User's Manual

Model 731070 RFC2544 Test Application for AE5511

YOKOGAWA
Yokogawa Electric Corporation

IM 731070-01E
1st Edition

Thank you for purchasing the RFC2544 Test Application for AE5511, a software option for the AE5511 TrafficTesterPro.
This User's Manual contains useful information about the functions and operations of the software. To ensure correct use, please read this manual thoroughly before beginning operation. After reading the manual, keep it in a convenient location for quick reference whenever a question arises during operation.
For the operation and handling of the AE5511 TrafficTesterPro, see the respective manuals for the AE5511.

- AE5511 TrafficTesterPro User's Manual (IM417322900-01E)
- AE5511 TrafficTesterPro Startup Manual (IM417322900-02E)
- AE5511 TrafficTesterPro Remote Command Manual (IM417322900-17E)

Notes

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Revisions

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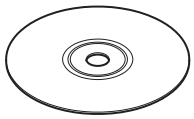
Model	Suffix Code	Description
731070		RFC2544 Test Application for the AE5511
Language	-LNE	English

Contents of the Package

- Software CD (RFC2544 Test Application CD for the AE5511): 1
- User's manual (this manual): 1

Software CD



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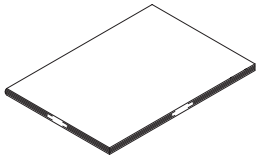


Conventions Used in This Manual

Markings

The following markings are used in this manual.

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

Subheadings

On pages that describe the operating procedures in chapters 4 through 6, the following symbols, displayed characters, and terminology are used to distinguish the procedures from their explanations.

Procedure Carry out the procedure according to the numbered steps. All procedures are written with inexperienced users in mind; experienced users may not need to carry out all the steps.

Explanation This section describes the setup items and the limitations regarding the procedures. It may not give a detailed explanation of the function. For a detailed explanation of the function, see chapter 2.

Displayed Characters and Terminology Used in the Procedural Explanations

- Software buttons: Bold characters Example) Click **OK**.
- Parameters: Bold characters Example) Select **TRAFFIC**.
- Switches: xxx switch Example) Press the power switch.
- Hard keys: xxx key Example) Press the cursor key.

Units

k: Denotes 1000. Example: 100 kHz and 10 kg
K: Denotes 1024. Example: 100 KB
M: Denotes 1000000 if the unit is bps or Hz. Example: 100 Mbps and 10 MHz
Denotes 1048576 if the unit is bytes. Example: 100 MB
G: Denotes 1000000000 if the unit is bps or Hz. Example: 10 Gbps and 10 GHz

Contents

1.1 Overview

This software application is a software option for the AE5511 TrafficTesterPro that supports RFC2544, an industry standard for network device evaluation. It can objectively evaluate the performance of network devices and improve the work efficiency through auto tests.

Main Functions and Features

- A RFC2544 performance auto test software for the AE5511 TrafficTesterPro.
- The software application supports the four test modes defined in the RFC2544, throughput, latency, frame loss rate, and back-to-back.
- The traffic map enables combinations of the traffic direction with respect to the DUT (unidirectional, bidirectional, or auto reverse) and the input/output of test ports (one-to-one or multi) to be set up.
- One-step operation to execute the auto reverse test that can carry out performance tests on devices whose performance is different between uplink and downlink.
- The test results can be verified on a numeric data table or graph. The software application can also output the results to a report format convenient for creating test reports.

Applicable Units

This software application supports the following units.

- AE5522 10GBASE-X Unit
- AE5523 1000BASE-T Unit
- AE5524 1000BASE-X Unit

Note

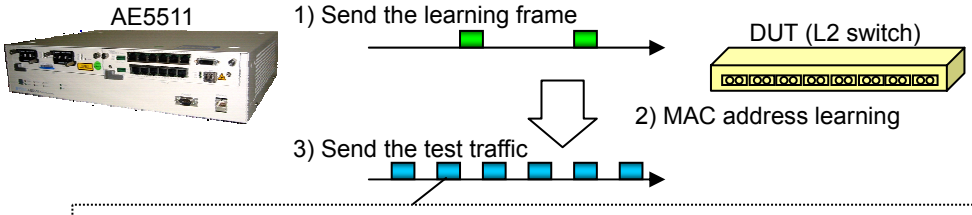
AE5520 100BASE-T Unit and AE5521 1000BASE-X Units are not supported. Ports cannot be reserved on the AE5520 and AE5521.

2.1 Tests by DUT Type

When you specify the DUT type, this software application automatically sends appropriate test frames and performs MAC address and IP address learning before starting the test. This feature allows you to easily start the test. For the operating procedure, see section 5.3.

L2 Switch Test

You can execute an L2 switch test by specifying L2 Switch for the DUT type. In the L2 switch test, a MAC address learning frame is sent between the pair of ports before the test.



The destination MAC address is automatically set to the MAC address of the opposite port.

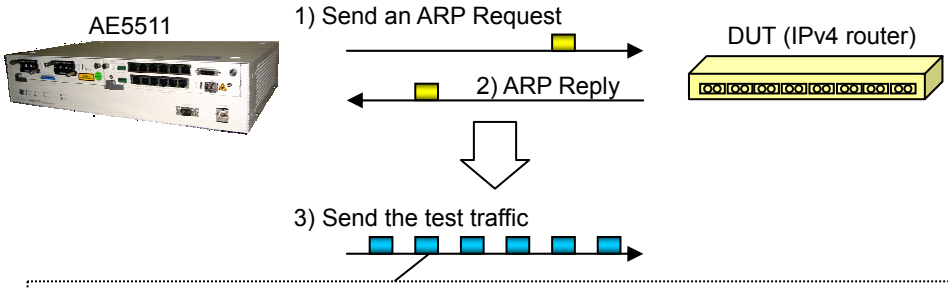
Note

- Three learning frames are sent to each opposite port at 0.1% of the wire speed.
- The learning frames are resent until they reach the opposite port normally. Once they do, the AE5511 sends the test traffic.

Because the destination MAC address of the transmitted frames is automatically set to the MAC address of the opposite port, you can easily start the test by specifying the port pair.

IPv4 Router Test

You can execute an IPv4 router test by specifying IPv4 router for the DUT type. In the IPv4 router test, the AE5511 sends an ARP Request to the DUT port before starting the test. The AE5511 automatically detects the MAC address of the DUT port from the ARP Reply received from the DUT and applies it to the test frames. As with the L2 switch test, learning frames can be sent to the DUT before the test or at each trial in the IPv4 router test.



The destination MAC address is automatically set to the MAC address resolved by ARP.
The destination IP address is automatically set to the IP address of the opposite port.

Note

The address resolution through ARP Request transmission is executed immediately after the measurement is started. The AE5511 retries up to three times until the address is resolved normally.
If the address is not resolved after three retrials, the AE5511 aborts the measurement.

Because the destination IP address of the transmitted frames is automatically set to the IP address of the opposite port, you can easily start the test by specifying the IP address of each port and the IP address of the destination router.

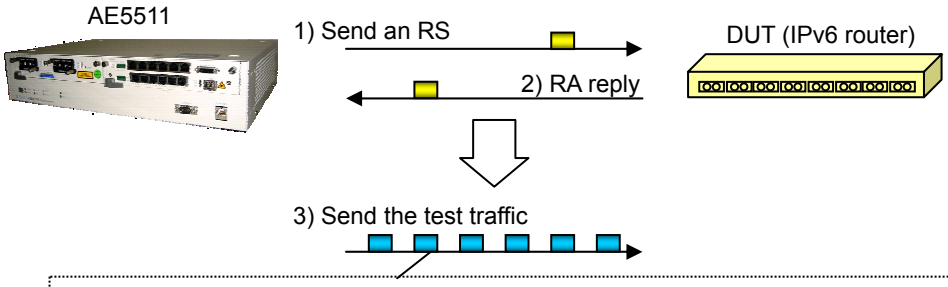
IPv6 Router Test

You can execute an IPv6 router test by specifying IPv6 router for the DUT type. The IPv6 router test supports stateless address autoconfiguration. As with the L2 switch test, learning frames can be sent to the DUT before the test or at each trial in the IPv6 router test.

Note

The AE5522 10GBASE-X Unit does not support the IPv6 router test.

- Stateless address autoconfiguration operation
  Before starting the test, the AE5511 automatically detects the MAC address of the DUT port and the IP address of its own port by sending a Router Solicitation (RS) to the DUT port and receiving the Router Advertisement (RA) from the DUT. The auto detected addresses are automatically applied to the test frames.



The destination MAC address is automatically set to the MAC address resolved by the RA response.
The source IP address is automatically detected by the stateless address reconfiguration.
The destination IP address is automatically set to the IP address of the opposite port.

Note

The address resolution through RS transmission is executed immediately after the measurement is started. The AE5511 retries up to three times until the address is resolved normally.
If the address is not resolved after three retrials, the AE5511 aborts the measurement.

Because the destination IP address of the transmitted frames is automatically set to the IP address of the opposite port, you can easily start the test by specifying the port pair.

2.2 Traffic Map Designation Function

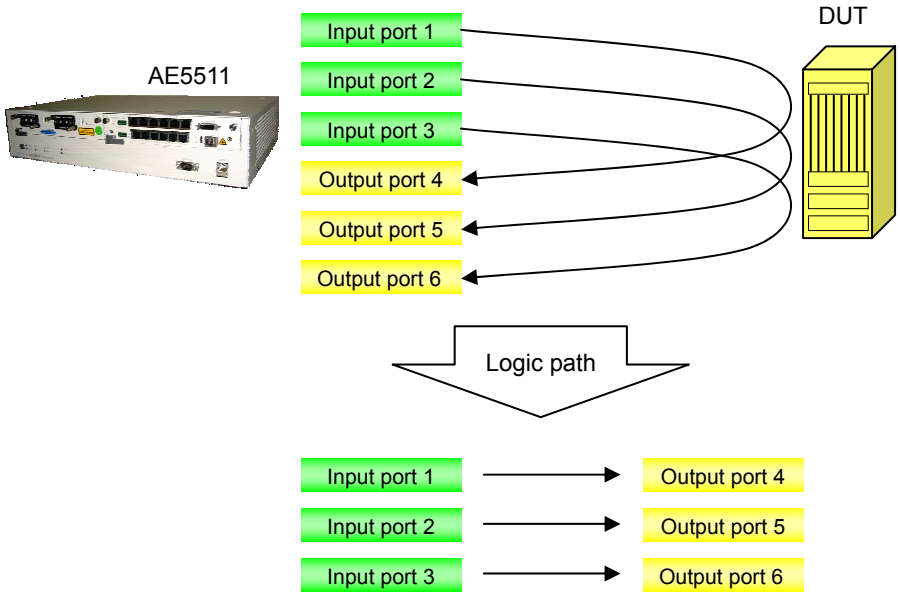
The software application supports one-to-one port traffic and multiple port traffic tests. Both tests support unidirectional and bidirectional tests. The unidirectional test has an auto reverse function that tests the forward direction from the input ports to the output ports and then the reverse direction from the output ports to the input ports.
For the operating procedure, see section 5.2.

Note

The input port and output port indicate the traffic direction as seen from the DUT.

One-to-One Port Test

The AE5511 generates test traffic between pairs of input and output ports in a one-to-one configuration.
The unidirectional test generates traffic from the input ports and checks the received frames at the output ports.
The bidirectional test generates traffic from both the input and output ports simultaneously and checks the received frames at the corresponding ports.

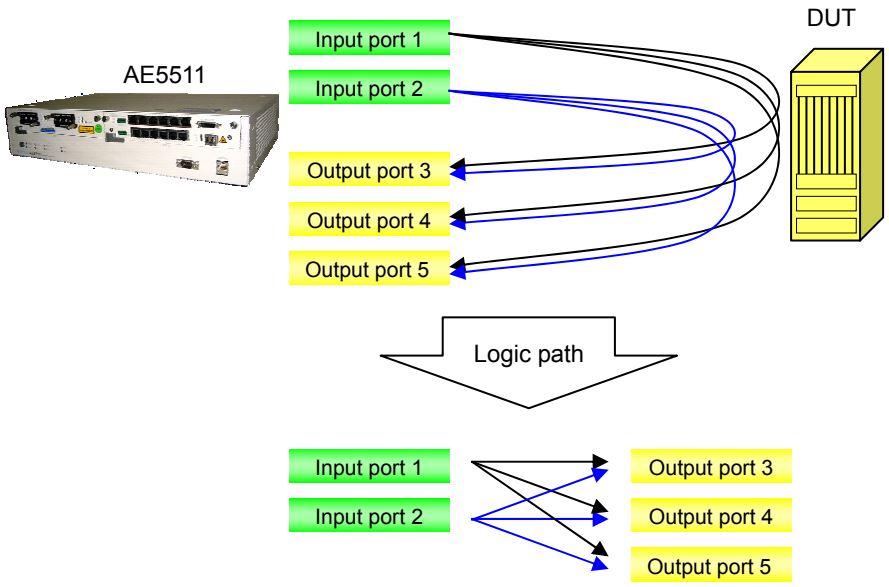


Note

In the throughput or back-to-back tests, the AE5511 indicates “Pass” if the frames sent from all input ports are received at all output ports within one test duration (or within the loss tolerance). The AE5511 indicates “Fail” if a frame is lost (when the loss tolerance is zero) in any of the port pairs even if all frames pass between a given port pair.

Multi Port Test

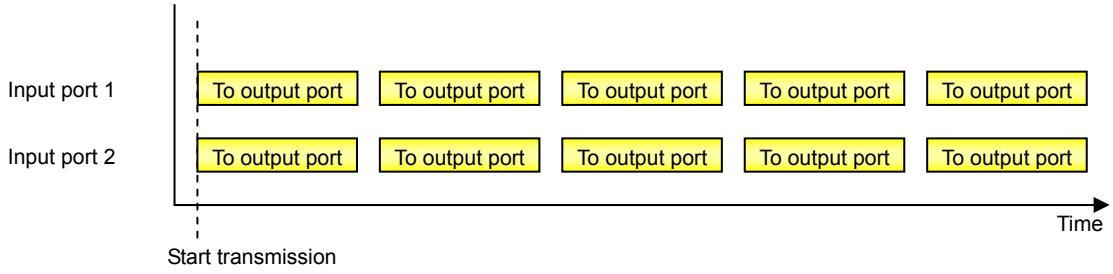
The AE5511 generates test traffic between input and output ports in a mesh configuration.
The unidirectional test generates traffic from the input ports and checks the received frames at the output ports.
The bidirectional test generates traffic from both the input and output ports simultaneously and checks the received frames at the corresponding ports.



Note

Latency measurement cannot be executed in the multi port test.

- Transmission timing from the input ports
  In the multi port test, frames are sent from all input ports simultaneously to the same output ports.

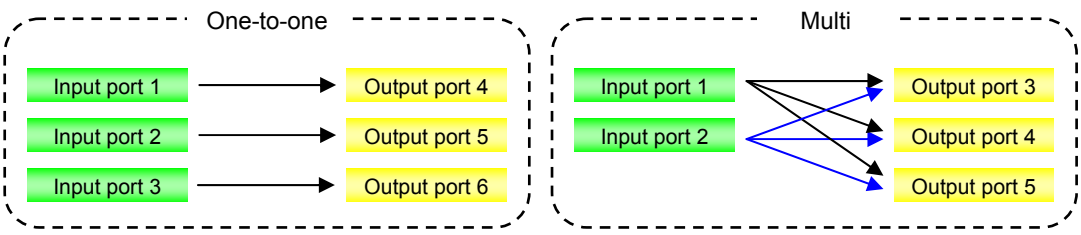


Note

- The synchronization of the frame transmission is not guaranteed on the AE5522 10GBASE-X Unit.
- If the transmission clock is changed with the transmission clock adjustment function, the synchronization of the frame transmission is not guaranteed.

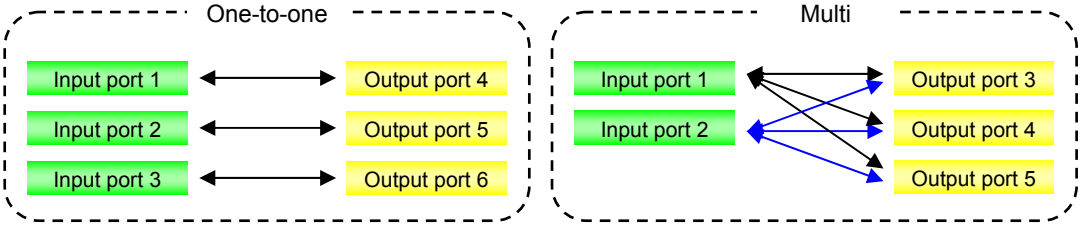
Unidirectional Test

The unidirectional test generates traffic from the input ports and checks the received frames at the output ports.



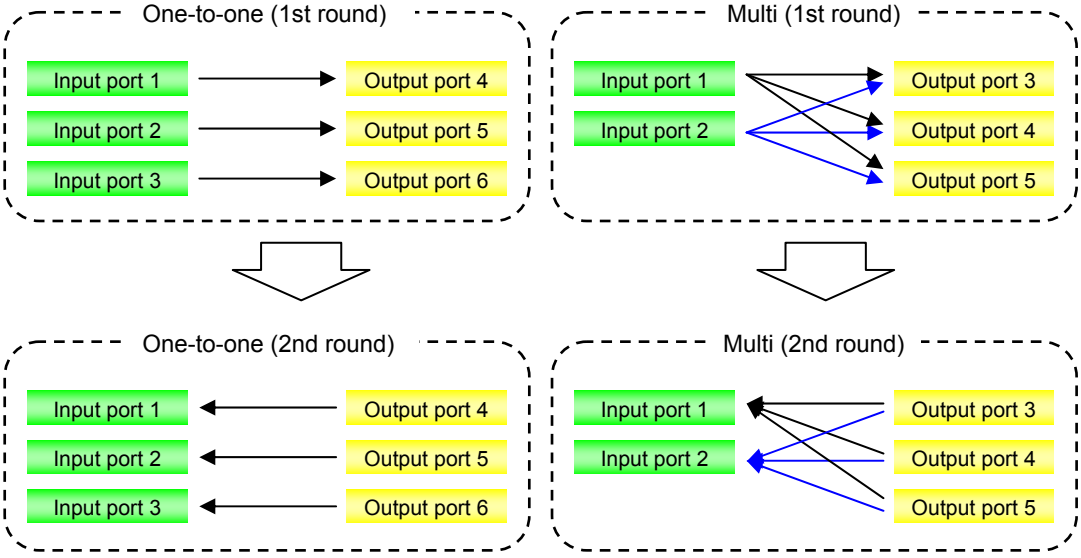
Bidirectional Test

The bidirectional test generates traffic from both the input and output ports simultaneously and checks the received frames at the corresponding ports.



Auto Reverse Test

The auto reverse test first generates unidirectional traffic from the input ports and checks the received frames at the output ports. Then, the test generates unidirectional traffic from the output ports and checks the received frames at the input ports.



2.3 Operation Switch Function during Measurement Error

The software application enables you to select whether to automatically stop the measurement when an error occurs during measurement or to continue the measurement if possible. If a port-dependent error is detected, you can identify the port on the port status display.
For the operating procedure, see section 5.3.

The following types of measurement errors are available.

(1) Address auto learn failure
When the address auto learn fails during an IPv4 or IPv6 router test.
(2) Link speed error
When the link speed changes on a port during measurement.
(3) Link down
When a link down occurs on a port during measurement.
(4) Learning frame failure
When a response is not received after sending the retrial count of learning frames.
(5) Received frames greater than transmitted frames
When the number of received test frames is greater than the number of transmitted test frames.
(6) Undelivered latency tag
When the latency measurement source frame is lost.

The following table shows how the AE5511 behaves when each error occurs.

Measurement Error Item	Status Display	Error Operation Setting	
		Stop	Not Stop
(1) Address auto learn failure	-	Stops the measurement	Stops the measurement
(2) Link speed error	Red	Stops the measurement	Stops the measurement
(3) Link down	Red	Stops the measurement	Continues the measurement
(4) Learning frame failure	Red	Stops the measurement	Continues the measurement
(5) Received frames greater than transmitted frames	Red	Stops the measurement	Continues the measurement
(6) Undelivered latency tag	Red	Continues the measurement	Continues the measurement

If error (1) or (2) occurs, the measurement stops even if the error operation setting is set to not stop, because the measurement cannot be continued.
If error (6) occurs, the measurement continues regardless of the error operation setting.

Note

- If a measurement error occurs, the AE5511 aborts the transmission operation of all ports for that test duration and indicates Fail.
- If Layer1 Setup of PORT1 to 12 on the AE5523 is set to auto negotiation, measurement starts by assuming a link speed of 10M on ports whose link is down at the time the measurement is started.

2.4 Measurement Functions

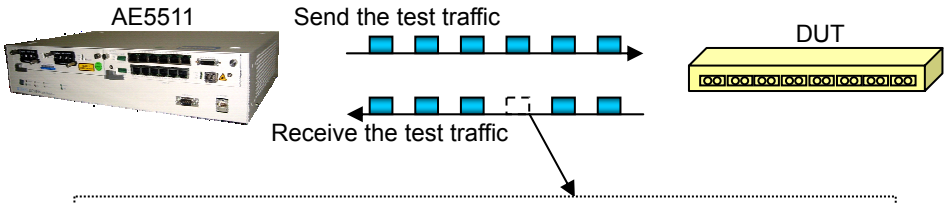
This section describes the functional operation of the four measurement items, throughput, latency, frame loss rate, and back-to-back, that the software application supports.
For the operating procedure, see section 5.3.

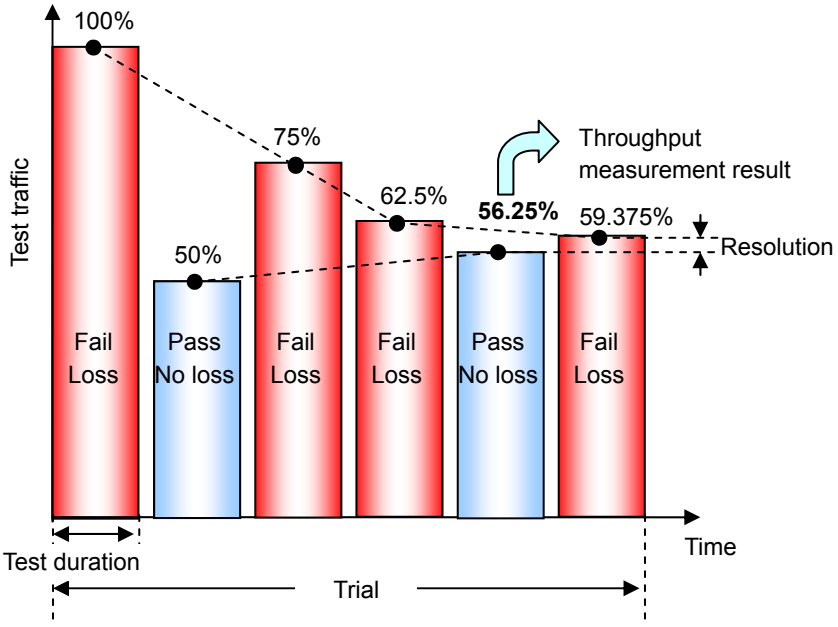
Throughput Measurement Function

The throughput measurement determines the maximum rate for each frame length that the network device can transmit without loss.
In this measurement, frames are sent at a specific rate over a specific time (test duration). If frames are lost, the rate is reduced. If no frames are lost, the rate is increased. This operation is repeated until the rate converges within a specified resolution range. The operation that is repeated until the rate converges is considered a single trial. The average of the results obtained by performing a specified number of trials is the throughput result.

Note

In the throughput measurement, you can change the threshold level for detecting a loss by setting a loss tolerance.





Note

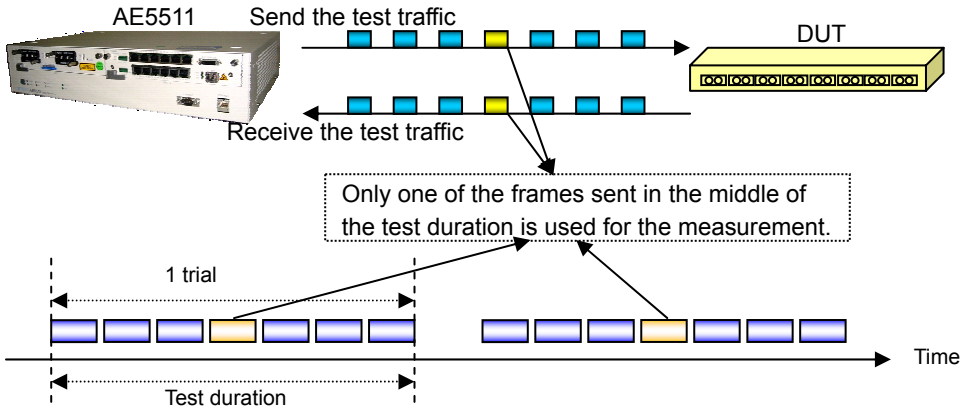
In some cases, the rate cannot be converged within a specified resolution range due to the resolution capability of the IFG setting of each unit. The throughput measurement result includes quantization errors that depend on the resolution of the IFG setting of each unit.

Latency Measurement Function

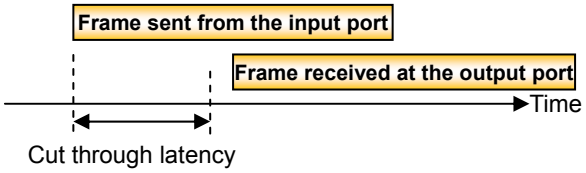
The latency measurement determines the latency for each frame size when frames are sent through the DUT.
In this measurement, only one of the frames sent in the middle of the test duration is used for the measurement. The rate used during the measurement can be set to the rate of the throughput measurement result or a rate specified manually. The latency measurement results can be displayed by selecting the cut through latency and store & forward latency.

Note

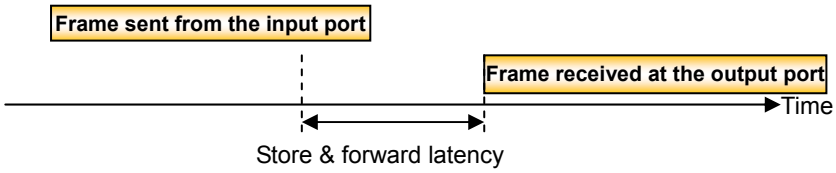
- If the rate is specified manually, the result is displayed for each rate within a specified range.
- Latency measurement cannot be executed in the multi port test.
- The display resolution of the latency measurement result is 0.1 µs, but the accuracy depends on the latency measurement capabilities of the unit.



- Cut through latency
  The cut through latency indicates the time from when the first bit of the frame is sent from the AE5511 input port to when the bit is received at the output port.



- Store & forward latency
  The store & forward latency indicates the time from when the last bit of the frame is sent from the AE5511 input port to when the first bit of the frame is received at the output port.



Note

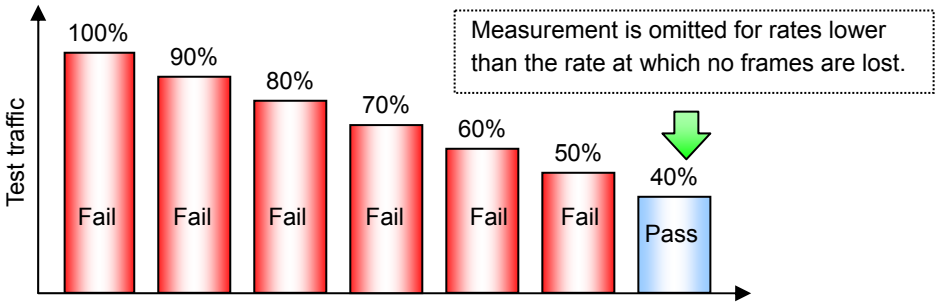
- If the link speed is different between the input and output ports, the cut through latency will not be measured correctly.
- The result of the store & forward latency measurement is zero if the first bit of the frame is received at the output port before the last bit of the frame is sent from the input port.
- If none of the measurement source frame is received at the output port, the measurement result displays N/A.

Frame Loss Rate Measurement Function

The frame loss rate measurement determines the frame loss rate for each frame length when traffic exceeding the transmission capability of the network device is applied.
The frame loss rate is measured for each test rate while the rate is continuously reduced from the start rate of the test until no frames are lost.

Note

Measurements for rates lower than the rate at which no frames are lost are omitted.

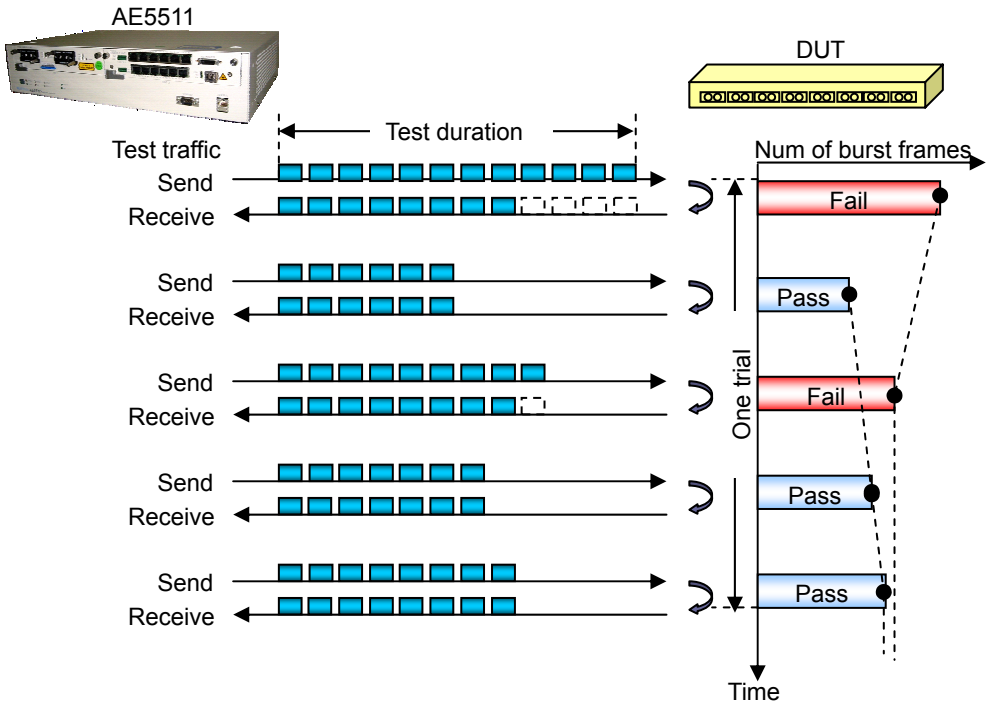


The frame loss rate is calculated using the following equation.

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

Back-to-Back Measurement Function

The back-to-back measurement determines the maximum burst size for each frame length that the network device can tolerate without the loss of any frames.
In this measurement, the number of burst frames is varied to determine the limit at which no frames are lost. The operation to converge the trial result down to one frame resolution is considered a single trial. The average of the results obtained by performing a specified number of trials is the back-to-back measurement result.



Note

The load during the burst is fixed to 100%.

2.5 File Function

File Types

The software application uses the following files.

File Type	File Format	Extension	SAVE	LOAD	Notes
Setup file	Binary	r2s	x	x	
Result file	Text	csv	x	-	
Log File	Text	txt	x	-	
Graph file	Binary	cfx	x	-	File format for Chart FX
	Text	txt	x	-	Text file (text only)
	Text	xml	x	-	XML file (properties only)
	Binary	bmp	x	-	BMP file
	Binary	emf	x	-	Meta file

x: Supported, -: Unsupported

Setup File

- Save
  Port pair settings, test configurations, DUT information settings, layer 1 setup of reserved ports, and network settings are saved.

  Directory path displayed by default
  C:\Program Files\RFC2544\RFC2544App\file\setup

- Load
  The entire setup data is loaded collectively.
  If the port specified by the loaded file is not reserved, the port pair settings are reset to default.
  If a port that is not specified in the loaded file is reserved, the layer 1 setup and network settings are set to default.

Result File

- Save
  The measured results are saved in CSV format.
  The items that are saved are those that are displayed. Save the result for each measurement item.

  Directory path displayed by default
  C:\Program Files\RFC2544\RFC2544App\file\Result

- Load
  The result file cannot be loaded.

Log File

- Save
  The log results are saved in text format.

  Directory path displayed by default
  C:\Program Files\RFC2544\RFC2544App\file\log

- Load
  The log file cannot be loaded.

Graph File

- Save
  The graph display results are saved in a specified format.

- Load
  The graph file cannot be loaded.

3.1 Notes on Using This Product

The product CD (RFC2544 TestApplicationE CD for the AE5511) contains the software application that you install to the PC (RFC2544 TestApplicationE) and a license key for installing the RFC2544 option to the AE5511.

You must install the RFC2544 option to the AE5511 to use this product. You will be able to use the functions of this product by controlling the AE5511 with the RFC2544 option from a PC that has the application (RFC2544 TestApplicationE) installed.

- License Coverage
  This product can be used to install the RFC2544 option to a single AE5511. The controller PC application (RFC2544 TestApplicationE) can be installed to an unlimited number of PCs.

Note

- If the controller PC application (RFC2544 TestApplicationE) and the AE5511 firmware version are not compatible, you may not be able to use the product even when you install the RFC2544 to the AE5511. Please download the latest AE5511 firmware from YOKOGAWA's Website and update the AE5511.
- User registration is required to download the firmware. Please register at the following URL.
  http://www.yokogawa.com/tm/AE5511/

3.2 Setting Up the Application

System Requirements

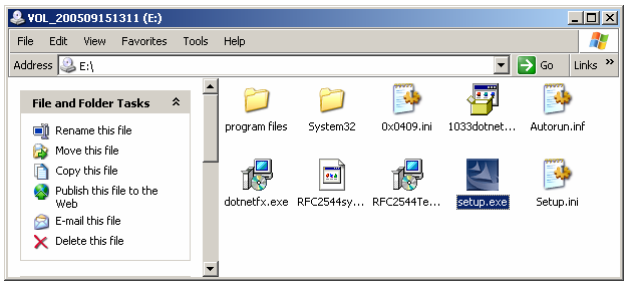
- PC: Windows PC
- OS: Windows2000 SP3 or SP4 or Windows XP SP1 or SP2
- CPU: Pentium III, 1.2 GHz or faster
- Memory: 512 MB or more
- Hard disk: Free space of 200 MB or more (300 MB or more recommended)
- Disk drive: CD-ROM drive

Note

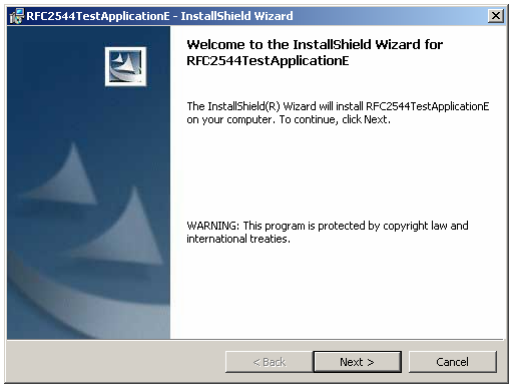
A PC of higher specifications may be necessary if you are running this software application along with various firewalls and virus checking programs.

Installing RFC2544 TestApplicationE to the PC

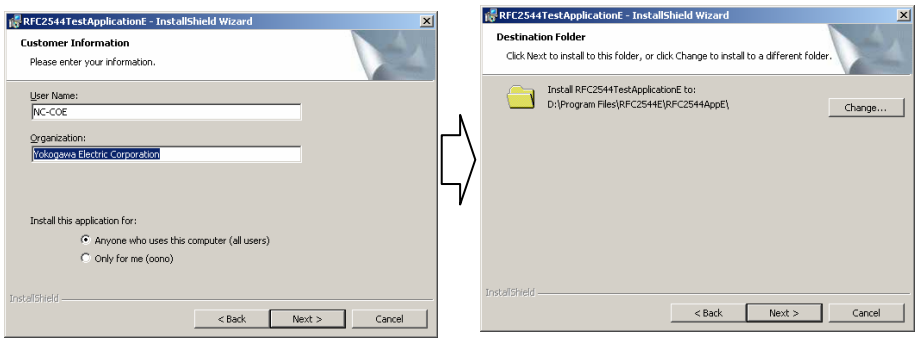
1. Log in to Windows with administrator privileges.
2. Load the software CD (RFC2544 TestApplicationE for the AE5511) into the CD-ROM drive.
3. Double-click **My Computer**, and then double-click the **CD-ROM** icon. The CD-ROM dialog box opens. Double-click setup.exe on the CD-ROM. The RFC2544 TestApplicationE setup dialog box opens.



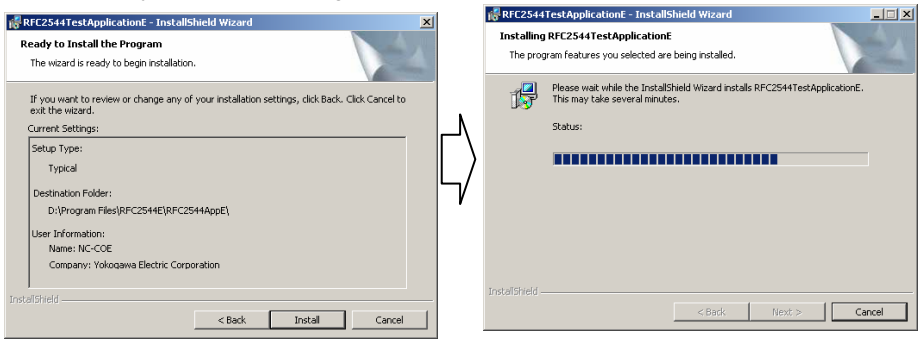
4. Click **Next**.



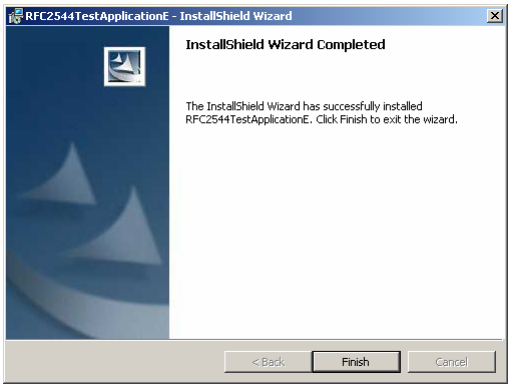
5. Enter the customer information and click **Next**. Specify the destination folder and click **Next**.



6. On the Ready to Install the Program screen, click **Install** to start the installation.



7. A message indicating that the installation has been completed appears. Click **Finish**.

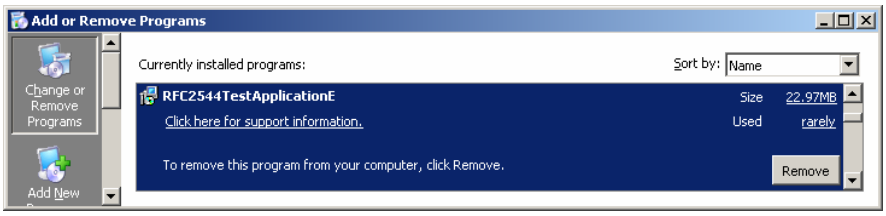


Note

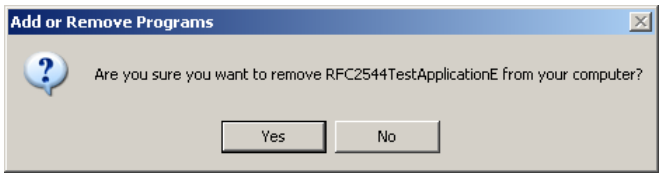
Microsoft .NET Framework is required to start the software application. If the target PC does not have Microsoft .NET Framework installed, an installation menu automatically appears. Install it according to the menu instructions.

Uninstalling RFC2544 TestApplicationE

1. Log in to Windows with administrator privileges. From the taskbar, click the Windows **Start** button, point to **Settings**, and click **Control Panel**. Then, double-click **Add or Remove Programs**. The Add or Remove Programs dialog box opens.
2. Select RFC2544 TestApplicationE, and click **Remove**. The Add/Remove Programs dialog box opens.



3. Click **Yes**.

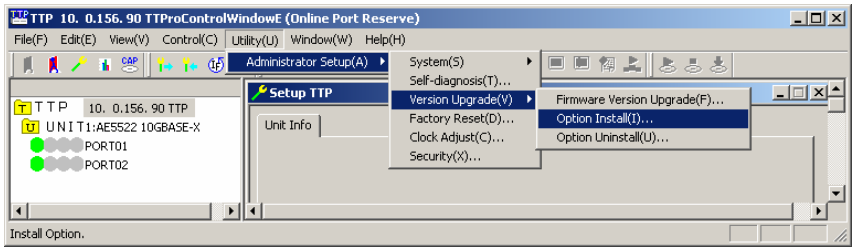


4. The program is removed, and the message box automatically closes when the operation is complete.
5. Uninstallation is finished when the message box closes.

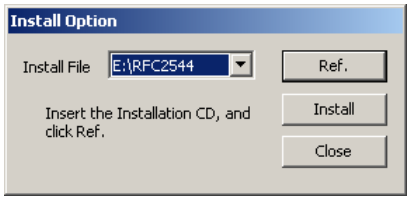
3.3 Installing or Uninstalling the Option from the AE5511

Installing the RFC2544 Option to the AE5511

1. Start TTProControlWindowE, and log in to the AE5511 to which the RFC2544 option is to be installed as admin.
2. From the **Utility** menu, point to **Administrator Setup**, point to **Version Upgrade**, and click **Option Install**. The Install Option dialog box opens.



3. Load the option installation CD into the CD-ROM drive, and click **Ref.** The option file is shown.



4. Click **Install**. A dialog option opens indicating that the installation is complete.

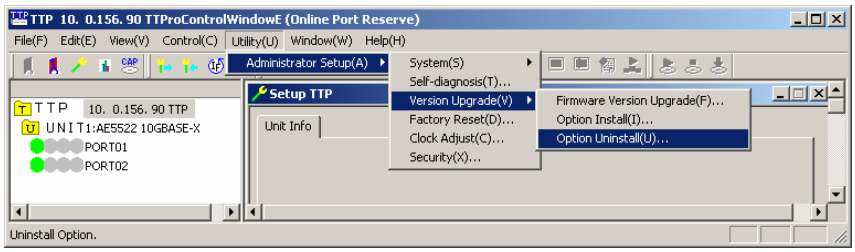
5. Click **OK**.
6. In the Install Option dialog box, click **Close**.

Note

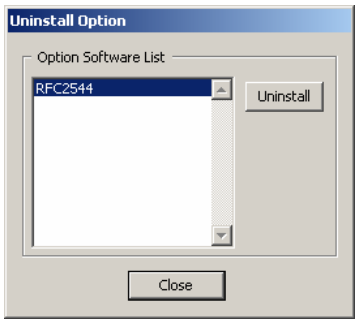
- This product can be used to install the RFC2544 option to a single AE5511.
- To install the RFC2544 to another AE5511, uninstall the RFC2544 option from the AE5511 that has the option installed, or purchase an additional application.

Uninstalling the RFC2544 Option from the AE5511

1. Start TTProControlWindowE, and log in to the AE5511 to which the RFC2544 option is to be uninstalled as admin.
2. From the **Utility** menu, point to **Administrator Setup**, point to **Version Upgrade**, and click **Option Uninstall**. The Uninstall Option dialog box opens.



3. Select the option to be uninstalled from the Option Software List, and click **Uninstall**. A dialog box containing the message “Are you sure?” opens.



4. Click **OK**. The selected option is removed from the list.
5. In the Uninstall Option dialog box, click **Close**.

4.1 Starting/Closing the Application

To make RFC2544 measurements on the AE5511, start the RFC2544 TestApplicationE application on your PC. Chapter 4 explains the operations on the main screen, the procedure to log in to the AE5511, the procedure to reserve the measurement ports to be used, and the procedure to start the measurement.

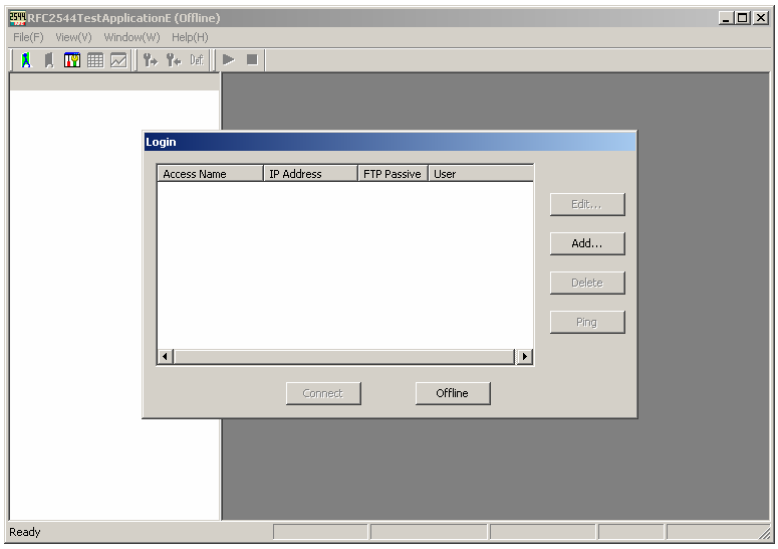
Starting the Application

Procedure

1. On the taskbar, click the Windows **Start** button, point to **All Programs**, point to **RFC2544 TestApplicationE**, and click **RFC2544AppE**. The application starts and a Login dialog box opens.

- Connecting to the AE5511
  2. Click **Add** or **Connect**. For the operating procedure, see section 4.2.

- Creating the Setup Conditions on the PC
  2. Click **Offline**. For the operating procedure, see chapter 5.



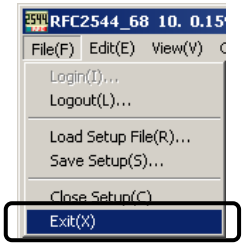
Explanation

- Starting the Application Using the Icon on the Desktop
  You can also double-click the **RFC2544AppE** icon on the desktop to start the application.

Closing the Application

Procedure

1. From the **File** menu, choose **Exit**. A dialog box containing the message “Quit the application?" opens.



2. Click **Yes**. The application closes.

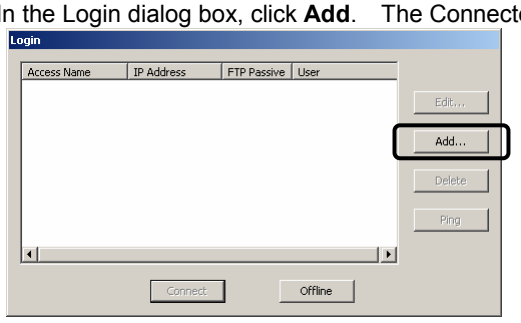
4.2 Login and Logout

Login

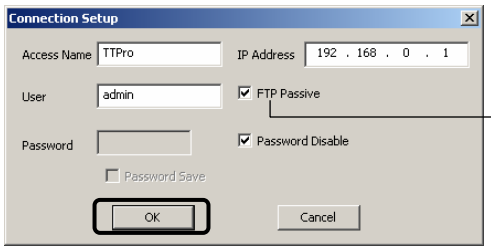
Procedure

- Registering the Connection Destination

1. In the Login dialog box, click **Add**. The Connected Setup dialog box opens.

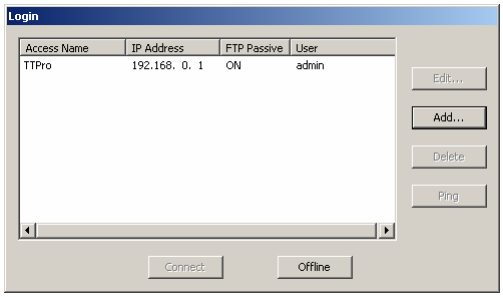


2. Enter the destination information.
   (Example) Access Name: TTPro, IP Address: 192.168.0.1
   User: admin



Select the check box when using a firewall function

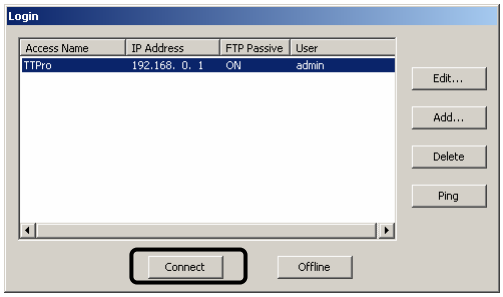
3. Click **OK**. The entered destination is registered.



Note

- When you enter admin in the User box, the application logs in to the AE5511 with administrator privileges. However, admin setup functions used to configure the AE5511 with administrator privileges cannot be used on RFC2544 TestApplicationE. To use the admin setup functions, use TTPro ControlWindowE.
- Password is valid when Enable Password Function is specified in the AE5511 Login Setup.
- Specify FTP Passive as necessary.
- If you are using the firewall function on Windows XP SP2 or a virus checking program, select the **FTP Passive** check box.
- If you wish to change the information after it is registered, click **Edit**. To delete the registered information, click **Delete**.

- Logging in to the Registered Destination
  1. Select the destination to which you wish to connect.



  2. Click **Connect**. The Port Reserve dialog box opens. See section 4.3.

- Checking the Connection Using PING
  1. Select the destination to which you wish to connect.
  2. Click **PING**. A command prompt screen (an accessory) on the PC automatically starts and the PING command is executed.
  3. Press any key. The PC command prompt screen closes.

Explanation

- To log in from an offline condition, choose **Login** from the **File** menu.

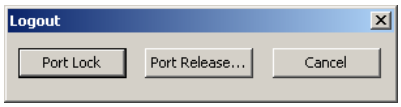
Note

You can also log in by clicking the Login icon.

Logout

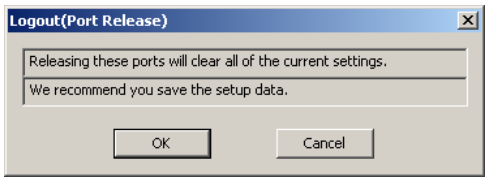
Procedure

1. From the **File** menu, choose **Logout**. The Logout dialog box opens.



- Locking the port (logging out while retaining the measurement condition)
  2. Click **Port Lock**. You are logged out.

- Releasing the port (aborting the measurement condition and logging out)
  2. Click **Port Release**. The Logout (Port Release) dialog box opens.



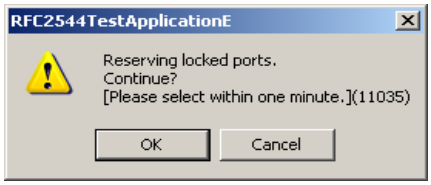
  3. Click **OK**. You are logged out.

Note

- You can also log out by clicking the Logout icon.
- To log out while retaining the measurement condition, select Port Lock. If you log out using Port Lock, you can reconnect with the conditions that existed when you logged out when you log in using the same user name.
- If you release the port, the measurement operation stops, and all the measured results and logs are cleared. Save the measured results and settings as necessary. For the operating procedure, see chapter 5.

Explanation

- If you log in to a destination that has been port locked, a dialog box with the message "Reserving locked ports. Continue?" opens.



Note

- The login mode is set to Port Lock by default on RFC2544 TestApplicationE.
- Port lock is a login mode in which the ports are reserved at all times.

4.3 Port Reserve

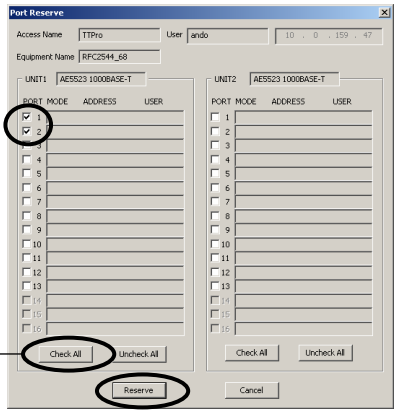
Because the AE5511 is controlled from multiple PCs, be sure to reserve the necessary number of ports for the measurement when you log in. This section explains the procedure to reserve the ports.

Procedure

1. Log in. See section 4.2.

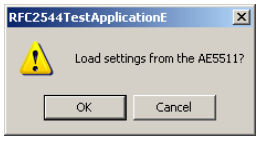
- On the AE5523 and AE5524

2. Select the unit port check boxes that are to be used for the measurement. (In the example below, ports 1 and 2 are selected.)



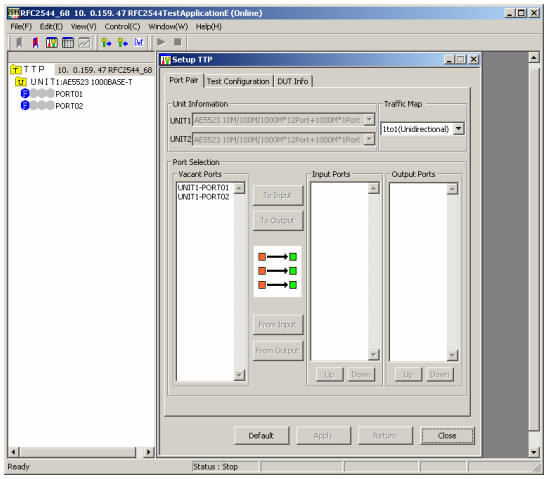
Click when using all ports

3. Click **Reserve**. A dialog box containing the message “Load settings from the AE5511?” opens.



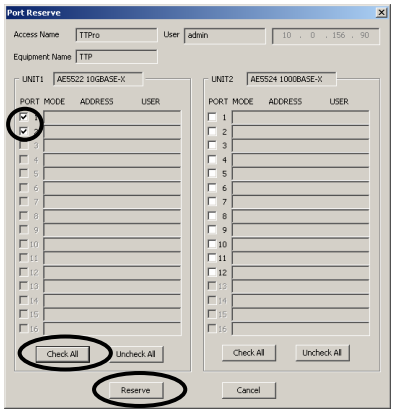
4. Click **OK**. The Download setup from AE5511 dialog box opens.

5. Click **OK**. The RFC2544 Test ApplicationE window opens.



- On the AE5522

2. Select a unit port check box or click **Check All**. All ports on the unit are selected.



3. Click **Reserve**. A dialog box containing the message “The settings reload from the current settings of AE5511?” opens.
4. Click **OK**. The Download setup from AE5511 dialog box opens.
5. Click **OK**. The RFC2544 Test ApplicationE window opens.

Explanation

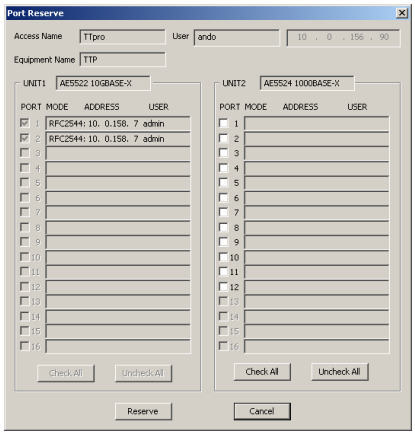
- Ports can be reserved individually on the AE5523 and AE5524.

- Ports are reserved by units on the AE5522. Even if you select the check box of a single port, all ports are selected.

Note

The AE5520 and AE5521 are not supported by RFC2544 TestApplicationE. Ports cannot be reserved on the AE5520 and AE5521.

- The Port Reserve screen shows the port reserve conditions of other users.

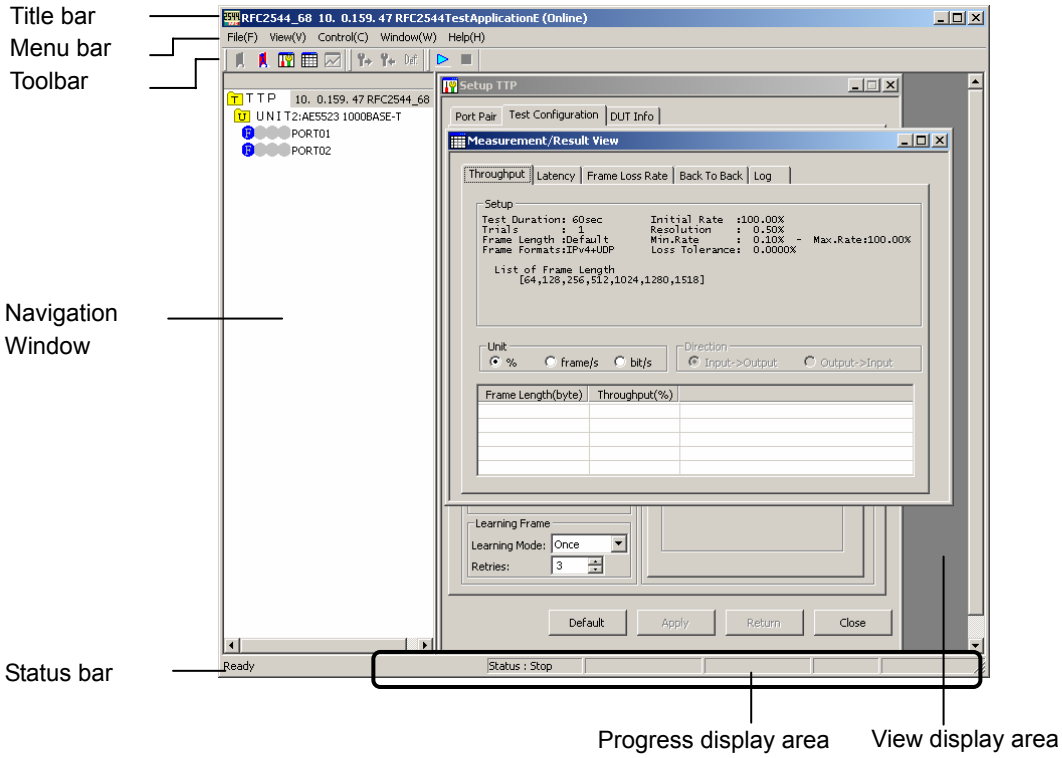


Item	Description	
PORT	Reserved ports cannot be selected.	
Mode	Shows the login mode.	
	Normal:	Logged in with TTProControlWindowE
	Auto:	Logged in with auto test
	RFC2544:	Logged in with the RFC2544 Test Application
Address	Shows the IP address.	
User	Shows the user name.	

4.4 Screen Description

Main Screen

The main screen consists of a Navigation Window, Screen Display Area, and various Windows bars.



- Navigation Window
  This window is used to select or set the AE5511 ports.

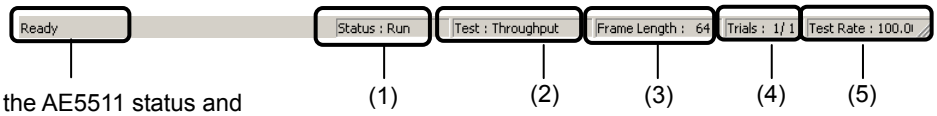
- View display area
  Displays the Setup View, Measurement/Result View, and Graph View.
  For details of each view in the view display area, see the following chapters.
  - Setup View See chapter 5.
  - Measurement/Result View See chapter 6.
  - Graph View See section 6.8.

- Title bar
  Shows the status of the application screen and the online/offline state of the AE5511.
  When online, the device name and IP address are also shown.

- Menu bar
  Shows the application menus for controlling the software.

- Toolbar
  Shows the application toolbar containing icons for controlling the software.

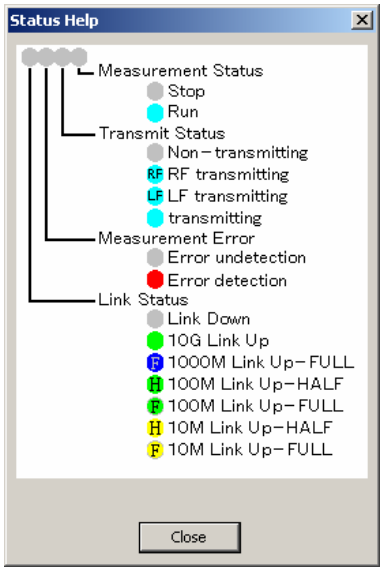
- Status bar
  Shows the AE5511 status and descriptions of the menus and icons at the left edge.
  During measurement, the progress display area shows the progress of the test.



No.	Displayed Information	Display Parameters
(1)	Measurements status display	Run, Stop, and Error Stop
(2)	Current test item	Finished, Throughput, Latency, Frame Loss Rate, and Back To Back
(3)	Measured frame size	(in bytes)
(4)	Trial count during measurement	Current trial count/specified trial count
(5)	Rate or number of burst frames during measurement	Number of burst frames during back-to-back. Rate (%) for types other than back-to-back.

Status Help Screen

If you double-click a port on the Navigation Window, a Status Help screen opens. This screen shows the usage of ports in color.



Status Help Screen

4.5 Switching the Views

Procedure

Switching the Setup, Measurement/Result, and Graph Views from the Menu

- Displaying the Setup View
  From the **View** menu, choose **Setup**. The view display area shows the Setup View.

- Displaying the Measurement/Result View
  From the **View** menu, choose **Measurement/Result**. The view display area shows the Measurement/Result View.

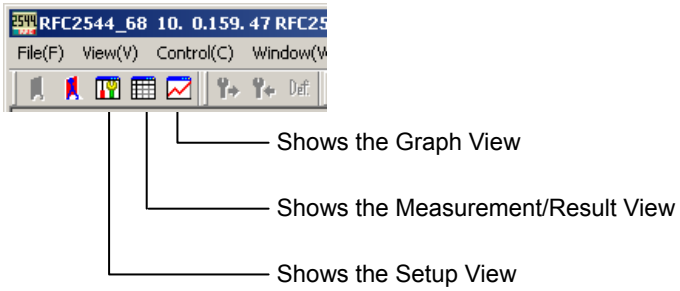
- Displaying the Graph View
  From the **View** menu, choose **Graph**. The view display area shows the Graph View.

Note

The Graph View cannot be shown if there are no measured results.

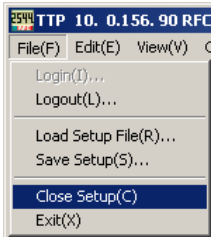
Switching the Setup, Measurement/Result, and Graph Views from the Toolbar

Click the following buttons. The same windows described above open.



Closing the Setup View

From the **File** menu, choose **Close Setup**. The Setup View in the view display area closes.

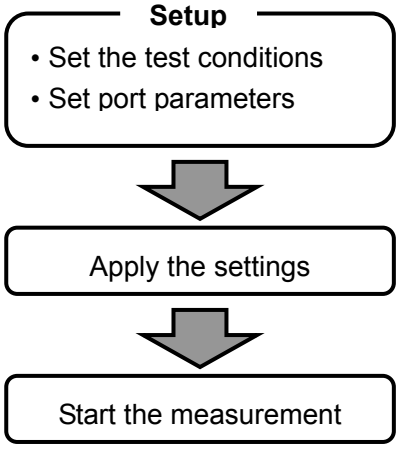


Note

This command is used when setup is finished and there is no need to show the view during measurement.

4.6 Starting and Stopping Measurements

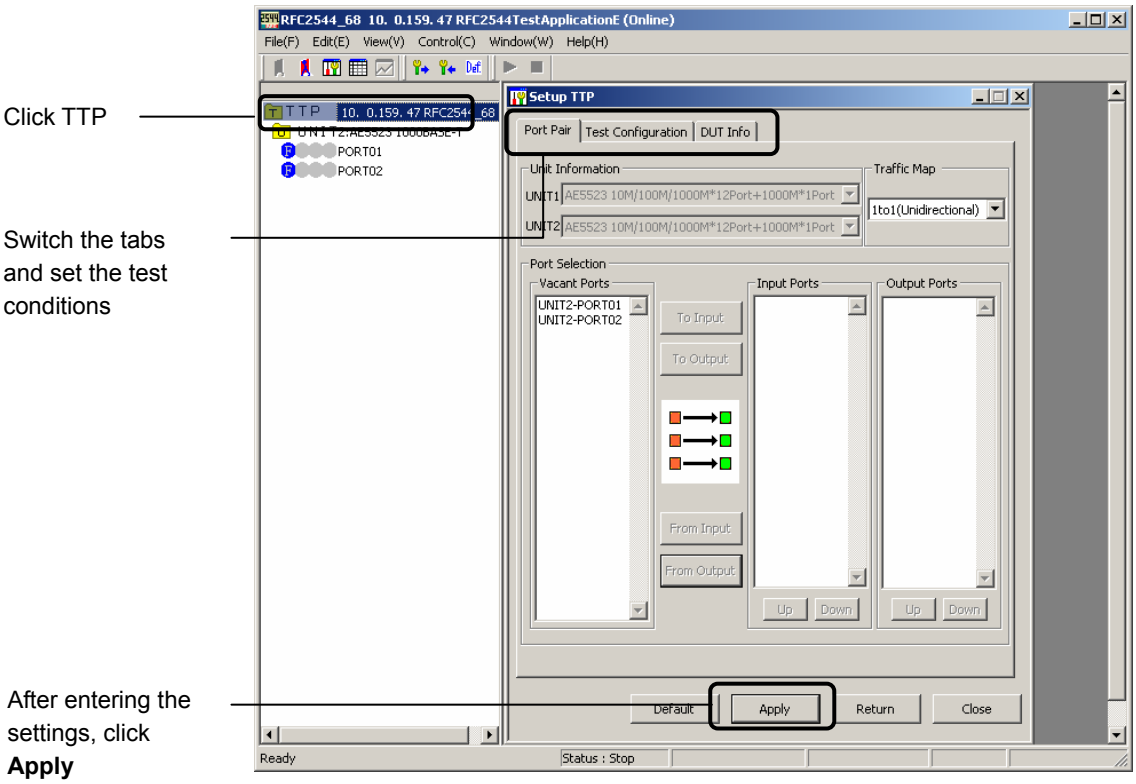
The figure below shows the basic flow of operation until a measurement is started. This section explains the basic operation according to this flow chart.



Setting the Test Conditions

Procedure

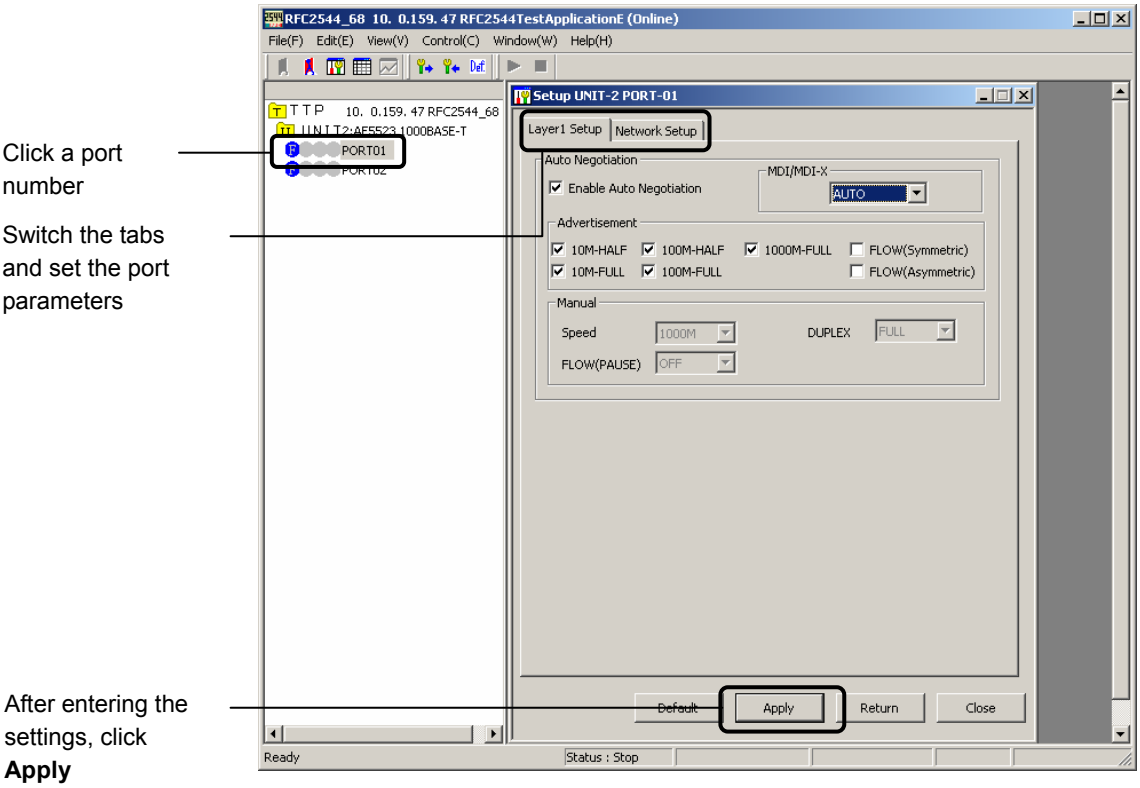
1. Open the Setup View, and click TTP on the Navigation Window. The Setup TTP view opens.
2. Select the tabs in the Setup TTP view, and set the test conditions. See chapter 5.
3. After entering the settings, click **Apply**.



Setting the Port Parameters

Procedure

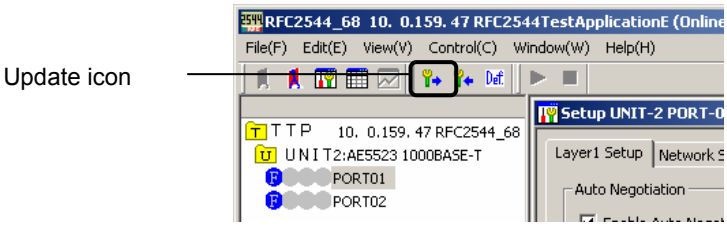
1. On the Navigation Window, click the desired PORT number. The Setup UNIT-n PORT-n view of the selected port opens.
2. Select the tabs in the Setup UNIT-n PORT-n view, and set the port parameters. See chapter 5.
3. After entering the settings, click **Apply**.



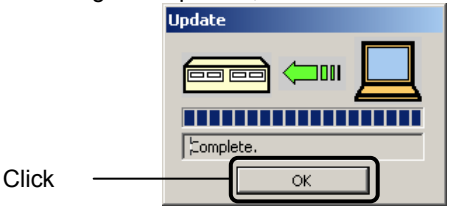
Updating the Settings

Procedure

1. Click the **Update** icon or choose **Update** from the **Control** menu. The Update dialog box opens.



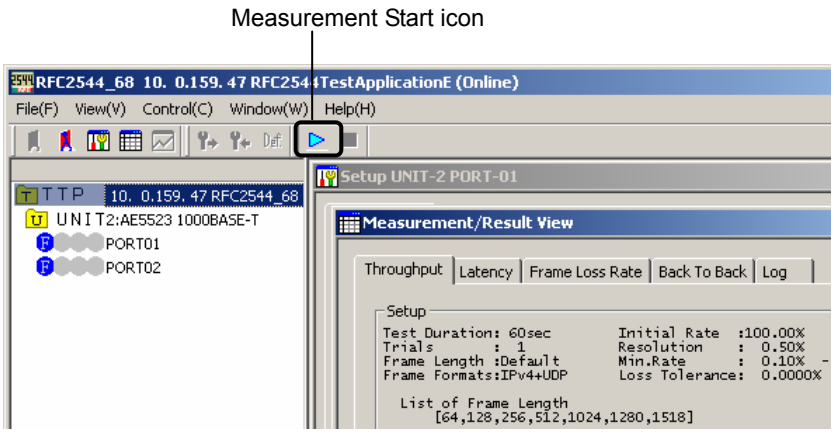
2. When the settings are updated, click **OK**.



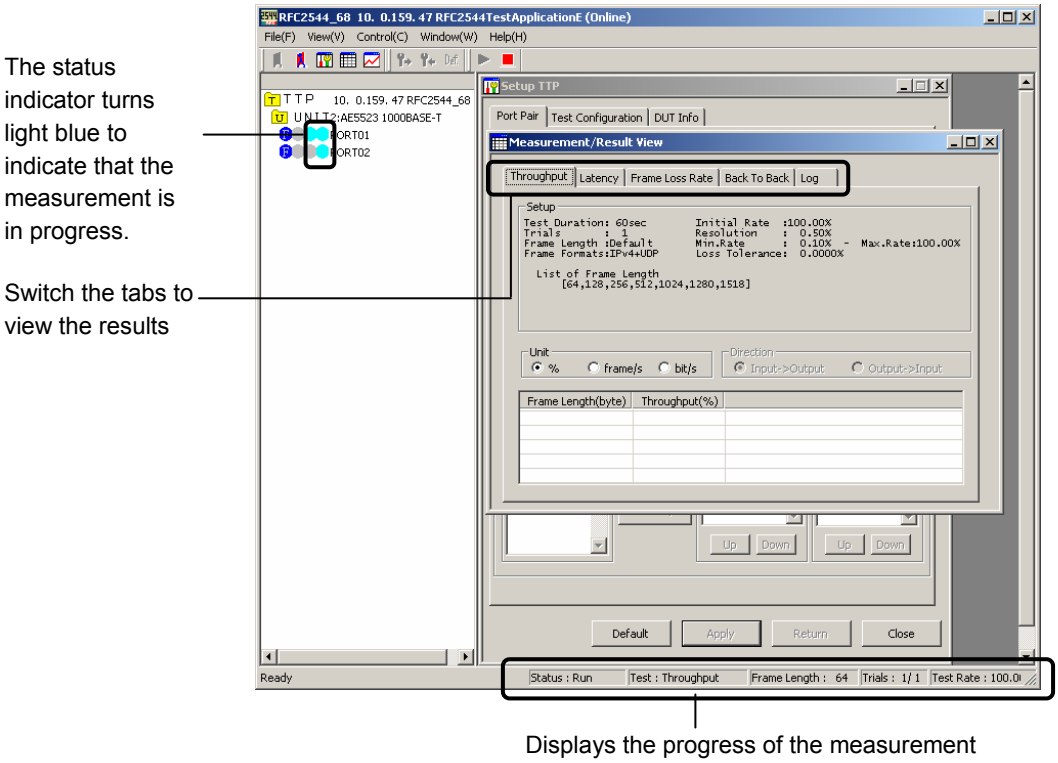
Starting the Measurement

Procedure

Open the Measurement/Result View, and click the **Start Measurement** icon or choose **Start Measurement** from the **Control** menu. The measurement starts.



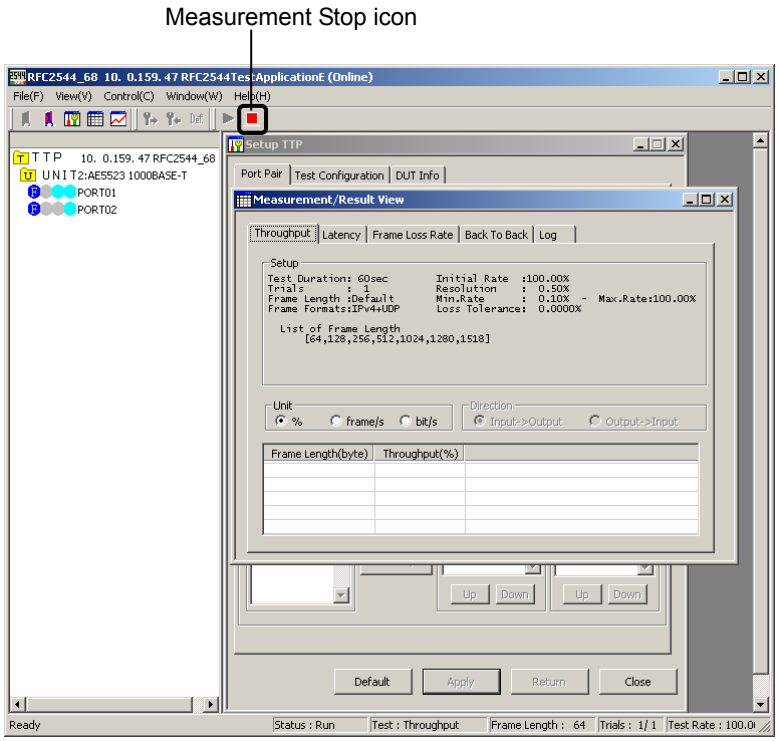
The status indicator in the Navigation Window turns light blue to indicate that measurement is in progress. In addition, the status bar shows the progress of the measurement. You can switch the tabs in the Measurement/Result View to check the log and the result of each measurement item.



Stopping the Measurement

Procedure

When all of the measurements are complete, the measurement automatically stops. To stop the measurement manually while the measurement is in progress, click the **Stop Measurement** icon or choose **Stop Measurement** from the **Control** menu.

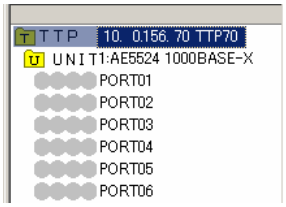
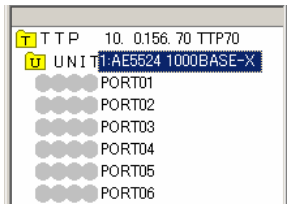
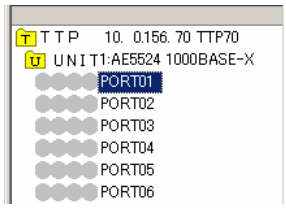
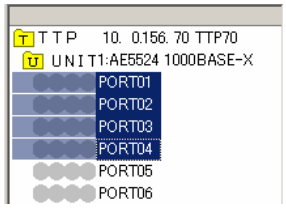


5.1 Setup View Configuration

This section explains the relationship between the cursor positions on the Navigation Window and the Setup View configuration.

Explanation

Cursor Positions on the Navigation Window and the Setup View Configuration

Cursor Position	Setup tabs shown in the Setup View
• TTP position 	• Port Pair • Test Configuration • DUT Info
• UNIT position 	• Port Info • Common Port
• PORT position 	• Layer1 Setup • Network Setup
• Multiple Ports Selected 	• Common Port

Description of the Tabs in the Setup View

- Port Pair

  The following items can be specified.
  - Online: Shows the information of the units that are installed (Unit Information).
  - Offline: Select the units to install virtually (Unit Information).
  - Set the test direction of the RFC2544 measurement (Traffic Map).
  - Set the combination of the ports used in the RFC2544 measurement (Port Selection).

- Test Configuration

  The following items can be specified.
  - Set the type of device on which to perform the RFC2544 measurement.
  - Select the test items to be carried out in the RFC2544 measurement.
  - Set the frame length used in the RFC2544 measurement.
  - Set the details of each test of the RFC2544 measurement.

- DUT Info

  The following item can be specified.
  - Information on the device on which to perform the RFC2544 measurement.

  * The information entered here is applied to the file output of the measured results.

- Port Info

  A list of the following information is shown on the reserved ports under the selected unit.
  - Layer 1 setup information
  - Type of module installed

- Common Port

  The layer 1 setup can be set collectively to the same values on multiple ports that are selected.

  * Port 13 on the AE5523 is an exception.

- Layer1 Setup

  The following items can be specified.
  - Auto negotiation ON/OFF
  - Auto negotiation advertisement
  - MDI/MDI-X
  - Manual settings

- Network Setup

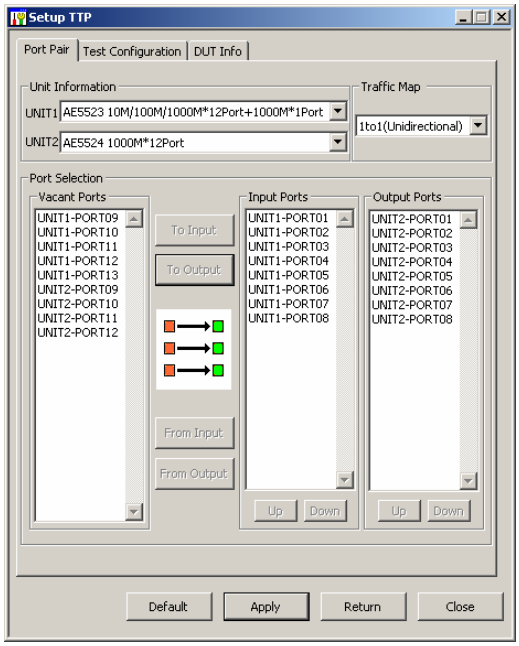
  The following items can be specified.
  - MAC address of its own port
  - IPv4 address of its own port
  - IPv6 address of its own port
  - Auto learn DUT MAC address

5.2 Port Pair

You can set the unit information, traffic map, and port selection in the Port Pair tab. For a functional explanation, see section 2.2.

Procedure

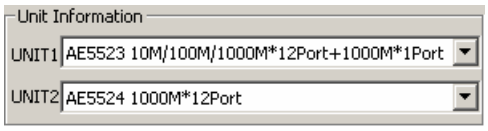
1. On the Navigation Window, click the instrument name.
2. Click the Port Pair tab. The Port Pair dialog box appears.



Unit Information

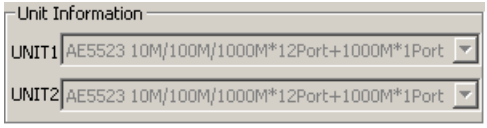
The function of the Unit Information box is different between online mode and offline mode.

- Offline mode



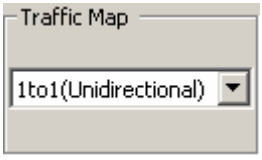
3. In the UNIT1 and UNIT2 list, choose AE5522 10G∗2Port, AE5523 10M/100M/1000M∗12Port+1000M∗1Port, or AE5524 1000M∗12Port.

- Online mode



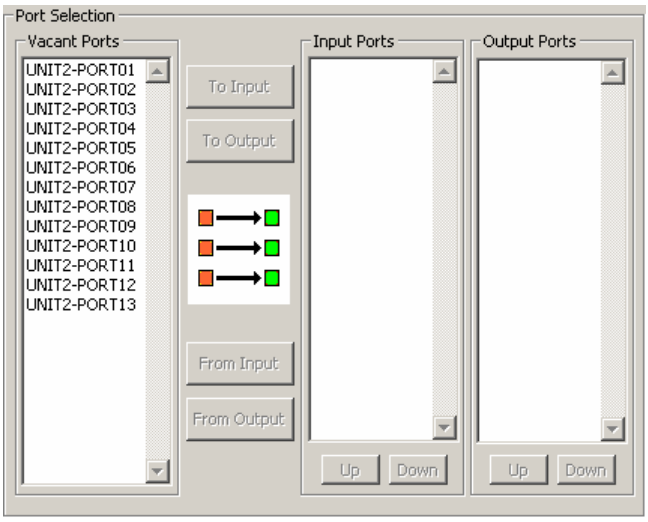
Shows the unit that is installed in UNIT1 and UNIT2.

Traffic Map



4. In the list, select 1to1 (Unidirectional), 1to1 (Bidirectional), 1to1 (Auto Reverse), Multi (Unidirectional), Multi (Bidirectional), or Multi (Auto Reverse).

Port Selection



- Setting the input ports
  5. In the **Vacant Ports** list, click the port you want to set to input port.
  6. Click **To Input**. The selected port is shown in the **Input Ports** list.
- Setting the output ports
  7. In the Vacant Ports list, click the port you want to set to output port.
  8. Click **To Output**. The selected port is shown in the **Output Ports** list. If there are ports you want to delete, proceed to step 9. Otherwise, proceed to step 13.

- Removing ports from the input ports
  9. In the **Input Ports** list, click the port you want to remove.
  10. Click **From Input**. The selected port is removed from the **Input Ports** list.
- Removing ports from the output ports
  11. In the **Output Ports** list, click the port you want to remove.
  12. Click **From Output**. The selected port is removed from the **Output Ports** list.

- Updating the Settings
  13. Click **Apply**. The data is applied on the application.
  14. Click the **Update** icon or choose **Update** from the **Control** menu.

Note

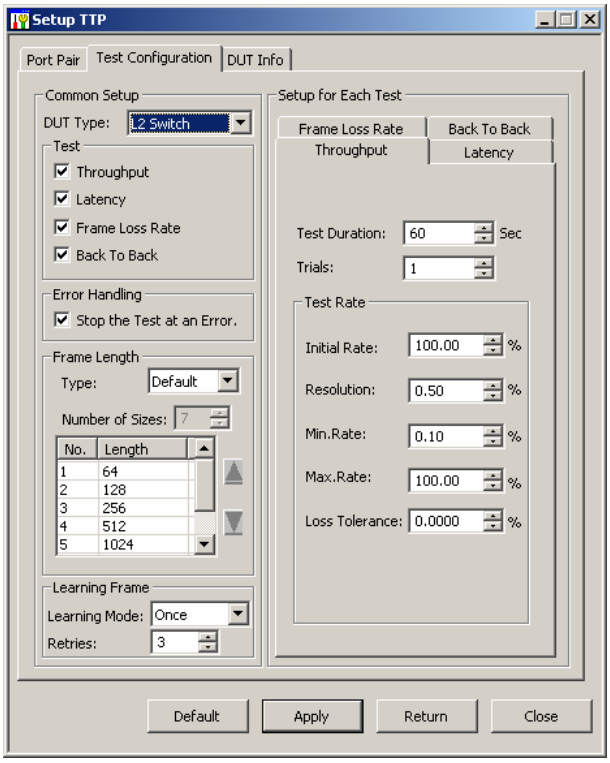
- If the traffic map is one-to-one, the pair of ports in the same line in the Input Ports and Output Ports list becomes a port pair.
- You can set multiple port pairs.
- When selecting the ports to be assigned or removed, you can select multiple ports by clicking ports while holding down the Ctrl or Shift key.

5.3 Test Configuration

You can specify common setup and setup for each test in the Test Configuration tab. For a functional explanation, see sections 2.1, 2.3, and 2.4.

Procedure

1. On the Navigation Window, click the instrument name.
2. Click the Test Configuration tab. The Test Configuration dialog box appears.



Common Setup

- Setting the DUT type
  3. In the list, select **L2 Switch**, **IPv4 Router**, or **IPv6 Router**.

- Setting the test
  4. Select the check boxes for the parameters to be tested.

Note

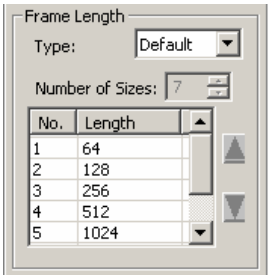
Latency cannot be selected if Traffic Map in the Port Pair tab is set to Multi.

- Setting the error handling
  5. Select the check box to stop the test when an error occurs.

Note

The applicable errors are address auto learn failure, learning frame failure, link down, and when the number of sent frames is less than the number of received frames.

- Setting the test frame length
  - Setting the test frame length to default

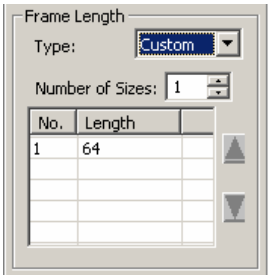


6. In the **Type** list, select **Default**. Values are shown in the Number of Sizes box and frame length entry area and cannot be changed.

Note

- When the text frame length is set to default, the number of sizes, the frame length, and the frame order are fixed and cannot be changed.
- The number of sizes and the frame length values vary depending on the DUT Type setting.
  - L2 Switch or IPv4 Router:
    Number of sizes: 7. Frame lengths: 64, 128, 256, 512, 1024, 1280, and 1518.
  - IPv6 Router:
    Number of sizes: 6. Frame lengths: 128, 256, 512, 1024, 1280, and 1518.
- The tests are executed in order from No. 1.

  - Setting the test frame length to custom

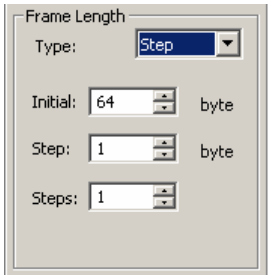


6. In the **Type** list, select **Custom**.
7. In the Number of Sizes box, enter a value between 1 and 25. The specified number of data values is shown in the No. and Length areas.
8. Click the No. line containing the frame length you want to change, and click the value in the Length box. The value in the Length box can now be changed.
9. Enter the value in the Length box.

Note

- The range of the frame length that can be specified varies depending on the DUT Type setting.
  - L2 Switch or IPv4 Router: 64 to 9999
  - IPv6 Router: 84 to 9999
- You can change the order of the frame lengths by selecting a line and clicking the ▲ or ▼ button.
- The tests are executed in order from No. 1.

- Setting the test frame length to steps



6. In the **Type** list, select **Step**.
7. In the Initial box, enter the frame length at the start of the test.
8. In the Step box, enter the step value (a value that is added to the frame length for each test).
9. In the Steps box, enter the number of times to change the frame length.

Note

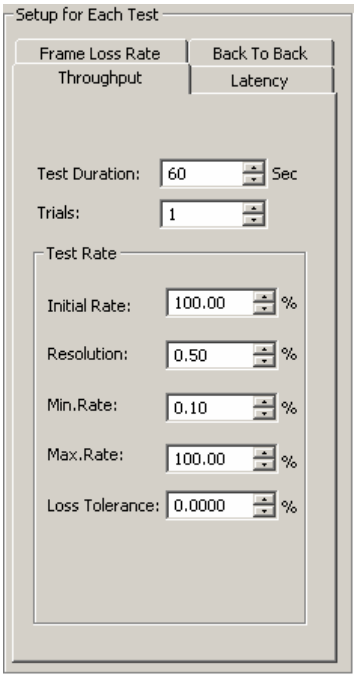
- The range of the frame length that can be specified varies depending on the DUT Type setting.
  - L2 Switch or IPv4 Router: 64 to 9999
  - IPv6 Router: 84 to 9999
- The range of values that can be entered in each box is limited so that Step × Steps + Initial is less than or equal to 9999.

- Setting the learning frame

10. In the Learning Mode list, select **Never**, **Once**, or **Every trial**.
11. In the Retries box, enter the number of retries when an error occurs in the range of 1 to 999.

Setup for Each Test > Throughput

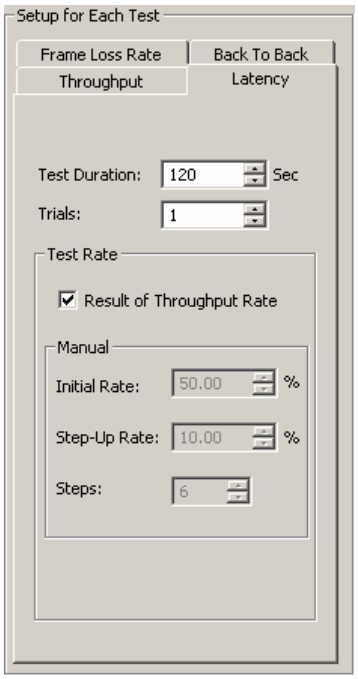
12. In Setup for Each Test, click the Throughput tab.



13. In the Test Duration box, enter a value between 1 and 999 (Sec).
14. In the Trials box, enter a value between 1 and 60.
15. In the Initial Rate box, enter the traffic rate at the start of the test in the range of 0.10 to 100.00 (%).
16. In the Resolution box, enter the range to which the test result is to converge in the range of 0.01 to 100.00 (%).
17. In the Min. Rate box, enter the minimum rate to which the test result is to converge in the range of 0.01 to 100.00 (%). Enter a value less than or equal to the Initial Rate.
18. In the Max. Rate box, enter the maximum rate to which the test result is to converge in the range of 0.01 to 100.00 (%). Enter a value greater than or equal to the Initial Rate.
19. In the Loss Tolerance box, enter the amount of lost frames that is allowed during the test in the range of 0.01 to 100.00 (%).

Setup for Each Test > Latency

12. In Setup for Each Test, click the Latency tab.



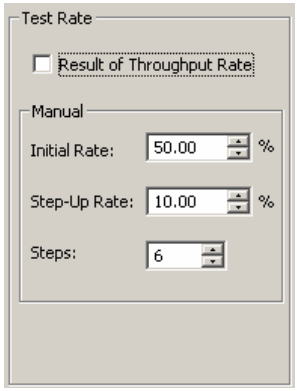
13. In the Test Duration box, enter a value between 1 and 999 (Sec).
14. In the Trials box, enter a value between 1 and 60.

- Setting the test rate to auto (result of the throughput rate)

15. Select the Result of Throughput Rate test box. This is available when the Throughput check box is selected under Test.

- Setting the test rate manually

15. Clear the Result of Throughput Rate check box.



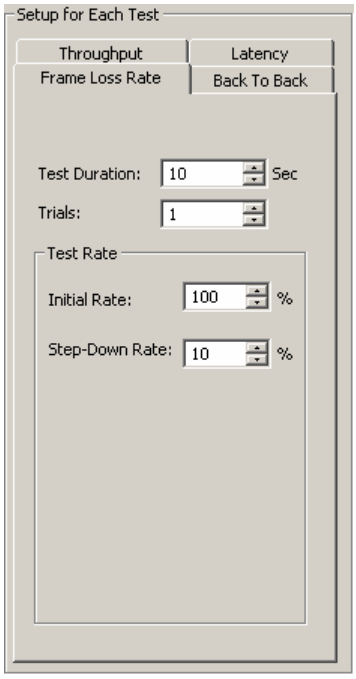
16. In the Initial box, enter the traffic rate at the start of the test.
17. In the Step-Up Rate box, enter the rate that is added for each test.
18. In the Steps box, enter the number of times to change the traffic rate.

Note

The range of values that can be entered in each box is limited so that Step-Up Rate × Steps + Initial Rate is less than or equal to 100.00.

Setup for Each Test > Frame Loss Rate

12. In Setup for Each Test, click the Frame Loss Rate tab.



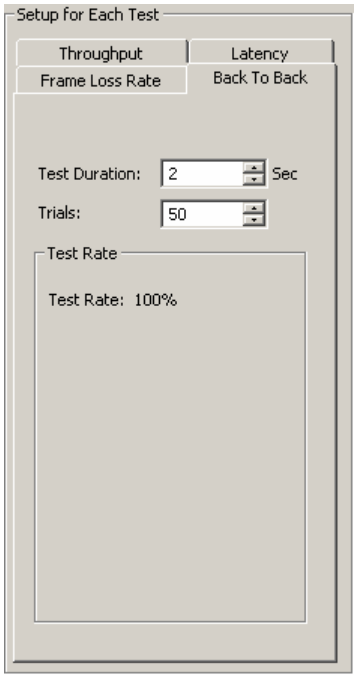
13. In the Test Duration box, enter a value between 1 and 999 (Sec).
14. In the Trials box, enter a value between 1 and 60.
15. In the Initial box, enter the traffic rate at the start of the test.
16. In the Step-Down Rate box, enter the rate that is subtracted for each test.

Note

The range of values that can be entered in each box is limited so that Initial Rate is greater than Step-Down Rate.

Setup for Each Test > Back To Back

12. In Setup for Each Test, click the Back To Back tab.



13. In the Test Duration box, enter a value between 1 and 999 (Sec).
14. In the Trials box, enter a value between 1 and 60.

- Updating the Settings

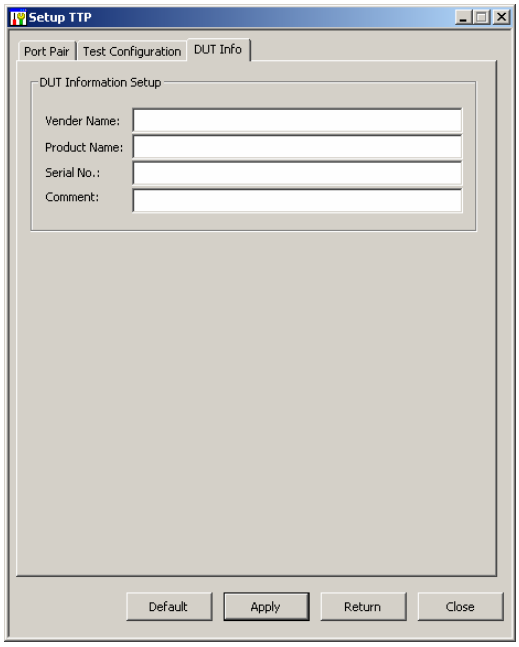
20. Click **Apply**. The data is applied on the application.
21. Click the **Update** icon or choose **Update** from the **Control** menu.

5.4 DUT Info

You can set character strings for the vender name, product name, serial number, and comment that are output in the result file in the DUT Info tab.

Procedure

1. On the Navigation Window, click the instrument name.
2. Click the **DUT Info** tab. The DUT Info dialog box appears.



3. Enter the vender name, product name, serial number, and comment (alphanumeric characters and symbols).

- Updating the Settings

4. Click **Apply**. The data is applied on the application.
5. Click the **Update** icon or choose **Update** from the **Control** menu.

Note

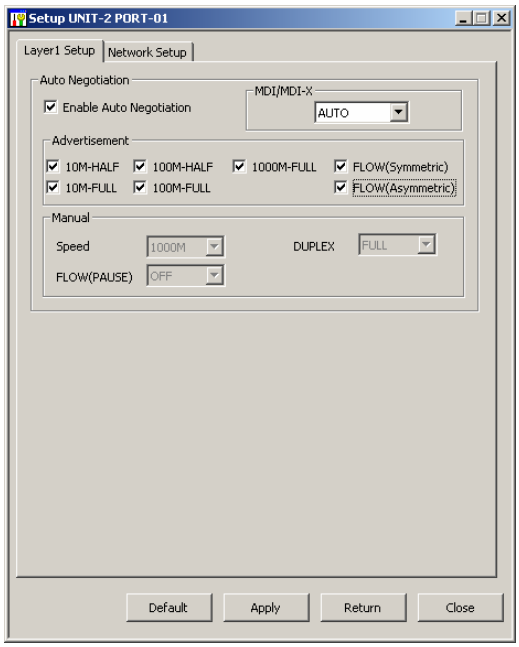
- You can enter up to 31 alphanumeric characters and symbols for the vender name, product name, and serial number.
- You can enter up to 63 alphanumeric characters and symbols for the comment.

5.5 Layer1 Setup

You can set auto negotiation on the reserved ports in the Layer1 Setup tab.

Procedure

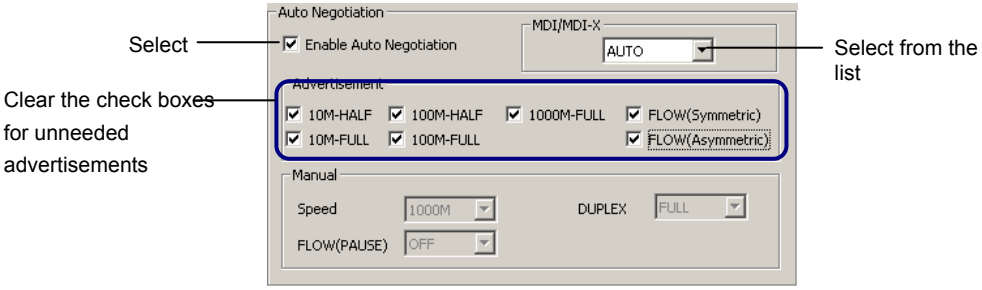
1. On the Navigation Window, click the desired PORT number. The Setup UNIT-n PORT-n view of the selected port opens.
2. Click the Layer1 Setup tab. The Layer1 Setup dialog box appears.



Auto Negotiation

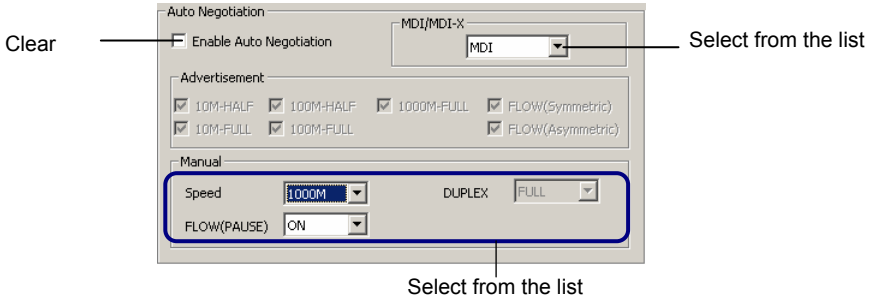
The displayed items vary depending on the unit.

- Enabling Auto Negotiation



3. Select the **Enable Auto Negotiation** check box. The check boxes for advertisements that can be used are selected.
4. Clear the check boxes for unneeded advertisements.
5. If the interface is T, select **MDI**, **MDI-X**, or **AUTO** in the **MDI/MDI-X** box.

• Disabling Auto Negotiation



3. Clear the **Enable Auto Negotiation** check box. The Manual setup parameters become available.
4. Select the appropriate parameters in the **Speed**, **DUPLEX**, and **FLOW (PAUSE)** boxes.
5. If the interface is T, select **MDI** or **MDI-X** in the **MDI/MDI-X** box.

• Updating the Settings

6. Click **Apply**. The data is applied on the application.
7. Click the **Update** icon or choose **Update** from the **Control** menu.

Explanation

• The parameters that you can specify vary depending on the installed unit.

Parameter	Input Method	Input Range/ Selection	Unit*1				Description
			22	23*2		24	
				1-12	13		
Auto Negotiation							
Auto Negotiation	Check box	ON/OFF	-	x	x	x	
Advertisement							Available when Auto Negotiation is enabled
10M-Half	Check box	ON/OFF	-	x	-	-	
10M-Full	Check box	ON/OFF	-	x	-	-	
100M-Half	Check box	ON/OFF	-	x	-	-	
100M-Full	Check box	ON/OFF	-	x	-	-	
1000M-Full	Check box	ON/OFF	-	x	-	-	
Flow(Symmetric)	Check box	ON/OFF	-	x	x	x	
Flow(Asymmetric)	Check box	ON/OFF	-	x	x	x	
Manual							Available when Auto Negotiation is disabled
Speed	Drop-down list	10M/100M/1000M	-	x	-	-	
DUPLEX	Drop-down list	FULL/HALF	-	x	-	-	Fixed to FULL when the speed on the AE5523 is 1000M.
FLOW(PAUSE)	Drop-down list	ON/OFF	x	x	x	x	
MDI/MDI-X	Drop-down list	MDI/MDI-X/AUTO	-	x	-	-	

x: Supported, -: Unsupported

*1: Unit. 22: AE5522, 23: AE5523, and 24: AE5524

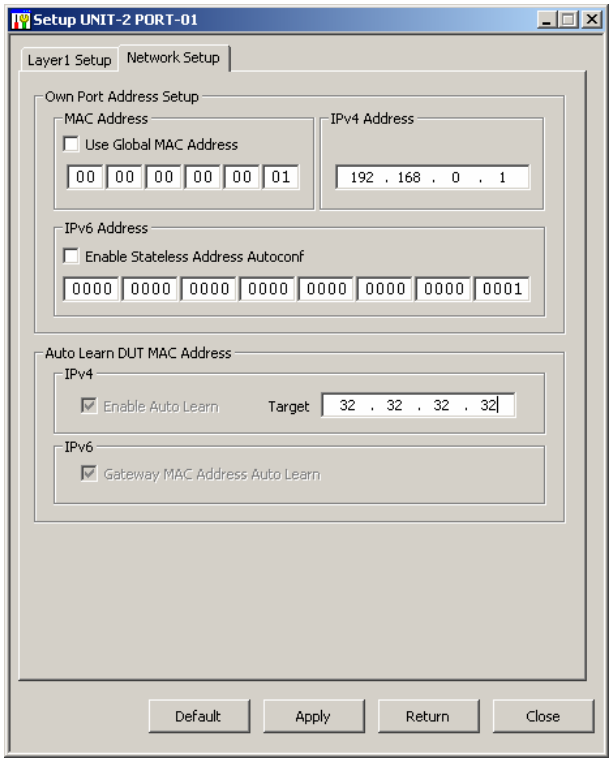
*2: “1-12” of the AE5523 represent the parameters for PORT1 to PORT12, and “13” represents PORT13.

5.6 Network Setup

This section explains the details of setting the port addresses of the reserved ports and the IPv4/IPv6 emulation function.

Procedure

1. On the Navigation Window, click the desired PORT number. The Setup UNIT-n PORT-n view of the selected port opens.
2. Click the Network Setup tab. The Network Setup dialog box opens.



Own Port Address Setup

- Setting the MAC address
  - Using a Global MAC Address
    3. Select the **Use Global MAC address** check box. The MAC address boxes become unavailable. Proceed to step 5.

  - Using a local MAC address
    3. Clear the **Use Global MAC address** check box. The MAC address boxes become available.
    4. Type the local MAC address in the boxes in hexadecimal notation.

- Setting the IPv4 address
  5. Type the IPv4 address in the **IPv4 Address** box.

- Setting the IPv6 address (AE5523 and AE5524)
  - Enabling stateless address auto configuration
    6. Select the **Enable Stateless Address Autoconf** check box. The IPv6 address boxes become unavailable. Proceed to step 8.

• Disabling stateless address auto configuration

6. Clear the **Enable Stateless Address Autoconf** check box. The IPv6 address boxes become available.
7. Type the IPv6 address in the **IPv6 Address** box. Proceed to step 8.

Note

To automatically configure the source IP address, select the **Enable Stateless Address Autoconf** check box.

Auto Learn DUT MAC Address

• Enabling IPv4 emulation

8. The **Enable Auto Learn** check box is always selected.
9. Type the target IP address in the **Target** box.

• Enabling IPv6 emulation (AE5523 and AE5524)

10. The **Gateway MAC Address Auto Learn** check box is always selected.

• Updating the Settings

11. Click **Apply**. The data is applied on the application.
12. Click the **Update** icon or choose **Update** from the **Control** menu.

Explanation

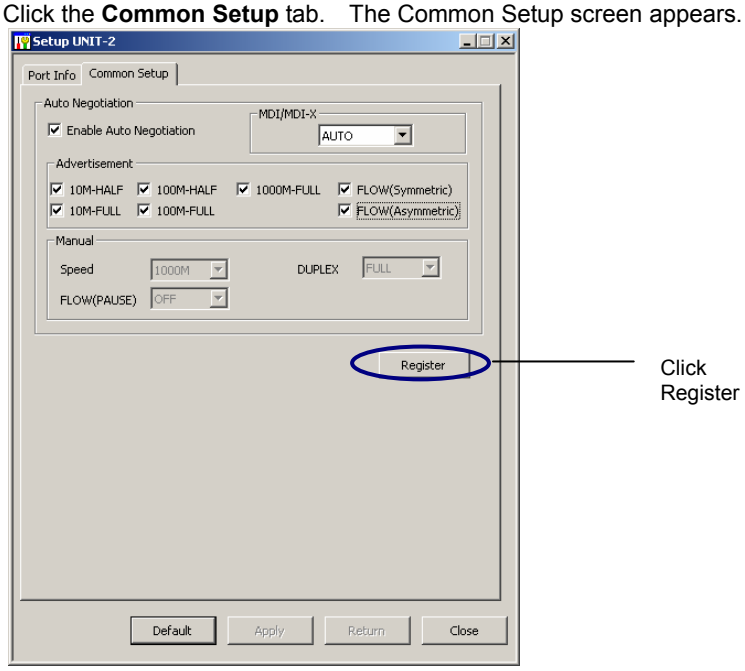
Parameter	Input Method	Input Range/Selection	Description
Own Port Address Setup			
MAC Address			
Use Global MAC Address	Check box	ON/OFF	Selects whether to use a global MAC address. • ON: Use a global MAC address. • OFF: Not use the global MAC address.
MAC Address	Text box	000000000000 to FFFFFFFFFFFF (HEX)	Sets the MAC address. Available when the Use Global MAC Address check box is not selected.
IPv4 Address	Text box	0.0.0.0 to 255.255.255.255	Sets the IPv4 address.
IPv6 Address			
Enable Stateless Address Autoconf	Text box	ON/OFF	Selects whether to use stateless address auto configuration. This function is available on the AE5523 and AE5524. • ON: Enables stateless address auto configuration. • OFF: Disables stateless address auto configuration.
IPv6 Address	Text box	00000000000000000000000000000000 to FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF (HEX)	Sets the IPv6 address. Available on the AE5523 and AE5524 when the Enable Stateless Address Autoconf check box is not selected.
Auto Learn DUT MAC Address			
IPv4			
Enable Auto Learn	Check box	ON	Carries out MAC address auto learn of the DUT port.
Target	Text box	0.0.0.0 to 255.255.255.255	Sets the MAC address of the DUT port. Available when the Enable Auto Learn check box is selected.
IPv6			
Gateway MAC Address Auto Learn	Check box	ON	Carries out MAC address auto learn of the gateway. This function is available on the AE5523 and AE5524.

5.7 Common Port

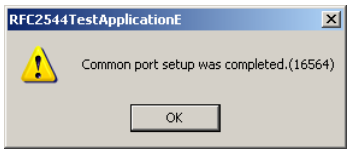
If multiple ports are reserved, common port settings can be specified. Common port settings enable the auto negotiation settings of the reserved ports to be specified collectively.

Procedure

1. On the Navigation Window, click the desired UNIT number. Or click multiple port numbers. The Setup UNIT-n window of the selected unit opens.
2. Click the **Common Setup** tab. The Common Setup screen appears.



- Setting the Auto Negotiation
  1. Enable or disable auto negotiation, and make selections under MDI/MDI-X, advertisement, and manual setup. For details, see auto negotiation in section 5.5.
  2. Click **Register**. A dialog box containing the message “Common port setup was completed.” opens.



  3. Click **OK**.

- Updating the Settings
  4. Click **Apply**. The test mode selected on the application is shown.
  5. Click the **Update** icon or choose **Update** from the **Control** menu.

Explanation

Note

- Common port settings do not appear if only one port is reserved.
- The settings on the Common Setup screen are not held. The settings are reset to default values when you switch the tab.
- PORT13 of the AE5523 is excluded from the common port settings.

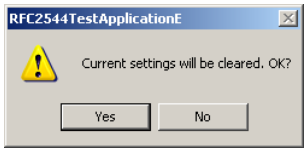
5.8 Loading and Saving the Setup File

This section explains the details of loading, and saving the setup files of the AE5511.

Loading the Setup File

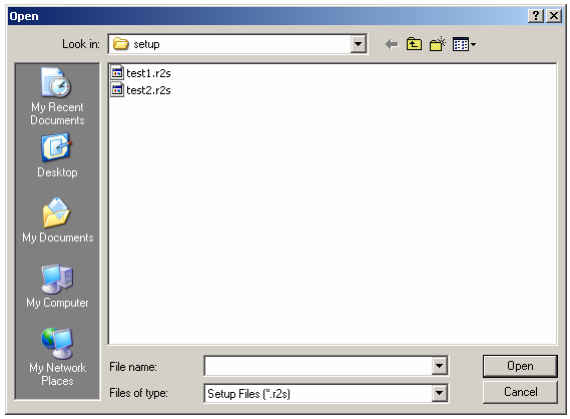
Procedure

1. From the **File** menu, choose **Load Setup File**. A dialog box containing the message "Current settings will be cleared. OK?" opens.

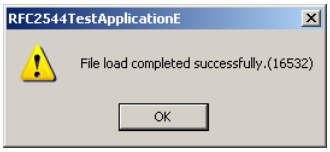


- **When Loading the Setup File**

2. Click **Yes**. The Open dialog box opens.



3. Select the setup file you wish to load and click **Open**. A dialog box containing the message “File load completed successfully.” opens.



4. Click **OK**. The original screen appears.

- **When Not Loading the Setup File**

2. Click **No**. The original screen appears.

Explanation

- A setup file that has been saved on the PC is loaded on the application.

- The items that are loaded from a setup file are as follows:

	Item
Setup file	Version information, port pair, test configuration, DUT info, layer 1 setup, and network setup.

- Setup files of different units
  - Items that can be set are loaded.
  - Items not in the setup file are set to their default values.
  - Items in the setup file but not available on the unit are not loaded.

Note

If a setup file of a different unit is loaded, a Default List is shown.

- Setup files of different ports
  - Port in the setup file but is not reserved
    Unreserved ports are removed from the port pair settings.
  - Port not in the setup file but is reserved
    Layer1 setup and network setup are set to their default values.

Note

If a setup file with different port conditions is loaded, a message appears.

- You can also load the setup file by right-clicking on the Navigation Window.

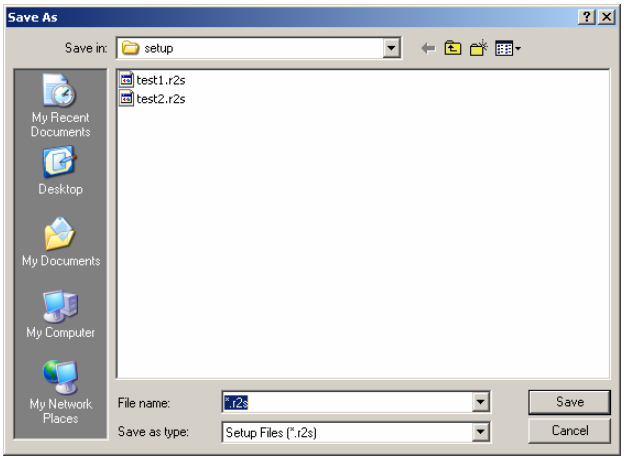
Note

The AE5511 settings are not updated at the time the file is loaded. To update the AE5511 settings, use the **Update** command.

Saving the Setup

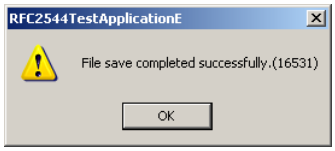
Procedure

1. From the **File** menu, choose **Save Setup**. The Save As dialog box opens.



- **When Saving the Setup File**

2. Type the file name and click **Save**. A dialog box containing the message “File save completed successfully.” opens.



3. Click **OK**. The original screen appears.

- **When Not Saving the Setup File**

2. Click **Cancel**. The original screen appears.

Explanation

- The setup data on the application can be saved as setup files on the PC.
- In online mode, all ports that are reserved are saved. In offline mode, all ports are saved.
- The items that are saved to the setup file are as follows:

	Item
Setup file	Version information, port pair, test configuration, DUT info, layer 1 setup, and network setup.

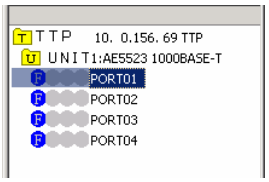
- You can also save the setup file by right-clicking on the Navigation Window.

5.9 Copying and Pasting Setup Data

This section explains the details of copying the setup data of one port to another port.

Procedure

- **Copying**
  1. On the Navigation Window, click the PORT number of the setup data copy source.



  2. From the **Edit** menu, choose **Copy**.

- **Pasting**
  3. Click the PORT number of the copy destination.
  4. From the **Edit** menu, choose **Paste**. The setup data is copied.

Note

If a setup file of a different unit is copied and pasted, Default List may be shown.

Explanation

- You can also copy the setup data by right-clicking on the Navigation Window.
- The following parameters are copied.

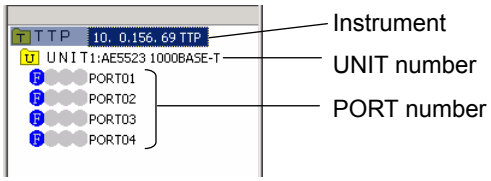
	Item
Setup file	Layer 1 setup and network setup.

5.10 Restoring the Default Settings

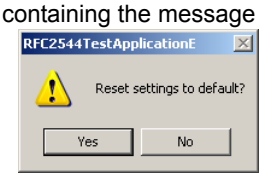
This section explains the details of restoring the default settings.

Procedure

1. On the Navigation Window, click the instrument name, UNIT number, or PORT number for restoring the settings.



2. Click the Def. icon or choose **Default** from the **Edit** menu. A dialog box containing the message “Reset settings to default?” opens.



- When restoring the default settings
  3. Click **Yes**. The settings are reset to default.

- When not restoring the default settings
  3. Click **No**. The original screen appears.

Explanation

- The ports that are reset vary between online mode and offline mode. In addition, the ports that are reset vary depending on the specified type of operation.

Type	Ports That Are Reset	
	Online Mode	**Offline Mode**
Entire instrument (Instrument name)	All reserved ports Port pair, test configuration, and DUT information are also reset.	All ports Port pair, test configuration, and DUT information are also reset.
Unit level (UNIT number)	Reserved ports on the specified unit Only Layer1 setup and network setup are reset.	All ports on the specified unit Only Layer1 setup and network setup are reset.
Port level (PORT number)	Specified ports that are reserved Only Layer1 setup and network setup are reset.	Specified ports Only Layer1 setup and network setup are reset.

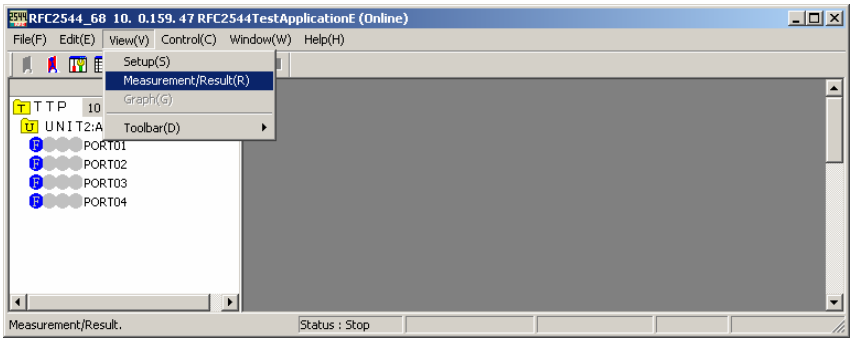
- You can also restore the settings by right-clicking on the Navigation Window or clicking **Default** on the Setup window.

6.1 Measurement/Result View

This chapter explains the displaying and saving of the measured results.
For the procedure to set the measurement conditions, see chapter 5. For the procedure to start/stop the measurement, see section 4.6.
This section explains the Measurement/Result View.

Procedure

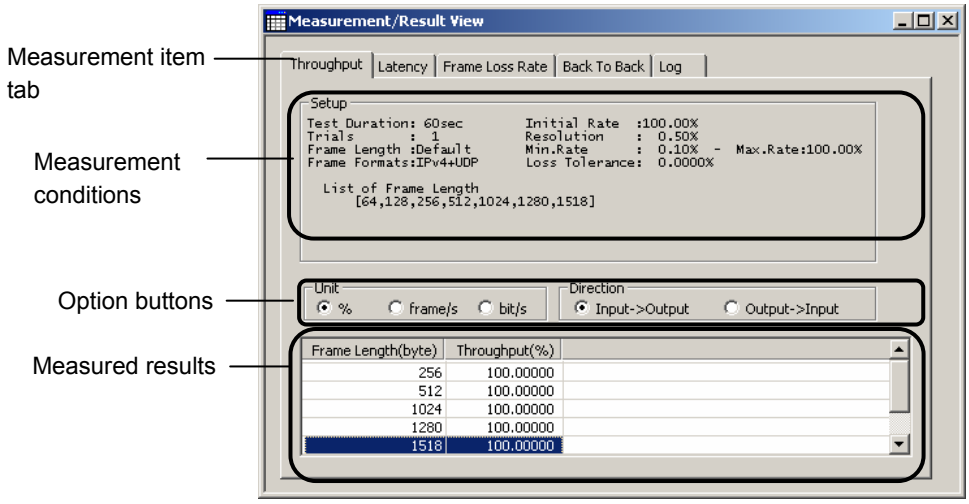
1. From the **View** menu, choose **Measurement/Result**. The view display area shows the Measurement/Result View.



Note

You can also click the Measurement/Result icon to display the Measurement/Result View.

2. Click each measurement item tab in the Measurement/Result View. The Measurement/Result View of the clicked tab is shown.



- For throughput and latency measurements

3. Click a **Unit** option button. The measured results are displayed with the selected unit.

- When Traffic Map of Port Pair is set to 1to1 (Auto Reverse) or Multi (Auto Reverse)

4. Click a **Direction** option button. The measured results are displayed for the selected direction (excluding the log).

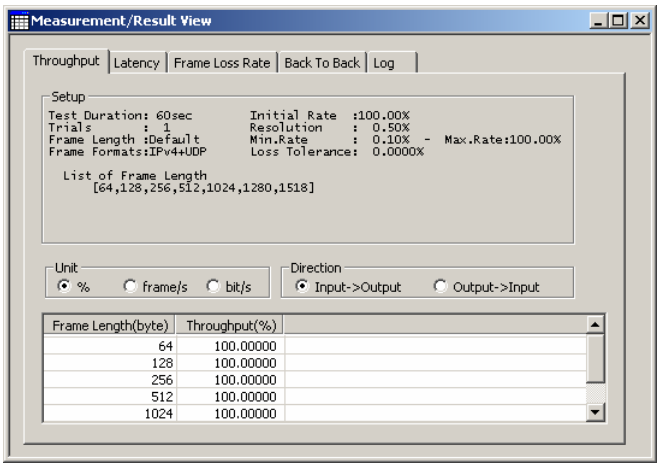
Explanation

- The Measurement/Result View can be shown only when logged in. While logged it, the view can be displayed regardless of whether the measurement is in progress.
- The measurement items selected under Test in the Test Configuration tab are shown as tabs. Those that are not selected are not shown.
- For measurement result views other than the log, the measurement conditions are shown in the Setup area.
- If the measurement is in progress, the measured results that have completed the measurement are displayed as they become available.
- Operations on the Measurement/Result View does not affect the measurement operation in progress. However, the Measurement/Result View cannot be closed while the measurement is in progress.

6.2 Throughput Result View

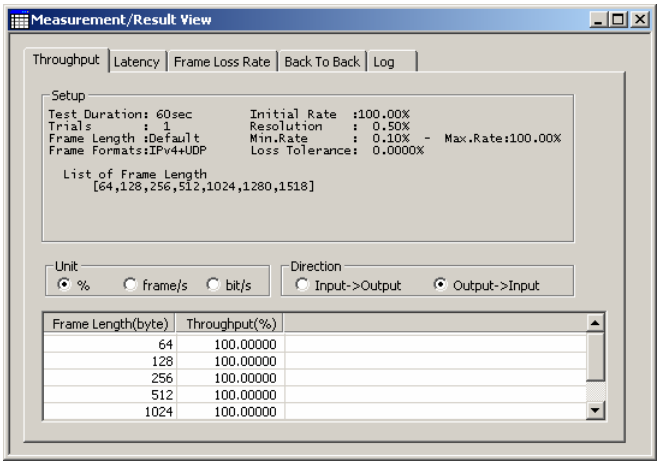
Procedure

1. Click the **Throughput** tab in the Measurement/Result View. The measured results of throughput are shown.

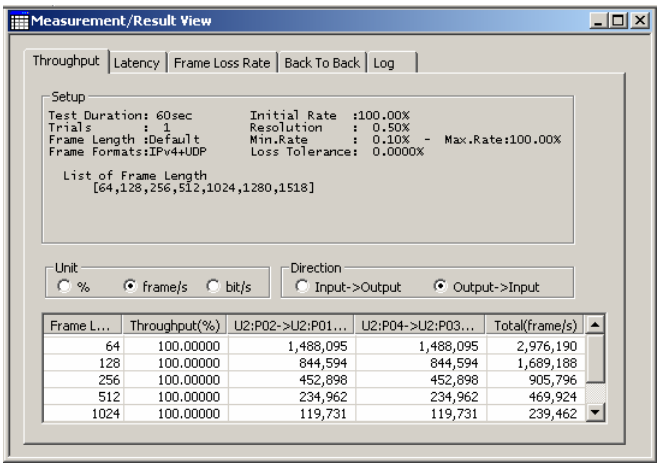


- When Traffic Map of Port Pair is set to 1to1 (Auto Reverse) or Multi (Auto Reverse)

2. Click a **Direction** option button. The measured results for the selected direction are displayed .



3. Click a **Unit** option button. The measured results are displayed with the selected unit.



Explanation

- The measured result shows the average value of the convergence result for the number of trials for each frame length.

- The measurement result display varies depending on the unit selection and traffic map setting as follows:

Unit Selection	Traffic Map Setting	Displayed Measured Results
%	All	Shows the throughput (%) for each frame length.
frame/s bit/s	1to1 (Unidirectional)	Shows in the selected unit (frames/s or bits/s) the throughput (%), the frame rate or bit rate (input-to-output direction) of each port pair, and the total frame rate or bit rate of all ports in the input-to-output direction for each frame length.
	1to1 (Bidirectional)	Shows in the selected unit (frames/s or bits/s) the throughput (%), the frame rate or bit rate (input-to-output and output-to-input directions) of each port pair, and the total frame rate or bit rate of all ports in the input-to-output and output-to-input directions for each frame length.
	1to1 (Auto Reverse)	Shows in the selected unit (frames/s or bits/s) the throughput (%), the frame rate or bit rate (only in the selected direction) of each port pair, and the total frame rate or bit rate of all ports in the selected direction for each frame length.
	Multi (Unidirectional)	Shows in the selected unit (frames/s or bits/s) the throughput (%), the sum of the frame rates or bit rates of the input port, and the total frame rate or bit rate of all input ports for each frame length.
	Multi (Bidirectional)	Shows in the selected unit (frames/s or bits/s) the throughput (%), the sum of the frame rates or bit rates of each input port, the sum of the frame rates or bit rates of the output port, and the total frame rate or bit rate of all input and output ports for each frame length.
	Multi (Auto Reverse)	Shows in the selected unit (frames/s or bits/s) the throughput (%), the sum of the frame rates or bit rates of each input port or output port (only in the selected direction), and the total frame rate or bit rate of all input or output ports in the selected direction for each frame length.

* Unit number x (where x is 1 or 2) and port number y (where y is a number between 01 and 13) are displayed as UxPy.
* Input port: Input-to-output direction. Output port: Output-to-input direction.

- The unit and direction can be changed regardless of whether the measurement is in progress. The changing of the unit and direction does not affect the measurement operation.

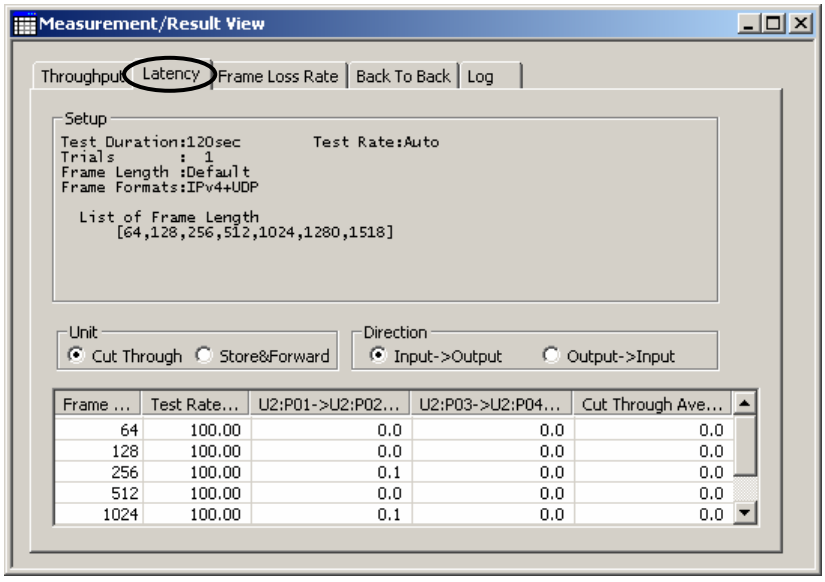
- The measured results of multiple ports are displayed in the order specified in the Port Pair settings.

- The graph shown by the graph display function varies depending on the selected unit. For details, see section 6.8.

6.3 Latency Result View

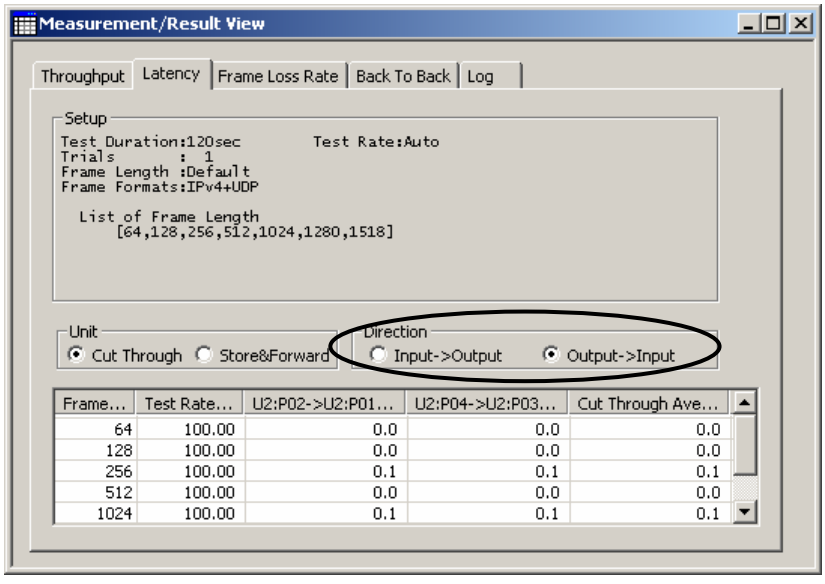
Procedure

1. Click the **Latency** tab in the Measurement/Result View. The measured results of latency are shown.

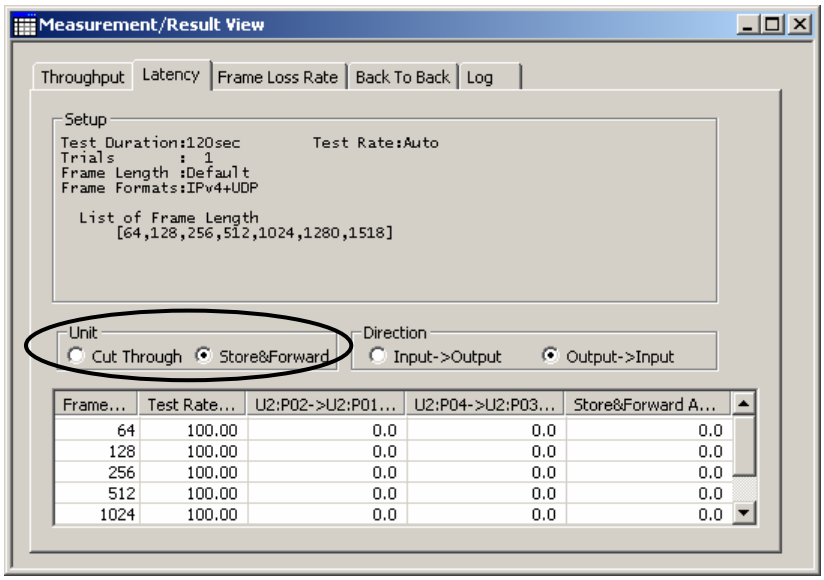


- When Traffic Map of Port Pair is set to 1to1 (Auto Reverse) or Multi (Auto Reverse)

2. Click a **Direction** option button. The measured results for the selected direction are displayed .



3. Click a **Unit** option button. The measured results are displayed with the selected unit.



Explanation

- The measured results are displayed with a display resolution of 0.1 µs for each frame length and test rate.
- The latency measurement results are displayed for the Cut Through and Store & Forward methods by selecting the unit.
- The measurement result display varies depending on traffic map setting as follows:

Traffic Map Setting	Displayed Measured Results
1to1 (Unidirectional)	Shows in the selected unit (cut through or store & forward) the latency of each port pair (input-to-output direction) and the average of the latencies of all ports in the input-to-output direction for each frame length and test rate.
1to1 (Bidirectional)	Shows in the selected unit (cut through or store & forward) the latency of each port pair (input-to-output and output-to-input directions) and the average of the latencies of all ports in the input-to-output and output-to-input directions for each frame length and test rate.
1to1 (Auto Reverse)	Shows in the selected unit (cut through or store & forward) the latency of each port pair (only in the selected direction) and the average of the latencies of all ports in the selected direction for each frame length and test rate.

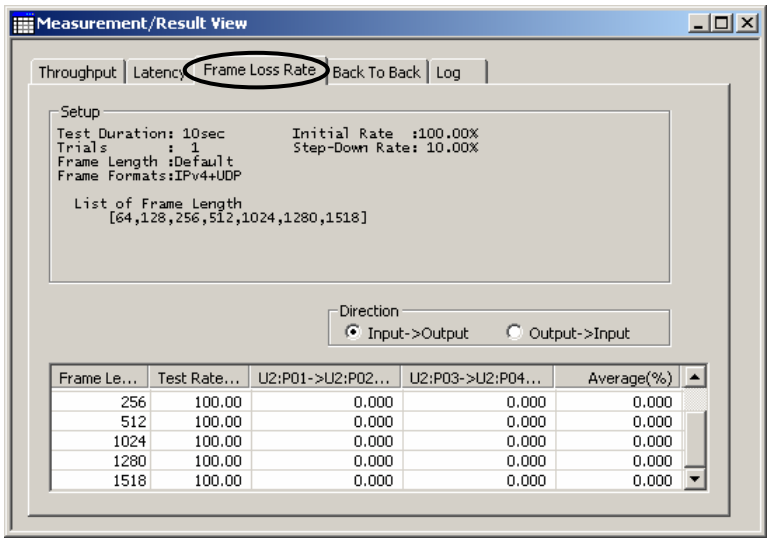
* Unit number x (where x is 1 or 2) and port number y (where y is a number between 01 and 13) are displayed as UxPy.

- The result shows 'N/A' if a measured result could not be obtained such as due to lost packets. Such measured results are excluded from the average calculation.
- The unit and direction can be changed regardless of whether the measurement is in progress. The changing of the unit and direction does not affect the measurement operation.
- The measured results of multiple ports are displayed in the order specified in the Port Pair settings.
- The graph shown by the graph display function varies depending on the selected unit. For details, see section 6.8.

6.4 Frame Loss Rate Result View

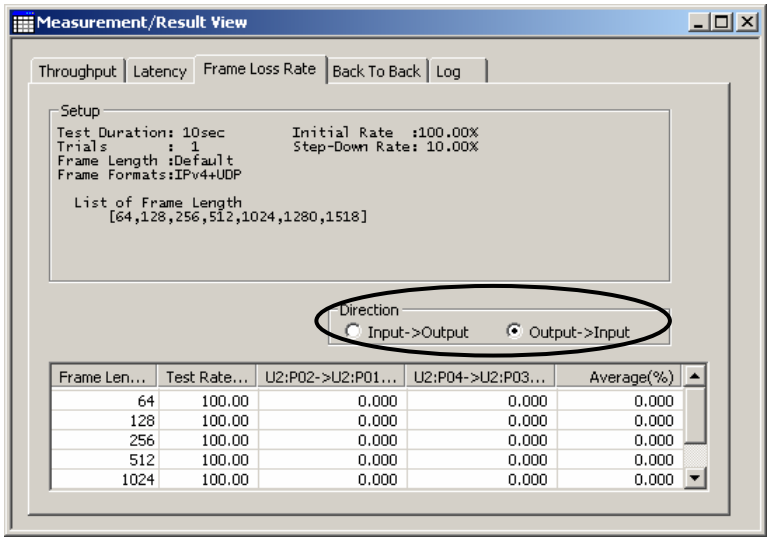
Procedure

1. Click the **Frame Loss Rate** tab in the Measurement/Result View. The measured results of frame loss rate are shown.



- When Traffic Map of Port Pair is set to 1to1 (Auto Reverse) or Multi (Auto Reverse)

2. Click a **Direction** option button. The measured results for the selected direction are displayed.



Explanation

- The measured results are displayed with three digits to the right of the decimal point for each frame length and test rate.

- If the measured result is negative, the word “Err” is displayed, and the measurement is carried out in the next frame length.

- The measurement result display varies depending on traffic map setting as follows:

Traffic Map Setting	Displayed Measured Results
1to1 (Unidirectional)	Shows the frame loss rate of each port pair (input-to-output direction) and the average of the frame loss rates of all ports in the input-to-output direction for each frame length and test rate.
1to1 (Bidirectional)	Shows the frame loss rate of each port pair (input-to-output and output-to-input directions) and the average of the frame loss rates of all ports in the input-to-output and output-to-input directions for each frame length and test rate.
1to1 (Auto Reverse)	Shows the frame loss rate of each port pair (only in the selected direction) and the average of the frame loss rates of all ports in the selected direction for each frame length and test rate.
Multi (Unidirectional)	Shows the average frame loss rate of each input port and the average frame loss rate of all input ports for each frame length and test rate.
Multi (Bidirectional)	Shows the average frame loss rate of each input port, the average frame loss rate of each output port, and the average frame loss rate of all input and output ports for each frame length and test rate.
Multi (Auto Reverse)	Show the average frame loss rate of each input port or output port (only in the selected direction) and the average frame loss rate of all input or output ports (only in the selected direction).

  * Unit number x (where x is 1 or 2) and port number y (where y is a number between 01 and 13) are displayed as UxPy.
  * Input port: Input-to-output direction. Output port: Output-to-input direction.

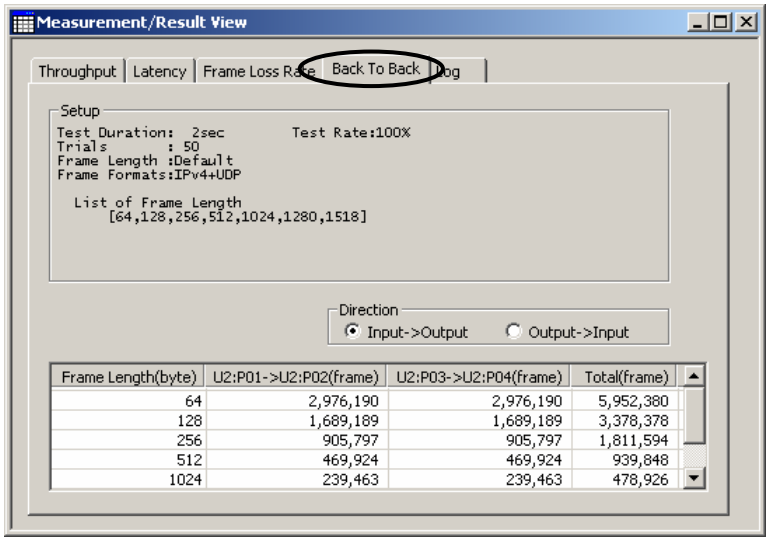
- The unit and direction can be changed regardless of whether the measurement is in progress. The changing of the unit and direction does not affect the measurement operation.

- The measured results of multiple ports are displayed in the order specified in the Port Pair settings.

6.5 Back-to-Back Measurement Result

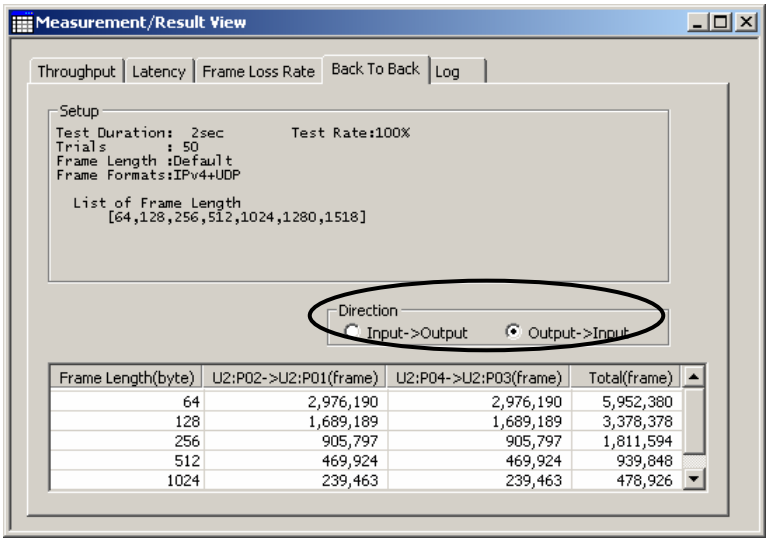
Procedure

1. Click the **Back To Back** tab in the Measurement/Result View. The back-to-back measured results are shown.



- When Traffic Map of Port Pair is set to 1to1 (Auto Reverse) or Multi (Auto Reverse)

2. Click a **Direction** option button. The measured results for the selected direction are displayed.



Explanation

- The measurement result display varies depending on traffic map setting as follows:

Traffic Map Setting	Displayed Measured Results
1to1 (Unidirectional)	Shows the back-to-back frames of each port pair (input-to-output direction) and the total back-to-back frames of all ports in the input-to-output direction for each frame length.
1to1 (Bidirectional)	Shows the back-to-back frames of each port pair (input-to-output and output-to-input directions) and the total back-to-back frames of all ports in the input-to-output and output-to-input directions for each frame length.
1to1 (Auto Reverse)	Shows the back-to-back frames of each port pair (only in the selected direction) and the total back-to-back frames of all ports in the selected direction for each frame length.
Multi (Unidirectional)	Shows the sum of the back-to-back frames of each input port and the total back-to-back frames of all input ports for each frame length.
Multi (Bidirectional)	Shows the sum of the back-to-back frames of each input port, the sum of the back-to-back frames of each output port, and the total back-to-back frames of all input and output ports for each frame length.
Multi (Auto Reverse)	Shows the sum of back-to-back frames of each input or output port (only in the selected direction) and the total back-to-back frames of all input or output ports (only in the selected direction) for each frame length.

  * Unit number x (where x is 1 or 2) and port number y (where y is a number between 01 and 13) are displayed as UxPy.
  * Input port: Input-to-output direction. Output port: Output-to-input direction.

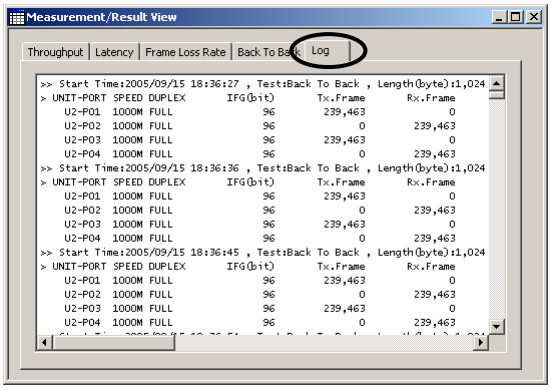
- The unit and direction can be changed regardless of whether the measurement is in progress. The changing of the unit and direction does not affect the measurement operation.

- The measured results of multiple ports are displayed in the order specified in the Port Pair settings.

6.6 Log View

Procedure

Click the **Log** tab in the Measurement/Result View. The log is displayed.



Explanation

- The Log View can display up to 500 events.
- The past log is cleared when the measurement is started.
- The log can be saved to a file. For details, see section 6.7.
- The table below shows the contents shown in the log.

Title	Displayed Parameter	Displayed Information
<INDEX>	Start Time	Shows the year, month, day, hour, minute, and second of the start time.
	Test	Shows the test item. Address Auto Learn, Learning Frame, Throughput, Latency, Frame Loss Rate, or Back To Back.
	Frame Length (bytes)*1	Shows the frame length of the test data.
	Rate (%)*1	Shows the test data rate with five digits to the right of the decimal point.
	Burst*1	Number of burst frames for the back-to-back measurement.
	Trial*1	Current trial count.
	Test Result	Judgement result (pass or fail) at the current test phase.
<UNITx-PORTxx>	UNIT	Unit number
	PORT	Port number
	SPEED	Shows the link speed at the start of the measurement.
	DUPLEX	Shows the DUPLEX at the start of the measurement.
	IFG(bit)	Transmission IFG of the test data.
	Tx. Frame	Number of transmission frames of each port.
	Rx. Frame	Number of received frames of each port.
	Rx. Byte	Number of received bytes of each port.
	Collision	Number of collision detections of each port.
	Pause Frame	Number of received Pause frames of each port.
	CRC Error	Number of received CRC error frames of each port.
	Alignment	Number of received alignment error frames of each port.
	Over Size	Number of received oversize error frames of each port.
	Under Size	Number of received undersize error frames of each port.
	Symbol Error	Number of received symbol error frames of each port.
	Link Down	Number of link down occurrences of each port
	LF Detect	Number of LF detections of each port.
	RF Detect	Number of RF detections of each port.
	Error	Shows the error information of each port.

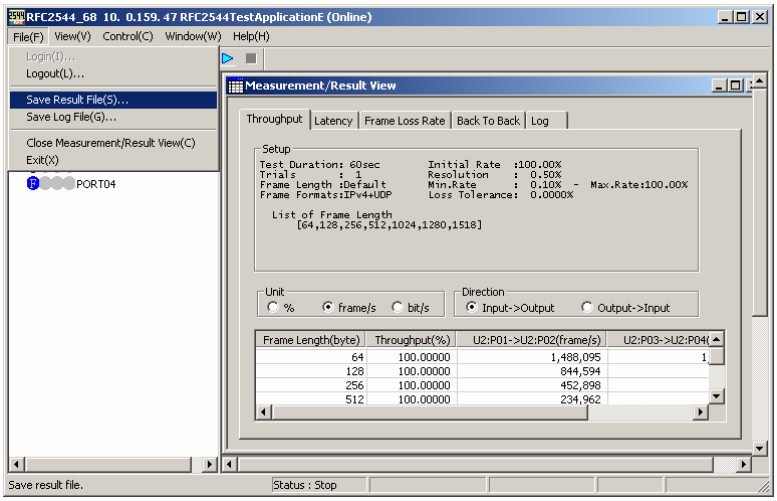
6.7 Saving Measured Results and Log

This section describes the details of saving the measured results and the log shown on the Measurement/Result View.

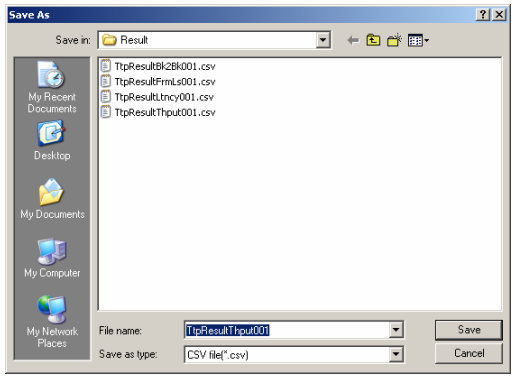
Saving the Result File

Procedure

1. Click the measurement item tab containing the measured results you want to save. The Measurement/Result View of the clicked tab is shown.
2. From the **File** menu, choose **Save Result File**. The Save As dialog box opens.



3. Enter the save destination and the file name.
4. Click **Save**. The result of the test shown in the Measurement/Result View is saved.



5. To save other measured results, repeat steps 1 to 4.

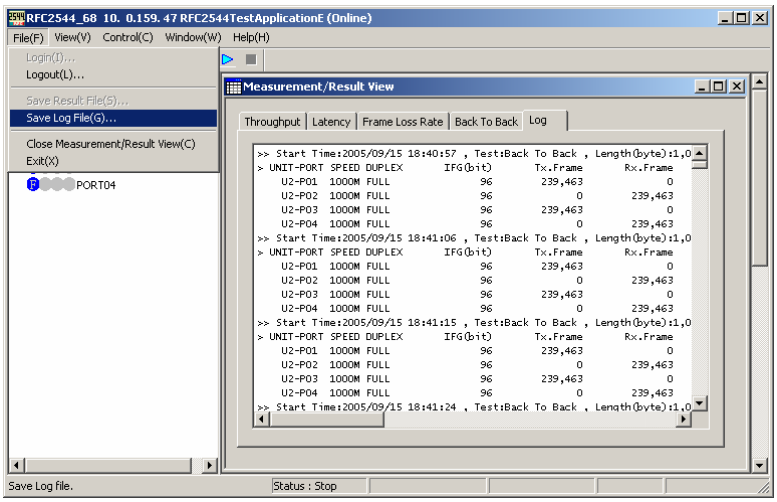
Explanatio

- The measured results of one test item are saved to the result file. To save the measured results of multiple test items, save the result file for each test item.
- The result file is in CSV format. If the measurement is in progress, the most recent data is saved.
- If the log is shown in the Measurement/Result View, the result file cannot be saved.
- All measured results are saved to the result file regardless of the unit and direction settings in the Measurement/Result View.

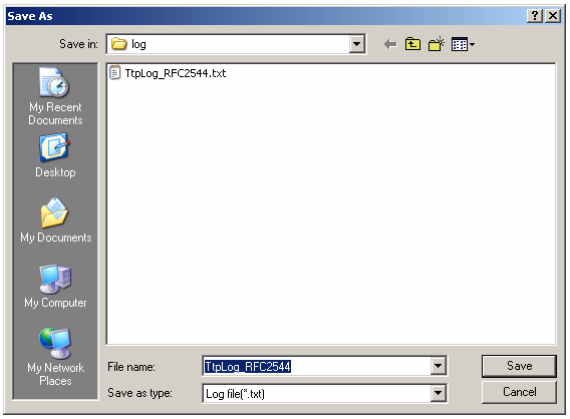
Saving the Log File

Procedure

1. From the **File** menu, choose **Save Log File**. The Save As dialog box opens.



2. Enter the save destination and the file name.
3. Click **Save**. The log file is saved.



Explanatio

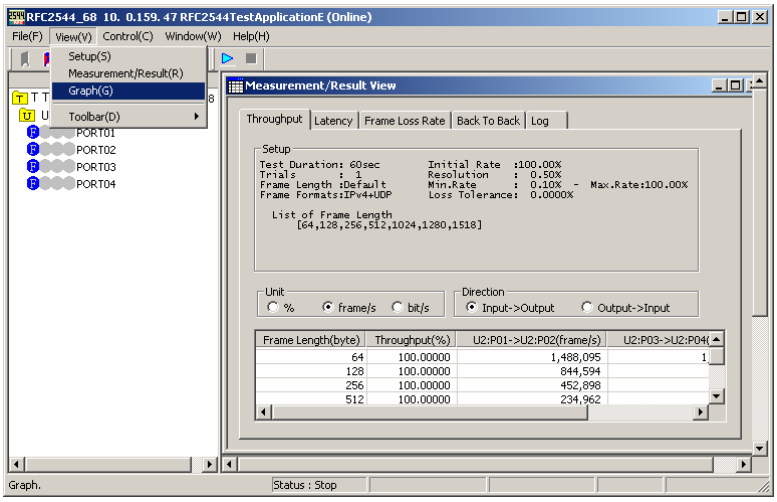
- The log file is in text format. If the measurement is in progress, the most recent data is saved.
- The log file can be saved even when a view other than the log is shown in the Measurement/Result View.
- The maximum number of events that can be saved to the log file is 10000.

6.8 Graph View

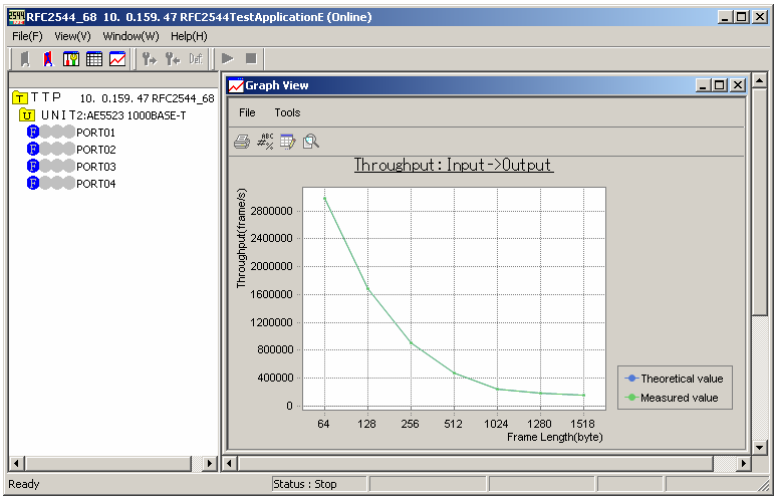
Showing the Graph View

Procedure

1. Click the measurement item tab containing the measured results you want to graph. The Measurement/Result View of the clicked tab is shown.



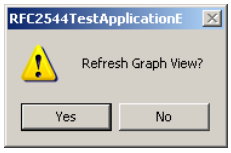
2. From the **View** menu, choose **Graph**. The graph of the measured results shown in the Measurement/Result View is shown in the Graph View.



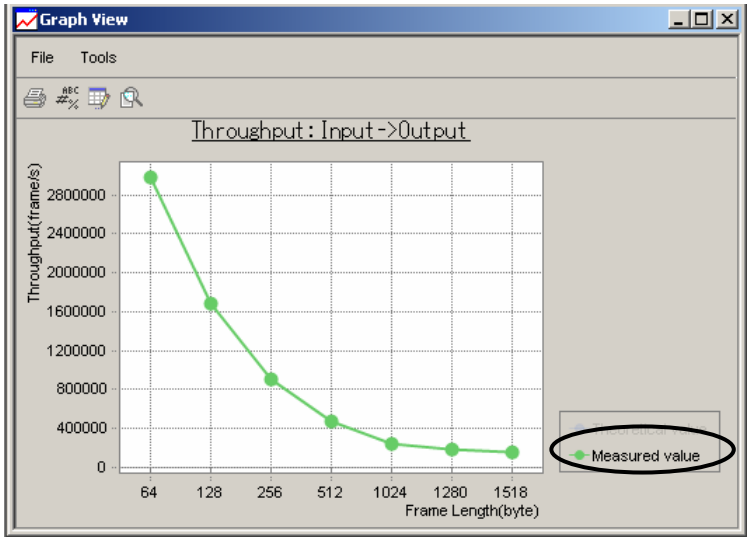
Note

You can also click the Graph icon to show the Graph View.

3. To show the graph of other measured results, repeat steps 1 and 2.
4. If you carry out the procedure to show a graph when a graph is already shown, a dialog box opens for you to confirm the refreshing of the Graph View. To refresh, click **Yes**. To cancel, click **No**.



5. If move the cursor on a graph type in the Graph View, the corresponding graph is highlighted.



Explanation

- The Graph View can be shown when the Measurement/Result View is shown.
- The Graph View can be shown regardless of whether the measurement is in progress. However, it cannot be shown if there are no measured results.
- If the measurement is in progress, the measured result at the time you carried out the procedure to show the graph is shown on the graph. The Graph View is not refreshed even when the measurement proceeds. To show the most recent graph, carry out the procedure to show the graph again.
- The contents shown in the Graph View vary depending on the test item as follows:

Test item	Displayed Unit	X-Axis	Y-Axis	Graph Type
Throughput	%	Frame length (bytes)	Throughput (%)	Logical values and measured values
	frame/s	Frame length (bytes)	Total (frames/s)	Logical values and measured values
	bit/s	Frame length (bytes)	Total (bits/s)	Logical values and measured values
Latency	Cut through	Frame length (bytes)	Average (µs)	For each test rate
	Store & Forward			
Frame loss rate	-	Test rate (%)	Average (%)	For each frame length
Back-to-back	-	Frame length (bytes)	Total (frames)	Measured values

* If the X-axis is frame length, the values are shown in the order of the frame lengths registered in Test Configuration.

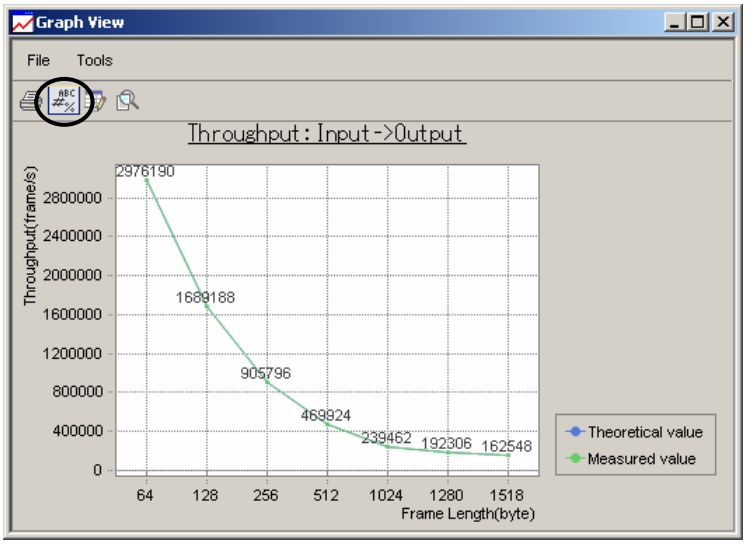
- The content shown in each axis varies depending on the test item as follows:

Test Item	Displayed Unit	X-Axis	Y-Axis
Throughput	%	Test frame length (bytes)	Throughput (%)
	frame/s		Throughput (frames/s)
	bit/s		Throughput (bits/s)
Latency	Cut through	Test frame length (bytes)	Latency CT (µs)
	Store & Forward		Latency S&F (µs)
Frame loss rate	-	Test rate (%)	Loss rate (%)
Back-to-back	-	Test frame length (bytes)	Number of burst frames (frames)

Point Label Display

Procedure

1. Click the **Point Label** icon on the toolbar in the Graph View. Numeric data is displayed at each point on the graph.



2. Click the **Point Label** icon again to clear the numeric data.

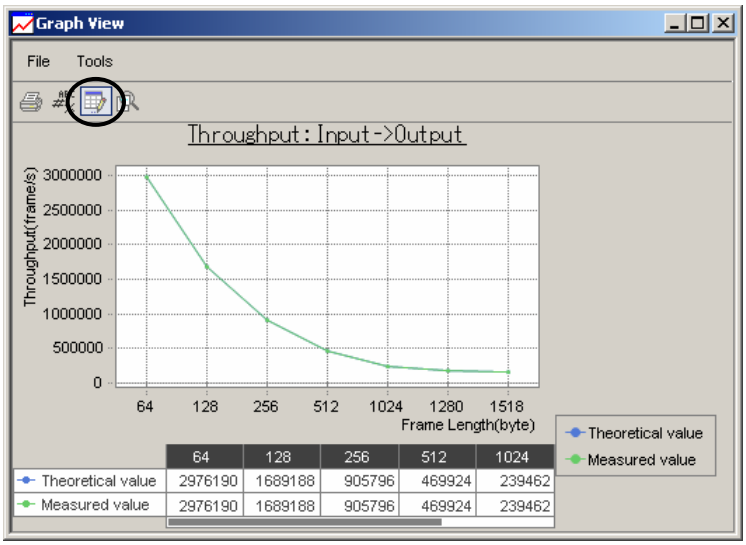
Explanation

You can show or hide the toolbar in the Graph View by choosing Toolbar from the Tools menu of the Graph View. When enabled, a check mark appears by Toolbar.

Data Editor Display

Procedure

1. Click the **Data Editor** icon on the toolbar in the Graph View. The data at each point is displayed below the graph.



2. Click the **Data Editor** icon again to clear the data display.

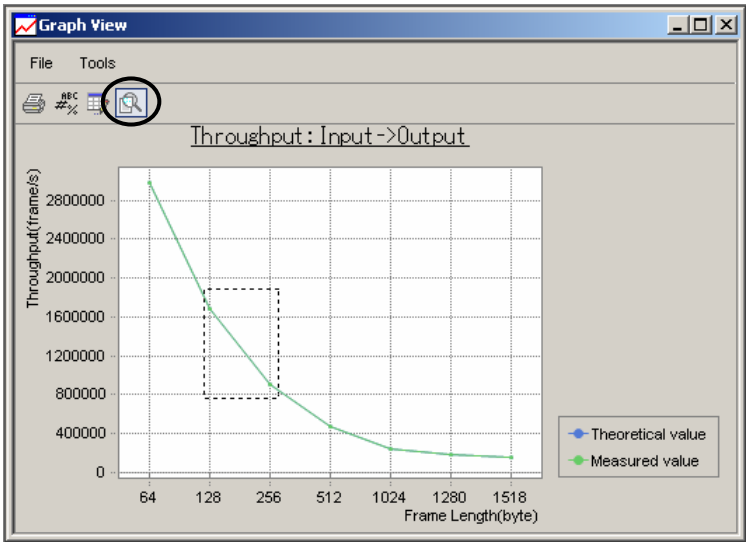
Explanation

- You can show or hide the toolbar in the Graph View by choosing Toolbar from the Tools menu of the Graph View. When enabled, a check mark appears by Toolbar.
- You can also select Data Editor from the Tools menu to show the data display.
- You cannot change the data.

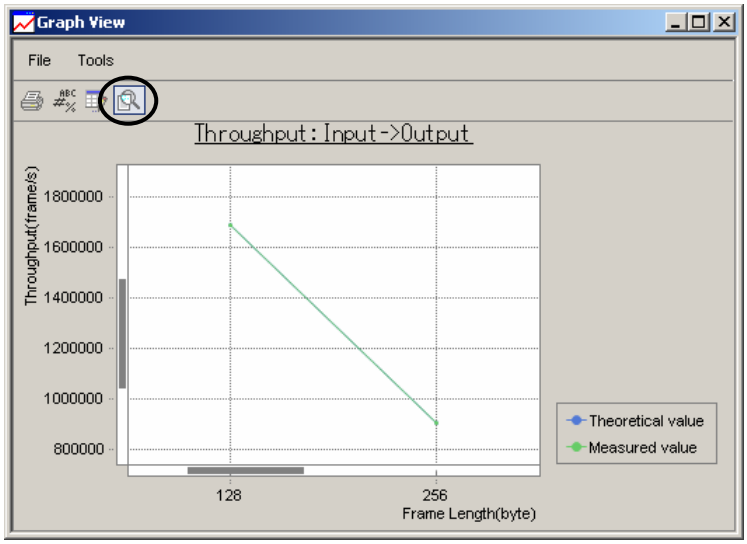
Zoom Display

Procedure

1. In the Graph View, click the **Zoom** icon in the toolbar and drag the area to be expanded. The dragged area is shown expanded.



2. Click the **Zoom** icon on the toolbar when the display is expanded to return to the normal graph display.



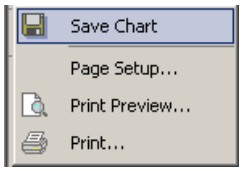
Explanation

- You can show or hide the tool bar in the Graph View by choosing Toolbar from the Tools menu of the Graph View. When enabled, a check mark appears by Toolbar.
- If the dragged area contains only one data point, only the data point is expanded.

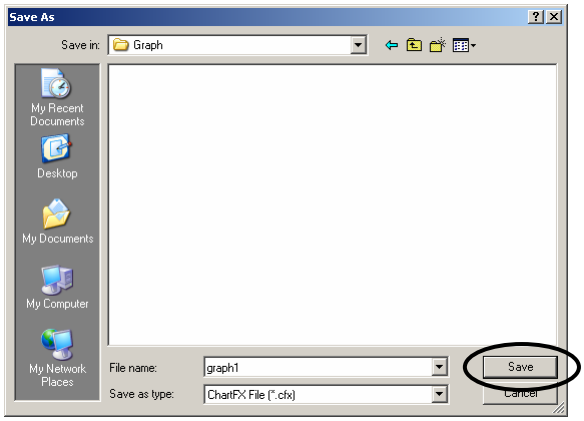
Saving the Graph

Procedure

1. In the Graph View, choose **Save Chart** from the **File** menu. The Save As dialog box opens.



2. Enter the save destination and the file name.
3. Click **Save**. The graph is saved.



Explanation

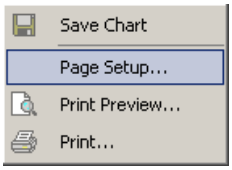
- You can select the graph save format from CFX, TXT (data only), XML (properties only), BMP, or EMF.

- The software application does not have a function to load the saved data. To view the saved data, use an application that supports the respective file format.

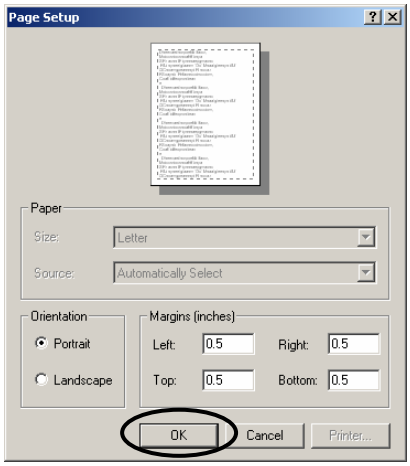
Printing the Graph

Procedure

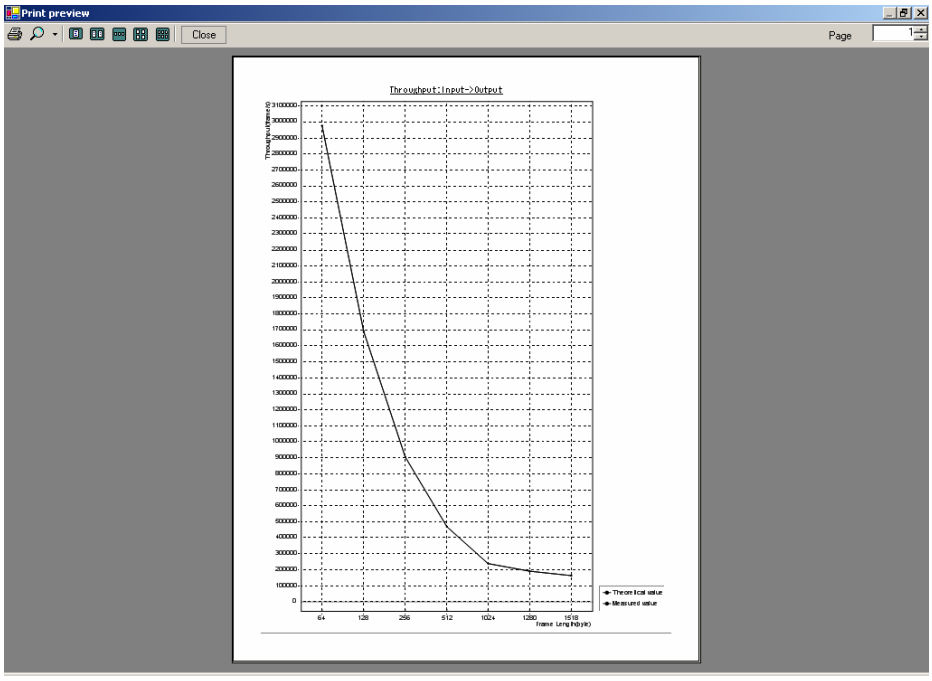
1. In the Graph View, choose **Page Setup** from the **File** menu. The Page Setup dialog box opens.



2. Set the orientation and margins, and click **OK**.



3. From the **File** menu, choose **Print Preview**. The print preview dialog box opens.
4. To close the Print Preview dialog box, click **Close**.



5. From the **File** menu, choose **Print**. The Print dialog box opens.
6. To print, click **OK**. To cancel, click **Cancel**.

Note

You can also open the Print dialog box by clicking the Print icon.

7.1 Messages and Corrective Actions

Error Messages

There are cases in which error messages are displayed on the screen while using the RFC2544 TestApplicationE. This section describes the meanings of the messages and their corrective actions. If the corrective action requires servicing, contact your nearest YOKOGAWA dealer for repairs.

System Control Error Messages

Code	Message	Corrective Action	Ref. Section
11013	Connection failed	Failed to log in. Check the connection using Ping.	4.2
11018	User name not entered.	Specify the login user name correctly.	4.2
11019	PORT reservation failed.	Another user may have reserved the port at the same time. Try to reserve the port again.	4.2, 4.3
11020	Port to reserve not selected.	Select the port to be reserved.	4.3
11022	Failed to release PORT.	Communication error occurred. Check the LAN cables connected to the PC and AE5511. Then, restart the PC and the AE5511.	4.1 3.6*1, 3.12*1
11023	LOGOUT failed.	Communication error occurred. Check the LAN cables connected to the PC and AE5511. Then, restart the PC and the AE5511.	4.1 3.6*1, 3.12*1
11036	TELNET connection failed.	Communication error occurred. Check the LAN cables connected to the PC and AE5511. Then, restart the PC and the AE5511.	4.1 3.6*1, 3.12*1
11037	Time out	Communication error occurred. Check the LAN cables connected to the PC and AE5511. Then, restart the PC and the AE5511. If you are using a notebook PC, check that the PC is not in standby or sleep mode.	4.1 3.6*1, 3.12*1
11038	FTP connection failed.	Communication error occurred. Check the following items and restart the PC and the AE5511. • Check the LAN cables connected to the PC and AE5511. • If the firewall function is enabled on the PC, specify FTP passive in the login settings.	4.1, 4.2 3.6*1, 3.12*1
11039	Unauthorized password.	Specify the password correctly.	4.2
11040	User already logged in.	The same login name is used. Log in again using a different login name.	4.2
11041	Exceeded maximum number of logins.	The maximum number of users (eight) are already logged in. Log in after another user logs out.	4.2
11042	Shutting down	The AE5511 is shutting down. To continue operation, start the AE5511.	3.6*1
11043	Unknown Error	Restart the PC and the AE5511.	4.1 3.6*1
11044	Disconnected	Communication error occurred. Check the following items and restart the PC and the AE5511. • Check the LAN cables connected to the PC and AE5511. • Check the specifications of your PC.	3.2, 4.1 4.2 3.6*1, 3.12*1

Code	Message	Corrective Action	Ref. Section
11045	Disconnected	Communication error occurred. Check the following items and restart the PC and the AE5511. • Check the LAN cables connected to the PC and AE5511. • Check the specifications of your PC. • If the firewall function is enabled on the PC, specify FTP passive in the login settings.	3.2, 4.1 4.2 3.6[*1], 3.12[*1]
11046	Application will be shut down due to forced logout.	A user logged in using TTPControl WindowE with administrator privileges logged you out, or the AE5511 was shut down. Measured data and setup may be lost.	4.2
11047	Fan error occurred.	The fan on the AE5511 is not running normally. Shut down the AE5511, and check that foreign objects are not present in the fan vent port.	1.2[*1], 9.6[*1]
11048	XENPAK Error	The XENPAK may have malfunctioned. Replace the XENPAK. However, an XENPAK error may be detected when the optical input transits from ON to OFF or OFF to ON. In this case, the XENPAK does not need to be replaced.	-
11049	Failed to reconnect.	Communication error occurred. Check the LAN cables connected to the PC and AE5511. Then, restart the PC and the AE5511.	4.1 3.6[*1], 3.12[*1]
11050	Cannot login during autotesting.	Another user may have reserved the port at the same time with the auto test. Try to reserve the port again.	4.2, 4.3
11051	Input may not begin with "-".	A hyphen cannot be used for the first letter of an access name or user name. Enter a correct name.	4.2
11052	Can not carry out measurement and setup because the AE5511 firmware is of an old version. \nLog in to the AE5511 as an ADMIN User with the TTProControlWindowE software. Upgrade the AE5511 firmware after log-in.	The firmware version of the AE5511 is an old version that is incompatible with the RFC2544. Update the AE5511 firmware.	3.7[*1]
11053	Can not carry out measurement and setup because the RFC2544 option has not been added to the AE5511 firmware. \nLog in to AE5511 as an ADMIN User with the TTProControlWindowE software. Add the RFC2544 option to the AE5511 firmware after log-in.	The RFC2544 option is not installed in the AE5511. Install the option.	3.3 9.5[*1]
11056	Invalid address.	The login address to the AE5511 cannot be set to 0.0.0.0 or multicast address. Enter a correct address.	4.2
11057	No space available on hard disk.	Not enough free space in the user area on the HDD. Consolidate the files of users running auto tests.	[*2]
11059	Response Failed	An error occurred on the application. Restart the PC and the AE5511.	4.1, 4.2 3.6[*1]
13052	Could not open file.	Check whether the access to the save destination drive is prohibited. For an external drive, check the cabling.	-
13070	Log file read error.	The log file could not be loaded. Log out, and restart the PC.	4.2
13071	Cannot close Measurement/Results screen during measurement.	The Result View cannot be closed while the measurement is in progress.	6.1

Code	Message	Corrective Action	Ref. Section
16530	Can not paste because the copy buffer is empty.	The copy source of the port setup is not designated. Copy before paste.	5.9
17041	Register the same number of inputs and outputs in the port pair settings.	When the traffic map of the port pair is one-to-one, the number of registered input ports must match that of the output ports. Match the number of input ports to that of the output ports.	5.2
17056	Register input ports or output ports in the port pair settings.	Input port or output port is not registered in the port pair setup. Enter it correctly.	5.2
17057	This file cannot be loaded.	The file that you tried to load is not supported. Check the file.	5.8
17055	Could not read from File.	An error was found in the file. Check whether the file on the drive is corrupt.	5.8
17019	Link Layer setting error.	An error occurred on the application. Restart the PC and the AE5511.	4.1 3.6*1
17020	Port Pair setting error.	An error occurred on the application. Restart the PC and the AE5511.	4.1 3.6*1
17021	Test Configuration setting error.	An error occurred on the application. Restart the PC and the AE5511.	4.1 3.6*1
17022	Throughput setting error.	An error occurred on the application. Restart the PC and the AE5511.	4.1 3.6*1
17023	Latency setting error.	An error occurred on the application. Restart the PC and the AE5511.	4.1 3.6*1
17024	Frame Loss Rate setting error.	An error occurred on the application. Restart the PC and the AE5511.	4.1 3.6*1
17025	Back To Back setting error.	An error occurred on the application. Restart the PC and the AE5511.	4.1 3.6*1
17026	DUT Information setting error.	An error occurred in the communication or on the application. Check the LAN cables connected to the PC and AE5511. Then, restart the PC and the AE5511.	4.1 3.6*1, 3.12*1
17027	Setting registration error.	An error occurred on the application. Restart the PC and the AE5511.	4.1 3.6*1

*1 Reference section in the *AE5511 TrafficTesterPro User's Manual (IM417322900-01E)*.

*2 Reference section in the *AE5511 TrafficTesterPro Remote Command Manual (IM417322900-17E)*.