

**LINEEYE**

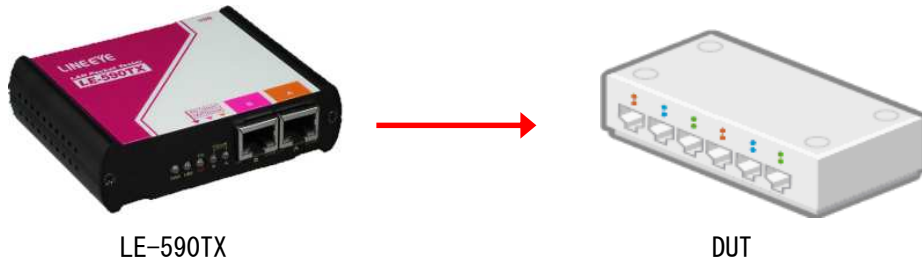
**LE-590-2544**  
**User's Manual**

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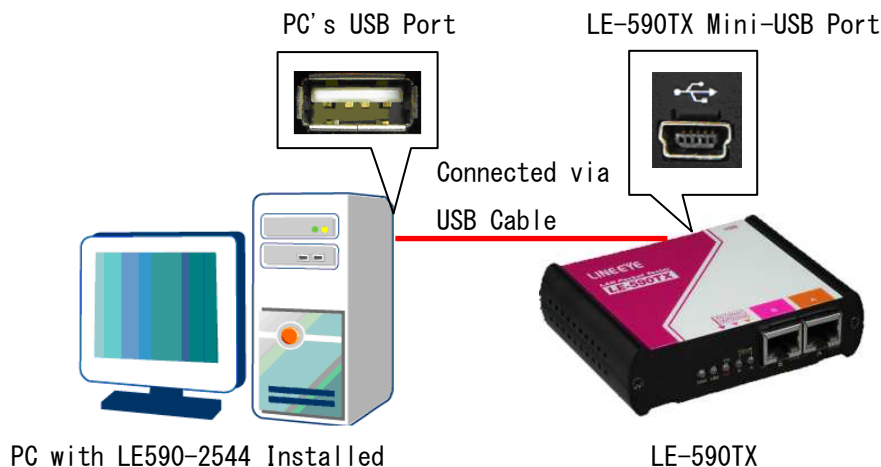
## 1. LE590-2544 Overview

LE590-2544 is a user-friendly and automatic test suite based on industry-standard RFC 2544. It generates and analyzes packets to evaluate the Throughput performances, Latency, Packet Loss, and Back-to-Back of Ethernet switches or routers via this device. The real-time test results display and customized report provide an effective way when examining the DUT.



### 1.1. Hardware Installation

Before starting LE590-2544, your PC and LE-590TX shall be connected properly. The figure down below illustrates connecting PC and LE-590TX. You can connect LE-590TX with PC in the same manner.



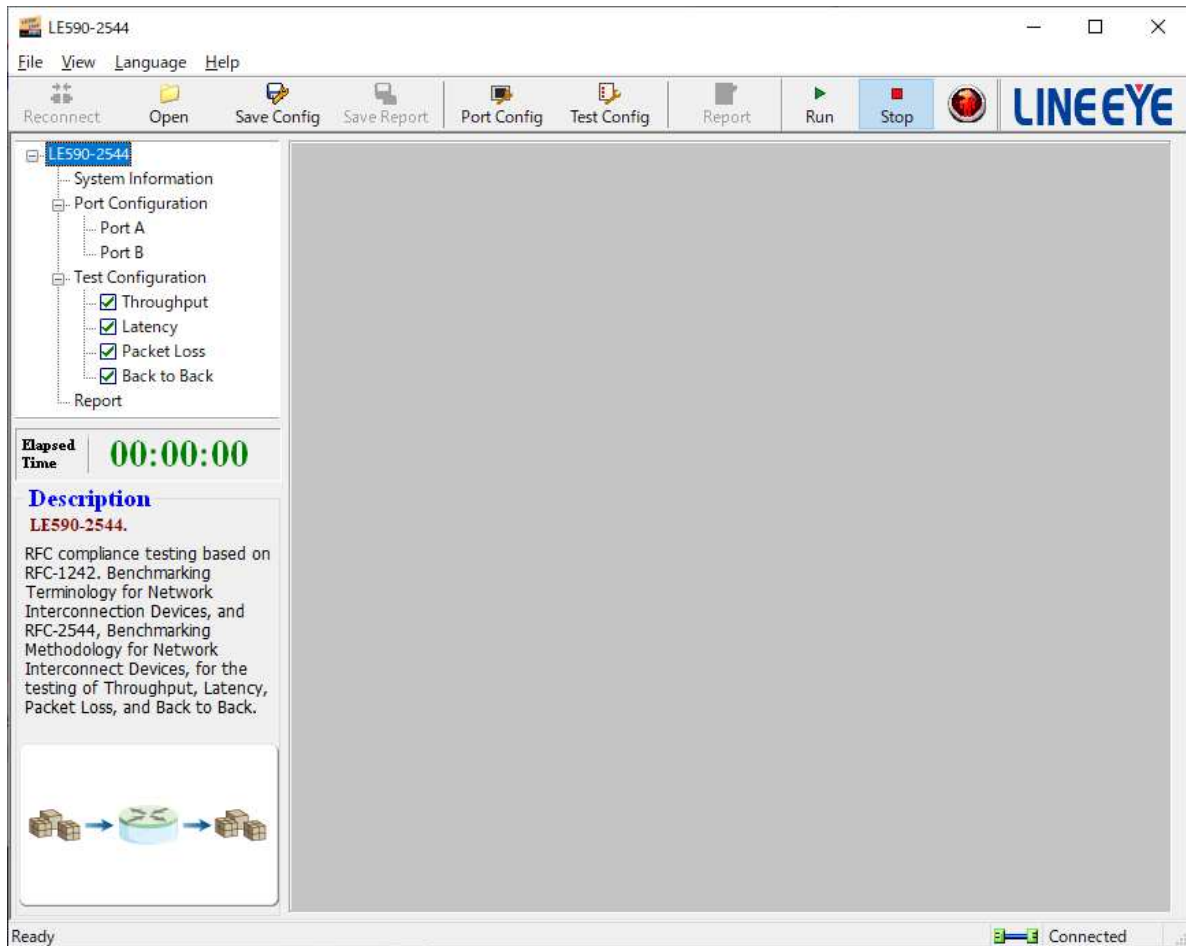
### 1.2. Starting LE590-2544

Before starting LE590-2544, the DUT, your PC, and LE-590TX shall be connected as shown in “1.1. Hardware Installation”.

**You can start running LE590-2544 by:**

- Click **Start** → **Programs** → **LINEEYE** → **LE-590TX** → **LE590-2544 Vxxxxx** → **LE590-2544 Vxxxxx**.
- Double-click LE590-2544 icon located on your PC's desktop.

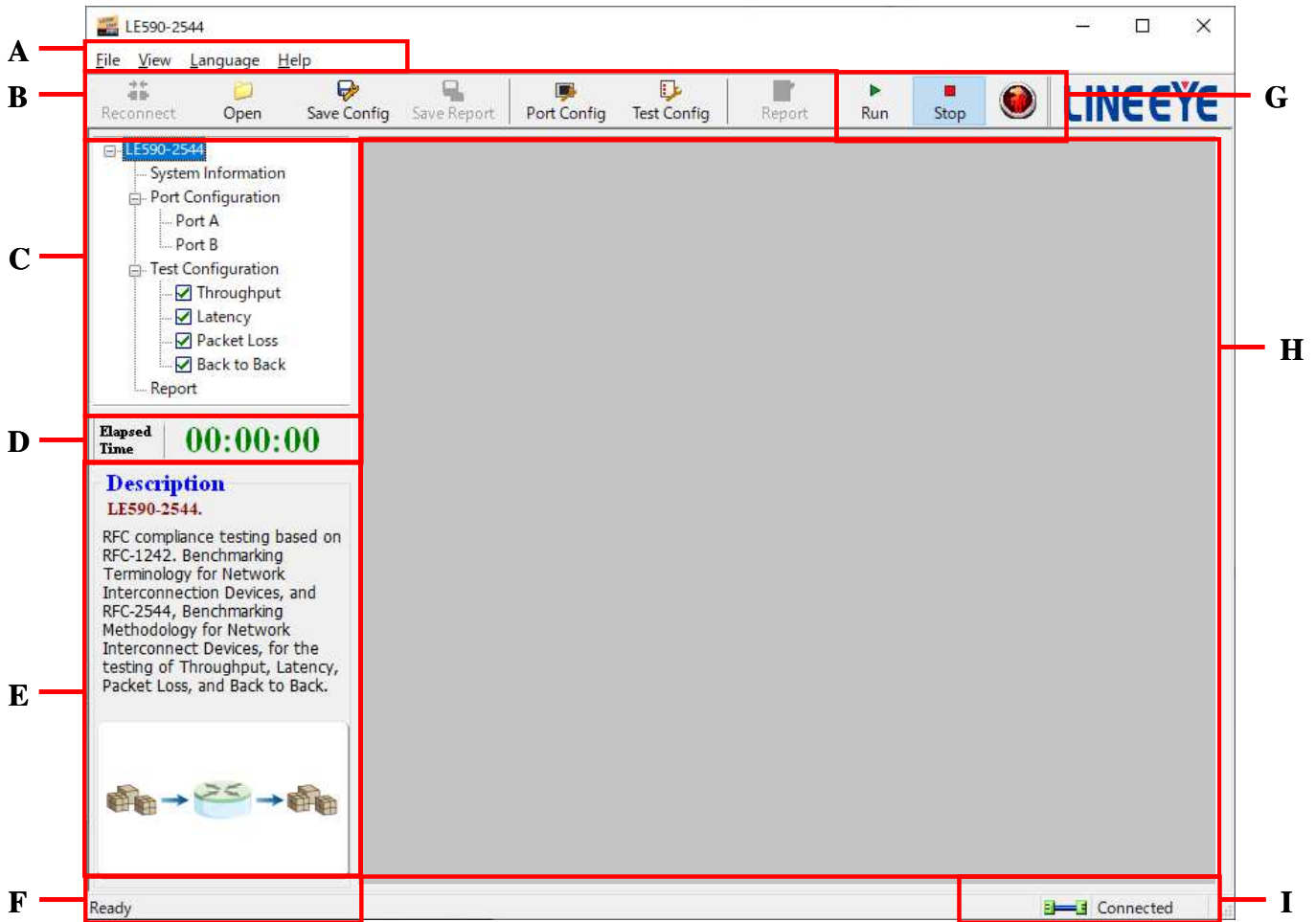




If your PC is not connected with LE-590TX, you can still run LE590-2544 under Demo mode. Almost all LE590-2544's functions are available under Demo Mode. However, please note that **Demo Mode is for system demo purposes only**, and does not serve any testing purposes at all.

## 1.3. LE590-2544 Main Window Overview

### LE590-2544 Main Window



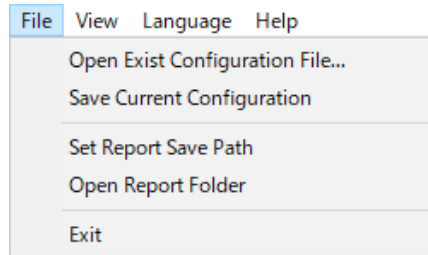
LE590-2544 Functions Overview		
A	<b>Menu Bar</b>	The <b>Menu Bar</b> allows you to load/save settings, show or hide the Tool Bar/Status Bar, change language displayed, view the version of the software/LE-590TX and system requirement.
B	<b>Tool Bar</b>	The <b>Tool Bar</b> allows you to reconnect your PC to your LE-590TX, save the configuration, save and show the test report, and configure the port/test settings.
C	<b>System Info/Configuration List</b>	By clicking the <b>System Info/Configuration List</b> , you can view system information, making port/test configurations, or view test reports on <b>H. Main Display Screen</b> .
D	<b>Elapsed Time</b>	The <b>Elapsed Time</b> field displays the elapsed time during test.
E	<b>Description</b>	The <b>Description</b> field display brief descriptions regarding to tests.
F	<b>Status Bar</b>	The <b>Status Bar</b> shows the LE590-2544's running status.
G	<b>Control Buttons/Test Running Status Icon</b>	The <b>Control Buttons</b> allow you to start/stop tests, and the <b>Test Running Status Icon</b> indicates if there's a test running.
H	<b>Counter Window</b>	You can make detail configurations and view real-time testing diagrams on the <b>Main Display Screen</b> .
I	<b>System Connection Status</b>	This icon shows the connection status between your PC and LE-590TX.

## 1.4. Menu Bar

File View Language Help

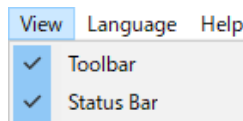
LE590-2544 Menu Bar includes configuration options such as **File**, **View**, **Languages**, and **Help**. Please refer to the sections down below for detail information regarding to each configuration option.

### 1.4.1. File



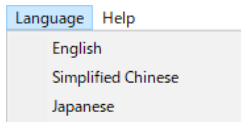
File	
<b>Load default configuration</b>	If you have a previously saved configuration setting file stored in your PC, you can load it and apply all the setting you've made by choosing <b>Load default configuration</b> . All configuration files are saved in the format of <b>"*.xml"</b> .
<b>Save current configuration</b>	The <b>Save current configuration</b> function on the <b>Menu Bar</b> allows you to save the settings you've made. Configuration files are saved in the format of <b>"*.xml"</b> .
<b>Set Report Save Path to...</b>	To save the test results, choose <b>Set Report Save Path to...</b> from the <b>Menu Bar</b> after performing test, and choose the file path where you would like to save your test results. Test results and related statistic are available and can be viewed with the <b>"*.xls"</b> file you saved this way. Please note that you need Microsoft Excel® to view <b>"*.xls"</b> file.
<b>Exit</b>	A prompt pop-up window will ask if you are sure to exit LE590-2544. Click <b>YES</b> to exit LE590-2544, or click <b>NO</b> to cancel.

### 1.4.2. View



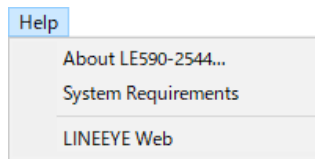
View	
<b>Toolbar</b>	Selecting this option will allow you to show or hide the <b>Tool Bar</b> .
<b>Status Bar</b>	Selecting this option will allow you to show or hide the <b>Status Bar</b> .

## 1.4.3. Language



Language	
English/ Chinese Simplified	LE590-2544 has <b>2</b> different languages for its UI available. You can set the language of UI to either <b>English and Simplified Chinese</b> .

## 1.4.4. Help



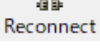









Help	
<p><b>About...</b></p>	<p>An "About" window will pop up and show detailed system information.</p> <p>Click the <b>OK</b> button to exit the "<b>About LE590-2544</b>" pop-up window.</p>
<p><b>System Requirements</b></p>	<p>A "<b>System Requirements</b>" window will pop up and show the requirements for your PC and the FPGA/Firmware of the module.</p> <p>Click the <b>OK</b> button to exit the "<b>System Requirements</b>" pop-up window.</p>

## 1.5. Tool Bar

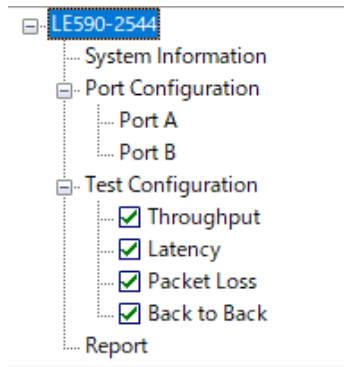


The Tool Bar allows you to load/save configuration, save report, configure port/test settings, reconnect the LE-590TX to your PC and see test report.

Tool Bar	
	<p>If the USB connection between your PC and LE-590TX is down, a “<b>Disconnected</b>” icon  <b>Disconnected</b> will be shown in “<b>System Connection Status</b>”.</p> <p>Press <b>Reconnect</b> button  to re-establish the connection between your PC and LE-590TX. If the connection has been established successfully, a message window will pop up, and the “<b>System Connection Status</b>” will be shown as “<b>Connected</b>”  <b>Connected</b>.</p>
	<p>If you have a previously saved configuration setting file stored in your PC, you can load it and apply all the setting you’ve made by clicking the “<b>Open</b>” button on the <b>Tool Bar</b>. All configuration files are saved in the format of “<b>*.xml</b>”</p>
	<p>The <b>Save Config</b> button on the <b>Tool Bar</b> allow you to save the settings you’ve made or the test results. Configuration files are saved in the format of “<b>*.xml</b>”.</p>
	<p>The <b>Save Report</b> button on the <b>Tool Bar</b> allow you to save the test results. To save the test results, <b>click the “Save” button on the Tool Bar after performing tests</b>, and choose the file path where you would like to save your test results. By default, these test results are named with a prefix of “<b>RFC 2544TestResult</b>”, and following by the date/time when the file are created. Test results and related statistic are available and can be viewed with the “<b>*.xls</b>” file you saved this way. Please note that you need Microsoft Excel® to view “<b>*.xls</b>” file.</p>
	<p>By clicking the <b>Port Config</b> button, the <b>Port Configuration</b> screen will be shown on the <b>Main Display Screen</b> located on the right side of LE590-2544’s main window, allowing you to make settings for LE-590TX’s ports. Settings such as port transmitting rate, auto-negotiation, and protocol are available and can be set here. For more detail description about <b>Port Configuration</b>, please refer to <b>7.1. Port Configuration</b>.</p>
	<p>By clicking the <b>Test Config</b> button, the <b>Test Configuration</b> screen will be shown on the <b>Main Display Screen</b> located on the right side of LE590-2544’s main window, allowing you to make test settings. You can set 4 different test modes here, including <b>Throughput, Latency, Packet Loss</b> and <b>Back to Back</b>. For more detail description about <b>Test Configuration</b>, please refer to <b>7.2. Test Configuration</b>.</p>
	<p>Clicking this button will show the test result on the Main Screen.</p>

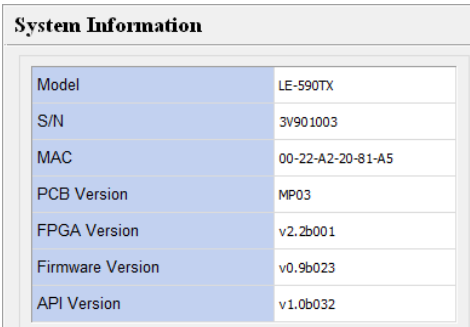


## 1.6. System Info/Configuration List



The **System Info/Configuration List** allows you to view system information, making port/test configurations, and check test reports on the **Main Display Screen**.

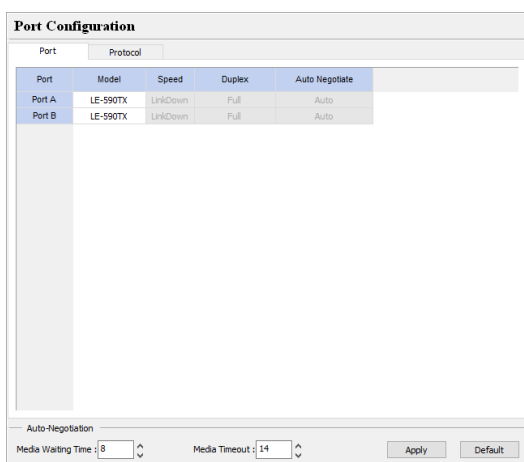
### System Information



System Information	
Model	LE-590TX
S/N	3V901003
MAC	00-22-A2-20-81-A5
PCB Version	MP03
FPGA Version	v2.2b001
Firmware Version	v0.9b023
API Version	v1.0b032

By clicking the **System Information** on the **System Info/Configuration List**, the **System Information** screen will be shown on the **Main Display Screen** located on the right side of LE590-2544's main window.

### Port Config



Port	Model	Speed	Duplex	Auto Negotiate
Port A	LE-590TX	LinkDown	Full	Auto
Port B	LE-590TX	LinkDown	Full	Auto

By clicking the **Port Config** on the **System Info/Configuration List**, the **Port Configuration** screen will be shown on the **Main Display Screen** located on the right side of LE590-2544's main window, allowing you to make settings for LE-590TX's ports.

Settings such as port transmitting rate, auto-negotiation, and protocol are available and can be set here.

For more detail description please refer to **7.1. Port Configuration**.

## Test Config (Throughput, Latency, Packet Loss, Back to Back)

**Test Configuration**

Source Port:  Port A,  Port B  
 Destination Port:  Port A,  Port B

LE-550TX Ethernet Frame Generator & Analyzer → DUT

Throughput | Latency | Packet Loss | Back to Back

Duration (Secs): 3  
 Number of Trials: 1  
 Load Percentage(%): 50  
 Initial Rate: 10  
 Min Rate: 10  
 Max Rate: 100  
 Resolution: 10  
 Acceptable Loss: 0

Frame Size(Bytes): Starting from 64, Step Size 64, Stopping at 128  
 Delay Time after Learning: 0.5 second(s)  
 Bi-Directional

Custom Edit...

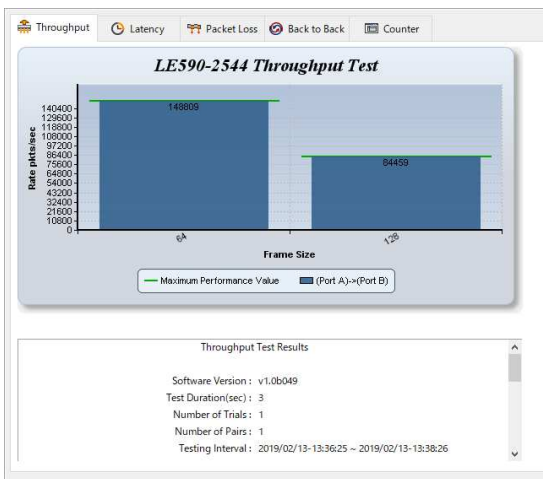
Learning Mode: Once  
 Learning Retry: 1

By clicking the **Test Config** on the **System Info/Configuration List**, the **Test Configuration** screen will be shown on the **Main Display Screen** located on the right side of LE590-2544's main window, allowing you to make test settings.

You can set 4 different test modes here, including **Throughput, Latency, Packet Loss, and Back to Back**.

For more detail description, please refer to **7.2. Test Configuration**.

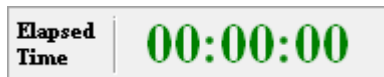
## Report



The **Report** on the **System Info/Configuration List** allows you to view test results, charts, and statistics on the **Main Display Screen** located on the right side of LE590-2544's main window.

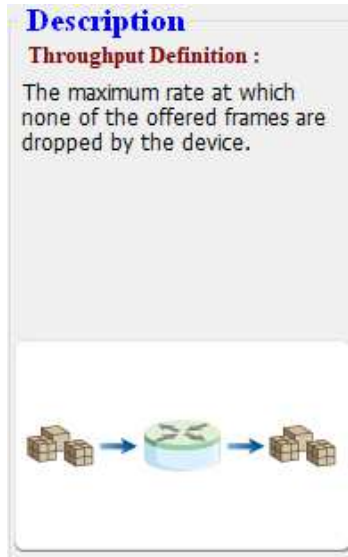
For more detail description about **Report**, please refer to **7.3. Report**.

### 1.7. Elapsed Time



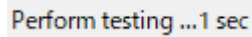
The **Elapsed Time** allows you to know the time spent during tests.

## 1.8. Description



The **Description** displays brief descriptions and figures regarding to **Throughput**, **Latency**, **Packet Loss**, and **Back to Back** tests.

## 1.9. Status Bar







The **Status Bar** shows the running status of LE590-2544.

## 1.10. Control Buttons/Test Running Status Icon



The **Control Buttons** allow you to start/stop tests, and the **Test Running Status Icon** indicates if there's a test running.

Control Buttons	
 Run	Start test
 Stop	Stop test

Test Running Status Icon	
	No test is underway
	Test is running

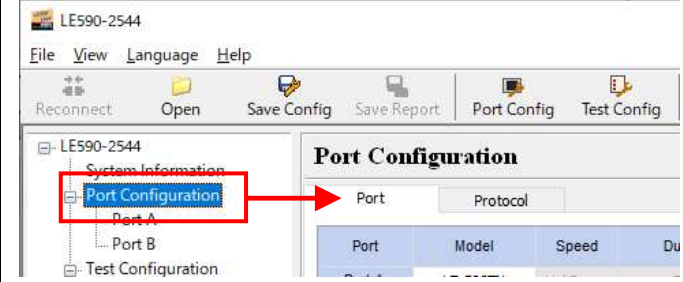
## 2. Port Configuration and Test Configuration

### 2.1. Port Configuration

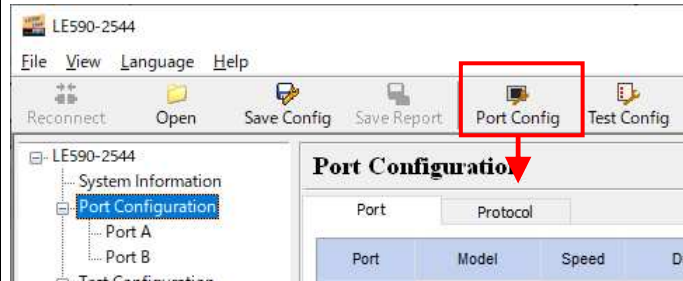
Settings such as port transmitting rate, auto-negotiation, and protocol are available and can be configured on the **Port Configuration** displayed on the **Main Display Screen**.

There are two ways to access **Port Config**:

**Accessing Port Config**



- Click **Port Config** located on **System Info/Configuration List**



- Click the **Port Config** button located on **Tool Bar**.

**Port Configuration**

Port    Protocol

Port	Model	Speed	Duplex	Auto Negotiate
Port A	LE-590TX	LinkDown	Full	Auto
Port B	LE-590TX	LinkDown	Full	Auto

Auto-Negotiation  
Media Waiting Time: 8    Media Timeout: 14    Apply    Default

**Port Configuration**

Port    Protocol

Port	MAC	VLAN	VID	CFI	Priority	IP Address	Default Gateway
Port A	0000000000001	Disable	0	Disable	0	192.168.1.1	192.168.1.254
Port B	0000000000002	Disable	0	Disable	0	192.168.1.2	192.168.1.254

Protocol  
 Layer 2     Layer 3 - IPv4    Default

The **Port Configuration** contains two different sets of settings: **Port** and **Protocol**. These two settings can be accessed by clicking the **Port** or **Protocol** menu tab.

- **Port:** Allows you to set each port's transmitting rate, flow control, and auto-negotiation.
- **Protocol:** Allows you to set each port's protocol (Layer 2 or Layer 3-IP), VLAN, and IP addresses.

## Port

### Port Configuration

Port	Model	Speed	Duplex	Auto Negotiate
Port A	LE-590TX	LinkDown	Full	Auto
Port B	LE-590TX	LinkDown	Full	Auto

Auto-Negotiation

Media Waiting Time :

Media Timeout :

- **Port No:** This field lists LE-590TX's Test Port (Port A/B).
- **Card Type:** This field lists the model name of the test device.
- **Speed:** The **Speed** scroll-down menu allows you to set each port's transmitting/receiving rate.
- **Duplex:** You can set the port as Full-Duplex or Half-Duplex with the scroll-down menu.
- **Flow Control:** When enabling this function, the transmitting rate will drop if traffic overflow occurs.
- **Auto Negotiate:** By clicking the scroll-down menu, you can set the transmitting mode to **Auto** (with auto-negotiation) or **Force** (without auto-negotiation).
- **Media Waiting Time:** The minimum waiting time (**in seconds**) for auto-negotiation.
- **Media Timeout:** If the time (**in seconds**) LE590-2544 spent for auto-negotiation exceeds the time you set here, the test will stop.

## Protocol

Port Configuration							
Port	MAC	VLAN	VID	CFI	Priority	IP Address	Default Gateway
Port A	00000000000001	Disable	0	Disable	0	192.168.1.1	192.168.1.254
Port B	00000000000002	Disable	0	Disable	0	192.168.1.2	192.168.1.254

Protocol:  Layer 2  Layer 3 - IPv4 Default

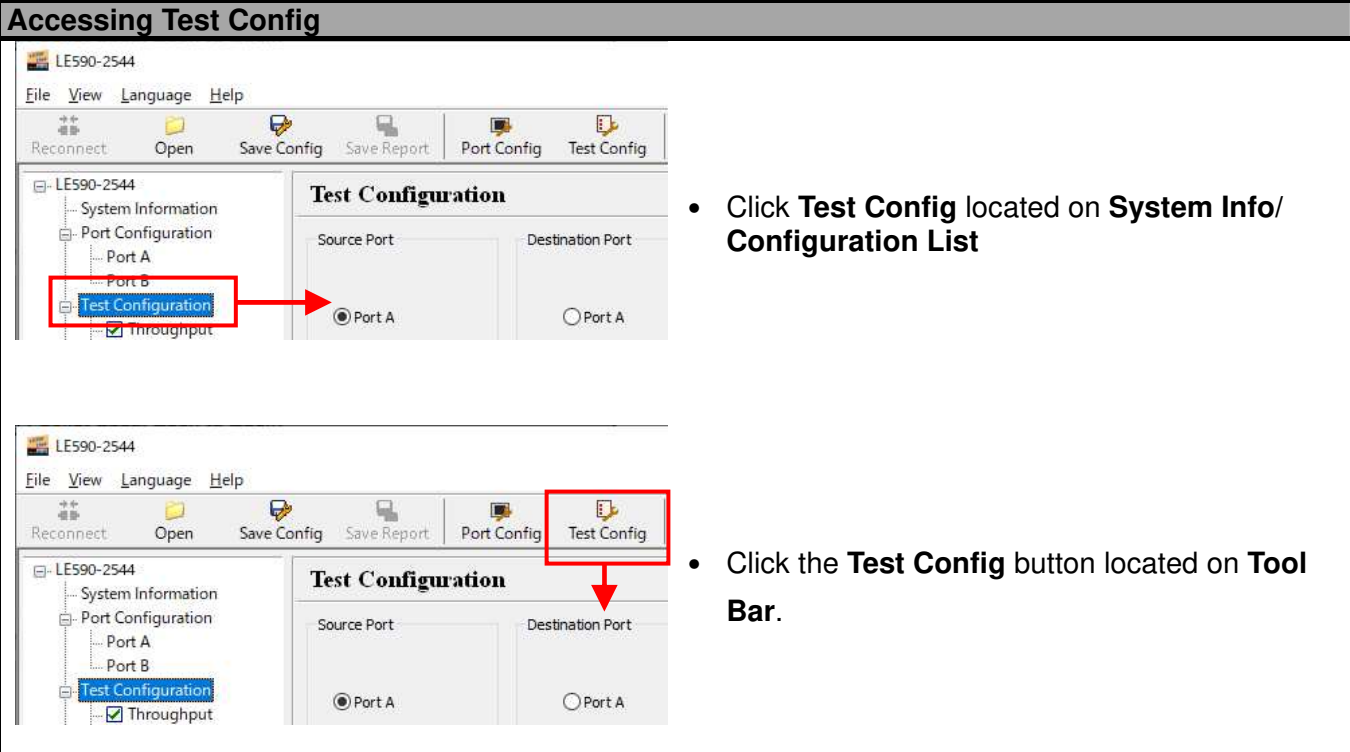
- **Port No.:** This field displays each port's Port ID.
- **Protocol:** The **Protocol** shows each port's protocol.
  - **Layer 2:** Packets will be transmitted and received via layer 2 MAC addresses.
  - **Layer 3-IP:** Packets will be transmitted and received via layer 3 IP addresses.
- **Port MAC:** These fields display the **Source/Destination MAC addresses**.
- **Enable VLAN:** Enable or Disable VLAN function.
- **VID:** You can set the VID in this field.
- **CFI:** Enable or Disable the CID in this field.
- **Priority:** Set the value of priority in this field.
- **Port IP:** You can modify the port IP in this field.
- **Gateway IP:** You can modify the gateway IP address in this field.
- **IP Mask:** You can modify the IP Mask in this field.
- **Min Waiting Time:** The minimum waiting time (**in seconds**) for auto-negotiation.
- **Media Timeout:** If the time (**in seconds**) LE590-2544 spent for auto-negotiation exceeds the time you set here, the test will stop.

## 2.2. Test Configuration

4 different test modes, including **Throughput**, **Latency**, **Packet Loss**, and **Back to Back**, can be configured on the **Test Configuration** displayed on the **Main Display Screen**.

There are two ways to access **Test Config**:

**Accessing Test Config**



- Click **Test Config** located on **System Info/Configuration List**
- Click the **Test Config** button located on **Tool Bar**.

**Test Configuration** Reset

Source Port:  Port A  Port B  
Destination Port:  Port A  Port B

LE-590TX Ethernet Frame Generator & Analyzer → DUT

Throughput | Latency | Packet Loss | Back to Back

Duration (Secs)	3	Frame Size(Bytes)	Starting from: 64	Delay Time after Learning	0.5 second(s)
Number of Trials	1		Step Size: 64		<input type="checkbox"/> Bi-Directional
Load Percentage(%)	50		Stopping at: 128		
Initial Rate	10		<input type="checkbox"/> Custom <span>Edit...</span>		
Min Rate	10		Learning Mode	Once	
Max Rate	100		Learning Retry	1	
Resolution	10				
Acceptable Loss	0				

The **Test Configuration** contains four different sets of settings: **Throughput**, **Latency**, **Packet Loss** and **Back to Back**, which can be accessed by clicking the test you would like to perform on **System Info/Configuration List** or the tab menu located on **Test Configuration** screen.

## Assigning Source Port and Destination Port for LE590-2544

Before making any test configurations on the **Test Configuration** screen, you have to assign the Source Port and Destination Port for LE590-2544 first on the upper part of the **Test Configuration** menu.





Please select whether you would like to use LE-590TX's Port A or Port B as the Source Port or Destination Port as shown in the figure down below.





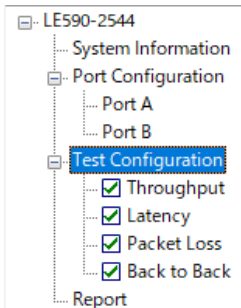
## 2.2.1. Test Configuration Overview

LE590-2544 supports four different tests including:

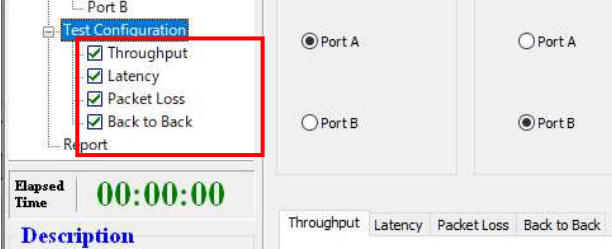
Diagram	Description
	<b>Throughput</b> test determines the DUT's maximum capable throughput rate without dropping any packets.
	<b>Latency</b> test measures the time it takes for the DUT to forward a packet.
	<b>Packet Loss</b> test measures the percentage of packets that are not forwarded due to the lack of resource.
	<b>Back to Back</b> test measures DUT's buffer capacity by sending bursts of traffic at the maximum frame rate and measuring the longest burst size without dropping any packets.

To start performing tests with LE590-2544, please check the check box  in front of the test you would like to perform first. Unchecked tests will not be performed, and you cannot access their reports as well during or after the tests.

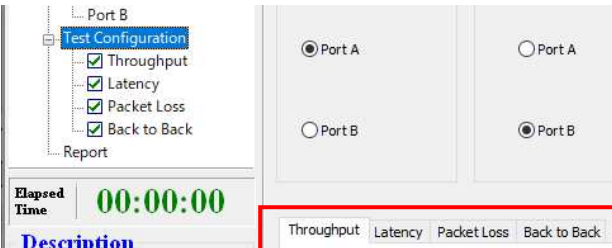
You can access setting options for the tests you would like to perform by:



### Accessing Test Setting Pages



- Click the test you would like to configure located on **System Info/Configuration List**



- Click the test you would like to configure located on the test tab menu.

For more detailed setting options regarding to **Throughput**, **Latency**, **Packet Loss** and **Back to Back**, please refer to the sections down below.

## 2.2.2. Throughput Test

**Throughput** test determines the DUT's maximum capable throughput rate without dropping any packets. The **Throughput** configuration page allows you to customize the test duration, packet length, packet transmission rate (%) for the desired testing environment.

<b>Duration (Secs)</b>	The duration of time (in seconds) for the test. The range for the testing time is <b>1~5000</b> .
<b>Number of Trials</b>	The number of times of the test. The range for the number of times of the test is <b>1~100</b> .
<b>Load Percentage (%)</b>	
<b>Start from</b>	The starting network traffic rate (%) of the test.
<b>Load Percentage Min.</b>	The minimum acceptable network traffic rate (%) of the test.
<b>Stopping at</b>	The maximum acceptable network traffic rate (%) of the test.
<b>Resolution</b>	The test will stop when the difference between the current network traffic rate and the last network traffic rate is smaller than the value you set here.
<b>Acceptable Loss</b>	The acceptable rate of packet loss during the test.

<b>Frame Size (bytes)</b>	
<b>Starting from</b>	The starting/ending size of the transmitted packet. The range of the <b>Starting from/at</b> field is <b>64~2032</b> .
<b>Frame Size Step</b>	The frame size will increase in arithmetic progression fashion, while the value you set here will serve as its difference. The range of the <b>Frame Size Step</b> is <b>64~2032</b> .
<b>Stopping at</b>	The maximum network frame size (Bytes) of the test.

<p style="text-align: center;"><b>Custom</b></p>	<p>You can customize the size of each transmitted packet manually by enabling <b>Custom</b> function and clicking the <b>Edit</b> button. A <b>Packet Size Customization -Throughput</b> window will pop up. You can customize the <b>Initial Rate</b>, <b>Min/Max Rate</b>, <b>Resolution</b>, and <b>Acceptable Loss</b> here as well.</p> <div style="border: 1px solid gray; padding: 5px;"> <p style="text-align: right; margin: 0;">X</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 15%;">Frame Size (Bytes)</th> <th style="width: 10%;">Initial Rate(%)</th> <th style="width: 10%;">Min. Rate(%)</th> <th style="width: 10%;">Max. Rate(%)</th> <th style="width: 10%;">Resolution (%)</th> <th style="width: 10%;">Acceptable Loss(packets)</th> </tr> </thead> <tbody> <tr> <td>All</td> <td></td> <td>50.00</td> <td>1.00</td> <td>100.00</td> <td>10.00</td> <td>0</td> </tr> <tr> <td>1</td> <td>64</td> <td>50.00</td> <td>1.00</td> <td>100.00</td> <td>10.00</td> <td>0</td> </tr> <tr> <td>2</td> <td>128</td> <td>50.00</td> <td>1.00</td> <td>100.00</td> <td>10.00</td> <td>0</td> </tr> <tr> <td>3</td> <td>256</td> <td>50.00</td> <td>1.00</td> <td>100.00</td> <td>10.00</td> <td>0</td> </tr> <tr> <td>4</td> <td>512</td> <td>50.00</td> <td>1.00</td> <td>100.00</td> <td>10.00</td> <td>0</td> </tr> <tr> <td>5</td> <td>1024</td> <td>50.00</td> <td>1.00</td> <td>100.00</td> <td>10.00</td> <td>0</td> </tr> <tr> <td>6</td> <td>1280</td> <td>50.00</td> <td>1.00</td> <td>100.00</td> <td>10.00</td> <td>0</td> </tr> <tr> <td>7</td> <td>1518</td> <td>50.00</td> <td>1.00</td> <td>100.00</td> <td>10.00</td> <td>0</td> </tr> </tbody> </table> <p style="margin-top: 10px;">Number of different packet size : <input style="width: 50px;" type="text" value="7"/> <span style="margin-left: 20px;">OK</span> <span style="margin-left: 20px;">Cancel</span> <span style="margin-left: 20px;">Default</span></p> </div> <p>You can double-click the field you would like to customize and input the value manually.</p> <ul style="list-style-type: none"> <li><b>Number of Different Packet Size:</b> You can set how many different frame sizes you would like to apply to the test here in this field.</li> <li><b>OK/Cancel:</b> Apply/cancel the changes you've made.</li> <li><b>Default:</b> Set all the values to default value.</li> </ul>		Frame Size (Bytes)	Initial Rate(%)	Min. Rate(%)	Max. Rate(%)	Resolution (%)	Acceptable Loss(packets)	All		50.00	1.00	100.00	10.00	0	1	64	50.00	1.00	100.00	10.00	0	2	128	50.00	1.00	100.00	10.00	0	3	256	50.00	1.00	100.00	10.00	0	4	512	50.00	1.00	100.00	10.00	0	5	1024	50.00	1.00	100.00	10.00	0	6	1280	50.00	1.00	100.00	10.00	0	7	1518	50.00	1.00	100.00	10.00	0
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## 2.2.3. Latency Test

**Latency** test measures the time it takes for the DUT to forward a packet. The load generated by LE-590TX can be customized with different packet lengths and for specified period of times.

Load Percentage (%)	
<b>Duration (Secs)</b>	The duration of time (in seconds) for the test. The range for the testing time is <b>1~5000</b> .
<b>Number of Trials</b>	The number of times of the test. The range for the number of times of the test is <b>1~100</b> .
<b>Starting from</b>	The starting network traffic rate (%) of the test.
<b>Load Percentage Step</b>	The minimum acceptable network traffic rate (%) of the test.
<b>Stopping at</b>	The maximum acceptable network traffic rate (%) of the test.
<b>Resolution</b>	The test will stop when the difference between the current network traffic rate and the last network traffic rate is smaller than the value you set here.
<b>Acceptable Loss</b>	The acceptable rate of packet loss during the test.

Frame Size (bytes)	
<b>Starting from</b>	The starting/ending size of the transmitted packet. The range of the <b>Starting from/at</b> field is <b>64~2032</b> .
<b>Frame Size Step</b>	The frame size will increase in arithmetic progression fashion, while the value you set here will serve as its difference. The range of the <b>Frame Size Step</b> is <b>64~2032</b> .
<b>Stopping at</b>	The maximum network frame size (Bytes) of the test.

<p><b>Custom</b></p>	<p>You can customize the size of each transmitted packet manually by enabling <b>Custom</b> function and clicking the <b>Edit</b> button. A <b>Packet Size Customization - Latency</b> window will pop up. You can customize the <b>Initial Rate</b>, <b>Step Rate</b>, and <b>Max. Rate</b> here as well.</p> <div style="border: 1px solid gray; padding: 5px;"> <p style="text-align: right; margin: 0;">✕</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 20%;">Frame Size (Bytes)</th> <th style="width: 5%;"></th> <th style="width: 15%;">Initial Rate(%)</th> <th style="width: 15%;">Step Rate(%)</th> <th style="width: 15%;">Max. Rate(%)</th> </tr> </thead> <tbody> <tr> <td>All</td> <td></td> <td></td> <td>50.00</td> <td>10.00</td> <td>100.00</td> </tr> <tr> <td>1</td> <td>64</td> <td>▼</td> <td>50.00</td> <td>10.00</td> <td>100.00</td> </tr> <tr> <td>2</td> <td>128</td> <td>▼</td> <td>50.00</td> <td>10.00</td> <td>100.00</td> </tr> <tr> <td>3</td> <td>256</td> <td>▼</td> <td>50.00</td> <td>10.00</td> <td>100.00</td> </tr> <tr> <td>4</td> <td>512</td> <td>▼</td> <td>50.00</td> <td>10.00</td> <td>100.00</td> </tr> <tr> <td>5</td> <td>1024</td> <td>▼</td> <td>50.00</td> <td>10.00</td> <td>100.00</td> </tr> <tr> <td>6</td> <td>1280</td> <td>▼</td> <td>50.00</td> <td>10.00</td> <td>100.00</td> </tr> <tr> <td>7</td> <td>1518</td> <td>▼</td> <td>50.00</td> <td>10.00</td> <td>100.00</td> </tr> </tbody> </table> <p style="margin-top: 10px;">Number of different packet size : <input style="width: 50px;" type="text" value="7"/> <span style="float: right;"> <input type="button" value="OK"/> <input type="button" value="Cancel"/> <input type="button" value="Default"/> </span></p> </div> <p>You can double-click the field you would like to customize and input the value manually.</p> <ul style="list-style-type: none"> <li><b>Number of Different Packet Size:</b> You can set how many different frame sizes you would like to apply to the test here in this field.</li> <li><b>OK/Cancel:</b> Apply/cancel the changes you've made.</li> <li><b>Default:</b> Set all the values to default value.</li> </ul>		Frame Size (Bytes)		Initial Rate(%)	Step Rate(%)	Max. Rate(%)	All			50.00	10.00	100.00	1	64	▼	50.00	10.00	100.00	2	128	▼	50.00	10.00	100.00	3	256	▼	50.00	10.00	100.00	4	512	▼	50.00	10.00	100.00	5	1024	▼	50.00	10.00	100.00	6	1280	▼	50.00	10.00	100.00	7	1518	▼	50.00	10.00	100.00
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## 2.2.4. Packet Loss Test

**Packet Loss** test measures the percentage of packets that are not forwarded (therefore, lost) due to the lack of resource. The loading and the testing time can be customized to simulate real-world scenario; thus, giving the user a clear view of DUT's performance limits under different loading environments.

<b>Duration (Secs)</b>	The duration of time (in seconds) for the test. The range for the testing time is <b>1~5000</b> .
<b>Number of Trials</b>	The number of times of the test. The range for the number of times of the test is <b>1~100</b> .
<b>Load Percentage (%)</b>	
<b>Start from</b>	The starting network traffic rate (%) of the test.
<b>Load Percentage Min.</b>	The minimum acceptable network traffic rate (%) of the test.
<b>Stopping at</b>	The maximum acceptable network traffic rate (%) of the test.
<b>Resolution</b>	The test will stop when the difference between the current network traffic rate and the last network traffic rate is smaller than the value you set here.
<b>Acceptable Loss</b>	The acceptable rate of packet loss during the test.

<b>Frame Size (bytes)</b>	
<b>Starting from/at</b>	The starting/ending size of the transmitted packet. The range of the <b>Starting from/at</b> field is <b>64~2032</b> .
<b>Frame Size Step</b>	The frame size will increase in arithmetic progression fashion, while the value you set here will serve as its difference. The range of the <b>Frame Size Step</b> is <b>64~2032</b> .
<b>Stopping at</b>	The maximum network frame size (Bytes) of the test.

<p style="text-align: center;"><b>Custom</b></p>	<p>You can customize the size of each transmitted packet manually by enabling <b>Custom</b> function and clicking the <b>Edit</b> button. A <b>Packet Size Customization – Packet Loss</b> window will pop up. You can customize the <b>Initial Rate</b>, <b>Step Rate</b>, and <b>Max. Rate</b> here as well.</p> <div style="border: 1px solid gray; padding: 5px;"> <p style="text-align: right; margin: 0;">✕</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 20%;">Frame Size (Bytes)</th> <th style="width: 15%;">Initial Rate(%)</th> <th style="width: 15%;">Step Rate(%)</th> <th style="width: 15%;">Max. Rate(%)</th> </tr> </thead> <tbody> <tr> <td>All</td> <td></td> <td>50.00</td> <td>10.00</td> <td>100.00</td> </tr> <tr> <td>1</td> <td>64</td> <td>50.00</td> <td>10.00</td> <td>100.00</td> </tr> <tr> <td>2</td> <td>128</td> <td>50.00</td> <td>10.00</td> <td>100.00</td> </tr> <tr> <td>3</td> <td>256</td> <td>50.00</td> <td>10.00</td> <td>100.00</td> </tr> <tr> <td>4</td> <td>512</td> <td>50.00</td> <td>10.00</td> <td>100.00</td> </tr> <tr> <td>5</td> <td>1024</td> <td>50.00</td> <td>10.00</td> <td>100.00</td> </tr> <tr> <td>6</td> <td>1280</td> <td>50.00</td> <td>10.00</td> <td>100.00</td> </tr> <tr> <td>7</td> <td>1518</td> <td>50.00</td> <td>10.00</td> <td>100.00</td> </tr> </tbody> </table> <p style="margin-top: 10px;">Number of different packet size : <input style="width: 50px;" type="text" value="7"/> <span style="margin-left: 20px;">OK</span> <span style="margin-left: 20px;">Cancel</span> <span style="margin-left: 20px;">Default</span></p> </div> <p>You can double-click the field you would like to customize and input the value manually.</p> <ul style="list-style-type: none"> <li><b>Number of Different Packet Size:</b> You can set how many different frame sizes you would like to apply to the test here in this field.</li> <li><b>OK/Cancel:</b> Apply/cancel the changes you've made.</li> <li><b>Default:</b> Set all the values to default value.</li> </ul>		Frame Size (Bytes)	Initial Rate(%)	Step Rate(%)	Max. Rate(%)	All		50.00	10.00	100.00	1	64	50.00	10.00	100.00	2	128	50.00	10.00	100.00	3	256	50.00	10.00	100.00	4	512	50.00	10.00	100.00	5	1024	50.00	10.00	100.00	6	1280	50.00	10.00	100.00	7	1518	50.00	10.00	100.00
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## 2.2.5. Back to Back Test

**Back to Back** test measures DUT's buffer capacity by sending bursts of traffic at the maximum frame rate and measuring the longest burst size without dropping any packets.

<b>Duration (Secs)</b>	The duration of time (in seconds) for the test. The range for the testing time is <b>1~5000</b> .
<b>Number of Trials</b>	The number of times of the test. The range for the number of times of the test is <b>1~100</b> .
<b>Load Percentage (%)</b>	
<b>Starting from</b>	The starting network traffic rate (%) of the test.
<b>Load Percentage Step</b>	The minimum acceptable network traffic rate (%) of the test.
<b>Stopping at</b>	The maximum acceptable network traffic rate (%) of the test.
<b>Resolution</b>	The test will stop when the difference between the current network traffic rate and the last network traffic rate is smaller than the value you set here.
<b>Acceptable Loss</b>	The acceptable rate of packet loss during the test.

<b>Frame Size (bytes)</b>	
<b>Starting from</b>	The starting/ending size of the transmitted packet. The range of the <b>Starting from/at</b> field is <b>64~2032</b> .
<b>Frame Size Step</b>	The frame size will increase in arithmetic progression fashion, while the value you set here will serve as its difference. The range of the <b>Frame Size Step</b> is <b>64~2032</b> .
<b>Stopping at</b>	The maximum network frame size (Bytes) of the test.

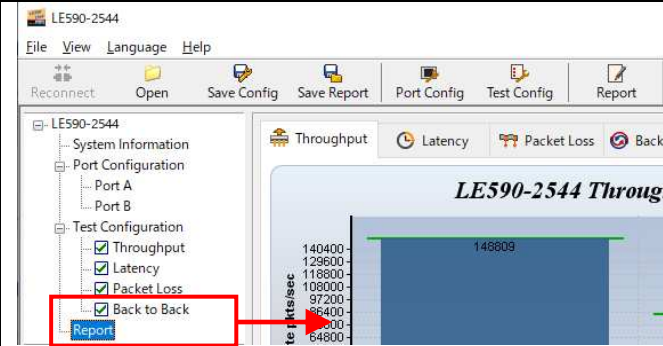


<p><b>Custom</b></p>	<p>You can customize the size of each transmitted packet manually by enabling <b>Custom</b> function and clicking the <b>Edit</b> button. A <b>Packet Size Customization – Back to Back</b> window will pop up. You can customize the <b>Initial Rate</b>, <b>Step Rate</b>, and <b>Max. Rate</b> here as well.</p> <div style="border: 1px solid gray; padding: 5px;"> <p style="text-align: center; margin: 0;">Packet Size Customization - Back to Back <span style="float: right;">✕</span></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 15%;">Frame Size (Bytes)</th> <th style="width: 10%;"></th> <th style="width: 15%;">Initial Rate(%)</th> <th style="width: 15%;">Step Rate(%)</th> <th style="width: 15%;">Max. Rate(%)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">All</td> <td></td> <td></td> <td style="text-align: center;">50.00</td> <td style="text-align: center;">10.00</td> <td style="text-align: center;">100.00</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">64</td> <td style="text-align: center;">▼</td> <td style="text-align: center;">50.00</td> <td style="text-align: center;">10.00</td> <td style="text-align: center;">100.00</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">128</td> <td style="text-align: center;">▼</td> <td style="text-align: center;">50.00</td> <td style="text-align: center;">10.00</td> <td style="text-align: center;">100.00</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">256</td> <td style="text-align: center;">▼</td> <td style="text-align: center;">50.00</td> <td style="text-align: center;">10.00</td> <td style="text-align: center;">100.00</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">512</td> <td style="text-align: center;">▼</td> <td style="text-align: center;">50.00</td> <td style="text-align: center;">10.00</td> <td style="text-align: center;">100.00</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">1024</td> <td style="text-align: center;">▼</td> <td style="text-align: center;">50.00</td> <td style="text-align: center;">10.00</td> <td style="text-align: center;">100.00</td> </tr> <tr> <td style="text-align: center;">6</td> <td style="text-align: center;">1280</td> <td style="text-align: center;">▼</td> <td style="text-align: center;">50.00</td> <td style="text-align: center;">10.00</td> <td style="text-align: center;">100.00</td> </tr> <tr> <td style="text-align: center;">7</td> <td style="text-align: center;">1518</td> <td style="text-align: center;">▼</td> <td style="text-align: center;">50.00</td> <td style="text-align: center;">10.00</td> <td style="text-align: center;">100.00</td> </tr> </tbody> </table> <p style="margin-top: 10px;">Number of different packet size : <input style="width: 50px;" type="text" value="7"/> <span style="margin-left: 10px;">↕</span> <span style="margin-left: 20px;">OK</span> <span style="margin-left: 20px;">Cancel</span> <span style="margin-left: 20px;">Default</span></p> </div> <p>You can double-click the field you would like to customize and input the value manually.</p> <ul style="list-style-type: none"> <li><b>Number of Different Packet Size:</b> You can set how many different frame sizes you would like to apply to the test here in this field.</li> <li><b>OK/Cancel:</b> Apply/cancel the changes you've made.</li> <li><b>Default:</b> Set all the values to default value.</li> </ul>		Frame Size (Bytes)		Initial Rate(%)	Step Rate(%)	Max. Rate(%)	All			50.00	10.00	100.00	1	64	▼	50.00	10.00	100.00	2	128	▼	50.00	10.00	100.00	3	256	▼	50.00	10.00	100.00	4	512	▼	50.00	10.00	100.00	5	1024	▼	50.00	10.00	100.00	6	1280	▼	50.00	10.00	100.00	7	1518	▼	50.00	10.00	100.00
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7	1518	▼	50.00	10.00	100.00																																																		
<p><b>Learning Mode</b></p>	<p>This function allows the DUT to create an address table according to the source address in the received frame.</p> <ul style="list-style-type: none"> <li><b>Never:</b> DUT will <b>never</b> create an address table, and <b>Learning Mode</b> is disabled.</li> <li><b>Once:</b> DUT will create an address table only <b>once</b>.</li> <li><b>Every Trial:</b> DUT will create an address table <b>in every trial</b>.</li> </ul>																																																						
<p><b>Learning Retry</b></p>	<p>The value set here will be the number of learning packets that will be sent through the ports chosen to be learned for building address table.</p>																																																						
<p><b>Bi-Direction</b></p>	<p>Enabling this function allows two-way direction transmitting during the test.</p>																																																						

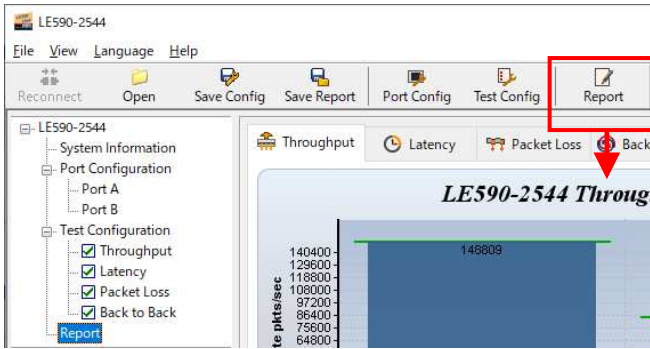
## 2.3. Report

Test results, statistics and charts are displayed and can be checked on the **Main Display Screen**. There are two ways to view **Report**:

### Accessing Report

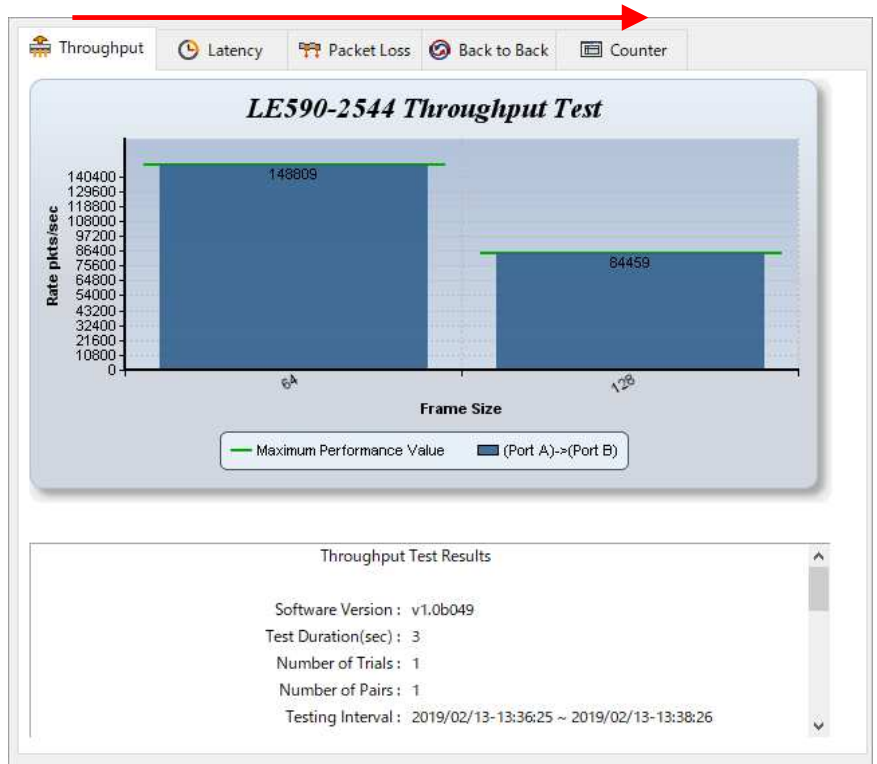


- Click **Report** located on **System Info/ Configuration List**.

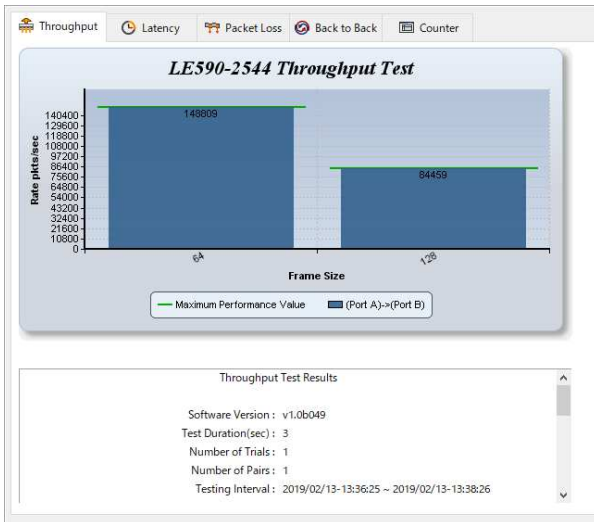


- Click the **Report** button located on **Quick Launch Buttons**.

During the tests, charts for the results of each test (**Throughput**, **Latency**, **Packet Loss** or **Back to Back**) will be displayed on the **Main Display Screen**. LE590-2544 will switch charts of each test automatically when finishing the current test and starting the next test as shown in the figures. Please note that you can only access charts of the tests you've performed.

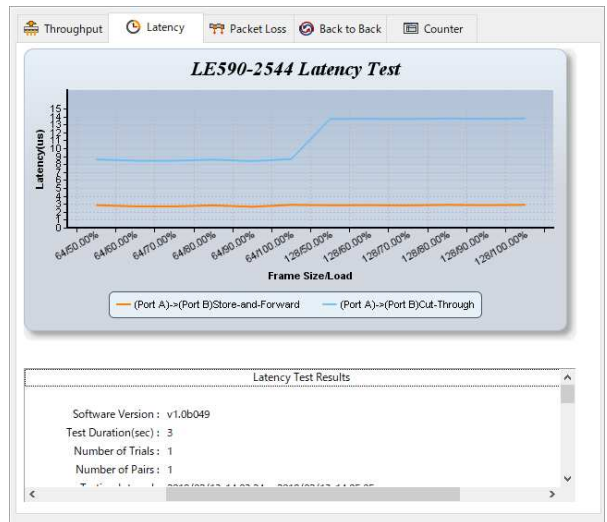


## Throughput Test Result Chart



This chart uses **Frame Count per Second** as X-Axis, and **Frame Size** as Y-Axis to show DUT's throughput performance.

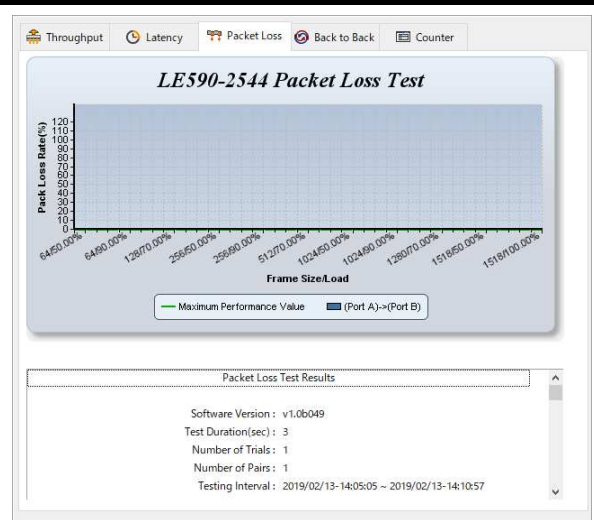
## Latency Test Result Chart



This chart uses **Latency in Microseconds ( $\mu$ s)** as X-Axis, and **Frame Size/Load** as Y-Axis.

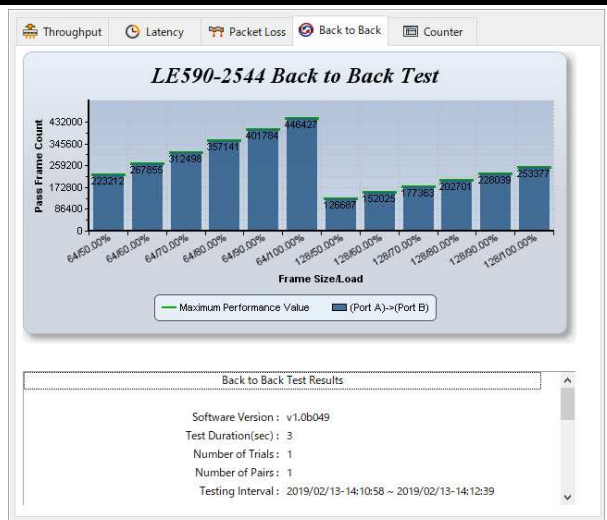
- **Store and Forward:** Represents packets that were stored inside DUT's buffer before transmitted.
- **Cut Through:** Represents packets that were transmitted right away.

## Packet Loss Test Result Chart

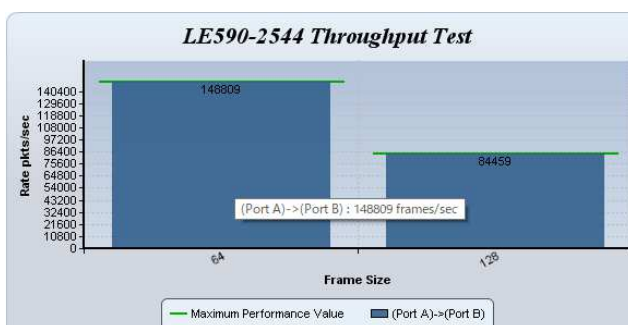


This chart uses **Packet Loss Rate (%)** as X-Axis, and **Frame Size/Load** as Y-Axis to show DUT's packet loss ratio.

## Back to Back Test Result Chart



This chart uses **Pass Frame Count** as X-Axis, and **Frame Size/Load** as Y-Axis to show DUT's back to back test result.



To view detail statistics on the chart, please move the mouse cursor to the part you would like to know more, as shown in the figure on the left.

Also, you can view test results counter by clicking the **Counter** tab menu. All statistics will be displayed in this table in great detail for test result analysis.

Port	Pkt Size	FrameGap	Percent(%)	Rate(pps)	Tx Packets	Rx Packets
Benchmark : Throughput Trial:1 Repetition : 1 Duration : 3 sec.						
Port A	64	768	50.000	74404	223213	0
Port B	n/a	n/a	n/a	n/a	0	223213
Unconformity : 0						
Benchmark : Throughput Trial:1 Repetition : 2 Duration : 3 sec.						
Port A	64	320	75.000	111606	334820	0
Port B	n/a	n/a	n/a	n/a	0	334820
Unconformity : 0						
Benchmark : Throughput Trial:1 Repetition : 3 Duration : 3 sec.						
Port A	64	192	87.500	130207	390623	0
Port B	n/a	n/a	n/a	n/a	0	390623
Unconformity : 0						
Benchmark : Throughput Trial:1 Repetition : 4 Duration : 3 sec.						
Port A	64	136	93.750	139508	418525	0
Port B	n/a	n/a	n/a	n/a	0	418525
Unconformity : 0						
Benchmark : Throughput Trial:1 Repetition : 5 Duration : 3 sec.						
Port A	64	96	100.000	148809	446427	0
Port B	n/a	n/a	n/a	n/a	0	446427
Unconformity : 0						
Benchmark : Throughput Trial:1 Repetition : 1 Duration : 3 sec.						
Port A	128	1280	50.000	42229	126688	0
Port B	n/a	n/a	n/a	n/a	0	126688
Unconformity : 0						
Benchmark : Throughput Trial:1 Repetition : 2 Duration : 3 sec.						
Port A	128	488	75.000	63344	190032	0
Port B	n/a	n/a	n/a	n/a	0	190032

You can save the test results by:

### Saving Test Results

- Click the **Save** button located on **Tool Bar**.

Test results and related statistic are available and can be viewed with the “\*.xls” file you saved this way. You need Microsoft Excel® to view “\*.xls” file.

4F., Marufuku Bldg., 39-1, Karahasi, Nishihiragaki-cho, Minami-ku, Kyoto, 601-8468, Japan  
TEL: 075-693-0161 FAX: 075-693-0163  
URL: <https://www.lineeye.com>  
Email: [info@lineeye.co.jp](mailto:info@lineeye.co.jp)

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