.99603
CH3 Rate(%)	99.76039
CH4 Rate(%)	99.78465
CH5 Rate(%)	---
CH6 Rate(%)	---
CH7 Rate(%)	---
CH8 Rate(%)	---

[Tx] Rate(%): 0.12537 [Rx] Rate(%): 99.75895

Normal Frame: Tx: 20,641 Rx: 34,651

Rx Frame Length(byte): ---

Error History: LINK L2 L3 ERR ERRERR

### Explanation

#### Target

Specify the QoS channel whose rate you want to change. This setting is valid when you are performing a QoS test.

CH1 to CH8 (Manual)

CH1 to CH4 (Auto, Auto(Remote))

#### Tx Rate

Set the Tx rate.

Range: 0-100.00000%

#### Note

During a QoS test, you can change the Tx rates of the channels selected in the QoS transmission settings.

#### Default

Press this soft key to return the Tx rates to their original settings.

## 7.4 Inserting Errors

### Procedure

Follow the procedure in section 7.1 to start measurement and transmission for a traffic, QoS, or BER test.

Press the **Special Control** soft key and then the **Error Insertion** soft key to display the following screen.

### Example When a BERT Is Being Performed

The screenshot shows the Error Insertion screen with the following data:

Parameter	Value
Remain	16[s]
Tx Rate(bit)	96
Frame Len.(byte)	64
Tx Time(s)	60
[BERT] Bit Error Rate	1,674.5 E-12
[BERT] Bit Error Count	12,549
[BERT] BERT Target Byte	17,411
[Tx] Rate(%)	0.20784
[Rx] Rate(%)	99.95009
Normal Frame Tx	16,316
Normal Frame Rx	44,821
Rx Frame Length(byte)	---

The Error Insertion menu options and their descriptions are:

- Bit Error**: Inserts a bit error. Valid when the test mode is BERT.
- CRC Error**: Inserts a CRC error.
- Symbol Error**: Inserts a symbol error.
- Sequence Error**: Inserts a sequence error.
- Payload Error**: Inserts a payload error.

### Explanation

#### Bit Error

A single bit error is inserted. This soft key is valid during a BER test.

#### CRC Error

A single frame is inserted with a CRC error. This setting is valid when you are performing a traffic, QoS, or BER test.

#### Symbol Error

A single frame is inserted with a symbol error. This setting is valid when you are performing a traffic, QoS, or BER test.

#### Sequence Error

A single frame is inserted with a sequence error. This setting is valid when you are performing a traffic, QoS, or BER test.

#### Payload Error

A single frame is inserted with a payload error. This setting is valid when you are performing a traffic, QoS, or BER test.

### Note

When Manual has been selected in the Test menu, if you select the "Remove Test Tag from Test Frame" check box in the Option (Manual) Advance setup, sequence errors and payload errors are not inserted.



## 7.5 Performing a Traceroute Test

### Procedure

Follow the procedure in section 4.8 or 6.8 to set the test mode to PING Test, and press STOP. The PING measurement screen appears.

Press the **Special Control** soft key and then the **Traceroute** soft key to display the following screen.

The screenshot shows the Traceroute test interface. At the top, it displays the date and time (2009/10/29 16:28:18) and the test mode (Auto). The destination IP address is 192.168.000.002, and the interval is 1s. The 'Result Hop Number' is 0, and the page is 1/4. The table below is empty, with columns for Hop Number (No.), 1st(ms), 2nd(ms), 3rd(ms), and IP Address. On the right side, there are several control buttons: Start (Starts Traceroute testing), Stop (Stops Traceroute testing), File (Save data to a file. ▶ section 9.3), and Next Page (To the next page IPv4: (1/4-4/4) IPv6: (1/8-8/8)).

If measurement ends as a result of success, error detection, or manual stopping, the following screen appears.

### Measurement Result Indications (Example with an error)

The screenshot shows the Traceroute test interface after a successful measurement. The date and time are 2010/2/16 15:30:53. The 'Result Hop Number' is 13, and the page is 1/4. The table below contains 13 rows of data, with the 13th row marked with an asterisk (\*). The columns are Hop Number (No.), 1st(ms), 2nd(ms), 3rd(ms), and IP Address. On the right side, there are several control buttons: Start (The number of hops performed in the test), Stop, File (Events (No.: Hop number; 1st(ms), 2nd(ms), and 3rd(ms): response time; IP address)), and Next Page.

No.	1st(ms)	2nd(ms)	3rd(ms)	IP Address
1	200	100	100	44.212.35.19
2	*	300	300	121.205.166.9
3	100	300	200	194.32.118.87
4	300	100	300	146.221.69.38
5	200	100	200	125.131.243.205
6	100	300	200	237.207.73.236
7	300	100	200	33.228.67.91
8	200	200	200	68.31.53.242
9	100	300	300	207.107.97.207
10	300	200	300	53.54.24.52
11	300	300	100	113.170.144.96
12	300	200	200	47.18.11.42
13	*	300	200	119.253.202.247
14				
15				
16				

Status  
(Unexecution, Executing..., Success!, Error(Hop Count Over),  
Error(Route Error), Error(Target Unreachable), Cancel..)

**Explanation****Start**

Press this key to start Traceroute testing.

**Stop**

Press this key to stop Traceroute testing.

**File**

Press this key to save the Traceroute measurement results to a .csv file. For details, see section 9.3.

**To the next page**

Press this key to switch between Traceroute result screens.

IPv4: Pages 1/4 to 4/4

IPv6: Pages 1/8 to 8/8

**Measurement Result Display****Hop Number**

Indicates the number of hops performed in the Traceroute test.

**Events****No.**

Indicates the hop number.

**1st(ms), 2nd(ms), and 3rd(ms)**

Indicates the response time for three separate ping requests to the host.

Indication	Description
*	Indicates that no response was received from the host.
Number	Indicates the response time in ms.

**IP Address**

Indicates the host IP address from which the responses were received.

If no response was received to any of the three requests, “\*.\*.\*” appears.

**Status Indications**

Indication	Description
Unexecution	Execution has not yet taken place.
Executing..	Execution is taking place.
Success!	A response was received from the target host.
Error(Hop Count Over)	After 64 hops, no response was received from the target host.
Error(Route Error)	Responses for the 1st, 2nd, and 3rd ping requests came from more than one IP address.
Error(Target Unreachable)	A “Destination Unreachable” notification was received three times in a row.
Cancel..	The user stopped the Traceroute test in the middle of execution.

## 7.6 Displaying Test Results

### Procedure

Follow the procedure in section 7.1 to start or stop measurement.  
Press the **Test Result Display** soft key to display the following screen.

#### Example When a Traffic Test Is Being Performed

The screenshot shows the Test Result Display screen with the following data:

- Header: 2009/10/23 14:06:55, =AC=, Test Result Display
- Manual: Remain 0[s], STAT, LASER OFF, LFS Control
- Traffic: Tx Rate(%) : 100.00000, Frame Len.(byte): 64, Tx Time(s) : 60, Fill Pattern: Random
- Test Results: Page 1/1, Duration 13:38:33
- Summary: [Rx] Peak Rate(%): 99.81614, [Latency] Max Latency(us): 5,851.5
- Normal Frame: Tx: 6,809, Rx: 59,040, Rx Frame Length(byte): ---
- Error History: LINK L2 L3 ERR ERRERR

Annotations on the right side of the screen:

- Rate Unit**: Switches the rate unit (% , fps , bps). This setting is valid when you are performing a traffic or QoS test.
- Traffic**: Switches the traffic indication (Maximum, Average). This setting is valid when you are performing a traffic test.
- QoS**: Switches the QoS indication (Maximum, Average, Current). This setting is valid when you are performing a QoS test.
- Summary Display**: Switches the contents of the summary display (Summary, Address).

### Explanation

#### Rate Unit

This soft key switches the unit of the measured rate. This setting is valid when you are performing a traffic or QoS test.

- %: The rate is displayed as a percentage.
- fps: The number of frames that have been received normally in a single second is indicated.
- bps: The number of bits that have been received normally in a single second is indicated.

#### Traffic

This soft key switches between the types of values that are displayed for the Rx rate and the packet latency. This soft key is valid when you are performing a traffic test.

- Maximum: The maximum values are indicated.
- Average: The average values are indicated.

#### QoS

This soft key switches the types of values that are displayed for the Rx QoS channel rates. This setting is valid when you are performing a QoS test.

- Maximum: The maximum values are indicated.
- Average: The average values are indicated.
- Current: The current values are indicated.

#### Summary display

You can switch the contents of the summary display.

- Summary: A summary of the settings is displayed.

Test Mode	Displayed Items
Traffic Test	Tx rate, Tx time, frame length, fill pattern
Loopback Test	Loopback target
QoS Test	Tx rate for each channel
PING Test	Destination IP address, Tx interval, number of frames
BERT	Tx rate, Tx time, frame length

- Address: The source and destination MAC and IP addresses are displayed.

#### Note

You can change the contents of the Test Result Display regardless of whether measurement is in progress or stopped.

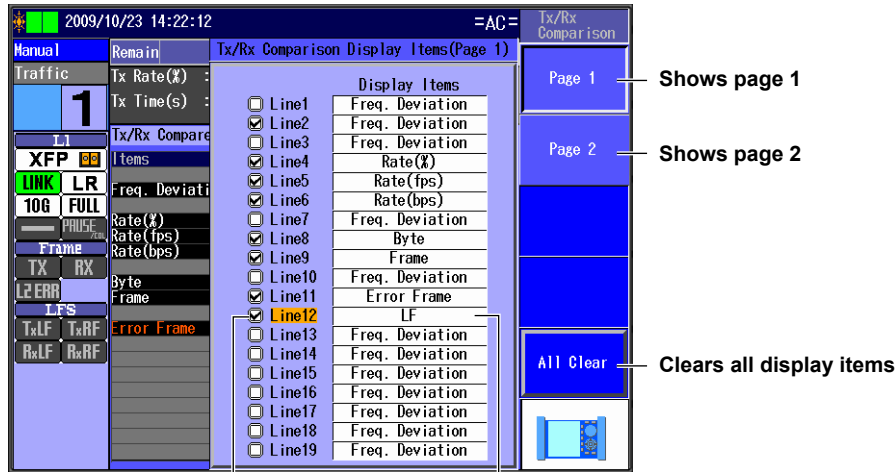
# 7.7 Comparing Transmission and Reception

## Procedure

### Setting the Tx/Rx Comparison Display Items

Follow the procedure in section 7.1 to start or stop measurement.

Press the **Tx/Rx Comparison** soft key and then the **Tx/Rx Comparison** soft key to display the following screen.

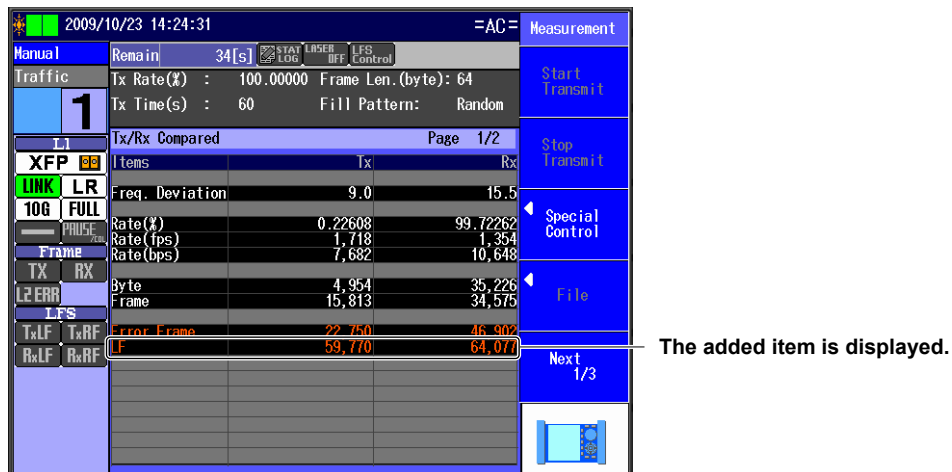


Select the lines that you want to display. Lines with cleared check boxes are blank.

Select the item that you want to display.

### Displaying the Tx/Rx Comparison

**START** to display the items that you added.



The added item is displayed.

**Explanation**

**Setting the Tx/Rx Comparison Display Items**

**Pages 1 and 2**

You can switch between the two pages of comparison display items.

- Page 1: Press this soft key to show the first page.
- Page 2: Press this soft key to show the second page.

**All Clear**

Press this soft key to clear the check boxes for all the display items.

**Lines 1 to 19**

Select the check boxes of the items that you want to display Tx/Rx comparisons for.

- Selected: The item is displayed.
- Cleared: The item is not displayed. The line that corresponds to the item is blank.

**Display Items**

Select the items that you want to display. You can select up to 38 of the items listed in the table below.

Display Item	Notes
Freq. Deviation	
LF	
RF	
Frame	
Byte	
Rate(%)	
Rate(fps)	
Rate(Bps)	
Rate(bps)	
Error Frame	
CHn Frame	n = 1 to 8 (CH1 to CH8)
CHn Byte	
CHn Rate(%)	
CHn Rate(fps)	
CHn Rate(bps)	

**Displaying the Tx/Rx Comparison**

You can display the same statistics for transmission and reception next to each other.

## 7.8 Customizing the Display

### Procedure

#### Configuring the Custom Display Items

Follow the procedure in section 7.1 to start or stop measurement.

Press the **Custom Display** soft key and then the **Custom Display Item** soft key to display the following screen.

Master/slave indication (M: master, S: slave)

The screenshot shows a list of 19 lines. Lines 1, 2, 3, 5, 6, 8, 9, 10, 12, 14, 15, 16, 17, and 18 have checked boxes. Lines 4, 7, 11, 13, and 19 are blank. The 'Detail' button for Line 17 is highlighted.

- Shows page 1
- Shows page 2
- Clears all display items
- Select the item that you want to display.

Select the lines that you want to display.

Lines with cleared check boxes are blank.

#### Custom Display Items Screen

Press **Detail** next to the line that you want to customize to display the following screen.

The configuration screen shows the following settings:

- Master/Slave: Master
- Group: Sequence
- Item: Reorder Packet

- Select Master or Slave. When the test mode is Auto(Remote), the controlling device is the master and the controlled device is the slave.
- Set the group.
- Set the display item.

#### Custom Display

Press **START** to display the items that you added.

The main measurement screen shows the following data:

- Manual: Remain 23[s]
- Traffic: Tx Rate(%) : 100.00000, Frame Len.(byte): 64, Tx Time(s) : 60, Fill Pattern: Random
- Custom Display Page 1/2:
  - Tx:Rate(%) M 0.14101
  - Rx:Rate(%) M 99.99311
  - Rx:Average Rate(%) M 99.68400
  - Latency:Max Latency(us) M 3,908.8
  - Latency:Avg Latency(us) M 4,496.7
  - Tx:Frame M 5,052
  - Rx:Frame M 37,258
  - Sequence:Loss Packet M 39,093
  - Payload:Payload Error M 39,133
  - Link:Link Down Count M 43,160
  - Link:LF Detect Count M 57,396
  - Link:RF Detect Count M 45,373
  - Link:Rx Freq Deviate(ppm) M 4.8
  - Sequence:Reorder Packet M 57,644

The added item is displayed.

### Explanation

#### Configuring the Custom Display Items

##### Pages 1 and 2

You can switch between the two pages of custom display items.

- Page1: Press this soft key to show the first page.
- Page2: Press this soft key to show the second page.

##### All Clear

Press this soft key to clear the check boxes for all the display items.

##### Lines 1 to 19

Select the check boxes of the items that you want to display Tx/Rx comparisons for.

- Selected: The item is displayed.
- Cleared: The item is not displayed. The line that corresponds to the item is blank.

#### Custom Display Items

##### Master/Slave

Select Master or Slave.

##### Note

---

If you specify Slave for a statistical item when the test mode is not Auto(Remote), results are not shown for that item.

---

##### Group

Select the group of the item that you want to display.

##### Display Item

Select the item that you want to display.

You can select up to 38 of the statistical items. For details, see section 1.8.

#### Custom Display

The specified statistical items are displayed.

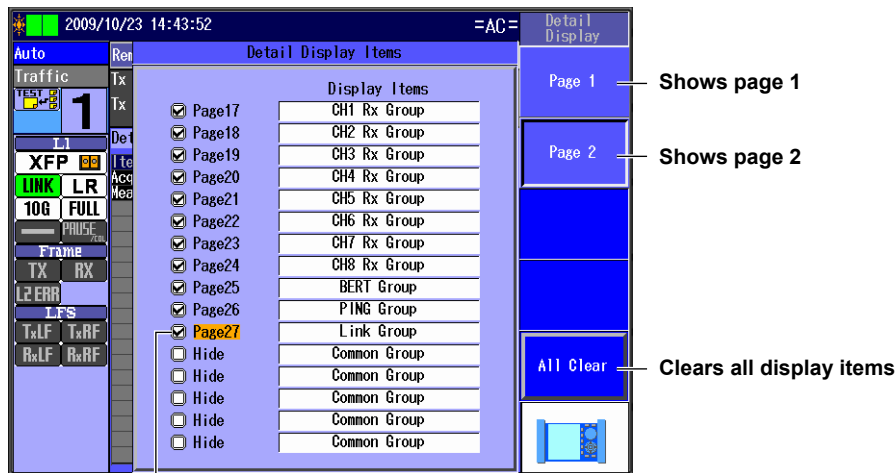
## 7.9 Displaying Detailed Statistics

### Procedure

#### Configuring the Detailed Statistics

Follow the procedure in section 7.1 to start or stop measurement.

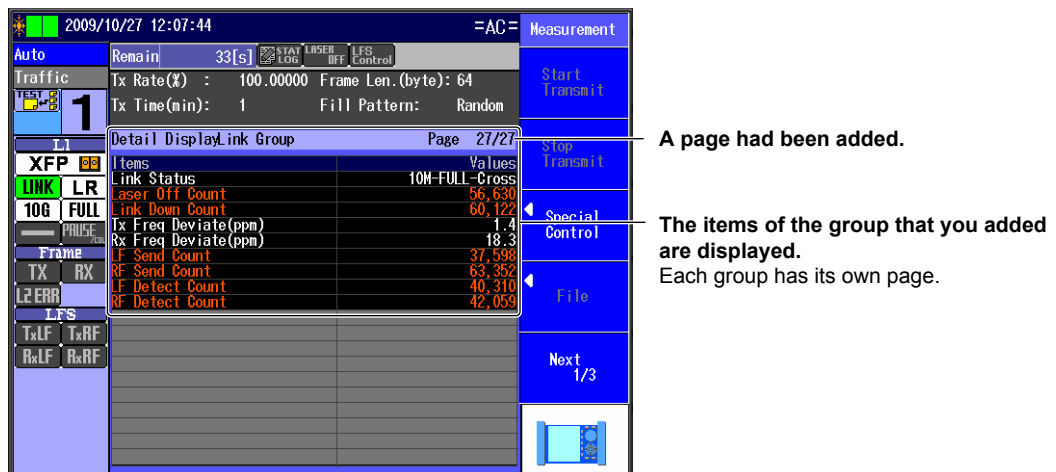
Press the **Detail Display** soft key and then the **Detail Display Item** soft key to display the following screen.



Select the pages that you want to display.  
Pages with cleared check boxes are not displayed.

#### Displaying the Detailed Statistics

Press **START** to display the items of the groups that you added.



#### Note

Each group of detailed statistics is displayed on a single page.



### Explanation

#### Configuring the Detailed Statistics

##### Pages 1 and 2

You can switch between the two pages of detailed statistic items.

- Page 1: Press this soft key to configure the settings on the first page.
- Page 2: Press this soft key to configure the settings on the second page.

##### All Clear

Press this soft key to clear the check boxes for all the display items.

##### Pages 1 to 32

Select the check boxes of the detailed statistic groups that you want to display.

- Selected: The group's items are displayed.
- Cleared: The group's items are not displayed.

##### Note

---

If you clear the check box of a group, it is not displayed, and the page numbers of the following groups are adjusted accordingly.

---

#### Displaying the Detailed Statistics

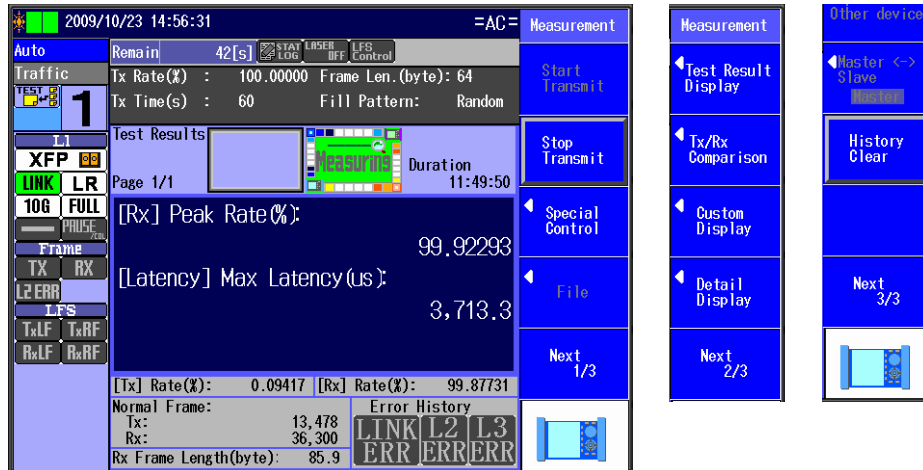
Statistical items are displayed in groups.

## 7.10 Changing the Displayed Screen

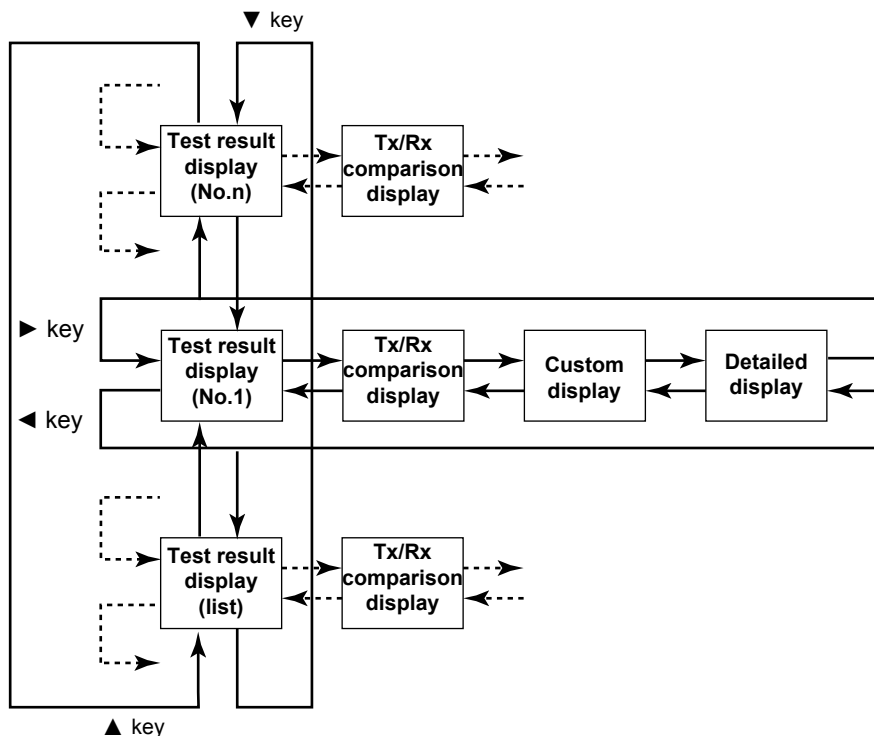
### Procedure

Follow the procedure in section 7.1 to start or stop measurement.

Configure the AQ1300/AQ1301 so that a soft key from Next 1/3 to 3/3 is displayed on the measurement screen.



Press the arrow keys to switch screens in the manner indicated below when the Test Result Display screen is displayed.



In any screen other than the Test Result Display screen, press the up and down arrow keys to switch pages in the manner indicated below.

▲ key: To the next page  
▼ key: To the previous page

## 7.10 Changing the Displayed Screen

---

### **Explanation**

#### **▶ and ◀ Keys**

These keys change the displayed screen. They are valid in measurement screens when a soft key from Next 1/3 to 3/3 is displayed on the screen.

Test Result Display, Tx/Rx Comparison, Custom Display, Detail Display

#### **▲ and ▼ Keys**

These keys switch between the pages of the displayed screen.

### **Note**

---

- You can use the keys in measurement screens when a soft key from Next 1/3 to 3/3 is displayed.
  - You can change the displayed screen regardless of whether measurement is in progress or stopped.
-

# 7.11 Operating the Other Device

## Procedure

Perform the following operation when measurement has finished.

Press the **Operate Other device** soft key to display the following screen.

## Explanation

### Setup File Acquisition

When the test mode is Auto or Manual, you can acquire the current settings of the other device and save them to /inband/rmtSetup.sd.

### Result File Acquisition

When the test mode is Auto or Manual, you can acquire the current measured results of the other device and save them to /inbandrmtResult.mr.

### Send Screen Image

When the test mode is Auto(Remote), you can send the master's measurement results screen to the slave.

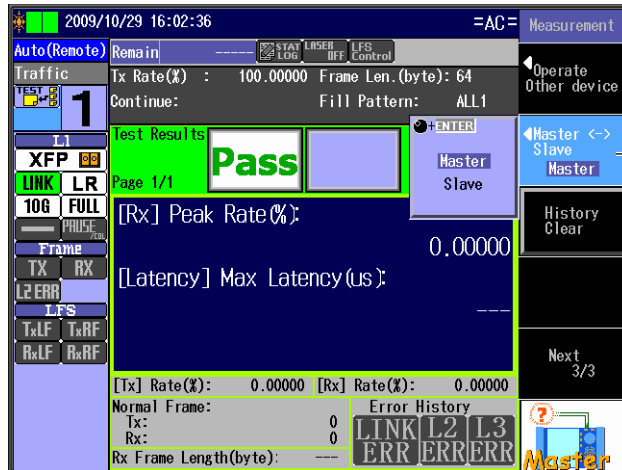
### Note

- You can control the other device after measurement has finished.
- If a file with the same name already exists, it is overwritten.

## 7.12 Switching between the Master and Slave Displays

### Procedure

Perform the following operation when the test mode is Auto(Remote) and measurement has finished. Press the **Master <-> Slave** soft key to display the following screen.



Switches between the master and slave displays (Master, Slave)  
Valid when the test mode is Auto(Remote)

### Explanation

#### Switching between the Master and Slave Displays

On the master, you can switch between showing the measurement results of the master and the slave.

- Master: The master's measurement results are displayed.
- Slave: The slave's measurement results are displayed.

#### Note

You can switch between the master and slave displays when the test mode is Auto(Remote) and measurement has finished.

## 7.13 Clearing the History

### Procedure

Follow the procedure in section 7.1 to start or stop measurement.  
Press the **History Clear** soft key to display the following screen.

The screenshot displays the following data:

- Time: 2009/10/23 17:13:56
- Mode: Auto
- Traffic: Tx Rate(%) : 100.00000, Frame Len.(byte): 64, Tx Time(min): 1, Fill Pattern: Random
- Test Results: **Pass**, Duration: 00:00:18
- [Rx] Peak Rate(%): 99.99640
- [Latency] Max Latency(us): 5,466.9
- [Tx] Rate(%): 0.10093, [Rx] Rate(%): 99.91167
- Normal Frame: Tx: 18,345, Rx: 61,907
- Rx Frame Length(byte): 97.3
- Error History: LINK ERR, L2 ERR, L3 ERR

Callouts below the screenshot:

- Flow control (PAUSE/COL)
- L2 error (L2 ERR)
- LFS (TxLF, TxRF, RxLF, RxRF)

### Explanation

#### History Clear

The flow control, L2 error, and LFS histories are cleared.

When you clear the history, the flow control (PAUSE/COL), L2 error (L2 ERR), and LFS (TxLF, TxRF, RxLF, RxRF) status indications become gray.

#### Note

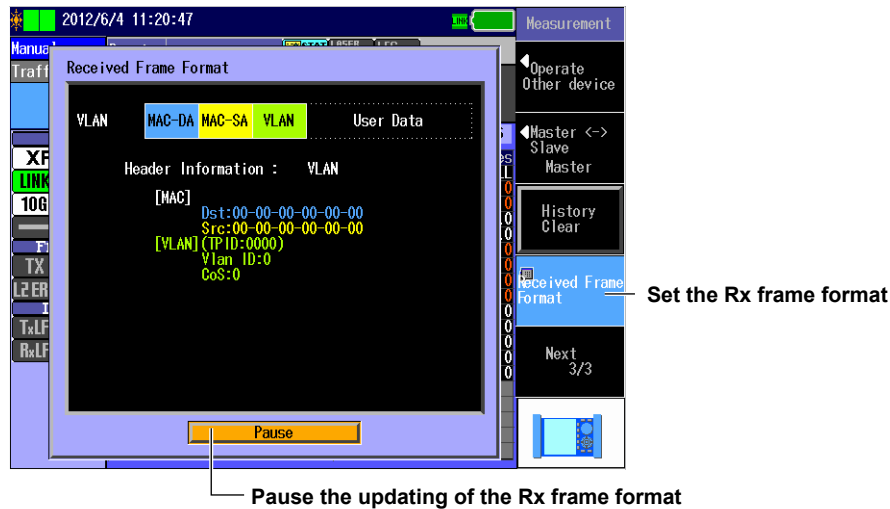
The History Clear operation does not clear the error history (LINK ERR, L2 ERR, L3 ERR).

## 7.14 Displaying the Header Information of Received Frames

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

### Procedure

Display the measurement screen. To start measurement and display the measurement screen, press **START**. To display the measurement screen without starting measurement, press **STOP**. Press the **Received Frame Format** soft key. The following screen appears.



### Explanation

#### Displaying Received Headers

The AQ1300/AQ1301 displays the header information of received frames. The following header information can be displayed.

Protocol	Header	Parameter	Detection Conditions
VLAN	MAC	MAC address	When the first type value is [88A8], [9100], [9200], or [9300].
	VLAN	Cos, VLAN-ID	
802.1Q	MAC	MAC address	When the first type value is [8100].
	C-VLAN	Cos, VLAN-ID	
802.1ad	MAC	MAC address	When the first type value is [88A8] and the subsequent type value is [8100].
	C-VLAN	Cos, VLAN-ID	
	S-VLAN	Cos, VLAN-ID	
QinQ	MAC	MAC address	When the first type value is [9100], [9200], or [9300] and the subsequent type value is [8100], [9100], [9200], or [9300].
	VLAN1	Cos, VLAN-ID	
	VLAN2	Cos, VLAN-ID	
PBB-I	MAC	MAC address	When the first type value is [88E7].
	I-SID	I-SID, I-PCP	
PBB-IB	MAC	MAC address	When the first type value is [88A8] and the subsequent type value is [88E7].
	I-SID	I-SID, I-PCP	
	B-VLAN	B-VLAN-ID, B-PCP	
EoE	MAC	MAC address	When the first type value is [E0E0].
	EoE	TTL, EID	
EoE VLAN	MAC	MAC address	When the first type value is [A100] and the subsequent type value is not [E0E0].
	EoE	TTL, EID	
	EoE-VLAN	VPN-ID, PCP	
VPLS	MAC	MAC address	When the first type value is [88E7] or [8848].
	VC Label	Label, Exp, TTL	
	T Label	Label, Exp, TTL	
	E-Type	E-TYPE	
No reception	—	—	Other than those above.
Other	MAC	MAC address	

---

## 7.14 Displaying the Header Information of Received Frames

The header information is updated every second.  
Press the Pause soft key to pause the screen updating.

### **Note**

---

Header information can be displayed when Manual is selected in the Test menu.

---



# 8.1 Selecting a Setup File

## Procedure

### Select Setup File Screen

Press the **Option** soft key and then the **RFC2544** soft key to display the following screen.

**Registered setup files**  
A comment or file name appears next to each number.

**Test type from the setup file**  
Values other than "RFC2544" appear dimmed.

**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 to 4/4)**

#### Setup file list

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

#### Select the setup file.

Select a registered setup file from the setup file list.

### Note

To select an RFC2544 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

Press the **File** soft key to display the following screen.

**Set File Operation 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.

## 8.1 Selecting a Setup File

### RFC2544 Setup Screen

The following screen appears when you select a setup file.

The screenshot shows the RFC2544 Test Setup screen. The main area is divided into sections: Test Setup, Address Setting, and Common Setting. The Test Setup section shows Test Interface: XFP(10GbE). The Address Setting section shows Source MAC, Destination MAC, Source IPv4, and Destination IPv4. The Common Setting section shows Test Select, Throughput, Frame Length, Latency, Frame Loss Rate, Back to Back, and Packet Jitter. The right sidebar contains navigation options: Test Setup, L3-IPv4 Test, Common Setting, Link/Address, Detail Setup, and Next 1/2. The bottom sidebar contains: Select Setup File, Option (RFC2544), and Next 2/2. Annotations on the right explain each option.

**Test Setup** — Set up the test. ► section 8.2

**L3-IPv4 Test** — Configure the settings that are common to all RFC2544 tests. ► section 8.4

**Common Setting** — Configure link and address settings. ► section 8.3

**Link/Address** — Configure the detailed settings for the individual RFC2544 tests. ► section 8.5 to 8.9

**Detail Setup** — To RFC2544 setup page 2/2

**Next 1/2** — To RFC2544 setup page 2/2

**Select Setup File** — Select the setup file. ► section 8.1

**Option (RFC2544)** — Configure the options (RFC2544). ► section 8.10

**Next 2/2** — To RFC2544 setup page 1/2

**Explanation****Latest Setup**

Select this item to use the setup that was displayed previously.

**Default Setup**

Select this item to return to the default setup.

**File**

Select this item to load a setup file (with an .sd extension) from the file list.

Select this item when you want to load a setup file that is not in the setup file list.

To create a setup file, you can use the setup software and send the file to the AQ1300/AQ1301, or you can save the settings on the AQ1300/AQ1301.

**Setup File Selection**

To select a registered setup file, use the setup file list.

You can register up to 48 setup files to the setup file list (4 pages with 12 files per page).

A comment or file name is displayed for each of the registered setup files in the setup file list.

The setup file list is updated when you open the Select Setup File screen after you have created a display management file and setup files with the setup software and sent the files to the AQ1300/AQ1301.

For details, see the *Setup Software User's Manual*, IM AQ1300-61EN.

**Note**

- The AQ1300/AQ1301 can only display the setup file list if the display management file that you created using the setup software (disManage.dmf) and the setup (.sd) files that the display management file refers to are saved to the AQ1300/AQ1301 /setup directory.

Example: /setup/disManage.dmf

/setup/0000.sd

/setup/0001.sd

:

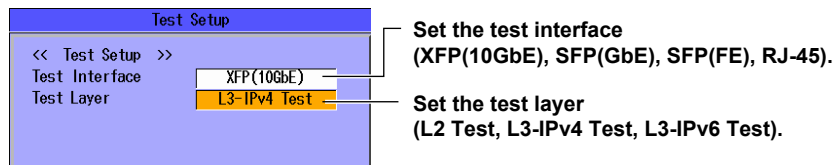
- When you are performing RFC2544 tests, you can only select setup files for RFC2544 tests.

## 8.2 Setting Up a Test

### Procedure

#### Test Setup Screen

Follow the procedure in section 8.1 to display the RFC2544 Setup screen. Press the **Test Setup** soft key to display the following screen.



### Explanation

#### Test Interface

Specify which test interface to use.

- XFP (10GbE): Select this option to use the 10GBASE-R measurement port.
- SFP (GbE): Select this option to use the 1000BASE-X measurement port.
- SFP (FE): Select this option to use the 100BASE-X measurement port.
- RJ-45: Select this option to use the 10BASE-T/100BASE-TX/1000BASE-T measurement port.

#### Test Layer

Set the layer to test.

- L2 Test: Select this option to test layer 2.
- L3-IPv4 Test: Select this option to test layer 3 according to the IPv4 protocol.
- L3-IPv6 Test: Select this option to test layer 3 according to the IPv6 protocol.

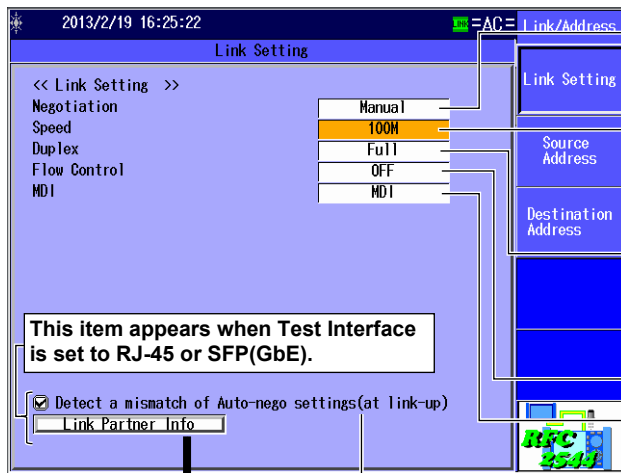
## 8.3 Configuring Link Address Settings

### Procedure

#### Link Setup Screen

Follow the procedure in section 8.1 to display the RFC2544 Setup screen.

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.

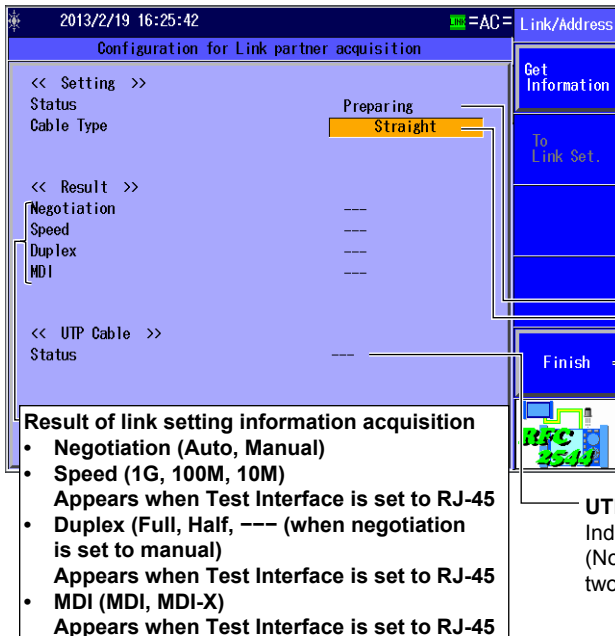
#### Set the flow control (ON, OFF).

#### Set the MDI (MDI, MDI-X, Auto).

The Auto setting for MDI is valid when Negotiation is set to Auto.

Select this check box to automatically detect mismatches in the auto negotiation during link establishment.

#### Link Setting Acquisition



#### Executes link setting information acquisition

Acquires the link setting information of the other device connected to the AQ1300/AQ1301

#### Applies link settings

Applies the acquired other device's link settings to the AQ1300/AQ1301. You can execute this when the measurement interface is RJ-45 or SFP(GbE) and the acquisition status is Finish.

#### Status (Preparing, Finish, Fail)

#### Cable type (Straight, Cross)

This setting is valid when Test Interface is set to RJ-45.

#### Returns to the link setting screen

#### UTP Cable Status

Indicates the UTP cable status as follows. (Normal, The cable may be defective. It is two-pair cable)

- Result of link setting information acquisition
- Negotiation (Auto, Manual)  
Appears when Test Interface is set to RJ-45
  - Speed (1G, 100M, 10M)  
Appears when Test Interface is set to RJ-45
  - Duplex (Full, Half, --- (when negotiation is set to manual)  
Appears when Test Interface is set to RJ-45
  - MDI (MDI, MDI-X)  
Appears when Test Interface is set to RJ-45

## Source Address Setup Screen

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

The screenshot shows the 'Source Address' configuration screen. It includes fields for Source MAC, VLAN stacks (VLAN2 and VLAN1), Source IPv4 (Address, Subnet Mask, Gateway), and UDP Port Number. A secondary section for Source IPv6 (Address, Router Address, Prefix Length) is also visible. Callouts point to these fields with descriptive text and references to other sections.

**Source Address Setup Fields:**

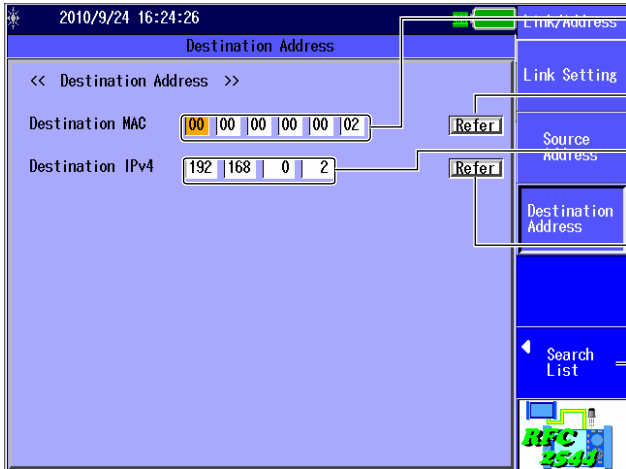
- Source MAC:** 00 00 00 00 00 01
- VLAN stacks:** None
- VLAN2:** IP ID 88A8, CoS 0, ID 1001
- VLAN1:** IP ID 8100, CoS 0, ID 1000
- Source IPv4:** Manual
- Address:** 192 168 0 1 / 24
- Subnet Mask:** 255 255 255 0
- Gateway:** 192 168 0 254
- UDP Port Number:** 0
- Source IPv6:** Manual
- Address:** FE80 0000 0000 0000 0000 0000 0000 0001
- Router Address:**  Set Router Address manually. FE80 0000 0000 0000 0000 0000 0000 0000
- Prefix Length:** 64

**Callout Descriptions:**

- Link/Address:** Set the source MAC address. Refer to the MAC address table. ▶ section 4.3
- Link Setting:** Set the VLAN stack number (None, 1, 2).
- Source Address:** Configure the VLAN settings (CoS: 0 to 7, ID: 0 to 4095, TPID: 0 to FFFF). These settings are valid when VLAN stacks is set to 1 or 2.
- Destination Address:** Refer to the VLAN table. ▶ section 4.3
- Source Address (IPv4):** Set IPv4 (Manual, DHCP). This setting appears when Test Layer is set to L3-IPv4.
- Address (IPv4):** Refer to the IP address table. ▶ section 4.3
- Subnet Mask (IPv4):** Refer to the gateway reference. ▶ section 4.3
- Gateway (IPv4):** Set the source IPv4 address. Set the subnet mask (1 to 31). Set the gateway. These settings are valid when IPv4 is set to Manual.
- UDP Port Number:** Set the source UDP port.
- Source IPv6:** Set IPv6 (Manual, Stateless Address). This setting appears when Test Layer is set to L3-IPv6.
- Address (IPv6):** Set the source IPv6 address. This setting is valid when IPv6 is set to Manual. Refer to the IP Address table.
- Router Address (IPv6):** Select this check box when you want to manually set the router address.
- Prefix Length (IPv6):** View and set the IPv6 prefix length and the IPv6 router address.

### Destination Address Setup Screen

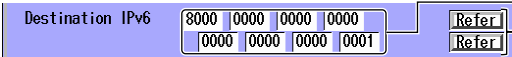
Press the **Link/Address** soft key and then the **Destination Address** soft key to display the following screen.



**Set the destination MAC address.**  
This setting appears when Test Layer is set to L2.  
**Refer to the MAC address table. ▶ section 4.3**

**Set the destination IPv4 address.**  
This setting appears when Test Layer is set to L3-IPv4.  
**Refer to the IP address table. ▶ section 4.3**

**Select the search list. ▶ section 4.3**



**Set the destination IPv6 address.**  
This setting appears when Test Layer is set to L3-IPv6.  
**Refer to the IP address table. ▶ section 4.3**

#### Note

- When Test Layer is set to L3-IPv4 Test or L3-IPv6 Test, the destination MAC address is fixed to ARP (NDP).
- **Address Settings**  
When you are configuring RFC2544 settings, you can also set the source and destination MAC, IPv4, and IPv6 addresses on the top RFC2544 setup screen.



Address settings

### Explanation

#### Link Setup Screen

##### Negotiation

Select whether to use auto negotiation. This setting is valid when Test Interface is set to RJ-45 or SFP(GbE).

- Auto: The link between the AQ1300/AQ1301 and the device that it is connected to is configured automatically through auto negotiation.
- Manual: The link must be configured manually.

##### Speed

When Test Interface is set to RJ-45, you can set the link speed.

- 1G: A 1 Gbit/s 100BASE-T connection is used.
- 100M: A 100 Mbit/s 100BASE-TX connection is used.
- 10M: A 10 Mbit/s 10BASE-T connection is used.
- Auto: The link speed is set automatically. This setting is valid when Negotiation is set to Auto.

##### Note

---

When Test Interface is set to XFP(10GbE), the link speed is fixed at 10G. When Test Interface is set to SFP(GbE), the link speed is fixed at 1G. When Test Interface is set to SFP(FE), the link speed is fixed at 100M.

---

##### Duplex

You can set the communication mode for when Speed is set to 100M or 10M. This setting is valid when Test Interface is set to RJ-45.

- FULL: Full duplex communication
- HALF: Half duplex communication
- Auto: The AQ1300/AQ1301 chooses full or half duplex automatically. This setting is valid when Negotiation is set to Auto.

##### Note

---

When Test Interface is set to XFP(10GbE), SFP(GbE), or SFP(FE), or when it is set to RJ-45 and Speed is set to 1G, the duplex mode is fixed at FULL.

---

##### Flow Control

You can enable or disable flow control.

- ON: Flow control is enabled.
- OFF: Flow control is disabled.

##### MDI

You can set the measurement port to straight or crossover mode. This setting is valid when Test Interface is set to RJ-45.

- MDI: Straight
- MDI-X: Cross
- Auto: The AQ1300/AQ1301 switches between straight and crossover mode automatically (this setting is valid when Negotiation is set to Auto).

##### Link Setting Acquisition

If the interface is SFP(GbE) or RJ-45, you can acquire and display link setting information of the other device (DUT; the device on the user side) connected to the AQ1300/AQ1301. For details, see section 4.3.



## Source Address Setup Screen

### Source MAC Address

Set the source MAC address. You can refer to the MAC address table to set the address.

### VLAN Stacks

Set the number of VLAN stacks.

- None: No VLAN stacks
- 1: One VLAN stack
- 2: Two VLAN stacks

### VLAN1 and VLAN2

Set the CoS (Class of Service) and VLAN-ID for 1 or 2 VLAN stacks. You can refer to the VLAN table to set the values.

- CoS: 0 to 7
- ID: 0 to 4095
- TPID: 0 to FFFF (supported in firmware version (FW Ver.) R1.08.01.001 and later)

### IPv4

Select whether to specify the source IPv4 address manually or to acquire and set it automatically through DHCP. This setting is valid when Test Layer is set to L3-IPv4 Test.

- Manual: You must set the source IPv4 address manually.
- DHCP: When you press Get IP Address, the AQ1300/AQ1301 acquires and sets the source IPv4 address using DHCP.

### Source IPv4 Address, Subnet Mask, and Gateway

Set the source IPv4 address, subnet mask, and gateway when IPv4 is set to Manual. You can refer to the IP Address table and the gateway reference to configure the settings.

- Subnet Mask: 1 to 31

### IPv6

Select whether to specify the source IPv6 address manually or to specify it through stateless autoconfiguration using the RA from an IPv6 router. This setting is valid when Test Layer is set to L3-IPv6 Test.

- Manual: You must set the source IPv6 address manually.
- Stateless Address: When you press Get IP Address, the AQ1300/AQ1301 automatically configures the source IPv6 address.

### Source IPv6 Address

Set the source IPv6 address when IPv6 is set to Manual. You can refer to the IP address table to set the address.

### IPv6 Router Address

You can automatically acquire the router address or set it manually.

- Automatic: Clear the Set Router Address manually check box. The IPv6 prefix length and router address that have been acquired automatically are displayed.
- Manual: Select the Set Router Address manually check box. You can manually set the prefix length and router address.

## 8.3 Configuring Link Address Settings

---

### MAC Address Table

Select the source MAC address from the MAC Address table.

- Global Address: You can set the source MAC address to a global address.

### VLAN Table

Select the VLAN CoS and ID from the VLAN table.

### IP Address Table

Select the source IP address from the IP address table.

- Get IP Address: Press this soft key to get the IP address. The AQ1300/AQ1301 will acquire an IP address, using DHCP when the test layer is L3-IPv4 or stateless address autoconfiguration when the test layer is L3-IPv6.

### Gateway

Set the gateway.

- Manual: Select this option to set the gateway manually.
- Auto.1: Select this option to set the gateway to xxx.xxx.xxx.1.
- Auto.254: Select this option to set the gateway to xxx.xxx.xxx.254.

### UDP Port Number

Set the test frame's source UDP port number.

## Destination Address Setup Screen

### Destination MAC Address

Set the destination MAC address. You can refer to the MAC address table to set the address.

### IPv4

Set the destination IPv4 address. This setting is valid when Test Layer is set to L3-IPv4 Test. You can refer to the IP address table or select Search List to set the address.

### IPv6

Set the destination IPv6 address. This setting is valid when Test Layer is set to L3-IPv6 Test. You can refer to the IP address table or select Search List to set the address.

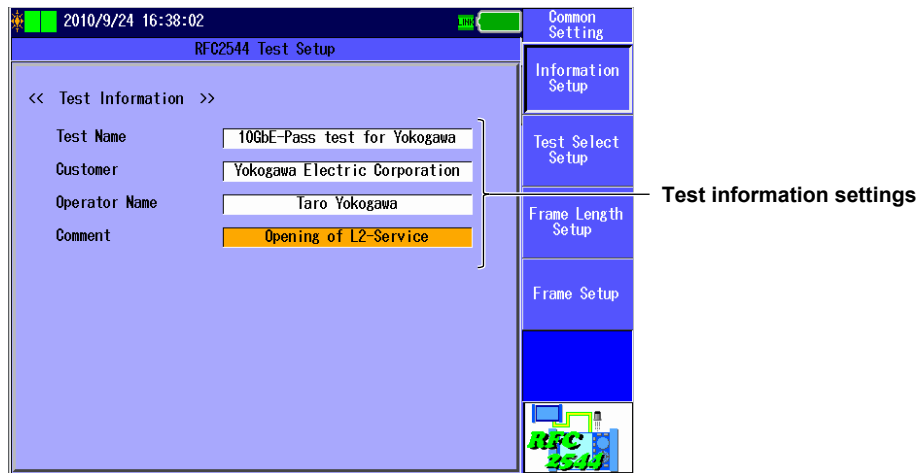
## 8.4 Configuring Common RFC2544 Test Items

### Procedure

#### Test Information Setup Screen

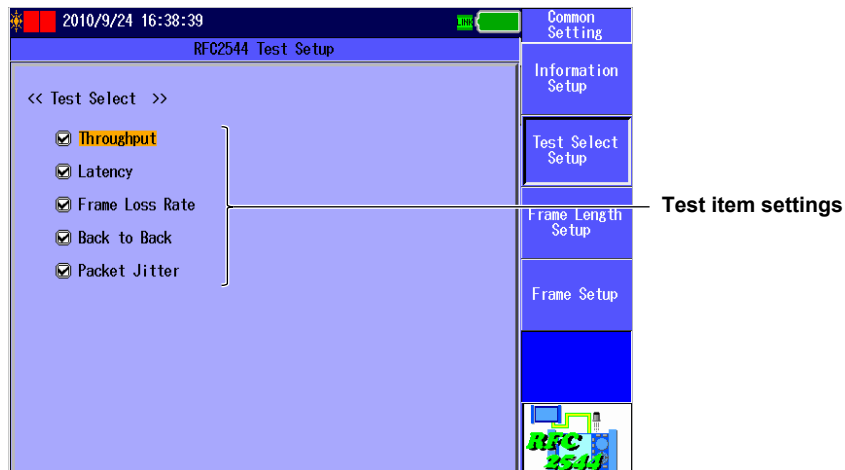
Follow the procedure in section 8.1 to display the RFC2544 Setup screen.

Press the **Common Setting** soft key and then the **Information Setup** soft key to display the following screen.



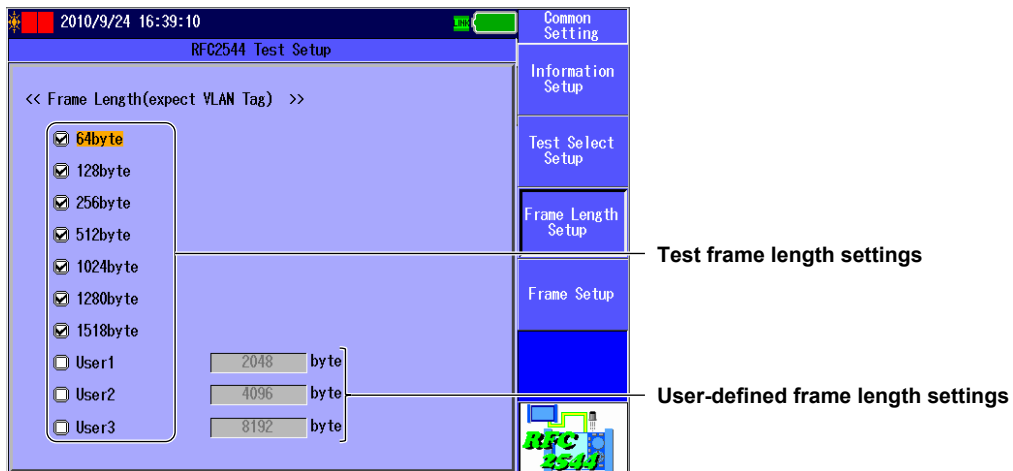
#### Test Item Setup Screen

Press the **Common Setting** soft key and then the **Test Select Setup** soft key to display the following screen.



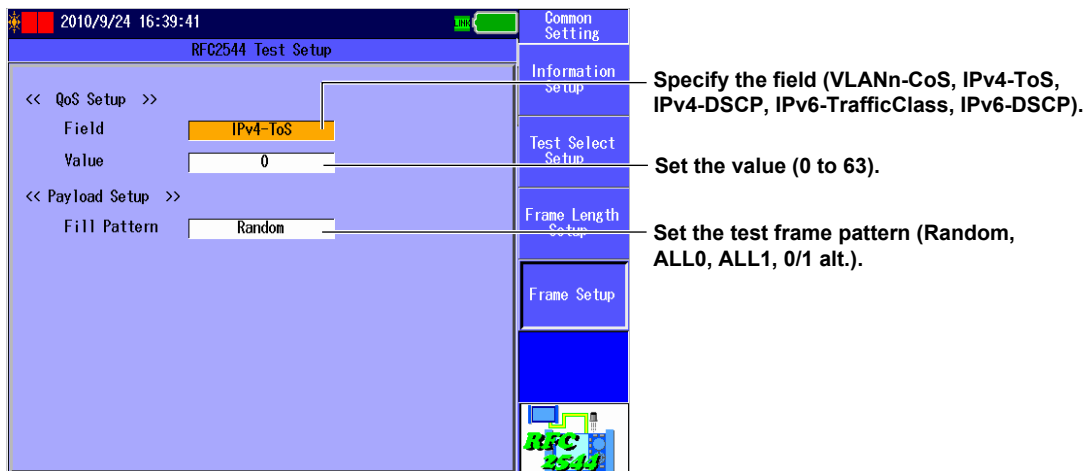
## Frame Length Setup Screen

Press the **Common Setting** soft key and then the **Frame Length Setup** soft key to display the following screen.



## Frame Setup Screen

Press the **Common Setting** soft key and then the **Frame Setup** soft key to display the following screen.



### Explanation

## Test Information Setup Screen

### Test Information

You can enter the following information. Follow the procedure in section 3.2 to enter characters.

- Test Name
- Customer
- Operator Name
- Comment
  - You can enter up to 30 characters.
  - When you press the Commit soft key in the character input dialog box, the character string changes to the characters that you entered.

### Note

The information that you enter here will be included in the report of the test results. Use the setup software to generate the report. For details, see the *Setup Software User's Manual*, IM AQ1300-61EN.

## Test Item Setup Screen

### Test Item Selection

Select the tests that you want to execute. Select the check boxes of the tests that you want to perform.

- Throughput test
- Latency test
- Frame loss rate test
- Back to back test
- Packet jitter test

## Frame Length Setup Screen

### Test Frame Length Selection

Select the frame lengths of the tests that you want to execute. Select the check boxes of the frame lengths that you want to use.

You can select from the following 10 frame lengths.

- Default RFC2544 frame lengths (64, 128, 256, 512, 1024, 1280, and 1518)
- Three user-defined frame lengths

### Note

- The frame lengths that you select here do not include VLAN tags.  
Example: If there are two VLAN stacks and you select 64byte, the length of the frame that is actually transmitted is 72 bytes.
- When Test Layer is set to L3-IPv6 Test on the Test Setup screen, you cannot select 64byte.

### User-Defined Frame Length

Use one of the user-defined frame lengths when you want to specify your own frame length.

Range: 64 to 9999 bytes

### Note

- The maximum frame length of a frame that can be transmitted is 9999 bytes, including the VLAN tags.  
Example: If there are two VLAN stacks and you set a user-defined frame length to 9996 bytes, the length of the frame that is actually transmitted is 9999 bytes.
- When Test Layer is set to L3-IPv6 Test on the Test Setup screen, you cannot specify a frame length that is less than 82 bytes.

## Frame Setup Screen

### Field

Set the field of the QoS value that will be inserted into the test frame.

- None
- VLANn-CoS
- IPv4-ToS
- IPv4-DSCP
- IPv6-TrafficClass
- IPv6-DSCP

### Note

- VLANn-CoS can be selected when VLAN Stacks is set to n or greater on the Link/Address Source Address setup screen. The VLANn-CoS value that you set here is only inserted into the test frame. The CoS value that has been set in the link and address source address settings is inserted into ARP (NDP) request frames and response frames.
- IPv4-ToS and IPv4-DSCP can be selected when Test Layer is set to L3-IPv4 Test on the Test Setup screen.
- IPv6-TrafficClass and IPv6-DSCP can be selected when Test Layer is set to L3-IPv6 Test on the Test Setup screen.

## 8.4 Configuring Common RFC2544 Test Items

---

### Value

Set the value that will be inserted in the field that you selected with Field.

### Range

VLANn-CoS/IPv4-ToS/IPv6-TrafficClass:	0 to 7
IPv4-DSCP/IPv6-DSCP:	0 to 63

### Fill Pattern

Set the test frame's payload pattern.

- Random: A random pattern
- ALL0: All zeros
- ALL1: All ones
- 0/1: Alternating zeros and ones

### Note

---

A 16-byte block of test management information is always inserted at the end of the test frame payload.

---

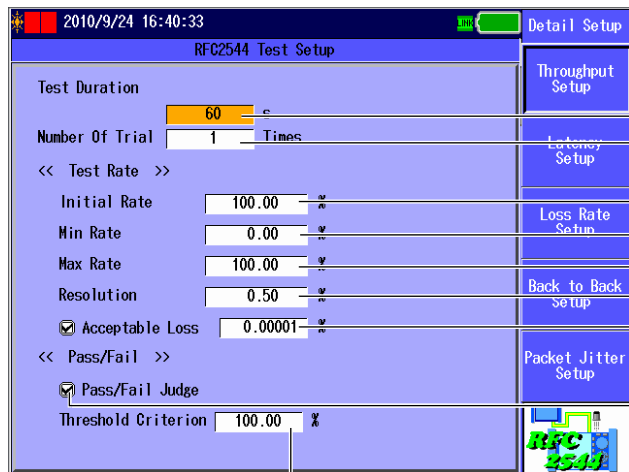
## 8.5 Configuring Throughput Test Settings

### Procedure

#### Throughput Test Setup Screen

Follow the procedure in section 8.1 to display the RFC2544 Setup screen.

Press the **Detail Setup** soft key and then the **Throughput Setup** soft key to display the following screen.



The screenshot shows the 'RFC2544 Test Setup' screen with the following fields and soft keys:

- Test Duration:** 60 seconds. Soft key: **Throughput Setup**. Description: Set the test duration (1 to 999).
- Number Of Trial:** 1 Times. Soft key: **Latency Setup**. Description: Set the number of trials (1 to 60).
- Initial Rate:** 100.00. Soft key: **Loss Rate Setup**. Description: Set the initial rate (0.01 to 100.00).
- Min Rate:** 0.00. Soft key: **Loss Rate Setup**. Description: Set the minimum rate (0.00 to 100.00).
- Max Rate:** 100.00. Soft key: **Loss Rate Setup**. Description: Set the maximum rate (0.01 to 100.00).
- Resolution:** 0.50. Soft key: **Back to Back Setup**. Description: Set the resolution (0.01 to 100.00).
- Acceptable Loss:** 0.00001. Soft key: **Back to Back Setup**. Description: Set the acceptable loss (0.00001 to 100.00000).
- Pass/Fail Judge:** Checked. Soft key: **Packet Jitter Setup**. Description: Select this check box to perform pass/fail judgment.
- Threshold Criterion:** 100.00%. Soft key: **Packet Jitter Setup**. Description: Set the judgment threshold (0.01 to 100.00).

### Explanation

#### Test Duration

Set the test duration. The value that you specify here is the time that a single test frame is transmitted for.

Range: 1 to 999 seconds

#### Number of Trial

Set the number of trials that you want to perform.

Range: 1 to 60

#### Initial Rate

Set the initial traffic rate that the throughput test will use.

Range: 0.01 to 100.00%

#### Min Rate

Set the minimum rate that the result of the throughput test will be converged toward. Enter a value that is less than or equal to the initial rate.

Range: 0.00 to 100.00%

#### Max Rate

Set the maximum rate that the result of the throughput test will be converged toward. Enter a value that is greater than or equal to the initial rate.

Range: 0.01 to 100.00%

## 8.5 Configuring Throughput Test Settings

---

### Resolution

Select whether to accept frame loss during the throughput test.

- Selected: Loss during the throughput test will be accepted.
- Cleared: Loss during the throughput test will not be accepted.

If loss will be accepted, set the acceptable frame loss as a percentage.

Range: 0.01 to 100.00%

### Acceptable Loss

Set the acceptable frame loss during the throughput test as a percentage.

Range: 0.00001 to 100.00000%

### Pass/Fail Judge

Set whether to perform pass/fail judgments on the throughput test result.

- Selected: Pass/fail judgments are performed.
- Cleared: Pass/fail judgments are not performed.

### Note

---

If you want to perform pass/fail judgments, enable the pass/fail judgment setting in the optional measurement settings as well.

---

### Threshold Criterion

If you select to perform pass/fail judgments on the throughput test result, set the judgment threshold.

Range: 0.01 to 100.00%



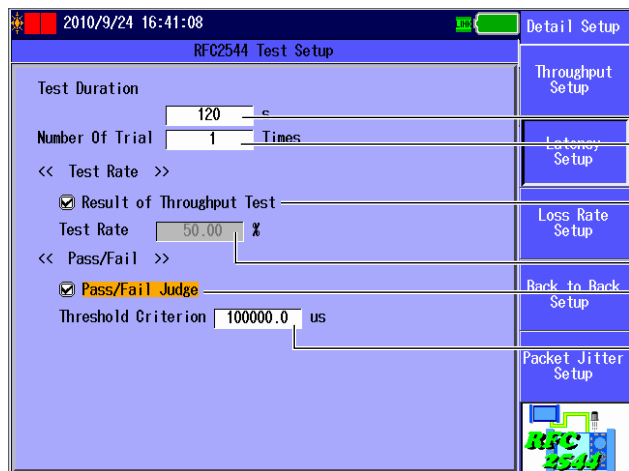
## 8.6 Configuring Latency Test Settings

### Procedure

#### Latency Test Setup Screen

Follow the procedure in section 8.1 to display the RFC2544 Setup screen.

Press the **Detail Setup** soft key and then the **Latency Setup** soft key to display the following screen.



The screenshot shows the 'RFC2544 Test Setup' screen with the 'Latency Setup' soft key selected. The screen displays the following settings:

- Test Duration: 120 s
- Number Of Trial: 1 Times
- Test Rate: 50.00 %
- Result of Throughput Test:  (Selected)
- Pass/Fail Judge:  (Selected)
- Threshold Criterion: 100000.0 us

Annotations on the right side of the screen provide instructions for each setting:

- Set the test duration (1 to 999).
- Set the number of trials (1 to 60).
- Select this check box to use the throughput test result.
- Select the measurement rate (0.01 to 100.00).
- Select this check box to perform pass/fail judgment.
- Set the upper limit on the delay (0.1 to 999999.9).

### Explanation

#### Test Duration

Set the test duration. The value that you specify here is the time that a single test frame is transmitted for.

Range: 1 to 999 seconds

#### Number of Trial

Set the number of trials that you want to perform.

Range: 1 to 60

#### Result of Throughput Test

Set whether to use the result of the throughput test as the latency test's measurement rate.

- Selected: The result of the throughput test is used.
- Cleared: The result of the throughput test is not used.

#### Test Rate

Set the measurement rate of the latency test. You can specify this value when you are not using the result of the throughput test as the measurement rate.

Range: 0.01 to 100.00%

## 8.6 Configuring Latency Test Settings

---

### Pass/Fail Judge

Set whether to perform pass/fail judgments on the latency test result.

- Selected: Pass/fail judgments are performed.
- Cleared: Pass/fail judgments are not performed.

### Note

---

If you want to perform pass/fail judgments, enable the pass/fail judgment setting in the optional measurement settings as well.

---

### Threshold Criterion

If you select to perform pass/fail judgments on the latency test result, set the judgment threshold.

Range: 0.1 to 999999.9 $\mu$ s

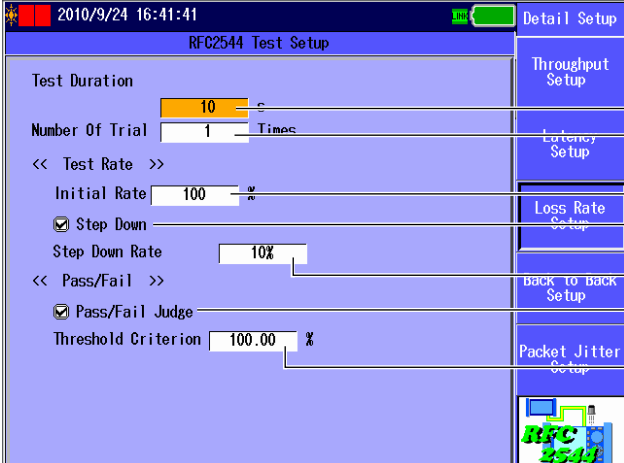
## 8.7 Configuring Frame Loss Rate Test Settings

### Procedure

#### Frame Loss Rate Test Setup Screen

Follow the procedure in section 8.1 to display the RFC2544 Setup screen.

Press the **Detail Setup** soft key and then the **Loss Rate Setup** soft key to display the following screen.



The screenshot shows the 'RFC2544 Test Setup' screen with the following fields and options:

- Test Duration:** 10 seconds
- Number Of Trial:** 1 Times
- Test Rate:**
  - Initial Rate:** 100 %
  - Step Down**
  - Step Down Rate:** 10%
- Pass/Fail:**
  - Pass/Fail Judge**
  - Threshold Criterion:** 100.00 %

On the right side, there are soft keys: **Detail Setup**, **Throughput Setup**, **Latency Setup**, **Loss Rate Setup**, **back to back Setup**, and **Packet Jitter Setup**. A vertical bar on the right contains the number 8 and the text 'Configuring RFC2544 Measurement Settings (AQ1300 Option)'.

### Explanation

#### Test Duration

Set the test duration. The value that you specify here is the time that a single test frame is transmitted for.

Range: 1 to 999 seconds

#### Number of Trial

Set the number of trials that you want to perform.

Range: 1 to 60

#### Initial Rate

Set the initial traffic rate that the frame loss rate test will use.

Range: 1 to 100%

#### Step Down

Set whether the rate is decreased between measurements in the frame loss rate test.

- Selected: The rate is decreased between measurements.
- Cleared: The rate is not decreased between measurements.

#### Note

The test result format is different depending on whether the rate is decreased between measurements.

For details, see section 9.5, "Displaying Frame Loss Rate Test Results."

## 8.7 Configuring Frame Loss Rate Test Settings

---

### Step Down Rate

If you have selected to have the rate decreased between measurements, set the step down rate.

- Value: 10%, 20%

### Pass/Fail Judge

Set whether to perform pass/fail judgments on the frame loss rate test result.

- Selected: Pass/fail judgments are performed.
- Cleared: Pass/fail judgments are not performed.

### Note

---

If you want to perform pass/fail judgments, enable the pass/fail judgment setting in the optional measurement settings as well.

---

### Threshold Criterion

If you select to perform pass/fail judgments on the frame loss rate test result, set the judgment threshold.

Range: 0.01 to 100.00%

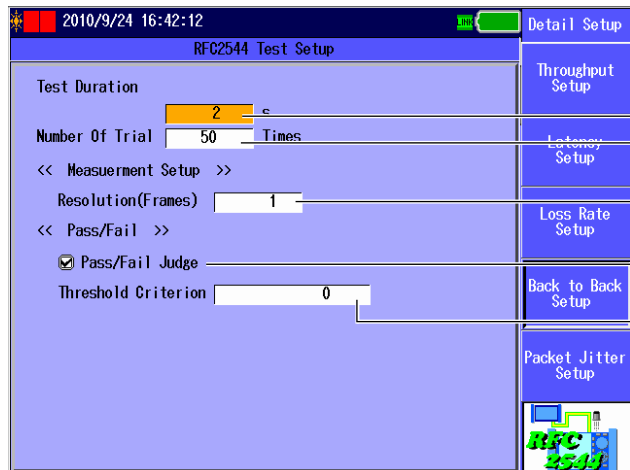
## 8.8 Configuring Back to Back Test Settings

### Procedure

#### Back to Back Test Setup Screen

Follow the procedure in section 8.1 to display the RFC2544 Setup screen.

Press the **Detail Setup** soft key and then the **Back to Back Setup** soft key to display the following screen.



The screenshot shows the 'RFC2544 Test Setup' screen with the following settings and annotations:

- Test Duration:** 2 seconds. Annotation: Set the test duration (1 to 999).
- Number Of Trial:** 50 Times. Annotation: Set the number of trials (1 to 60).
- Resolution(Frames):** 1. Annotation: Set the resolution (1 to 65535).
- Pass/Fail Judge:** . Annotation: Select this check box to perform pass/fail judgment.
- Threshold Criterion:** 0. Annotation: Set the lower limit on the number of frames (0 to 1486607142).

Other visible options on the right side of the screen include: Throughput Setup, Latency Setup, Loss Rate Setup, Back to Back Setup, and Packet Jitter Setup. The top status bar shows the date and time: 2010/9/24 16:42:12.

### Explanation

#### Test Duration

Set the test duration. The value that you specify here is the time that a single test frame is transmitted for.

Range: 1 to 999 seconds

#### Number of Trial

Set the number of trials that you want to perform.

Range: 1 to 60

#### Resolution(Frames)

Set the range that the result of the back to back test will be contained within.

Range: 1 to 65535 frames

#### Pass/Fail Judge

Set whether to perform pass/fail judgments on the back to back test result.

- Selected: Pass/fail judgments are performed.
- Cleared: Pass/fail judgments are not performed.

#### Note

If you want to perform pass/fail judgments, enable the pass/fail judgment setting in the optional measurement settings as well.

#### Threshold Criterion

If you select to perform pass/fail judgments on the back to back test result, set the judgment threshold.

Range: 0 to 1486607143 frames

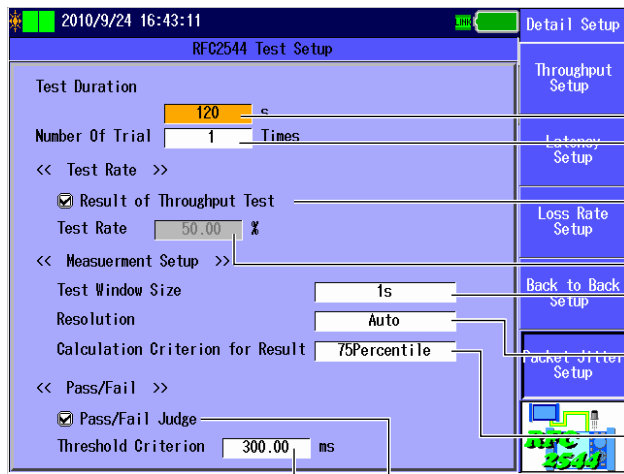
## 8.9 Configuring Packet Jitter Test Settings

### Procedure

#### Packet Jitter Test Setup Screen

Follow the procedure in section 8.1 to display the RFC2544 Setup screen.

Press the **Detail Setup** soft key and then the **Packet Jitter Setup** soft key to display the following screen.



The screenshot shows the 'RFC2544 Test Setup' screen with the following settings and annotations:

- Test Duration:** 120 s. Annotation: Set the test duration (1 to 999).
- Number Of Trial:** 1 Times. Annotation: Set the number of trials (1 to 60).
- Test Rate:** 50.00 %. Annotation: Set the measurement rate (0.01 to 100.00).
- Measurement Setup:** Includes Test Window Size (1s), Resolution (Auto), and Calculation Criterion for Result (75Percentile). Annotations: Select this check box to measure at the throughput result rate; Set the test window size (100ms, 500ms, 1s, 10s, Test duration); Set the measurement resolution (Auto, 0.05ms, 0.1ms, 0.5ms, 1.0ms, 2.5ms, 5.0ms).
- Pass/Fail:** Includes Pass/Fail Judge (checked) and Threshold Criterion (300.00 ms). Annotations: Set the delay variation threshold (50Percentile, 75Percentile, 90Percentile); Select this check box to perform pass/fail judgment; Set the upper limit on the delay variation (0.05 to 300.00).

Navigation options on the right include: Detail Setup, Throughput Setup, Latency Setup, Loss Rate Setup, Back to Back Setup, and Packet Jitter Setup.

### Explanation

#### Test Duration

Set the test duration. The value that you specify here is the time that a single test frame is transmitted for.

Range: 1 to 999 seconds

#### Number of Trial

Set the number of trials that you want to perform.

Range: 1 to 60

#### Result of Throughput Test

Set whether to use the result of the throughput test as the packet jitter test's measurement rate.

- Selected: The result of the throughput test is used.
- Cleared: The result of the throughput test is not used.

#### Test Rate

Set the measurement rate of the packet jitter test. You can specify this value when you are not using the result of the throughput test as the measurement rate.

Range: 0.01 to 100.00%

### Test Window Size

Set the sample width for the calculation of the delay variation value. The AQ1300/AQ1301 statistically processes a delay variation value for each sample width. For details, see section 1.16, "RFC2544 Measurement."

- 100ms
- 500ms
- 1s
- 10s
- Test duration

### Resolution

Set the resolution for the calculation of the delay variation value. If you set Resolution to Auto, the AQ1300/AQ1301 automatically selects the value of the setting when it performs the measurement. For details, see section 1.16, "RFC2544 Measurement."

- Auto
- 0.05ms
- 0.1ms
- 0.5ms
- 1.0ms
- 2.5ms
- 5.0ms

### Note

If the delay variation changes greatly depending on the test frame length, the percentile value may not be measurable when the resolution is set to Auto. If this is the case, set the resolution to a specific value, and perform the measurement.

### Calculation Criterion for Result

Set the threshold value that is used to calculate the statistical result of the delay variations. For details, see section 1.16, "RFC2544 Measurement."

- 50Percentile
- 75Percentile
- 90Percentile

### Pass/Fail Judge

Set whether to perform pass/fail judgments on the packet jitter test result.

- Selected: Pass/fail judgments are performed.
- Cleared: Pass/fail judgments are not performed.

### Note

If you want to perform pass/fail judgments, enable the pass/fail judgment setting in the optional measurement settings as well.

### Threshold Criterion

If you select to perform pass/fail judgments on the packet jitter test result, set the judgment threshold.

Range: 0.05 to 300.00 ms

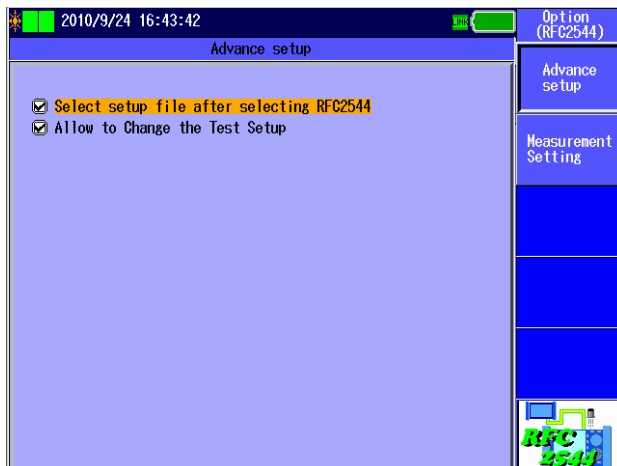
## 8.10 Configuring RFC2544 Options

### Procedure

#### Advance Setup Screen

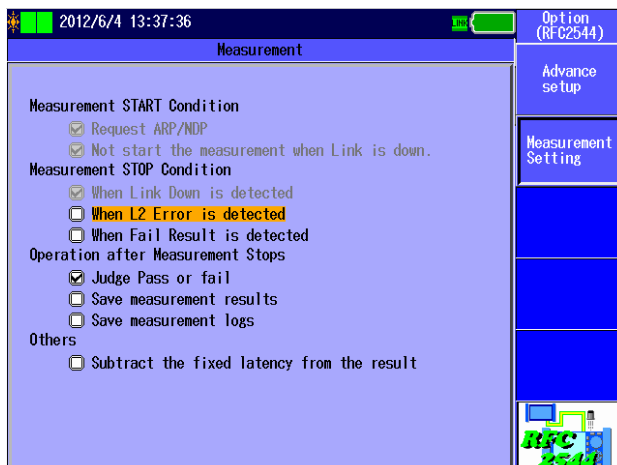
Follow the procedure in section 8.1 to display the RFC2544 Setup screen.

Press the **Option (RFC2544)** soft key and then the **Advance setup** soft key to display the following screen.



#### Measurement Setup Screen

Press the **Option (RFC2544)** soft key and then the **Measurement Setting** soft key to display the following screen.





**Explanation****Advance Setup Screen****Select setup file after selecting RFC2544**

Select whether to display the Select Setup File screen after you select RFC2544 on the Test Menu.

- Selected: The Select Setup File screen is displayed.
- Cleared: The Select Setup File screen is not displayed. The previous settings are automatically selected.

**Allow to Change the Test Setup**

Select whether to allow the Test Setup screen settings to be changed.

- Selected: The Test Setup screen settings can be changed.
- Cleared: The Test Setup screen settings cannot be changed.

**Measurement Setup Screen****Measurement START Condition****Request ARP/NDP (During RFC2544 tests, this is fixed to selected and appears dimmed.)**

For ARP (IPv4) and NDP (IPv6) destination MAC addresses, select whether to use an ARP or NDP request to acquire the MAC address when the START key is pressed. This setting is valid when the test layer is L3-IPv4 or L3-IPv6.

- Selected: An ARP/NDP request is sent.
- Cleared: An ARP/NDP request is not sent.

**Not start the measurement when Link is down. (During RFC2544 tests, this is fixed to selected and appears dimmed.)**

Select whether to start measurement when the START key is pressed and a linkdown is detected.

- Selected: Measurement is not started when a linkdown is detected.
- Cleared: Measurement is started when a linkdown is detected.

**Measurement STOP Condition****When Link Down is detected (During RFC2544 tests, this is fixed to selected and appears dimmed.)**

Select whether to stop measurement when a linkdown is detected during measurement.

- Selected: Measurement is stopped when a linkdown is detected.
- Cleared: Measurement is not stopped when a linkdown is detected.

**When L2 Error is detected**

Select whether to stop measurement when an L2 error is detected during measurement.

- Selected: Measurement is stopped when an L2 error is detected.
- Cleared: Measurement is not stopped when an L2 error is detected.

**When Fail Result is detected**

Select whether to stop measurement when the result of the test currently being performed produces a fail judgment.

- Selected: Measurement is stopped when the test result produces a fail judgment.
- Cleared: Measurement is not stopped when the test result produces a fail judgment.

### Operation after Measurement Stops

#### Judge Pass or fail

Select whether to perform pass/fail judgments after measurements finish.

- Selected: Pass/fail judgments are performed after measurements finish.
- Cleared: Pass/fail judgments are not performed after measurements finish.

#### Note

---

To perform pass/fail judgments for a particular test, you have to set the pass/fail judgment setting on the test's setup screen.

---

#### Save measurement results

Select whether to save the measurement results to a file after measurement finishes.

- Selected: The measurement results are saved to a file when measurement finishes.
- Cleared: The measurement results are not saved to a file when measurement finishes.

#### Save measurement logs

Select whether to save the measurement log to a file after measurement finishes.

- Selected: The measurement log is saved to a file when measurement finishes.
- Cleared: The measurement log is not saved to a file when measurement finishes.

#### Others

##### Subtrac the fixed latency from the result

During latency measurement, the fixed delay that occurs in the other device during loopback is subtracted from the measured results. The subtracted results are displayed as measurement results. If the measured value is less than the fixed delay, 0.00  $\mu$ s is displayed.

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

- Selected: The fixed delay is subtracted from the measured values.
- Cleared: The fixed delay is not subtracted from the measured values.

Fixed delay value based on the interface

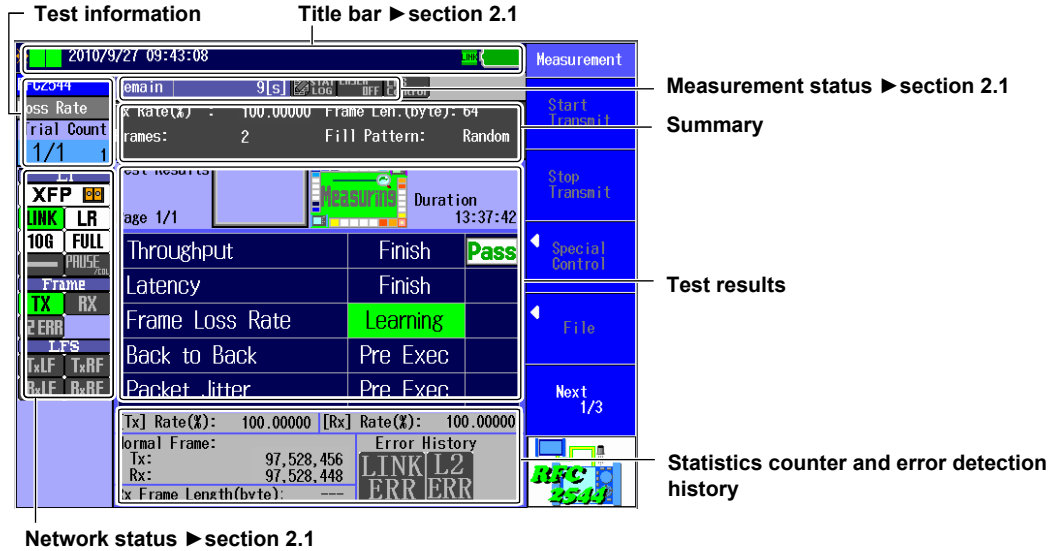
Interface	Delay
XFP	1.0 $\mu$ s
SFP (GbE)	1.4 $\mu$ s
SFP (FE)	12 $\mu$ s
RJ-45 (1000M)	1.6 $\mu$ s
RJ-45 (100M)	11 $\mu$ s
RJ-45 (10M)	108 $\mu$ s

# 9.1 Starting Measurement

## Procedure

### Starting Measurement

Press **START** to display the following screen and start measurement and transmission.



### Note

Before starting the measurement, check that the AQ1300/AQ1301 connected to the other device is set to Loopback Test mode. For instructions on how to specify Loopback Test mode, see section 4.6, "Configuring a Loopback Test" or section 6.6, "Configuring a Loopback Test."

## Explanation

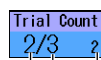
### Test Information

The name of the test that is currently being performed and the number of trials that will be performed are displayed here.

#### Test Items

- Throughput: Throughput test
- Latency: Latency test
- Frame Loss Rate: Frame loss rate test
- Back to Back: Back to back test
- Packet Jitter: Packet jitter test

#### Number of Trials



- Current iteration of increasing or decreasing the rate (for the throughput test) or the burst length (for the back to back test)
- The total number of trials for the test that is currently being executed
- The number of the current trial

## Summary

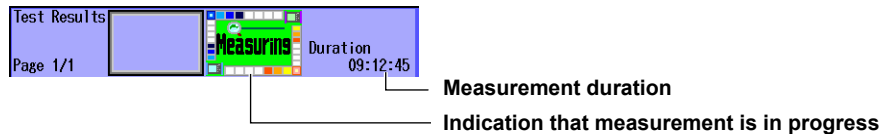
A summary of the settings is displayed, or the addresses are displayed.

- Summary: A summary of representative settings is displayed.
- Address: The source and destination MAC and IP addresses are displayed.

For information about switching between the summary and the address display, see section 9.2.

## Test Results

### Display during Measurement



Measuring: This appears while measurement is being performed.

Measurement duration: Indicated in the following format: hh:mm:ss.

### Display When Measurement Has Finished

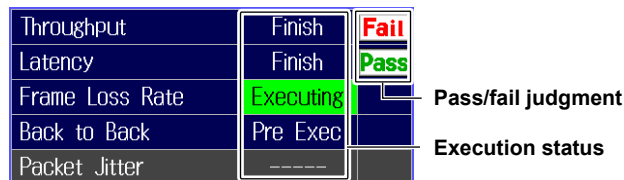


- **Pass/Fail Judgment Indication**

The pass/fail judgment of the test is displayed here. This appears when the pass/fail judgment is enabled. For details on the pass/fail judgment setting, see section 8.10.

- Pass: The results meet the requirements.
- Fail: The results do not meet the requirements.

### Results Display



For each test, the current measurement execution state and the pass/fail judgment result are displayed here.

- **Execution State**

Pre Exec: The AQ1300/AQ1301 is waiting to execute the test.

Learning: The AQ1300/AQ1301 is learning an address.

Preparing: The AQ1300/AQ1301 is performing the preliminary measurement (only during the packet jitter test).

Executing: The AQ1300/AQ1301 is executing the test.

Finish: The test has finished.

Aborted: During test execution, the STOP button was pressed to force the test to stop or the test stopped automatically because an error was detected.

----: The test is not enabled.

- **Pass/Fail Judgment**

Pass: The results meet the requirements.

Fail: The results do not meet the requirements.

**Note**

The pass/fail judgment result is not displayed while a test is being executed or if the pass/fail judgment is not enabled.

## Statistics Counter and Error Detection History Display

During measurement, the statistical information of the frames that are transmitted from and received by the measurement port and the status of error detection are displayed here.

- **Transmission and Reception Rates**

During measurement, the transmission and reception rates are indicated (as percentages).

- **Normal Frames**

The number of normal frames that have been sent and received during a single measurement period is indicated.

- **Received Frame Length**

The currently received frame length is indicated as an average over 1-second intervals.

- **Error Detection History**

From the start of measurement to the time that measurement is stopped, link errors and L2 errors (L2 frame errors) are displayed here as they are detected.

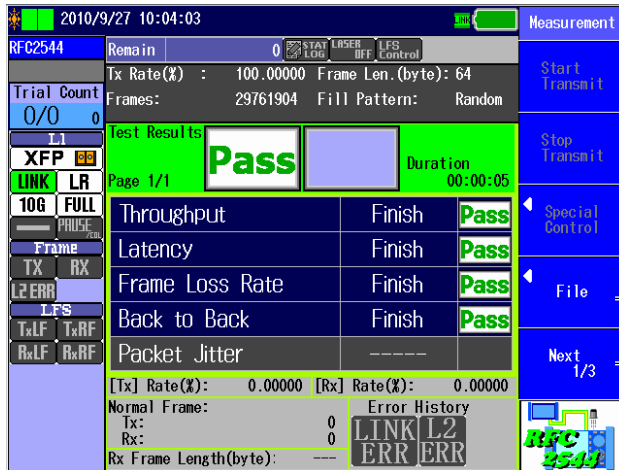
Display Item	Display	Explanation
LINK ERR	LINK ERR (gray)	No linkdowns have been detected during measurement.
	LINK ERR (red)	If even one linkdown is detected during measurement, the indication becomes red.
L2 ERR	L2 ERR (gray)	During measurement, no frames have been received with any of the following errors. <ul style="list-style-type: none"> <li>• CRC errors</li> <li>• Undersize errors</li> <li>• Oversize errors</li> <li>• Symbol errors</li> <li>• Alignment errors</li> </ul>
	L2 ERR (red)	During measurement, if even one frame is received with any of the following errors, the indication becomes red. <ul style="list-style-type: none"> <li>• CRC errors</li> <li>• Undersize errors</li> <li>• Oversize errors</li> <li>• Symbol errors</li> <li>• Alignment errors</li> </ul>

## 9.2 Displaying the Test Results

### Procedure

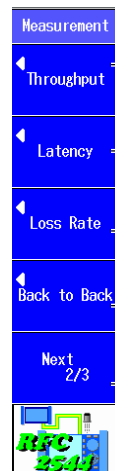
#### Test Result Display Screen

Follow the procedure in section 9.1 to start and stop measurement.



Displays the file operation screen  
► section 12.2

To measurement page 2/3



Displays the results screen for the throughput test  
► section 9.3

Displays the results screen for the latency test  
► section 9.4

Displays the results screen for the frame loss rate test  
► section 9.5

Displays the results screen for the back to back test  
► section 9.6

To measurement page 3/3



Displays the results screen for the packet jitter test  
► section 9.7

Switches the contents of the summary display (Summary, Address)

To measurement page 1/3

### Note

- During measurement, you can select menu items other than “File.”
  - If you press ESC while another measurement screen is displayed, the measurement results screen will appear.
  - You can also use the left and right arrow keys to switch between measurement screens. For details, see section 9.8.
- 

### Explanation

#### Switching the Summary Display

You can switch the contents of the summary display.

- Summary: The transmission rate, transmission time, frame length, and fill pattern are displayed.
- Address: The source and destination MAC and IP addresses are displayed.

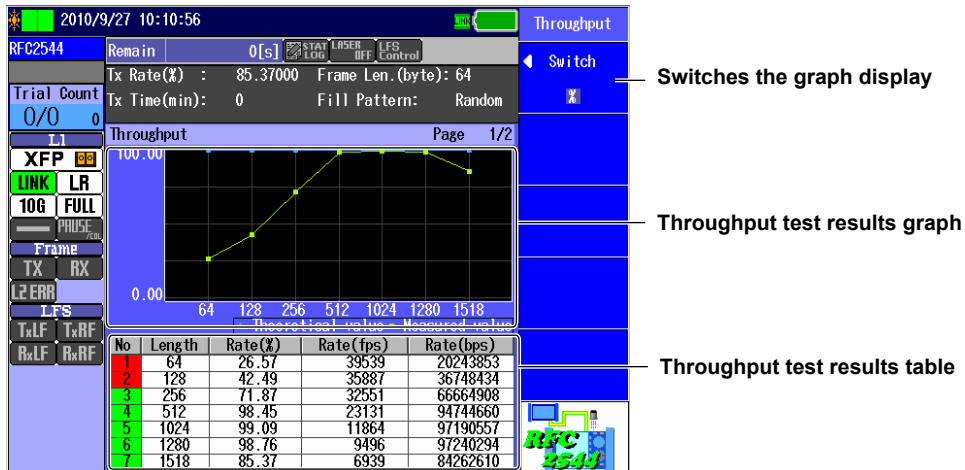
## 9.3 Displaying Throughput Test Results

### Procedure

#### Throughput Test Results Screen

Follow the procedure in section 9.1 to start and stop measurement.

Press the **Throughput** soft key to display the following screen.



#### Note

- You can display this screen even during measurement.
- You can also use the left and right arrow keys to switch between measurement screens. For details, see section 9.8.
- Press ESC to return to the Test Result Display screen (see section 9.2).



### Explanation

#### Throughput Test Results Graph

The measured results are displayed on a graph.

- Horizontal axis: Test frame length
- Vertical axis: Throughput. You can switch the units that the graph is displayed in between rate (%), frames/second (fps), and bits/second (bps).

Two types of graphs are displayed: a graph that displays theoretical values and a graph that displays actual measured values.

-  (theoretical values): The maximum theoretical values of the test interface are displayed.
-  (actual measured values): The measured results are displayed.



Throughput Test Results Table

The following items are displayed.

- No: This is the test frame length number. If pass/fail judgment is enabled, the pass/fail judgment results are indicated with colors for each frame length.  
Green: Pass  
Red: Fail
- Length: Test frame length
- Rate(%): The measured result is displayed as a rate (%).
- Rate(fps): The measured result is displayed as frames per second.
- Rate(bps): The measured result is displayed as bits per second.

Note

- Use the up and down arrow keys to switch the displayed page. If more than seven test frame lengths are enabled, the first seven frame lengths are displayed on the first page, and the remaining test frame lengths are displayed on the second page.
- During measurement or for any test frame lengths that have not yet gone through measurement, the result columns display "----."

No	Length	Rate(%)	Rate(fps)	Rate(bps)
1	64	26.57	39539	20243853
2	128	42.49	35887	36748434
3	256	71.87	32551	66664908
4	512	----	----	----
5	1024	----	----	----
6	1280	----	----	----
7	1518	----	----	----

- For any test frame lengths that the throughput measured result could not be obtained for (for example, if a loss was detected even at the minimum rate), the result columns display "\*\*\*\*."

No	Length	Rate(%)	Rate(fps)	Rate(bps)
1	64	26.57	39539	20243853
2	128	42.49	35887	36748434
3	256	71.87	32551	66664908
4	512	****	****	****
5	1024	****	****	****
6	1280	****	****	****
7	1518	****	****	****

Switching the Graph Display

You can switch the unit of the measured result graph.

- %: Rate (%)
- fps: Frames per second
- bps: Bits per second

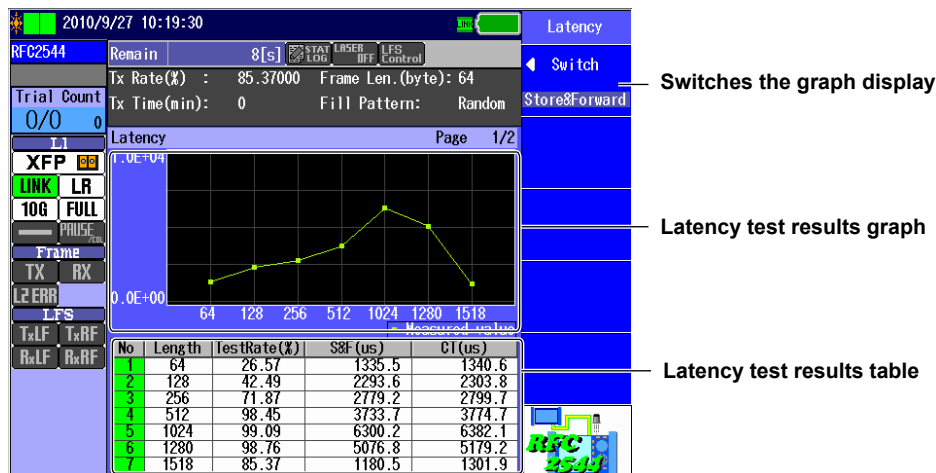
## 9.4 Displaying Latency Test Results

### Procedure

#### Latency Test Results Screen

Follow the procedure in section 9.1 to start and stop measurement.

Press the **Latency** soft key to display the following screen.



#### Note

- You can display this screen even during measurement.
- You can also use the left and right arrow keys to switch between measurement screens. For details, see section 9.8.
- Press ESC to return to the Test Result Display screen (see section 9.2).

### Explanation

#### Latency Test Results Graph

The measured results are displayed on a graph.

- Horizontal axis: Test frame length
- Vertical axis: Delay ( $\mu$ s). You can switch the units that the graph is displayed in between store and forward (Store&Forward) and cut through (Cut Through).

#### Latency Test Results Table

The following items are displayed.

- No: This is the test frame length number. If pass/fail judgment is enabled, the pass/fail judgment results are indicated with colors for each frame length.  
Green: Pass  
Red: Fail
- Length: Test frame length
- TestRate(%): Test rate (%)
- S&F(us): The measured result under the store and forward system is displayed.
- CT(us): The measured result under the cut through system is displayed.

### Note

- Use the up and down arrow keys to switch the displayed page. If more than seven test frame lengths are enabled, the first seven frame lengths are displayed on the first page, and the remaining test frame lengths are displayed on the second page.
  - During measurement or for any test frame lengths that have not yet gone through measurement, the result columns display “----.”
  - During measurement, the No cells for any test frame lengths whose delay measurement frames were lost are displayed in orange.
  - For any test frame lengths that the throughput measured result could not be obtained for (if the delay measurement frames were lost for all trials), the result columns display “\*\*\*\*.”
- 

### Switching the Graph Display

You can switch the unit of the measured result graph.

- Store&Forward: Store and forward values are displayed.
- Cut Through: Cut through values are displayed.

# 9.5 Displaying Frame Loss Rate Test Results

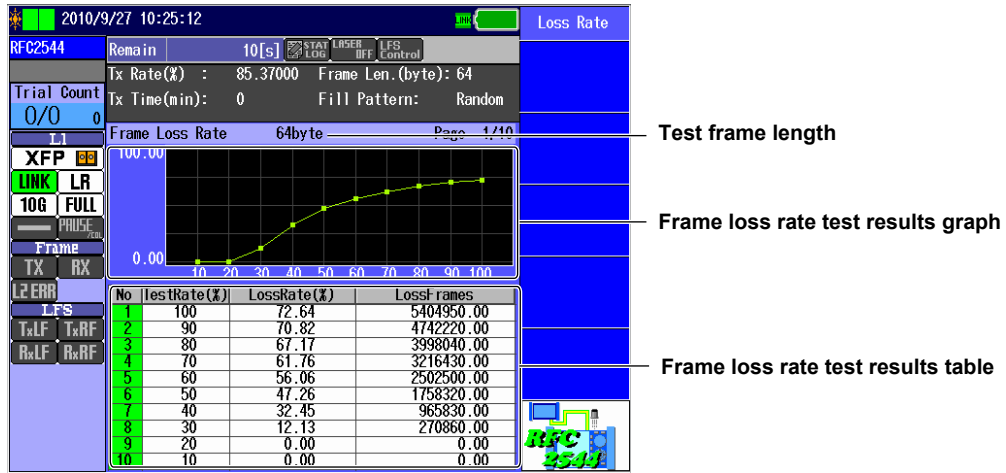
## Procedure

### Frame Loss Rate Test Results Screen

Follow the procedure in section 9.1 to start and stop measurement.  
Press the **Loss Rate** soft key.

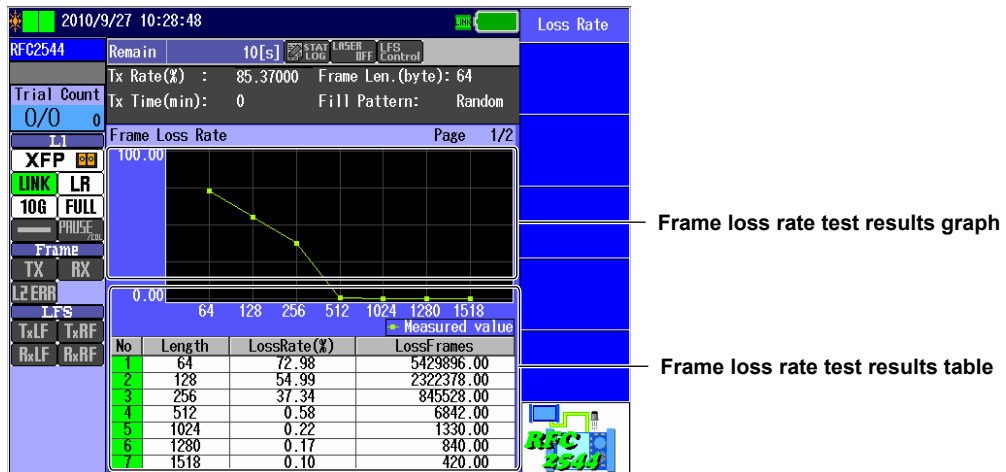
#### When the Rate Is Decreased between Measurements

If you have selected the **Step Down** check box in the frame loss rate test settings (see section 8.7), the following screen is displayed.



#### When the Rate Is Not Decreased between Measurements

If the **Step Down** check box is not selected, the following screen is displayed.



### Note

- You can display this screen even during measurement.
- You can also use the left and right arrow keys to switch between measurement screens. For details, see section 9.8.
- Press ESC to return to the Test Result Display screen (see section 9.2).

**Explanation****When the Rate Is Decreased between Measurements****Test Frame Length**

This indicates the frame length that was used to generate the results graph and results table that are currently displayed.

You can use the up and down arrow keys to switch the displayed test frame length.

**Frame Loss Rate Test Results Graph**

The measured results are displayed on a graph.

- Horizontal axis: Test rate (%)
- Vertical axis: Frame loss rate (%)

**Frame Loss Rate Test Results Table**

The following items are displayed.

- No: This is the test rate number. If pass/fail judgment is enabled, the pass/fail judgment results are indicated with colors for each test rate.  
Green: Pass  
Red: Fail
- TestRate(%): Test rate (%)
- LossRate(%): The measured results are displayed as frame loss rates (%).
- LossFrame: The measured results are displayed as the number of lost frames.

**Note**

- During measurement or for any test frame lengths that have not yet gone through measurement, the result columns display "----."
- If no frame losses are detected for two consecutive rates, no frame signals at lower rates are measured. In this case, "0" is displayed for the measured results of the frame signals at the rates that were not measured.

**When the Rate Is Not Decreased between Measurements****Frame Loss Rate Test Results Graph**

The measured results are displayed on a graph.

- Horizontal axis: Test frame length
- Vertical axis: Frame loss rate (%)

**Frame Loss Rate Test Results Table**

The following items are displayed.

- No: This is the test frame length number. If pass/fail judgment is enabled, the pass/fail judgment results are indicated with colors for each frame length.  
Green: Pass  
Red: Fail
- Length: Test frame length
- LossRate(%): The measured results are displayed as frame loss rates (%).
- LossFrame: The measured results are displayed as the number of lost frames.

**Note**

- Use the up and down arrow keys to switch the displayed page. If more than seven test frame lengths are enabled, the first seven frame lengths are displayed on the first page, and the remaining test frame lengths are displayed on the second page.
- During measurement or for any test frame lengths that have not yet gone through measurement, the result columns display "----."

## 9.6 Displaying Back to Back Test Results

### Procedure

#### Back to Back Test Results Screen

Follow the procedure in section 9.1 to start and stop measurement.  
Press the **Back to Back** soft key to display the following screen.



#### Note

- You can display this screen even during measurement.
- You can also use the left and right arrow keys to switch between measurement screens. For details, see section 9.8.
- Press ESC to return to the Test Result Display screen (see section 9.2).

### Explanation

#### Back to Back Test Results Graph

The measured results are displayed on a graph.

- Horizontal axis: Test frame length
- Vertical axis: Number of burst frames

#### Back to Back Test Results Table

The following items are displayed.

- No: This is the test frame length number. If pass/fail judgment is enabled, the pass/fail judgment results are indicated with colors for each frame length.  
Green: Pass  
Red: Fail
- Length: Test frame length
- NumOfFrames: The measured results are displayed as the number of burst frames.

#### Note

- Use the up and down arrow keys to switch the displayed page. If more than seven test frame lengths are enabled, the first seven frame lengths are displayed on the first page, and the remaining test frame lengths are displayed on the second page.
- During measurement or for any test frame lengths that have not yet gone through measurement, the result columns display "----."

# 9.7 Displaying Packet Jitter Test Results

## Procedure

### Packet Jitter Test Results Screen

Follow the procedure in section 9.1 to start and stop measurement. Press the **Packet Jitter** soft key to display the following screen.

The screenshot shows the Packet Jitter test results screen. At the top, it displays 'RFC2544' and 'Remain 10[s]'. Below this, it shows 'Tx Rate(%) : 95.93000', 'Frame Len. (byte): 64', 'Tx Time(min): 0', and 'Fill Pattern: Random'. The main part of the screen is a graph titled 'Packet Jitter' with a y-axis from 0.00 to 10.48 and an x-axis with values 64, 128, 256, 512, 1024, 1280, 1518. The graph shows three data series: Max Value (red circles), Min Value (green triangles), and Percentile (blue squares). Below the graph is a table with the following data:

No	Length	Rate(%)	Max(ms)	Min(ms)	Percentile(ms)
1	64	26.57	2.32	0.64	1.50
2	128	42.43	2.48	0.20	2.50
3	256	71.93	3.06	0.08	3.00
4	512	98.10	7.42	0.15	3.40
5	1024	99.04	9.14	0.29	4.40
6	1280	95.93	2.61	0.38	1.50
7	1512	95.93	2.43	0.46	1.60

Annotations on the right side of the screenshot point to various controls: 'Max Value ON OFF' (Set whether the maximum value graph is displayed), 'Min Value ON OFF' (Set whether the minimum value graph is displayed), 'Percentile ON OFF' (Set whether the percentile graph is displayed), 'Packet jitter test results graph' (points to the graph area), and 'Packet jitter test results table' (points to the table below the graph).

### Note

- You can display this screen even during measurement.
- You can also use the left and right arrow keys to switch between measurement screens. For details, see section 9.8.
- Press ESC to return to the Test Result Display screen (see section 9.2).

## Explanation

### Packet Jitter Test Results Graph

The measured results are displayed on a graph.

- Horizontal axis: Test frame length
- Vertical axis: Delay variation

Three types of graphs are displayed: a graph that displays maximum values of delay variations, a graph that displays minimum values of delay variations, and a graph that displays percentile values.

- (maximum values): The maximum measured delay variations are displayed.
- ▲ (minimum values): The minimum measured delay variations are displayed.
- (percentile values): The statistically processed values (percentiles) of the measured delay variations are displayed.

### Packet Jitter Test Results Table

The following items are displayed.

- No: This is the test frame length number. If pass/fail judgment is enabled, the pass/fail judgment results are indicated with colors for each frame length.  
Green: Pass  
Red: Fail
- Length: Test frame length
- Rate(%): Test rate (%)
- Max(ms): Maximum delay variations
- Min(ms): Minimum delay variations
- Percentile(ms): Percentile value of the delay variations

## 9.7 Displaying Packet Jitter Test Results

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### **Note**

- Use the up and down arrow keys to switch the displayed page. If more than seven test frame lengths are enabled, the first seven frame lengths are displayed on the first page, and the remaining test frame lengths are displayed on the second page.
  - During measurement or for any test frame lengths that have not yet gone through measurement, the result columns display "----."
  - During measurement, the No cells for any test frame lengths whose test frames were lost are displayed in orange.
  - For any test frame lengths that the percentile value could not be obtained for (for example, if the measurement resolution setting was smaller than an appropriate value), the result columns display "\*\*\*\*."
- 

### **Switching the Graph Display**

You can select whether each of the following graphs is displayed on the screen.

Maximum value graph

Minimum value graph

Percentile value graph

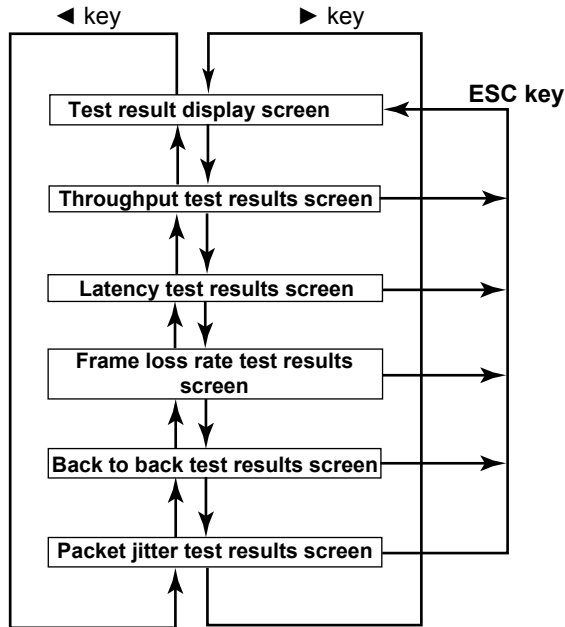
- ON: The graph is displayed.
- OFF: The graph is not displayed.



## 9.8 Changing the Displayed Screen

### Procedure

You can switch the displayed measurement screen by pressing the left and right arrow keys.



On every screen except for the Test Result Display screen, you can switch between pages of results on the displayed screen by pressing the up and down arrow keys.

### Explanation

#### ▶ and ◀ Keys

These keys change the displayed screen. They are valid when a measurement screen is displayed.

#### ▲ and ▼ Keys

These keys switch between the pages of the displayed screen. They are valid on any screen other than the Test Result Display screen.

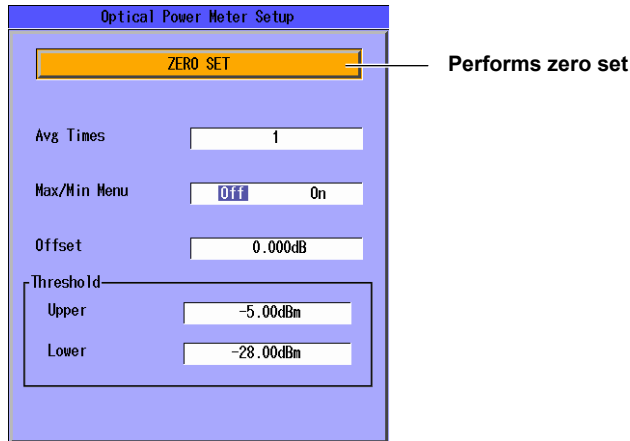
## 10.1 Pre-Measurement Calibration

Before you calibrate the optical power meter, remove the optical fiber cable from the AQ1300, and close the AQ1300 optical connector covers.

### Procedure

#### Performing Zero Set

Press the **OPM** soft key and then the **Setup** soft key to display the following screen.



### Explanation

Perform zero set whenever necessary. Performing zero set adjusts the offset of the optical power measurement section and enables you to obtain more accurate absolute optical power values.

## 10.2 Setting Optical Power Measurement Conditions and Holding the Display

### Procedure

#### Power Meter Screen

Press the **OPM** soft key to display the following screen.

The diagram shows the Power Meter Screen with a bar graph display of the measured value (20.31 dB) and various settings. The screen is divided into several sections:

- Measured value:** 20.31 dB
- Wavelength:** 1310nm
- Modulation:** CW
- Unit:** dB
- Reference:** -31.00dBm

Soft keys and their functions:

- OPM:** Presses the OPM soft key to display the screen.
- DREF:** Sets the reference to the currently displayed measured value.
- HOLD:** Holds the measured value display.
- Setup:** Displays the detail setup screen.

Threshold lines:

- Lower threshold line:** -70.00dBm
- Upper threshold line:** 10.00dBm

Additional instructions:

- Set the wavelength (850nm, 1300nm, 1310nm, 1490nm, 1550nm, 1625nm, 1650nm).
- Set the modulation (CW, 270Hz, 1kHz, 2kHz).
- Set the unit (dB, dBm, W).
- Set the reference manually (-70 to 5 dBm). The Reference box appears if you press the DREF soft key or set the unit to dB.

These lines indicate the upper and lower threshold values (see the detail setup screen in the next section).

#### Detail Setup Screen

Press the **OPM** soft key and then the **Setup** soft key to display the following screen.

The diagram shows the Detail Setup Screen with various configuration options:

- ZERO SET:** A button to set the zero value.
- Avg Times:** 1 (Set the average count (1, 10, 50, 100)).
- Max/Min Menu:** Off (Turns on and off the display of the maximum and minimum measured optical power values).
- Offset:** 0.000dB (Set the offset (-9.900 to 9.900 dB)).
- Threshold:**
  - Upper:** -5.00dBm (Set the upper threshold value (-70.00 to 5.00 dB)).
  - Lower:** -28.00dBm (Set the lower threshold value (-70.00 to 5.00 dB)).

**Explanation****Wavelength**

The light receiving element of the optical power measurement section has a wavelength sensitivity distribution. The AQ1300 measures optical power more accurately by adjusting the sensitivity according to the specified wavelength.

You can set the measurement wavelength to one of the following values.

850 nm, 1300 nm, 1310 nm, 1490 nm, 1550 nm, 1625 nm, 1650 nm

Set the wavelength according to the test interface as indicated in the table below.

Test Interface	Wavelength
100BASE-FX (SFP)	1310 nm
1000BASE-SX (SFP)	850 nm
1000BASE-LX (SFP)	1310 nm
10GBASE-SR (XFP)	850 nm
10GBASE-LR (XFP)	1310 nm
10GBASE-ER (XFP)	1550 nm

**Modulation**

You can set the frequency of the measured light to one of the following options.

CW (continuous light), 270 Hz, 1 kHz, 2 kHz

**Unit**

You can set the optical power display unit to one of the following options.

dB (relative value), dBm (absolute value), W (absolute value)

- The following prefixes are attached to W: m ( $10^{-3}$ ),  $\mu$  ( $10^{-6}$ ), and n ( $10^{-9}$ ).
- The relationship between the absolute values dBm and W is indicated below.

$$P_{\text{dBm}} = 10 \times \log (P_{\text{W}}/10^3)$$

where  $P_{\text{dBm}}$  is the optical power in units of dBm and  $P_{\text{W}}$  is the optical power in units of W.

**Reference**

You can set a reference and display measured values as relative values (display their difference from the reference).

- Press the DREF soft key to make the displayed measured value the reference and display subsequent measured values as relative values. The unit will change to dB.
- Press the DREF soft key or set the unit to dB to display the Reference box in the Power Meter screen.
- You can set the reference manually in the Reference box. The range is  $-70$  to 5 dBm.
- If you set the unit to dBm or W, the Reference box disappears and the measured values are displayed as absolute values.

**Average Count**

Averages of the measured values are displayed. You can set the number of values to average to one of the following options.

1, 10, 50, 100

## 10.2 Setting Optical Power Measurement Conditions and Holding the Display

### Turning the Maximum and Minimum Value Menu On and Off

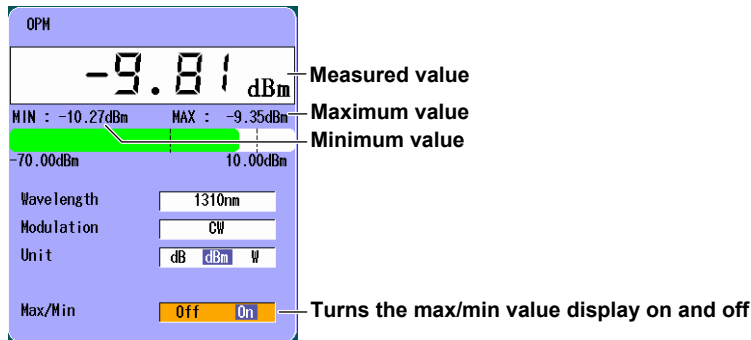
In the Power Meter screen, you can display a menu that shows the maximum (Max) and minimum (Min) measured values.

On	The menu is displayed.
Off	The menu is not displayed.

### Turning the Maximum and Minimum Value Display On and Off

In the menu that appears in the Power Meter screen, you can start the display of the maximum and minimum measured values. The maximum and minimum value displays are constantly updated while measurement is being performed.

On	The maximum and minimum measured values from the time that you selected On are constantly updated and displayed.
Off	The maximum and minimum values are not displayed. The maximum and minimum values are reset when you select Off.



### Offset

The value that you specify (the offset value) is added to the measured optical power values that are displayed.

The range is -9.900 to 9.900 dBm.

### Threshold Value

You can set upper and lower threshold values and determine whether or not the measured values fall within them.

- The range for the upper and lower threshold values is -70 to 5 dBm. You must set the values so that the upper threshold value is greater than the lower threshold value.
- When a measured value is within the upper and lower thresholds, its bar graph is green.
- When a measured value exceeds the upper threshold or falls below the lower threshold, its bar graph is red.

Refer to the table below for recommended threshold settings for the receiving device.

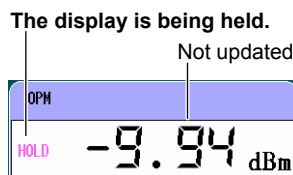
Test Interface	Upper Limit	Lower Limit
100BASE-SX (SFP)*	0.0 dBm	-17.0 dBm
100BASE-LX (SFP)*	-3.0 dBm	-19.0 dBm
10GBASE-SR (XFP)*	-1.0 dBm	-9.9 dBm
10GBASE-LR (XFP)*	+0.5 dBm	-14.4 dBm
10GBASE-ER (XFP)*	-1.0 dBm	-15.8 dBm
100BASE-FX (SFP)**	-14.0 dBm	-31.0 dBm

\*: Taken from the average receive power values listed in IEEE 802.3

\*\* : Taken from the ISO/IEC 9314-3

### Holding the Measured Value Display

When you press the HOLD soft key, the updating of the measured values, bar graph, and maximum and minimum values is held. The values at the time that you pressed the HOLD soft key remain displayed. To release the hold on the display, press the HOLD soft key again.



# 11.1 Selecting a Setup File

## Procedure

### VLAN Test Setup Screen

Press the **Option** soft key and then the **VLAN Test** soft key to display the following screen.

**Test Setup**

- Test Interface: XFP(10GbE)
- Source MAC: 00 00 00 00 00 01
- Destination MAC: 00 00 00 00 00 01
- Source IPv4: 192 168 0 1
- Destination IPv4: 192 168 0 1

**VLAN stacks**

VLAN	TP ID	CFI	CoS	ID	Target
VLAN2	0000	0	7	ID	Refer
VLAN1	8100	1	0	ID 4095	Refer

Target: Please set ID in VLAN ID TX Setting menu.

**Right-hand menu:**

- Test Setup: Set up the test. ▶ section 11.2
- Link/Address: Configure link and address settings. ▶ section 11.3
- Detail Setup: Configure the detailed settings for the individual VLAN tests. ▶ section 11.4 to 11.6
- Next 1/2: To VLAN Test Setup 2/2

Press the **Next 1/2** soft key to display the following screen.

**Test Setup**

- Test Interface: XFP(10GbE)
- Source MAC: 00 00 00 00 00 01
- Destination MAC: 00 00 00 00 00 01
- Source IPv4: 192 168 0 1
- Destination IPv4: 192 168 0 1

**VLAN stacks**

VLAN	TP ID	CFI	CoS	ID	Target
VLAN2	0000	0	7	ID	Refer
VLAN1	8100	1	0	ID target	Refer

Target: Please set ID in VLAN ID TX Setting menu.

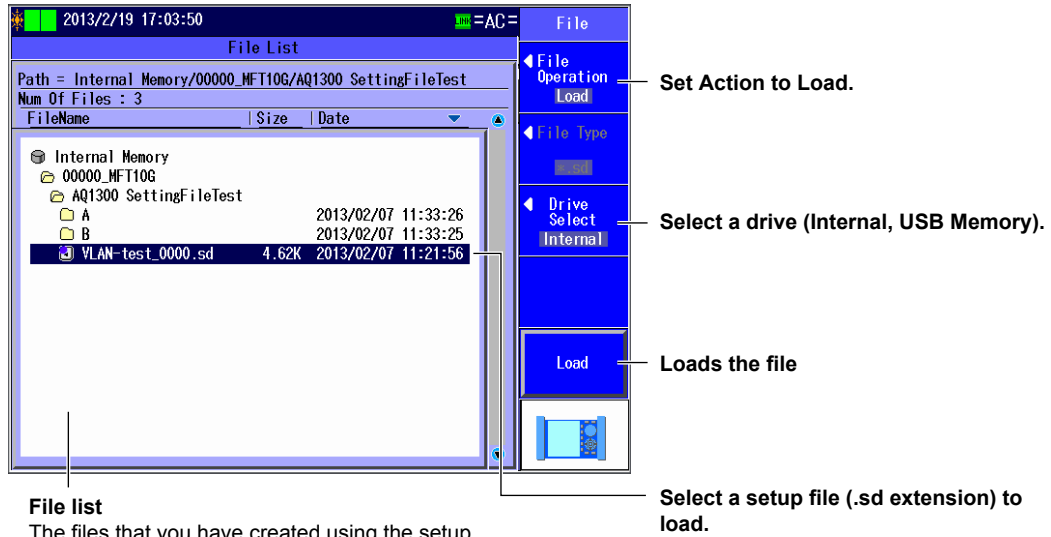
**Right-hand menu:**

- Default: Default setup
- File: Loads a file. Loads the selected setup file from the file list
- Next 2/2: To VLAN Test Setup 1/2

## 11.1 Selecting a Setup File

### File Screen

Press the **File** soft key to display the following screen.



### Explanation

#### Default setup

Select this item to return to the default setup.

#### Loads a file

Select this item to load a VLAN test setup file (with an .sd extension) from the file list.

To create a setup file, you can use the setup software and send the file to the AQ1300, or you can save the settings on the AQ1300.

For details on the Setup Software, see the Setup Software User's Manual, IM AQ1300-61EN.

#### VLAN ID Definition File

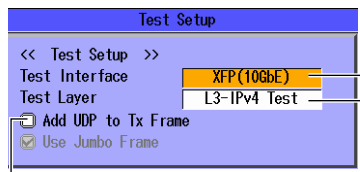
VLAN ID definition files (csv format; .csv or .txt extension) created in advance can be loaded into the VLAN ID list of the AQ1300/AQ1301. For the procedure, see section 11.5.

## 11.2 Configuring the Test Settings

### Procedure

#### Test Setup Screen

Follow the procedure in section 11.1 to display the VLAN Test Setup screen. Press the **Test Setup** soft key to display the following screen.



**Set the test interface**  
(XFP(10GbE), SFP(GbE), SFP(FE), RJ-45).

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

**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.

### Explanation

#### Test Interface

Specify which test interface to use.

- XFP(10GbE): Select this option to use the 10GBASE-R measurement port.
- SFP(GbE): Select this option to use the 1000BASE-X measurement port.
- SFP(FE): Select this option to use the 100BASE-X measurement port.  
This feature is supported in firmware version R1.05.01.001 and later.
- RJ-45: Select this option to use the 10BASE-T/100BASE-TX/1000BASE-T measurement port.

#### Test Layer

Set the layer to test.

- L2 Test: Select this option to test layer 2.
- L3-IPv4 Test: Select this option to test layer 3 according to the IPv4 protocol.
- L3-IPv6 Test: Select this option to test layer 3 according to the IPv6 protocol.

#### Add UDP to Tx Frame

Set whether to add UDP to Tx frames. You can select this check box when the test layer is L3-IPv4 or L3-IPv6.



# 11.3 Configuring Link Address Settings

## Procedure

### Link Setting Screen

Follow the procedure in section 11.1 to display the VLAN Test Setup screen.

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

The screenshot shows the 'Link Setting' screen with the following configuration options and callouts:

- Link Setting:** Manual
- Speed:** 100M
- Duplex:** Full
- Flow Control:** ON
- MDI:** MDI

Callouts on the right side of the screen provide instructions for each setting:

- 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.

### Source Address Screen

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

The screenshot shows the 'Source Address' screen with the following configuration options and callouts:

- Source MAC:** 00 00 00 00 00 01
- VLAN stacks:** 2
- VLAN2:** IP ID 0000, CFI 0, CoS 7, ID Target
- VLAN1:** IP ID 8100, CFI 1, CoS 0, ID 4095
- Source IPv4:** Address 192.168.0.1, Subnet Mask 255.255.255.0, Gateway 192.168.0.254
- Source IPv6:** Address FE80:0000:0000:0000:0000:0000:0000:0001, Prefix Length 64, IPv6 Router Address FE80:0000:0000:0000:0000:0000:0000:0000

Callouts on the right side of the screen provide instructions for each setting:

- Set the source MAC address.** Refer to the MAC Address table. ▶ section 4.3
- Set the VLAN stack number (1, 2).** Configure the VLAN settings (TPID: 0-FFFF, CFI: 0-1, CoS: 0-7, ID: 0-4095). When VLAN stacks is set to 1, the word "Target" appears by the VLAN1 ID, and you cannot set the ID. When VLAN stacks is set to 2, the word "Target" appears by the VLAN2 ID, and you cannot set the ID.
- Refer to the VLAN table.** ▶ section 4.3
- Set IPv4 (Manual, DHCP).** This setting appears when Test Layer is set to L3-IPv4. Refer to the IP address table. ▶ section 4.3
- Refer to the gateway reference.** ▶ section 4.3
- Set IPv6 (Manual, Stateless Address).** This setting appears when Test Layer is set to L3-IPv6.
- Set the source IPv6 address.** This setting is valid when IPv6 is set to Manual. Refer to the IP Address table.
- Select this check box when you want to manually set the router address.**
- View and set the IPv6 prefix length and the IPv6 router address.**

Callouts on the left side of the screen provide instructions for the IPv4 settings:

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

## Destination Address Screen

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

**Set the destination MAC address.**  
This setting appears when Test Layer is set to L2.  
**Refer to the MAC Address table.**  
▶ section 4.3

**Set the destination IPv4 address.**  
This setting appears when Test Layer is set to L3-IPv4.  
**Refer to the IP address table.**  
▶ section 4.3

**Select the search list.** ▶ section 4.3

**Set the destination IPv6 address.**  
This setting appears when Test Layer is set to L3-IPv6.  
**Refer to the IP address table.**  
▶ section 4.3

### Note

#### Address Settings and VLAN Settings

For the VLAN test, you can also set the source and destination MAC, IPv4, and IPv6 addresses and VLAN settings on the top VLAN test setup screen.

**Address settings**

**VLAN settings**

### Explanation

#### Link Setting Screen

##### Negotiation

Select whether to use auto negotiation. This setting is valid when Test Interface is set to RJ-45 or SFP(GbE).

- Auto: The link between the AQ1300 and the device that it is connected to is configured automatically through auto negotiation.
- Manual: The link must be configured manually.

##### Speed

When Test Interface is set to RJ-45, you can set the link speed.

- 1G: A 1 Gbit/s 1000BASE-T connection is used.
- 100M: A 100 Mbit/s 100BASE-TX connection is used.
- 10M: A 10 Mbit/s 10BASE-T connection is used.
- Auto: The link speed is set automatically. This setting is valid when Negotiation is set to Auto.

##### Note

---

When Test Interface is set to XFP(10GbE), the link speed is fixed at 10G. When Test Interface is set to SFP(GbE), the link speed is fixed at 1G. When Test Interface is set to SFP(FE), the link speed is fixed at 100M.

---

##### Duplex

You can set the communication mode for when Speed is set to 100M or 10M. This setting is valid when Test Interface is set to RJ-45.

- FULL: Full duplex communication
- HALF: Half duplex communication
- Auto: The AQ1300 chooses full or half duplex automatically. This setting is valid when Negotiation is set to Auto.

##### Note

---

When Test Interface is set to XFP(10GbE), SFP(GbE), or SFP(FE), or when it is set to RJ-45 and Speed is set to 1G, the duplex mode is fixed at FULL.

---

##### Flow Control

You can enable or disable flow control.

- ON: Flow control is enabled.
- OFF: Flow control is disabled.

##### MDI

You can set the measurement port to straight or crossover mode. This setting is valid when Test Interface is set to RJ-45.

- MDI: Straight
- MDI-X: Cross
- Auto: The AQ1300 switches between straight and crossover mode automatically (this setting is valid when Negotiation is set to Auto).

#### Source Address Screen

##### Source MAC Address

Set the source MAC address. You can refer to the MAC address table to set the address.

##### VLAN Stacks

Set the number of VLAN stacks.

- 1: One VLAN stack.
- 2: Two VLAN stacks.

**VLAN1 and VLAN2**

Set the TPID (Tag Protocol Identifier), CFI (Canonical Format Indicator), CoS (Class of Service), and VLAN-ID for 1 or 2 VLAN stacks. You can refer to the VLAN table to set the values.

- TPID: 0 to FFFF
- CFI: 0 or 1
- CoS: 0 to 7
- ID: 0 to 4095

When VLAN stacks is set to 1, the word “Target” appears by the VLAN1 ID, and you cannot set the ID.

When VLAN stacks is set to 2, the word “Target” appears by the VLAN2 ID, and you cannot set the ID.

**IPv4**

Select whether to specify the source IPv4 address manually or to acquire and set it automatically through DHCP. This setting is valid when Test Layer is set to L3-IPv4 Test.

- Manual: You must set the source IPv4 address manually.
- DHCP: When you press Get IP Address, the AQ1300 acquires and sets the source IPv4 address using DHCP.

**Source IPv4 Address, Subnet Mask, and Gateway**

Set the source IPv4 address, subnet mask, and gateway when IPv4 is set to Manual. You can refer to the IP Address table and the gateway reference to configure the settings.

- Netmask: 1 to 31

**IPv6**

Select whether to specify the source IPv6 address manually or to specify it through stateless autoconfiguration using the RA from an IPv6 router. This setting is valid when Test Layer is set to L3-IPv6 Test.

- Manual: You must set the source IPv6 address manually.
- Stateless Address: When you press Get IP Address, the AQ1300 automatically configures the source IPv6 address.

**Source IPv6 Address**

Set the source IPv6 address when IPv6 is set to Manual. You can refer to the IP address table to set the address.

**IPv6 Router Address**

You can automatically acquire the router address or set it manually.

- Automatic: Clear the Set Router Address manually check box. The IPv6 prefix length and router address that have been acquired automatically are displayed.
- Manual: Select the Set Router Address manually check box. You can manually set the prefix length and router address.

**MAC Address Table**

Select the source MAC address from the MAC Address table.

- Global Address: You can set the source MAC address to a global address.

**VLAN Table**

Select the VLAN CoS and ID from the VLAN table.

**IP Address Table**

Select the source IP address from the IP address table.

- Get IP Address: Press this soft key to get the IP address. The AQ1300 will acquire an IP address, using DHCP when the test layer is L3-IPv4 or stateless address autoconfiguration when the test layer is L3-IPv6.

### Gateway

Set the gateway.

- Manual: Select this option to set the gateway manually.
- Auto.1: Select this option to set the gateway to xxx.xxx.xxx.1.
- Auto.254: Select this option to set the gateway to xxx.xxx.xxx.254.

## Destination Address Screen

### Destination MAC Address

Set the destination MAC address. You can refer to the MAC address table to set the address.

### IPv4

Set the destination IPv4 address. This setting is valid when Test Layer is set to L3-IPv4 Test. You can refer to the IP address table or select Search List to set the address.

### IPv6

Set the destination IPv6 address. This setting is valid when Test Layer is set to L3-IPv6 Test. You can refer to the IP address table or select Search List to set the address.

### Search List

Select the address of the other device (the destination address) from the search list.

### Searching for Other Devices

When you select Search other Device, the AQ1300/AQ1301 searches for other devices (AQ1300 or AQ1301) on the same VLAN or network segment and displays the results in the search list.

### Switching the Display

You can switch between different search list displays.

- SerialNo+Ver: The equipment name, serial number, and version are displayed.
- Test Setup: The equipment name, test interface, and test layer are displayed.
- Status+MAC: The equipment name, status, and MAC address are displayed.
- IPv4/IPv6: The equipment name and IP address are displayed.
- Master Addr: The device name and master address (MAC or IP address) are displayed.

### Note

---

You can check the equipment name and serial number of the AQ1300/AQ1301 in the system settings.

---

### Setting the Address Type

You can switch the address type that is displayed when Switch is set to Master Addr.

- MAC address
- IP address

### MAC Address Table

Select the destination MAC address from the MAC Address table.

- MAC Address (ARP): When the test layer is L3-IPv4, press this soft key to automatically acquire the destination MAC address.
- MAC Address (NDP): When the test layer is L3-IPv6, press this soft key to automatically acquire the destination MAC address.

### IP Address Table

Select the destination IP address from the IP Address table.

### Note

---

All the tables are created on the setup software. For details, see the Setup Software User's Manual.

---

# 11.4 Configuring the Tx Settings

## Procedure

### TX Setting Screen

Follow the procedure in section 11.1 to display the VLAN Test Setup screen. Press the **Detail Setup** soft key and then the **TX Setting** soft key to display the following screen.

**Set the interval (1ms, 10ms, 100ms, 1s).**

**Set the frame length (actual). L2 and L3-IPv4 (VLAN 1 stack: 64 (68) to 9999 (9999) bytes VLAN 2 stacks: 64 (72) to 9999 (9999) bytes) L3-IPv6 (VLAN 1 stack: 74 (78) to 9999 (9999) bytes VLAN 2 stacks: 74 (82) to 9999 (9999) bytes)**

**Refer to the frame length table. ► section 4.5**

**Set the repeat count (1-15).**

## Explanation

### TX Setting Screen

#### Interval

Set the Tx frame transmission interval.  
1ms, 10ms, 100ms, 1s

#### Frame Length (Actual)

Set the frame length of Tx frames. The actual frame length of the specified frame is also displayed.

VLAN	L2 and L3-IPv4	L3-IPv6
1 stack	64 (68) to 9999 (9999) bytes	74 (78) to 9999 (9999) bytes
2 stacks	64 (72) to 9999 (9999) bytes	74 (82) to 9999 (9999) bytes

#### Frame Length Table

You can refer to the frame length table to select the value. The table is created on the setup software. For details, see the Setup Software User's Manual.

#### Repeat Count

Set the number of times to transmit the VLAN ID group.  
Range: 1 to 15

# 11.5 Configuring the VLAN ID Tx Settings

## Procedure

### VLAN ID TX Setting Screen

Follow the procedure in section 11.1 to display the VLAN Test Setup screen.

Press the **Detail Setup** soft key and then the **VLAN ID TX Setting** soft key to display the following screen.

The screenshot shows the 'VLAN ID TX Setting' screen. At the top, there is a 'VLAN ID Setting' section with a 'Not Send VLAN ID' checkbox. Below this is an 'Input' section with 'Single' and 'Range' options. The 'Range' option is selected, and there are input fields for 'ID' (0), 'Step' (0), and '1'. There are also 'Add', 'Delete', 'All Add', and 'All Del' buttons. Below the input fields is a 'Set VLAN ID Rx Setting' button. The main part of the screen is a 'Vlan ID List' table with columns for ID values (3, 4, 5, 9, 12, 13) and a grid for adding more IDs. On the right side, there is a vertical menu with options: 'VLAN Setup', 'Tx Setting', 'VLAN ID TX Setting', 'VLAN ID RX Setting', and 'Sub Menu'. A 'Sub Menu' icon is also visible at the bottom right of the screen.

**Select this check box to not send VLAN IDs.**

**Set the input method (Single, Range).**  
Set the method to use to add and delete IDs when you create VLAN ID lists.

**Set the ID (0-4095).**  
Left box: Set the first ID to add or delete from the list.  
Right box: Set the last ID to add or delete from the list.

**Set the step (1-1000).**  
If the input method is set to Range, set in how many steps between the first and the last IDs to add or delete.

**Sub menu**  
Load VLAN ID definition files and scroll VLAN ID lists.

**Add**  
Adds an ID to the VLAN ID list according to the ID and step settings described above

**Delete**  
Deletes an ID from the VLAN ID list according to the ID and step settings described above

**All Add**  
Adds all IDs from 0 to 4095 to the VLAN ID list

**All Del**  
Deletes all IDs from 0 to 4095 from the VLAN ID list

**List of VLAN IDs to send**  
How to create a list

- On the sub menu, load a VLAN ID definition file. Edit the loaded list using the input method described above.
- Create a list from scratch using the input method described above.

**Applies the VLAN ID Rx settings**  
Copies the contents of the VLAN ID list registered in the VLAN ID Rx setting (see section 11.6) to the VLAN ID list of the VLAN ID Tx setting (this screen).

## Sub Menu

Press the **Sub Menu** soft key to display the following screen.

**Refer to a file**  
A File screen opens. Select a VLAN ID definition file and load it.

- File operation (fixed to Load)
- File type (\*.csv, \*.txt)
- Select a drive (Internal, USB Memory).

**List Disp**  
Switches the display format (All ID, Input ID)

**Next 1/2**  
To VLAN ID TX Setting 2/2

### Display formats

**All ID**

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49

**Input ID**

3	4	5	9	12	13				

Unentered IDs appear dimmed (light gray).

Press the **Next 1/2** soft key to display the following screen.

**Scrolls the VLAN ID list one page up**

**Scrolls the VLAN ID list one line up**

**Scrolls the VLAN ID list one line down**

**Scrolls the VLAN ID list one page down**

**Next 2/2**  
To VLAN ID TX Setting 1/2



### Explanation

#### VLAN ID TX Setting Screen

##### Not Send VLAN ID

Set whether to send VLAN IDs.

- Selected: VLAN IDs are not sent. You will not be able to create VLAN ID lists or load VLAN ID definition files. You can use this setting to prevent mistakes in operation.
- Cleared: VLAN IDs are sent. You will be able to create VLAN ID lists and load VLAN ID definition files.

##### Setting the Input Method

Set the method to use to add and delete IDs when you create VLAN ID lists.

- Single: You can set a single ID and add it or delete it from the VLAN ID list.
- Range: You can set a range of IDs and add them or delete them from the VLAN ID list.
- ID  
Specify the ID to add or delete from the VLAN ID list.  
Range: 0 to 4095
  - Left box  
If the input method is set to Single, set the ID to add or delete.  
If the input method is set to Range, set the first ID to add or delete.
  - Right box: Set the last ID to add or delete. You can set this when the input method is set to Range.
- Step  
Set in how many steps between the first and the last IDs to add or delete from the VLAN ID list.  
You can set this when the input method is set to Range.  
Range: 1 to 1000

##### VLAN ID List

The VLAN ID list contains the VLAN IDs to send. You can create this list in the following ways.

- On the sub menu, load a VLAN ID definition file. The data is loaded into the VLAN ID list. After loading, you can edit the list using the input method described above.
- Create a VLAN ID list from scratch using the input method described above.

##### Add

Adds an ID to the VLAN ID list according to the ID and step settings described above

##### Delete

Deletes an ID from the VLAN ID list according to the ID and step settings described above

##### All Add

Adds all IDs from 0 to 4095 to the VLAN ID list

##### All Del

Deletes all IDs from 0 to 4095 from the VLAN ID list

### Set VLAN ID Rx Setting

The contents of the VLAN ID list registered in the VLAN ID Rx setting (see section 11.6) are copied to the VLAN ID list of the VLAN ID Tx setting that you are editing. When you execute this operation, a confirmation message will appear.

## Sub Menu

### Refer File

The File screen opens. Select a VLAN ID definition file, and execute Load.

- File Operation: Fixed to Load.
- File Type: Select \*.csv or \*.txt.
- Drives: Select internal memory or USB memory.

### VLAN ID Definition File

VLAN ID definition files (csv format; .csv or .txt extension) created in advance can be loaded into the VLAN ID list of VLAN tests. You can use a text editor or spreadsheet application to create VLAN ID definition files.

#### Allowed Characters

- ID value: A number up to four digits; preceding zeros are allowed (example: 0001)
- Delimiter: Comma or line feed (LF or CR+LF)
- Others: Consecutive spaces or tabs around the delimiter

If a file contains a character other than those described above, an error will occur when the file is loaded into the AQ1300/AQ1301.

#### Example

```
1, 2, 3, 0004, 5, 6 , 7, 8, 9 , 0010  
0011 ,12 ,13, 14,15,16,17,18 ,19, 20
```

### List Disp

Select the display format of the VLAN ID list from the following:

- All ID: All IDs from 0 to 4095 are displayed. Unentered IDs appear dimmed (light gray).
- Input ID Only the entered IDs are displayed.

### Scrolling the VLAN ID List

You can scroll the list up and down by page or by line.

# 11.6 Configuring the VLAN ID Rx Settings

## Procedure

### VLAN ID RX Setting Screen

Follow the procedure in section 11.1 to display the VLAN Test Setup screen.

Press the **Detail Setup** soft key and then the **VLAN ID RX Setting** soft key to display the following screen.

The screenshot shows the 'VLAN ID RX Setting' screen. At the top, it displays the date and time '2013/2/19 18:34:50'. The screen is divided into several sections: 'VLAN ID Setting' with a 'Use as Monitor' checkbox and a 'Target Frame' dropdown set to 'All'; 'Input' section with 'Single' and 'Range' radio buttons, and two input boxes for 'ID' (0 and 12) and 'Step' (2); a 'VLAN ID List' table with columns for IDs (0, 2, 4, 6, 8, 10, 12); and a 'Sub Menu' button. A right-hand sidebar contains buttons for 'VLAN Setup', 'Tx Setting', 'VLAN ID TX Setting', 'VLAN ID RX Setting', and 'Sub Menu'. Callouts point to these elements with descriptive text.

**Select this check box to use the AQ1300/AQ1301 as a monitor.**

**Sets the frames to receive (All, Only AQ130x)**  
Select the type of frames to receive.

**Set the input method (Single, Range).**  
Set the method to use to add and delete IDs when you create VLAN ID lists that are planned to be received.

**Set the ID (0-4095).**  
Left box: Set the first ID to add or delete from the list.  
Right box: Set the last ID to add or delete from the list.

**Set the step (1-1000).**  
If the input method is set to Range, set in how many steps between the first and the last IDs to add or delete.

**Sub menu**  
Load VLAN ID definition files and scroll VLAN ID lists.

**Add**  
Adds an ID to the VLAN ID list according to the ID and step settings described above

**Delete**  
Deletes an ID from the VLAN ID list according to the ID and step settings described above

**All Add**  
Adds all IDs from 0 to 4095 to the VLAN ID list

**All Del**  
Deletes all IDs from 0 to 4095 from the VLAN ID list

**VLAN ID list that is planned to be received**  
How to create a list

- On the sub menu, load a VLAN ID definition file. Edit the loaded list using the input method described above.
- Create a list from scratch using the input method described above.

**Set VLAN ID Tx Setting**  
Copies the contents of the VLAN ID list registered in the VLAN ID Tx setting (see section 11.5) to the VLAN ID list that is planned to be received (this screen).

## Sub Menu

Press the **Sub Menu** soft key to display the following screen.

The screenshot shows the 'VLAN ID RX Setting' screen. At the top, it displays the date and time '2013/2/19 18:38:06' and the status '=AC='. The screen is divided into several sections:

- Top Bar:** 'VLAN Setup' on the right.
- Left Panel:** '<< Vlan ID Setting >>', 'Use as Monitor' checkbox, 'Target Frame' dropdown (set to 'All'), 'Input' dropdown (set to 'Single'), 'Range' dropdown, 'ID' field (0 - 12), 'Step' field (2), 'Add' and 'Delete' buttons, 'Set VLAN ID Rx Setting' button, and 'All Add' and 'All Del' buttons.
- Right Panel:** 'Refer File' button, 'List Disp' button, and 'Next 1/2' button.
- Main Area:** '<< Vlan ID List >>' followed by a grid of VLAN IDs. The first row shows IDs 0, 2, 4, 6, 8, 10, 12. Other IDs are dimmed.

Annotations on the right side of the screenshot:

- 'Refer File' → Refer to a file. ▶ section 11.5
- 'List Disp' → Switches the display format (All ID, Input ID).
- 'Next 1/2' → To VLAN ID RX Setting 2/2

### Display formats

#### All ID

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49

#### Input ID

0	2	4	6	8	10	12			

Unentered IDs appear dimmed (light gray).

Press the **Next 1/2** soft key to display the following screen.

The screenshot shows the 'VLAN ID RX Setting' screen after pressing the 'Next 1/2' key. The date and time are '2013/2/19 18:39:10'. The configuration options are the same as in the previous screenshot. The 'Vlan ID List' now shows a larger range of IDs, from 0 to 99, with unentered IDs dimmed.

Annotations on the right side of the screenshot:

- ▲ (Page Up) → Scrolls the VLAN ID list one page up
- ▲ (Line Up) → Scrolls the VLAN ID list one line up
- ▼ (Line Down) → Scrolls the VLAN ID list one line down
- ▼ (Page Down) → Scrolls the VLAN ID list one page down
- 'Next 2/2' → To VLAN ID RX Setting 1/2

### Explanation

#### VLAN ID RX Setting Screen

##### Use as Monitor

Set whether to use as a monitor.

- Selected: The VLAN ID list that is planned to be received is not used, and the actual received VLAN IDs are monitored. Judgment is not performed on the measured results. You will not be able to create VLAN ID lists or load VLAN ID definition files. You can use this setting to prevent mistakes in operation.
- Cleared: The VLAN ID list that is planned to be received is compared against the actual received VLAN IDs, and judgment is performed on the measured results. You will be able to create VLAN ID lists and load VLAN ID definition files.

##### Setting the Frames to Receive

Select the type of frames to receive.

- All: All frames are received.
- Only AQ130x: Only the test frames that the AQ1300/AQ1301 transmits are received.

##### Setting the Input Method

Same as VLAN ID Tx Setting. For details, see section 11.5.

##### VLAN ID List That Is Planned to Be Received

Same as VLAN ID Tx Setting. For details, see section 11.5.

##### Add, Delete, All Add, and All Del

Same as VLAN ID Tx Setting. For details, see section 11.5.

##### Set VLAN ID Tx Setting

The contents of the VLAN ID list registered in the VLAN ID Tx setting (see section 11.5) are copied to the VLAN ID list that is planned to be received. When you execute this operation, a confirmation message will appear.

#### Sub Menu

##### Refer File

Same as VLAN ID Tx Setting. For details, see section 11.5.

##### List Disp

Same as VLAN ID Tx Setting. For details, see section 11.5.

##### Scrolling the VLAN ID List

You can scroll the list up and down by page or by line.

# 11.7 Starting and Stopping Measurement

## Procedure

After entering the settings described in sections 11.1 to 11.6, you can execute the VLAN test.

### Starting Measurement

1. Press **START** on the Tx and Rx sides. The following screen appears, and measurement starts.
2. Press the **Start Transmit** soft key on the Tx side. VLAN ID transmission starts.  
The **Stop Transmit** soft key is enabled. If you want to stop transmission before the specified repeat count, press the **Stop Transmit** soft key.

**Test information**      Title bar ▶ section 2.1

2013/2/19 18:51:13      Measurement

VLAN      Remain      4095      STAT      L2ERR      LFS      Control

Duration: 00:00:06      Status:Executing...

Rx ID Success: 0 / Plan: 0

Rx ID Fail: 0      Rx ID Error: 0

Start Transmit      Measurement status

Stop Transmit      Starts transmission

To List      Measured results

Area      Stops transmission

All Part      This key is enabled when the Start Transmit soft key is pressed.

Next 1/2      Received VLAN IDs

Received Frame Format      Displays the Rx frame format

File      ▶ section 7.14

Next 2/2      File

Save the measured results of VLAN tests. ▶ section 12.2

Link status      During the test, if a frame with a different TPID or a frame without a VLAN tag is detected, the following message is displayed.

“Received the unexpected TPID.”

### Stopping Measurement

Press **STOP** on the Tx side and then **STOP** on the Rx side. Measurement stops. The following screen appears on the Rx side.

#### Example of pass judgment

Pass      Duration: 00:00:18      Status:Finish

Rx ID Success: 4096 / Plan: 4096

Rx ID Fail: 0      Rx ID Error: 0

Start Transmit      Measured results

Stop Transmit      Received VLAN IDs

To List

Area

All Part

Next 1/2

#### Example of fail judgment

Fail      Duration: 00:00:05      Status:Finish

Rx ID Success: 81 / Plan: 176

Rx ID Fail: 95      Rx ID Error: 80

Start Transmit

Stop Transmit

To List

Area

All Part

### Explanation

#### Test Information

The type of test that is currently being performed and the repeat count are displayed.

#### Test Type

**VLAN**: Indicates a VLAN test

#### Repeat Count

The current Tx count and the specified repeat count (see section 11.4) are displayed.



#### Measurement Status

The measurement status is indicated.

**Remain 40**: Indicates the remaining number of Tx frames in measurement  
The other areas of the measurement status are not used in VLAN tests.

#### Starting and Stopping Transmission

Press START on the Tx and Rx sides to start measurement, and then start or stop transmission.

- Start Transmit soft key: VLAN ID transmission starts according to the VLAN ID list specified in the VLAN ID Tx setting.
- Stop Transmit soft key: Transmission stops.

After stopping the transmission, press STOP. Measurement will stop.

#### Note

If you press STOP without pressing the Stop Transmit soft key first, transmission and measurement are both stopped.

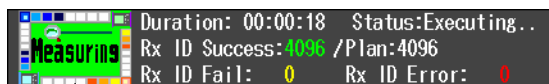
---

## Measured Result Display

The judgment result and measurement results are displayed on the Rx side. The display varies depending on whether the Use as Monitor check box is selected (see section 11.6).

### If the Use As Monitor Check Box Is Cleared

The judgment result and measurement results are displayed.

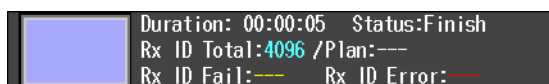


**Judgment result**  
Displays "Measuring" during measurement

Judgment result	No display	Before measurement
	Measuring	Measuring
	Pass	Pass (judgment result after measurement completion)
	Fail	Fail (judgment result after measurement completion)
Measurement time	Time elapsed from the start of measurement	Displayed as hh:mm:ss (hour:minute:second)
Status	Unexecution	Before measurement
	Executing..	Measurement in execution
	Finish	Measurement complete
	Error	Error detected
Rx ID Success	The value in green	The number of received VLAN IDs that matched the IDs in the VLAN ID list that is planned to be received
Plan	The value in white	The number of IDs in the VLAN ID list that is planned to be received
Rx ID Fail	The value in yellow	The number of IDs in the VLAN ID list that is planned to be received that has not been received
Rx ID Error	The value in red	The number of IDs that are not in the VLAN ID list that is planned to be received

### If the Use As Monitor Check Box Is Selected

The measurement time, status, and the total number of received IDs are displayed.



Judgment result	No display	No display at all times
Measurement time	Time elapsed from the start of measurement	Displayed as hh:mm:ss (hour:minute:second)
Status	Unexecution	Before measurement
	Executing..	Measurement in execution
	Finish	Measurement complete
	Error	Error detected
Rx ID Total	The value in blue	The total number of received VLAN IDs
Plan	"---" in white	Invalid indication
Rx ID Fail	"---" in yellow	Invalid indication
Rx ID Error	"---" in red	Invalid indication

## Displaying the Received VLAN IDs

The received VLAN IDs can be displayed on a map or a list. For details, see section 11.8.



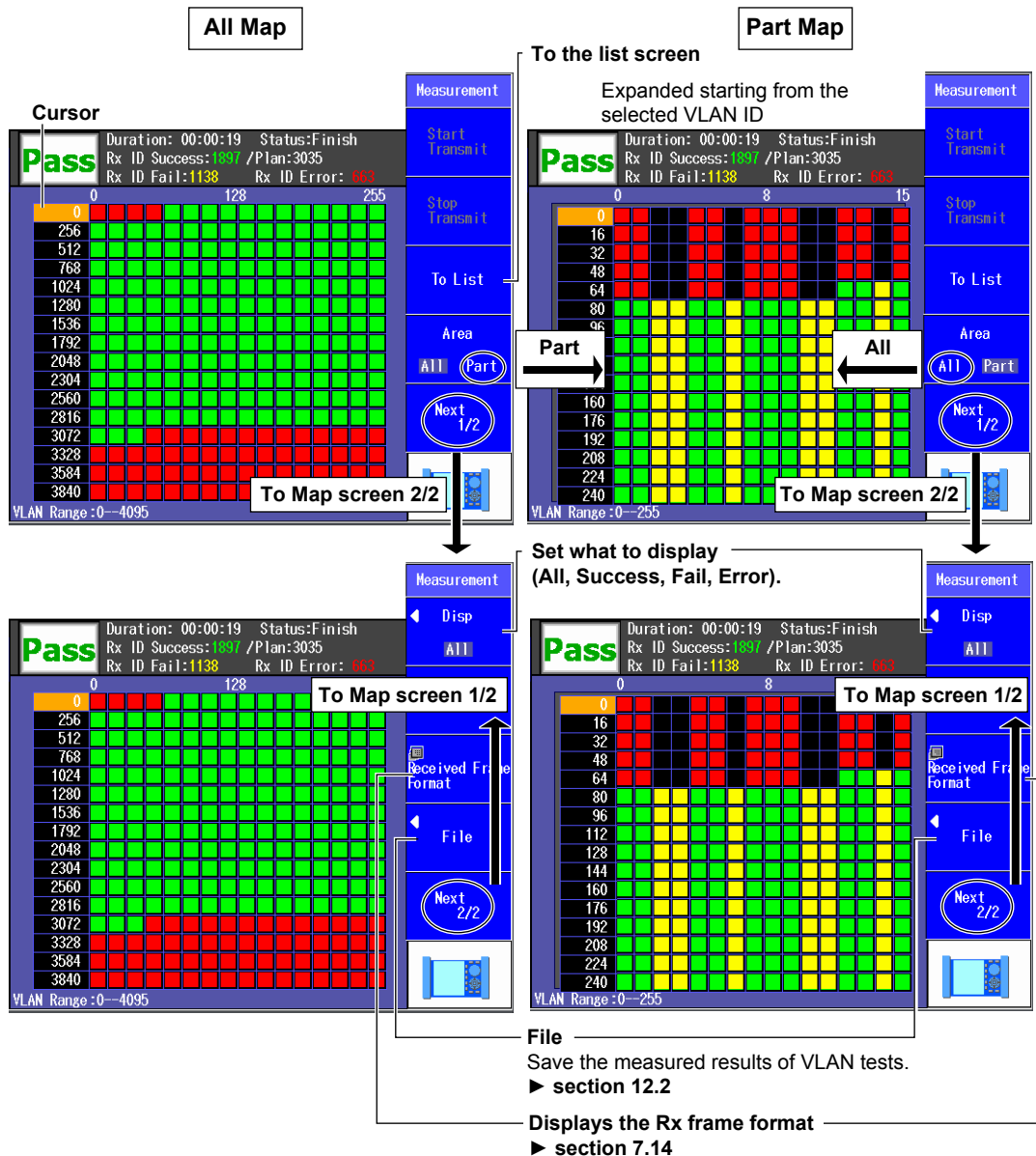
# 11.8 Switching Screens and Saving Measured Results

## Procedure

After making measurements in section 11.7, the received VLAN IDs can be displayed on a map or a list.

### Map Screen

When you press **STOP** to stop the measurement, the measured results of all VLAN IDs are displayed on a map.



## List Screen

IDs are listed starting from the VLAN ID that is selected on the Map screen.

Duration: 00:00:19 Status: Finish  
 Rx ID Success: 1897 / Plan: 3035  
 Rx ID Fail: 1138 Rx ID Error: 003

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
0	1	4	5	7	8	9	12
13	15	16	17	20	21	23	24
25	28	29	31	32	33	36	37
39	40	41	44	45	47	48	49
52	53	55	56	57	60	61	63
64	65	68	69	71	72	73	76
77	78	79	80	81	82	83	84
85	86	87	88	89	90	91	92
93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108
109	110	111	112	113	114	115	116
117	118	119	120	121	122	123	124
125	126	127	128	129	130	131	132
133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148
149	150	151	152	153	154	155	156

Page 1/29

Measurement

- Start Transmit
- Stop Transmit
- To Map
- VLAN ID
- Next 1/2

**Switch pages.**  
Press the left and right arrow keys to switch pages.

**To the map screen**

**Set the VLAN ID (0-4095).**  
Switches to the page containing the specified VLAN ID

**To List screen 2/2**

Duration: 00:00:19 Status: Finish  
 Rx ID Success: 1897 / Plan: 3035  
 Rx ID Fail: 1138 Rx ID Error: 003

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
0	1	4	5	7	8	9	12
13	15	16	17	20	21	23	24
25	28	29	31	32	33	36	37
39	40	41	44	45	47	48	49
52	53	55	56	57	60	61	63
64	65	68	69	71	72	73	76
77	78	79	80	81	82	83	84
85	86	87	88	89	90	91	92
93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108
109	110	111	112	113	114	115	116
117	118	119	120	121	122	123	124
125	126	127	128	129	130	131	132
133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148
149	150	151	152	153	154	155	156

Page 1/29

Measurement

- Disp
- All
- Received Frame Format
- File
- Next 2/2

**Set what to display (All, Success, Fail, Error).**

**Displays the Rx frame format**  
► section 7.14

**File**  
Save the measured results of VLAN tests.  
► section 12.2

**To List screen 1/2**

**Explanation**

**Map Screen**

The measured results of all VLAN IDs (from 0 to 4095) are mapped to 16 by 16 grids.







**All and Part**

You can display the entire map or expand a part of the map.

- All: 16 VLAN IDs are assigned to each grid. If the statuses of the IDs are different, the color is displayed according to the order of precedence explained later.
- Part: A single VLAN ID is assigned to each grid. The status of each ID is indicated by color.







**Color**

Depending on the ID Rx status, the grids on the map are displayed using different colors as follows. The colors used in the ID list are the same. However, IDs that correspond to none or other are not displayed on the list, so they are not applicable.

Success	 Green	The received VLAN ID matches the ID in the VLAN ID list that is planned to be received.
Fail	 Yellow	An ID in the VLAN ID list that is planned to be received that has not yet been received
Error	 Red	An ID that is not in the VLAN ID list that is planned to be received
Monitor	 Blue	A VLAN ID that has been received when the Use As Monitor check box is selected
None	 Black	An ID that is not in the VLAN ID list that is planned to be received and has not been received
Other	 Gray	An ID whose status is other than the above For example, an ID that is not specified in the "Disp" menu

**Color Precedence**

When the Map screen is set to All, 16 VLAN IDs are assigned to each grid. If the statuses of these 16 IDs are different, the color with the highest precedence is displayed. The order of precedence is defined below.

- **If the Use As Monitor Check Box Is Cleared**  
Highest precedence →  red >  yellow >  green >  black ← Lowest precedence
- **If the Use As Monitor Check Box Is Selected**  
Highest precedence →  blue > > >  black ← Lowest precedence  
There are no settings between blue and black.

**What to Display**

You can set which VLAN IDs to display depending on their status. IDs whose status are other than the specified will be displayed in the "other" (gray) color.

All	All received VLAN IDs are displayed.
Success	Only the successfully received VLAN IDs are displayed.
Fail	Only the unreceived VLAN IDs are displayed.
Error	Only the erroneous VLAN IDs are displayed.

## List Screen

IDs are listed in a 16 line by 8 column spreadsheet starting from the VLAN ID that is selected on the Map screen.

### Color

Depending on the ID Rx status, the IDs are displayed using different colors. The colors are the same as those of the Map screen. For details, see “Map Screen” on the previous page. However, IDs that correspond to none or other are not displayed on the list, so they are not applicable.

### Switching Pages

Press the up and down arrow keys to switch pages.

### VLAN ID

You can specify a VLAN ID and display the page that contains the ID.

Range: 0 to 4095

### What to Display

You can set which VLAN IDs to display depending on their status. Only the specified IDs are displayed. The options are the same as those of the Map screen.

## Saving Measured Results

You can save the measured results of VLAN tests. Set the save destination and file name on the File menu, and save the results. For details, see section 12.2.

# 12.1 Selecting a Setup File

## Procedure

### E-OAM Test Setup Screen

Press the **Option** soft key, the **Next 1/2** soft key and then the **E-OAM** soft key to display the following screen.

**Test Setup** (SFP (GbE) IEEE802.1ag) — Set up the test. ► section 12.2

**Test Item** (CC) — Configure the test items. ► section 12.3

**Link/Address** — Configure link and address settings. ► section 12.4

**Next 1/2** — To E-OAM Test Setup 2/2

Press the **Next 1/2** soft key to display the following screen.

**Default** — Default setup

**File** — Load a file. Loads the selected setup file from the file list

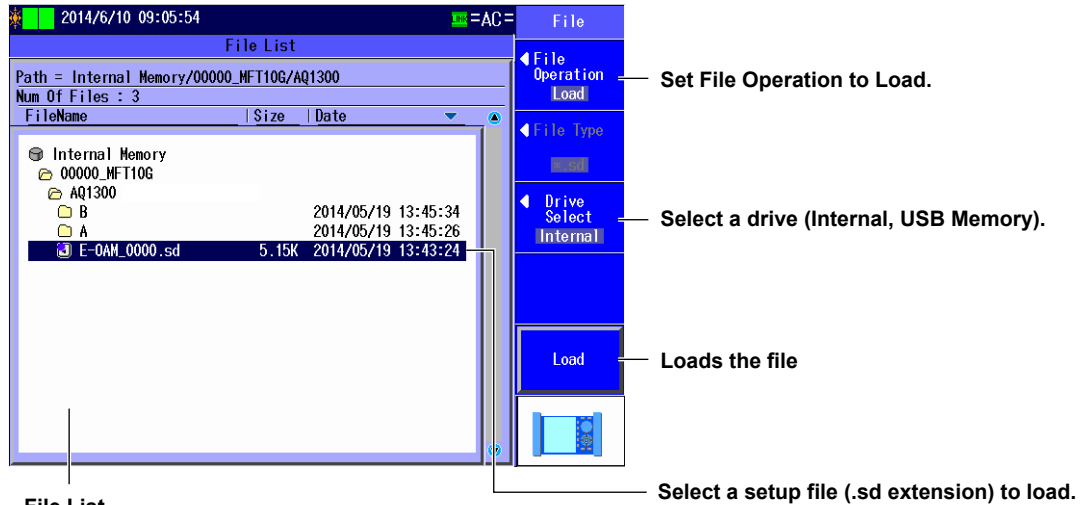
**Option (E-OAM)** — Set options (E-OAM). ► section 12.7

**Next 2/2** — To E-OAM Test Setup 1/2

## 12.1 Selecting a Setup File

### File Screen

Press the **File** soft key to display the following screen.



#### File List

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

### Explanation

#### Default setup

Select this item to return to the default setup.

#### Load a file

Select this item to load an E-OAM test setup file (with an .sd extension) from the file list.

To create a setup file, you can use the setup software and send the file to the AQ1300/AQ1301, or you can save the settings on the AQ1300/AQ1301.

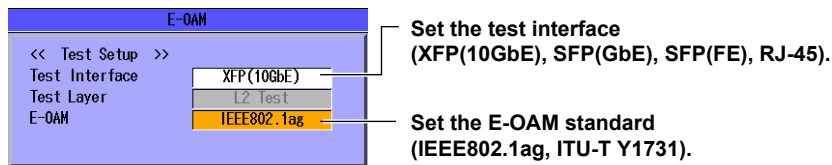
For details on the Setup Software, see the Setup Software User's Manual, IM AQ1300-61EN.

## 12.2 Configuring the Test Settings

### Procedure

#### Test Setup Screen

Follow the procedure in section 12.1 to display the E-OAM Test Setup screen. Press the **Test Setup** soft key to display the following screen.



### Explanation

#### Test Interface

Specify which test interface to use.

- XFP (10GbE): Select this option to use the 10GBASE-R measurement port.
- SFP (GbE): Select this option to use the 1000BASE-X measurement port.
- SFP (FE): Select this option to use the 100BASE-X measurement port.
- RJ-45: Select this option to use the 10BASE-T/100BASE-TX/1000BASE-T measurement port.

#### E-OAM Standard

Set the E-OAM standard to comply with.

- IEEE802.1ag: Test complying with IEEE802.1ag, Connectivity Fault Management
- ITU-T Y1731: Test complying with ITU-T Y1731, OAM Functions and Mechanisms for Ethernet based networks

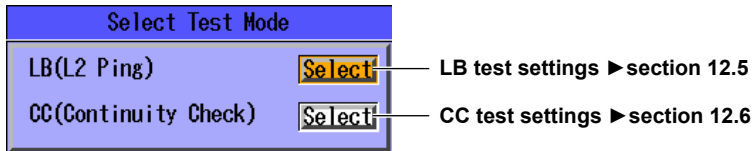
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## 12.3 Setting the Test Mode

### Procedure

#### Select Test Mode Screen

Follow the procedure in section 12.1 to display the E-OAM Test Setup screen.  
Press the **Test Item** soft key to display the following screen.



### Explanation

Select a test mode.

When you select a test mode, its setup screen will appear.



# 12.4 Configuring Link Address Settings

## Procedure

### Link Setting Screen

Follow the procedure in section 12.1 to display the E-OAM Test Setup screen.

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

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

**Select this check box to continue transmission while the link is down.**  
This setting is valid when Test Interface is set to XFP(10GbE).

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

**Advertisement**  
This setting is valid when Test Interface is set to SFP(GbE) or RJ-45 and Negotiation is set to Auto.

**Link Setting screen (this screen)**

**Source Address Screen**

**Emulation Setting Screen**

**Destination Address Screen**

**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.

**Set the RF response (Auto, Manual).**  
This setting is valid when Test Interface is set to XFP (10GbE).

**Set the Tx clock source (Internal CLK, Received CLK).**  
This setting is valid when Test Interface is set to XFP (10GbE) or SFP(GbE).

**Select this check box to automatically detect mismatches in the auto negotiation during link establishment.**

**Link Setting Acquisition**

**Executes link setting information acquisition**  
Acquires the link setting information of the other device connected to the AQ1300/AQ1301

**Applies link settings**  
Applies the acquired other device's link settings to the AQ1300/AQ1301. You can execute this when the measurement interface is RJ-45 or SFP(GbE) and the acquisition status is Finish.

**Status (Preparing, Finish, Fail)**

**Cable type (Straight, Cross)**  
This setting is valid when Test Interface is set to RJ-45.

**Returns to the link setting screen**

**UTP Cable Status**  
Indicates the UTP cable status as follows. (Normal, The cable may be defective. It is two-pair cable)

**Result of link setting information acquisition**

- Negotiation (Auto, Manual)**
- Speed (1G, 100M, 10M)**  
Appears when Test Interface is set to RJ-45
- Duplex (Full, Half, --- (when negotiation is set to manual)**  
Appears when Test Interface is set to RJ-45
- MDI (MDI, MDI-X)**  
Appears when Test Interface is set to RJ-45

### Source Address Screen

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

The screenshot shows the 'Source Address' configuration screen. The top status bar displays '2014/6/10 09:25:03' and '-AC-'. The main area contains the following fields and tables:

- Source MAC:** 00 00 00 00 00 01
- VLAN stacks:** 2
- VLAN2 Table:**

TP ID	88A8	CF I	0	CoS	0	ID	1001
TP ID	8100	CF I	0	CoS	0	ID	1000
- VLAN1:** (Empty table)
- MDLevel:** 0

Callouts on the right side of the screen provide instructions:

- Link/Address:** Set the source MAC address.
- Link Setting:** Refer to the MAC Address table. ▶ section 4.3
- Source Address:** Set the VLAN stack number (1, 2).
- Emulation Setting:** Configure the VLAN settings (TPID: 0-FFFF, CFI: 0-1, CoS: 0-7, ID: 0-4095).
- Destination Address:** Refer to the VLAN table. ▶ section 4.3
- Bottom Soft Key:** Set the MD level (0 to 7).

### Emulation Setting Screen

Press the **Link/Address** soft key and then the **Emulation Setting** soft key to display the following screen.

- Select this check box to send LT replies.
- Select this check box to send LB replies.

The screenshot shows the 'Emulation Setting' configuration screen. The top status bar displays '2014/6/10 09:27:08' and '-AC-'. The main area contains the following fields:

- Emulation Setting:**
  - LB Reply
  - LT Reply

Callouts on the right side of the screen provide instructions:

- Link Setting:** (Points to the Emulation Setting section)
- Source Address:** (Points to the Emulation Setting section)
- Emulation Setting:** (Points to the Emulation Setting section)
- Destination Address:** (Points to the Emulation Setting section)
- Bottom Soft Key:** (Points to the Emulation Setting section)

## Destination Address Screen

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

2014/6/10 09:28:58 AC= Link/Address

Destination Address

<< Destination Address >>

Destination MAC 00 00 00 00 00 01 Refer

Link Settings Refer to the MAC Address table. ▶ section 4.3

Source Address

Emulation Setting

Destination Address

Search List Select the search list. ▶ section 4.3

### Note

#### Address Settings and MD Level Setting

For the E-OAM test, you can also set the source and destination MAC address and MD level settings on the top E-OAM test setup screen.

2014/6/19 14:41:14 AC= E-OAM Setup

LB Setup

<< Test Setup >>

Test Interface SFP(GbE)

<< Address Setting >>

Source MAC 00 00 00 00 00 01 Refer

MDLevel 0

<< LB test >>

Destination MAC 00 00 00 00 00 01 Refer

Interval 1ms

Tx Mode Time 3 min Refer

Frame Length(Actual) 64 ( 64 ) byte Refer

Test Setup SFP(GbE) IEEE802.1ag

Test Item

LB Address

MD level

Link/Address

Address

Next 1/2

**Explanation**

**Link Setting Screen**

**Negotiation**

Select whether or not to use auto negotiation. This setting is valid when Test Interface is set to RJ-45 or SFP(GbE).

- Auto: The link between the AQ1300/AQ1301 and the device that it is connected to is configured automatically through auto negotiation.
- Manual: The link must be configured manually.

**Advertisement**

The connection types that can be offered are advertised when Test Interface is set to SFP(GbE) or RJ-45 and Negotiation is set to Auto.

Advertisement	SFP	RJ-45
1000M-FULL	No	Yes
100M-FULL, 100M-HALF	No	Yes
10M-FULL, 10M-HALF	No	Yes
Flow(Sym), Flow(Asym)	Yes	Yes

**Speed**

When Test Interface is set to RJ-45, you can set the link speed.

- 1G: A 1 Gbit/s 1000BASE-T connection is used.
- 100M: A 100 Mbit/s 100BASE-TX connection is used.
- 10M: A 10 Mbit/s 10BASE-T connection is used.
- Auto: The link speed is set automatically. This setting is valid when Negotiation is set to Auto.

**Note**

---

When Test Interface is set to XFP(10GbE), the link speed is fixed at 10G. When Test Interface is set to SFP(GbE), the link speed is fixed at 1G. When Test Interface is set to SFP(FE), the link speed is fixed at 100M

---

**Duplex**

You can set the communication mode for when Speed is set to 100M or 10M. This setting is valid when Test Interface is set to RJ-45.

- FULL: Full duplex communication
- HALF: Half duplex communication
- Auto: The AQ1300/AQ1301 chooses full or half duplex automatically. This setting is valid when Negotiation is set to Auto.

**Note**

---

When Test Interface is set to XFP(10GbE), SFP(GbE), or SFP(FE), or when it is set to RJ-45 and Speed is set to 1G, the duplex mode is fixed at FULL.

---

**Flow Control**

You can enable or disable flow control.

- ON: Flow control is enabled.
- OFF: Flow control is disabled.

**MDI**

You can set the measurement port to straight or crossover mode. This setting is valid when Test Interface is set to RJ-45.

- MDI: Straight
- MDI-X: Cross
- Auto: The AQ1300/AQ1301 switches between straight and crossover mode automatically (this setting is valid when Negotiation is set to Auto).

**RF Response Setting**

You can select whether or not to automatically respond with an RF when Test Interface is set to XFP(10GbE) and a linkdown is detected or an LF is received.

- Auto: The AQ1300/AQ1301 automatically responds with an RF.
- Manual: The AQ1300/AQ1301 does not automatically respond with an RF.

**Continuing to Transmit while the Link Is Down**

When Test Interface is set to XFP(10GbE), you can specify whether to continue or stop transmission after a linkdown is detected.

- Selected: Transmission continues when a linkdown is detected.
- Cleared: Transmission stops when a linkdown is detected.

**Tx Clock Source Setting**

Specify the Tx clock source for when Test Interface is set to XFP(10GbE) or SFP(GbE).

When Test Interface is set to SFP(FE) or RJ-45, the Tx clock source is fixed to the internal clock.

- Internal CLK: The internal clock is used.
- Received CLK: The AQ1300/AQ1301 synchronizes with the Rx line signal.

When Test Mode is set to Loopback Test, if Test Interface is set to XFP(GbE) or SFP(GbE), the AQ1300/AQ1301 uses the received clock regardless of the Tx clock source setting.

**Link Setting Acquisition**

If the interface is SFP(GbE) or RJ-45, you can acquire and display link setting information of the other device (DUT; the device on the user side) connected to the AQ1300/AQ1301. For details, see section 4.3.

**Source Address Screen****Source MAC Address**

Set the source MAC address. You can refer to the MAC address table to set the address.

**VLAN Stacks**

Set the number of VLAN stacks.

- None: No VLAN stacks
- 1: One VLAN stack
- 2: Two VLAN stacks

**VLAN1/VLAN2**

Set the TPID (Tag Protocol Identifier), CFI (Canonical Format Indicator), CoS (Class of Service), and VLAN-ID for 1 or 2 VLAN stacks. You can refer to the VLAN table to set the values.

- TPID: 0 to FFFF
- CFI: 0 or 1
- CoS: 0 to 7
- ID: 0 to 4095

**MAC Address Table**

Select the source MAC address from the MAC Address table.

- Global Address: You can set the source MAC address to a global address.

**VLAN Table**

Select the VLAN CoS and ID from the VLAN table.

**MD (Maintenance Domain) Level**

Set the test target domain level.

MDLevel: 0 to 7

### Emulation Setting Screen

#### Enabling LB (Loop Back) Reply

Set whether to use the AQ1300/AQ1301 as the other device and send an LBR frame when an LBM is received in an LB test or multicast LB test.

- Selected: An LBR frame is transmitted.
- Cleared: An LBR frame is not transmitted.

#### Enabling LT (Link Trace) Reply

Set whether to use the AQ1300/AQ1301 as the other device and send an LBR frame when an LBM is received during a link trace.

- Selected: An LBR frame is transmitted.
- Cleared: An LBR frame is not transmitted.

### Destination Address Screen

#### Destination MAC Address

Set the destination MAC address. You can refer to the MAC address table to set the address.

#### MAC Address Table

Select the destination MAC address from the MAC Address table.

- Global Address: You can set the destination MAC address to a global address.

#### Search List

Select the address of the other device (the destination address) from the search list.

#### Searching for Other Devices

When you select Search other Device, the AQ1300/AQ1301 searches for other devices (AQ1300 or AQ1301) on the same VLAN or network segment and displays the results in the search list.

#### Switching the Display

You can switch between different search list displays.

- SerialNo+Ver: The equipment name, serial number, and version are displayed.
- Test Setup: The equipment name, test interface, and test layer are displayed.
- Status+MAC: The equipment name, status, and MAC address are displayed.
- IPv4/IPv6: The equipment name and IP address are displayed.
- Master Addr: The device name and master address (MAC address) are displayed.

#### Note

---

You can check the equipment name and serial number of the AQ1300/AQ1301 in the system settings.

---

#### Address Type

For the E-OAM test, this is fixed to MAC address display.

## 12.5 Configuring the LB Test

### Procedure

#### LB Setup Screen

Follow the procedure in section 12.1 to display the E-OAM Test Setup screen.

Follow the procedure in section 12.3 to display the Select Test Mode screen, and then select LB (L2 Ping). The following screen appears.

**Set the interval**  
(1ms, 10ms, 100ms, 1s).

**Set the Tx mode**  
(Continuous, Frames, Time).

**Set the Tx mode length**  
This setting appears when Tx Mode is set to Time or Frames  
(Frames: 1 to 4294967295  
Time: 1 to 1440 min)

**Refer to the Tx Time table. > section 4.5**

**Refer to the frame length table. > section 4.5**

**Set the frame length (actual).**  
(VLAN 1 stack: 64 (68) to 9999 (9999) bytes  
VLAN 2 stacks: 64 (72) to 9999 (9999) bytes)

### Explanation

#### Interval

Set the LBM frame transmission interval.

1ms, 10ms, 100ms, 1s

#### Tx Mode

Set the length of the LB test.

- Continue: An LB test is executed from the start of the test (pressing of the START button) to the end of the test (pressing of the STOP button).
- Time: An LB test is executed until the specified time elapses.  
1 min to 1440 min (24 hours)
- Frames: An LB test is executed until the specified number of frames are transmitted.  
1 to 4294967295

#### Tx Time and Frame Length Tables

You can refer to the tables to select the values.

The table is created on the setup software. For details, see the *Setup Software User's Manual*.

#### Frame Length (Actual)

Set the frame length of Tx frames. The actual frame length of the specified frame is also displayed.

- VLAN 1 stack: 64 (68) to 9999 (9999) bytes
- VLAN 2 stacks: 64 (72) to 9999 (9999) bytes

## 12.6 Configuring the CC Test

### Procedure

#### CC Setup Screen

Follow the procedure in section 12.1 to display the E-OAM Test Setup screen.

Follow the procedure in section 12.3 to display the Select Test Mode screen, and then select CC(Continuity Check). The following screen appears.

The screenshot shows the 'CC Setup' screen with the following fields and options:

- Test Interface:** SFP(GbE)
- Address Setting:** Source MAC (00 00 00 00 00 01), MDLevel (0)
- Domain:** Short MA Name Format (User), Short MA Name, MEP ID (0)
- CC test:** Destination MAC (Unicast, 00 00 00 00 00 01), Interval (1s), Tx START Condition (First Rx CCM), Target MEP ID (Designation, 0)
- Options:** First Rx CCM apply to domain (checked), Auto Tx DD1 (unchecked)

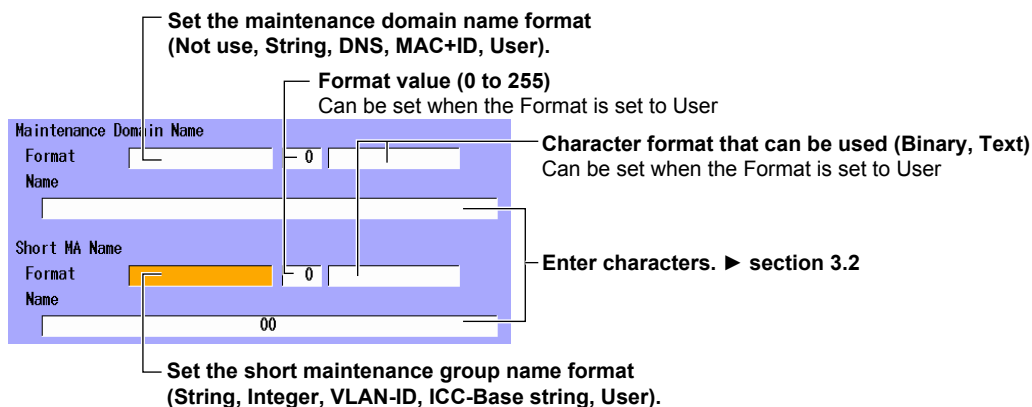
Callouts from the right side of the screen point to specific fields and options:

- Set the maintenance domain information.** When the test setting is IEEE802.1ag: Short MA Name Format, Short MA Name. When the test setting is ITU-T Y1731: MEG ID Format, MEG ID.
- Set the network device (MEP) ID number (0 to 8191).** (Points to MEP ID field)
- Select this check box to send CCM frames.** (Points to First Rx CCM apply to domain checkbox)
- Set the type of destination MAC address (Unicast, Multicast).** (Points to Destination MAC dropdown)
- Set the destination MAC address.** Valid when the destination MAC address type is unicast.
- Set the domain details.** Displayed when the test setting is IEEE802.1ag.
- Refer to the MAC Address table.** Displayed when the destination MAC address type is unicast. **► section 4.3**
- Select this check box to automatically send an RDI when an LOC is detected.** (Points to Auto Tx DD1 checkbox)
- Set the wait time.** Displayed when the transmission start timing of CCM frames is set to Test Start.
- Refer to the MEP ID table.** Displayed when the method of setting the ID number is set to Designation.
- Set the ID number (0 to 8191).** Displayed when the method of setting the ID number is set to Designation.
- Select how to set the ID number of the target network device (MEP) to receive CCM frames from (Designation, First CCM).** (Points to Target MEP ID dropdown)
- Set the interval (100ms, 1s, 10s, 60s).** (Points to Interval field)
- Set the transmission start timing of CCM frames (Test Start, First Rx CCM).** (Points to Tx START Condition dropdown)



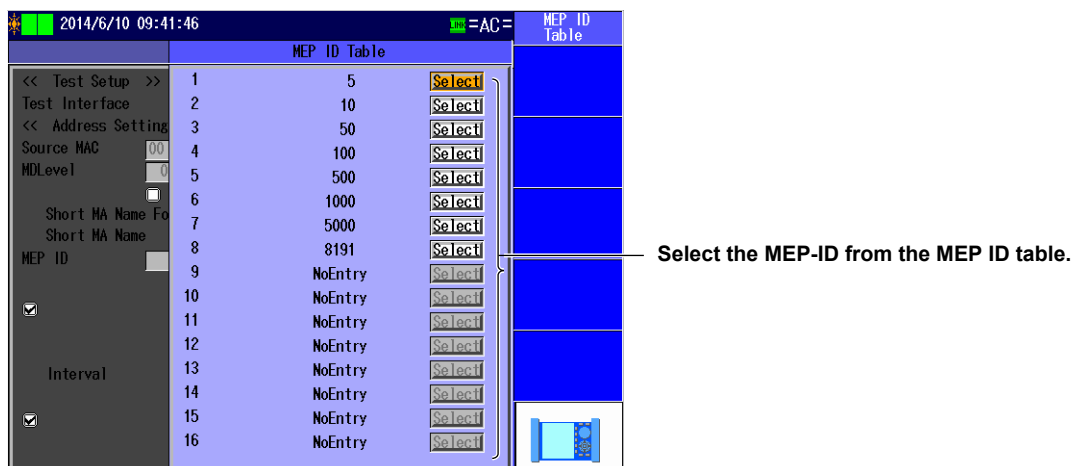
## Setting the Maintenance Domain Information

Press the **Detail** soft key under Domain to display the following screen.



## MEP ID Table

Press the **Refer** soft key under the Target MEP ID of the Rx to display the following screen.



## Explanation

### Setting the Domain Details

#### Setting the Maintenance Domain Information

- **When the Test Setting Is IEEE802.1ag**

##### First Rx CCM apply to domain Check Box

After a CC test is started, the AQ1300/AQ1301 receives the first CCM frame from the target MEP, reads the maintenance domain information in the frame, and saves it as its own domain name. The AQ1300/AQ1301 also copies the information into its Tx CCM frames. To set the information manually, clear the check box.

##### Maintenance Domain (Maintenance Domain Name)

Manually set the maintenance domain name. The following methods (formats) are available.

- Not use: The maintenance domain name is not entered.
- String: Enter a maintenance domain name of your choice using the notation defined in RFC2579.
- DNS: Enter a maintenance domain name of your choice using the notation defined in RFC1035.

## 12.6 Configuring the CC Test

- **MAC+ID:** Enter a maintenance domain name by combining the MAC address and a two-digit integer of your choice.
- **User:** Enter a maintenance domain name by using a character string of your choice (binary or ASCII format).

### Short MA (Short Maintenance Group Name)

Manually set the short maintenance group name. The following methods (formats) are available.

- **String:** Enter a short maintenance group name of your choice using the notation defined in RFC2579.
- **Integer:** Enter a short maintenance group name of your choice using a 2-digit integer.
- **VLAN-ID:** Enter a short maintenance group name using the VLAN ID value.
- **ICC-Base string:** Enter a short maintenance group name using the MEG ID value in ICC format as defined in ITU-T Y1731.
- **User:** Enter a short maintenance group name by using a character string of your choice (binary or ASCII format).

- **When the Test Setting Is ITU-T Y1731**

#### First Rx CCM apply to domain Check Box

After a CC test is started, the AQ1300/AQ1301 receives the first CCM frame from the target MEP, reads the MEG ID in the frame, and copies it into its Tx CCM frames. To set the information manually, clear the check box.

#### MEG ID

Manually enter the MEG ID. The input format is fixed to ICC-Base string.

- **ICC-Base string:** Enter a MEG ID value in ICC format as defined in ITU-T Y1731.

## CCM Frame Transmission Settings

### Tx

Set whether to transmit CCM frames during CC tests.

- **Selected:** CCM frames are transmitted during CC tests.
- **Cleared:** CCM frames are not transmitted during CC tests.

### Destination MAC

Set the target MEP's MAC address for CC tests.

- **Unicast:** CCM frames are transmitted to the specified destination MAC address.
- **Multicast:** CCM frames are transmitted simultaneously to multiple MEPs set to the same MD level. The destination MAC address is fixed at the following values depending on the MD level.

Multicast Address

Destination MAC Address	MD Level
01:80:C2:00:00:30	0
01:80:C2:00:00:31	1
01:80:C2:00:00:32	2
01:80:C2:00:00:33	3
01:80:C2:00:00:34	4
01:80:C2:00:00:35	5
01:80:C2:00:00:36	6
01:80:C2:00:00:37	7

### Interval

Set the CCM frame transmission interval.

100 ms, 1 s, 10 s, 60 s

**Auto Tx RDI**

Set whether to transmit an RDI frame to the network device at the destination address when a loss of continuity is detected (CCM frame is not received).

- Selected: An RDI frame is transmitted.
- Cleared: An RDI frame is not transmitted.

**Tx START Condition**

The CCM frame transmission and reception timing can be synchronized within the same maintenance domain.

- First Rx CCM: After a CC test is started, CCM frame transmission starts when the AQ1300/AQ1301 receives the first CCM frame from the target MEP.
- Test Start: CCM frame transmission starts when the specified wait time elapses after the START key is pressed.
- Wait Time: Set the wait time for when the Tx START Condition is set to Test Start.  
0 to 999 s (approx. 16 minutes)

**CCM Frame Reception Settings****Rx**

Set whether to receive CCM frames during CC tests.

- Selected: CCM frames are received during CC tests.
- Cleared: CCM frames are not received during CC tests.

**Target MEP ID**

Select how to set the ID number of the target network device (MEP) to receive CCM frames from.

- First CCM: After a CC test is started, the AQ1300/AQ1301 receives the first CCM frame, reads the MEP ID in the frame, and saves it as its target MEP.
- Designation:  
Manually enter the MEP ID.  
0 to 8191

**MEP ID table**

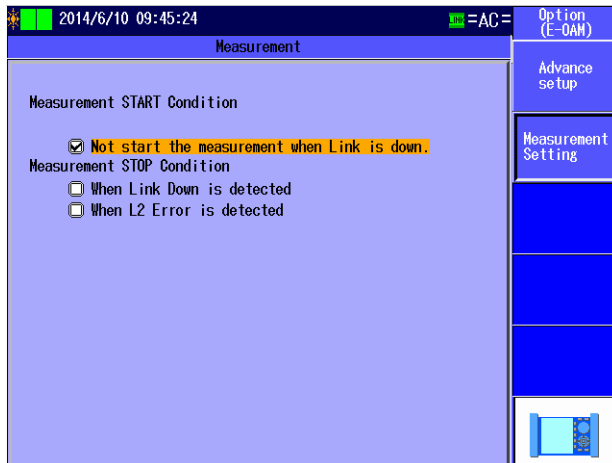
Select the ID value from the MEP ID table. Displayed when the method of setting the ID number is set to Designation.

## 12.7 Setting Options (E-OAM)

### Procedure

#### Measurement Screen

Press the **Next 1/2** soft key, the **Option (E-OAM)** soft key, and then the **Advanced setup** soft key to display the following screen.



### Explanation

#### Measurement Screen

##### Measurement START Condition

###### Not start the measurement when Link is down.

If linkdown is detected when START is pressed, measurement does not start.  
You cannot clear this check box.

##### Measurement STOP Condition

###### When Link Down is detected

Select whether to stop measurement when a linkdown is detected during measurement.

- Selected: Measurement is stopped when a linkdown is detected.
- Cleared: Measurement is not stopped when a linkdown is detected.

###### When L2 Error is detected

Select whether to stop measurement when an L2 error is detected during measurement.

- Selected: Measurement is stopped when an L2 error is detected.
- Cleared: Measurement is not stopped when an L2 error is detected.

## 12.8 Starting and Stopping an LB Test

### Procedure

After entering the settings described in sections 12.1 to 12.5 and 12.7, you can execute an E-OAM LB test.

### Starting an LB Test

1. Press **START**. The following screen appears, and an LB test starts.

**Test information**      **Title bar ▶ section 2.1**

2014/6/19 14:47:21      Measurement

Remain 159 [s]      Start Transmit

Interval: 1ms      Tx Time(min): 3

Duration 00:00:22

[LB] Loss Count: 0

Send Count: 20,975

Seq.No.	Round Trip Time(ms)	Length	TTL
21033	<1	64	---
21034	<1	64	---
21035	<1	64	---
21036	<1	64	---
Latest 21037	<1	64	---

[Tx] Rate(%): 0.06720      [Rx] Rate(%): 0.13440

Normal Frame: ---      Error History

Tx: ---      LINK L2

Rx: ---      0      0

Rx Frame Length(byte): ---

Network status ▶ section 2.1

Statistics counter and error detection history ▶ section 2.1

Measurement status ▶ section 2.1

Summary

Test results

Execute an LT or Multicast LB. ▶ section 12.10

File

Save the measured results of LB tests. ▶ section 13.2

Next 1/2

Measurement

Detail Display      Displays detailed statistics

Tx/Rx CDM information

### Stopping an LB Test

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

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

2014/6/19 14:47:41      Measurement

E-OAM      Remain 151 [s]      Start Transmit

LB      Dst: 00-00-00-00-00-01      MDLevel: 0

Interval: 1ms      Tx Time(min): 3

Duration 00:00:34

Test Results

[LB] Loss Count: 0

Send Count: 29,553

Seq.No.	Round Trip Time(ms)	Length	TTL
29549	<1	64	---
29550	<1	64	---
29551	<1	64	---
29552	<1	64	---
Latest 29553	<1	64	---

[Tx] Rate(%): 0.00000      [Rx] Rate(%): 0.00000

Normal Frame: ---      Error History

Tx: ---      LINK L2

Rx: ---      0      0

Rx Frame Length(byte): ---

Remaining Tx time

Indication that measurement has finished

Measurement duration

## 12.8 Starting and Stopping an LB Test

### Detailed Statistics Display

Start or stop a measurement.

Press the **Detail Display** soft key to display the following screen.



### Explanation

#### Test Results

Indication that measurement is in progress



Measurement duration

Indication that measurement is in progress

#### Results Display

[LB] Loss Count:	0		
Send Count:	6,259		
Seq.No.	Round Trip Time(ms)	Length	TTL
51	<1	194	---
52	<1	165	---
53	<1	176	---
54	<1	171	---
Latest 55	<1	164	---

Number of lost LBM frames

Number of sent LBM frames

Frame length

Response time (ms)

Sequence number

#### Sequence Number

A number is assigned in sequence from the start of transmission. When an LBM frame is lost, the sequence number of the corresponding frame is not displayed.

#### Response Time

The time from when the AQ1300/AQ1301 transmits an LBM frame until it receives an LBR frame from the destination network device (MEP). The unit is ms.

## 12.9 Starting and Stopping a CC Test

### Procedure

After entering the settings described in sections 12.1 to 12.4, 12.6, and 12.7, you can execute an E-OAM CC test.

### Starting a CC Test

1. Press **START**. The following screen appears, and a CC test starts.

**Test information**      **Title bar ▶ section 2.1**

2014/6/19 14:51:11      Measurement

Remain      STAT LOG OFF LFS Control

Start Transmit

Stop Transmit

Special Control

File

Next 1/2

Measurement

Detail Display

Tx/Rx CCM frame information

Measurement status ▶ section 2.1

Test results

Execute an LT and Multicast LB or transmit RDI frames ▶ section 12.10 (LT, multicast LB)

File

Save the measured results of CC tests. ▶ section 13.2

Displays detailed statistics

Tx and Rx CCM frame information

Network status ▶ section 2.1

Statistics counter and error detection history ▶ section 2.1

<< RX >>		<< TX >>	
Status	Count	Status	Count
CCM	31	CCM	31
RDI	19	RDI	19
LOC	0	LOC	0

Rx CCM information      Tx CCM information

DA 00-00-00-00-00-01      DA 00-00-00-00-00-01

SA 00-00-00-00-00-01      SA 00-00-00-00-00-01

MEP ID 0      MEP ID 0

Interval 1s      Interval 1s

[Tx] Rate(X): 0.00009      [Rx] Rate(X): 0.00009

Normal Frame:      Error History

Tx: 31      LINK L2

Rx: 31      0 0

Rx Frame Length(byte): ---

### Stopping a CC Test

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

2014/6/19 14:51:32      Measurement

E-OAM      STAT LOG OFF LFS Control

Remain      Start Transmit

Stop Transmit

Special Control

File

Next 1/2

Remaining Tx time

Indication that measurement has finished

<< RX >>		<< TX >>	
Status	Count	Status	Count
CCM	38	CCM	38
RDI	26	RDI	26
LOC	0	LOC	0

Rx CCM information      Tx CCM information

DA 00-00-00-00-00-01      DA 00-00-00-00-00-01

SA 00-00-00-00-00-01      SA 00-00-00-00-00-01

MEP ID 0      MEP ID 0

Interval 1s      Interval 1s

[Tx] Rate(X): 0.00000      [Rx] Rate(X): 0.00000

Normal Frame:      Error History

Tx: 38      LINK L2

Rx: 38      0 0

Rx Frame Length(byte): ---

### Detailed Statistics Display

Start or stop a measurement.

Press the **Detail Display** soft key to display the following screen.

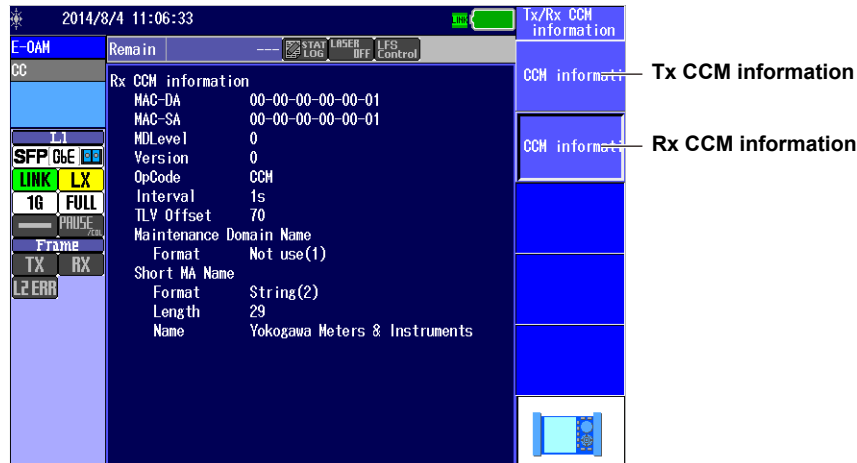


### Displaying Tx/Rx CCM information

Start or stop a measurement.

Press the **Tx/Rx CCM** information soft key to display the following screen.

Rx CCM Frame Information Display Example

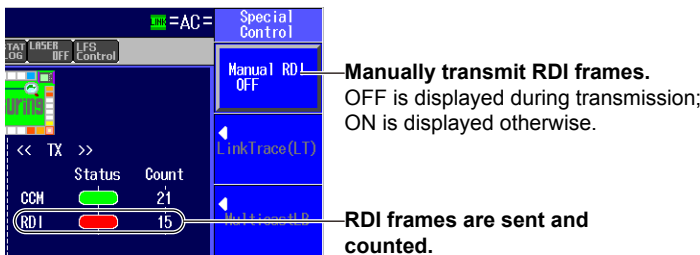


### Transmitting RDI Frames

Start a measurement.

Press the **Special Control** soft key and then the **Manual RDI** soft key. The following screen appears, and RDI frames are transmitted.

Press the **RDI** soft key again to stop the RDI frame transmission.

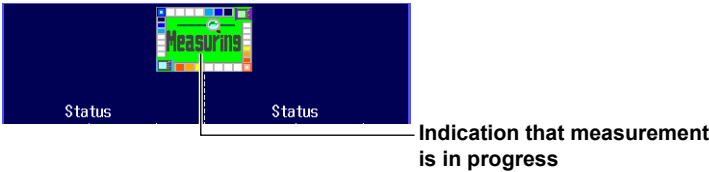




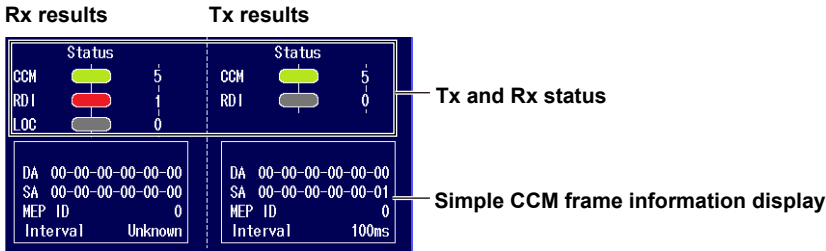
**Explanation**

**Test Results**

Indication that measurement is in progress



**Results Display**



The Tx and Rx results show counters that indicate the number of transmitted and received frames and the transmission and reception status. The transmission and reception status is displayed in the following manner depending on the frame type and fault signaling.

Type	Color	Description
Rx CCM	Gray	Not received
	Green	Receiving
	Yellow	Received
Rx RDI	Gray	Not received
	Red	Receiving
	Yellow	Received
Rx LOC	Gray	Not detected
	Red	Being detected
	Yellow	Detected
Tx CCM	Gray	Not transmitted
	Green	Transmitting
	Yellow	Transmitted
Tx RDI	Gray	Not transmitted
	Red	Transmitting
	Yellow	Transmitted

## 12.10 Executing an LT and Multicast LB

### Procedure

#### Executing an LT

Follow the procedure in section 12.8 to select LB test or section 12.9 to select CC test, and press **STOP**. The LT execution screen appears.

Press the **Special** soft key and then the **LinkTrace(LT)** soft key to display the following screen.

Annotations for the LinkTrace(LT) screen:

- Start Transmit**: Starts a link trace
- Stop Transmit**: Stops a link trace
- Special Control**: Save to file > section 13.2
- Next 1/2**: Next page 1/4 to 4/4

When the measurement is completed successfully or with an error or when the measurement is forcibly stopped, the following screen appears.

#### Measurement Result Display (Success example)

Annotations for the Measurement Result Display screen:

- Start**: The number of hops performed in the test
- Stop**: Events (No.: Hop number; Source MAC Address; connected device type)
- Set to Dest**: Assigns the source MAC address of the selected event to the destination MAC address of the LB or CC test

#### Status

(Unexecution, Executing..., Success!, Error(Hop Count Over), Error(Route Error), Error(Target Unreachable), Cancel..)

## Executing a Multicast LB

Follow the procedure in section 12.8 to select LB test or section 12.9 to select CC test, and press **STOP**. The LT execution screen appears.

Press the **Special** soft key and then the **MulticastLB** soft key to display the following screen.

**Start** — Starts a multicast LB

**Stop** — Stops a multicast LB

**File** — Save to file ▶ section 13.2

**Set to Dest**

**Next Page** — Next page  
1/4 to 4/4

When the measurement is completed successfully or with an error or when the measurement is forcibly stopped, the following screen appears.

### Measurement Result Display (Success example)

**Start** — The number of hops performed in the test

**Stop** — Events  
(No.: Hop number; response time, Source MAC Address)

**File**

**Set to Dest** — Assigns the source MAC address of the selected event to the destination MAC address of the LB or CC test

**Next Page**

**Status**  
(Unexecution, Executing..., Success!, Error(Hop Count Over), Error(Route Error), Error(Target Unreachable), Cancel..)

**Explanation**

**Executing an LT**

**Start**

Starts a link trace.

**Stop**

Stops a link trace.

**File**

The measurement results of a link trace is saved to a CSV file. For details, see section 13.2.

**Next Page**

Flips the link trace result pages.

Pages 1/4 to 4/4

**Measurement Result Display**

**Events**

**No.**

Indicates the hop number.

**Source MAC Address**

The source MAC addresses of the devices that responded are displayed.

**Status Indications**

Indication	Description
Unexecution	Execution has not yet taken place.
Executing..	Execution is taking place.
Success!	A response was received from the target host.
Error(Target Unreachable)	No response was received from the target host.
Cancel	The user stopped the link trace in the middle of execution.

**Executing a Multicast LB**

**Start**

Starts a multicast LB.

**Stop**

Stops a multicast LB.

**File**

The measurement results of a multicast LB is saved to a CSV file. For details, see section 13.2.

**Next Page**

Flips the multicast LB result pages.

Pages 1/4 to 4/4

**Measurement Result Display****Events****No.**

Indicates the hop number.

**1st(ms)**

The response time for when an LBM frame was sent to the connected device is displayed.

Indication	Description
*	No response was received from the host.
Value	The response time is displayed in 100 ms resolution. The smallest value is 100 ms.

**Source MAC Address**

The source MAC addresses of the devices that responded are displayed.

**Status Indications**

The indications are the same as those of LT execution. See the previous page.

# 13.1 Selecting a Setup File

## Procedure

### Select Setup File Screen

Press the **Option** soft key and then the **Y.1564** soft key to display the following screen.

**Registered setup files**  
A comment or file name appears next to each number.

**Test type from the setup file**  
Values other than “Y.1564” appear dimmed.

**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

To select an Y.1564 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

Press the **File** soft key to display the following screen.

**Set File Operation 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.

## 13.1 Selecting a Setup File

### Y.1564 Setup Screen

The following screen appears when you select a setup file whose configuration type is standalone. For details on the configuration type, see section 13.2.

The screenshot shows the Y.1564 Test Setup interface. The main window is titled 'Y.1564 Test Setup' and contains several sections:

- Test Setup >>**: Includes 'Test Interface' (XFP(10GbE)), 'Address Setting >>' (Source MAC, Destination MAC, Source IPv4, Destination IPv4), and 'Test Setup >>' (Direction: Two-way, Asymmetric Test checkbox).
- Test Select**: A table with columns 'Configuration' and 'Test'. Rows include CIR Test, Policing Test, CBS Test, and Performance Test.
- Service Setup**: A table with columns 'Service 1:Data' through 'Service 8:Data'.

Callouts on the right side of the screen provide instructions for each section:

- Test Setup**: Set up the test. ► section 13.3
- Common Setting**: Configure the settings that are common to all Y1564 tests. ► section 13.5
- Link/Address**: Configure link and address settings. ► section 13.4
- Service Setup**: Configure the detailed settings for the individual Y.1564 tests. ► section 13.6
- Next 1/2**: To Y.1564 setup page 2/2

Callouts on the left side of the screen provide instructions for the Test Select and Service Setup sections:

- Test Select**: Select the test. ► section 13.5
- Service Setup**: Set the test direction. ► section 13.3

Callouts on the right side of the bottom screen provide instructions for the Select Setup File and Option (Y.1564) sections:

- Select Setup File**: Select a setup file. ► section 13.1
- Option (Y.1564)**: Configure the options (Y.1564). ► section 13.7
- Next 2/2**: To Y.1564 setup page 1/2

### Note

Selecting a setup file whose configuration type is MasterDevice opens the screen in section 13.8.  
Selecting a setup file whose configuration type is SlaveDevice opens the screen in section 13.9.

**Explanation****Latest Setup**

Select this item to use the setup that was displayed previously.

**Default Setup**

Select this item to return to the default setup.

**File**

Select this item to load a setup file (with an .sd extension) from the file list.

Select this item when you want to load a setup file that is not in the setup file list.

To create a setup file, you can use the setup software and send the file to the AQ1300/AQ1301, or you can save the settings on the AQ1300/AQ1301.

**Setup File Selection**

To select a registered setup file, use the setup file list.

You can register up to 48 setup files to the setup file list (4 pages with 12 files per page).

A comment or file name is displayed for each of the registered setup files in the setup file list.

The setup file list is updated when you open the Select Setup File screen after you have created a display management file and setup files with the setup software and sent the files to the AQ1300/AQ1301.

For details, see the Setup Software User's Manual, IM AQ1300-61EN.

**Note**

- The AQ1300/AQ1301 can only display the setup file list if the display management file that you created using the setup software (disManage.dmf) and the setup (.sd) files that the display management file refers to are saved to the AQ1300/AQ1301 /setup folder.

Example:     /setup/disManage.dmf  
              /setup/0000.sd  
              /setup/0001.sd  
              :

- When you are performing Y.1564 tests, you can only select setup files for Y.1564 tests.



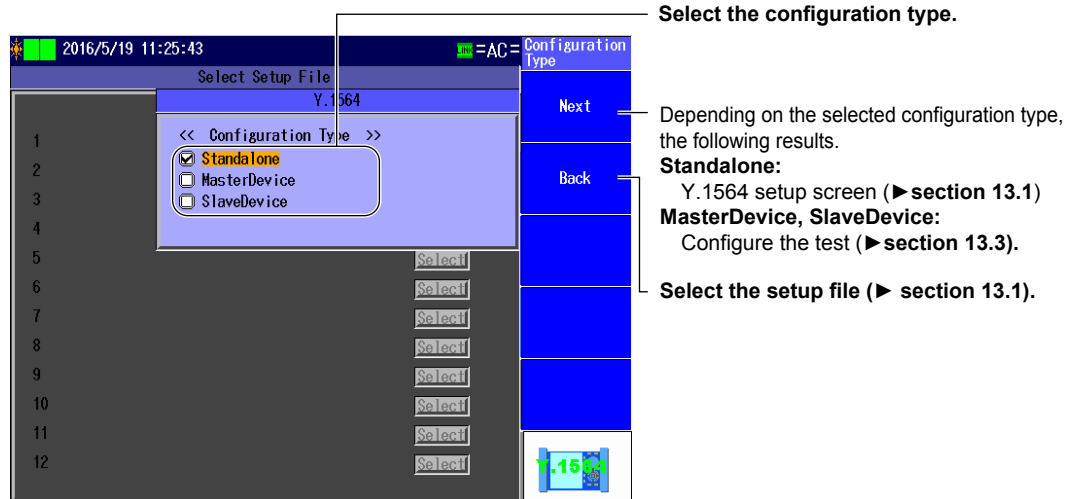
## 13.2 Selecting the Configuration Type

### Procedure

#### Configuration Type Selection Screen

Follow the procedure in section 13.1 to display the Select Setup File screen.

Press the **Default** soft key to display the following screen.



### Explanation

#### Configuration Type

Select the test configuration you want to use on the AQ1300/AQ1301.

- **Standalone:**

A single AQ1300/AQ1301 is used to make measurements. The optical fiber cable must be looped back or a dedicated loopback device (or another AQ1300/AQ1301 set to loopback test mode) must be connected at the other end of the network to be measured.

See “Loopback Traffic Test (Latency measurement)” in section 1.4.

- **MasterDevice:**

When the test configuration is inband remote (see “Inband Remote” in section 1.4), measurement is performed with the AQ1300/AQ1301 as the master device.

An AQ1300/AQ1301 set to SlaveDevice must be connected at the other end of the network to be measured.

- **SlaveDevice:**

When the test configuration is inband remote (see “Inband Remote” in section 1.4), measurement is performed with the AQ1300/AQ1301 as the slave device.

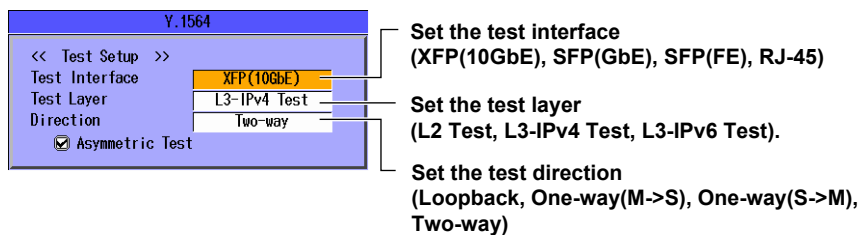
An AQ1300/AQ1301 set to MasterDevice must be connected at the other end of the network to be measured.

## 13.3 Setting Up a Test

### Procedure

#### Test Setup Screen

- **Standalone**  
Follow the procedure in section 13.1 to display the Y.1564 Setup screen.  
Press the **Test Setup** soft key to display the Test Setup screen.
- **MasterDevice**  
Follow the procedure in section 13.8 to display the Y.1564 Setup screen.  
Press the **Test Setup** soft key to display the Test Setup screen.
- **SlaveDevice**  
Follow the procedure in section 13.9 to display the Test Setup screen.  
Note that the following items are not available.
  - Test direction
  - Frame delay variation measurement reference



### Explanation

#### Test Interface

Specify which test interface to use.

- XFP (10GbE): Select this option to use the 10GBASE-R measurement port.
- SFP (GbE): Select this option to use the 1000BASE-X measurement port.
- SFP (FE): Select this option to use the 100BASE-FX measurement port. This feature is supported in firmware version (FW Ver.) R1.05.01.001 and later.
- RJ-45: Select this option to use the 10BASE-T/100BASE-TX/1000BASE-T measurement port.

#### Test Layer

Set the layer to test.

- L2 Test: Select this option to test layer 2.
- L3-IPv4 Test: Select this option to test layer 3 according to the IPv4 protocol.
- L3-IPv6 Test: Select this option to test layer 3 according to the IPv6 protocol.

#### Direction

Set the test direction when executing Y.1564 tests with the AQ1300/AQ1301 set to MasterDevice. When the configuration type is set to Standalone, this is fixed to Loopback.

#### • Loopback

The slave device is set to loopback. Traffic is sent from the master to the slave. The master receives the traffic that is looped back from the slave to execute tests.

### 13.3 Setting Up a Test

---

- **One-way(M->S)**  
Test is executed in the master-to-slave direction.
- **One-way(S->M)**  
Test is executed in the slave-to-master direction.
- **Two-way**  
Test is executed in the master-to-slave direction and slave-to-master directions.
  - **Asymmetric Test**  
Different services can be set on the master device and slave device. The frame length and Tx rate can be set to different values to perform tests on different traffic conditions in the master-to-slave and slave-to-master directions. Use this option when the uplink and downlink speeds of the network segment are different. When Asymmetric Test is unselected, the service setting of the slave device is set the same as the master device.

# 13.4 Configuring Link Address Settings

## Procedure

### Link Setup Screen

- Standalone**  
 Follow the procedure in section 13.1 to display the Y.1564 Setup screen.  
 Press the **Link/Address** soft key and then the **Link Setting** soft key to display the Link Setup screen.
- MasterDevice**  
 Follow the procedure in section 13.8 to display the Y.1564 Setup screen.  
 Press the **Link/Address** soft key and then the **Link Setting** soft key to display the Link Setup screen.
- SlaveDevice**  
 Follow the procedure in section 13.9 to display the Link Setup 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.

**Executes link setting information acquisition**  
Acquires the link setting information of the other device connected to the AQ1300/AQ1301

**Applies link settings**  
Applies the acquired other device' s link settings to the AQ1300/AQ1301. You can execute this when the measurement interface is RJ-45 or SFP(GbE) and the acquisition status is Finish.

**Status (Preparing, Finish, Fail)**

**Cable type (Straight, Cross)**  
This setting is valid when Test Interface is set to RJ-45.

**Returns to the link setting screen**

**UTP Cable Status**  
Indicates the UTP cable status as follows.  
(Normal, The cable may be defective. It is two-pair cable)

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

**Select this check box to automatically detect mismatches in the auto negotiation during link establishment.**

**Result of link setting information acquisition**

- Negotiation (Auto, Manual)**
- Speed (1G, 100M, 10M)**  
Appears when Test Interface is set to RJ-45
- Duplex (Full, Half, --- (when negotiation is set to manual)**  
Appears when Test Interface is set to RJ-45
- MDI (MDI, MDI-X)**  
Appears when Test Interface is set to RJ-45

## Source Address Setup Screen

- **Standalone**

Follow the procedure in section 13.1 to display the Y.1564 Setup screen.

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

- **MasterDevice**

Follow the procedure in section 13.8 to display the Y.1564 Setup screen.

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

- **SlaveDevice**

Follow the procedure in section 13.9 to display the Source Address Setup screen.

The screenshot shows the 'Source Address' configuration screen. The top bar displays the date and time '2016/5/18 15:04:38' and the device name 'AC'. The screen is divided into several sections:

- Source MAC:** A field containing '00 00 00 00 00 01'.
- VLAN stacks:** A table with columns for VLAN, TP ID, CoS, and ID.
 

VLAN2	TP ID 88A8	CoS 0	ID 1001
VLAN1	TP ID 8100	CoS 0	ID 1000
- Source IPv4:** A section with a 'Manual' mode selected. Fields include:
  - Address: 192.168.0.1
  - Subnet Mask: 255.255.255.0 /24
  - Gateway: 192.168.0.254
  - ToS: 0
  - TTL: 64
- UDP Port Number:** A field containing '0'.
- Source IPv6:** A section with 'Manual' mode selected. Fields include:
  - Address: FE80:0000:0000:0000:0000:0000:0000:0001
  - Prefix Length: 0
  - Router Address: FE80:0000:0000:0000:0000:0000:0000:0000
  - A checked checkbox labeled 'Set Router Address manually'.

Callouts on the right side of the screen provide instructions for each field:

- Link Setting:** Set the source MAC address. Refer to the MAC Address table. ▶ section 4.3
- Source Address:** 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. ▶ section 4.3
- Emulation Setting:** Set IPv4 (Manual, DHCP). This setting appears when Test Layer is set to L3-IPv4. Refer to the IP address table. ▶ section 4.3
- Destination Address:** Refer to the gateway reference. ▶ section 4.3
- Get IP Address:** Set the source IPv4 address. Set the subnet mask (1-31). Set the gateway. Set the QoS field (ToS: 0-7). Set the TTL (1-255). These settings are valid when IPv4 is set to Manual. Set the source UDP port.
- Y.1564:** Set IPv6 (Manual, Stateless Address). This setting appears when Test Layer is set to L3-IPv6. Set the source IPv6 address. These settings are valid when IPv6 is set to Manual. Refer to the IP Address table. Select this check box when you want to manually set the router address. View and set the IPv6 prefix length and the IPv6 router address.

## Destination Address Setup Screen

- **Standalone**

Follow the procedure in section 13.1 to display the Y.1564 Setup screen.  
 Press the **Link/Address** soft key and then the **Destination Address** soft key to display the Destination Address Setup screen.

- **MasterDevice**

Follow the procedure in section 13.8 to display the Y.1564 Setup screen.  
 Press the **Link/Address** soft key and then the **Destination Address** soft key to display the Destination Address Setup screen.

**Set the destination MAC address.**  
 This setting appears when Test Layer is set to L2.

**Refer to the MAC Address table.**  
 ► section 4.3

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

**Refer to the IP address table.**  
 ► section 4.3

**Select the search list.** ► section 4.3

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

**Refer to the IP address table.**  
 ► section 4.3

## Emulation Setting Screen

- Standalone**  
 Follow the procedure in section 13.1 to display the Y.1564 Setup screen.  
 Press the **Link/Address** soft key and then the **Emulation Setting** soft key to display the Emulation Setting screen.
- MasterDevice**  
 Follow the procedure in section 13.8 to display the Y.1564 Setup screen.  
 Press the **Link/Address** soft key and then the **Emulation Setting** soft key to display the Emulation Setting screen.

The screenshot shows the 'Emulation Setting' screen with a right-hand menu. The main area is divided into IPv4 and IPv6 sections. In the IPv4 section, there is a checked 'ARP Reply' option and an 'ARP Reply Target' field set to 'Source Address only'. In the IPv6 section, there is an 'NDP Reply' option. The right-hand menu includes 'Link/Address', 'Link Setting', 'Source Address', 'Emulation Setting', and 'Destination Address'. A 'Y.1564' icon is visible at the bottom right of the screen.

- Select this check box to perform ARP replying.**  
 This setting is valid when Test Layer is set to L3-IPv4.
- Set the ARP reply target (Source Address only, All addresses, All Vlan/addresses).**
  - This setting is valid when Test Layer is set to L3-IPv4.
  - You can select the All Vlan/addresses options when VLAN stacks of the Source Address setting is set to 1 or 2.
- Select this check box to perform NDP replying.**  
 This setting is valid when Test Layer is set to L3-IPv6.

### Explanation

## Link Setting Screen

### Negotiation

Select whether to use auto negotiation. This setting is valid when Test Interface is set to RJ-45 or SFP(GbE).

- Auto: The link between the AQ1300/AQ1301 and the device that it is connected to is configured automatically through auto negotiation.
- Manual: The link must be configured manually.

### Speed

When Test Interface is set to RJ-45, you can set the link speed.

- 1G: A 1 Gbit/s 1000BASE-T connection is used.
- 100M: A 100 Mbit/s 100BASE-TX connection is used.
- 10M: A 10 Mbit/s 10BASE-T connection is used.
- Auto: The link speed is set automatically. This setting is valid when Negotiation is set to Auto.

### Note

When Test Interface is set to XFP(10GbE), the link speed is fixed at 10G. When Test Interface is set to SFP(GbE), the link speed is fixed at 1G. When Test Interface is set to SFP(FE), the link speed is fixed at 100M.

**Duplex**

You can set the communication mode for when Speed is set to 100M or 10M. This setting is valid when Test Interface is set to RJ-45.

- FULL: Full duplex communication
- HALF: Half duplex communication
- Auto: The AQ1300/AQ1301 chooses full or half duplex automatically. This setting is valid when Negotiation is set to Auto.

**Note**

When Test Interface is set to XFP(10GbE), SFP(GbE), or SFP(FE), or when it is set to RJ-45 and Speed is set to 1G, the duplex mode is fixed at FULL.

**Flow Control**

You can enable or disable flow control.

- ON: Flow control is enabled.
- OFF: Flow control is disabled.

**MDI**

You can set the measurement port to straight or crossover mode. This setting is valid when Test Interface is set to RJ-45.

- MDI: Straight
- MDI-X: Cross
- Auto: The AQ1300/AQ1301 switches between straight and crossover mode automatically (this setting is valid when Negotiation is set to Auto).

**Source Address Setup Screen****Source MAC Address**

Set the source MAC address. You can refer to the MAC address table to set the address.

**VLAN Stacks**

Set the number of VLAN stacks.

- 1: One VLAN stack
- 2: Two VLAN stacks

**VLAN1/VLAN2**

Set the CoS (Class of Service) and VLAN-ID for 1 or 2 VLAN stacks. You can refer to the VLAN table to set the values.

- CoS: 0 to 7
- ID: 0 to 4095
- TPID: 0 to FFFF (supported in firmware version (FW Ver.) R1.08.01.001 and later)

**IPv4**

Select whether to specify the source IPv4 address manually or to acquire and set it automatically through DHCP. This setting is valid when Test Layer is set to L3-IPv4 Test.

- Manual: You must set the source IPv4 address manually.
- DHCP: When you press Get IP Address, the AQ1300/AQ1301 acquires and sets the source IPv4 address using DHCP.

**Source IPv4 Address, Subnet Mask, and Gateway**

Set the source IPv4 address, subnet mask, and gateway when IPv4 is set to Manual. You can refer to the IP Address table and the gateway reference to configure the settings.

- Subnet Mask: 1 to 31



## 13.4 Configuring Link Address Settings

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### IPv6

Select whether to specify the source IPv6 address manually or to specify it through stateless autoconfiguration using the RA from an IPv6 router. This setting is valid when Test Layer is set to L3-IPv6 Test.

- Manual: You must set the source IPv6 address manually.
- Stateless Address: When you press Get IP Address, the AQ1300/AQ1301 automatically configures the source IPv6 address.

### Source IPv6 Address

Set the source IPv6 address when IPv6 is set to Manual. You can refer to the IP address table to set the address.

### IPv6 Router Address

You can automatically acquire the router address or set it manually.

- Automatic: Clear the Set Router Address manually check box. The IPv6 prefix length and router address that have been acquired automatically are displayed.
- Manual: Select the Set Router Address manually check box. You can manually set the prefix length and router address.

### MAC Address Table

Select the source MAC address from the MAC Address table.

- Global Address: You can set the source MAC address to a global address.

### VLAN Table

Select the VLAN CoS and ID from the VLAN table.

### IP Address Table

Select the source IP address from the IP address table.

- Get IP Address: Press this soft key to get the IP address. The AQ1300/AQ1301 will acquire an IP address, using DHCP when the test layer is L3-IPv4 or stateless address autoconfiguration when the test layer is L3-IPv6.

### Gateway

Set the gateway.

- Manual: Select this option to set the gateway manually.
- Auto.1: Select this option to set the gateway to xxx.xxx.xxx.1.
- Auto.254: Select this option to set the gateway to xxx.xxx.xxx.254.

### QoS Field

Set the ToS value (Type of Service).

Range: 0 to 7

### TTL

Set the TTL value (Time To Live).

Range: 1 to 255

### UDP Port Number

Set the source UDP port of the test frame.

Range: 0 to 65535

## Destination Address Setup Screen

### Destination MAC Address

Set the destination MAC address. You can refer to the MAC address table to set the address.

### IPv4

Set the destination IPv4 address. This setting is valid when Test Layer is set to L3-IPv4 Test. You can refer to the IP address table or select Search List to set the address.

### IPv6

Set the destination IPv6 address. This setting is valid when Test Layer is set to L3-IPv6 Test. You can refer to the IP address table or select Search List to set the address.

## Emulation Setting Screen

### ARP reply

Select whether to send ARP replies to ARP requests when the test layer is L3-IPv4.

- Selected: ARP replies are sent.
- Cleared: ARP replies are not sent.

### ARP Reply Target Setting

When the test layer is L3-IPv4 and ARP Reply is selected, you can specify the ARP reply target frames.

- Source Address only:  
The AQ1300/AQ1301 will send ARP replies to ARP requests that are directed at the source address.
- All addresses:  
The AQ1300/AQ1301 will send ARP replies to ARP requests, regardless of the address that they are directed at.
- All Vlan/addresses:  
The AQ1300/AQ1301 will send ARP replies to ARP requests that are directed at all VLAN ID/addresses. You can select this option when the VLAN stacks in the source address settings is set to 1 or 2.

## 13.5 Configuring Common Y.1564 Test Items

### Procedure

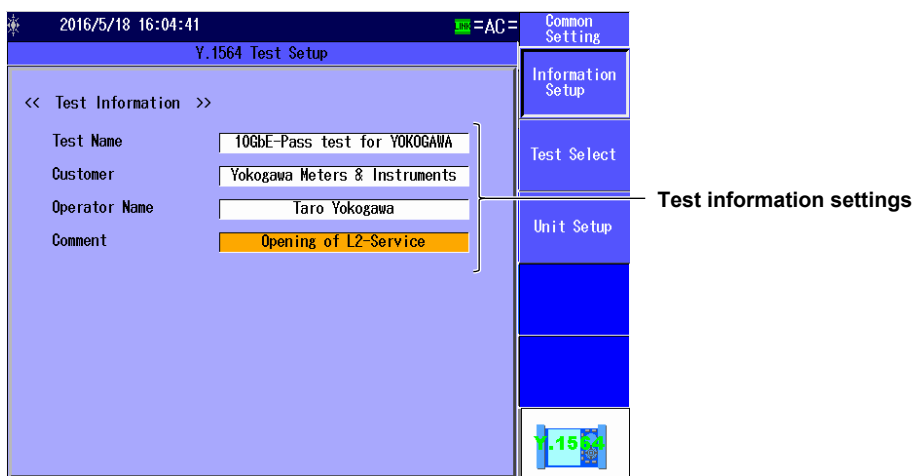
#### Test Information Setup Screen

- **Standalone**

Follow the procedure in section 13.1 to display the Y.1564 Setup screen.  
Press the **Common Setting** soft key to display the Common Setting screen.

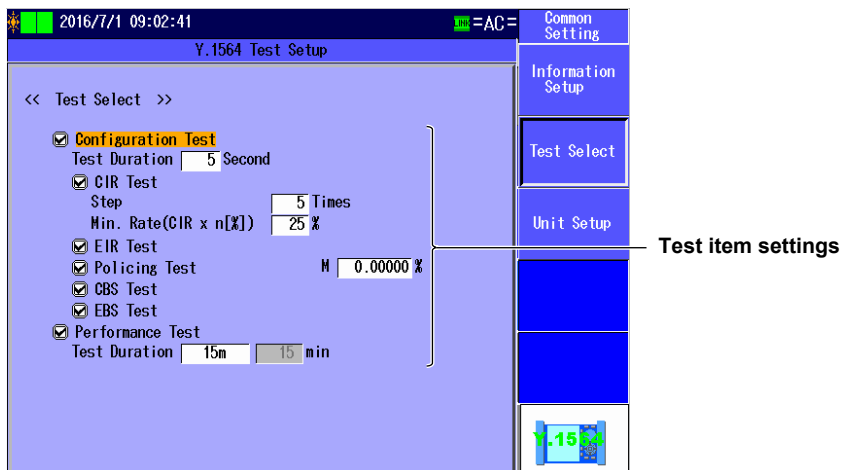
- **MasterDevice**

Follow the procedure in section 13.8 to display the Y.1564 Setup screen.  
Press the **Common Setting** soft key to display the Common Setting screen.



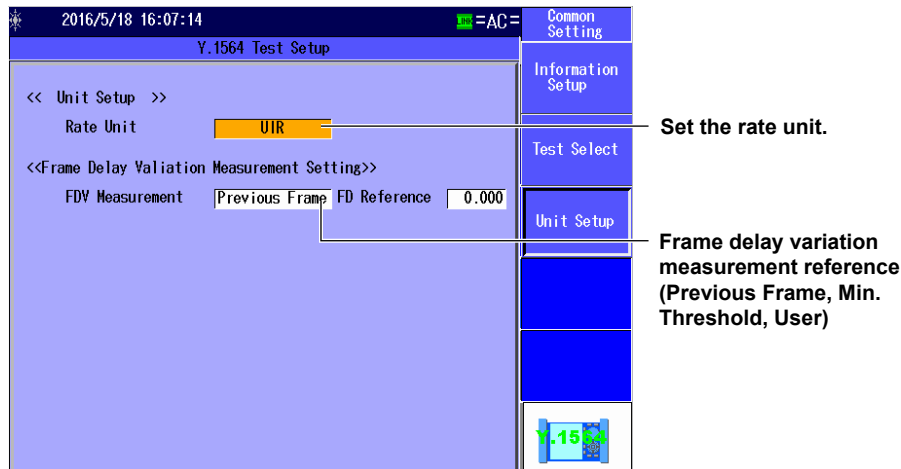
#### Test Select Screen

Press the **Common Setting** soft key and then the **Test Select** soft key to display the following screen.



## Unit Setup Screen

Press the **Common Setting** soft key and then the **Unit Setup** soft key to display the following screen.



### Explanation

## Test Information Setup Screen

### Test Information

You can enter the following information. Follow the procedure in section 3.2 to enter characters.

- Test Name
- Customer
- Operator Name
- Comment
- You can enter up to 30 characters.
- When you press the Commit soft key in the character input dialog box, the character string changes to the characters that you entered.

### Note

The information that you enter here will be included in the report of the test results. Use the setup software to generate the report. For details, see the Setup Software User's Manual, IM AQ1300-61EN.

## Test Select Screen

### Select a test item.

Select the tests that you want to execute. Select the check boxes of the tests that you want to perform.

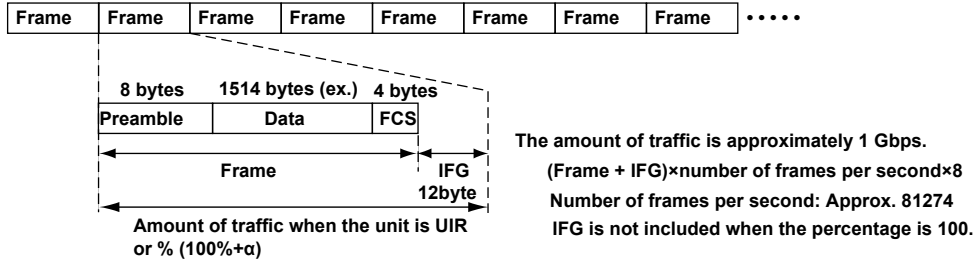
- **Configuration Test Test Duration: 1 to 60 seconds**
  - CIR Test
    - Step count: Set the number of test steps to be executed. Range: 1 to 7
    - Min. Rate (CIR×n[%]): Set the test's start rate. Range: 10 to 90%
  - EIR Test
  - Policing Test
    - Margin (M): Set the margin on the upper limit of the EIR rate.
    - Range: 0.000 to 10000.000 (when unit is IR or UIR), 0.000 to 100.000 (when unit is %)
  - CBS Test
  - EBS Test
- **Performance Time Test Duration: 15m, 2h, 24h, User**
  - User range: 1 to 4320 minutes

## Unit Setup Screen

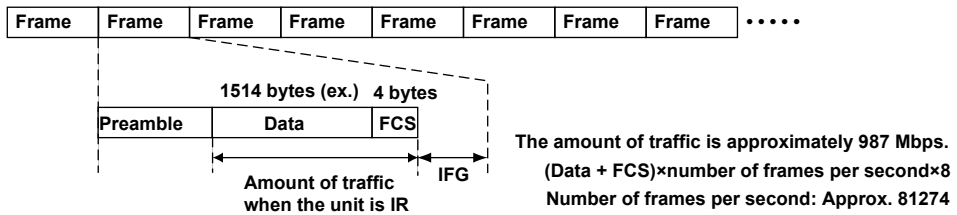
Set the unit of the Tx load rate.

IR (effective speed: bps), UIR (data rate), % (ratio of the data rate to the Tx rate)

### Example of when Tx rate is 1 Gbps (unit: UIR or %)



### Example of when Tx rate is 1 Gbps (unit: IR)



## Frame Measurement

Set the condition for the reference used to measure the frame delay variation (FDV).

- **Previous Frame**

The maximum, minimum, and average are calculated from the delay time of the frame received previous to the measurement target.

- **Min. Threshold**

The maximum, minimum, and average are calculated from the minimum delay time recorded within the measurement duration.

- **User**

The maximum, minimum, and average are calculated from the specified delay reference. If the calculated result is negative, it is calculated as zero.

### FD Reference

Specify the delay time that will be the reference when measuring the delay variation using user-defined conditions.

Range: 0.000 ms to 1000 ms

# 13.6 Configuring the Detailed Settings (Service Setup) of the Y.1564 Test

## Service Setup Screen

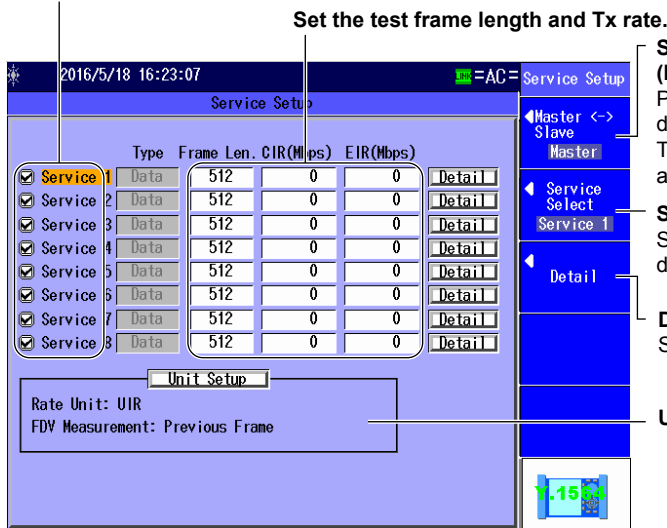
- **Standalone**

Follow the procedure in section 13.1 to display the Y.1564 Setup screen.  
Press the **Service Setup** soft key to display the Service Setup screen.

- **MasterDevice**

Follow the procedure in section 13.8 to display the Y.1564 Setup screen.  
Press the **Service Setup** soft key to display the Service Setup screen.

Set the service circuits to run the Y.1564 test on.



**Switch between the master and slave (Master, Slave).**

Press this soft key to switch between the displays of the master and slave settings. The settings that appear are the service and detailed service settings.

**Select the services (Service 1-Service 8).**  
Select the service numbers to display the detailed settings of.

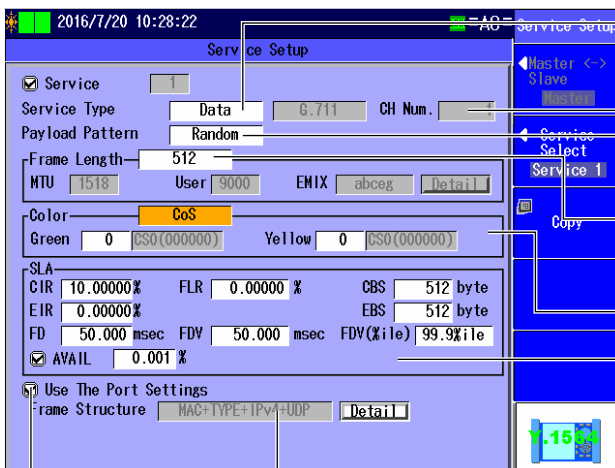
**Detail settings**

Set the details of test frames.

**Unit settings** ▶ section 13.5

## Detail Screen of Service Setup

Press the **Detail** soft key to display the following screen.



**Set the service type (Data, Voice, Video).**

**Set the channel number (1 to 367647).**

**Set the payload pattern (Random, All 0, All 1, 0/1)**

**Set the frame length (64, 128, 256, 512, 1024, 1280, 1518, MTU, USER, EMIX).**

**Set the color (OFF, CoS, ToS, DSCP).**

**Set the SLA (Service Level Agreement).**

Set the traffic conditions such as the committed information rate and excess information rate.

**Set the frame structure.** ▶ section 1.6

When Test Layer is set to L3-IPv6, the IPv6 address is always used (fixed).

### Setting the Frame Length (EMIX)

Press the **Detail** soft key and then the **Detail** soft key next to EMIX under Frame Length to display the following screen.

**Current value**  
The alphabet item letters of the specified frame lengths are displayed.

**New value**  
The alphabet item letters of the selected frame lengths are displayed (up to five items).

**Commits the frame length (EMIX) details**

**Clears the new value**

**Number of selectable frame lengths**  
When selected, the corresponding alphabet item letter is displayed as a new value.

### Frame Structure Setup Screen for each Service Setup

Press the **Detail** soft key, the **Detail** soft key next to Frame Structure, and then the **Basic Setting** soft key to display the following screen.

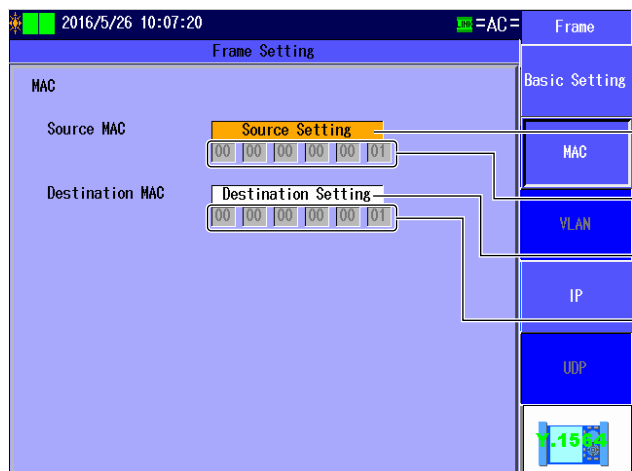
Frame Setting (Basic setting) Screen

**Frame structure**  
The frame structure in port settings is displayed.  
(MAC+TYPE, MAC+TYPE+IPv4, MAC+VLAN+TYPE+IPv4, MAC+TYPE+IPv6, MAC+VLAN+TYPE+IPv6)

**VLAN stacks**  
The number of VLAN stacks in port settings is displayed.

Press the **MAC** soft key to display the following screen.

**Frame Setting (MAC) Screen**



Set the source MAC address (Manual, Source Setting).

This setting is valid when Source MAC is set to Manual.

Set the destination MAC address (Manual, Destination Setting).

This setting is valid when Destination MAC is set to Manual.

Press the **VLAN** soft key to display the following screen.

**Frame Setting (VLAN) Screen**



VLAN (TPID: 0-FFFF, CFI: 0-1, CoS: 0-7, ID: 0-4095).

**Note**

The VLAN soft key is valid in the following situations.

- When VLAN stacks is 1 or 2 under Basic Setting
- When the Refer to Source Address for the VLAN stacks Setting check box is selected under Basic Setting and VLAN stacks of Source Address Setup is 1 or 2



### 13.6 Configuring the Detailed Settings (Service Setup) of the Y.1564 Test

Press the **IP** soft key to display the following screen.

#### Frame Setting (IPv4) Screen

**Set the source IPv4 address. (Manual, Source Setting).**  
This setting is valid when Source IPv4 is set to Manual.

**Set the destination IPv4 address. (Manual, Destination Setting).**  
This setting is valid when Destination IPv4 is set to Manual.

**Set the ToS/DS (DSCP) (Manual, IPv4-ToS, IPv4-DSCP). Value (Manual: 0-FF, IPv4-ToS: 0-7, IPv4-DSCP: 0-63)**  
This setting is valid when Frame Structure is set to MAC+TYPE+IPv4.

**Set the protocol (0-255).**  
This setting is valid when Frame Structure is set to MAC+TYPE+IPv4.

**Set the TTL (1 to 255).**

**Set the subnet mask (1-31).**

**Set the gateway.**  
These settings are valid when IPv4 is set to Manual.

#### Frame Setting (IPv6) Screen

**Source IPv6 address.**  
The address used the port settings is displayed.

**Destination IPv6 address.**  
The address used the port settings is displayed.

**ToS/DS (DSCP)**  
The address used the port settings is displayed.

#### Note

The IP soft key is valid when Frame Structure is set to MAC+TYPE+IPv4, MAC+TYPE+IPv4+UDP, MAC+TYPE+IPv6, or MAC+TYPE+IPv6+UDP.

### Copying Service Settings

Press the **Detail** soft key and then the **Copy** soft key to display the following screen.

**Copy source master or slave (Master, Slave)**

**Copy source service number (Service 1-Service 8)**

**Copy destination master or slave (Master, Slave)**

**Copy destination service number (Service 1-Service 8)**

**Starts copying**

## Explanation

### Setting the Service Circuit to Perform the Test On

Set whether to perform the Y.1564 test for the service number currently displayed on the screen.

- Selected: Y.1564 test is performed.
- Cleared: Y.1564 test is not performed.

### Service Type

Set the type of test frame.

- Data: The test signal is set to a data sequence (Random, All 0, All 1, 0/1).
- Voice: The test signal is set to voice (G.711 compliant PCM code, G.729 compliant CS-ACELP format, G.723.1 compliant codec format).
- Video: The test signal is set to video (MPEG2, MPEG3, MPEG4).
- CH Num.: When VOICE or VIDEO has been selected as the service type, specify the number of channels.

### Frame Length

Set the Tx frame length.

- **64, 128, 256, 512, 1024, 1280, 1518**

The length is set to the specified number of bytes.

- **MTU (Maximum Transmission Unit)**

The length is set to the maximum number of frames to send in a single transmission.

Range: 64 to 9000

- **User**

The length is set to the specified number of bytes. Range: 64 to 9000

- **EMIX**

The length of a single transmission is defined to be the combination of the above three methods of setting the length (up to five types: a to e below).

A: 64, B: 128, C: 256, D: 512, E: 1024, F: 1280, G: 1518, H: MTU,

U: User Defined

Example: 1st (64)→2nd (512)→3rd (MTU)→4th (USER)→5th (512)

Example of the text shown in the EMIX box for the above setting: ADHUD

Redundant settings are possible (512 in the above example is redundant).

### Color

Set the field of the QoS value that will be inserted into the test frame. Assign a high-priority value to green frames (Color: Green) and a low-priority value to yellow frames (Color: Yellow).

- OFF: No color frame setting
- CoS, ToS: Green range 0 to 7, Yellow range 0 to 7
- DSCP: 000000 to 111111 (binary format)

## 13.6 Configuring the Detailed Settings (Service Setup) of the Y.1564 Test

---

### SLA (Service Level Agreement)

- CIR (0 to 10000) The unit is Mbps.
- EIR (0 to 10000) The unit is Mbps.
- CBS (0 to 1000) The unit is Kbyte.
- EBS (0 to 1000) The unit is Kbyte.
- FLR (0.00000 to 100.00000) The unit is %.
- FD (0.001 to 10000.000) The unit is msec.
- FDV (0.001 to 10000.000) The unit is msec.
- FDV (%ile) (100%ile, 99.9%ile, 90%ile, 75%ile) The unit is percentile (%ile).<sup>1</sup>
- AVAIL (0.001 to 100.000) The unit is %. This is valid when the check box is selected.

<sup>1</sup> Percentile is a number that represents a measurement position counted from the smallest of all the values measured in a single test duration.

- Example of 75th percentile: If 5000 values are measured in a single test duration, starting from the first measurement, the value that corresponds to 75% is measurement number 3750. In this case, the 75% percentile value is the 3750th value.

## 13.7 Configuring Y.1564 Options

### Procedure

#### Advance Setup Screen

- **Standalone**

Follow the procedure in section 13.1 to display the Y.1564 Setup screen.

Press the **Option (Y.1564)** soft key and then the **Advance setup** soft key to display the Advance setup screen.

- **MasterDevice**

Follow the procedure in section 13.8 to display the Y.1564 Setup screen.

Press the **Option (Y.1564)** soft key and then the **Advance setup** soft key to display the Advance setup screen.



#### Measurement Setup Screen

- **Standalone**

Follow the procedure in section 13.1 to display the Y.1564 Setup screen.

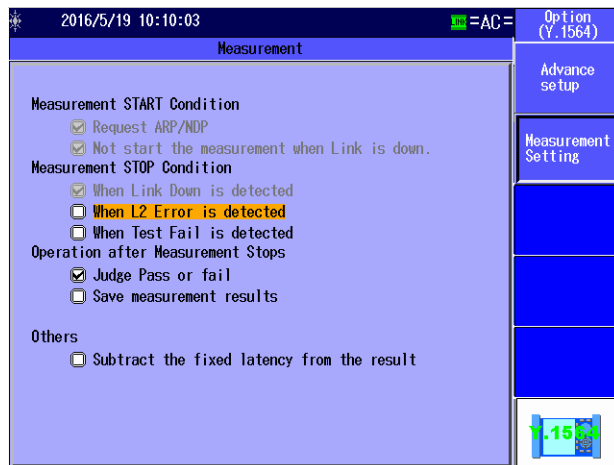
Press the **Option (Y.1564)** soft key and then the **Measurement Setting** soft key to display the Measurement Setting screen.

- **MasterDevice**

Follow the procedure in section 13.8 to display the Y.1564 Setup screen.

Press the **Option (Y.1564)** soft key and then the **Measurement Setting** soft key to display the Measurement Setting screen.

## 13.7 Configuring Y.1564 Options



### Explanation

#### Advance Setup Screen

##### Select setup file after selecting Y.1564

Select whether to display the Select Setup File screen after you select Y.1564 on the Test Menu.

- Selected: The Select Setup File screen is displayed.
- Cleared: The Select Setup File screen is not displayed. The previous settings are automatically selected.

##### Allow to Change the Test Setup

Select whether to allow the Test Setup screen settings to be changed.

- Selected: The Test Setup screen settings can be changed.
- Cleared: The Test Setup screen settings cannot be changed.

#### Measurement Setup Screen

##### Measurement START Condition

Request ARP/NDP (During Y.1564 tests, this is fixed to selected and appears dimmed.)

For ARP (IPv4) and NDP (IPv6) destination MAC addresses, select whether to use an ARP or NDP request to acquire the MAC address when the START key is pressed. This setting is valid when the test layer is L3-IPv4 or L3-IPv6.

- Selected: An ARP/NDP request is sent.
- Cleared: An ARP/NDP request is not sent.

##### Not start the measurement when Link is down. (During Y.1564 tests, this is fixed to selected and appears dimmed.)

Select whether to start measurement when the START key is pressed and a linkdown is detected.

- Selected: Measurement is not started when a linkdown is detected.
- Cleared: Measurement is started when a linkdown is detected.

##### Measurement STOP Condition

##### When Link Down is detected (During Y.1564 tests, this is fixed to selected and appears dimmed.)

Select whether to stop measurement when a linkdown is detected during measurement.

- Selected: Measurement is stopped when a linkdown is detected.
- Cleared: Measurement is not stopped when a linkdown is detected.

**When L2 Error is detected**

Select whether to stop measurement when an L2 error is detected during measurement.

- Selected: Measurement is stopped when an L2 error is detected.
- Cleared: Measurement is not stopped when an L2 error is detected.

**When Fail Result is detected**

Select whether to stop measurement when the result of the test currently being performed produces a fail judgment.

- Selected: Measurement is stopped when the test result produces a fail judgment.
- Cleared: Measurement is not stopped when the test result produces a fail judgment.

**Operation after measurement stops****Judge Pass or fail**

Select whether to perform pass/fail judgments after measurements finish.

- Selected: Pass/fail judgments are performed after measurements finish.
- Cleared: Pass/fail judgments are not performed after measurements finish.

**Note**

To perform pass/fail judgments for a particular test, you have to set the pass/fail judgment setting on the test's setup screen.

**Save measurement results**

Select whether to save the measurement results to a file after measurement finishes.

- Selected: The measurement results are saved to a file when measurement finishes.
- Cleared: The measurement results are not saved to a file when measurement finishes.

**Save measurement logs**

Select whether to save the measurement log to a file after measurement finishes.

- Selected: The measurement log is saved to a file when measurement finishes.
- Cleared: The measurement log is not saved to a file when measurement finishes.

**Others****Subtract the fixed latency from the result**

During latency measurement, the fixed delay that occurs in the other device during loopback is subtracted from the measured results. The subtracted results are displayed as measurement results. If the measured value is less than the fixed delay, 0.00  $\mu$ s is displayed.

- Selected: The fixed delay is subtracted from the measured values.
- Cleared: The fixed delay is not subtracted from the measured values.

Fixed delay value based on the interface

Interface	Delay
XFP	1.0 $\mu$ s
SFP(GbE)	1.4 $\mu$ s
SFP(FE)	12 $\mu$ s
RJ-45(1000M)	1.6 $\mu$ s
RJ-45(100M)	11 $\mu$ s
RJ-45(10M)	108 $\mu$ s

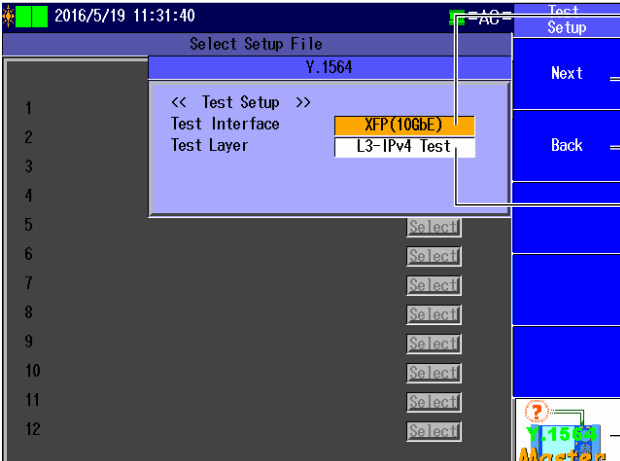
## 13.8 Configuring the AQ1300/AQ1301 as a Master Device

### Procedure

Perform the following procedure when the configuration type is set to MasterDevice.

#### Test Setup Screen

Select MasterDevice by following the procedure in section 13.2, and then press the **Next** soft key to display the following screen.



2016/5/19 11:31:40

Select Setup File

Y.1564

<< Test Setup >>

Test Interface XFP(10GbE)

Test Layer L3-IPv4 Test

1

2

3

4

5

6

7

8

9

10

11

12

Select

Select

Select

Select

Select

Select

Select

Select

Select

Select

Select

Select

Test Setup

Next

Back


Y.1564 Master

Remote control status ▶ section 2.1

- Set the test interface ▶ section 13.3
- Configure the link settings. ▶ section 13.4
- Select the configuration type. ▶ section 13.2
- Set the test layer (▶ section 13.3).

#### Link Setting Screen

Press the **Next** soft key to display the following screen.



2016/5/19 11:42:28

Link Setting

Link Setting

<< Link Setting >>

Negotiation Manual

Speed 100M

Duplex Full

Flow Control ON

HDI HDI

Next

Back

Y.1564 Master

- Configure the source address settings. ▶ section 13.4
- Select the test settings. ▶ section 13.3

## Source Address Setup Screen

Press the **Next** soft key to display the following screen.

**Next** — Set the destination address. ► section 13.4

**Back** — Configure the link settings. ► section 13.4

**Get IP Address**

## Destination Address Setup Screen

Press the **Next** soft key to display the following screen.

**Search List** — Select from the search list.

**Manual Setting** — Manual setting  
This setting is valid when a destination address is selected from the search list.

**Connect** — Connects to the other device

**Back** — Configure the source address settings.



## 13.8 Configuring the AQ1300/AQ1301 as a Master Device

### Search List

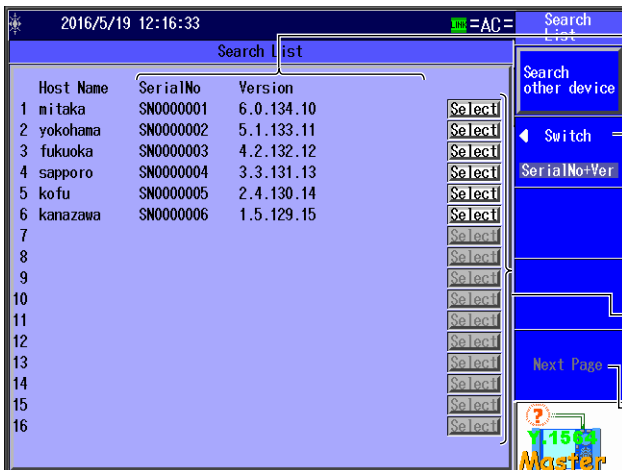
Press the **Search List** soft key to display the following screen.



#### Search for other devices.

When you press this soft key, the AQ1300/AQ1301 searches for other devices (AQ1300 or AQ1301) on the same network segment.

↓ Search for other devices



Area of the search list that changes when you switch the display

Switches the search list display (SerialNo+Ver, Test Setup, Status+MAC, IPv4/IPv6, Master Addr)

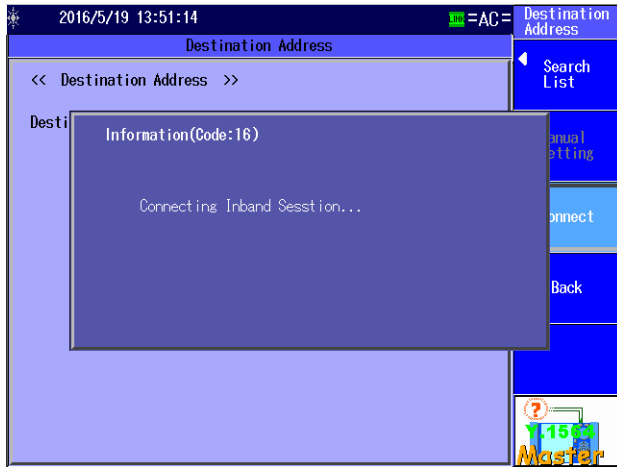
Set the address type (MAC Address, IP Address). This setting appears when Switch is set to Master Addr.

Select the address of the other device (the destination address) from the search list.

To the next page (1 to 16, 17 to 32, 33 to 48, 49 to 64)

## Connect Screen

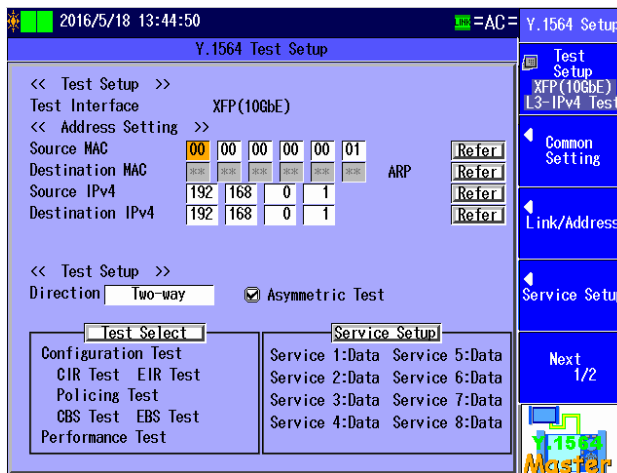
Press the **Connect** soft key to display the following screen.



- Complete** — Select when you don t want to change the slave settings. Pressing this soft key will open the Y.1564 Setup screen.
- Apply to Slave** — Select to apply the currently displayed settings to the slave. You must perform remote reconnection after you press this key.
- Copy from setup** — Select to copy the slave data on the master. You must press “Apply to Slave” after you press this key.

## Y.1564 Setup Screen

Press the **Complete** soft key to display the following screen.



► section 13.1

### Explanation

#### Destination Address Screen

##### Search List

Select the address of the other device (the destination address) from the search list.

##### Searching for Other Devices

When you select Search other Device, the AQ1300/AQ1301 searches for other devices (AQ1300 or AQ1301) on the same VLAN or network segment and displays the results in the search list.

##### Switching the Display

You can switch between different search list displays.

- SerialNo+Ver: The equipment name, serial number, and version are displayed.
- Test Setup: The equipment name, test interface, and test layer are displayed.
- Status+MAC: The equipment name, status, and MAC address are displayed.
- IPv4/IPv6: The equipment name and IP address are displayed.
- Master Addr:  
The device name and master address (MAC or IP address) are displayed.

##### Note

---

You can check the equipment name and serial number of the AQ1300/AQ1301 in the system settings.

---

##### Setting the Address Type

You can switch the address type that is displayed when Switch is set to Master Addr.

- MAC address
- IP address

##### Manual Setting

Press this soft key to cancel the selection that you made in the search list and enter the destination address manually. This soft key is valid when you have selected a destination address from the search list.

##### Connect

Press this soft key to connect to the other device.

#### Connect Screen

The AQ1300/AQ1301 will connect remotely to the other device with the specified destination address. After the connection, you can use the test interface to control the other device remotely.

##### Slave Setup

Complete: Press this soft key when you do not need to change the slave settings. Pressing this soft key will open the Auto Setup screen.

Apply to Slave: Press this soft key to apply the currently displayed test and link settings to the slave.

You must perform remote reconnection after you press this key.

Copy from setup: Press this soft key to use the slave data on the master to configure the setup items. must press "Apply to Slave" after you press this key.

##### Note

---

After the connection is established, you cannot change the source and destination addresses.

---

# 13.9 Configuring the AQ1300/AQ1301 as a Slave Device

## Procedure

Perform the following procedure when the configuration type is set to SlaveDevice.

### Test Setup Screen

Select SlaveDevice by following the procedure in section 13.2, and then press the **Next** soft key to display the following screen.

The screenshot shows the 'Test Setup' screen with the following fields and options:

- Test Interface: XFP (10GbE)
- Test Layer: L3-IPv4 Test
- Buttons: Next, Back
- Remote control status: Slave ?

Annotations on the right side of the image:

- Set the test interface ► section 13.3
- Configure the link settings. ► section 13.4
- Select the configuration type. ► section 13.2
- Set the test layer (► section 13.3).
- Remote control status ► section 2.1

### Link Setting Screen

Press the **Next** soft key to display the following screen.

The screenshot shows the 'Link Setting' screen with the following fields and options:

- Negotiation: Manual
- Speed: 100M
- Duplex: Full
- Flow Control: ON
- MDI: MDI
- Buttons: Next, Back
- Remote control status: Slave ?

Annotations on the right side of the image:

- Configure the source address settings. ► section 13.4
- Select the test settings. ► section 13.3

## Source Address Setup Screen

Press the **Next** soft key to display the following screen.

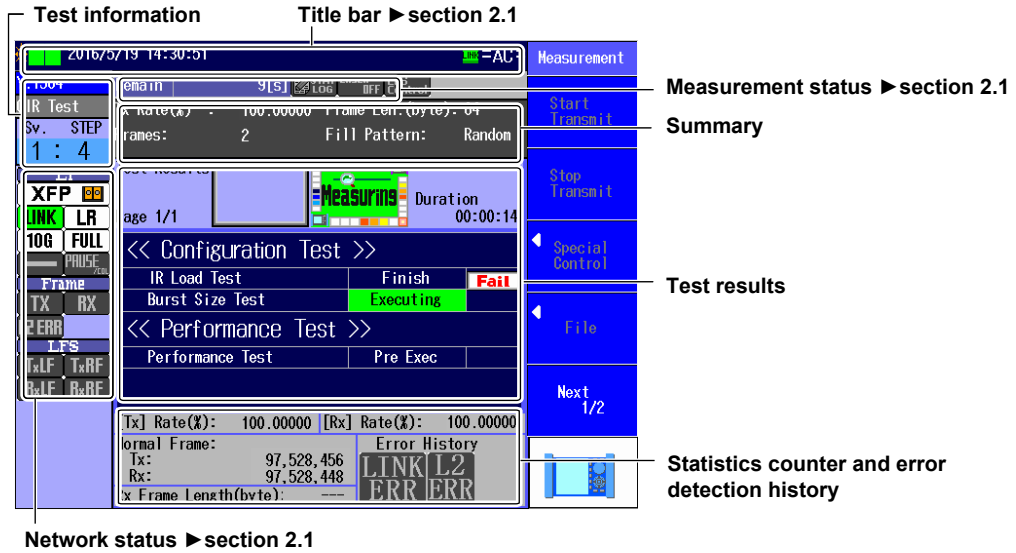
## Slave Execution

# 13.10 Starting Measurement

## Procedure

### Starting Measurement

Press START to display the following screen and start measurement and transmission.



## Explanation

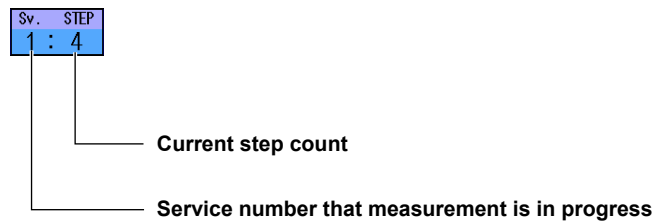
### Test Information

The name of the test that is currently being performed and the number of steps that will be performed are displayed here.

#### Test Items

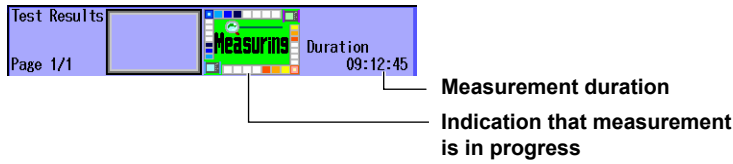
- IR load test
- Burst size test
- Performance test

#### Number of Steps and Services



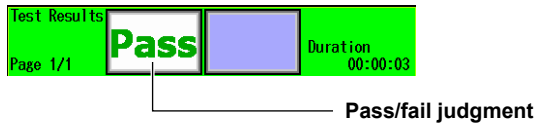
## Test Results

### Display during Measurement



Measuring: This appears while measurement is being performed.  
Measurement duration: Indicated in the following format: hh:mm:ss.

### Display When Measurement Has Finished

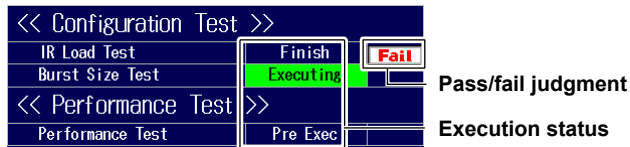


- **Pass/Fail Judgment Indication**

The pass/fail judgment of the test is displayed here. This appears when the pass/fail judgment is enabled. For details on the pass/fail judgment setting, see section 13.7.

- Pass: The results meet the requirements.
- Fail: The results do not meet the requirements.

### Results Display



For each test, the current measurement execution state and the pass/fail judgment result are displayed here.

- Execution State
  - Pre Exec: The AQ1300/AQ1301 is waiting to execute the test.
  - Executing: The AQ1300/AQ1301 is executing the test.
  - Finish: The test has finished.
  - Aborted: During test execution, the STOP button was pressed to force the test to stop or the test stopped automatically because an error was detected.
  - : The test is not enabled.
- Pass/Fail Judgment
  - Pass: The results meet the requirements.
  - Fail: The results do not meet the requirements.

### Note

The pass/fail judgment result is not displayed while a test is being executed or if the pass/fail judgment is not enabled.

## Statistics Counter and Error Detection History

During measurement, the statistical information of the frames that are transmitted from and received by the measurement port and the status of error detection are displayed here.

- **Transmission and Reception Rates**

During measurement, the transmission and reception rates are indicated (as percentages).

- **Normal Frames**

The number of normal frames that have been sent and received during a single measurement period is indicated.

- **Received Frame Length**

The currently received frame length is indicated as an average over 1-second intervals.

- **Error Detection History**

From the start of measurement to the time that measurement is stopped, link errors and L2 errors (L2 frame errors) are displayed here as they are detected.

Display Item	Display	Explanation
LINK ERR	LINK ERR (gray)	No linkdowns have been detected during measurement.
	LINK ERR (red)	If even one linkdown is detected during measurement, the indication becomes red.
L2 ERR	L2 ERR (gray)	During measurement, no frames have been received with any of the following errors.
		CRC errors
		Undersize errors
		Oversize errors
		Symbol errors
	Alignment errors	
	L2 ERR (red)	During measurement, if even one frame is received with any of the following errors, the indication becomes red.
		CRC errors
		Undersize errors
		Oversize errors
Symbol errors		
Alignment errors		

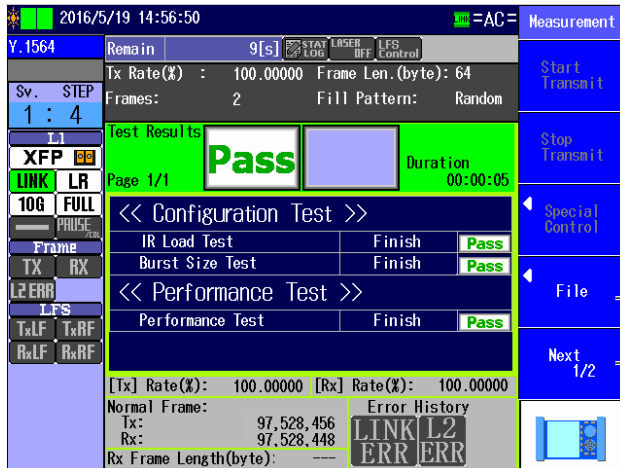


# 13.11 Displaying the Test Results

## Procedure

### Test Result Display Screen

Follow the procedure in section 13.10 to start and stop measurement.



Displays the file operation screen  
▶ section 12.2

To measurement page 2/2



Displays a table of test results  
▶ section 13.15

Displays the results screen for the IR load test  
▶ section 13.12

Displays the results screen for the burst size test  
▶ section 13.13

Displays the results screen for the performance test  
▶ section 13.14

To measurement page 1/2

### Note

- During measurement, you can select menu items other than “File.”
- If you press ESC while another measurement screen is displayed, the measurement results screen will appear.
- You can also use the left and right arrow keys to switch between measurement screens. For details, see section 13.16.

# 13.12 Displaying the IR Load Test Results

## Procedure

### IR Load Test Results Screen

Follow the procedure in section 13.10 to start and stop measurement.  
Press the **IR Load Test** soft key to display the following screen.

	P/F	Min	Mean	Max	Count	FL
ALL	Fail					
step1	Pass	3.300	3.500	3.700	2000	1.0E-2
step2	Pass	7.300	7.500	7.700	0	0.0E-2
step3	Pass	11.300	11.500	11.700	0	0.0E-2
step4	Pass	15.300	15.500	15.700	0	0.0E-2
step5	Pass	*****	*****	*****	*****	*****
step6	Pass	*****	*****	*****	*****	*****
step7	Pass	*****	*****	*****	*****	*****
EIR	Fail					
green	Pass	15.000	15.000	15.000	2000	1.0E-2
yellow	---	25.000	25.000	25.000	0	0.0E-2
total	Fail	40.000	40.000	40.000	0	0.0E-2
POL	Fail					
green	Pass	15.000	15.000	15.000	2000	1.0E-2
yellow	---	25.000	25.000	25.000	0	0.0E-2
total	Pass	40.000	40.000	40.000	0	0.0E-2

### Note

- You can display this screen even during measurement.
- You can also use the left and right arrow keys to switch between measurement screens. For details, see section 13.16.
- Press ESC to return to the Test Result Display screen (see section 13.11).

## Explanation

### IR Load Test Results Table

The following items are displayed.

- P/F:** The pass/fail judgment (Pass/Fail) is displayed. If pass/fail judgment is enabled, the pass/fail judgment results are indicated with colors for each item.  
Green: Pass  
Red: Fail
- IR(Mbit/s):** Information rate (minimum, average, maximum) is displayed.
- FL:** Frame loss (frame loss count, loss rate) is displayed. If the measured result has been exceeded 999999, the result columns display "Over."
- FTD(ms):** Frame transfer delay (minimum, average, maximum) is displayed. If the measured result has been exceeded a second, the result columns display "1s OVER."
- FDV(ms):** Frame delay variation (minimum, average, maximum) is displayed. If the measured result has been exceeded a second, the result columns display "1s OVER."

### Note

- Use the up and down arrow keys to switch the displayed page.
- During measurement, items that have not yet been measured are displayed as "\*\*\*\*\*."
- Pass/fail judgment is not performed on green frame measurement results when Color is set to OFF.
- Pass/fail judgment is not performed on yellow frame measurement results regardless of the Color setting.
- FTD(ms) is valid when the test direction is set to loopback.

# 13.13 Displaying the Burst Size Test Results

## Procedure

### Burst Size Test Result Display Screen

Follow the procedure in section 13.10 to start and stop measurement.  
Press the **Burst Size Test** soft key to display the following screen.

**Switch between the master and slave (Master, Slave)**

**Select the services (Service 1-Service 8).**

	P/F	Count	FLR
CBS	Pass	2000	1.0E-2
EBS	Pass	2000	1.0E-2
green	Pass	2000	1.0E-2
yellow	Pass	2000	1.0E-2
total	Pass	2000	1.0E-2

	FTD(ms)			FDV(ms)		
	Min	Mean	Max	Min	Mean	Max
CBS	22.000	22.000	22.000	11.000	11.000	11.000
EBS	22.000	22.000	22.000	11.000	11.000	11.000
green	22.000	22.000	22.000	11.000	11.000	11.000
yellow	22.000	22.000	22.000	11.000	11.000	11.000
total	22.000	22.000	22.000	11.000	11.000	11.000

### Note

- You can display this screen even during measurement.
- You can also use the left and right arrow keys to switch between measurement screens. For details, see section 13.16.
- Press ESC to return to the Test Result Display screen (see section 13.11).

## Explanation

### Burst Size Test Results Table

The following items are displayed.

- P/F:** The pass/fail judgment (Pass/Fail) is displayed. If pass/fail judgment is enabled, the pass/fail judgment results are indicated with colors for each item.  
Green: Pass  
Red: Fail
- FL:** Frame loss (frame loss count, loss rate) is displayed. If the measured result has been exceeded 999999, the result columns display "Over."
- FTD(ms):** Frame transfer delay (minimum, average, maximum) is displayed. If the measured result has been exceeded a second, the result columns display "1s OVER."
- FDV(ms):** Frame delay variation (minimum, average, maximum) is displayed. If the measured result has been exceeded a second, the result columns display "1s OVER."

### Note

- During measurement, items that have not yet been measured are displayed as "\*\*\*\*\*".
- Pass/fail judgment is not performed on green frame measurement results when Color is set to OFF.
- Pass/fail judgment is not performed on yellow frame measurement results regardless of the Color setting.
- FTD(ms) is valid when the test direction is set to loopback.

# 13.14 Displaying the Performance Test Results

## Procedure

### Performance Test Result Screen

Follow the procedure in section 13.10 to start and stop measurement. Press the **Performance Test** soft key to display the following screen.

The screenshot shows the Performance Test screen with the following data:

2016/5/19 15:41:43      Performance Tes

Y.1564      Remain      STAT      LASER      LFS

Performance Tx Rate(%) : 100.00000      Frame Len.(byte): 64      ←Master ↔

Sv. STEP      Frames: 2      Fill Pattern: Random      Slave

Performance Test      Page 1/3

ALL	P/F	Min	Mean	Max	Count	FLR
Sv. 1	Pass	15.300	15.500	15.700	2000	1.0E-2
Sv. 2	Pass	15.300	15.500	15.700	2000	1.0E-2
Sv. 3	Pass	15.300	15.500	15.700	2000	1.0E-2
Sv. 4	Pass	15.300	15.500	15.700	2000	1.0E-2
Sv. 5	Pass	15.300	15.500	15.700	2000	1.0E-2
Sv. 6	Pass	15.300	15.500	15.700	2000	1.0E-2
Sv. 7	Pass	15.300	15.500	15.700	2000	1.0E-2
Sv. 8	Fail	15.300	15.500	15.700	2000	1.0E-2

Switch between the master and slave (Master, Slave)

### Note

- You can display this screen even during measurement.
- You can also use the left and right arrow keys to switch between measurement screens. For details, see section 13.16.
- Press ESC to return to the Test Result Display screen (see section 13.11).

## Explanation

### Performance Test Results Table

The following items are displayed.

- P/F:** The pass/fail judgment (Pass/Fail) is displayed. If pass/fail judgment is enabled, the pass/fail judgment results are indicated with colors for each item.  
Green: Pass  
Red: Fail
- IR(Mbit/s):** Information rate (minimum, average, maximum) is displayed.
- FL:** Frame loss (frame loss count, loss rate) is displayed. If the measured result has been exceeded 999999, the result columns display "Over."
- FTD(ms):** Frame transfer delay (minimum, average, maximum) is displayed. If the measured result has been exceeded a second, the result columns display "1s OVER."
- FDV(ms):** Frame delay variation (minimum, average, maximum) is displayed. If the measured result has been exceeded a second, the result columns display "1s OVER."
- AVAIL(%):** Service circuit availability is displayed.

### Note

- Use the up and down arrow keys to switch the displayed page.
- During measurement, items that have not yet been measured are displayed as "\*\*\*\*\*."
- FTD(ms) is valid when the test direction is set to loopback.

# 13.15 Displaying a Table of Test Results

## Procedure

### Test Summary Screen

Follow the procedure in section 13.10 to start and stop measurement.  
 Press the **Summary List** soft key to display the following screen.

**IR load test, burst size test**

Sv.	STEP	ALL	P/F	CIR	EIR	POL	CBS	EBS	Performance
Sv. 1		Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Sv. 2		Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Sv. 3		Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Sv. 4		Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Sv. 5		Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Sv. 6		Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Sv. 7		Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Sv. 8		Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass

**Service numbers** (points to the 'Sv.' column)

**Performance test** (points to the 'Performance' column)

**Cursor (brown)** (points to the 'Sv. 8' row)

**Switch between the master and slave (Master, Slave)** (points to Master/Slave button)

**Select the services (Service 1-Service 8).** (points to Service Select button)

**Select the test (CIR Test, EIR Test, Policing Test, CBS Test, EBS Test, Performance Test)** (points to Test Select button)

**Detail** (points to Detail button)

Displays the detail screen of the test results for the selected test. For a description of the detail screen of each test, see sections 13.12 to 13.14.

### Cursor (brown)

Displays the service number of the selected service and the position of the test results that corresponds to the selected test result. Pressing the Detail soft key or ENTER displays the detail screen of the test results at the cursor position.

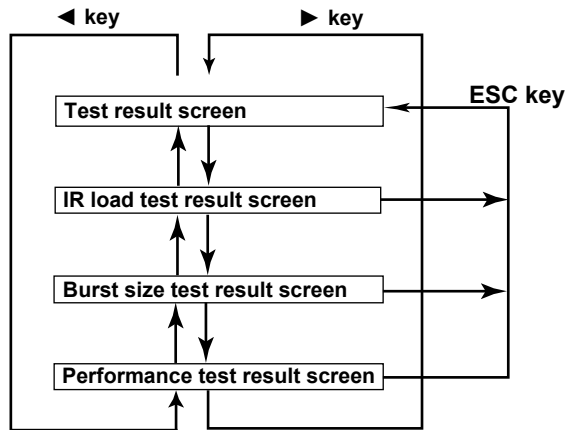
## Explanation

The pass/fail judgment results (Pass/Fail) of the test items in sections 13.12 to 13.14 are displayed in a tabular form.

## 13.16 Changing the Displayed Screen

### Procedure

You can switch the displayed measurement screen by pressing the left and right arrow keys.



On the IR load test result screen and performance test result screen, you can switch between pages of results on the displayed screen by pressing the up and down arrow keys.

### Explanation

#### ▶ and ◀ Keys

These keys change the displayed screen. They are valid when a measurement screen is displayed.

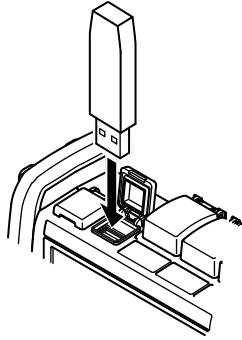
#### ▲ and ▼ Keys

These keys switch between the pages of the displayed screen. They are valid on the IR load test result screen and performance test result screen.

## 14.1 Connecting a USB Storage Medium to the USB Port

Use a portable USB storage medium. Connect it directly to the USB Type A port on the AQ1300/AQ1301.

Hot-plugging is supported: you can connect or disconnect the USB device at any time, regardless of whether the AQ1300/AQ1301 is on or off. When the power is on, the AQ1300/AQ1301 automatically detects the USB storage medium after it is connected.



### Note

- Connect USB storage devices to the AQ1300/AQ1301 directly, not through a USB hub.
- Use a portable USB storage medium. Do not connect an incompatible USB storage medium.
- Do not connect and disconnect a USB device repetitively. Provide a 10-second interval between removal and connection.
- Do not connect or disconnect a USB device during the time from when the AQ1300/AQ1301 is turned on until key operation becomes available.
- You can use USB storage devices that comply with USB 1.1.

---

## 14.2 Saving and Loading Data

### Procedure

#### File Screen

Display the screen for manipulating files. Operate according to the test menu.

##### Setting

- **Auto, Auto(Remote), or RFC2544**

Follow the procedure in the relevant section to display the Select File Display.

- Auto Section 4.1
- Auto(Remote) Section 5.1
- RFC2544 Section 8.1

Press the File soft key.

- **Manual**

Press the soft keys in the following sequence.

Manual > Next 1/2 > File

- **VLAN Test**

Press the soft keys in the following sequence.

Option > VLAN Test > Next 1/2 > File

##### Loading a VLAN ID Definition File

Option > VLAN Test > Detail Setup > VLAN ID TX Setting or VLAN ID RX Setting > Sub Menu > Refer File

- **E-OAM Test**

Press the soft keys in the following sequence.

**Option > Next 1/2 > E-OAM > Next 1/2 > File**

##### Measured Results

Follow the procedure in the relevant section to end the measurement.

- Auto, Auto(Remote), or Manual Section 7.1
- RFC2544 Section 9.2
- VLAN test Section 11.7
- E-OAM test Sections 12.8, 12.9, and 12.10

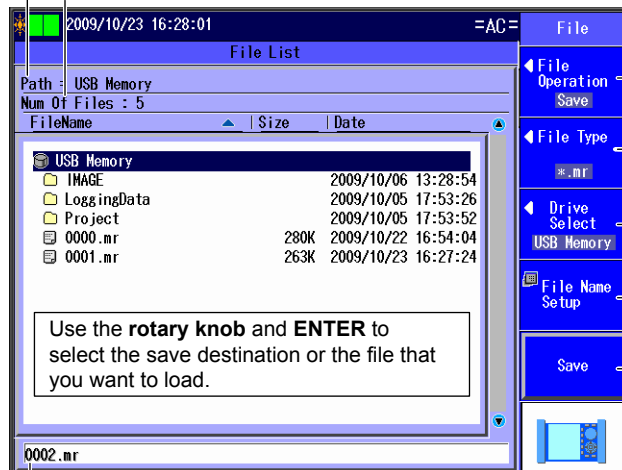
Press the **File** soft key.

The following screen appears.



Directory path

The number of directories and files in the selected directory



- Set the action (Save, Load).
- Set the file type. Set the extension of the file type you want to save or load. For details, see the explanation later in this section.
- Set the drive (Internal, USB Memory).
- Set the file name (see the File Name Setup screen in the next section).
- Saves or loads the file. Whether "Save" or "Load" is displayed depends on which option you choose for the Action setting.

The file name candidate for the next save operation  
This indication appears when you set the action to "Save."

File Name Setup Screen



- Set the file name format (No., Comment + No., Test Item No. + No., Comment + Test Item No. + No., Date, Comment + Date).
- Set the ID number (0 to 9999).
- Specify a comment (up to 30 characters). To enter a comment, follow the procedure in section 3.2.
- Select when you want to specify a directory name. Valid for statistical result and log files
- Set the directory name format (Directory Name, Setup File Name, Setup File Comment).
- Specify the directory name (up to 30 characters). To set the directory name, follow the procedure in section 3.2.
- File name. The file name that is produced by the above settings is displayed.

Explanation

File Operation

Select "Save" or "Load."

File Type

Set the extension for the measurement result data.

Note

Because the file type is fixed, you cannot set the extension when you save or load settings or load measurement results.

Saving

The types of files that you can save are listed below.

Extension	Description
.sd	Measurement setup files
.mr	File containing measured results or statistic results
.csv	Statistic log files (in Manual mode)
	Result file of LT execution or multicast LB execution (for E-OAM tests)

## 14.2 Saving and Loading Data

---

### Loading

The types of files that you can load are listed below.

Extension	Description
.sd	Measurement setup files
.mr	File containing measured results or statistic results
.csv, .txt	VLAN ID definition file (for VLAN tests) The VLAN ID definition file is a list of VLAN IDs that are registered in a VLAN ID list of a VLAN test. It is a text file in CSV format that you can create with a text editor or a spreadsheet application.

- \* For details on how to load display management files (disManage.dmf) and package files (.dmfz), see section 14.7.

### Drives

You can select one of the following drives.

Internal	The AQ1300/AQ1301 internal memory
USB Memory	The USB storage medium connected to the USB Type A port on the AQ1300/AQ1301.

### File Name

#### File Name Format

You can set the file name format to one of the following options. For all formats, the maximum number of characters is 30.

No., Comment + No., Test Item No. + No., Comment + Test Item No. + No., Date, Comment + Date

Comment	Up to 30 characters
ID No.	Four characters The range is 0 to 9999. Four characters are used in the file name. For example, if you set the number to "1," "0001" will be used in the file name.
Test Item No.	1 to 8 The registered test item number is displayed.
Date	Displayed in the following format: YYMMDD_hhmmss
Extension	Four characters, including the period.

- If the length of the specified file name, including the extension, exceeds 30 characters, the file is named "Name Over."

#### String and Character Types That Can Be Used in File and Directory Names

There are limitations on the types of strings and characters that you can use in file and directory names.

- The following character strings cannot be used as file or directory names due to MS-DOS limitations.  
AUX, CON, PRN, NUL, CLOCK, CLOCK\$, LPT0, LPT1, LPT2, LPT3, LPT4, LPT5, LPT6, LPT7, LPT8, LPT9, COM0, COM1, COM2, COM3, COM4, COM5, COM6, COM7, COM8, COM9
- The following types of characters can be used: 0 to 9, A to Z, a to z, \_, -, (, ), {, }, #, \$, %, &, ~, !, `, and @  
@ cannot be entered consecutively.
- Make sure that the full file path (absolute path from the root directory) is less than or equal to 200 characters in length. If it exceeds 200 characters, an error occurs when you perform a file operation (such as saving, copying, renaming, or creating a directory).  
Full file path: When an operation is being performed on a directory, the full path is up to the name of the directory.  
When an operation is being performed on a file, the full path is up to the name of the file.
- If the specified file or directory name contains characters that cannot be used, the file or directory is named "Bad File Name."

## Directory Name

You can specify a destination directory when you save statistical result and log files.

When you specify a directory name, the directory name appears followed by a slash in front of the file name.

### Attach Directory

Select this check box when you want to specify a directory name.

### Directory Name Format

You can set the directory name format to one of the following options. For all formats, the maximum number of characters is 30.

Directory Name, Setup File Name, Setup File Comment

Directory Name	Up to 30 characters
Setup File Name	The name of the loaded setup file is displayed.
Setup File Comment	The comment of the loaded setup file is displayed.

- Even when specifying a directory name, make sure that the name, including the extension, is 30 characters or less. If the specified directory name exceeds 30 characters, the directory is named "Name Over."

## Saving Files Automatically

In the measurement settings, when you set the "Operation after Measurement Stops" setting as described below, a file is saved automatically after measurement finishes. Files that are saved automatically are saved to the "result" folder in internal memory.

Mode	Condition	Saved Files
Auto or Auto(Remote)	When the "Save measurement results" check box is selected	Statistical result file (.mr)
Manual	When the "Save measurement results and Statistics Log" check box is selected	Statistical result file (.mr) and statistical log file (.csv)

## 14.3 Deleting and Copying Files

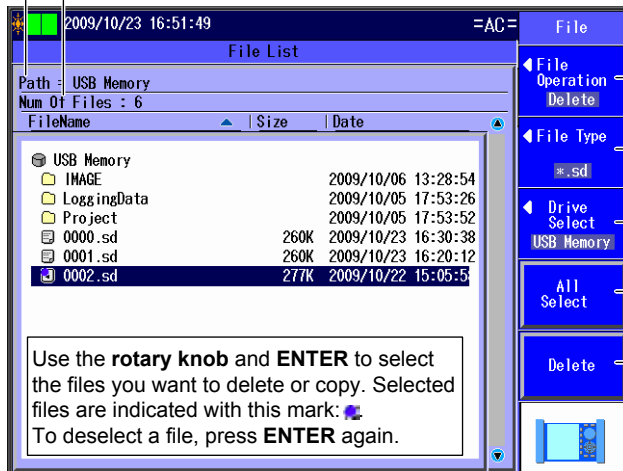
### Procedure

#### File Screen

Follow the procedure in section 14.2 to display the file screen.

#### Directory path

The number of directories and files in the selected directory



Set the action (Delete, Copy).

Set the file type.

Set the extension of the file type you want to delete or copy.

Set the drive (Internal, USB Memory).

Selects all files

Deletes the selected files or displays a screen for selecting the copy destination.

Whether "Delete" or "Dest. Folder" is displayed depends on which option you choose for the Action setting.

When you press the **Dest. Folder** soft key, a screen for selecting the copy destination directory appears.

In the screen that appears, select the destination directory and press the **Copy** soft key to copy the files.

### Explanation

#### File Operation

Select "Delete" or "Copy."

#### File Type

The files of the type that you selected appear in the File List screen.

- For details about file types, see "Explanation" in section 14.2.
- To display all the files in the current directory, set the file type to "\*.\*".

#### Drives

See "Explanation" in section 14.2.

#### Selecting All Files

All the files in the current directory will be deleted or copied.

- When you press the All Select soft key, "All Select" changes to "All Deselect."
- When you press the All Deselect soft key, "All Deselect" changes to "All Select." All the files in the current directory are deselected.

#### Deleting

The selected files are deleted.

## Setting the Copy Destination and Copying

After selecting the files to copy, set the destination directory and copy the selected files to it.

### **Note**

---

Using the mini B USB port on the AQ1300/AQ1301, you can send the files and directories in the AQ1300/AQ1301 internal memory to a PC. To do this, set the AQ1300/AQ1301 mini B USB port function to Storage (see section 14.1). When the PC accesses the AQ1300/AQ1301 and downloads the files, the download speed depends on the performance of the PC.

---

## 14.4 Changing File Names

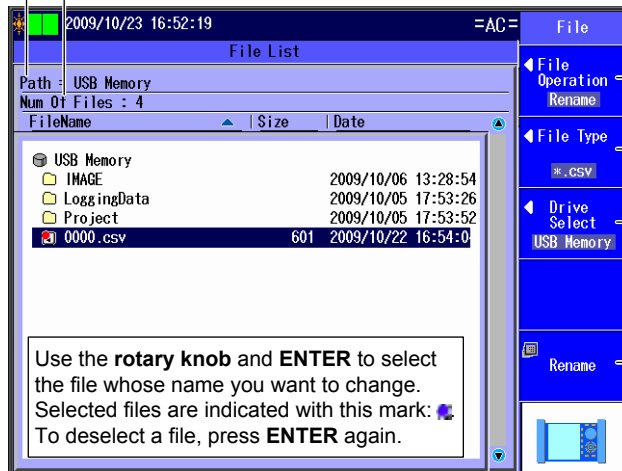
### Procedure

#### File Screen

Follow the procedure in section 14.2 to display the file screen.

#### Directory path

The number of directories and files in the selected directory



Set the action (**Rename**).

Set the file type.

Set the extension of the file type of the file whose name you want to change.

Set the drive (**Internal, USB Memory**).

Enter a new file name.

The character input dialog box appears. To set the file name, follow the procedure in section 3.2. Enter the extension as well. After you have entered the file name, press the **Commit** soft key in the character input dialog box to change the file name to the name that you entered.

### Explanation

#### File Operation

Select "Rename."

#### File Type

The files of the type that you selected appear in the File List screen.

- For details about file types, see "Explanation" in section 14.2.
- To display all the files in the current directory, set the file type to "\*.\*".

#### Drives

See "Explanation" in section 14.2.

#### Entering a File Name

Enter a file name into the character input dialog box that appears. Follow the procedure in section 3.2.

- Use the character input dialog box to enter the extension as well.
- When you press the Commit soft key in the character input dialog box, the file name changes to the name that you entered.

## 14.5 Creating Directories

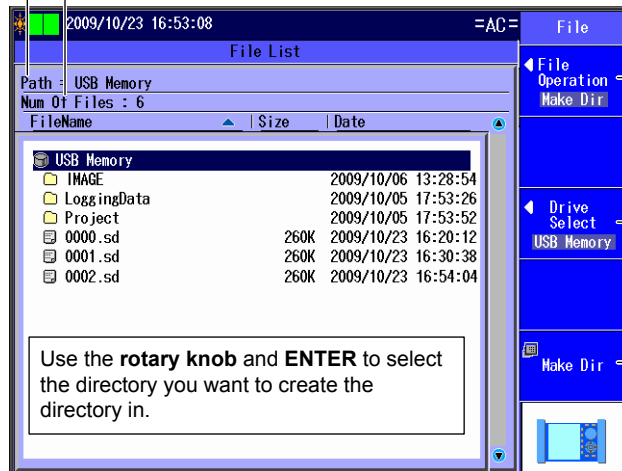
### Procedure

#### File Screen

Follow the procedure in section 14.2 to display the file screen.

#### Directory path

The number of directories and files in the selected directory



Set the action (Make Dir).

Set the drive (Internal, USB Memory).

Create a directory.

The character input dialog box appears. To set the directory name, follow the procedure in section 3.2.

After you have entered the directory name, press the **Commit** soft key in the character input dialog box to create the directory.

### Explanation

#### File Operation

Select "Make Dir."

#### Drive to Save To

See "Explanation" in section 14.2.

#### Entering a Directory Name

Enter a directory name into the character input dialog box that appears. You can use up to 20 characters. Follow the procedure in section 3.2. When you press the **Commit** soft key in the character input dialog box, a directory with the name that you specified is created.

## 14.6 Deleting and Copying Directories

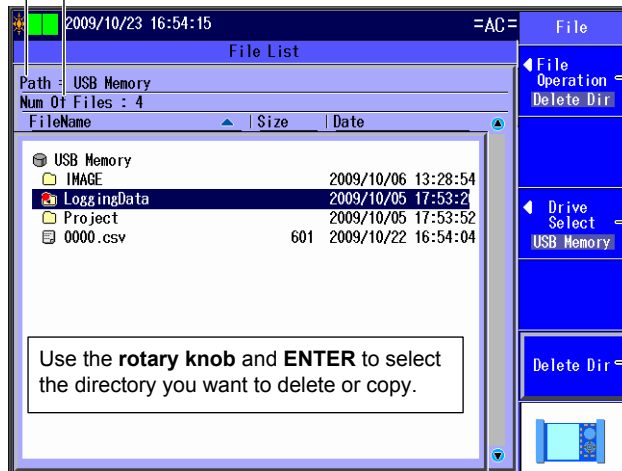
### Procedure

#### File Screen

Follow the procedure in section 14.2 to display the file screen.

#### Directory path

The number of directories and files in the selected directory



Set the action (Delete Dir, Copy Dir).

Set the drive (Internal, USB Memory).

Deletes the selected files or displays a screen for selecting the copy destination.

Whether "Delete Dir" or "Dest. Folder" is displayed depends on which option you choose for the Action setting.

When you press the **Dest. Folder** soft key, a screen for selecting the copy destination directory appears.

Make sure that the copy destination and source drives are different (see the explanation later in this section).

In the screen that appears, select the destination directory and press the **Copy Dir** soft key to copy the files.

### Explanation

#### File Operation

Select "Delete Dir" or "Copy Dir."

#### Drives

See "Explanation" in section 14.2.

#### Deleting

The selected directories are deleted.

#### Setting the Copy Destination and Copying

After selecting the directories to copy, set the destination directory and copy the selected directories to it.

You cannot copy from the internal memory to the internal memory or from the USB memory to the USB memory. Copy directories from the internal memory to the USB memory or from the USB memory to the internal memory.

#### Note

- You may not be able to copy or delete the selected directory if it contains many levels of directories.
- Using the mini B USB port on the AQ1300/AQ1301, you can send the files and directories in the AQ1300/AQ1301 internal memory to a PC. To do this, set the AQ1300/AQ1301 mini B USB port function to Storage (see section 14.1). When the PC accesses the AQ1300/AQ1301 and downloads the files, the download speed depends on the performance of the PC.



# 14.7 Specifying the Items That Are Displayed in the File List

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

## Procedure

### File List Setup Screen

1. Press the **System** soft key and then the **System** soft key.
2. Using the **rotary knob and ENTER**, select File List Setup to display the following screen.

#### When Display is set to Default or File List

**File List Setup**

Display: **Default** (Set Display to "Default" or "File List.")

Customize:

- Size: [Off] On (You cannot perform these operations.)
- Date: [Off] On
- Date Format: 2009/11/25 12:00:00
- Sort by: [Date] File Name
- Sort Order: [A -> Z] Z -> A
- Tree View: [Off] On

**File list preview**  
You can use this preview to check the way that the File List is displayed on the file operation screen (see section 14.2).

FileName	Size	Date
DriveName		
TreeA		
FileNameA		15:00
FileNameC		12:00
FileNameB		09:00

#### When Display is set to Customize

**File List Setup**

Display: **Customize** (Set Display to "Customize.")

Customize:

- Size: [Off] On (Turns the file size display on or off)
- Date: [Off] On (Turns the display of the date when the file was saved on or off)
- Date Format: 2009/11/25 12:00:00 (Set the date format (Year/month/day hour:minute:second, year/month/day hour:minute, year (short form)/month/day hour:minute, month/day hour:minute, hour:minute).)
- Sort by: [Date] File Name (Set what to sort by (Date, File Name).)
- Sort Order: [A -> Z] Z -> A (Set the sort order (A -> Z, Z -> A).)
- Tree View: [Off] On (Turns the tree view on or off)

**Preview**  
You can use this preview to check the way that the File List is displayed on the file operation screen (see section 14.2).

FileName
FileNameB
FileNameC
FileNameA

## Explanation

You can select the items that are displayed in the internal memory and USB memory file lists. You can also display a preview of the file list display.

### Default

File names, file sizes, and dates are displayed.

### File List

Only file names are shown in a list. File names can be displayed up to their first 36 characters.

### Customize

You can specify the items you want to display in the file list.

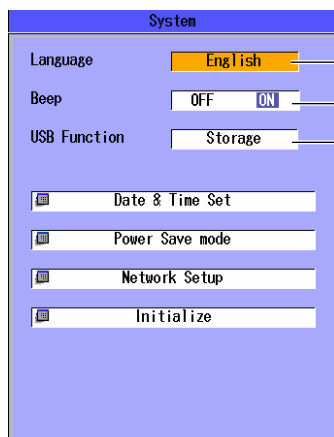
- File size, date the file was saved, and tree view on or off
- Date format, what to sort by, and the sort order

## 15.1 Configuring the Language, Beep, and USB Function

### Procedure

#### System Screen

Press the **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).

### Explanation

#### Display Language

Set the language to display on the AQ1300/AQ1301 screen. The options that appear vary depending on the product's language specification.

#### Turning the Beep On and Off

You can make the AQ1300/AQ1301 beep whenever an operation error occurs, an error message is displayed, measurement finishes, or an error occurs during measurement.

ON	The AQ1300/AQ1301 beeps.
OFF	The AQ1300/AQ1301 does not beep.

If Beep is set to ON, the following beeps are generated depending on the operating status.

Operating Status	Beep
During measurement	
Measurement completion	One long beep
Measurement error	Three short beeps
When displaying a message	
Status notification	One short beep
Error	Two short beeps
System error	Three long beeps

#### USB Function

You can set the function of the mini B USB port on the AQ1300/AQ1301.

Storage	You can access the AQ1300/AQ1301 internal memory from a PC and load and save data.
Control I/O	You can use the MFT remote control software to control the AQ1300/AQ1301 from a PC.

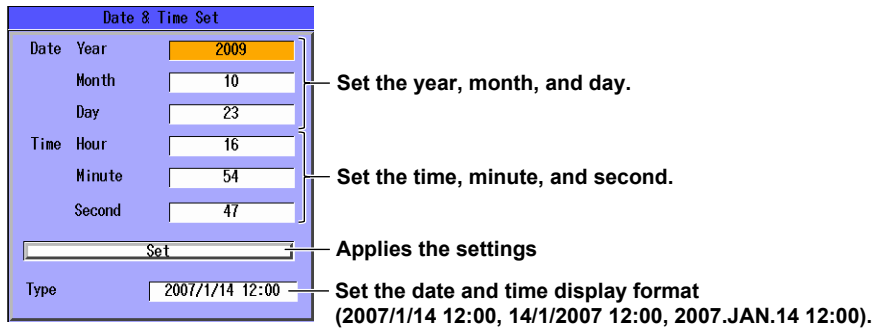
---

## 15.2 Setting the Date and Time

### Procedure

#### Date & Time Set Screen

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



### Explanation

#### 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

Date and time settings are backed up using an internal lithium battery. They are retained even if the power is turned off.

---

## 15.3 Configuring Power Save Settings

### Procedure

#### Power Save Screen

1. Press the **System** soft key and then the **System** soft key.
2. Using the **rotary knob** and **ENTER**, select **Power Save mode** to display the following screen.

**Using AC power**

- Auto Power Off: OFF
- LCD Brightness: Bright

**Using battery**

- Auto Power Off: OFF
- LCD Brightness: Bright
- Screen Save: OFF ON

Configure the auto power off feature (OFF, AutoPowerOff 1m, AutoPowerOff 5m, AutoPowerOff 10m, AutoPowerOff 30m).

Set the LCD brightness (Bright, Normal, Power save, OFF).

Switch screen saving on or off.

### Explanation

To reduce power consumption, you can set separate power save settings for when the AQ1300/AQ1301 is using an AC adapter and for when it is using a battery.

#### Auto Power Off

When the AQ1300/AQ1301 is on, it can turn itself off automatically after it has not been used for awhile.

OFF	The power does not turn off automatically.
AutoPowerOff 1m	The power turns off automatically after one minute.
AutoPowerOff 5m	The power turns off automatically after 5 minutes.
AutoPowerOff 10m	The power turns off automatically after 10 minutes.
AutoPowerOff 30m	The power turns off automatically after 30 minutes.

#### LCD Brightness

You can set the LCD brightness.

Bright	The screen is bright. Choose this setting when you are in a bright area. Because this setting uses a great deal of power, pay close attention to the remaining battery power when you are using a battery.
Normal	Normal brightness.
Power save	The screen is less bright than it is when you select Normal. You can view the screen at this brightness when you are in a dark area. You can use the battery longer than you can when you select Bright.
OFF	The LCD backlight is turned off. When you are viewing the screen beneath the sun or in another bright area, the screen will be difficult to view even if you select Bright. In this kind of situation, you can make the screen easier to view by selecting Off. You can use the battery even longer than you can when you select Power save.

#### Switching Screen Saving On and Off

When the AQ1300/AQ1301 is on, it can turn the display off automatically after it has not been used for 15 seconds.

## 15.4 Configuring Network Settings

### Procedure

#### Network Setup Screen

1. Press the **System** soft key and then the **System** soft key.
2. Using the **rotary knob** and **ENTER**, select **Network Setup** to display the following screen.

The screenshot shows the Network Setup screen with the following fields and annotations:

- Valid / Invalid:** A radio button menu with **Valid** selected. Annotation: "Enables or disables the network setup".
- Host Name:** An empty text field. Annotation: "Set the host name, user name, and password. To set the host name, user name, and password, follow the procedure in section 3.2."
- User Name:** A text field containing "anonymous".
- Password:** An empty text field.
- Time Out(sec):** A text field containing "0". Annotation: "Set the timeout value."
- DHCP:** A radio button menu with **OFF** selected.
- TCP/IP settings:** A group of fields including:
  - IP Address:** 192, 168, 0, 2
  - Subnet Mask:** 255, 255, 255, 0
  - Gateway:** 192, 168, 0, 1Annotation: "TCP/IP settings".

To apply the changes, power-cycle the AQ1300.

#### Note

You must restart the AQ1300/AQ1301 after you have changed the network settings. Before you restart the AQ1300/AQ1301, the settings from before you changed the settings are used.

### Explanation

For details about the network that you intend to connect the AQ1300/AQ1301 to, contact your network administrator.

#### Enabling or Disabling the Network Setup

After you have set the user name, password, timeout value, and TCP/IP parameters, select Valid to use the network connection.

---

Valid            The AQ1300/AQ1301 can communicate over the network.

---

Invalid        The AQ1300/AQ1301 cannot communicate over the network.

---

If Valid is selected and the AQ1300/AQ1301 is not connected to a network, it will require more time to start.

#### Host Name, User Name, and Password

Specify the host name for when you are performing remote control in Auto(Remote) mode using the test interface and for when you are searching for other devices.

Set the user name and password to use for user authentication when the AQ1300/AQ1301 is accessed by a PC.

The password is also used for authentication in Auto(Remote) mode when you are performing remote control using the test interface.

##### Host Name

You can use up to 11 characters.

##### User Name

You can use up to 15 characters. The default setting is "anonymous."

##### Password

You can use up to 15 characters.

**Note**

- The AQ1300/AQ1301 terminates the connection if there is an error in the user authentication process.
- You do not need to enter a password when the user name is set to “anonymous.”

**Timeout Value**

The connection to the network is automatically disconnected if there is no access to the AQ1300/AQ1301 for the specified time.

Range: 0 to 3600 s

The AQ1300/AQ1301 will not time out if you set the timeout value to 0. If the AQ1300/AQ1301 is connected to a network and the connection between the AQ1300/AQ1301 and another device is broken abnormally due to an external cause, the AQ1300/AQ1301 will remain connected to the network until the power is turned off. To avoid this kind of situation, we recommend that you set a finite timeout value.

**TCP/IP Settings****DHCP**

If you are connecting the AQ1300/AQ1301 to a network with a DHCP server and you want to use the server, set DHCP to “ON.”

ON	The IP address, subnet mask, and gateway information is assigned automatically.
OFF	You must enter the IP address, subnet mask, and gateway information.

- Ask your network administrator whether or not DHCP is available.
- When DHCP is set to ON, the information can change whenever you restart the AQ1300/AQ1301 or enable or disable the network setup as described in the previous section. Check the information when you access the AQ1300/AQ1301 from a PC.

**IP Address**

You can set the IP address assigned to the AQ1300/AQ1301. The IP address is an ID that is assigned to each device on a network such as the Internet or an intranet. Obtain an IP address from your network administrator. In a network that supports DHCP, this parameter is set automatically when DHCP is set to ON.

**Subnet Mask**

You can set the mask value used to determine the subnet network address from the IP address. Networks such as the Internet are often divided up into smaller networks called subnetworks. The subnet mask is a value that specifies the number of bits of the IP address that are used to identify the network address. Consult your network administrator for the subnet mask value. In a network that supports DHCP, this parameter is set automatically when DHCP is set to ON.

**Gateway**

You can set the IP address of the default gateway (which is a gateway used to communicate with other networks). The default gateway handles data exchange between multiple networks so that data transmission proceeds smoothly. Consult your network administrator for the default gateway value. In a network that supports DHCP, this parameter is set automatically when DHCP is set to ON.

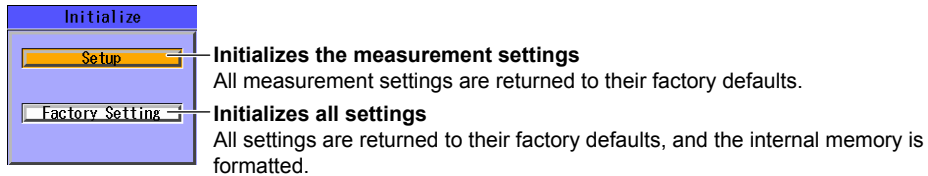
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## 15.5 Resetting the AQ1300/AQ1301 to Its Factory Default Settings

### Procedure

#### Initialize Screen

1. Press the **System** soft key and then the **System** soft key.
2. Using the **rotary knob** and **ENTER**, select **Initialize** to display the following screen.



### Explanation

You can reset the AQ1300/AQ1301 to its factory default settings.

#### Initializing the Measurement Settings

The measurement settings are returned to their factory defaults. The internal memory is not initialized.

#### Initializing All Settings

All settings are returned to their factory defaults. The internal memory is also initialized. All the data in the internal memory is deleted. Before you initialize the internal memory, backup the data as necessary.

#### Note

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Using the mini B USB port on the AQ1300/AQ1301, you can send the files and directories in the AQ1300/AQ1301 internal memory to a PC. To do this, set the AQ1300/AQ1301 mini B USB port function to Storage (see section 14.1). When the PC accesses the AQ1300/AQ1301 and downloads the files, the download speed depends on the performance of the PC.

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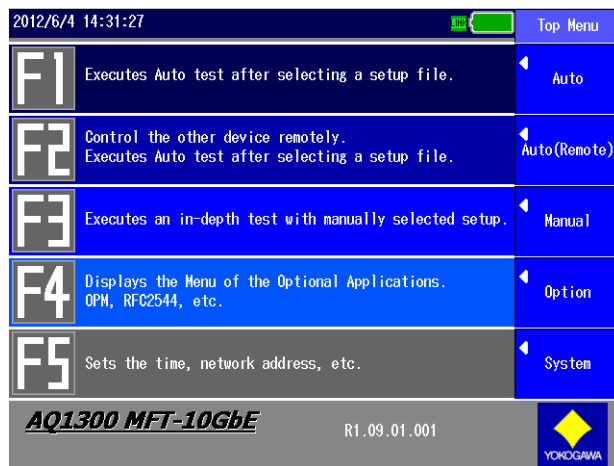
## 15.6 Setting the Top Menu Type

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

### Procedure

#### Type 1

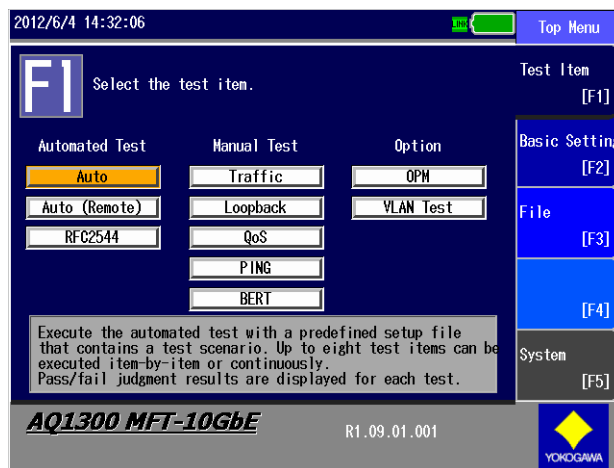
This is the conventional menu (default). The top menu is the test menu. For details on the test menu, see section 1.2.



#### Type 2

The top menu displays each test menu's test modes that you can select. You can use the soft keys to configure test items, files, system settings, etc.

1. On the type 1 screen, press the **System** soft key and then the **System** soft key again.
2. Using the **rotary knob and ENTER**, set the top menu type to Type2. The top menu display will change.





## 15.6 Setting the Top Menu Type

### Explanation

Menus for configuring different items are assigned to soft keys. When you display a setup screen from one of the menus, the operation from this point is the same as with the conventional menu.

**F1**: Displays the test item menu. For details on setting the test items, see the following chapters or sections.

Test Item	Reference	Reference	Notes
Auto test	Auto	Chapter 4	
	Auto(Remote)	Chapter 5	
	RFC2544	Chapter 8	
Manual test	Chapter 6	Chapter 6	
Options	Chapter 10	Chapter 10	Applies only to the AQ1300

**F2**: Items common to the F1 test items are displayed. For details on the items, see the following sections.

Setup Item	Reference
Measurement interface	Section 6.2
Test layer	
Link settings	Section 6.3
Source address settings	

**F3**: Save or load setup files or result files, and perform other similar operations. For details on the items, see the following sections.

Setup Item	Reference
Load a setup file	Section 14.7
Result file viewer	
Import a setup file	
File operations	Chapter 14

**F5**: Configure the system, perform self tests, and update the firmware. For details on the items, see the following sections.

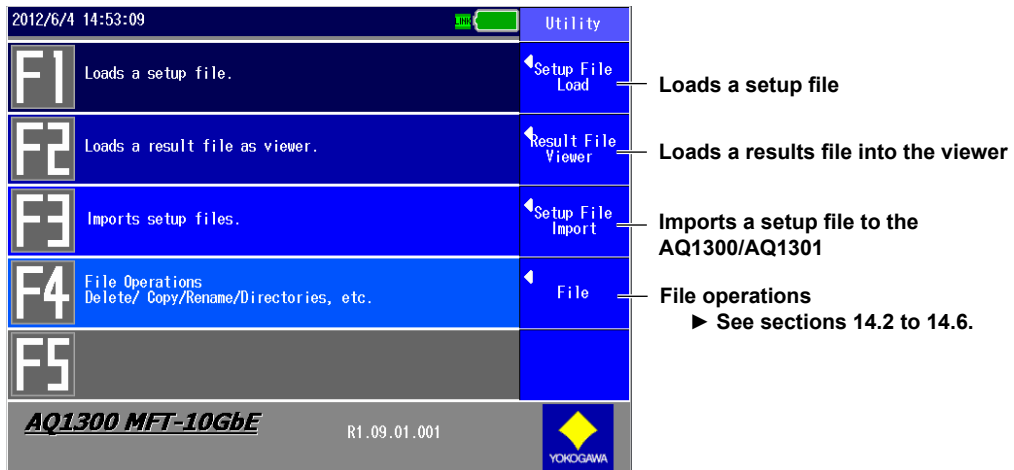
Setup Item	Reference
System configuration	Chapter 15
Self test	Section 16.3
Firmware updating	Section 16.5

## 15.7 Using the Utility Menu

### Procedure

#### Utility Menu Screen

On the Top Menu screen, press **SETUP** to display the following screen.



### Explanation

#### Setup File Load

Press this soft key to display the Select Setup File screen. Use this screen to select the setup file whose tests you want to perform.

You can select one of the following types of setup files.

- Auto
- Auto(Remote)
- Manual
- RFC2544

The AQ1300/AQ1301 automatically determines the test type of the selected setup file, and then displays the corresponding test setup screen. For information about how to operate the Select Setup File screen, see sections 4.1, 5.1, and 8.1, “Selecting a Setup File.”

#### Result File Viewer

Press this soft key to display the File screen. Select the test result file (.mr) that you want to display on the screen, and then press the Load soft key. You can display on the screen one of the following types of test result files.

- Auto
- Auto(Remote)
- Manual
- RFC2544

### Setup File Import

Press this soft key to display the File screen. Select the display management file (disManage.dmf) or the package file (.dmfz) for the setup file that you want to copy to the AQ1300/AQ1301. The corresponding setup file is copied to the /setup folder in the AQ1300/AQ1301 internal memory.

- **If You Select the Display Management File (disManage.dmf)**

The AQ1300/AQ1301 automatically finds the multiple setup files (.sd) that are registered to the list in the disManage.dmf file that you selected and that are located in the same folder as disManage.dmf, and then copies all these files to the /setup folder in its internal memory.

- **If You Select a Package File (.dmfz)**

The AQ1300/AQ1301 decompresses the contents of the package file to the /setup folder in its internal memory.

## 16.1 If a Problem Occurs

### Dealing with Unusual Circumstances

- If a message appears on the screen, see the following pages for reference.
- If servicing is necessary or the AQ1300 and AQ1301 do not operate properly even after you have attempted to deal with the problem according to the instructions in this section, contact your nearest YOKOGAWA dealer.

Symptom	Solution	Reference
Even when the power is on, nothing appears on the screen.	If you are using an AC adapter, make sure that the plug is connected firmly to the outlet, the power cord is connected firmly to the AC adapter, and the AC adapter's DC plug is connected firmly to the AQ1300 and AQ1301.	— <sup>1</sup>
	If you are using a battery pack, make sure that it is attached firmly.	— <sup>1</sup>
	Charge the battery pack, and make sure that the ON lamp is illuminated.	16.6
The display disappears after time passes.	The LCD turns black at high temperatures. At low temperatures, its display speed becomes slower. Make sure that the temperature of the area where you are using the AQ1300 or AQ1301 is within the operating temperature range.	— <sup>1</sup>
	The AQ1300 or AQ1301 turns off automatically when its battery is low. Check the remaining battery power.	16.6
The screen is dark.	If you have specified a time for the Power Save setting, the AQ1300 or AQ1301 will turn off automatically if no operations have been performed for the specified time. Check the settings.	15.3
	The screen is dark when the LCD Brightness setting is set to "Power save." Check the settings.	15.3
The measurement conditions cannot be changed.	The LCD may be worn out. Servicing is required.	16.8
	When the temperature of the AQ1300, AQ1301, or its battery pack is high, the AQ1300 or AQ1301 lowers the LCD brightness automatically to prevent damage. Make sure that the temperature of the area where you are using the AQ1300 or AQ1301 is within the operating temperature range.	— <sup>1</sup>
The power turns off automatically while the AQ1300 or AQ1301 is being used.	In the setup software, when "Enable to edit with MFT" is set to OFF, the measurement conditions cannot be changed. Check the settings.	— <sup>2</sup>
The battery pack cannot be charged.	The AQ1300 or AQ1301 turns off automatically when it detects an error. A warning message will appear when this happens. Read the message. Fix the problem indicated in the message, and then turn on the AQ1300 or AQ1301.	16.2 <sup>3</sup>
The power turns off automatically while the AQ1300 or AQ1301 is starting.	The battery pack temperature may be too low or too high. Make sure that the temperature of the area where you are using the AQ1300 or AQ1301 is within the operating temperature range. Remove the battery pack from the AQ1300 or AQ1301 and let it sit for awhile in a room temperature environment.	— <sup>1</sup>
	The battery pack may be reaching the end of its life expectancy. Replace it with a new one.	16.6, 16.8
The fan has stopped.	You may be holding down the power switch for too long when you turn on the power.	—
Unexpected optical interface measurement errors occur.	Press the power switch to turn off the power immediately. Contact your nearest YOKOGAWA dealer for repairs.	—
The OPM port measured values are unstable.	Clean the ends of the XFP and SFP module optical components with a stick-shaped cleaning tool.	—
	Clean the OPM port.	16.7

<sup>1</sup> See the operation guide, IM AQ1300-02EN.

<sup>2</sup> See the *Setup Software User's Manual*, IM AQ1300-61EN.

<sup>3</sup> When it is likely that the usage limitations of the AQ1300 or AQ1301 will be exceeded, the AQ1300 or AQ1301 will display a warning message and turn off automatically to prevent damage. For the conditions under which messages appear, see section 16.2.

## 16.2 Messages and Corrective Actions

### Error Messages

Messages may appear on the screen while you are using the AQ1300 or AQ1301. This section explains the meanings of the error messages and how to respond to them. You can display the error messages in English or Japanese (see section 14.1). If servicing is necessary to solve the problem indicated by a message, contact your nearest YOKOGAWA dealer.

Other error messages related to the setup software may also appear. These messages are described in the *Setup Software User's Manual*, IM AQ1300-61EN.

Error Number	Message	Solution
1001	File Operation Error.	Make sure that the directory or file that you are trying to access exists. Or, in the System screen, initialize the settings to their factory default values.
1004	Failed to access to the file.	
1005	The file/folder doesn't exist.	
1008	The file already exists.	
1010	Failed to open the file.	
1011	Insufficient disk space.	Delete unnecessary files and directories.
1012	The file/folder doesn't exist.	Make sure that the directory or file that you are trying to access exists. Or, in the System screen, initialize the settings to their factory default values.
1013	Failed to access to the file.	
1014	The file/folder doesn't exist.	
1015	It cannot be copied or deleted due to the nested structure.	
1250	The file is in use.	Wait a moment, and then try again.
1251	No USB memory.	Make sure that a USB memory device is connected.
1252	Formatting failed.	After restarting the AQ1300 or AQ1301, in system settings, initialize it.
1253	Invalid file name.	Check the file name.
1254	Too long path name.	
1255	Unreadable file.	Check that the file you tried to load is the correct file.
1257	Cannot be loaded.	Update the firmware.
1260	Unreadable setup/result file.	The file may be corrupt.
1261	Save Error.	In the System screen, initialize the settings to their factory default values.
1262	Load Error.	
1264	Detect Bad Container.	
1265	Load Error for "DisManage.dmf".	
1266	Load Error for "DisManage.dmf". (Bad Version)	Use the setup software to create new setup file list data.
1267	Load Error for "DisManage.dmf". (Bad Language)	
1268	Invalid file name or folder name.	
1269	Invalid path name.	Check the file path that you specified.
1270	Destination and Source is same folder.	Specify the correct directory name.
1271	Detect VersionUp Failure... Please Retry...	Upgrade the firmware again.
1272	Fail Getting Address...	Check the source and destination addresses and the network settings of the device under measurement.
1273	Load Error(Bad Measurement Type). (This File is for "Auto".)	Make sure that the current test type and the file test type match.
1274	Load Error(Bad Measurement Type). (This File is for "Auto(Remote)".)	
1275	Load Error(Bad Measurement Type). (This File is for "Manual".)	
1276	Bad Password.	Check the password setting in the network settings in system settings.
1277	Connection Timeout.	Check the source and destination addresses and the network settings of the device under measurement.
1278	In USB Storage mode, all keys are locked. Please disconnect the USB Cable.	Remove the USB cable first before operating. To use USB communication, in system settings, set USB Function to <b>Control I/O</b> .
1279	Fail verionup! Retry after reboot.	Update the system again.

## 16.2 Messages and Corrective Actions

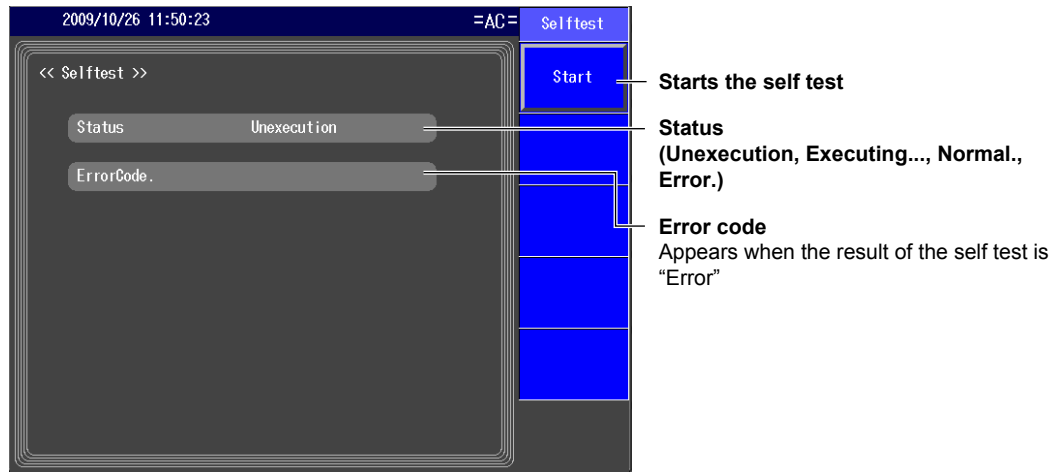
Error Number	Message	Solution
1280	Inband Session is disconnected.	Check the network settings of the other device.
1281	Incorrect date and time setting. Set the correct date and time.	Set the correct date and time.
1282	Incorrect User Name setting. Set the correct User Name.	Set the user name using up to 15 characters.
1284	The control to the destination machine failed.	Check the source/destination address and the network settings of the other device. If you do not want to use the function that tries to synchronize to the other device, disable this function in the test option settings.
1285	The control to the destination machine failed. There is a possibility that is not the measurement result display.	Press STOP on the other measuring device to display the measurement screen, and then start measurement again. If you do not want to use the function that tries to synchronize to the other device, disable this function in the test option settings.
1286	It failed in making of the file for the screen forwarding.	Wait a moment, and then try again.
1287	It failed in forwarding the screen.	Check the source/destination address and the network settings of the other device.
1288	Cannot make file or folder in this folder.	Delete unnecessary files and directories.
1289	Cannot make statistics log file, because log data doesn't exist.	Measure first and then save. Or, check the statistics log settings.
1290	The system version of the destination is mismatch.	Check the version of the other device.
1291	Cannot make measurement result file, because measurement data doesn't exist.	Measure first and then save.
1292	Load Error(Bad Measurement Type). (This File is for "RFC2544".)	Match the test type that you are loading to the test type that you used to create the test and then load.
1293	Some sd files were not found.	Check that all the setup files (sd files) that are defined in the setup file list are in the specified directory.
1294	Decompression of the dmz file failure.	Create the dmz file again using the setup software.
1295	This File is for "10G". The test interface was changed into SFP from XFP.	To test 10G, use the AQ1300.
1296	Load Error(Bad Measurement Type) (This File is for "VLAN Test".)	Match the test type that you are loading to the test type that you used to create the test and then load.
1297	The file format is not valid.	Check the contents of the file.
5001	System Error.	The system may be broken.
5002	FPGA Configuration Error.	Contact your nearest YOKOGAWA dealer.
5003	FAN Alarm.	
5004	Detect Bad Clock.	
5005	Detect Bad Optical Module.	The optical module may be broken. Replace it with a new optical module.

## 16.3 Performing a Self Test

### Procedure

#### System Menu

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



### Explanation

In the self test, the AQ1300 or AQ1301 performs the following operations.

- Internal 10 Gbps and 1 Gbps loopback tests.

#### Status

The self test status is indicated.

Status	Description
Unexecution	The self test has not been executed yet.
Executing...	The self test is being executed.
Normal.	The results of the self test are normal.
Error.	An error occurred during the self test.

#### ErrorCode.

An error code appears when the result of the self test is "Error."  
If "Error" is displayed, contact your nearest YOKOGAWA dealer.

## 16.4 Viewing the Product Information

### Procedure

#### Product Info. Screen

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



### Explanation

The following information about the AQ1300 or AQ1301 is displayed.

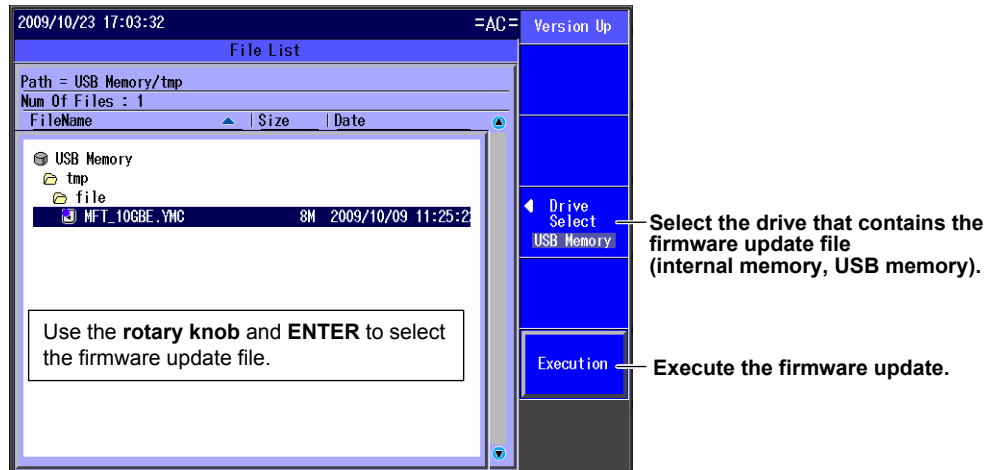
Model Name, Serial Number, Suffix Code, MAC Address Information (COM port, measure port), Version Information, etc.



## 16.5 Updating the Firmware

### Procedure

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



When you execute the firmware update, the following screen appears.



### Note

- When you are updating the firmware, use the AC adapter.
- When you are updating the firmware, do not turn off the power until the firmware update has finished.

### Explanation

To update the firmware, select a firmware update file (.YMC extension).

- The AQ1300 or AQ1301 will automatically restart when the firmware update ends successfully. After the AQ1300 or AQ1301 restarts, check the version information in the Product Info. screen.
- If the firmware update fails, the AQ1300 or AQ1301 will automatically restart and then display an error message. Make sure that there are no problems with the firmware update file.

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## 16.6 Replacing the Battery Pack

### Handling Precautions

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

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#### WARNING

##### Prohibitions against Actions That Cause Leaking, Heating, Ignition, and Explosion

- Do not charge the battery pack or leave it in a location that is exposed to direct sunlight, such as on a car dashboard or by a window, or in a location that is subject to high temperatures, such as in a car parked under the scorching sun.
- Do not throw the battery pack into fire or heat it.
- Do not expose the battery pack to strong mechanical shock.
- Do not allow the battery pack to be covered in water or other liquids.
- Do not disassemble or modify the battery pack.
- Do not short the positive and negative battery pack terminals. Also, do not move the battery or store it with metal items such as necklaces, hair pins, coins, or keys.
- Do not place combustible material on top of the battery pack or cover it with anything other than its case while it is providing electricity or being charged.
- Leakage from the battery pack can cause blindness if it comes into contact with your eyes. If you get leakage from the battery in your eyes, do not rub them; clean them thoroughly with clean water and then see a doctor immediately.
- Do not use or charge battery packs with the AQ1300 or AQ1301 that are not made by YOKOGAWA.
- When you attach the battery pack to the AQ1300 or AQ1301, attach it properly.

##### Prohibitions against Careless Use

- Keep the battery pack away from infants so that they do not lick it, put it in their mouths, bite it, or do other dangerous things with it.
- Leakage from the battery pack may cause damage to clothing and skin.

##### Prohibition against Use under Abnormal Conditions

If you notice that the battery pack is leaking, smells strange, is becoming hot, has changed color or shape, or exhibits some other abnormality, stop charging or using it, and turn off the power. If the battery pack is leaking, move it away from sources of fire.

##### Changing the Battery Pack

- To prevent electric shock, turn the AQ1300 or AQ1301 off, and disconnect the AC adapter power supply from it.
  - When you remove the battery pack cover, do not do so with the back of the AQ1300 or AQ1301 facing down. Also, after you attach the battery pack, be sure to close the battery cover completely. Otherwise, the battery pack may fall out and cause injury or be damaged.
- 
- 

#### CAUTION

##### Replacement Procedure

- Do not touch the battery pack electrodes. Doing so may damage the battery pack.
- When you put the battery pack in the battery case, make sure that the battery pack is facing the right direction.
- When you place the AQ1300 or AQ1301 so that its LCD is facing down, be careful not to damage the LCD.

## 16.6 Replacing the Battery Pack

### Storage Precautions

- If you will not be using the battery pack for an extended period of time, remove it from the AQ1300 or AQ1301 and store it in a dry place.
- 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 or AQ1301 will not turn on). Storing the battery pack under these conditions will degrade its performance and reduce its longevity. It is best 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 or AQ1301 and charge an empty battery for an hour at room temperature.

### Disposal

- When disposing of the batteries, follow the proper disposal regulations as specified by the relevant ordinance in your area.
- When disposing of the batteries in the EU, follow the Waste Electrical and Electronic Equipment (WEEE) Directive.

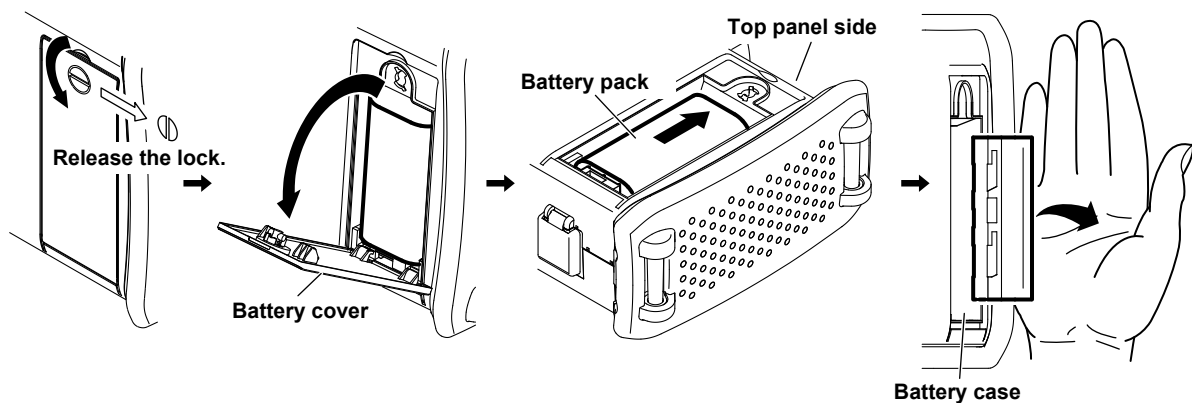
Contact your nearest YOKOGAWA dealer under the following circumstances.

- When the battery pack is broken or behaves strangely.
- When the battery run time becomes short and the battery pack needs to be replaced (the battery pack is a consumable item).

## Removing the Battery Pack

Before you remove the battery, turn off the power and unplug the AC adapter from the AQ1300 or AQ1301.

1. Release the battery cover lock.  
Insert a coin or screwdriver with a thickness that will not damage the lock slot into the lock slot, and release the lock.
2. Remove the battery cover.
3. Slide the battery pack towards the top panel.
4. Turn the AQ1300 or AQ1301 so that it is facing you, and remove the battery pack from the case.  
Put your hand next to the battery case so that the battery pack does not fall out.



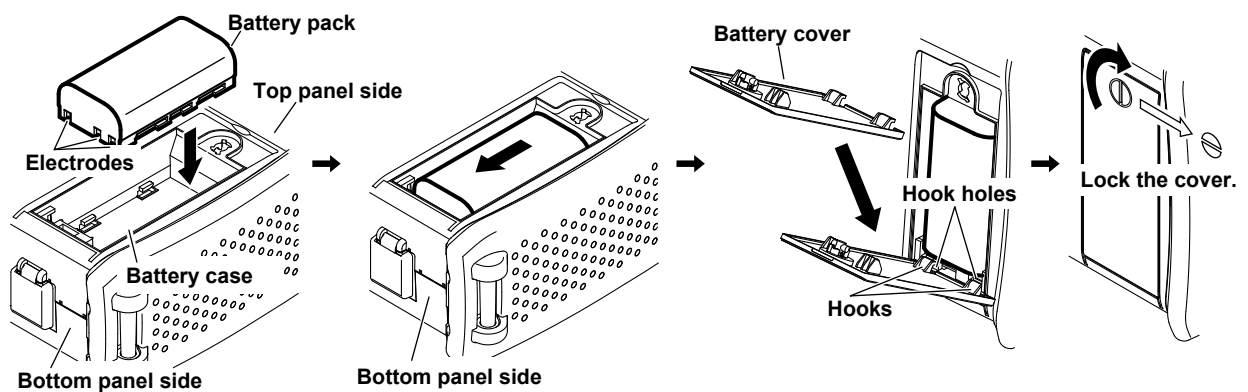
## Attaching a Battery Pack

Before you attach the battery, turn off the power, and unplug the AC adapter from the AQ1300 or AQ1301.

1. Remove the battery cover by following the first two steps in the previous section.
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.
 

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



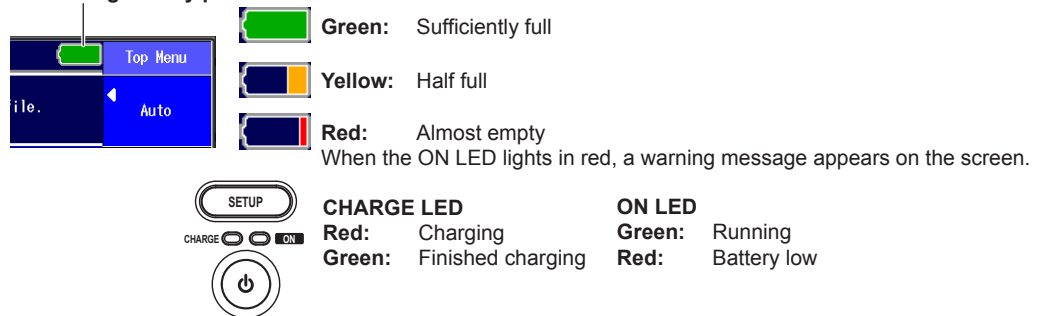
## Charging a Battery Pack

When the battery is low, a warning message will appear. When this happens, charge the battery.

1. Connect the power cord to the AC adapter.
2. Connect the AC adapter plug to the AQ1300 or AQ1301.
3. Connect the power plug to an outlet.

The remaining battery pack power appears at the top of the screen.

### Remaining battery power indicator



### Note

- The AQ1300 or AQ1301 will turn off automatically a few minutes after the warning message about the remaining battery power appears.
- If the battery pack is hot, wait for it to return to room temperature before you charge it.
- The battery run time depends on whether or not you make the screen bright and the other ways in which you use the AQ1300 or AQ1301.

## 16.7 Routine Maintenance

### Cleaning the Outside of the AQ1300 or AQ1301

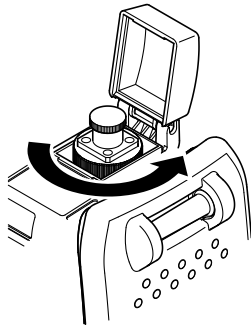
To clean the LCD and the outside of the AQ1300 or AQ1301, turn off the power; remove the power cord from the outlet; use a damp, well-wrung cloth to wipe the LCD and the outside of the AQ1300 or AQ1301; and then wipe them off with a dry cloth.

#### Note

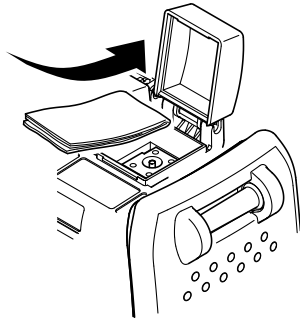
- Turn the power off when you clean the AQ1300 or AQ1301.
- Do not use chemicals such as thinner, benzene, or alcohol. Doing so may cause deformation and discoloring.
- Use a well-wrung cloth. Otherwise, water may get inside the AQ1300 or AQ1301.

### Cleaning the OPM Port

1. Open the OPM port cover.
2. Turn the optical adapter knob to the left.



3. Use a lens cleaner to clean the optical components.



4. Turn the optical adapter knob to the right.

#### Note

- Clean the optical components using a smooth lens cleaner that will not leave lint or dust on the lenses.
- The OPM port cannot be cleaned with a stick-shaped cleaning tool.

## 16.8 Recommended Replacement Parts

For part replacement, contact your nearest YOKOGAWA dealer.

### Parts with Limited Service Lives

Part Name	Service Life	Notes
Battery pack	Approx. 300 charges	The service life varies depending on the environment in which the battery pack is used.

### Consumables

We recommend replacing the following parts at the intervals listed below.

Part Name	Recommended Replacement Interval*
Cooling fan	3 years
Backup battery (lithium battery)	5 years
LCD backlight	Approx. 50,000 hours
DC power supply connector	5000 times
USB connector	1500 times
XFP module connector	200 times
SFP module connector	100 times
RJ-45 connector	200 times

\* The recommended replacement interval can vary greatly depending on the operating environment and the frequency of use. The above intervals are estimates.

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## 16.9 Calibration

Periodic calibration is an effective means of keeping the instrument performing correctly for a long time and of detecting malfunctions at an early stage. We recommend that you have the AQ1300 or AQ1301 calibrated once a year.

## Appendix 1 Data File Format

### Statistic Log File Example

The following example shows the saved statistic log file being displayed in a spreadsheet program.

	A	B	C	D	E
1	Time(YY/MM/DD hh:mm:ss)	Tx:Rate(fps)	Rx:Rate(fps)	Tx:Rate(%)	Rx:Rate(%)
2	2009/12/1 9:00:00	14881	14881	10.00000	10.00000
3	2009/12/1 9:00:01	14881	14881	10.00000	10.00000
4	2009/12/1 9:00:02	14881	14881	10.00000	10.00000
5	2009/12/1 9:00:03	14881	29762	10.00000	20.00000
6	2009/12/1 9:00:04	14881	119048	10.00000	80.00000
7	2009/12/1 9:00:05	14881	37202	10.00000	25.00000
8	2009/12/1 9:00:06	14881	14881	10.00000	10.00000
9	2009/12/1 9:00:07	14881	14881	10.00000	10.00000
10	2009/12/1 9:00:08	14881	14881	10.00000	10.00000
11	2009/12/1 9:00:09	14881	14881	10.00000	10.00000



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