
**User's
Manual**

**AQ1300 Series
1G/10G ETHERNET
Multi Field Tester**

Thank you for purchasing the AQ1300 Series 1G/10G ETHERNET Multi Field Tester. This user's manual explains the features, operating procedures, and handling precautions of the AQ1300 Series. 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 Series manuals. Please read all the manuals.

| Manual Title | Manual No. | Description |
|---|----------------|---|
| AQ1300 Series 1G/10G ETHERNET Multi Field Tester Operation Guide | IM AQ1300-02EN | This guide focuses on the handling precautions, basic operations, and specifications of the AQ1300 Series. |
| AQ1300 Series 1G/10G ETHERNET Multi Field Tester User's Manual (included in CD) | IM AQ1300-01EN | This manual. It explains all the AQ1300 Series features and how to use them. |
| AQ1300 Series 1G/10G 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 Series setup files, display result files, and generate CSV files. |
| AQ1300 Series Remote Control Software User's Manual (in CD) | IM AQ1300-63EN | This manual explains how to remotely control the AQ1300/AQ1301 from a PC. |

Notes

- **This manual (IM AQ1300-01EN 6th edition) applies to AQ1300 Series 1G/10G 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.
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Revisions

1st Edition: November 2009
2nd Edition: March 2010
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5th Edition: March 2013
6th Edition: June 2014

Conventions Used in This Manual

Notes

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



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

WARNING

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

CAUTION

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

Note

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

Symbols and Conventions Used in Procedural Explanations

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

Procedure

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

Explanation

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

Character Notations

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.

Unit

k Denotes 1000. Example: 12 kg, 100 kHz

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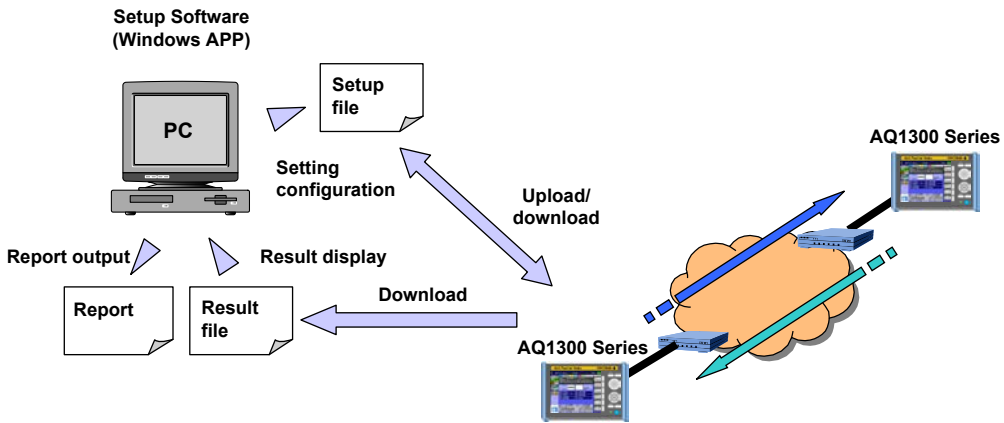
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1.1 Interaction between the Setup Software and the AQ1300 Series

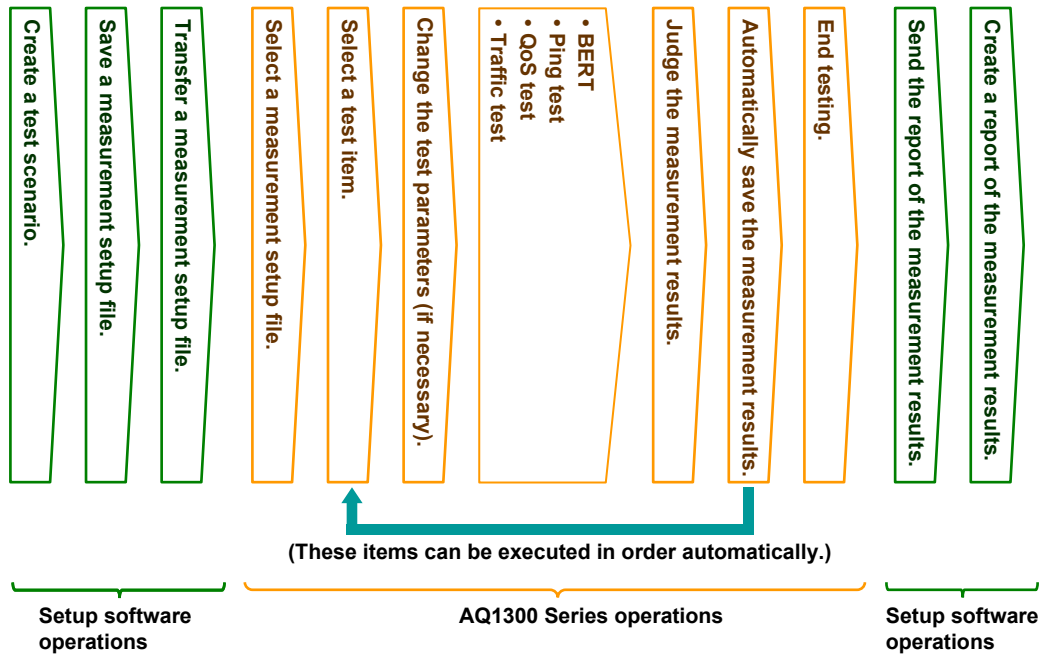
Create a test scenario with the setup software PC application, and then save the scenario to a setup file. Upload the saved setup file to the AQ1300 Series (AQ1300 and AQ1301), and then use the test scenario to perform a test. The test results are saved to a result file. Use the PC to download the result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

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 Series system settings.

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

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 Series 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 Series 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 Series 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.

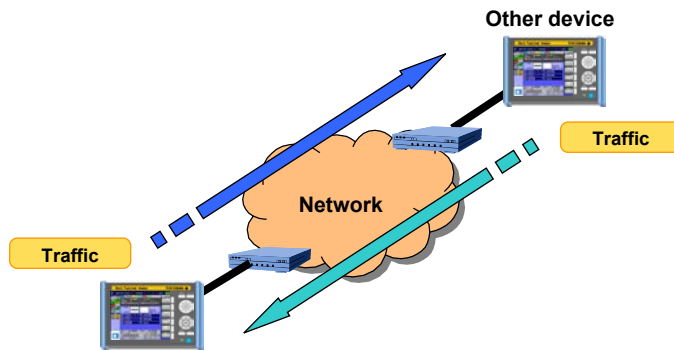
The other device must be set to BERT mode or Loopback Test mode.

1.4 Test Configurations

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

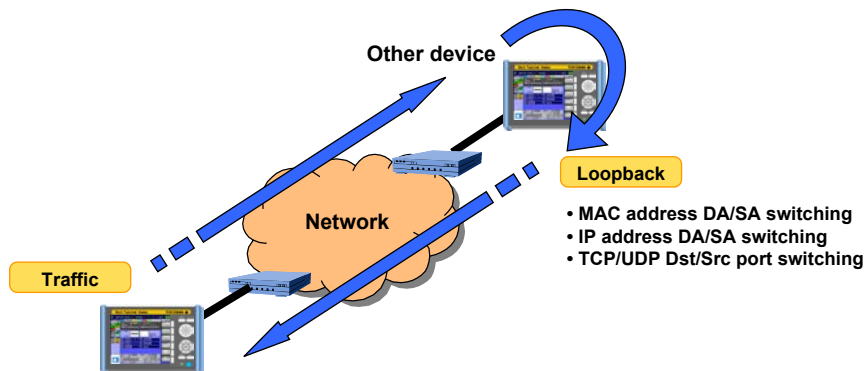
Two-Way Traffic Test

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



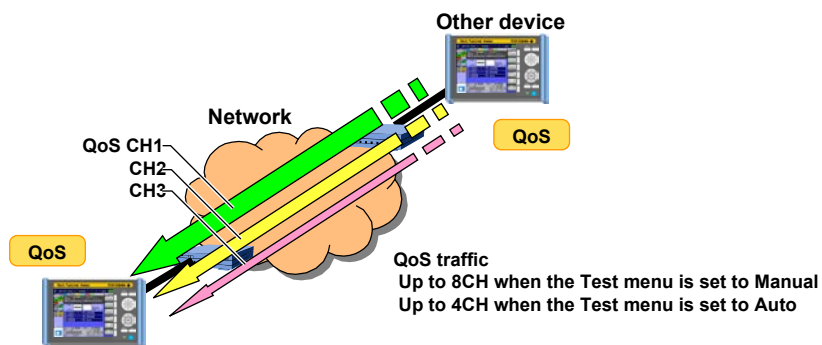
Loopback Traffic Test (Latency measurement)

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



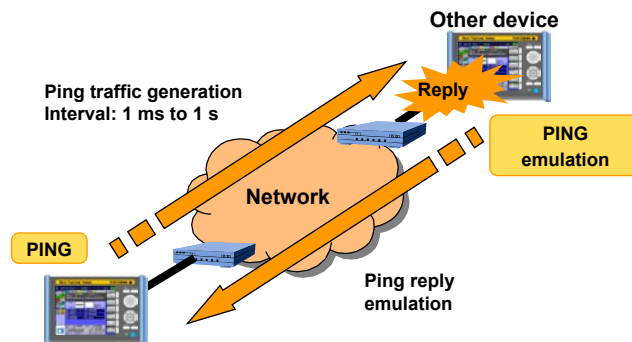
QoS Test

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



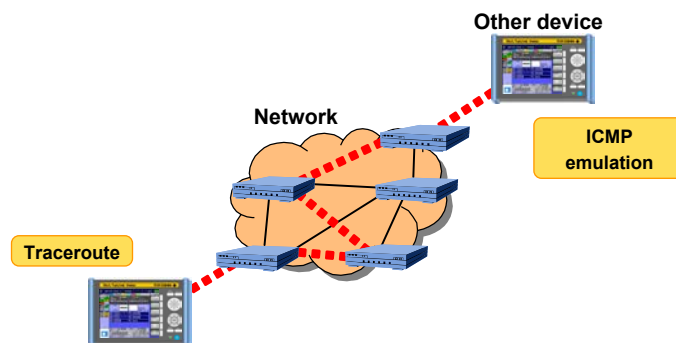
Ping Test

The AQ1300 Series verifies layer 3 connectivity.



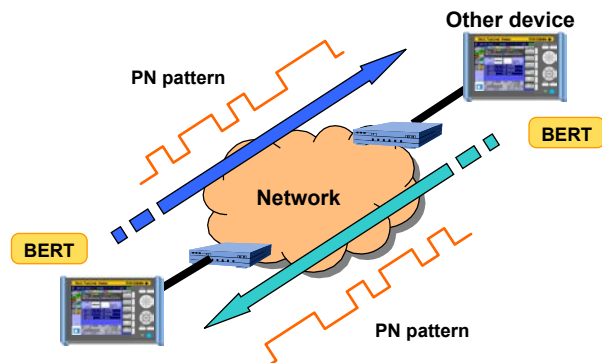
Traceroute Test

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



BERT Test

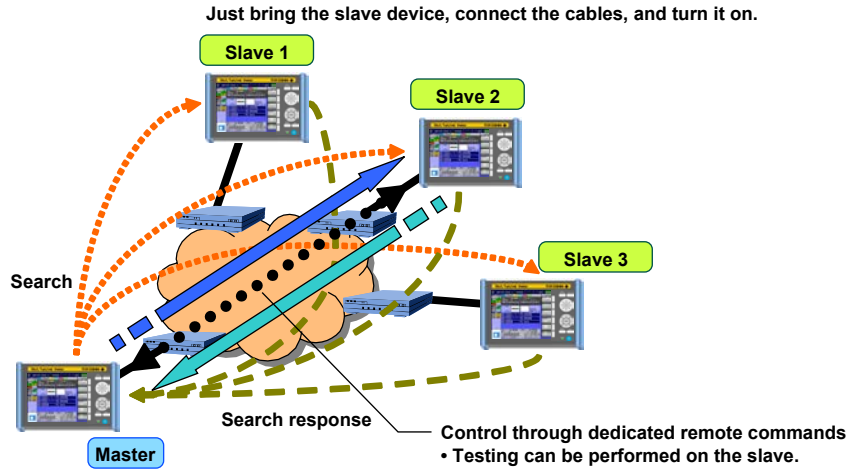
The AQ1300 Series performs a bit error rate test.



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 Series 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 Series 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 Series 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 Series can transmit LF and RF signals consecutively (start/stop).

Also, when Manual has been selected in the Test menu, the AQ1300 Series 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 Series 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 Series 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 Series 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 Series 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 μ 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 μ 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 Series or the DUT connected to the AQ1300 Series 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.

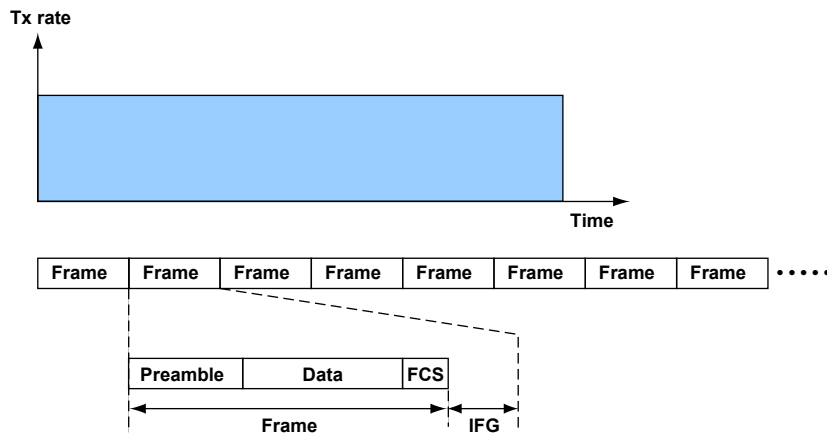
Tx Rate Settings

Traffic Format

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

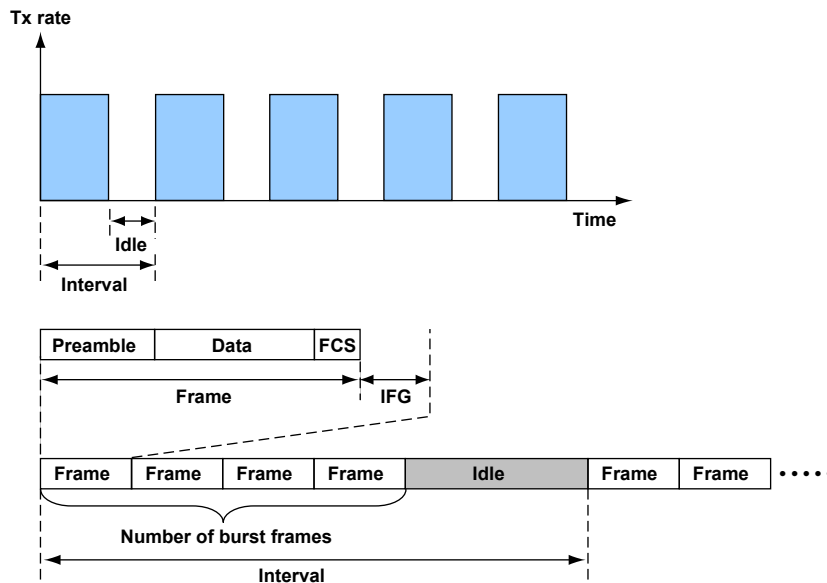
Constant

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.



1.6 Transmission Features

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 Series 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 |

1.6 Transmission Features

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 Series | 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 Series 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 Series 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.

| | | | |
|-----------------|------------------|------------------|----------------|
| Preamble | Data | Test tags | FCS |
| 8 bytes | Arbitrary | 16 bytes | 4 bytes |

Inserted Data

The following data is inserted into test tags.

| Data Type | Description |
|----------------------|---|
| Test ID | The IDs of the AQ1300 Series 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 Series 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 Series 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 Series can perform a BER measurement to check for device errors.

Error Addition

The AQ1300 Series 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 Series takes the statistics of the frames that pass through them.

Latency Measurement

If you set the other device to Loopback Test mode, the AQ1300 Series 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 Series measures the maximum, minimum, and average gaps (IFGs) between packets. The values are displayed both in μ 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 Series 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.

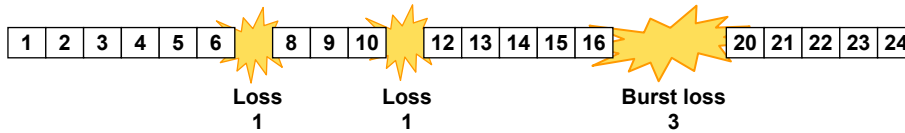
Detected Sequence Errors

| 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.



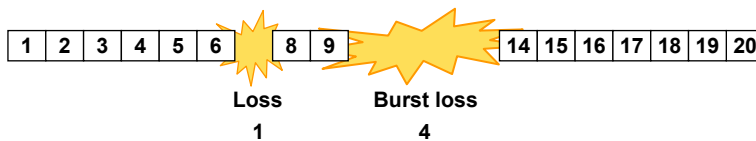
Loss Packet: 5
Max Burst Loss: 3
Reorder Packet: 0
Duplicate Packet: 0

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 Series is unable to receive are counted as burst loss packets. The Max Burst Loss number represents the maximum burst loss value.



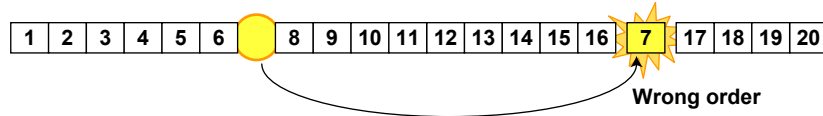
Loss Packet: 5
Max Burst Loss: 4
Reorder Packet: 0
Duplicate Packet: 0

Note

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

Reorder Packet

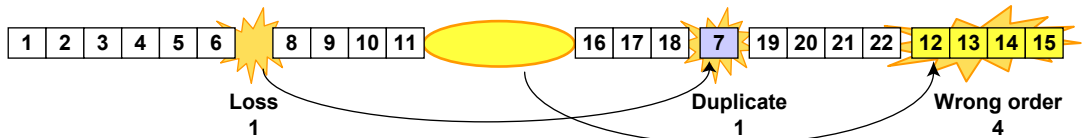
Frames that are received out of the order that they were sent in are counted as reorder packets. The Reorder Packet number represents the total number of reorder packets.



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

Note

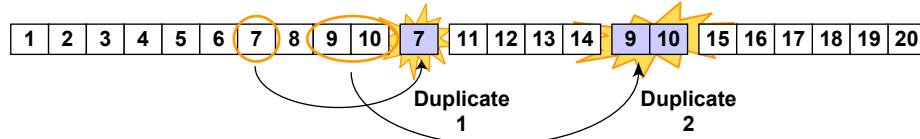
- Reorder packets are detected from the previous loss packet or burst loss packet area.
- Reordered frames that are from two or more losses or burst loss areas before are counted as duplicate packets.



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

Duplicate Packet

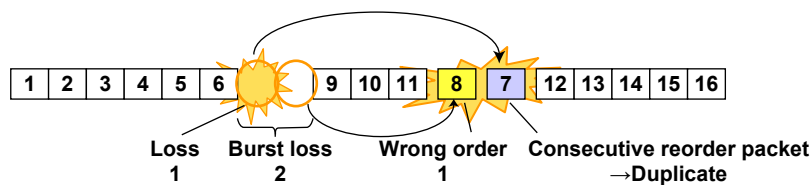
Frames that are received more than once are counted as duplicate packets. The Duplicate Packet number represents the total number of duplicate packets.



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 Series 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 Series 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

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 Series 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 Series 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. Supported in firmware version (FW Ver.) R1.08.01.001 and later. |
| | RF receive column count | 16-digit integer | |
| | 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 | |

1.8 Statistics

| 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 | 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 | 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 | |
| | 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 (×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 Series 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 Series 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 Series detected 16 or more sync headers (2 bits) set to 00 or 11 in a 125 μ 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 Series 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 (μ s)

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 Series 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 Series 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 Series synchronizes with the received frame at least once (when the BERT target byte is not zero). The AQ1300 Series 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 Series 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 Series 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 Series

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 Series.

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 Series.

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 Series 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 Series 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 Series sends ARP replies in response to ARP requests with VLAN tags attached.

ARP Requests with Test Tags

The AQ1300 Series 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 Series is waiting to send an ARP reply and a normal test frame, after transmission resumes, the AQ1300 Series 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 Series will not send a reply to that request.

Ping Reply

The AQ1300 Series 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 Series 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 Series 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 Series is waiting to send a ping reply and a normal test frame, after transmission resumes, the AQ1300 Series 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 Series will not send a reply to that request.

Automatic MAC Address Acquisition

In automatic MAC address acquisition, the AQ1300 Series 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 Series, ARP acquisition is performed with the default gateway. (Acquisition is performed before measurement starts. Afterwards, the statistics are cleared and measurement starts.)
- The AQ1300 Series waits for a reply after it sends an ARP packet. The timeout value is 1 second. The AQ1300 Series 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 Series 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 Series 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 Series 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 Series 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 Series sends NAs in response to NSs with VLAN tags attached.

NDP Requests with Test Tags

The AQ1300 Series 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 Series is waiting to send an NA, an insert frame, and a normal test frame, after transmission resumes, the AQ1300 Series 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 Series will not send a reply to that request.

Ping6 Reply

In Ping6 replying, the AQ1300 Series 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 Series 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 Series 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 Series is waiting to send a ping6 reply and a normal test frame, after transmission resumes, the AQ1300 Series 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 Series will not send a reply to that request.

Stateless Address Autoconfiguration

In stateless address autoconfiguration, the AQ1300 Series 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 Series 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 Series 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 Series waits for a reply after it sends an NS (neighbor solicitation) packet. The timeout value is 1 second. The AQ1300 Series 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.

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 Series. 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.

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 Series 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.

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 Series 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 Series and the setup software use the following files.

| File Type | File Format | Extension | AQ1300 Series (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 Series 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 Series can measure the frame signal delay variations when these frame signals travel across the network.

- Delay variations (packet jitter)

Throughput Measurement

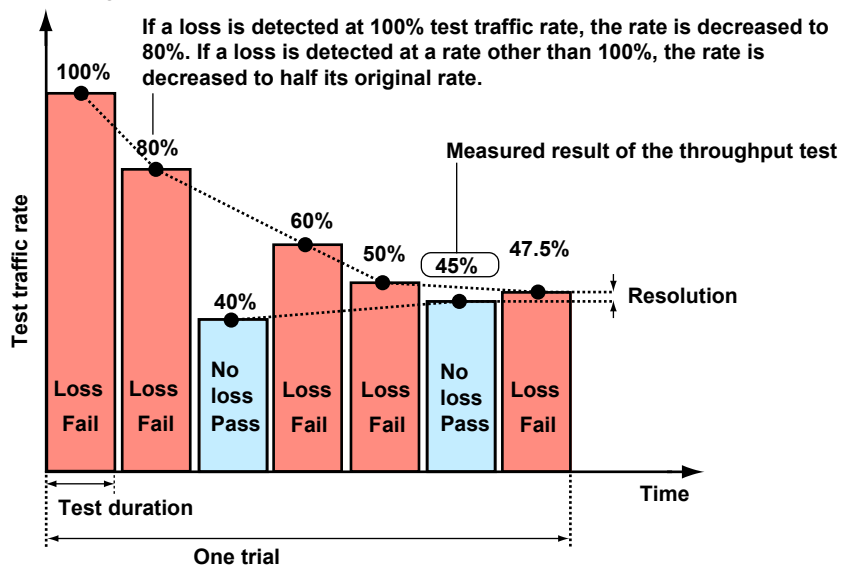
The throughput measurement measures the maximum amount of traffic (rate) that a network device can transmit without losing frame signals. In this measurement, a fixed number of frame signals are transmitted (at the initial rate) over the specified measurement time (the test duration).

During the test duration, if a loss is detected, the rate is automatically decreased. The AQ1300 Series 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 Series 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 Series 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 Series 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

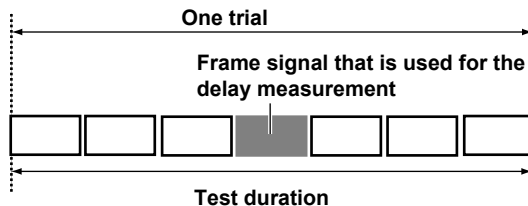
You can perform pass/fail judgments by setting the throughput threshold on the AQ1300 Series in advance. If the value falls below the threshold, a fail judgment occurs.

Latency Measurement

In the latency measurement, the AQ1300 Series 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

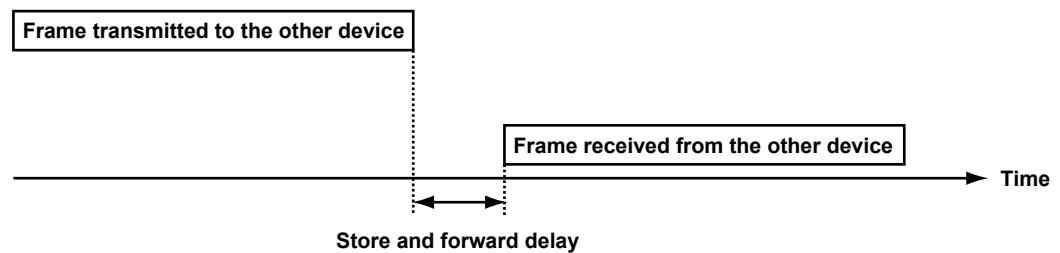
There are two transmission methods that can be used depending on the other network device. You can select the method that the AQ1300 Series displays measured results with that is suitable for the other device.

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.

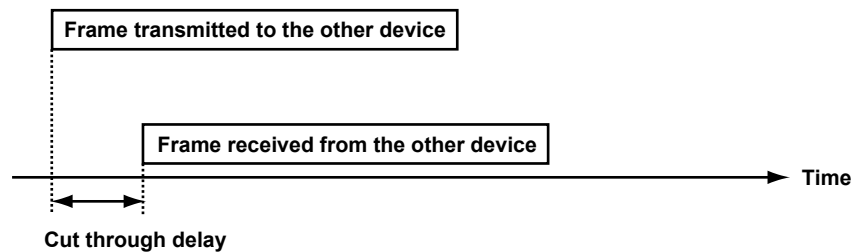
Store and Forward Method

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 Series 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

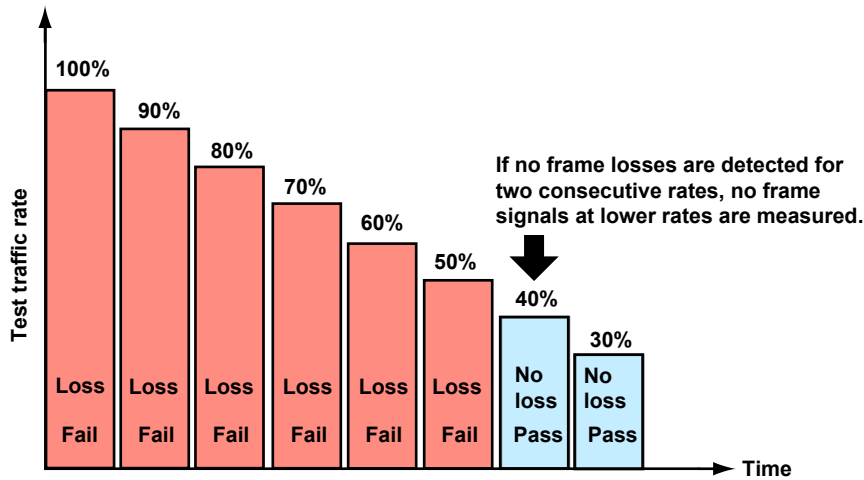
You can perform pass/fail judgments by setting the delay threshold on the AQ1300 Series in advance. If the value exceeds the threshold, a fail judgment occurs.

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 Series 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 Series 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 Series 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).

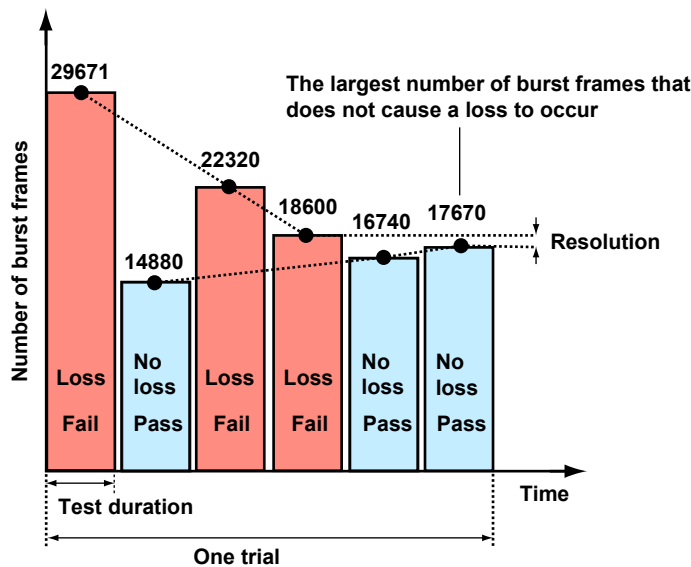
During the test duration, if a loss is detected, the number of burst frames is automatically decreased.

The AQ1300 Series 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 Series 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 Series 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 Series concludes the back to back measurement.

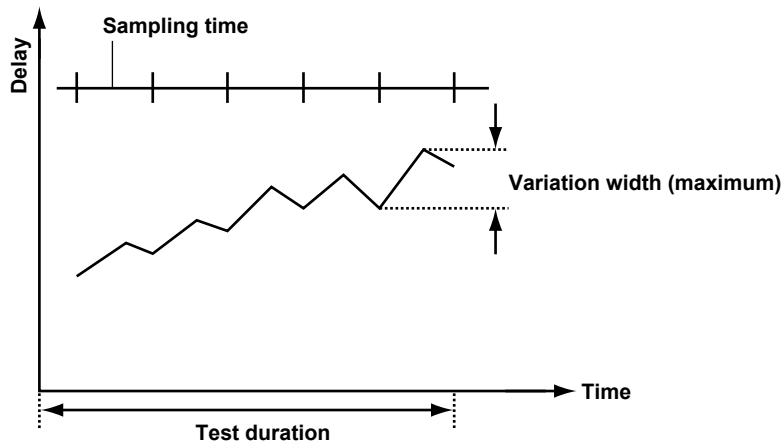
Pass/Fail Judgment

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 Series 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 Series 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 Series 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 Series 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 Series 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 Series 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.

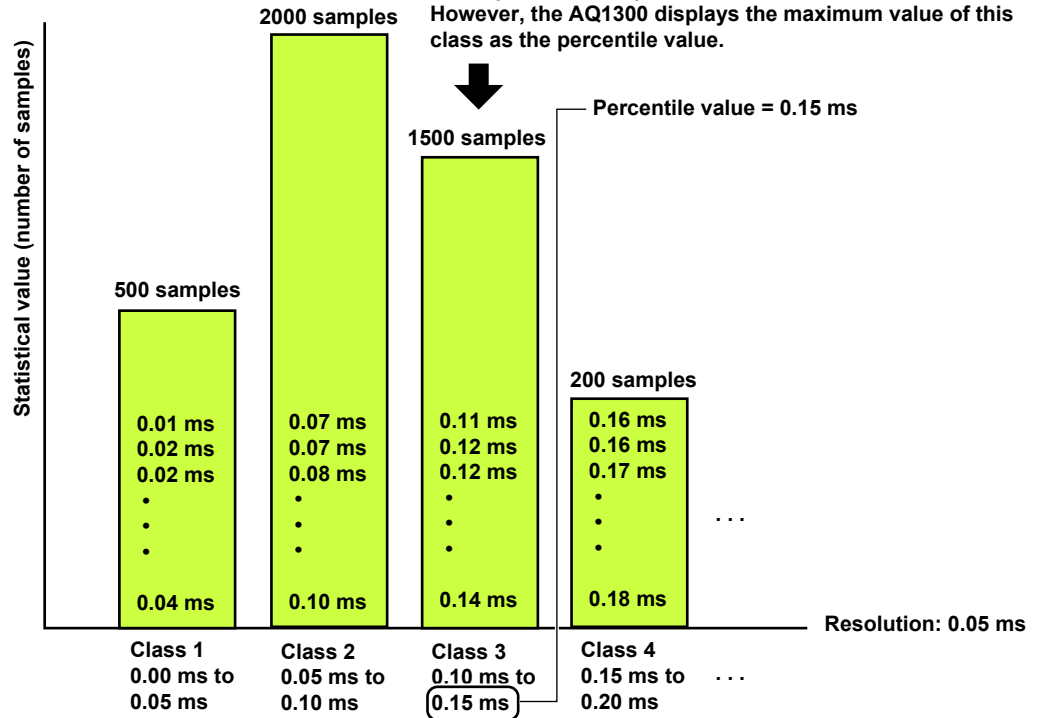
Calculation Criterion for Result

The AQ1300 Series 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 Series 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.

Example: 5000 samples

The threshold is the 75th percentile. In this example, this corresponds to sample number 3750, which is in this class. However, the AQ1300 displays the maximum value of this class as the percentile value.



Pass/Fail Judgment

You can perform pass/fail judgments by setting the delay variation threshold (the variation value's upper limit) on the AQ1300 Series 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 Series 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 Series 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 Series 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 Series in binary format (.mr extension). Saved result files can be uploaded to a Windows PC with the Setup Software.

1.18 Telnet Remote Control

The AQ1300 Series 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

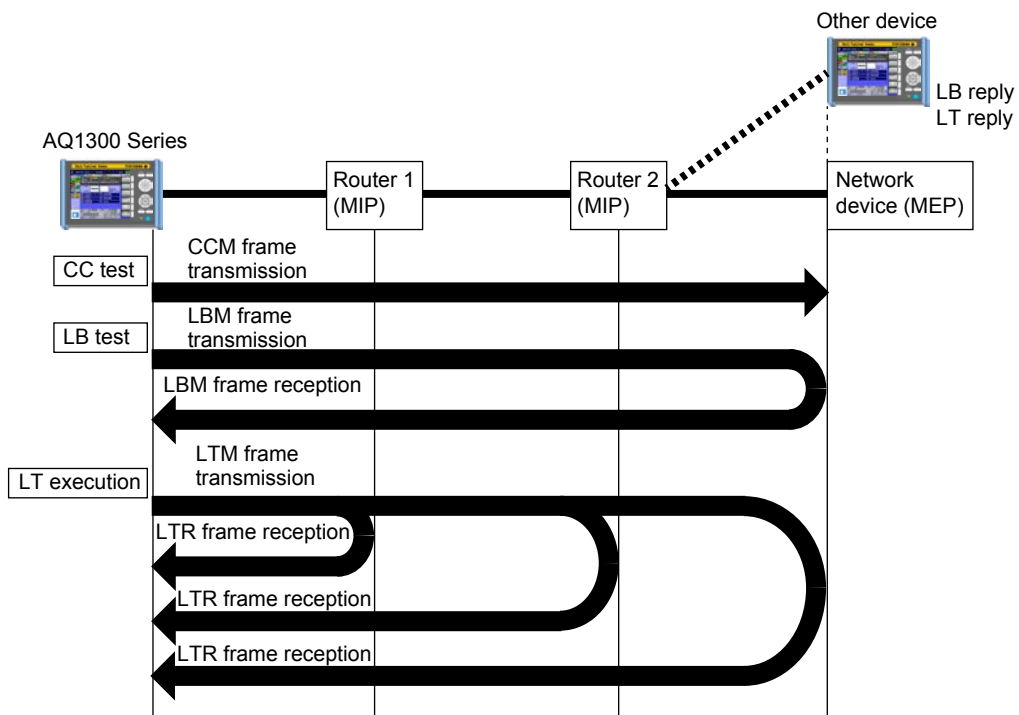
The AQ1300 Series is equipped with an Ethernet OAM (Ethernet operation, administration and maintenance; hereafter referred to as E-OAM) function that complies with the ITU-T Y.1731 Recommendation and IEEE802.1ag Standard. The following tests can be performed.

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

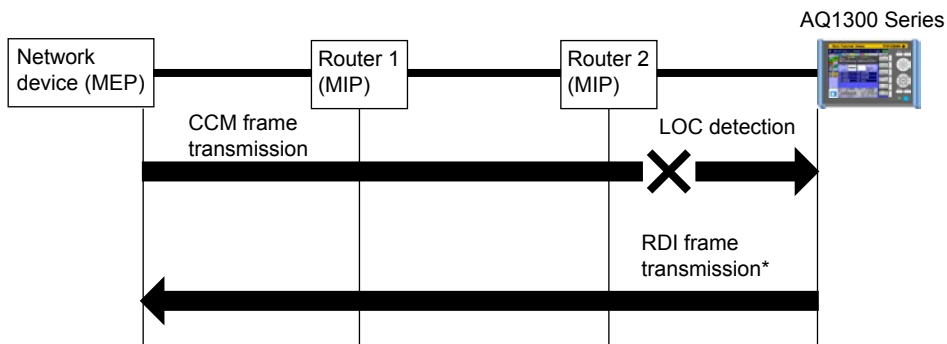


CC test

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 Series, 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.

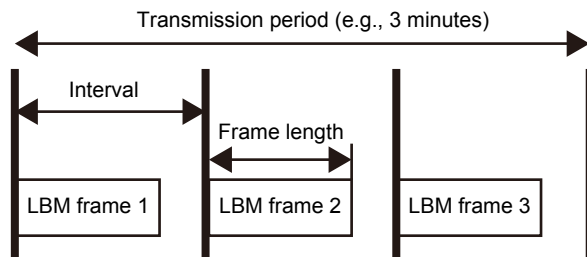
LB Test

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.

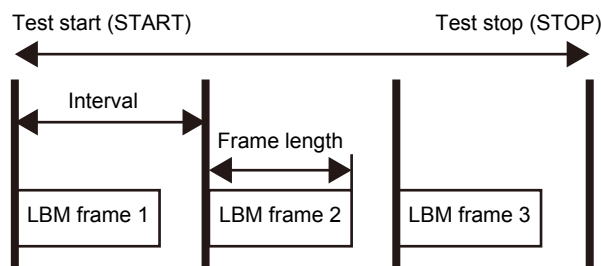
LB Test Mode

Set the length of the LB test.

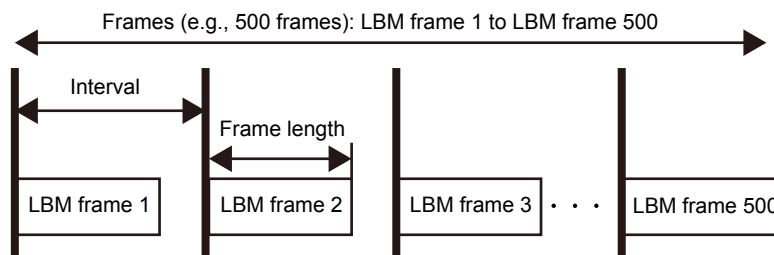
Tx mode: Time



Tx mode: Continue



Tx mode: Frames



LB Reply

If LB reply is enabled in the AQ1300 Series emulation settings, when an LBM frame addressed to the AQ1300 Series 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 Series 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 Series measurement screen.

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

Measurement status: Measurement

Summary: Remain 10[s], Tx Rate(%) : 100.00000, Frame Len.(byte): 64, Tx Time(s) : 60, Fill Pattern: Random

Test results: [Rx] Peak Rate(%): 99.77782, [Latency] Max Latency(us): 4,349.2

Error History: Error History table showing LINK L2 L3 with values 1, 0, and over.

Link status: LINK LR, 10G FULL, TX RX, L2 ERR, LFS, TxLF TxRF, RxLF RxRF

Remote control status: Start Transmit, Stop Transmit, Special Control, File, Next 1/3

Number of detected errors (0 to 999): "over" is displayed when the number of detected errors exceeds 999.

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

Test information (Title bar): 2009/10/23 17:10:58

Measurement status: Measurement

Summary: Remain 0[s], Tx Rate(%) : 100.00000, Frame Len.(byte): 64, Tx Time(s) : 60, Fill Pattern: Random

Test Results: [Rx] Peak Rate(%): 99.91743, [Latency] Max Latency(us): 5,504.0

Error History: Error History table showing LINK L2 L3 with values 1, 0, and over.

Link status: LINK LR, 10G FULL, TX RX, L2 ERR, LFS, TxLF TxRF, RxLF RxRF

Remote control status: Start Transmit, Stop Transmit, Special Control, File, Next 1/3

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

Test information (Title bar): 2009/10/23 17:13:56

Measurement status: Measurement

Summary: Remain 0[s], Tx Rate(%) : 100.00000, Frame Len.(byte): 64, Tx Time(min): 1, Fill Pattern: Random

Test Results: **Pass**, [Rx] Peak Rate(%): 99.89058, [Latency] Max Latency(us): 6,527.8

Error History: Error History table showing LINK L2 L3 with values 1, 0, and over.

Link status: LINK LR, 10G FULL, TX RX, L2 ERR, LFS, TxLF TxRF, RxLF RxRF

Remote control status: Start Transmit, Stop Transmit, Special Control, File, Next 1/3





Pass/fail indication (Pass, Fail): Pass

2.1 Measurement Screens (Common Items)

Title Bar

Simple Optical Power Monitor

When the interface is XFP or SFP, the AQ1300 Series 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 Series 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. |
| RX | | RX (green) | Frames are being received. |
| | | RX (gray) | 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"> • CRC errors • Undersize errors • Oversize errors • Symbol errors • Alignment errors |
| | 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"> • CRC errors • Undersize errors • Oversize errors • Symbol errors • Alignment errors |
| L3 | L3 (gray) | During measurement, no frames have been received with any of the following errors. <ul style="list-style-type: none"> • Bit errors • Sequence errors • Payload errors |
| | 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"> • Bit errors • Sequence errors • Payload errors |

The number of detected errors is cleared when:

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

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)

Loopback Test

Summary (loopback target)

Test-mode-specific indications (none)

QoS Test

| 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(%) | --- |

Summary (Tx rate for each channel)

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

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 Summary:
 [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.

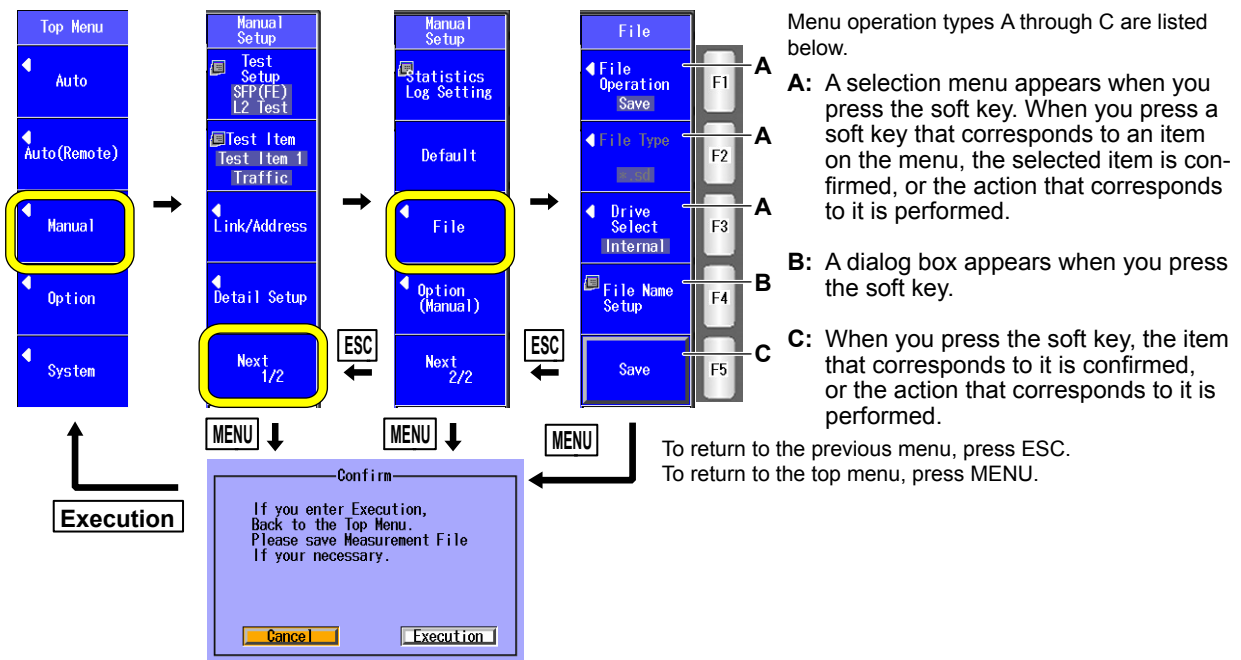
To make this manual easier to read, we have abbreviated or simplified explanations of the kinds of operations listed below.

- 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 Series will operate in the same manner as when MENU is pressed.

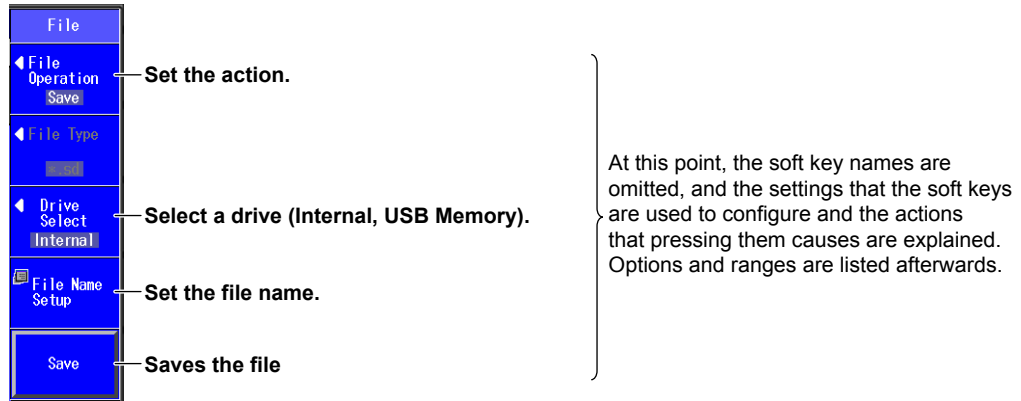
3.1 Key, Rotary Knob, and Arrow Key Operations

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.



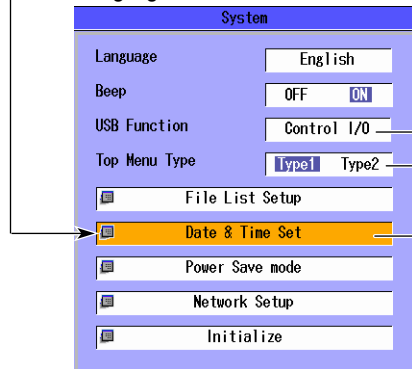
- Step numbers are used when there are many operations and when operations must be performed in different menus.
- The explanation for returning to the previous menu is omitted.

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**.”

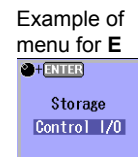
The item at the cursor location is highlighted.



Setup operation types D through H are listed below.

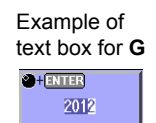
D: Press **ENTER** to confirm the item or execute its corresponding action.

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.



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.



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**.

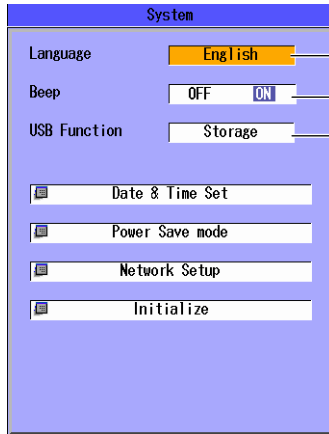
3.1 Key, Rotary Knob, and Arrow Key Operations

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.

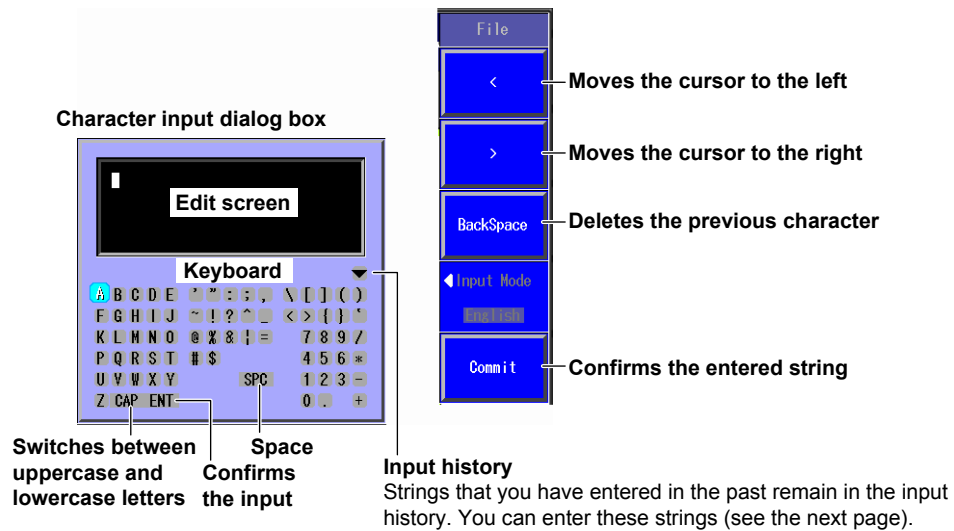
3.2 Entering Strings

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**.

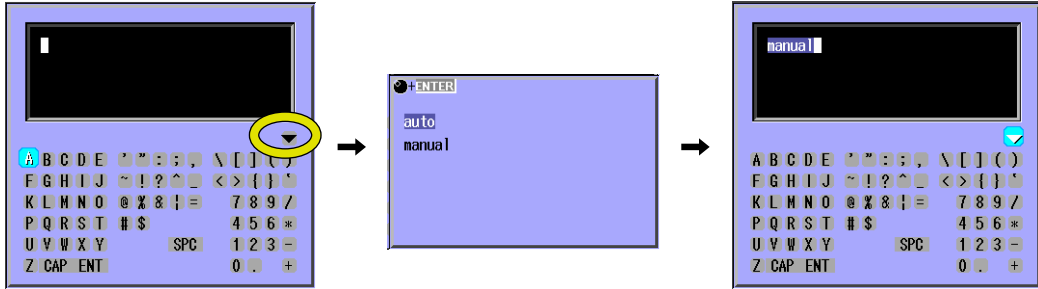


Note

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 with a list of 12 files and a right-hand navigation menu. The file list includes comments and file names, and each entry has a 'Select' button. The navigation menu includes options like 'Latest Setup', 'Default', 'File', 'Switch', 'Comment', and 'Next Page'.

Setup file list

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

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)

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 with a directory tree on the left and a file list on the right. The file list shows files with their names, sizes, and dates. The right-hand navigation menu includes options like 'File Operation', 'File Type', 'Drive Select', and 'Load'.

File list

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

Set Action to Load.

Select a drive (Internal, USB Memory).

Loads the selected file

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 Series, or you can save the settings on the AQ1300 Series.

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 Series.

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

Note

- The AQ1300 Series 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 Series.

Example: /setup/disManage.dmf
 /setup0000.sd
 /setup0001.sd
 :

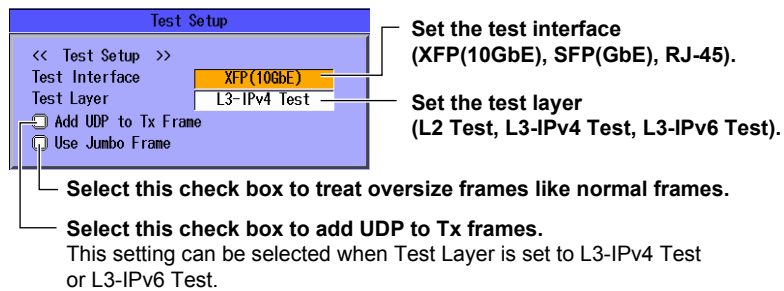
- When you are performing automatic testing, you can only select setup files that are used for automatic testing.

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)
Link Partner Info

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 Series

Applies link settings
Applies the acquired other device's link settings to the AQ1300 Series. 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:

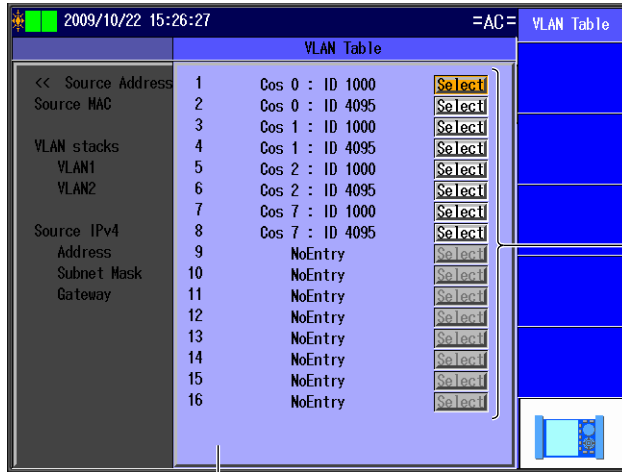
- グローバルアドレス: Select a global MAC address.
- 自動(ARP): Select the source MAC address from the MAC Address table.

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.

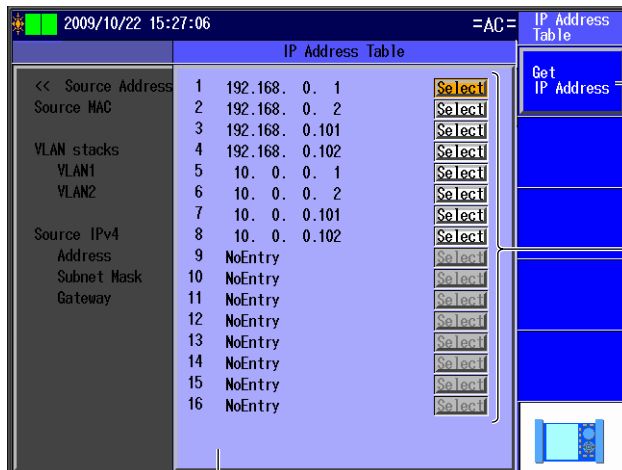
VLAN table

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.

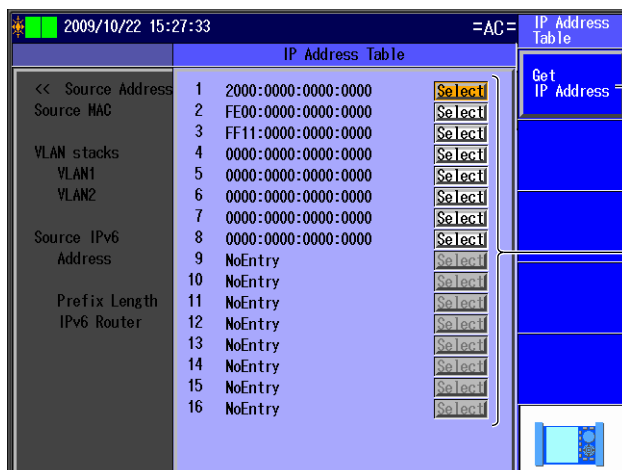
When you press this soft key, the AQ1300 Series acquires an IPv4 address through DHCP.

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.

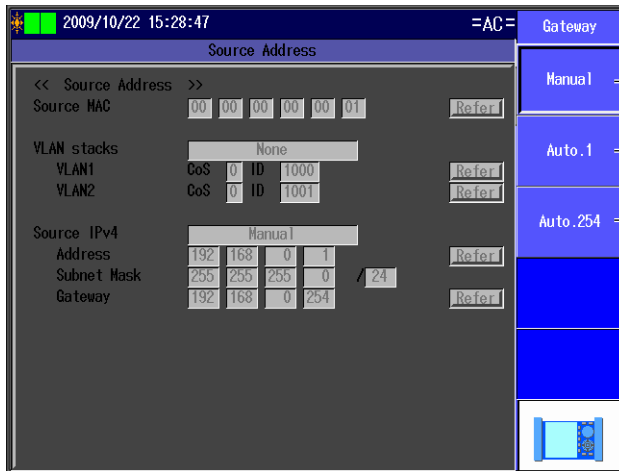
When you press this soft key, the AQ1300 Series acquires an IPv6 address through stateless autoconfiguration.

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.

Link/Address =AC=

Destination Address

<< 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:

- Link Setting: Set the destination MAC address. Refer to the MAC Address table.
- Source address: Set the destination IPv4 address. This setting appears when Test Layer is set to L3-IPv4. Refer to the IP Address table.
- Destination Address: Refer to the IP Address table.
- Search List: Select from the search list.
- Destination IPv6: Set the destination IPv6 address. This setting appears when Test Layer is set to L3-IPv6. Refer to the IP Address table.

Search List

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

Search List

| 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 Series searches for other devices (AQ1300 or AQ1301) on the same network segment.

↓ Search for other devices

Search List

| 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 | | |

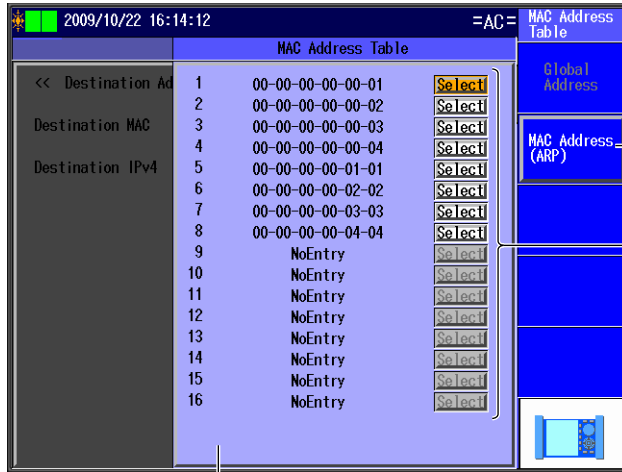
Annotations:

- Search other device: Area of the search list that changes when you switch the display
- 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 (1-16, 17-32, 33-48, 49-64)

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.

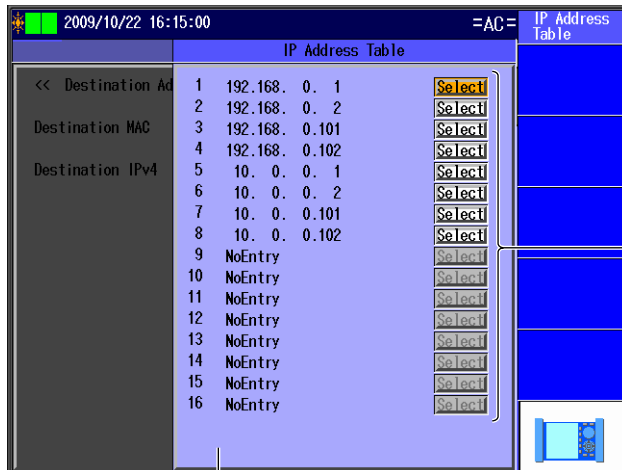
Select the destination MAC address from the MAC Address table.

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.

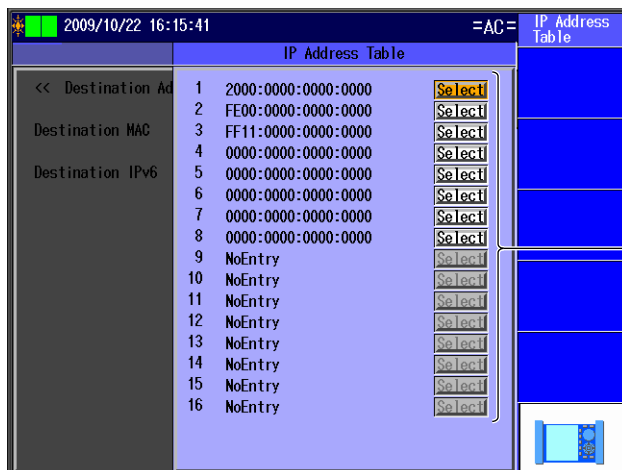
IPv4



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 fields and values:

| 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 |

Other fields include:

- Tx Rate: 100.00000 %
- Tx Mode: Time
- 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 Series 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 Series 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 Series 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 Series.

- **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 Series 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 Series. 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 Series 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 Series 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 Series 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 Series 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 Series 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 Series 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*.


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.

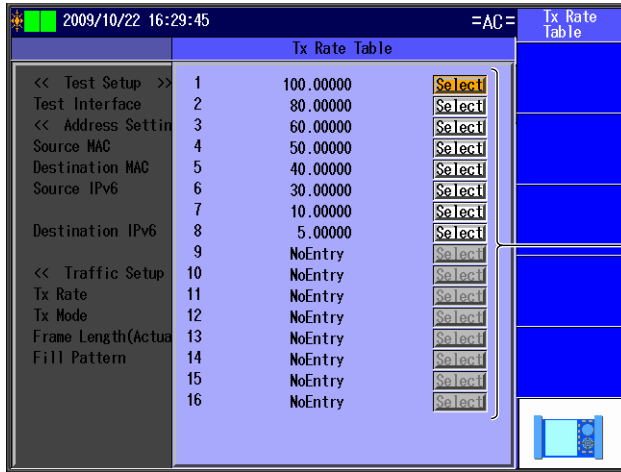
The screenshot shows the Traffic Setup screen with the following settings and callouts:

- Test Interface:** XFP(10GbE)
- Address Setting:** Source MAC (00:00:00:00:00:01), Destination MAC (00:00:00:00:00:02), Source 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:**
 - Set the Tx rate (0.00001-100.00000%).
 - Set the Tx mode (Continuous, Frames, Time).
 - 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."
 - 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.
 - Set the fill pattern (ALL0, ALL1, 0/1 alt., Random).
 - Set the number of frames (1-4294967295). This setting appears when Tx Mode is set to Frames. Refer to the Frame Length table.
 - 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.
 - Set the step (+1, -1, Random). This setting appears when frame length is set to variable.

4.5 Configuring a Traffic Test

Tx Rate Table

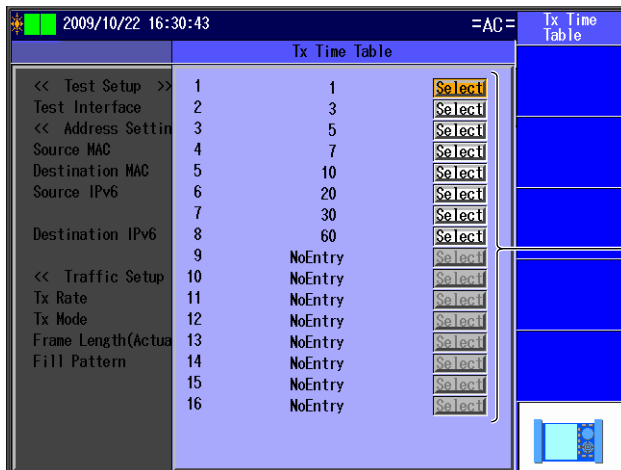
Press **Refer** next to the Tx rate to display the following screen.



Select a Tx rate from the Tx Rate table.

Tx Time Table

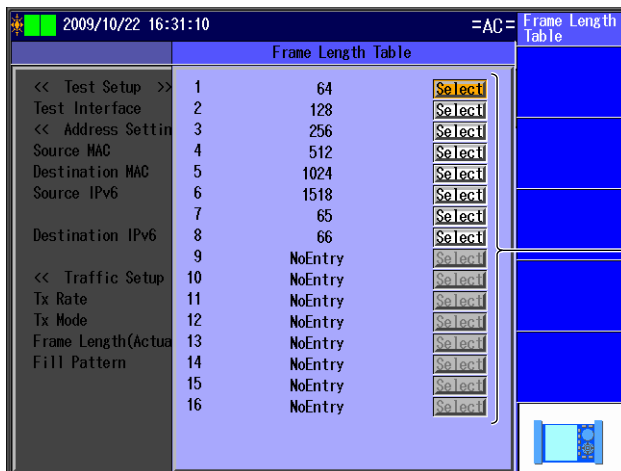
Press **Refer** next to the Tx time to display the following screen.



Select a Tx time from the Tx Time table.

Frame Length Table

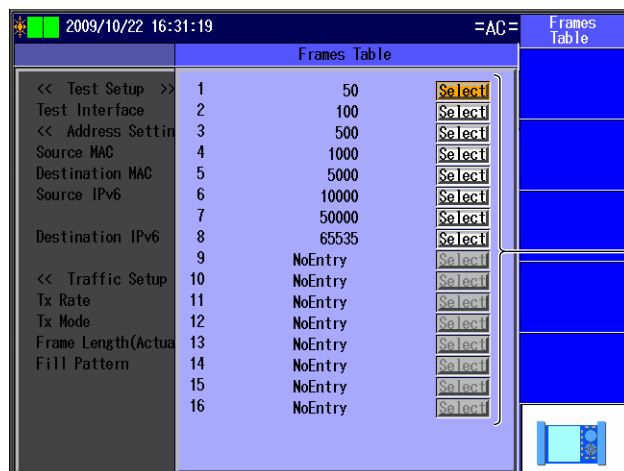
Press **Refer** next to the frame length to display the following screen.



Select a frame length from the Frame Length table.

Frames Table

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



Select a number of frames from the Frames table.

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.

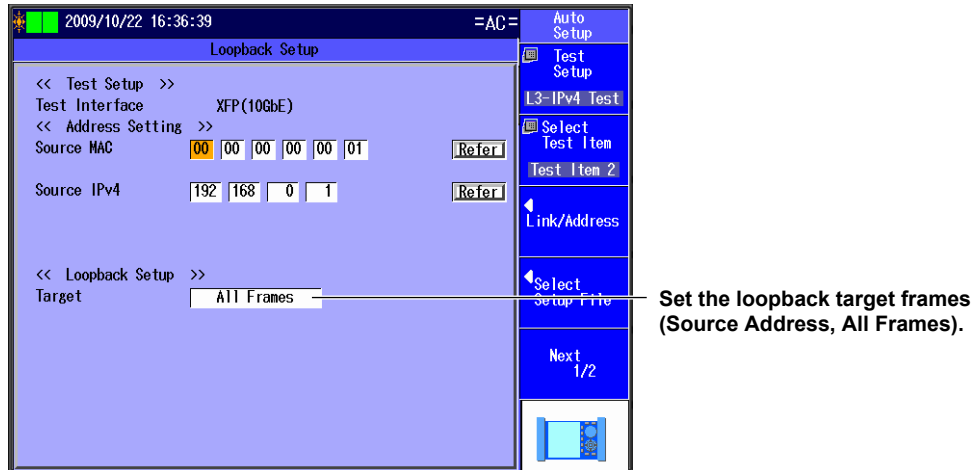
All the tables are created on the setup software. For details, see the *Setup Software User's Manual*.

4.6 Configuring a Loopback Test

Procedure

Loopback Setup Screen

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



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 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.

To the next 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 |
|-------|--------------|------------|
| CH1 | 64 byte | 25.00000 % |
| CH2 | 72 byte | 10.00000 % |
| CH3 | 128 byte | 5.00000 % |
| CH4 | 512 byte | 30.00000 % |

| Value | Frame Length | Rate |
|-------|--------------|------------|
| CH1 | 64 byte | 25.00000 % |
| CH2 | 48 byte | 20.00000 % |
| CH3 | 48 byte | 30.00000 % |
| CH4 | 48 byte | 40.00000 % |
| CH4 | 50 byte | 50.00000 % |

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 Address settings:

- Destination IPv4: Use Destination Address, 192 168 0 2
- Source IPv4 Address: 192 168 0 1
- Subnet Mask: 255 0 0 0 / 8
- 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

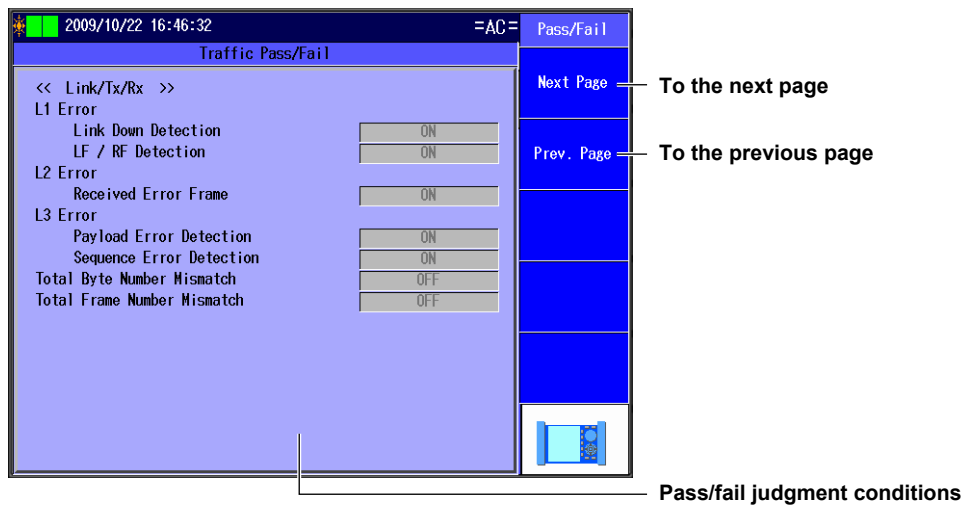
These are the same as the settings for a traffic test. For details, see section 4.5.

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*.

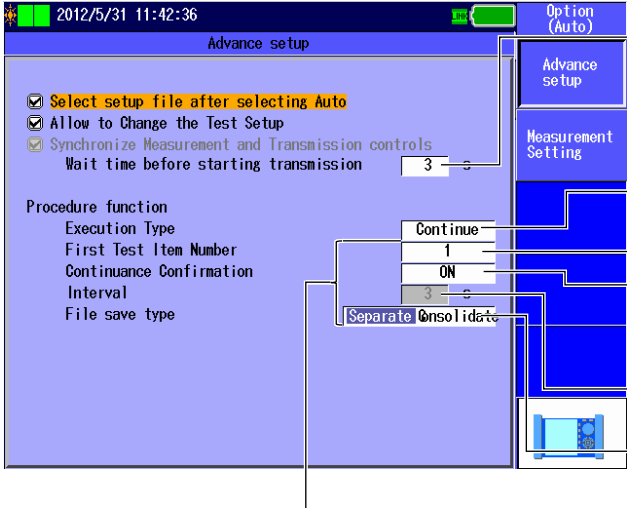
4.11 Configuring Options (Auto)

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.



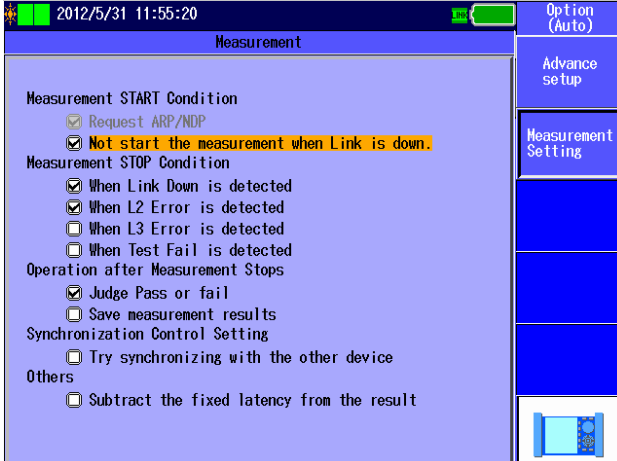
The screenshot shows the 'Advance setup' screen with the following settings and callouts:

- 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 Series will proceed to the next test item.
- OFF: Whenever a test item has finished, the AQ1300 Series 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 Series 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 Series 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 Series is already synchronized with the other device in Auto(Remote) mode.

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

Note

When you are performing BERT test, the AQ1300 Series 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 μ 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

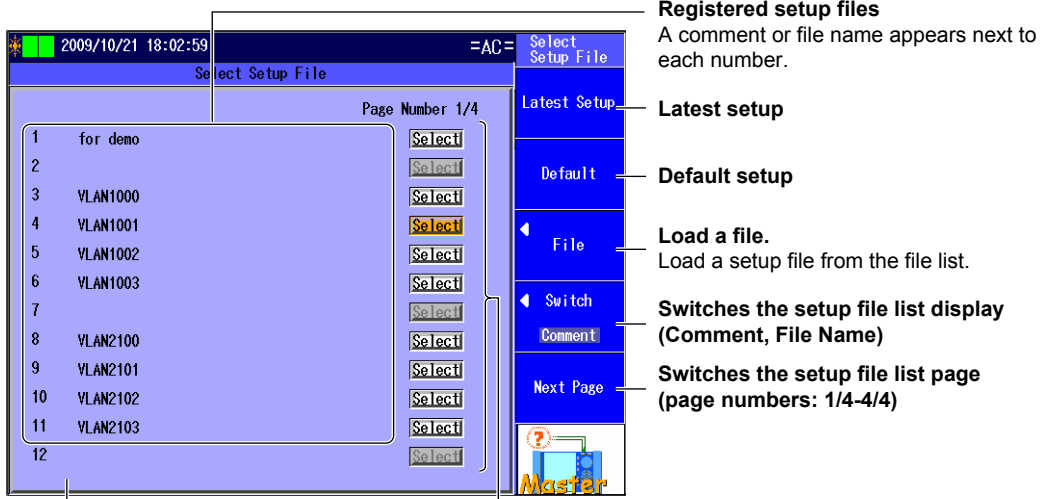
| Interface | Delay |
|---------------|-------------|
| XFP | 1.0 μ s |
| SFP (GbE) | 1.4 μ s |
| SFP (FE) | 12 μ s |
| RJ-45 (1000M) | 1.6 μ s |
| RJ-45 (100M) | 11 μ s |
| RJ-45 (10M) | 108 μ s |

5.1 Selecting a Setup File

Procedure

Select Setup File Screen

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



Setup file list

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

Select a setup file.

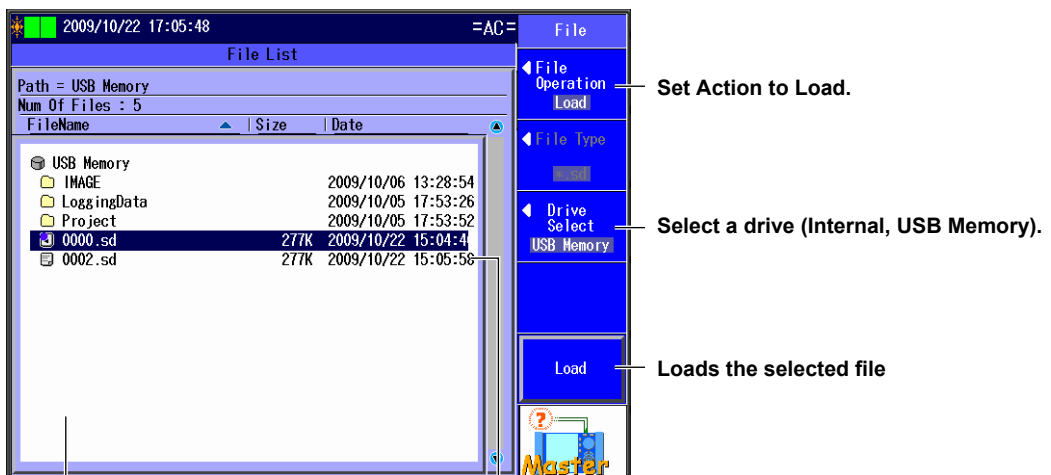
Select a registered setup file from the setup file list.

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.



File list

The files that you have created using the setup software or the AQ1300 Series 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 Series, or you can save the settings on the AQ1300 Series.

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 Series.

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

Note

- The AQ1300 Series 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 Series.

Example: /setup/disManage.dmf
 /setup0000.sd
 /setup0001.sd
 :

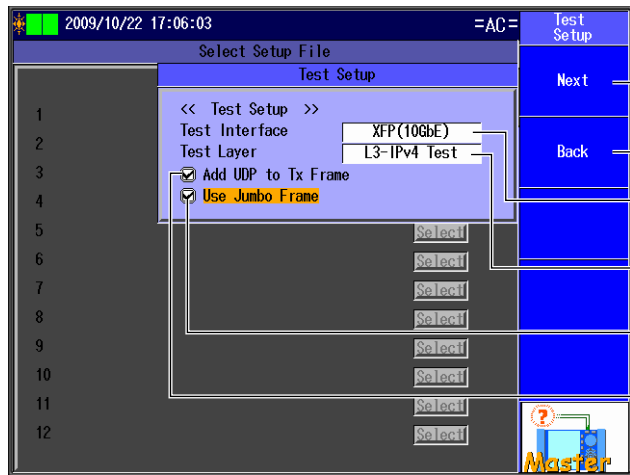
- When you are performing automatic(remote control) testing, you can only select setup files that are used for automatic(remote control) testing.
-

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 the 'Test Setup' window with the following fields and options:

- Test Interface:** XFP(10GbE)
- Test Layer:** L3-IPv4 Test
- Add UDP to Tx Frame
- Use Jumbo Frame

On the right side of the window, there are 'Next' and 'Back' buttons. A 'Master' icon is visible at the bottom right.

Annotations on the right side of the image:

- 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.

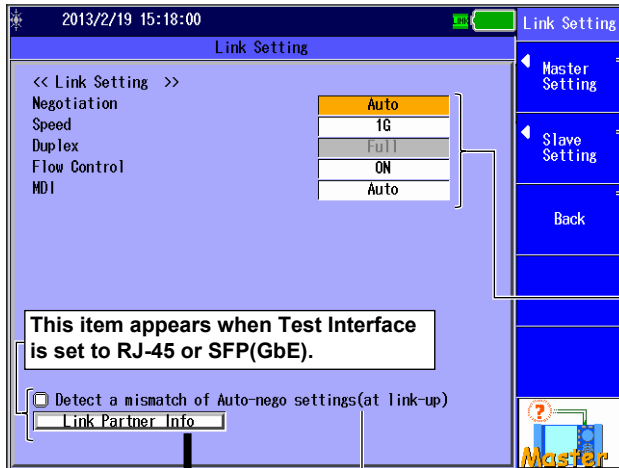
- Selected: Frames with lengths of 64 to 9999 bytes are treated as normal frames.
- Cleared: Frames whose size is above 1518 + the value set for "VLAN stacks" in the source settings × 4 are considered oversized.

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.



Configure master settings. ► section 5.4

Configure slave settings. ► section 5.5

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).

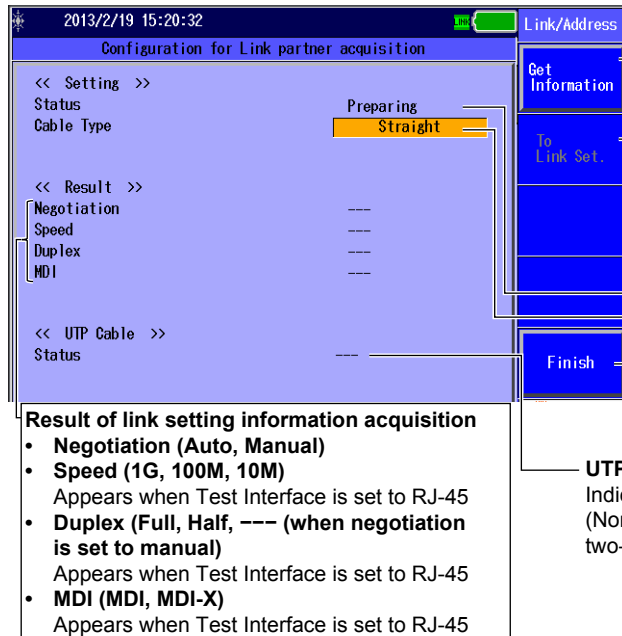
Set the speed (1G, 100M, 10M, Auto).
This setting is valid when Test Interface is set to RJ-45. The Auto setting for Speed is valid when Negotiation is set to Auto.

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 Series

Applies link settings

Applies the acquired other device's link settings to the AQ1300 Series. 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

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).

- Auto: The link between the AQ1300 Series 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 Series 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 Series 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 Series. For details, see section 4.3.

5.4 Configuring the Master Settings

Procedure

These are the procedures for configuring the AQ1300 Series 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 rows of fields: 'VLAN2' with IP ID 8100, CoS 0, ID 100; and 'VLAN1' with IP ID 8100, CoS 0, ID 1000.
- Source IPv4:** A dropdown menu set to 'Manual'. Below it, three rows of fields: 'Address' (192, 168, 0, 1), 'Subnet Mask' (255, 255, 255, 0) with a slash and '24', and 'Gateway' (192, 168, 0, 254).
- Navigation:** A vertical stack of buttons: 'Next', 'Back', and 'Get IP Address'. There are also 'Refer' buttons next to the VLAN and IPv4 sections.

Callouts on the right side of the screen provide instructions for each field and button:

- Set the source MAC 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
- Refer to the MAC Address table. ▶ section 4.3
- Configure the destination address settings.
- Configure the link settings. ▶ section 5.3
- 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.

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 rows of fields: 'Address' (FE80, 0000, 0000, 0000) and 'Prefix Length' (64).
- IPv6 Router:** A dropdown menu set to 'Manual'. Below it, two rows of fields: 'Prefix Length' (64) and 'Address' (FE80, 0000, 0000, 0000).
- Navigation:** A vertical stack of buttons: 'Next', 'Back', and 'Get IP Address'. There are also 'Refer' buttons next to the IPv6 sections.

Callouts on the right side of the screen provide instructions for each field and button:

- 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.

Destination Address Screen

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

Set the destination MAC address.
Refer to the MAC Address table. ▶ section 4.3

Select from the search list.

Manual Setting
This soft key is valid when you have selected a destination address from the search list.

Connect to the other device.

Configure the source address settings.
Refer to the IP Address table. ▶ section 4.3

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

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 Series 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)

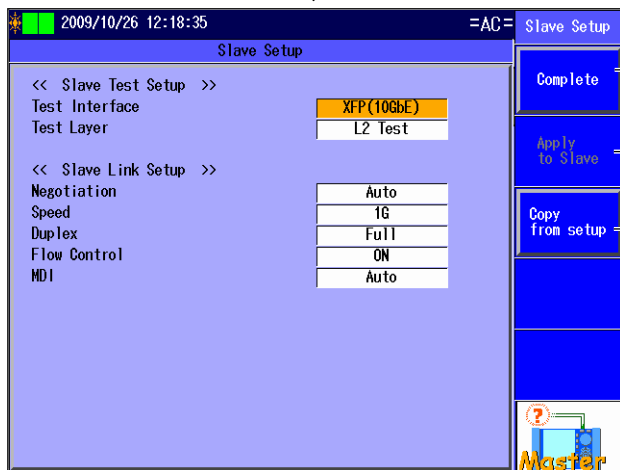
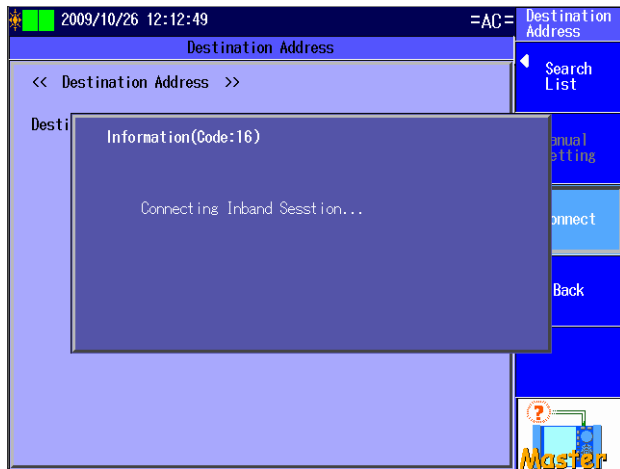
Set the address type (MAC Address, IP Address).
This setting appears when Switch is set to Master Addr.

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.

Apply to Slave — Pressing this soft key will open the Auto Setup screen.

Copy from setup — Select to apply the currently displayed settings to the slave.

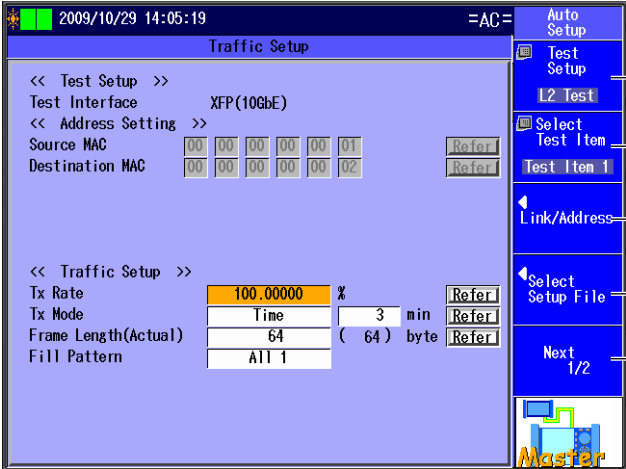
— You must perform remote reconnection after you press this key.

Copy from setup — Select to copy the slave data on the master.

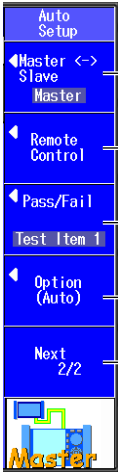
— You must press "Apply to Slave" after you press this key.

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 Series 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 Series 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 Series 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 Series 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 Series 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 Series 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 Series 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 fields for Source MAC, 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), test results (Rx Peak Rate, Latency Max, Tx/Rx Rate), and error history (LINK L2 L3, ERR ERRERR). 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.

5.5 Configuring the Slave Settings

Explanation

When you press the Slave Execution soft key, the AQ1300 Series enters into slave (connection standby) mode. The AQ1300 Series 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 Series acquires and sets the source IPv4 address using DHCP.
- Alloc From Master: The master automatically provides the AQ1300 Series 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 Series autoconfigures the source IPv6 address.
- Alloc From Master: The master automatically provides the AQ1300 Series 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 Series is displaying the top menu, it is in slave (connection standby) mode. When the master connects to the AQ1300 Series, the AQ1300 Series enters into slave mode and displays the slave execution screen.

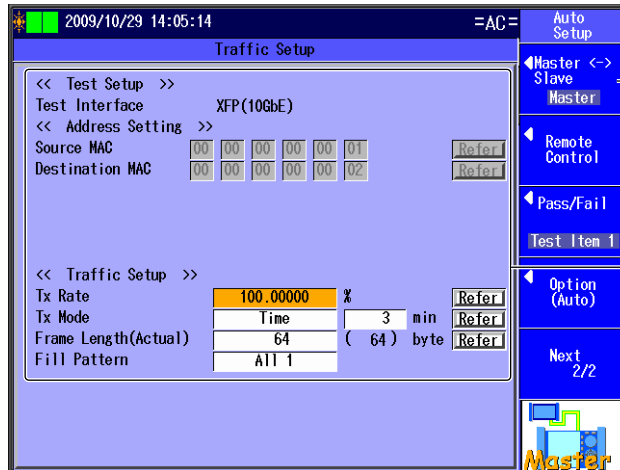
When the AQ1300 Series is in slave mode, even if you change the AQ1300 Series link or address settings from the master, they will not be saved as the latest setup.

5.6 Switching between the Master and Slave Settings

Procedure

Follow the procedure in section 5.4 to display the Auto Setup screen.

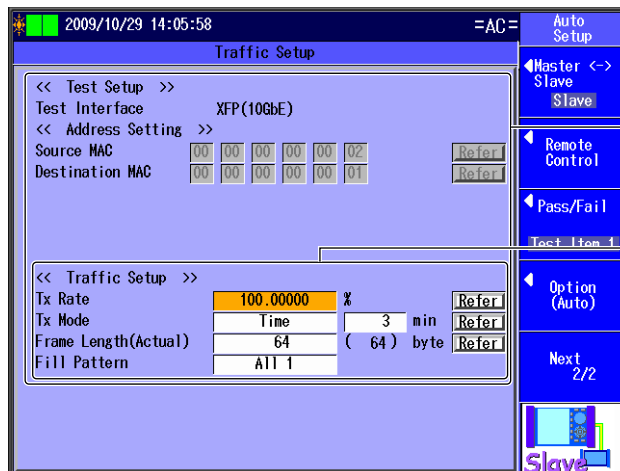
Press the **Master <-> Slave** soft key to switch between the displays of the master and slave settings.



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

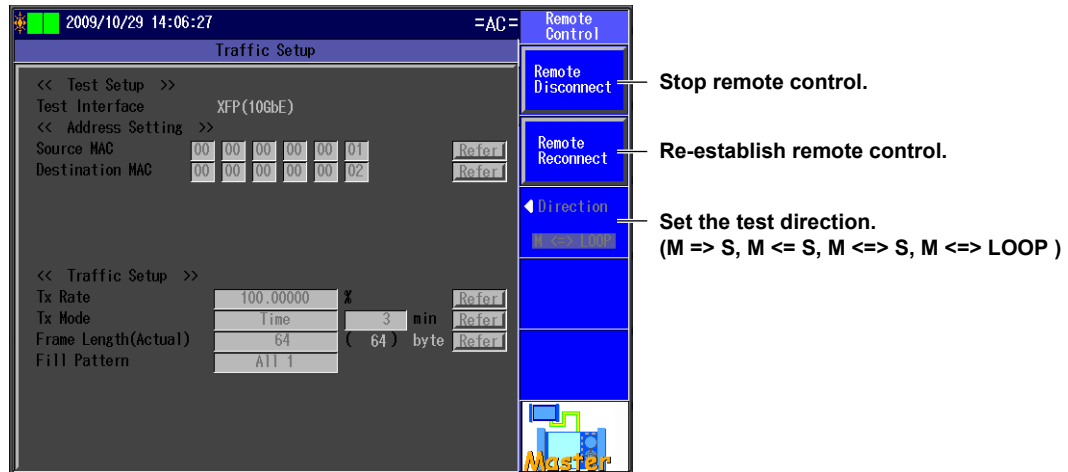
You can change the test item settings when you are displaying the slave settings.

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

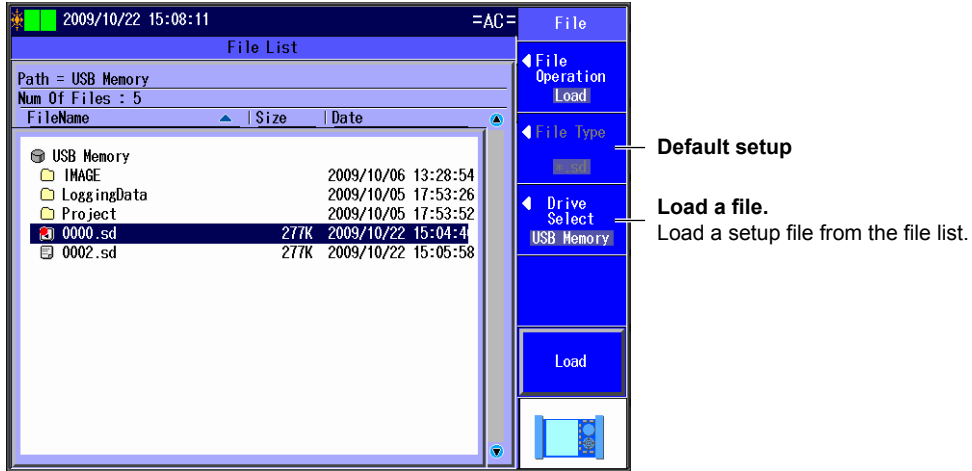
- M <=> LOOP: When the slave is set to Loopback Test mode, the direction setting is fixed at M <=> LOOP.

6.1 Selecting a Setup File

Procedure

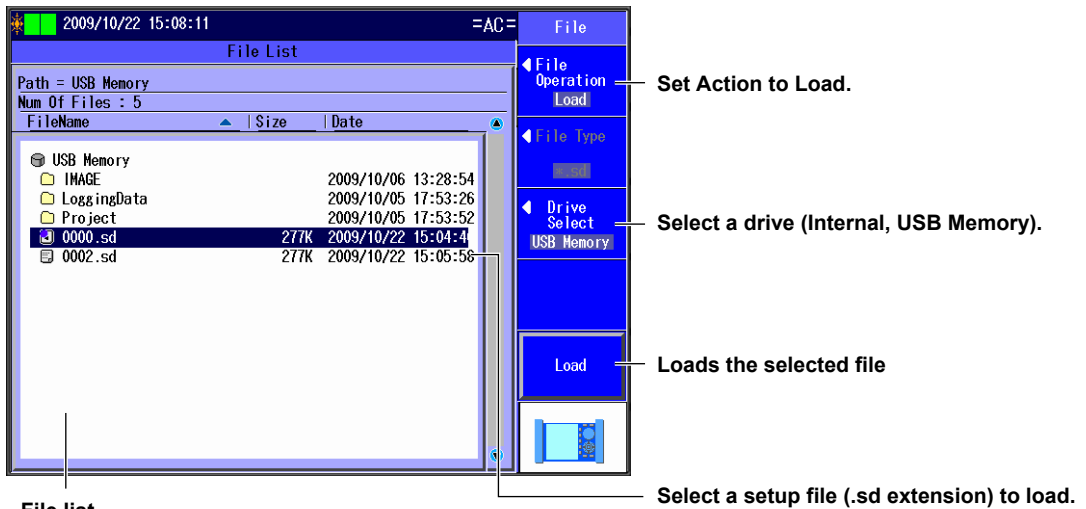
Manual Setup Screen

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



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 Series 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.

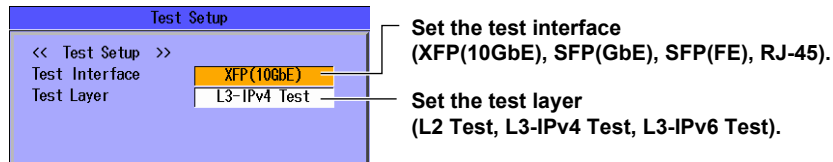
To create a setup file, you can use the setup software and send the file to the AQ1300 Series, or you can save the settings on the AQ1300 Series.

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).

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

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).

Executes link setting information acquisition
Acquires the link setting information of the other device connected to the AQ1300 Series

Applies link settings
Applies the acquired other device's link settings to the AQ1300 Series. 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

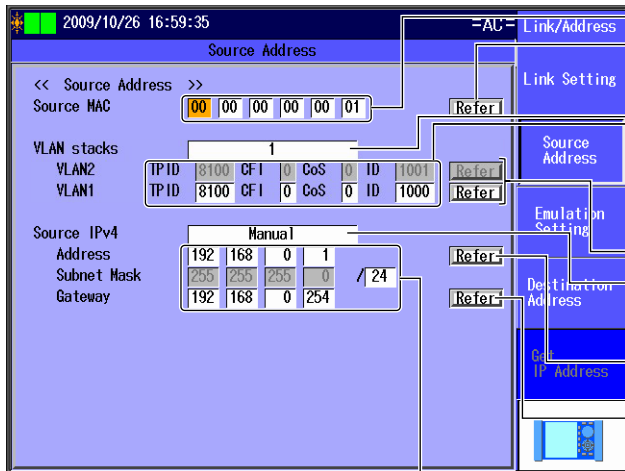
UTP Cable Status
Indicates the UTP cable status as follows. (Normal, The cable may be defective. It is two-pair cable)

Result of link setting information acquisition

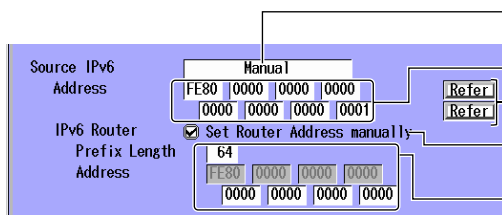
- **Negotiation (Auto, Manual)**
- **Speed (1G, 100M, 10M)**
Appears when Test Interface is set to RJ-45
- **Duplex (Full, Half, --- (when negotiation is set to manual))**
Appears when Test Interface is set to RJ-45
- **MDI (MDI, MDI-X)**
Appears when Test Interface is set to RJ-45

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.



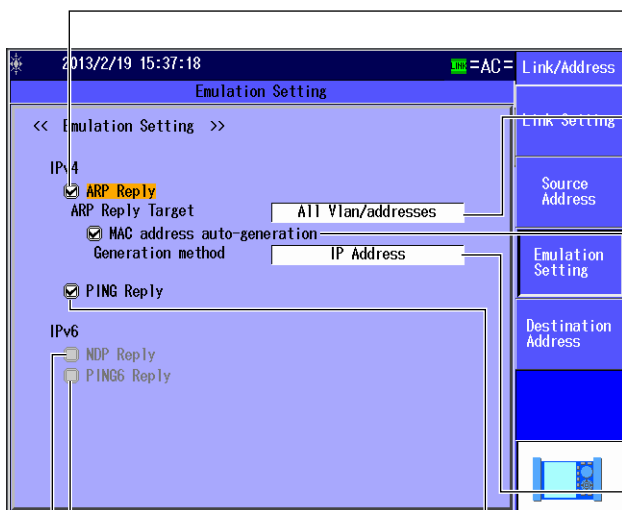
- Set the source MAC address. Refer to the MAC Address table. ▶ section 4.3
- Set the VLAN stack number (None, 1, 2). Configure the VLAN settings (TPID: 0-FFFF, CFI: 0-1, CoS: 0-7, ID: 0-4095). These settings are valid when VLAN stacks is set to 1 or 2.
- Refer to the VLAN table. ▶ section 4.3
- Set 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.

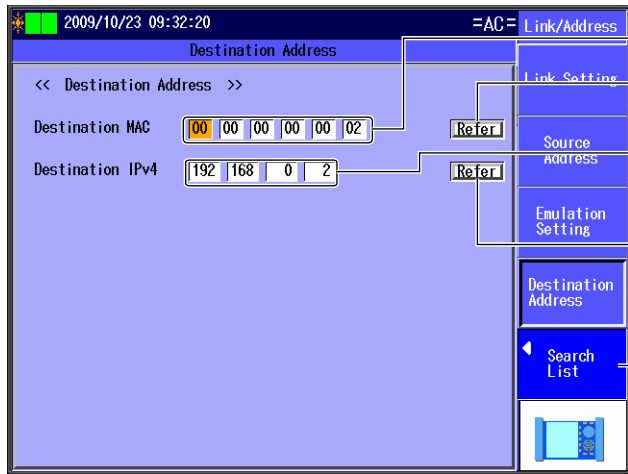


- Select this check box to perform ping6 replying. This setting is valid when Test Layer is set to L3-IPv6.
- Select this check box to perform NDP replying. This setting is valid when Test Layer is set to L3-IPv6.

- 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.



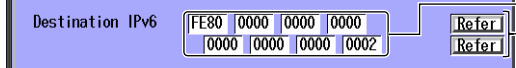
Set the destination MAC address.

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.

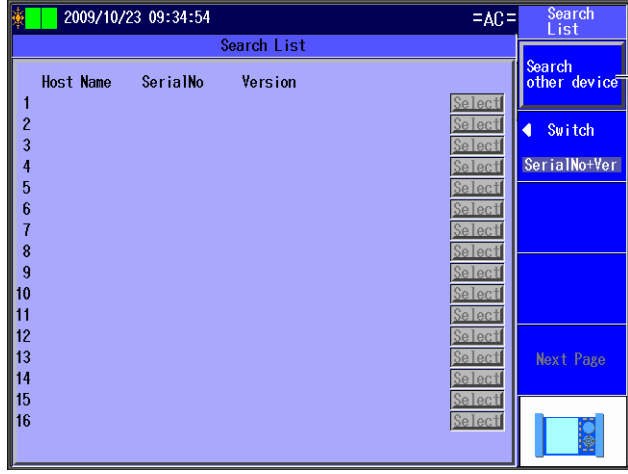


Set the destination IPv6 address.
This setting appears when Test Layer is set to L3-IPv6.

Refer to the IP Address table.
▶ section 4.3

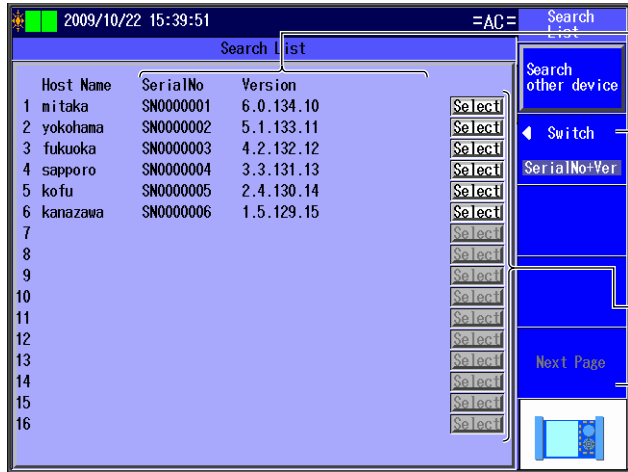
Search List

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



Search for other devices.
When you press this soft key, the AQ1300 Series 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 Series 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 Series 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 Series 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 Series automatically responds with an RF.
- Manual: The AQ1300 Series 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 Series 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 Series 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 Series. 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 Series 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 Series 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 Series 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 Series will send ARP replies to ARP requests that are directed at the source address.
- All addresses: The AQ1300 Series will send ARP replies to ARP requests, regardless of the address that they are directed at.
- All Vlan/addresses: The AQ1300 Series 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 Series 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 Series 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

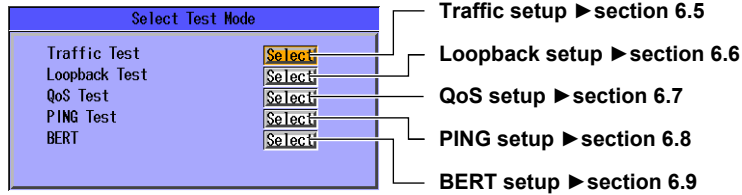
All the tables are created on the setup software. For details, see the *Setup Software User's Manual*.

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 settings:

- Frame structure indication:** Traffic
- Configure the frame settings:** Tx Setting
- Set the frame length (48-9999 bytes):** Frame Length (Actual Length) is set to 64 byte.
- Actual frame length indication:** (Actual Length) is set to 64 byte.
- Select this check box to adjust the frame length:** Variable Setting Frame Length Contents is checked.
- Configure the frame length settings:** Contents is set to +1 (64 - 1518).
- Contents:** Field Target Field is set to Offset.
- Configure field adjustment:** Payload Check Offset Setting Offset is set to Use Tx Frame setting 14 byte.
- Target field:** Target Field is set to Offset.
- Select this check box to adjust field settings:** Payload Check Offset Setting is checked.
- Set the payload check offset (Use Tx Frame setting, Manual):** Offset is set to 14 byte.
- Set the offset (byte 0-255):** This setting is valid when Manual is selected.

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 settings:

- Set the frame structure (MAC+TYPE, MAC+TYPE+IPv4, MAC+TYPE+IPv4+UDP, MAC+TYPE+IPv6, MAC+TYPE+IPv6+UDP):** Frame Structure is set to MAC+TYPE+IPv4+UDP.
- Select this check box to refer to the source address for the VLAN settings:** Refer to Source Address for the VLAN Setting is checked.
- Set the VLAN stack number (None, 1, 2):** VLAN stacks is set to 1. 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):** Frame Length (Actual Length) is set to 64 byte.
- Actual frame length indication:** (Actual Length) is set to 64 byte.
- Set the fill pattern (ALL0, ALL1, 0/1 alt., Random, Manual):** Fill Pattern is set to Random.
- Set the pattern value (0-FFFFFFF):** This setting is valid when Manual is selected.
- Configure error addition (Unused, CRC Error, Symbol Error):** Error Addition is set to Unused.

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

The screenshot shows the 'Frame Setting' screen for IPv4. At the top, it displays the date and time '2009/10/23 10:01:02' and the title 'Frame Setting'. Below this, there are several configuration fields:

- Source IPv4:** Set to '192.168.0.1' with a 'Source Setting' label above it.
- Destination IPv4:** Set to '192.168.0.2' with a 'Manual' label above it.
- ToS/DS(DSCP) Protocol:** Set to 'UDP' with 'IPv4-ToS' set to '0'.

 On the right side, there is a vertical menu with options: 'Basic Setting', 'MAC', 'VLAN', 'IP', and 'UDP'. The 'IP' option is currently selected.

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

The screenshot shows the 'Frame Setting' screen for IPv6. At the top, it displays the date and time '2009/10/23 10:04:02' and the title 'Frame Setting'. Below this, there are several configuration fields:

- Source IPv6:** Set to 'FE80:0000:0000:0000' with a 'Source Setting' label above it.
- Destination IPv6:** Set to 'FE80:0000:0000:0002' with a 'Destination Setting' label above it.
- ToS/DS(DSCP) Next Header:** Set to 'UDP' with 'IPv6-TrafficClass' set to '0'.

 On the right side, there is a vertical menu with options: 'Basic Setting', 'MAC', 'VLAN', 'IP', and 'UDP'. The 'IP' option is currently selected.

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

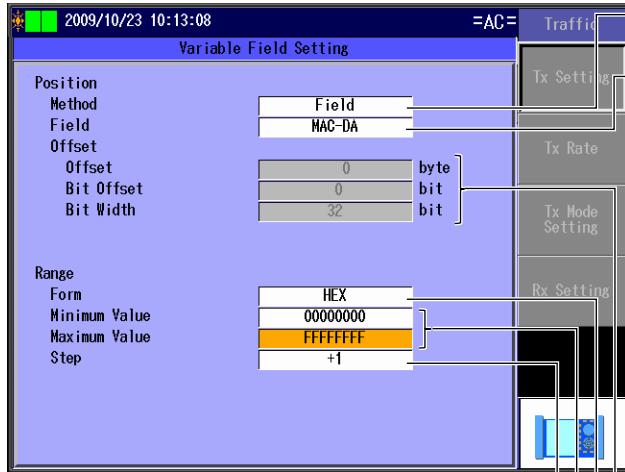
Press **Detail** next to Frame Length to display the following screen.

Set the adjustment range (64-9999 bytes).

Set the adjustment step (+1, -1, Random).

Variable Field Setting Screen

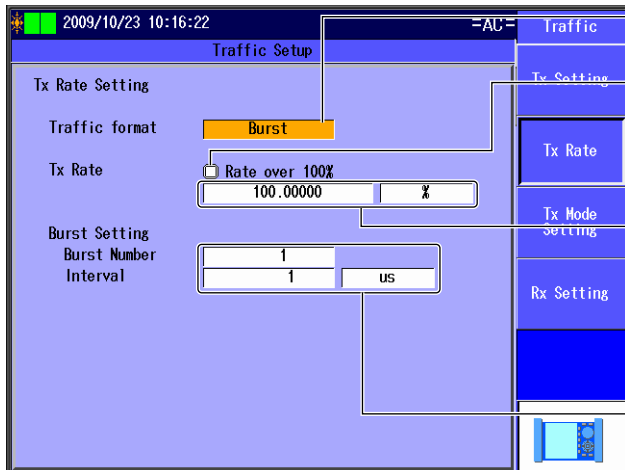
Press **Detail** next to Field to display the following screen.



- 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-FFFFFFF).**
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)

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 Series 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)
- 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)**
- 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 Series refers to the source address for the VLAN settings.
- Cleared: The AQ1300 Series 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 Series.

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 Series 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 Series 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. At the top, it displays the date and time '2009/10/23 10:30:00' and the device name 'Loopback'. The main area is titled 'Loopback Setup' and contains the following elements:

- Target:** A field with a yellow highlight labeled 'Source Address'.
- Swap L4 Port#(TCP/UDP):** A checkbox that is currently checked.

Annotations on the right side of the screen provide instructions:

- An arrow points to the 'Source Address' field with the text: "Set the loopback target frames (Source Address, All Frames)."
- An arrow points to the 'Swap L4 Port#(TCP/UDP)' checkbox with the 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 Series 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 |

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).

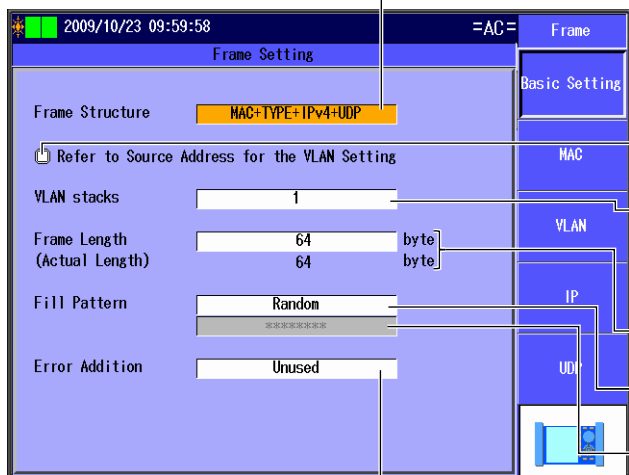
| Setting | Value | Unit |
|----------------|-----------|------|
| Traffic format | Burst | |
| Tx Rate | 100.00000 | % |
| Burst Number | 10000 | |
| Burst Time | 10000 | us |
| Interval | 10000 | us |

Frame Setting Screen

Press **Detail** next to Frame Structure.

Press the **Basic Setting** soft key to display the following screen.

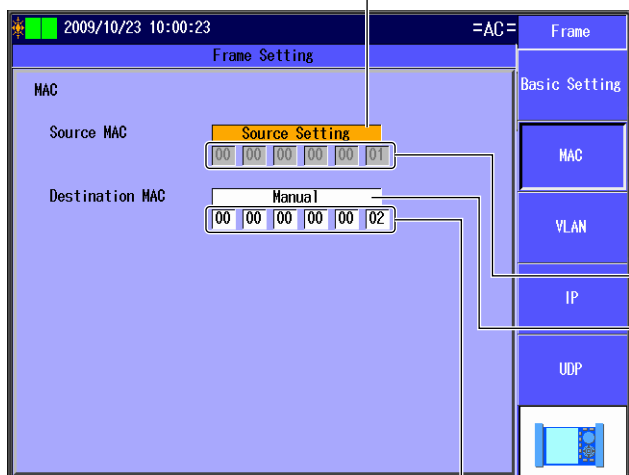
Frame Setting (Basic setting) Screen



- 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

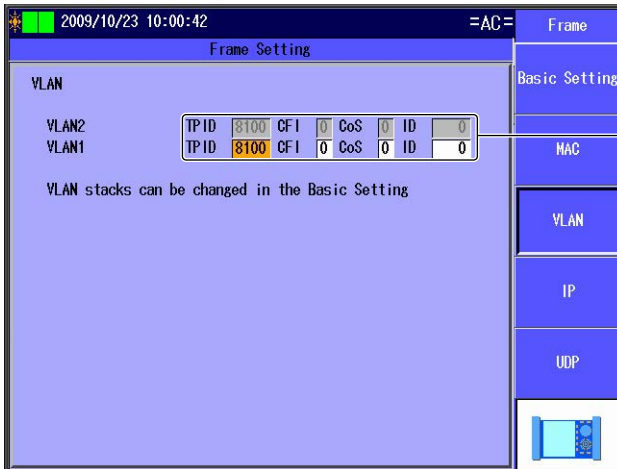


- Set the source MAC address (Manual, Source Setting, Generate from IP, Generate from VLAN ID).
 - You can select the Generate from IP option when Frame Structure on the Frame Setting (Basic setting) Screen includes the IPv4 header.
 - You can select the Generate from VLAN ID option when VLAN Stacks 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.

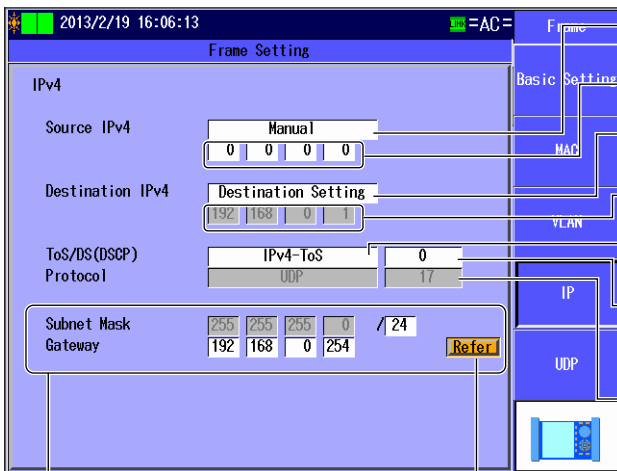
Note

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.

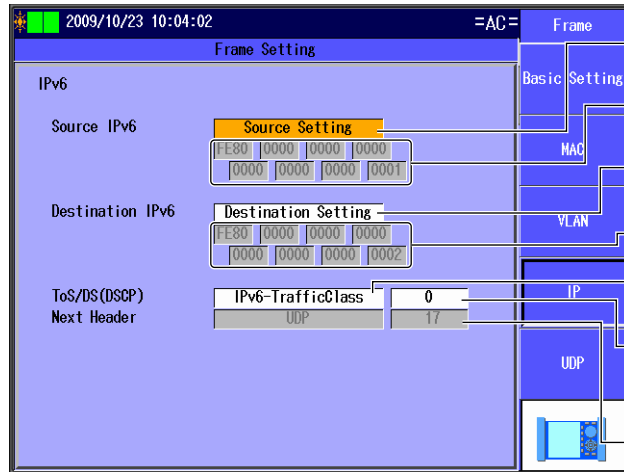
Set the subnet mask (1-31).

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.

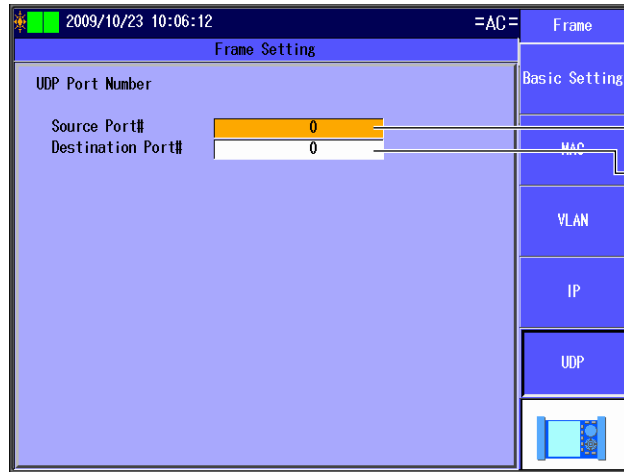
Frame Setting (IPv6) Screen



- 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 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: VLAN1-ID

Channel ID: 1

Frame Structure: IPv4, IPv4-ToS, Offset

QoS Filter1: QoS Filter2:

ID Pattern:

| Form | QoS Pattern1 (DEC) | QoS Pattern2 (DEC) |
|------|--------------------|--------------------|
| CH1 | 1 | 0 |
| CH2 | 2 | 0 |
| CH3 | 3 | 0 |
| CH4 | 4 | 0 |
| CH5 | 0 | 0 |
| CH6 | 0 | 0 |
| CH7 | 0 | 0 |
| CH8 | 0 | 0 |

Use CH8 as Other Channel

Callouts:

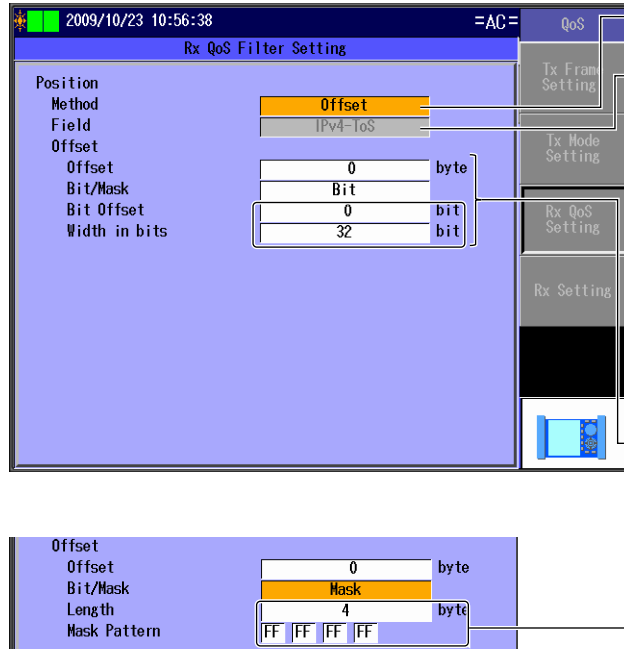
- Classification Type:** Set the Rx QoS (Classify by Frame ID, Classify by Tx Frame, Manual). Channel ID and ID pattern settings are invalid when Classify by Frame ID or Classify by Tx Frame is specified.
- Tx Frame Setting:** Set the classification type. Valid when the Rx QoS is set to "Classify by 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 Series will receive the type of frames specified by the Frame Structure setting.

Rx QoS Filter Setting Screen

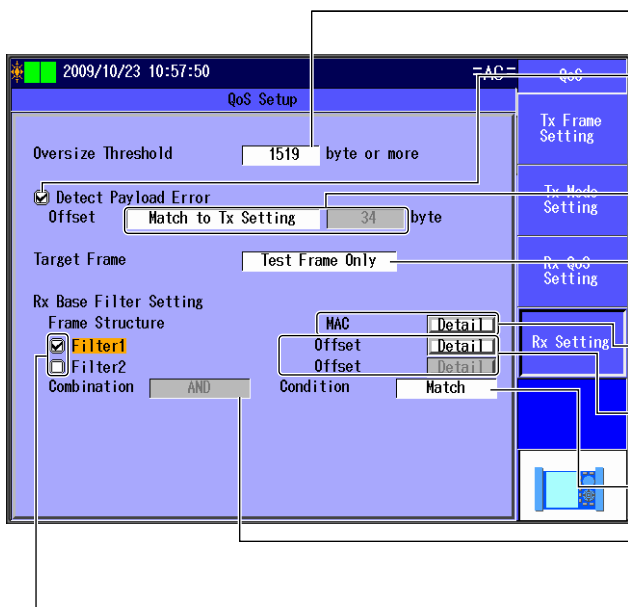
Press **Detail** next to an Rx QoS filter to display the following screen.



- 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 Series 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**

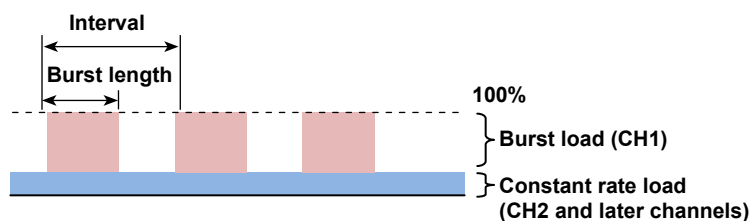
Set the interval.
Range: 1 to 1000000 us, 1 to 1000 ms

• **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 Series 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

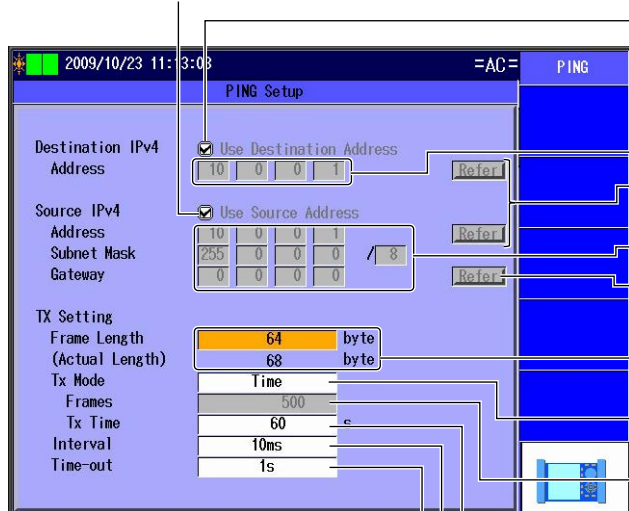
PING Setup Screen

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. **Set the destination IPv4 or IPv6 address.**
- Source IPv4 Address:** 10.0.0.1. Callout: **Refer to the IP Address table. ▶ section 4.3**
- Subnet Mask:** 255.0.0.0. Callout: **The source IPv4 or IPv6 address.**
- Gateway:** 0.0.0.0. Callout: **Refer to the gateway reference. ▶ section 4.3**
- TX Setting:**
 - Frame Length (Actual Length):** 64 byte. Callout: **Set the frame length (64 to 9999 bytes). Actual frame length indication (64 to 9999 bytes)**
 - Tx Mode:** Time. Callout: **Set the Tx Mode (Continuous, Frames, Time).**
 - Frames:** 500. Callout: **Set the number of frames (1-4294967295).** This setting appears when Tx Mode is set to Frames.
 - Tx Time:** 60 s. Callout: **Set the time (1-86400 s).** This setting appears when Tx Mode is set to Time.
 - Interval:** 10ms. Callout: **Set the transmission interval (1ms, 10ms, 100ms, 1s).**
 - Time-out:** 1s. Callout: **Set the timeout (100ms, 1s).**

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).

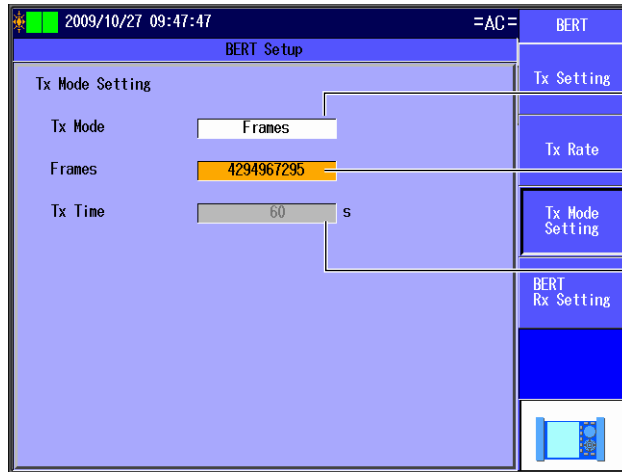
Set the interval (1-1000000 us, 1-1000 ms).

Set the unit (us, ms).

These settings are valid when the traffic format is "Burst."

Tx Mode Setting Screen

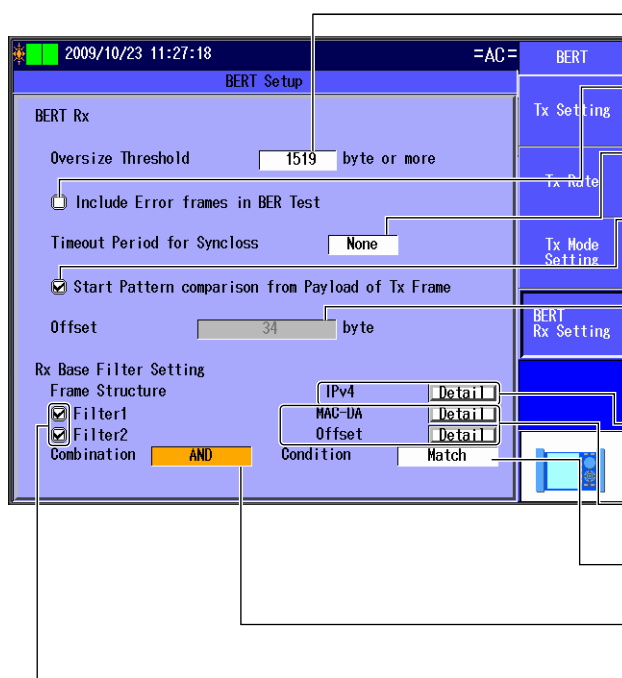
Press the **Detail Setup** soft key and then the **Tx Mode Setting** soft key to display the following screen.



- 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 features a 'Manual Setup' soft key at the top right. Below it are 'Statistics Log Setting', 'Default', 'File', 'Option (Manual)', and 'Next 2/2' soft keys. The main area contains the following settings:

- Execute Logging**: Select this check box to execute logging.
- Execute Long Logging (Generating ZIP file)**: Save the log after measurement is complete.
- Max Logging time**: 14400. Set the maximum logging time (1-14400 s).
- End Setting**: Stop. Set the end setting (Stop, Overwrite).
- Save a statistic log after the measurement**: Select this check box to log using current values (appears when the group is set to Latency or CH1-8 RX).
- Group**: A list of items with checkboxes:

| Group | Item | Current | Detail |
|---------------------------------------|---------|-------------|--------|
| <input checked="" type="checkbox"/> 1 | Latency | Max IFG(us) | Detail |
| <input checked="" type="checkbox"/> 2 | CH1 Rx | Frame | Detail |
| <input checked="" type="checkbox"/> 3 | Tx | Rate(%) | Detail |
| <input checked="" type="checkbox"/> 4 | Tx | Rate(fps) | Detail |

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 has a 'Statistics Item Set' title and two fields:

- Group**: Latency. Set the group.
- Item**: Max IFG(us). 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(μ s, bit) |
| | Min IFG(μ s, bit) |
| | Avg IFG(μ s, bit) |
| | Max Latency(μ s) |
| | Min Latency(μ s) |
| | Avg Latency(μ s) |
| Rx Channel (1 to 8) | Max Latency(μ s) |
| | Min Latency(μ s) |
| | Avg Latency(μ s) |

The word "Current" is attached to the item names in the statistical log files (CSV format).

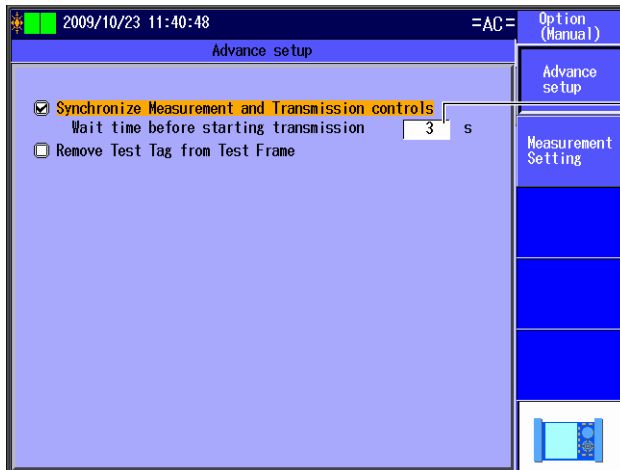
| Start Time | 2012/4/1 09:00 |
|--------------------------|--------------------------------------|
| Time (YY/MM/DD/hh/mm:ss) | Latency:[Current] Max IFG (μ s) |
| 2012/4/1 09:00::00 | 0 |
| 2012/4/1 09:00::01 | 1 |
| 2012/4/1 09:00::02 | 0 |

6.11 Configuring Options (Manual)

Procedure

Advance Setup Screen

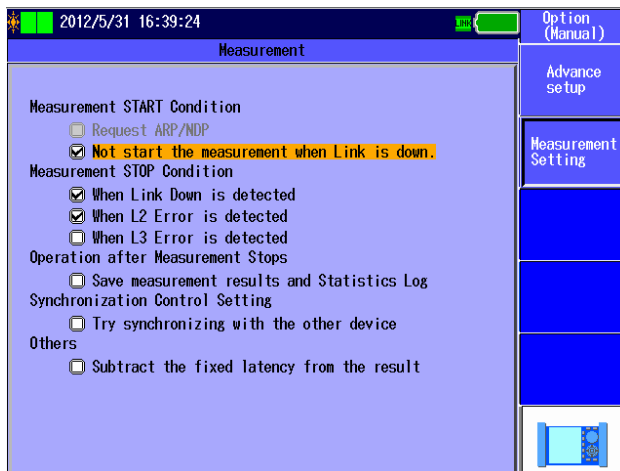
Press the **Manual** soft key, the **Next 1/2** soft key, the **Option (Manual)** soft key, and then the **Advance setup** soft key to display the following screen.



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 Series sends a measurement start or stop packet to the other device at the destination address.

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

Note

When you are performing BERT test, the AQ1300 Series 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 μ 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 μ s |
| SFP (GbE) | 1.4 μ s |
| SFP (FE) | 12 μ s |
| RJ-45 (1000M) | 1.6 μ s |
| RJ-45 (100M) | 11 μ s |
| RJ-45 (10M) | 108 μ s |

7.1 Starting and Stopping Measurement

Procedure

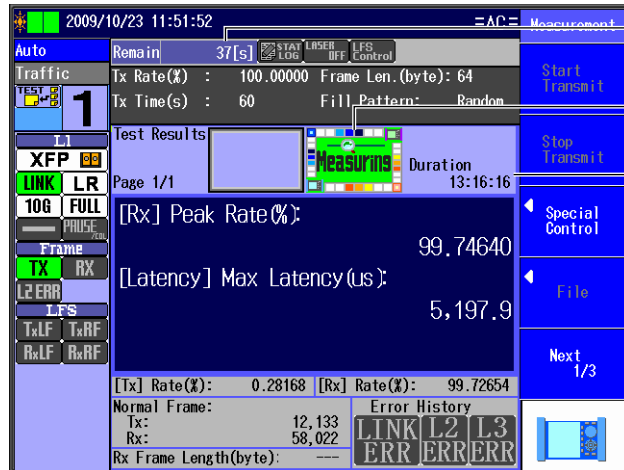
When Measurement and Transmission Control Are Synchronized

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

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

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)

Annotations for the screenshot:

- 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)

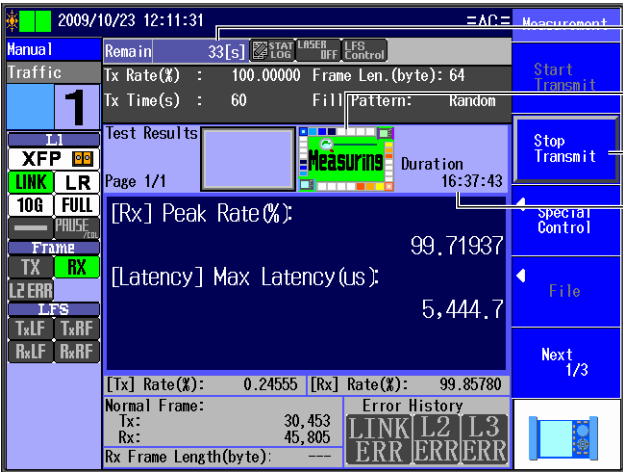
Annotations for the screenshot:

- Remaining Tx time
- Starts transmission
- Indication that measurement is in progress
- Measurement duration

Starting Transmission

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

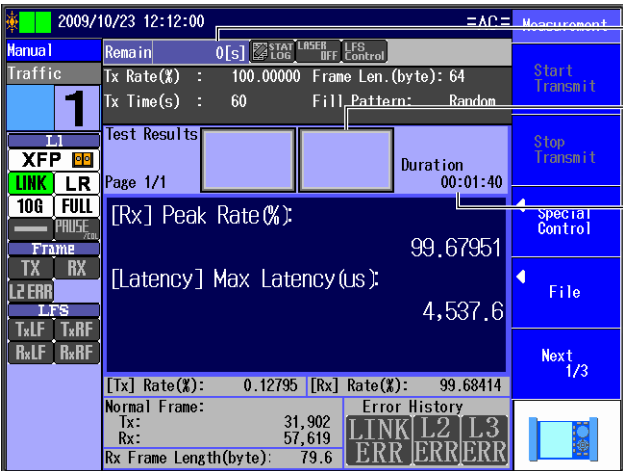
Screen during Measurement (Traffic Test)



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

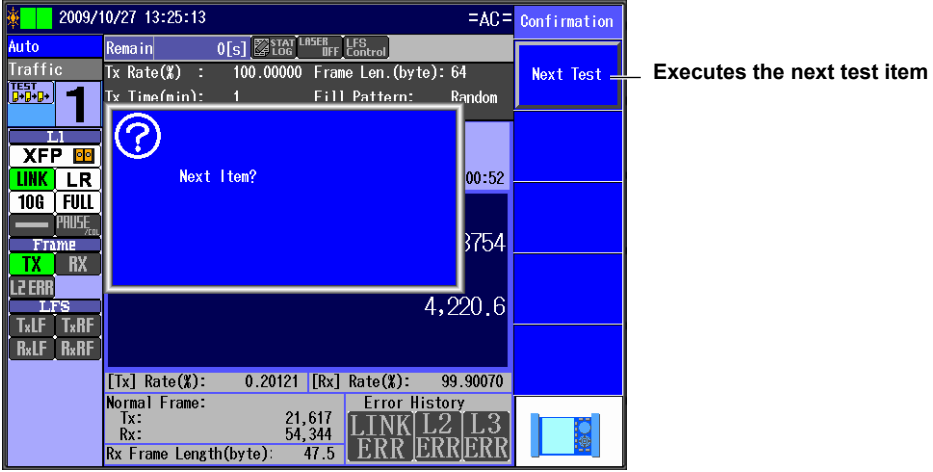
Measurement duration

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

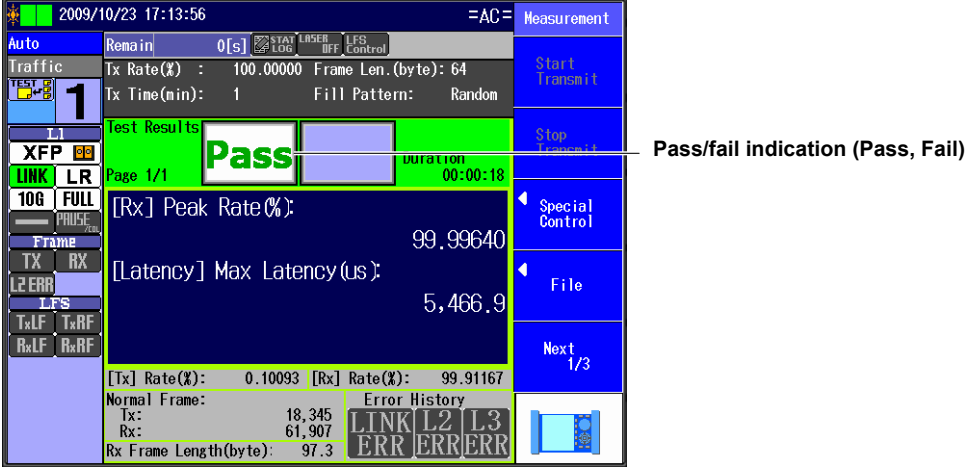
Follow the procedure in section 4.11 to set the test item Execution Type setting to Continue and Continuance Confirmation to ON. During measurement, whenever a test item finishes, the following screen appears.



- 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.



- 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.

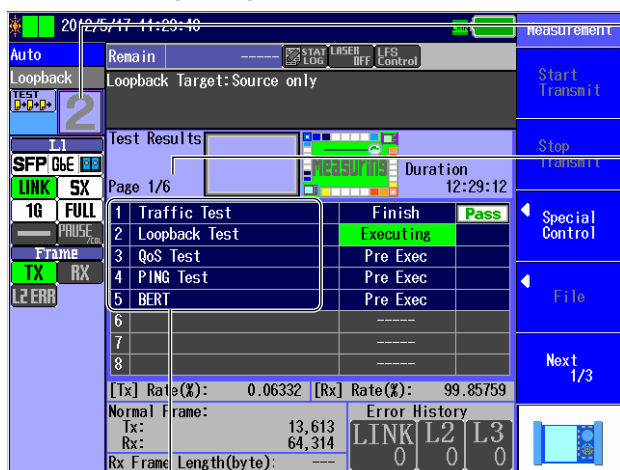
- Pass: The results meet the requirements.
- Fail: The results do not meet the requirements.

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."

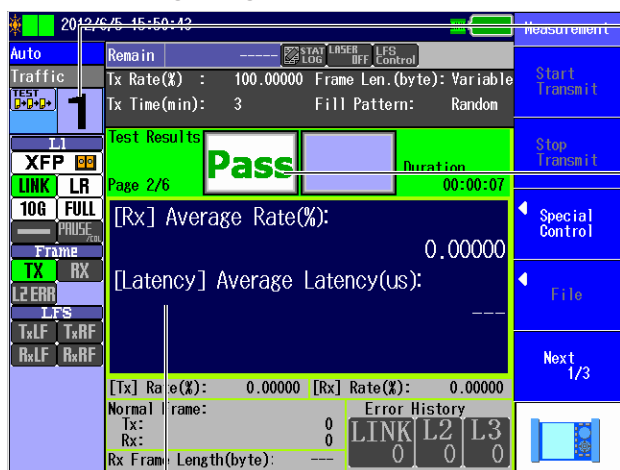
The second test, loopback test, is in progress.

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
- Auto:** Remain 0[s], STAT LOG, LASER OFF Control, LFS
- 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
- Test Results Data:**
 - [Rx] Average Rate(%): 99.71138
 - [Latency] Average Latency(us): 6,483.5
- Bottom Section:**
 - [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 ± 100 ppm.

Resolution: 1 ppm

Accuracy: ± 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 Series 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' and the test mode '=AC='. Below this, there are several soft keys: 'Manual', 'Remain 3[s]', 'Laser Off', 'LFS Control', and 'Tx Rate Change'. The 'Tx Rate Change' key is highlighted. Below the soft keys, there are two radio buttons: 'Target' (selected) and 'Tx Rate'. The 'Target' key is annotated with the text 'Specify the target QoS channel. This setting is valid when you are performing a QoS test.' The 'Tx Rate' key is annotated with 'Set the Tx rate.' Below these are three more soft keys: 'Default' (annotated with 'Returns the Tx rates to their original settings'), 'LINK', and 'L2'. The main display area shows a table of Rx QoS channel rates and a 'Normal Frame' section.

| 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(%) | --- |

Normal Frame:
Tx: 20,641
Rx: 34,651
Rx Frame Length(byte): ---

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 during a BERT test. The screen is divided into several sections:

- Top Bar:** Date and time (2009/10/23 13:36:33), AC indicator, and Error Insertion menu.
- Manual Section:** Remain 16[s], Tx Rate(bit): 96, Frame Len.(byte): 64, Tx Time(s): 60.
- Test Results Section:** Test Results, Page 1/1, Duration 11:35:51. It displays:
 - [BERT] Bit Error Rate: 1,674.5 E-12
 - [BERT] Bit Error Count: 12,549
 - [BERT] BERT Target Byte: 17,411
- Bottom Section:** [Tx] Rate(%): 0.20784, [Rx] Rate(%): 99.95009, Normal Frame: Tx: 16,316, Rx: 44,821, Rx Frame Length(byte): ---, Error History: LINK L2 L3 ERR ERRERR.
- Right Side Menu:** Error Insertion menu with options: Bit Error, CRC Error, Symbol Error, Sequence Error, Payload Error.

Annotations on the right side of the screenshot explain the error types:

- 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 has columns for Hop Number (No.), 1st(ms), 2nd(ms), 3rd(ms), and IP Address. The 'Start' button is highlighted, and the 'Stop' button is also visible. The 'File' button is used to save data to a file, as indicated by the annotation. The 'Next Page' button is used to navigate to the next page of results.

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 'Result Hop Number' is 13, and the page is 1/4. The table below has columns for Hop Number (No.), 1st(ms), 2nd(ms), 3rd(ms), and IP Address. The 'Start' button is highlighted, and the 'Stop' button is also visible. The 'File' button is used to save data to a file, as indicated by the annotation. The 'Next Page' button is used to navigate to the next page of results.

| 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 and controls:

- Header:** 2009/10/23 14:06:55, =AC=, Test Result Display
- Left Sidebar:** Manual, Traffic, 1, L1, XFP, LINK LR, 10G FULL, Frame, TX RX, L2ERR, LFS, Tx/LF Tx/RF, Rx/LF Rx/RF
- Main Display:**
 - Remain: 0[s]
 - Tx Rate(%): 100.00000, Frame Len.(byte): 64
 - Tx Time(s): 60, Fill Pattern: Random
 - Test Results: [Rx] Peak Rate(%): 99.81614, [Latency] Max Latency(us): 5.851,5
 - Duration: 13:38:33
 - [Tx] Rate(%): 0.08057, [Rx] Rate(%): 99.87418
 - Normal Frame: Tx: 6,809, Rx: 59,040
 - Rx Frame Length(byte): ---
 - Error History: LINK L2 L3 ERR ERRERR
- Right Sidebar:**
 - 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.

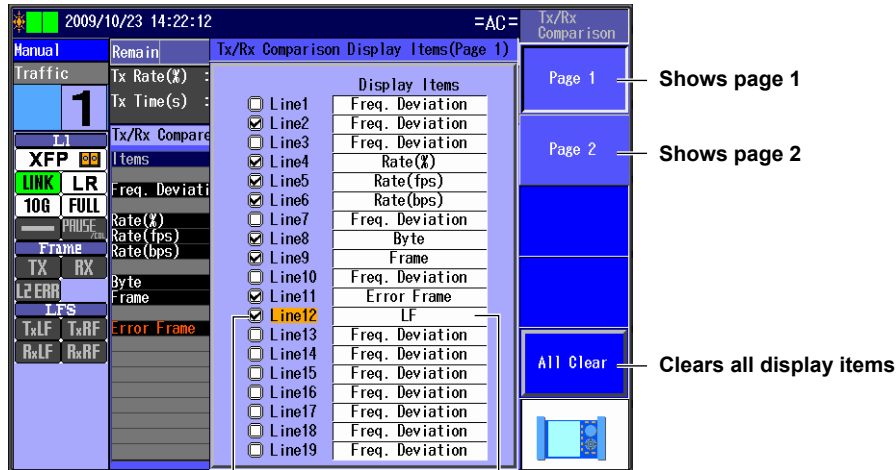
7.7 Comparing Transmission and Reception

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.

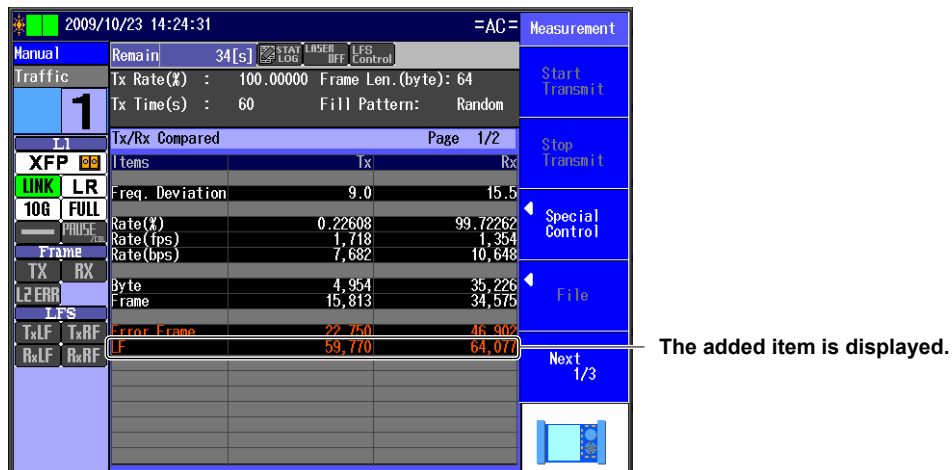


Select the lines that you want to display.
Lines with cleared check boxes are blank.

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 table with the following columns: M/S, Group, Display Item, and Detail. Lines 1-19 are listed. 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 have unchecked boxes. The 'Detail' button is highlighted for Line 18.

Annotations on the right side of the screenshot:

- Shows page 1 (points to Page 1 button)
- Shows page 2 (points to Page 2 button)
- Clears all display items (points to All Clear button)
- Select the item that you want to display. (points to the Detail button for Line 18)

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 screenshot shows a configuration screen with the following fields:

- Master/Slave: Master
- Group: Sequence
- Item: Reorder Packet

Annotations on the right side of the screenshot:

- 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 screenshot shows a table with the following columns: Items, Values, and a 'Detail' button. The 'Detail' button is highlighted for the 'Sequence:Reorder Packet' item.

Annotations on the right side of the screenshot:

- The added item is displayed. (points to the Detail button for Sequence:Reorder Packet)

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.

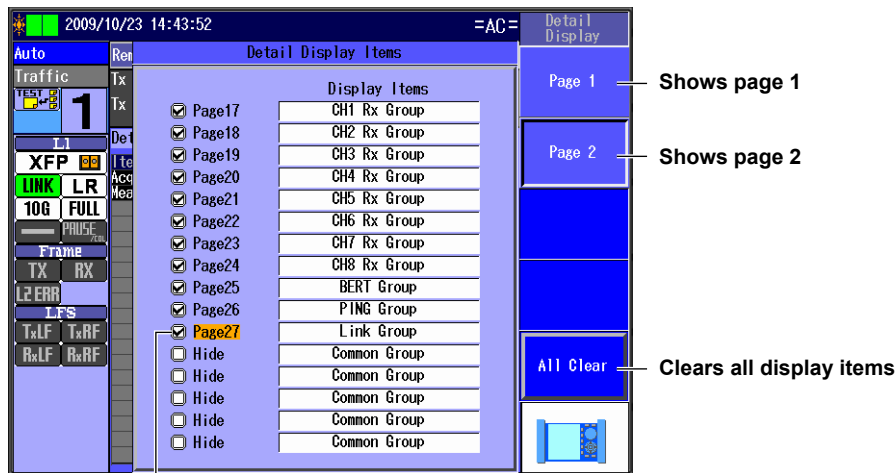
7.9 Displaying Detailed Statistics

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.



Shows page 1

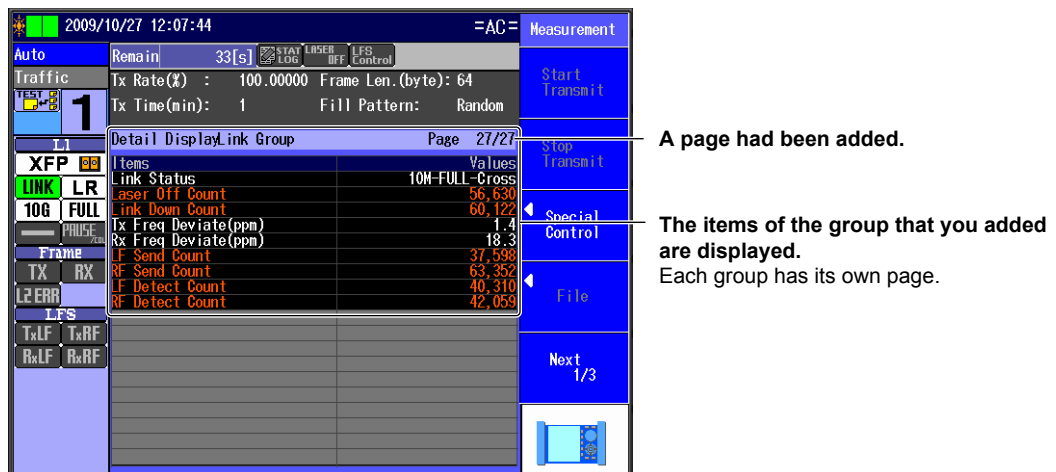
Shows page 2

Clears all display items

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.



A page had been added.

The items of the group that you added
are displayed.
Each group has its own page.

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

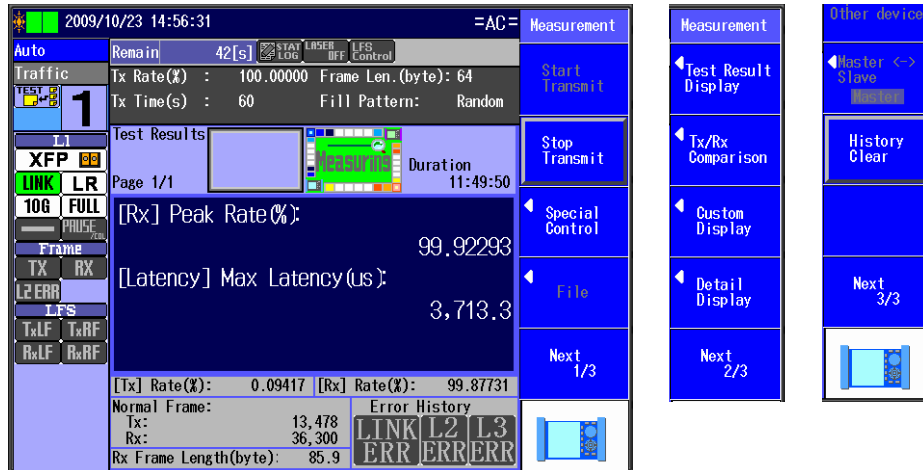
Statistical items are displayed in groups.

7.10 Changing the Displayed Screen

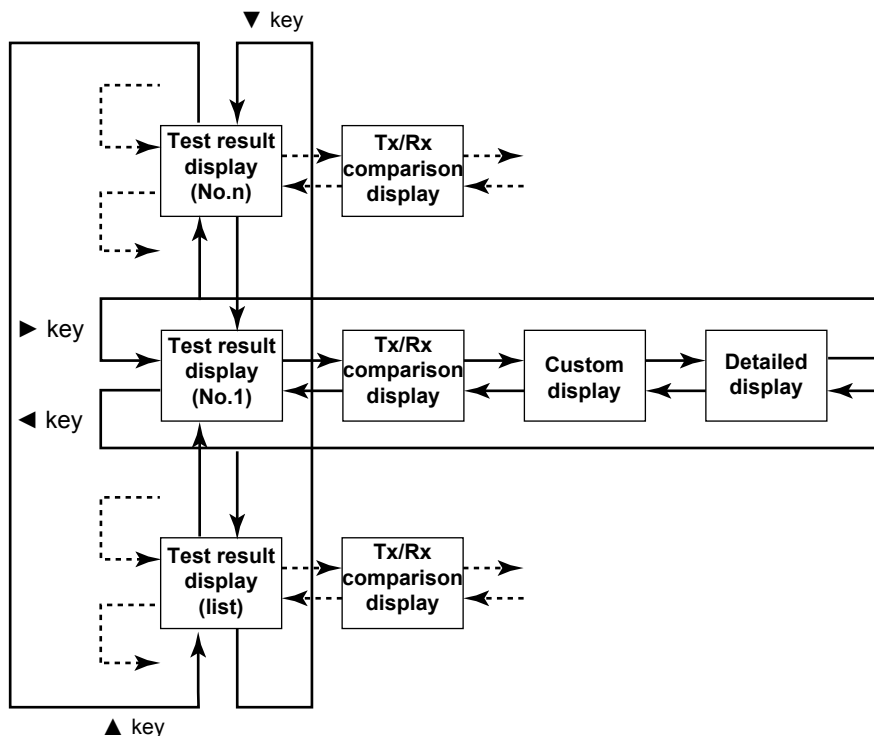
Procedure

Follow the procedure in section 7.1 to start or stop measurement.

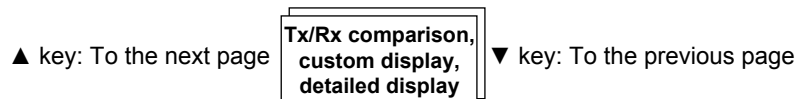
Configure the AQ1300 Series so that a soft key from Next 1/3 to 3/3 is displayed on the measurement screen.



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.



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.

The screenshot displays the following data:

- Time: 2009/10/23 17:13:56
- Mode: Auto
- Tx Rate(%): 100.00000
- Tx Time(min): 1
- Frame Len.(byte): 64
- 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 L2 L3 ERR ERRERR

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.

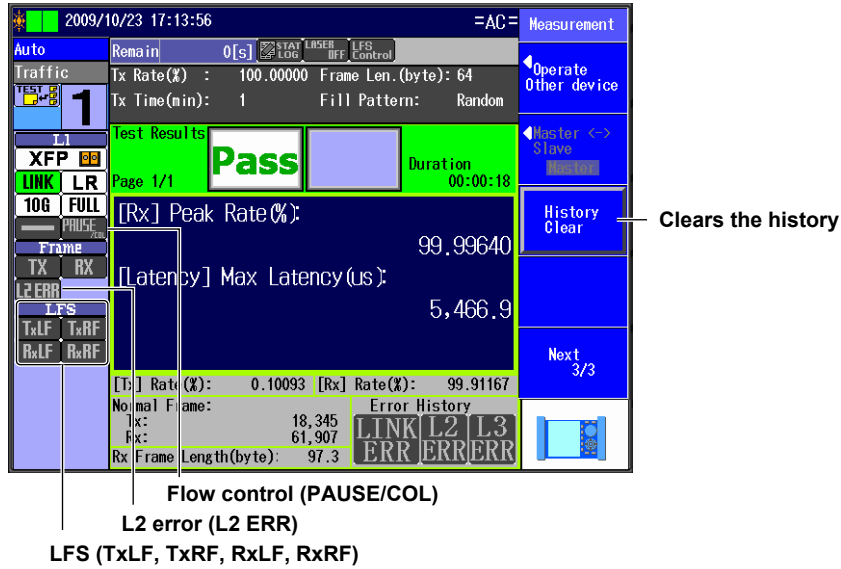
Note

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.



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

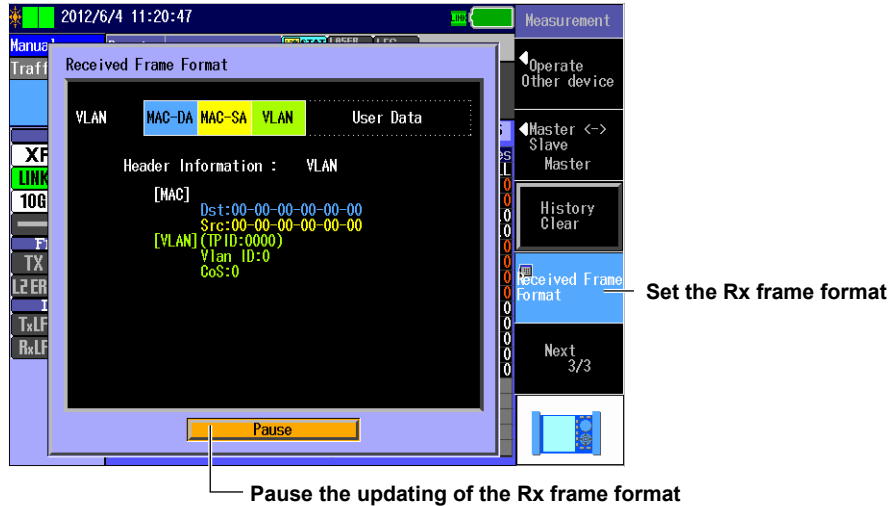
The History Clear operation does not clear the error history (LINK ERR, L2 ERR, L3 ERR).

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 Series 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 Series

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

File list

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

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

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, Common Setting, and a sidebar menu. The sidebar menu includes options like Test Setup, L3-IPv4 Test, Common Setting, Link/Address, Detail Setup, and Next 1/2. The main area displays configuration details for the Test Interface (XFP(10GbE)), Address Setting (Source MAC, Destination MAC, Source IPv4, Destination IPv4), and Common Setting (Test Select, Throughput, Frame Length, Latency, Frame Loss Rate, Back to Back, Packet Jitter). The sidebar menu also includes a 'Select Setup File' option and an 'Option (RFC2544)' option.

Test Setup
Test Interface: XFP(10GbE)

Address Setting
Source MAC: 00 00 00 00 00 01
Destination MAC: [Hex] [Hex] [Hex] [Hex] [Hex] [Hex] ARP
Source IPv4: 192 168 0 1
Destination IPv4: 192 168 0 1

Common Setting
Test Select: Throughput, Frame Length: 64byte
Latency: 128byte
Frame Loss Rate: 256byte
Back to Back: 512byte
Packet Jitter: 1024byte, 1280byte, 1518byte
User1 (2048byte), User2 (4096byte), User3 (8192byte)

Sidebar Menu:
Test Setup (Set up the test. ► section 8.2)
L3-IPv4 Test
Common Setting (Configure the settings that are common to all RFC2544 tests. ► section 8.4)
Link/Address (Configure link and address settings. ► section 8.3)
Detail Setup (Configure the detailed settings for the individual RFC2544 tests. ► section 8.5 to 8.9)
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 Series, or you can save the settings on the AQ1300 Series.

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 Series.

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

Note

- The AQ1300 Series 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 Series /setup directory.

Example: /setup/disManage.dmf

/setup/0000.sd

/setup/0001.sd

:

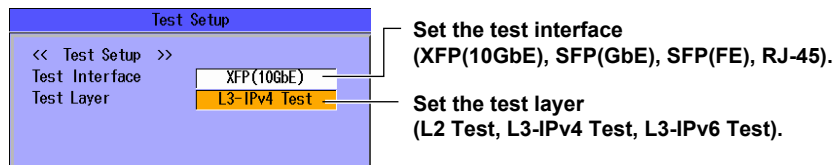
- When you are performing RFC2544 tests, you can only select setup files for RFC2544 tests.

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.

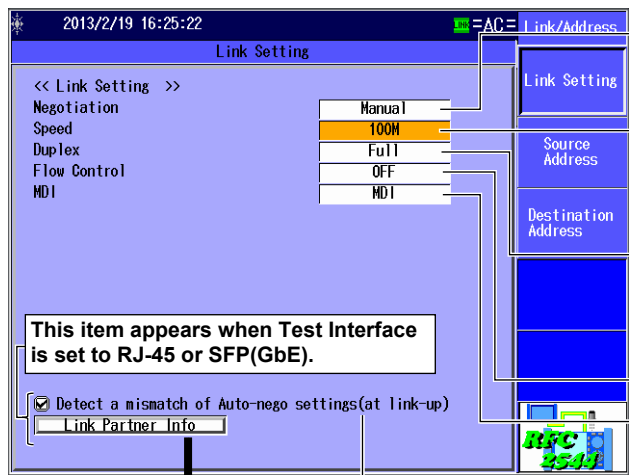
8.3 Configuring Link Address Settings

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).

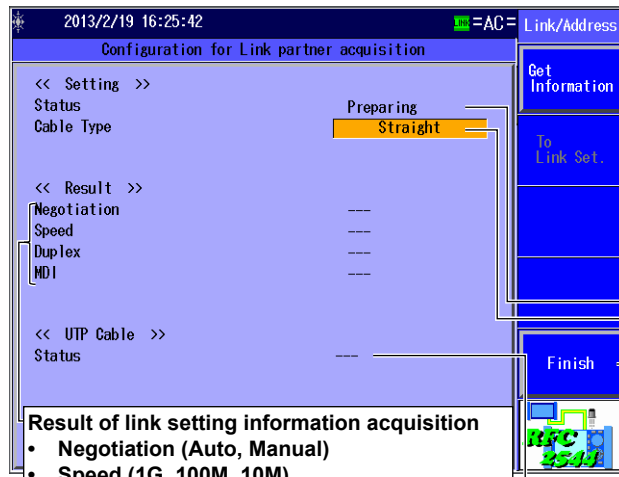
Set the MDI (MDI, MDI-X, Auto).
The Auto setting for MDI is valid when Negotiation is set to Auto.

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 Series

Applies link settings
Applies the acquired other device's link settings to the AQ1300 Series. 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)
- Duplex (Full, Half, --- (when negotiation is set to manual)
- MDI (MDI, MDI-X)

Appears when Test Interface is set to RJ-45

Appears when Test Interface is set to RJ-45

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 various fields and provide instructions and references.

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
- Subnet Mask:** 255 255 255 0 / 24
- Gateway:** 192 168 0 254
- UDP Port Number:** 0
- Source IPv6:** Manual
- Address:** FE80 0000 0000 0000
- IPv6 Router Address:** Set Router Address manually. FE80 0000 0000 0001
- Prefix Length:** 64
- Router Address:** FE80 0000 0000 0000

Callout Explanations:

- 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
- Gateway:** Refer to the gateway reference. ▶ section 4.3
- UDP Port Number:** Set the source UDP port.
- Source 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.
- Set Router Address manually:** Select this check box when you want to manually set the router address.
- Prefix Length:** 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.

The screenshot shows the 'Destination Address' configuration screen. It includes fields for 'Destination MAC' (00 00 00 00 00 02), 'Destination IPv4' (192 168 0 2), and 'Destination IPv6' (8000 0000 0000 0000 0000 0000 0001). A right-hand menu contains options: Link/Address, Link Setting, Source address, Destination Address, and Search List. Callouts provide instructions: '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', and '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.

The screenshot shows the 'RFC2544 Test Setup' screen. It features a 'Test Setup' section with 'Test Interface' set to 'XFP(10GbE)'. Below is an 'Address Setting' section with fields for Source MAC, Destination MAC, Source IPv4, and Destination IPv4, each with a 'Refer' button. A 'Common Setting' section lists parameters like Test Select, Throughput, Frame Length, Latency, Frame Loss Rate, Back to Back, and Packet Jitter. A right-hand menu includes Test Setup, L3-IPv4 Test, Common Setting, Link/Address, Detail Setup, and Next 1/2. A callout 'Address settings' points to the Address Setting section.

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 Series 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 Series 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 Series 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 Series. 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 Series 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 Series 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 Series 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.

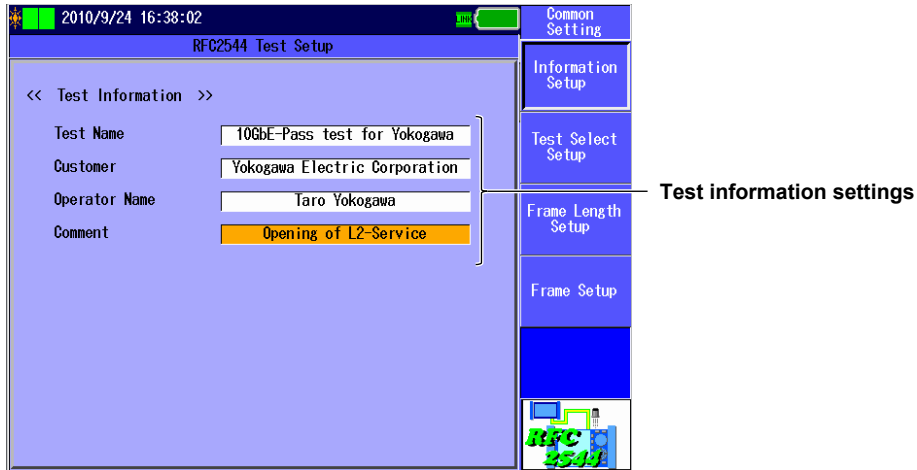
8.4 Configuring Common RFC2544 Test Items

Procedure

Test Information Setup Screen

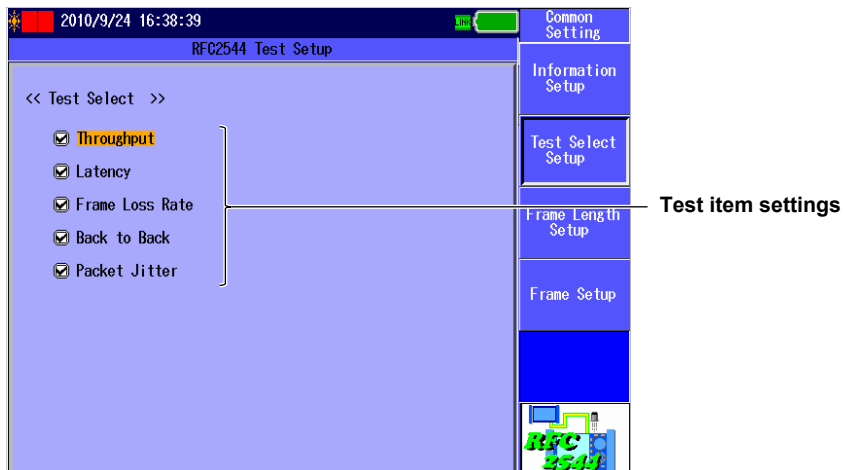
Follow the procedure in section 8.1 to display the RFC2544 Setup screen.

Press the **Common Setting** soft key and then the **Information Setup** soft key to display the following screen.



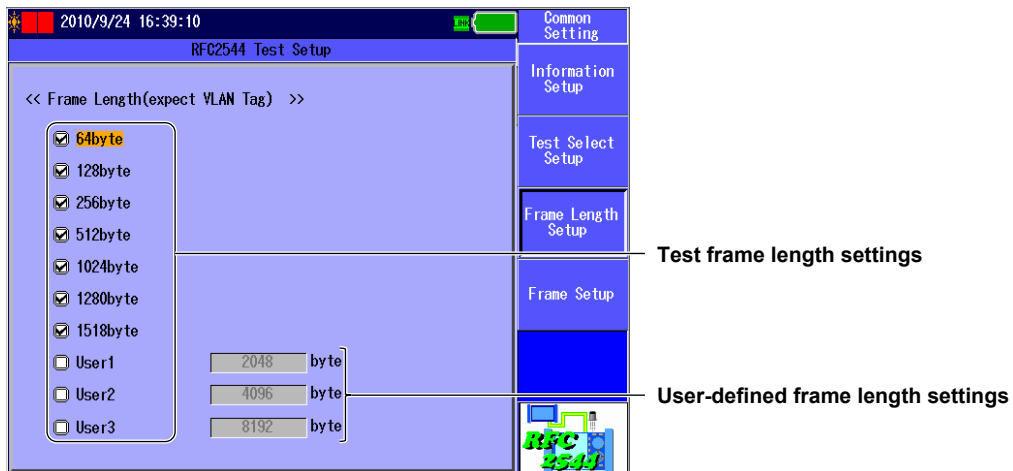
Test Item Setup Screen

Press the **Common Setting** soft key and then the **Test Select Setup** soft key to display the following screen.



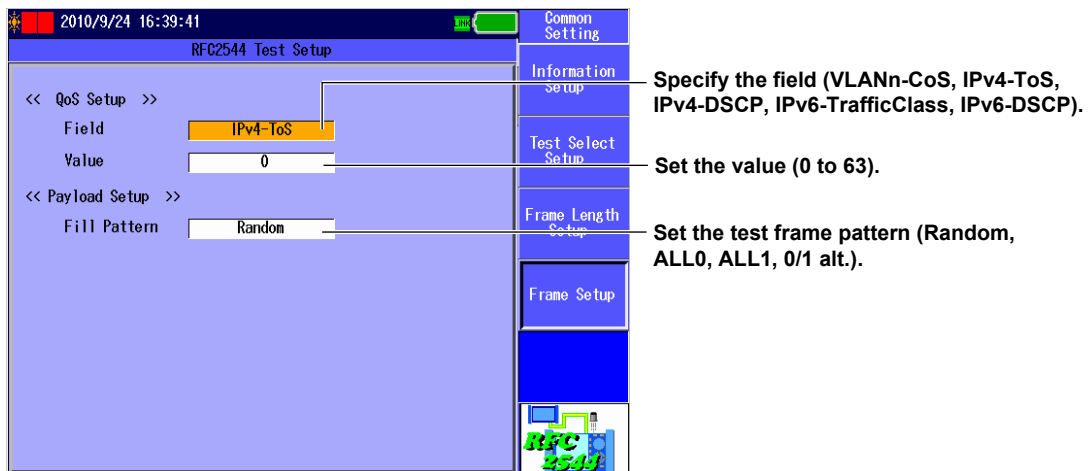
Frame Length Setup Screen

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.

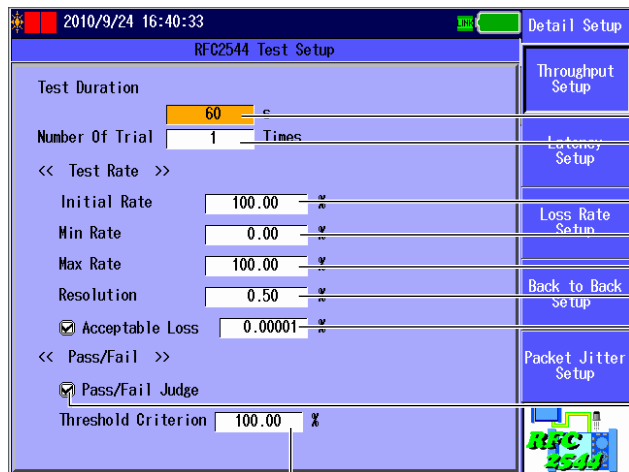
8.5 Configuring Throughput Test Settings

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
- Number Of Trial:** 1 Times
- Initial Rate:** 100.00 %
- Min Rate:** 0.00 %
- Max Rate:** 100.00 %
- Resolution:** 0.50 %
- Acceptable Loss:** 0.00001 %
- Pass/Fail Judge:**
- Threshold Criterion:** 100.00 %

Soft keys on the right side of the screen include: Detail Setup, Throughput Setup, Latency Setup, Loss Rate Setup, Back to Back Setup, and Packet Jitter Setup.

Annotations on the right side of the image provide instructions for each field:

- Set the test duration (1 to 999).
- Set the number of trials (1 to 60).
- Set the initial rate (0.01 to 100.00).
- Set the minimum rate (0.00 to 100.00).
- Set the maximum rate (0.01 to 100.00).
- Set the resolution (0.01 to 100.00).
- Set the acceptable loss (0.00001 to 100.00000).
- Select this check box to perform pass/fail judgment.
- 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%

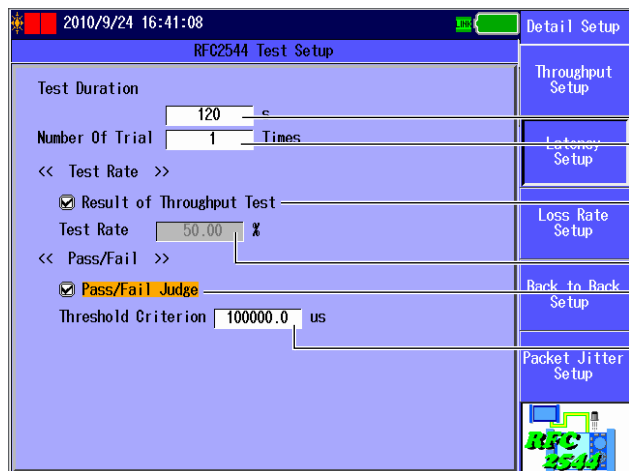
8.6 Configuring Latency Test Settings

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

On the right side of the screen, there are soft keys for 'Throughput Setup', 'Latency Setup', 'Loss Rate Setup', 'Back to Back Setup', and 'Packet Jitter Setup'. Lines connect these keys to their respective descriptions:

- Throughput Setup**: Set the test duration (1 to 999).
- Latency Setup**: Set the number of trials (1 to 60).
- Loss Rate Setup**: Select this check box to use the throughput test result.
- Back to Back Setup**: Set the measurement rate (0.01 to 100.00).
- Packet Jitter Setup**: Select this check box to perform pass/fail judgment.
- Packet Jitter Setup**: 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 μ s

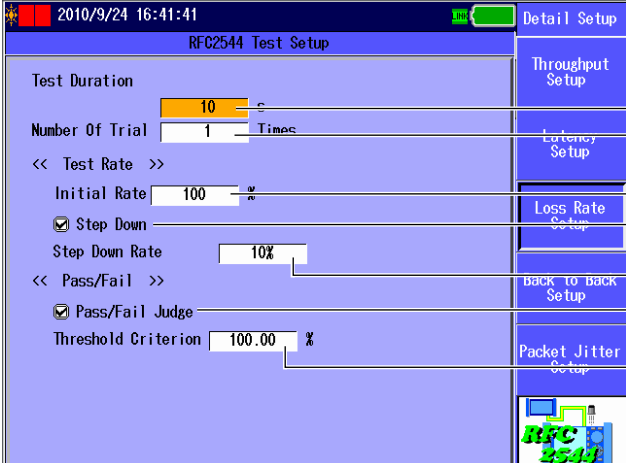
8.7 Configuring Frame Loss Rate Test Settings

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 settings and annotations:

- Test Duration:** 10 seconds. Annotation: Set the test duration (1 to 999).
- Number Of Trial:** 1 Times. Annotation: Set the number of trials (1 to 60).
- Test Rate:** Initial Rate: 100%. Annotation: Set the initial rate (1 to 100).
- Step Down:** . Annotation: Select this check box to have the rate decreased between measurements.
- Step Down Rate:** 10%. Annotation: Set the step down rate (10%, 20%).
- Pass/Fail Judge:** . Annotation: Select this check box to perform pass/fail judgment.
- Threshold Criterion:** 100.00%. Annotation: Set the upper limit on the loss rate (0.01 to 100.00).

Soft keys on the right side of the screen 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

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%

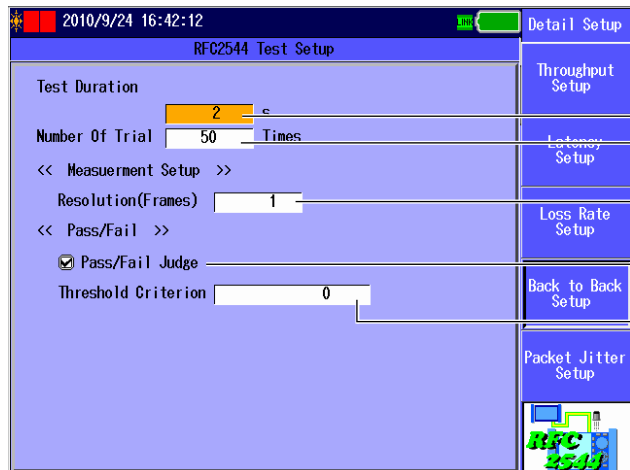
8.8 Configuring Back to Back Test Settings

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 fields and options:

- Test Duration:** 2 seconds
- Number Of Trial:** 50 Times
- Resolution(Frames):** 1
- Pass/Fail Judge:** (checked)
- Threshold Criterion:** 0

On the right side, there are soft keys for 'Throughput Setup', 'Latency Setup', 'Loss Rate Setup', 'Back to Back Setup', and 'Packet Jitter Setup'. A 'Detail Setup' soft key is at the top right. A 'RFC 2544' logo is at the bottom right.

Annotations on the right side of the screenshot:

- Line pointing to Test Duration: **Set the test duration (1 to 999).**
- Line pointing to Number Of Trial: **Set the number of trials (1 to 60).**
- Line pointing to Resolution(Frames): **Set the resolution (1 to 65535).**
- Line pointing to Pass/Fail Judge: **Select this check box to perform pass/fail judgment.**
- Line pointing to Threshold Criterion: **Set the lower limit on the number of frames (0 to 1486607142).**

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

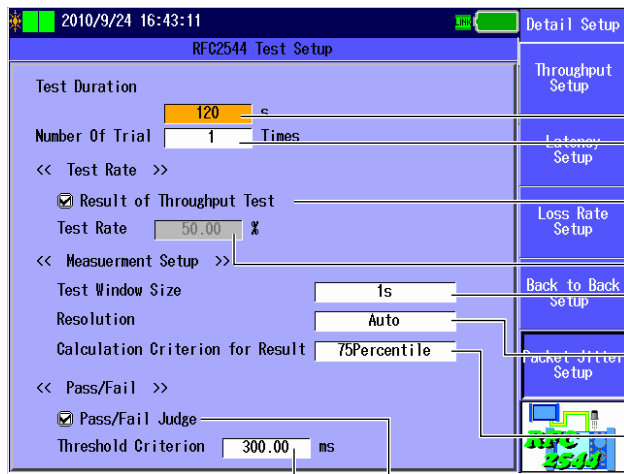
8.9 Configuring Packet Jitter Test Settings

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: 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).

Soft keys on the right side of the screen 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 Series 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 Series 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

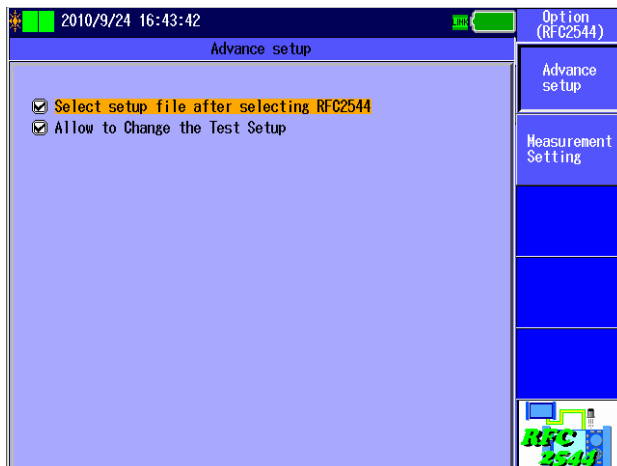
8.10 Configuring RFC2544 Options

Procedure

Advance Setup Screen

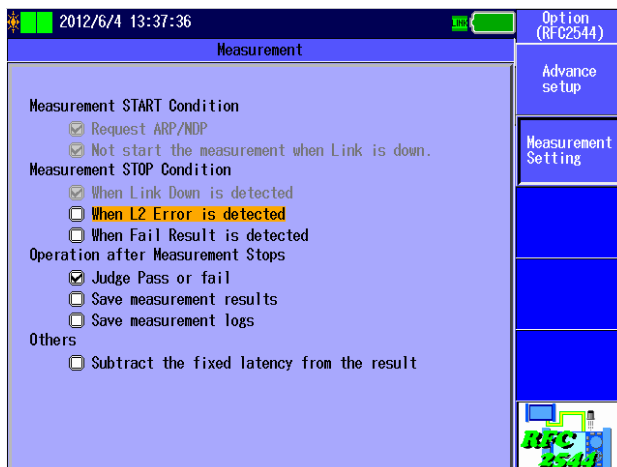
Follow the procedure in section 8.1 to display the RFC2544 Setup screen.

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 μs 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

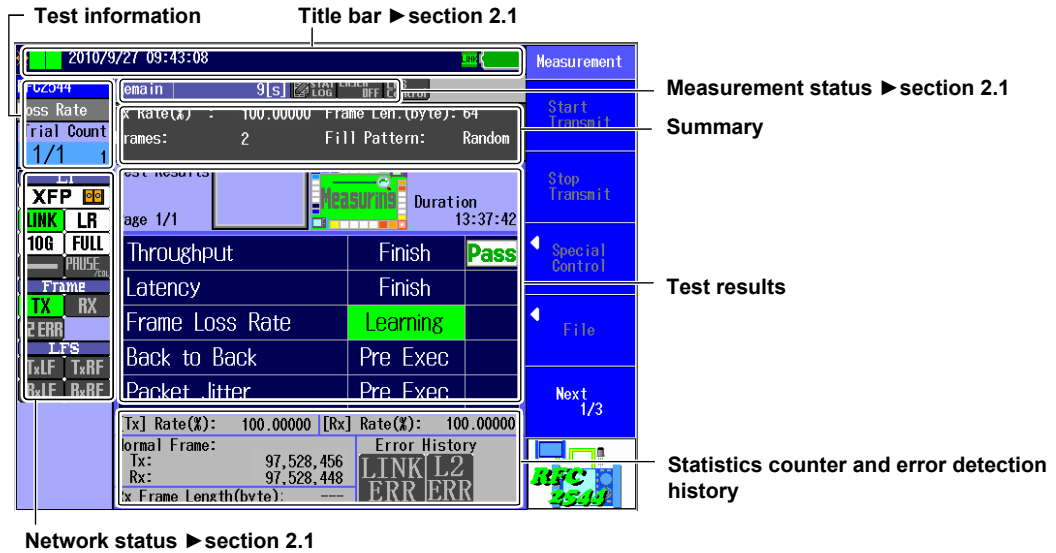
| Interface | Delay |
|---------------|-------------------|
| XFP | 1.0 μs |
| SFP (GbE) | 1.4 μs |
| SFP (FE) | 12 μs |
| RJ-45 (1000M) | 1.6 μs |
| RJ-45 (100M) | 11 μs |
| RJ-45 (10M) | 108 μs |

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 Series 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

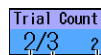
Test Information

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

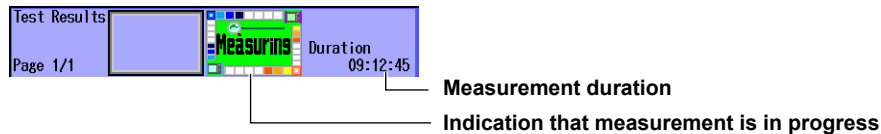
A summary of the settings is displayed, or the addresses are displayed.

- 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

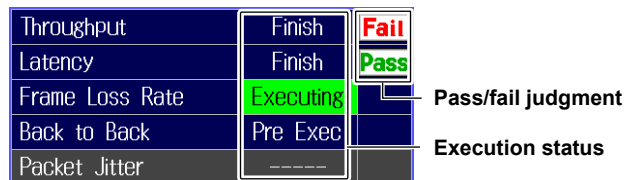


- **Pass/Fail Judgment Indication**

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 Series is waiting to execute the test.

Learning: The AQ1300 Series is learning an address.

Preparing: The AQ1300 Series is performing the preliminary measurement (only during the packet jitter test).

Executing: The AQ1300 Series 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. |
| | | • 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 | |

9.2 Displaying the Test Results

Procedure

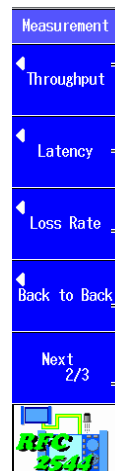
Test Result Display Screen

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.

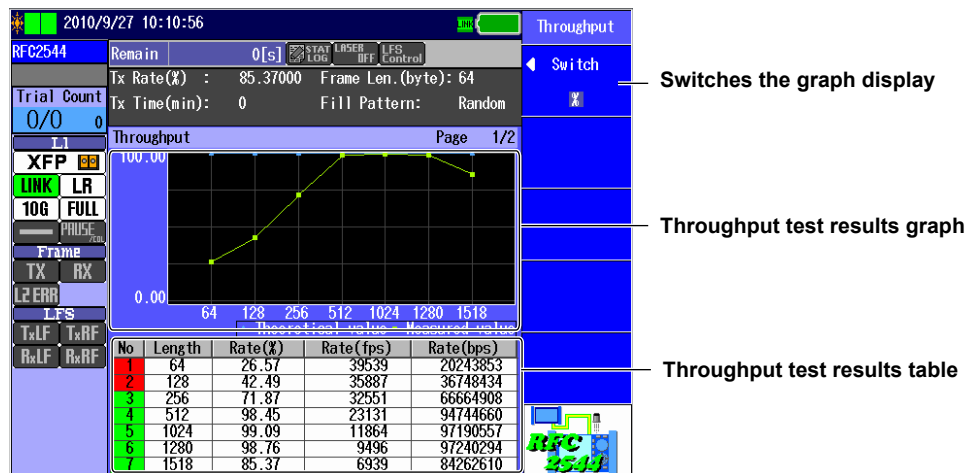
9.3 Displaying Throughput Test Results

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

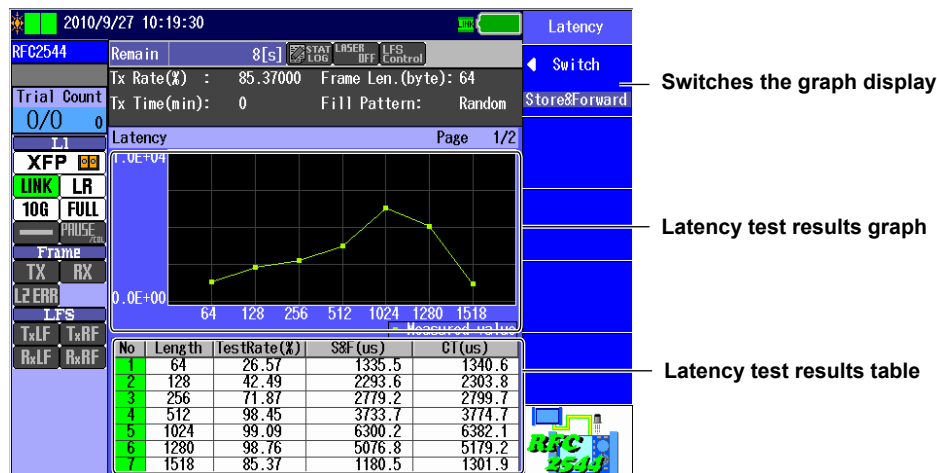
9.4 Displaying Latency Test Results

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 (μ 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

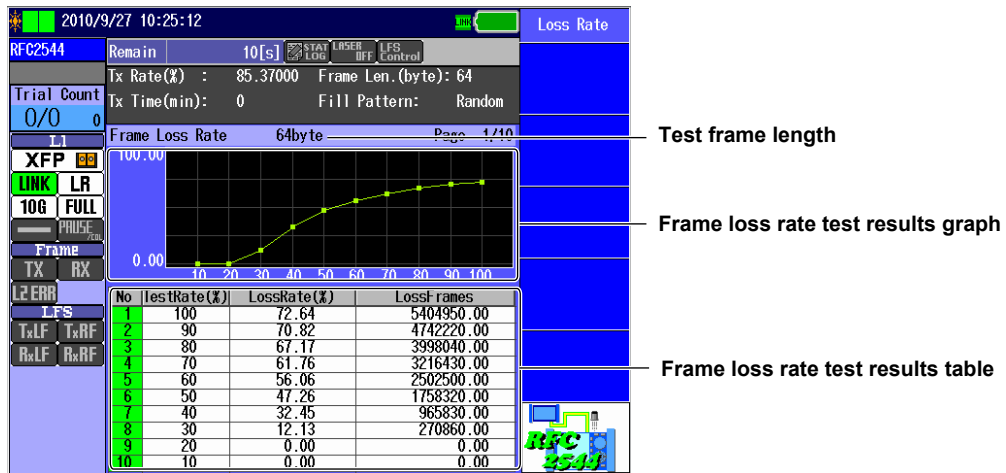
Procedure

Frame Loss Rate Test Results Screen

Follow the procedure in section 9.1 to start and stop measurement.
Press the **Loss Rate** soft key.

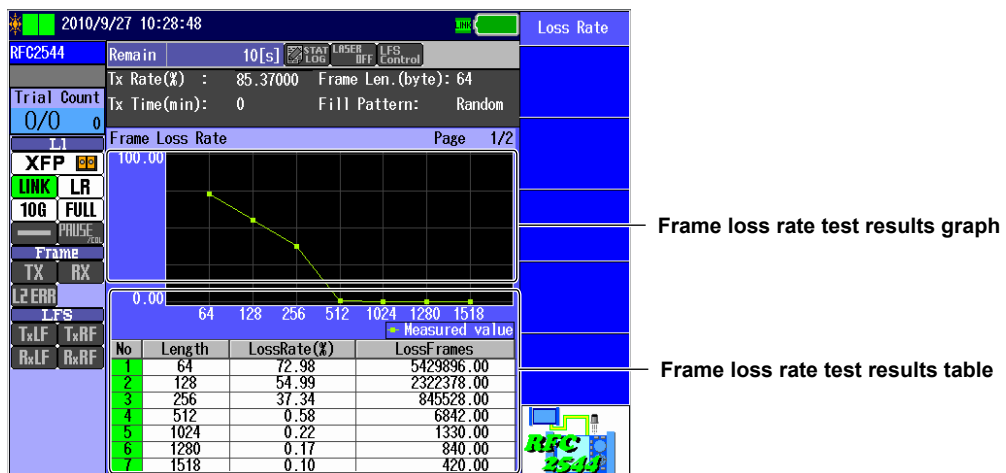
When the Rate Is Decreased between Measurements

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.



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

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

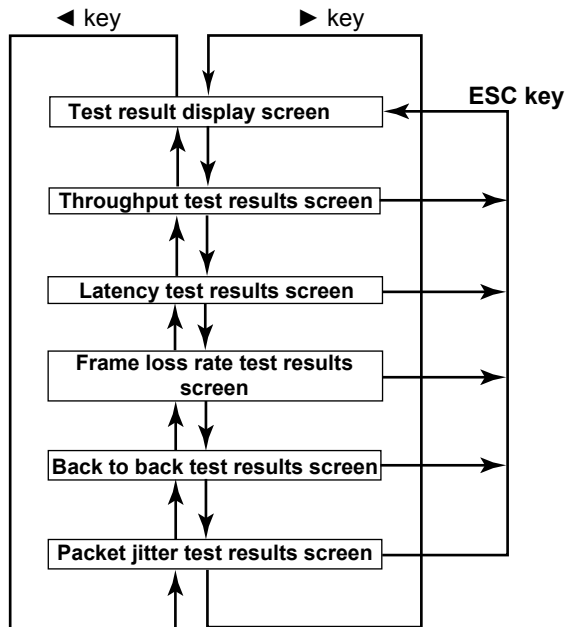
Percentile value graph

- 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.

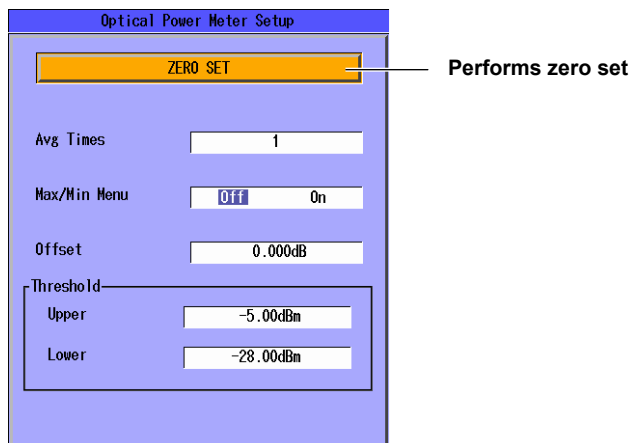
10.1 Pre-Measurement Calibration

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.

Bar graph display of the measured value

Measured value

OPM

20.31 dB

Wavelength: 1310nm

Modulation: CW

Unit: dB

Reference: -31.00dBm

OPM

DREF

HOLD

Setup

OPM

DREF

HOLD

Setup

Set the reference to the currently displayed measured value

Holds the measured value display

Displays the detail setup screen

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.

Lower threshold line

Upper threshold line

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.

Optical Power Meter Setup

ZERO SET

Avg Times: 1

Max/Min Menu: Off On

Offset: 0.000dB

Threshold

Upper: -5.00dBm

Lower: -28.00dBm

Set the average count (1, 10, 50, 100).

Turns on and off the display of the maximum and minimum measured optical power values

Set the offset (-9.900 to 9.900 dB).

Set the upper threshold value (-70.00 to 5.00 dB).

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}), μ (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_{dBm} is the optical power in units of dBm and P_{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

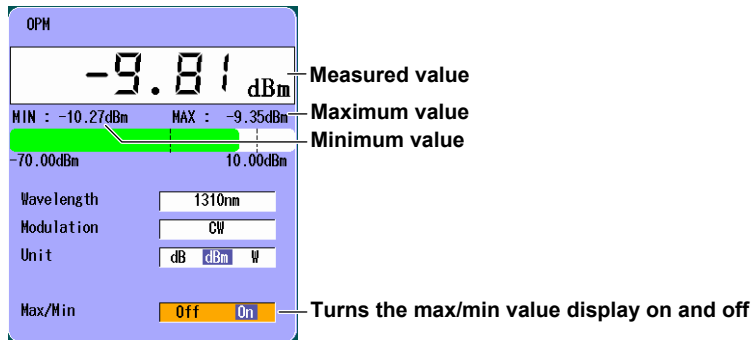
In the Power Meter screen, you can display a menu that shows the maximum (Max) and minimum (Min) measured values.

| | |
|-----|----------------------------|
| 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.

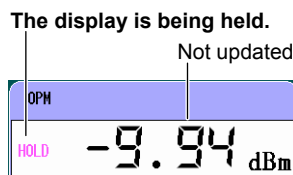
| Test Interface | Upper Limit | Lower Limit |
|--------------------|-------------|-------------|
| 1000BASE-SX (SFP)* | 0.0 dBm | -17.0 dBm |
| 1000BASE-LX (SFP)* | -3.0 dBm | -19.0 dBm |
| 10GBASE-SR (XFP)* | -1.0 dBm | -9.9 dBm |
| 10GBASE-LR (XFP)* | +0.5 dBm | -14.4 dBm |
| 10GBASE-ER (XFP)* | -1.0 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

Test For VLAN

VLAN stacks: 2

| 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

Test For VLAN

VLAN stacks: 1

| VLAN | TP ID | CFI | CoS | ID | Target |
|-------|-------|-----|-----|----|--------|
| VLAN2 | 0000 | 0 | 7 | ID | 0 |
| VLAN1 | 8100 | 1 | 0 | ID | target |

Target: Please set ID in VLAN ID TX Setting menu.

Right-hand menu:

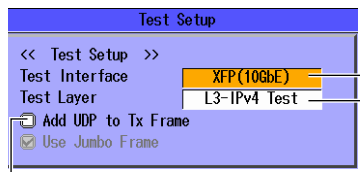
- Default: Default setup
- File: Loads a file. Loads the selected setup file from the file list
- Next 2/2: To VLAN Test Setup 1/2

11.2 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.

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.

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.

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' configuration screen. It includes fields for 'Destination MAC' (00 00 00 00 00 01), 'Destination IPv4' (192 168 0 1), and 'Destination IPv6' (FE80 0000 0000 0000 0000 0000 0000 0001). A right-hand menu contains options: 'Link/Address', 'Link Setting', 'Source Address', 'Destination Address', and 'Search List'. Below the main screen, a 'Destination IPv6' field is shown with its own 'Refer' buttons.

- Link/Address**: Set the destination MAC address. This setting appears when Test Layer is set to L2.
- Link Setting**: Refer to the MAC Address table. ▶ section 4.3
- Source Address**: Set the destination IPv4 address. This setting appears when Test Layer is set to L3-IPv4.
- Destination Address**: Refer to the IP address table. ▶ section 4.3
- Search List**: Select the search list. ▶ section 4.3
- Destination IPv6**: Set the destination IPv6 address. This setting appears when Test Layer is set to L3-IPv6.
- Refer**: 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.

The screenshot shows the 'VLAN Test Setup' screen. It includes a 'Test Interface' (XFP(10GbE)) and an 'Address Setting' section with fields for Source MAC, Destination MAC, Source IPv4, and Destination IPv4. Below this is a 'Test For VLAN' section with 'VLAN stacks' (VLAN2, VLAN1) and their respective TP ID, CF, CoS, and ID. A 'Next 1/2' button is at the bottom right.

- Address settings**: Points to the 'Address Setting' section.
- VLAN settings**: Points to the 'Test For VLAN' section.

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 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 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 Series 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 Series 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.

Annotations for the TX Setting screen:

- Interval:** Set the interval (1ms, 10ms, 100ms, 1s).
- Frame Length (Actual):** 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:** Refer to the frame length table. ▶ section 4.5
- Repeat Count:** 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

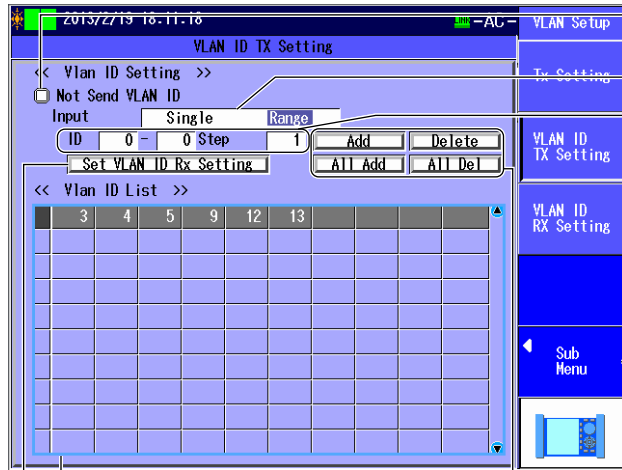
11.5 Configuring the VLAN ID Tx Settings

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.



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.

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).

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

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 Series.

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 'Target Frame' set to 'All'; 'Input' section with 'Single' and 'Range' options, and fields for 'ID' (0), 'Step' (12), and 'Step' (2); and a 'VLAN ID List' table with columns for ID values (0, 2, 4, 6, 8, 10, 12). A 'Sub Menu' button is located at the bottom left. 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'. Callouts from the right side of the image point to these elements and provide detailed instructions.

Select this check box to use the AQ1300 Series 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).

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 Series 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

Repeat: 0/1 Duration: 00:00:06 Status: Executing... Start Transmit

0/1 Rx ID Success: 0 / Plan: 0 Rx ID Fail: 0 Rx ID Error: 0 Stop Transmit

SFP FE LINK FX 100H FULL To List

Frame TX RX Area

L2 ERR 0 128 255 All Part

256 512 768 1024 Next 1/2

1280 1536 1792 2048 2304 2560 2816 3072 3328 3584 3840

VLAN Range: 0-4095

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."

Measurement status

Starts transmission

Measured results

Stops transmission
This key is enabled when the Start Transmit soft key is pressed.

Received VLAN IDs

Displays the Rx frame format
▶ section 7.14

File
Save the measured results of VLAN tests.
▶ section 12.2

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 Start Transmit

Rx ID Fail: 0 Rx ID Error: 0 Stop Transmit

0 128 255 To List

256 512 768 1024 Area

1280 1536 1792 2048 All Part

2304 2560 2816 3072 Next 1/2

3328 3584 3840

VLAN Range: 0-4095

Measured results

Received VLAN IDs

Example of fail judgment

Fail Duration: 00:00:05 Status: Finish

Rx ID Success: 81 / Plan: 176 Start Transmit

Rx ID Fail: 95 Rx ID Error: 80 Stop Transmit

0 8 15 To List

16 32 48 64 Area

80 96 112 128 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

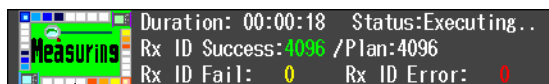
If you press STOP without pressing the Stop Transmit soft key first, transmission and measurement are both stopped.

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.

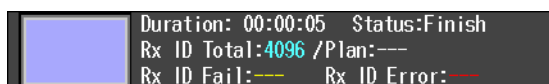


Judgment result
Displays "Measuring" during measurement

| | | |
|------------------|--|---|
| 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.

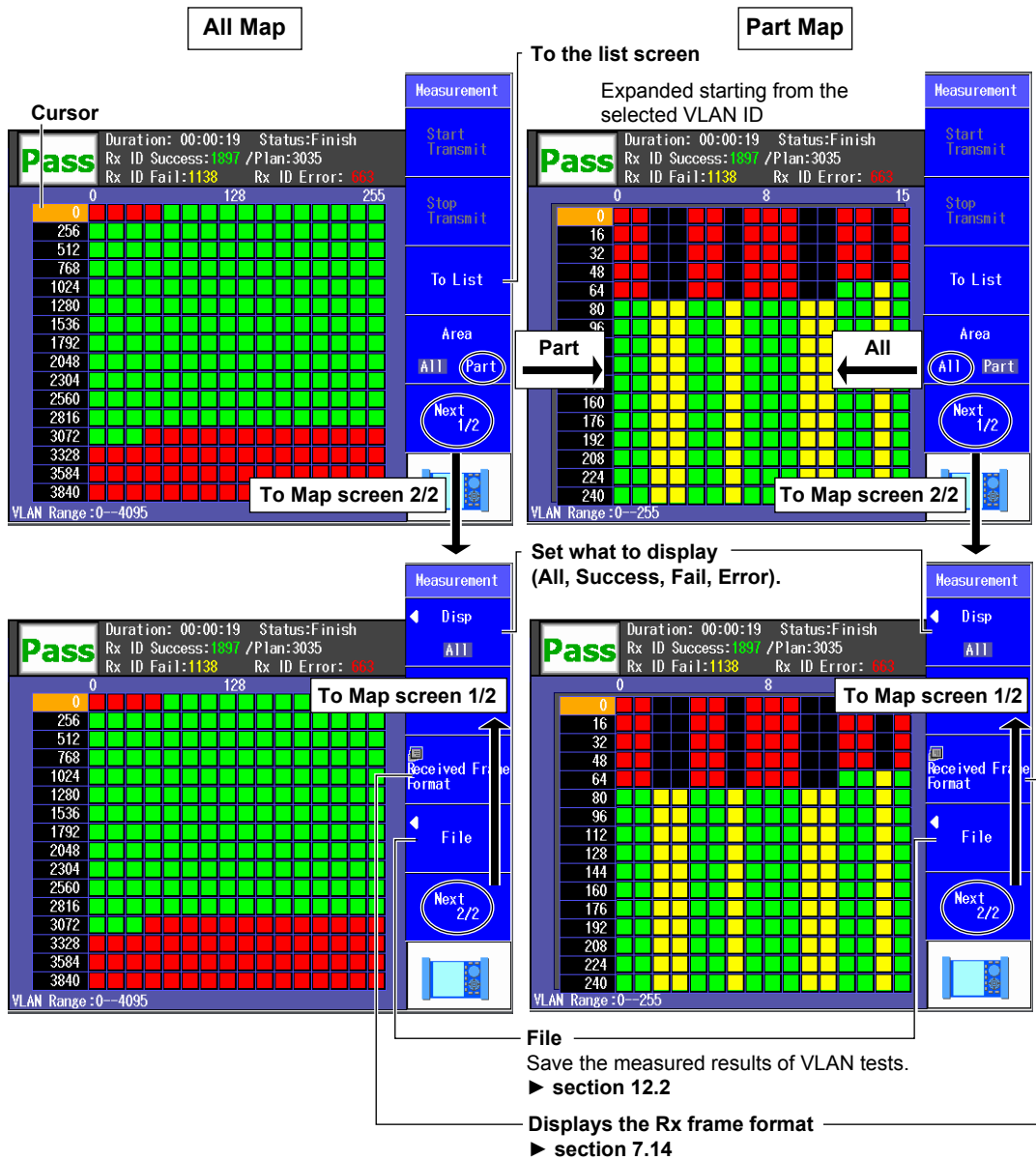
11.8 Switching Screens and Saving Measured Results

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.

Measurement

Start Transmit

Stop Transmit

To Map

VLAN ID

Next 1/2

Pass Duration: 00:00:19 Status: Finish
 Rx ID Success: 1897 / Plan: 3035
 Rx ID Fail: 1138 Rx ID Error: 003

Page 1/29

| (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 |

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

Measurement

Disp

All

Received Frame Format

File

Next 2/2

Pass Duration: 00:00:19 Status: Finish
 Rx ID Success: 1897 / Plan: 3035
 Rx ID Fail: 1138 Rx ID Error: 003

Page 1/29

| (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 |

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 — Set up the test. ► section 12.2

Test Item — 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

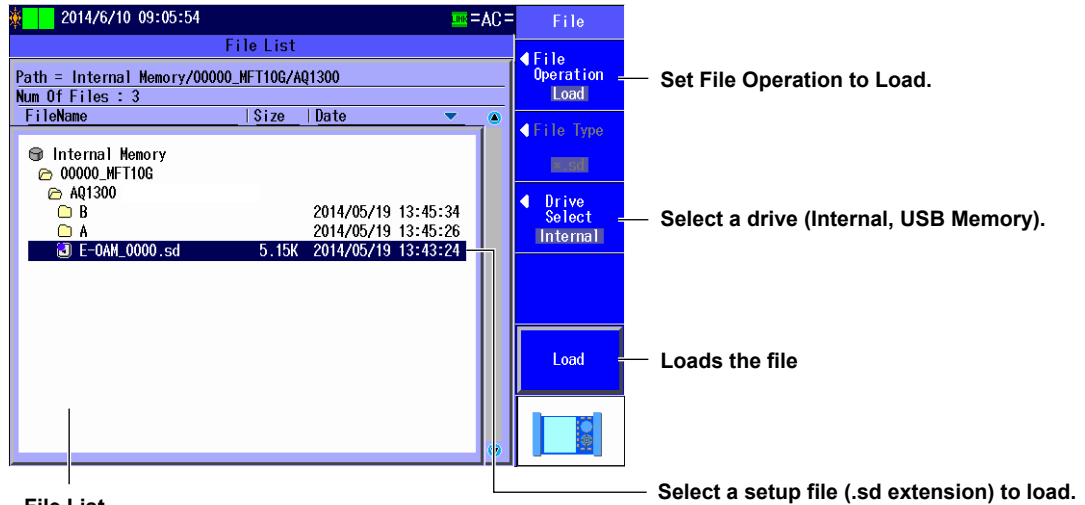
Option (E-OAM) — Set options (E-OAM). ► section 12.7

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 Series 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 Series, or you can save the settings on the AQ1300 Series.

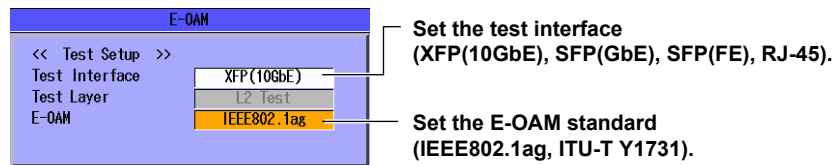
For details on the Setup Software, see the Setup Software User's Manual, IM AQ1300-61EN.

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.

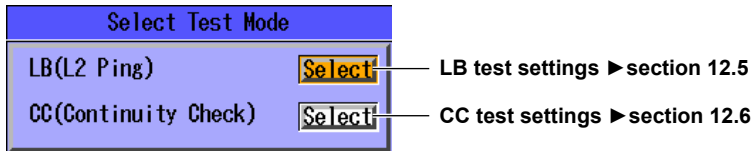
- IEEE802.1ag: Test complying with IEEE802.1ag, Connectivity Fault Management
- ITU-T Y1731: Test complying with ITU-T Y1731, OAM Functions and Mechanisms for Ethernet based networks

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 Series

Applies link settings
Applies the acquired other device's link settings to the AQ1300 Series. 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 screen title is 'Source Address'. Below the title, there are several configuration fields:

- Source MAC:** A field containing the hexadecimal value '00 00 00 00 00 01'. A callout points to this field with the text: 'Set the source MAC address.'
- VLAN stacks:** A section containing a table of VLAN settings. A callout points to the 'VLAN2' row with the text: 'Refer to the MAC Address table. ▶ section 4.3'. The table is as follows:

| VLAN | TPID | CFI | CoS | ID |
|-------|------|-----|-----|------|
| VLAN2 | 88A8 | 0 | 0 | 1001 |
| VLAN1 | 8100 | 0 | 0 | 1000 |
- MDLevel:** A field containing the value '0'. A callout points to this field with the text: 'Set the MD level (0 to 7).'

On the right side of the screen, there is a vertical menu with soft keys: 'Link/Address', 'Link Setting', 'Source Address', 'Emulation Setting', and 'Destination Address'. A callout points to the 'Link/Address' key with the text: 'Set the VLAN stack number (1, 2).'. Another callout points to the 'Source Address' key with the text: 'Configure the VLAN settings (TPID: 0-FFFF, CFI: 0-1, CoS: 0-7, ID: 0-4095)'. A third callout points to the 'Emulation Setting' key with the text: 'Refer to the VLAN table. ▶ section 4.3'.

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.

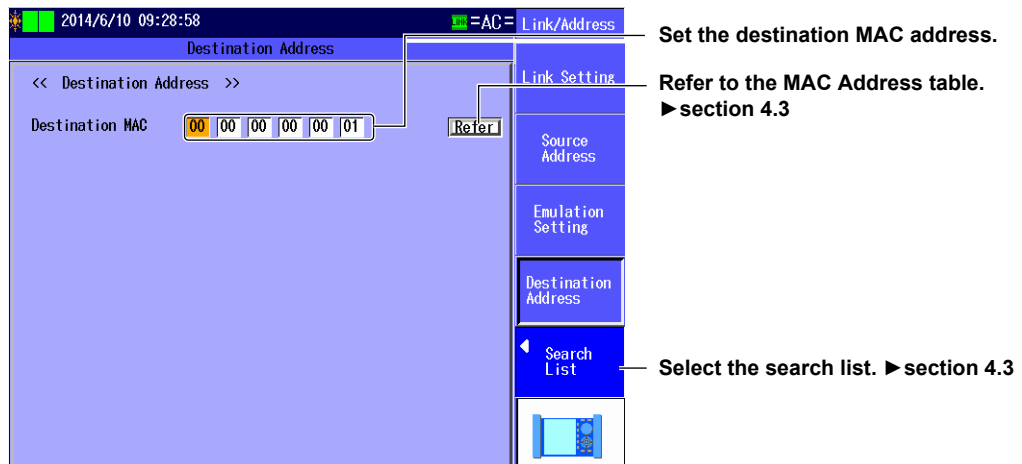
The screenshot shows the 'Emulation Setting' configuration screen. The top status bar displays '2014/6/10 09:27:08' and '-AC-'. The screen title is 'Emulation Setting'. Below the title, there are two checked checkboxes:

- LB Reply
- LT Reply

On the right side of the screen, there is a vertical menu with soft keys: 'Link/Address', 'Link Setting', 'Source Address', 'Emulation Setting', and 'Destination Address'. A callout points to the 'Emulation Setting' key with the text: 'Select this check box to send LB replies.' and another callout points to the 'LT Reply' checkbox with the text: 'Select this check box to send LT replies.'

Destination Address Screen

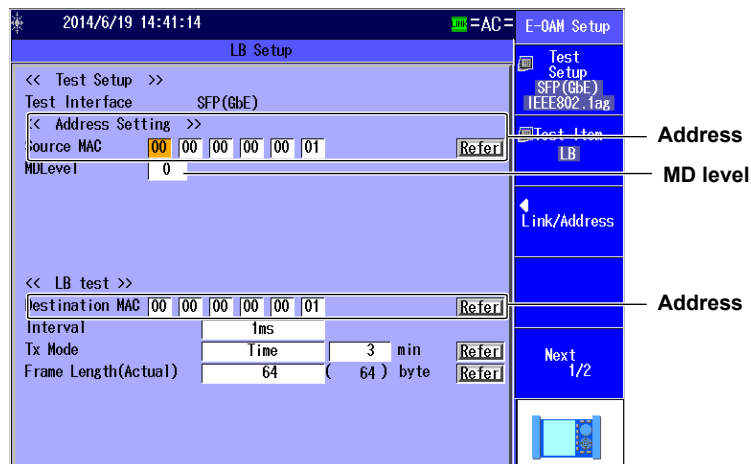
Press the **Link/Address** soft key and then the **Destination Address** soft key to display the following screen.



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.



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 Series 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 Series 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 Series 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 Series automatically responds with an RF.
- Manual: The AQ1300 Series 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 Series 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 Series 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 Series. 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 Series 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 Series 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 Series 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 Series 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:

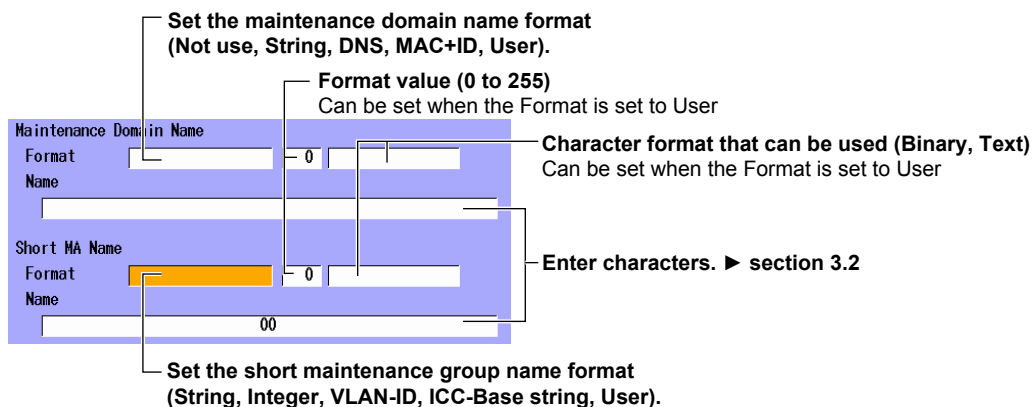
- Test Interface:** SFP(GbE)
- Address Setting:** Source MAC (00 00 00 00 00 01), MDLevel (0)
- Domain:** Short MA Name Format (User), Short MA Name, MEP ID (0)
- CC test:** Destination MAC (Unicast, 00 00 00 00 00 01), Interval (1s), Tx START Condition (First Rx CCM), Target MEP ID (Designation, 0)
- 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)
- 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)
- 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)

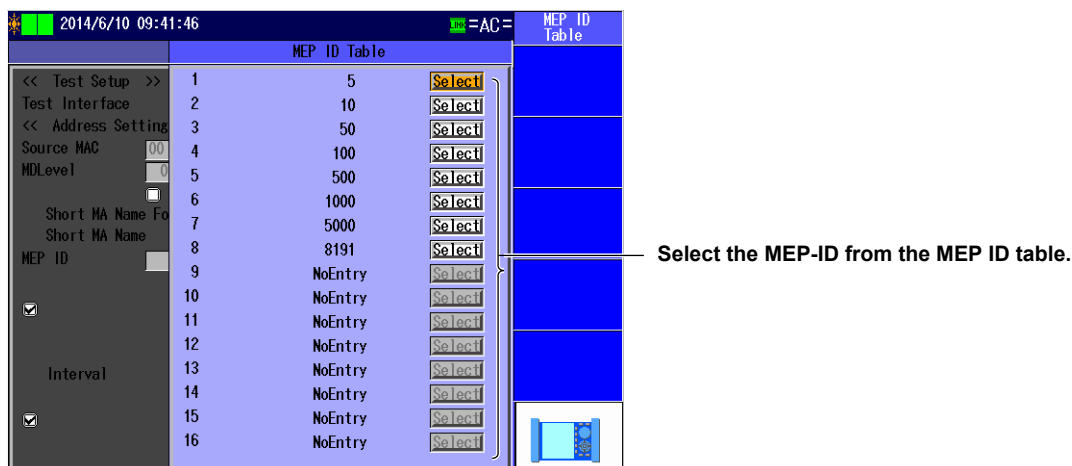
Setting the Maintenance Domain Information

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 Series 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 Series 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 Series 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 Series 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 Series 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

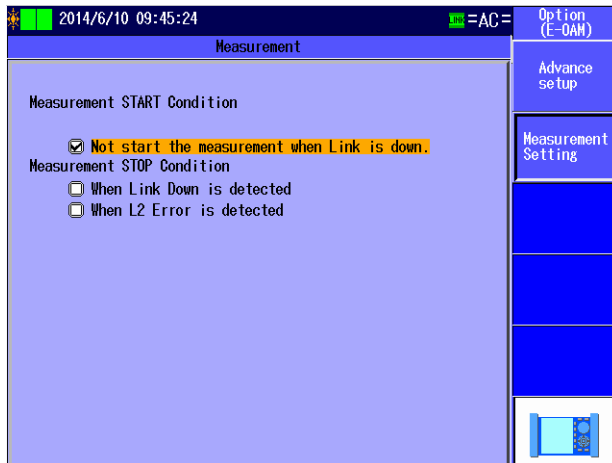
Select the ID value from the MEP ID table. Displayed when the method of setting the ID number is set to Designation.

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 Summary

Duration 00:00:22 Test results

[LB] Loss Count: 0 Execute an LT or Multicast LB. ▶ section 12.10

Send Count: 20,975 File Save the measured results of LB tests. ▶ section 13.2

| 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): 0 0

Network status ▶ section 2.1

Statistics counter and error detection history ▶ section 2.1

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 Indication that measurement has finished

Duration 00:00:34 Measurement duration

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): 0 0

Remaining Tx time

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 Series 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 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

Next 1/2 → Measurement

Detail Display Displays detailed statistics

Tx/Rx CCM information 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 | | |

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 | | |

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.

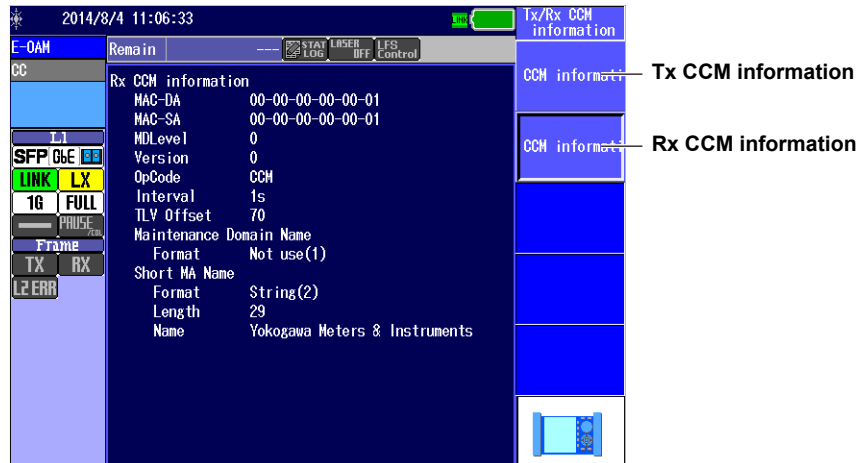


Displaying Tx/Rx CCM information

Start or stop a measurement.

Press the **Tx/Rx CCM** information soft key to display the following screen.

Rx CCM Frame Information Display Example

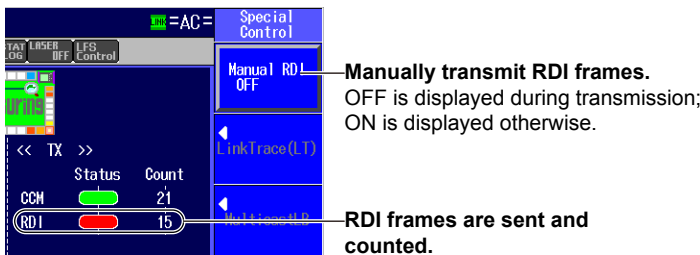


Transmitting RDI Frames

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



Indication that measurement is in progress

Results Display

Rx results

| | |
|----------------------|---|
| Status | |
| CCM | 5 |
| RDI | 1 |
| LOC | 0 |
| DA 00-00-00-00-00-00 | |
| SA 00-00-00-00-00-00 | |
| MEP ID 0 | |
| Interval Unknown | |

Tx results

| | |
|----------------------|---|
| Status | |
| CCM | 5 |
| RDI | 0 |
| DA 00-00-00-00-00-00 | |
| SA 00-00-00-00-00-01 | |
| MEP ID 0 | |
| Interval 100ms | |

Tx and Rx status

Simple CCM frame information 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

| No. | 1st(ms) | Source MAC Address |
|-----|---------|--------------------|
| 1 | 10700 | 8A-8B-8C-8D-8E-8F |
| 2 | 2600 | 90-91-92-93-94-95 |
| 3 | 2500 | 96-97-98-99-9A-9B |
| 4 | 21000 | 9C-9D-9E-9F-A0-A1 |
| 5 | 26900 | A2-A3-A4-A5-A6-A7 |
| 6 | 17900 | A8-A9-AA-AB-AC-AD |
| 7 | 14700 | AE-AF-B0-B1-B2-B3 |
| 8 | 13400 | B4-B5-B6-B7-B8-B9 |
| 9 | 9800 | BA-BB-BC-BD-BE-BF |
| 10 | 15300 | C0-C1-C2-C3-C4-C5 |
| 11 | 16400 | C6-C7-C8-C9-CA-CB |
| 12 | 5000 | CC-CD-CE-CF-D0-D1 |
| 13 | 10600 | D2-D3-D4-D5-D6-D7 |
| 14 | 24200 | D8-D9-DA-DB-DC-DD |
| 15 | 10300 | DE-DF-E0-E1-E2-E3 |
| 16 | 27100 | E4-E5-E6-E7-E8-E9 |

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

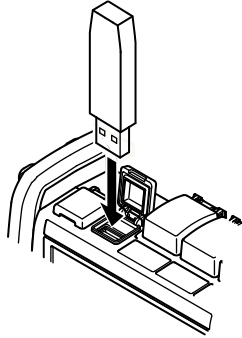
The source MAC addresses of the devices that responded are displayed.

Status Indications

The indications are the same as those of LT execution. See the previous page.

13.1 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 Series. Hot-plugging is supported: you can connect or disconnect the USB device at any time, regardless of whether the AQ1300 Series is on or off. When the power is on, the AQ1300 Series automatically detects the USB storage medium after it is connected.



Note

- Connect USB storage devices to the AQ1300 Series 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 Series is turned on until key operation becomes available.
- You can use USB storage devices that comply with USB 1.1.

13.2 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.

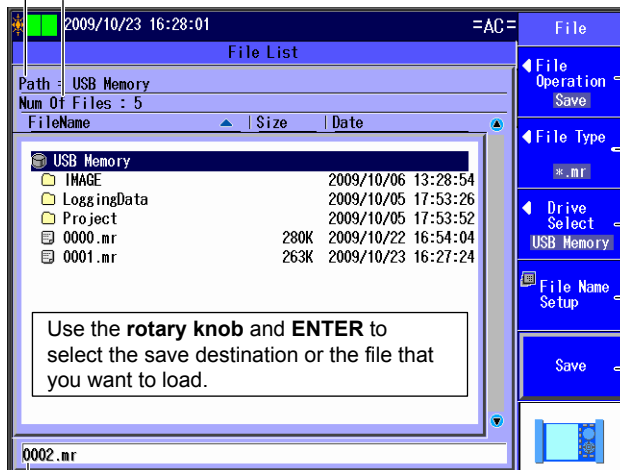
- Auto, Auto(Remote), or Manual Section 7.1
- RFC2544 Section 9.2
- VLAN test Section 11.7
- E-OAM test Sections 12.8, 12.9, and 12.10

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) |

13.2 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 13.7.

Drives

You can select one of the following drives.

| | |
|------------|---|
| Internal | The AQ1300 Series internal memory |
| USB Memory | The USB storage medium connected to the USB Type A port on the AQ1300 Series. |

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) |

13.3 Deleting and Copying Files

Procedure

File Screen

Follow the procedure in section 13.2 to display the file screen.

Directory path

The number of directories and files in the selected directory

Use the **rotary knob** and **ENTER** to select the files you want to delete or copy. Selected files are indicated with this mark: . To deselect a file, press **ENTER** again.

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 13.2.
- To display all the files in the current directory, set the file type to “*.*”.

Drives

See “Explanation” in section 13.2.

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 Series, you can send the files and directories in the AQ1300 Series internal memory to a PC. To do this, set the AQ1300 Series mini B USB port function to Storage (see section 13.1). When the PC accesses the AQ1300 Series and downloads the files, the download speed depends on the performance of the PC.

13.4 Changing File Names

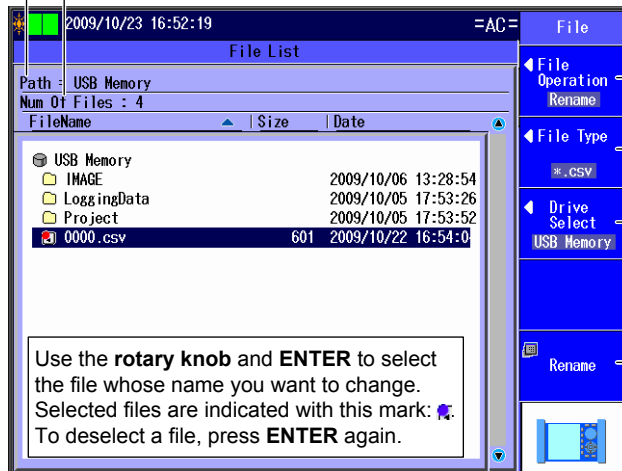
Procedure

File Screen

Follow the procedure in section 13.2 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 13.2.
- To display all the files in the current directory, set the file type to "*.*".

Drives

See "Explanation" in section 13.2.

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.

12.5 Creating Directories

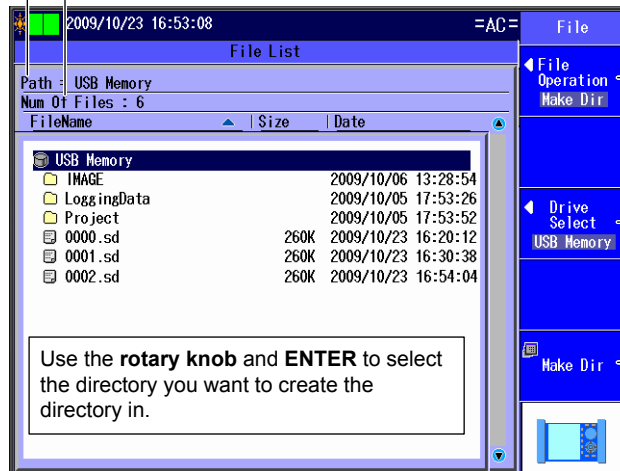
Procedure

File Screen

Follow the procedure in section 13.2 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 13.2.

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.

13.6 Deleting and Copying Directories

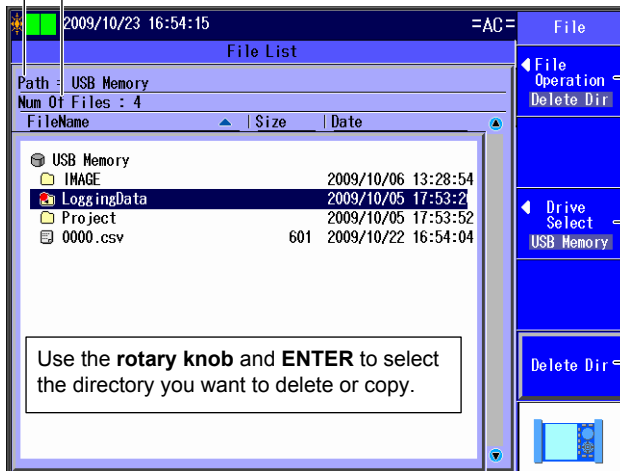
Procedure

File Screen

Follow the procedure in section 13.2 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 13.2.

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 Series, you can send the files and directories in the AQ1300 Series internal memory to a PC. To do this, set the AQ1300 Series mini B USB port function to Storage (see section 13.1). When the PC accesses the AQ1300 Series and downloads the files, the download speed depends on the performance of the PC.

13.7 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 12.2).

| 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 12.2).

| 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.

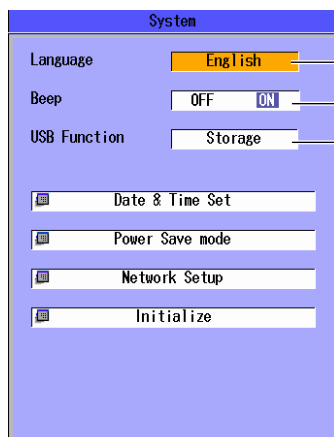
- File size, date the file was saved, and tree view on or off
- Date format, what to sort by, and the sort order

14.1 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 Series screen. The options that appear vary depending on the product's language specification.

Turning the Beep On and Off

You can make the AQ1300 Series beep whenever an operation error occurs, an error message is displayed, measurement finishes, or an error occurs during measurement.

| | |
|-----|----------------------------------|
| ON | The AQ1300 Series beeps. |
| OFF | The AQ1300 Series 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 Series.

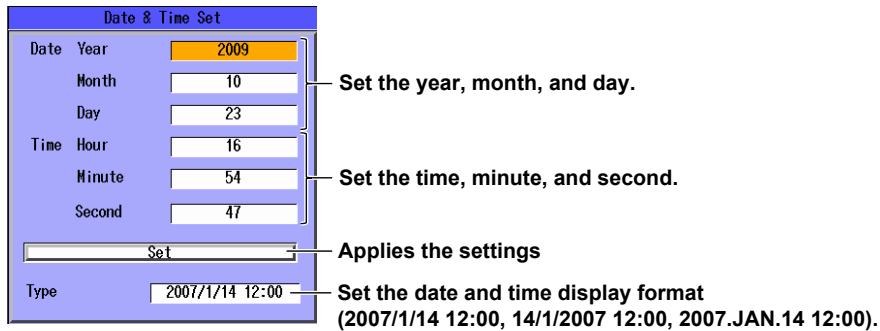
| | |
|-------------|---|
| Storage | You can access the AQ1300 Series internal memory from a PC and load and save data. |
| Control I/O | You can use the MFT remote control software to control the AQ1300 Series from a PC. |

14.2 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.

14.3 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.

The screenshot shows the 'Power Save mode' screen with the following settings:

- Using AC power:** Auto Power Off is set to OFF, and LCD Brightness is set to Bright.
- Using battery:** Auto Power Off is set to OFF, LCD Brightness is set to Bright, and Screen Save is set to OFF.

Annotations on the right side of the screen provide instructions:

- Using AC power:** Configure the auto power off feature (OFF, AutoPowerOff 1m, AutoPowerOff 5m, AutoPowerOff 10m, AutoPowerOff 30m). Set the LCD brightness (Bright, Normal, Power save, OFF).
- Using battery:** 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 Series is using an AC adapter and for when it is using a battery.

Auto Power Off

When the AQ1300 Series 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 Series is on, it can turn the display off automatically after it has not been used for 15 seconds.

14.4 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 callouts:

- Valid / Invalid:** A radio button menu with 'Valid' selected. Callout: "Enables or disables the network setup".
- Host Name:** An empty text field. Callout: "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'. Callout: "Set the timeout value."
- DHCP:** A radio button menu with 'OFF' selected.
- IP Address:** A 4-digit grid containing '192', '168', '0', '2'.
- Subnet Mask:** A 4-digit grid containing '255', '255', '255', '0'.
- Gateway:** A 4-digit grid containing '192', '168', '0', '1'.
- Callout for the IP, Subnet Mask, and Gateway fields: "TCP/IP settings".

At the bottom of the screen, it says: "To apply the changes, power-cycle the AQ1300."

Note

You must restart the AQ1300 Series after you have changed the network settings. Before you restart the AQ1300 Series, the settings from before you changed the settings are used.

Explanation

For details about the network that you intend to connect the AQ1300 Series 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 Series can communicate over the network.

Invalid The AQ1300 Series cannot communicate over the network.

If Valid is selected and the AQ1300 Series 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 Series 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 Series 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 Series for the specified time.

Range: 0 to 3600 s

The AQ1300 Series will not time out if you set the timeout value to 0. If the AQ1300 Series is connected to a network and the connection between the AQ1300 Series and another device is broken abnormally due to an external cause, the AQ1300 Series 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 Series 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 Series or enable or disable the network setup as described in the previous section. Check the information when you access the AQ1300 Series from a PC.

IP Address

You can set the IP address assigned to the AQ1300 Series. 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

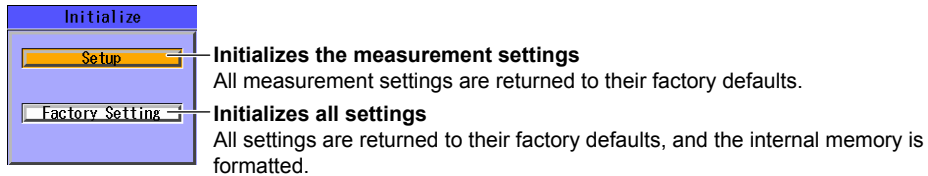
You can set the IP address of the default gateway (which is a gateway used to communicate with other networks). The default gateway handles data exchange between multiple networks so that data transmission proceeds smoothly. Consult your network administrator for the default gateway value. In a network that supports DHCP, this parameter is set automatically when DHCP is set to ON.

14.5 Resetting the AQ1300 Series 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 Series 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

Using the mini B USB port on the AQ1300 Series, you can send the files and directories in the AQ1300 Series internal memory to a PC. To do this, set the AQ1300 Series mini B USB port function to Storage (see section 13.1). When the PC accesses the AQ1300 Series and downloads the files, the download speed depends on the performance of the PC.

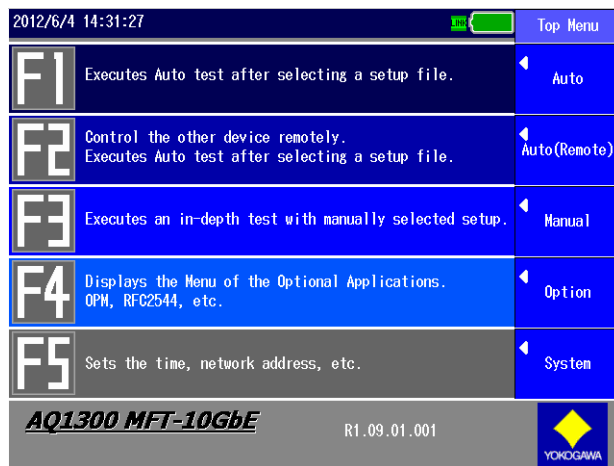
14.6 Setting the Top Menu Type

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

Procedure

Type 1

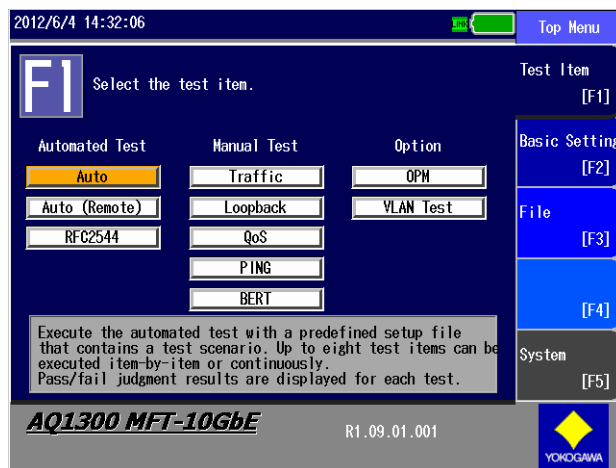
This is the conventional menu (default). The top menu is the test menu. For details on the test menu, see section 1.2.



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.



14.6 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 13.7 |
| Result file viewer | |
| Import a setup file | |
| File operations | Chapter 13 |

F5: Configure the system, perform self tests, and update the firmware. For details on the items, see the following sections.

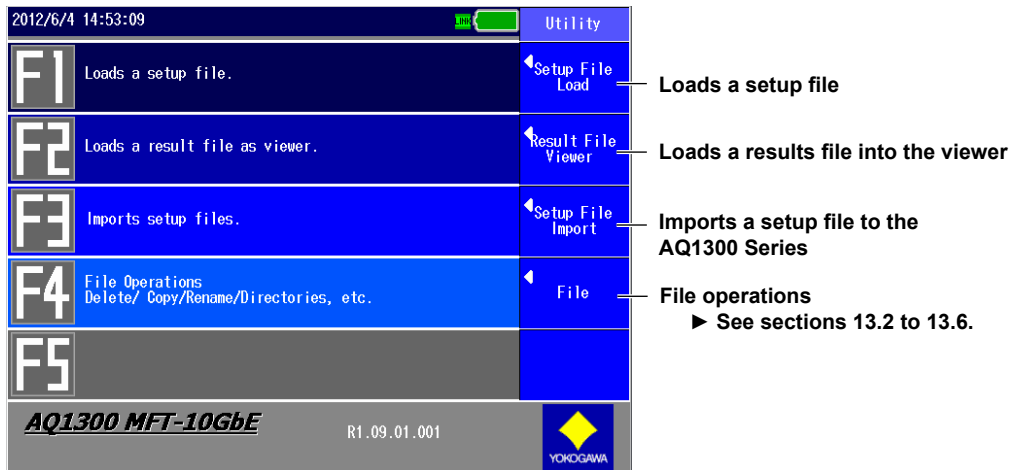
| Setup Item | Reference |
|----------------------|--------------|
| System configuration | Chapter 14 |
| Self test | Section 15.3 |
| Firmware updating | Section 15.5 |

14.7 Using the Utility Menu

Procedure

Utility Menu Screen

On the Top Menu screen, press **SETUP** to display the following screen.



Note

Press ESC to return to the Top Menu 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 Series 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 Series. The corresponding setup file is copied to the /setup folder in the AQ1300 Series internal memory.

- **If You Select the Display Management File (disManage.dmf)**

The AQ1300 Series 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 Series decompresses the contents of the package file to the /setup folder in its internal memory.

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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