NuApps-2889-RM
User's Manual

USM Ver 1.1

Foreword

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Revision History

Date	Version	History
2012/07/02	1.0	First draft version
2012/09/10	1.1	1. Deleting the description of NuApps-2889-RM supports operation system Windows 2000.(Page 5)

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1. NuApps-2889-RM Overview

Designed for Xtramus Technologies XM-RM series module cards, NuApps-2889-RM is an application that's designed base on RFC 2889 for analyzing Ethernet switches, bridges, and routers. NuApps-2889-RM's multiple topologies and the load-generating capabilities provide an effective way to evaluate DUTs on subjects such as Error Filtering, Forwarding, Broadcast Forwarding, Broadcast Latency, Forward Pressure, Address Learning, Address Caching, and Congestion Control. With its real-time display of test results and various customizable report formats that allow users to view the test data and organize them into an appropriate form for debug, report, and record, NuApps-2889-RM is the best solution for RFC 2889 Benchmarking Methodology.

NuApps-2889-RM must be activated with NuStreams Chassis. NuApps-2889-RM is designed for Xtramus Technologies XM-RM series module cards. The table down below contains the XM-RM module cards, FPGA/Firmware versions that are supported by NuApps-2889-RM.

Module Cards Support NuApps-2889-RM		
Module Card	**FPGA Version**	**Firmware Version**
XM-RM661/671/681	V3.1b007	v1.6b053
XM-RM751/761/781	V3.1b007	V1.6b056
XM-RM731	V2.1b007	V1.6b040
XM-RM881	v1.4b000	V0.9b026
XM-RM881-2	v1.4b000	V0.9b026
XM-RM891	v1.4b000	V1.6b056

*** Note: NuStreams-2000i and NuStreams-600i are required as well.**

Also, please make sure that your PC meets the requirements listed in the table down below before installing NuApps-2889-RM.

OS	**Windows XP**	**Windows Vista/7**
RAM	512MB RAM	1GB RAM
CPU	Pentium 1.6Ghz or higher	
HDD	10 GB Available Space	

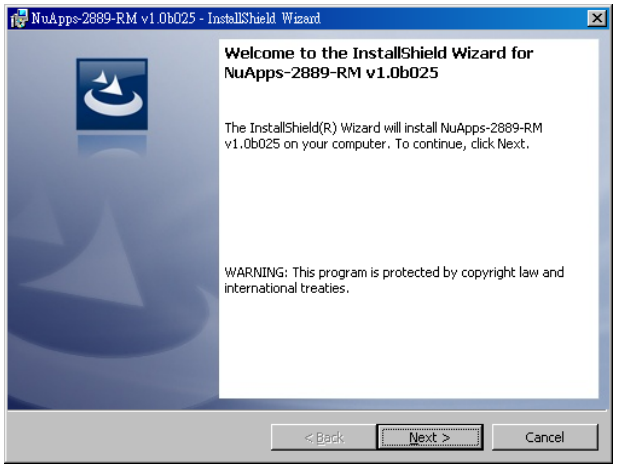
*** Note: Large amount of data will be generated while running NuApps-2889-RM. It is recommended to preserve enough available Hard-Disk space to store these data.**

2. Installing and Uninstalling NuApps-2889-RM

Please follow the steps down below to install NuApps-2889-RM.

Installing NuApps-2889-RM

1. Double-click NuApps-2889-RM installation program and start the installation process.*

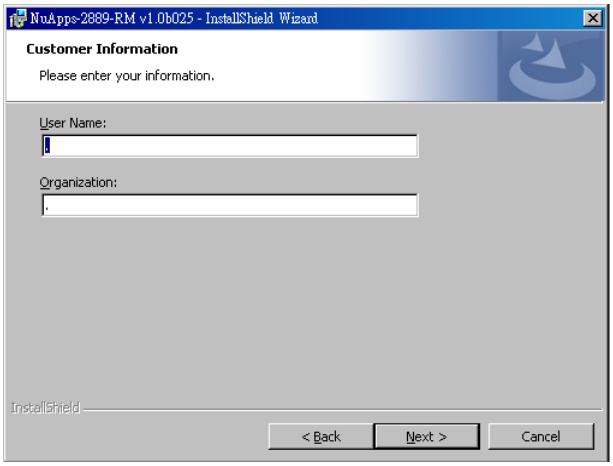


2. InstallShield Wizard is starting to install NuApps-2889-RM. If you would like to cancel installation, click **Cancel**, or click **Next** to continue installation.

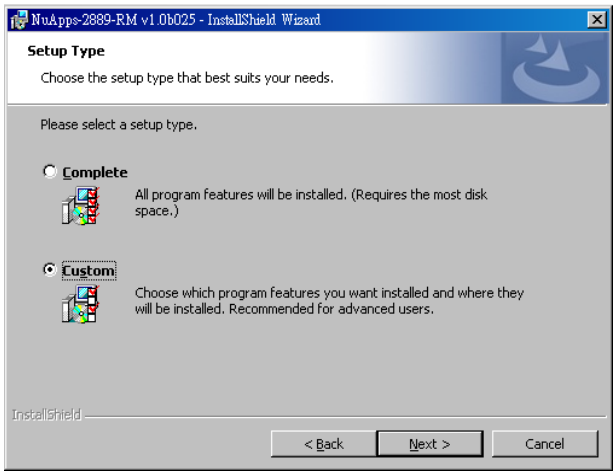
3. After reading the **End User License Agreement**, please select **I accept the terms in the license agreement**, and **Next** to proceed with the installation, or click **Cancel** to cancel installation. You may also click **Back** to return to the previous installation window.

***Note: Due to different Operating Systems or system settings, warning messages might pop up when installing NuApps-2889-RM. When this occurs, please choose the options on these pop-up warning messages that allow you to continue installing NuApps-2889-RM.**

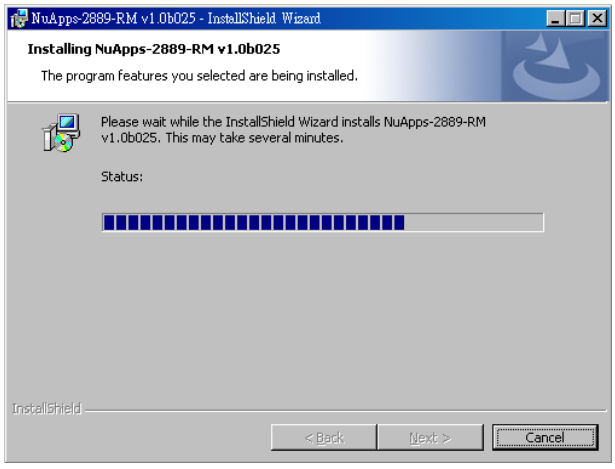
Installing NuApps-2889-RM



4. You can change the User/Organization name here, the default name for User/Organization name is ".". Click the **Next** button to continue with the next step. Click **Back** button to go back to the previous step to modify. And click Cancel to exit this installation wizard.

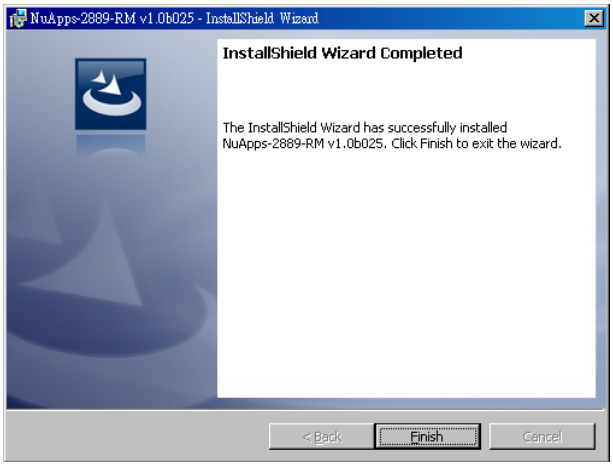


5. You can select the **Complete** option to install all program feature for running DApps-2889, or select **Custom** option to choose the program feature to be installed.

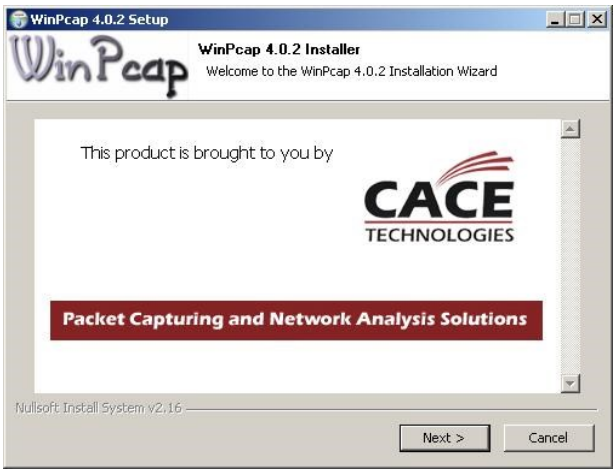


6. InstallShield Wizard is installing NuApps-2889-RM.

Installing NuApps-2889-RM



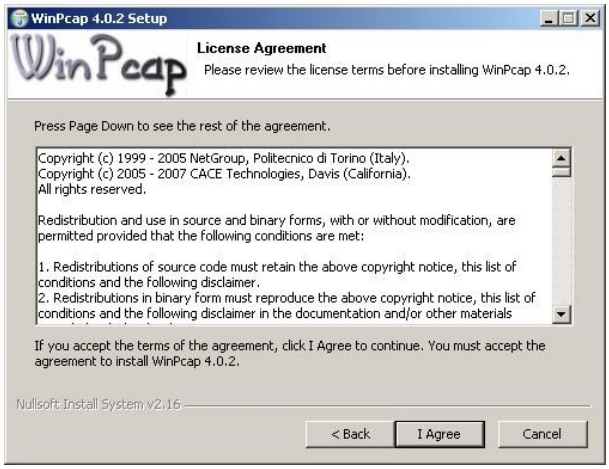
7. NuApps-2889-RM installation completes. Click **Finish** button to exit.



8. If your PC does not have **WinPcap** installed, a **WinPcap Installer** window will pop up. Click **Next** button to get ready to install, or click **Cancel** button to stop. For more detail information regarding to **WinPcap**, please visit their webpage at: www.winpcap.org.

9. WinPcap is preparing to install, or click **Cancel** button to stop at any time.

Installing NuApps-2889-RM

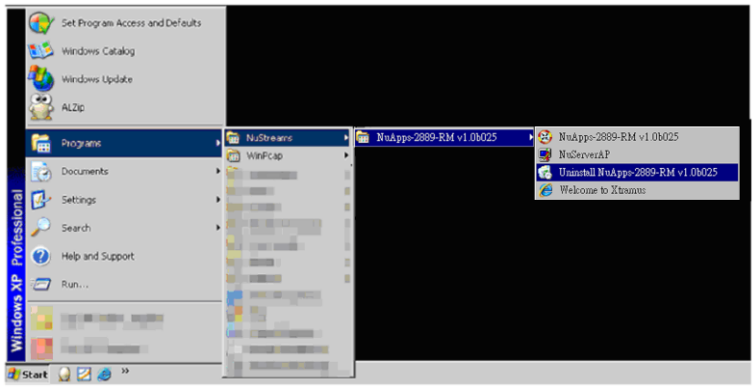
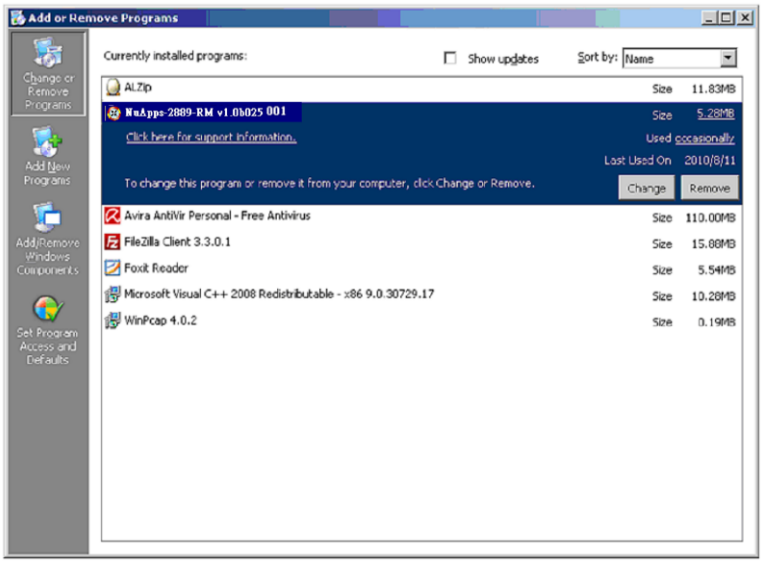


10. Review the license agreement before installing. Click **I Agree** button to continue. It is necessary to accept the agreement to install WinPcap.

11. WinPcap is installing.

12. WinPcap installation completes. Click **Finish** button to close the wizard.

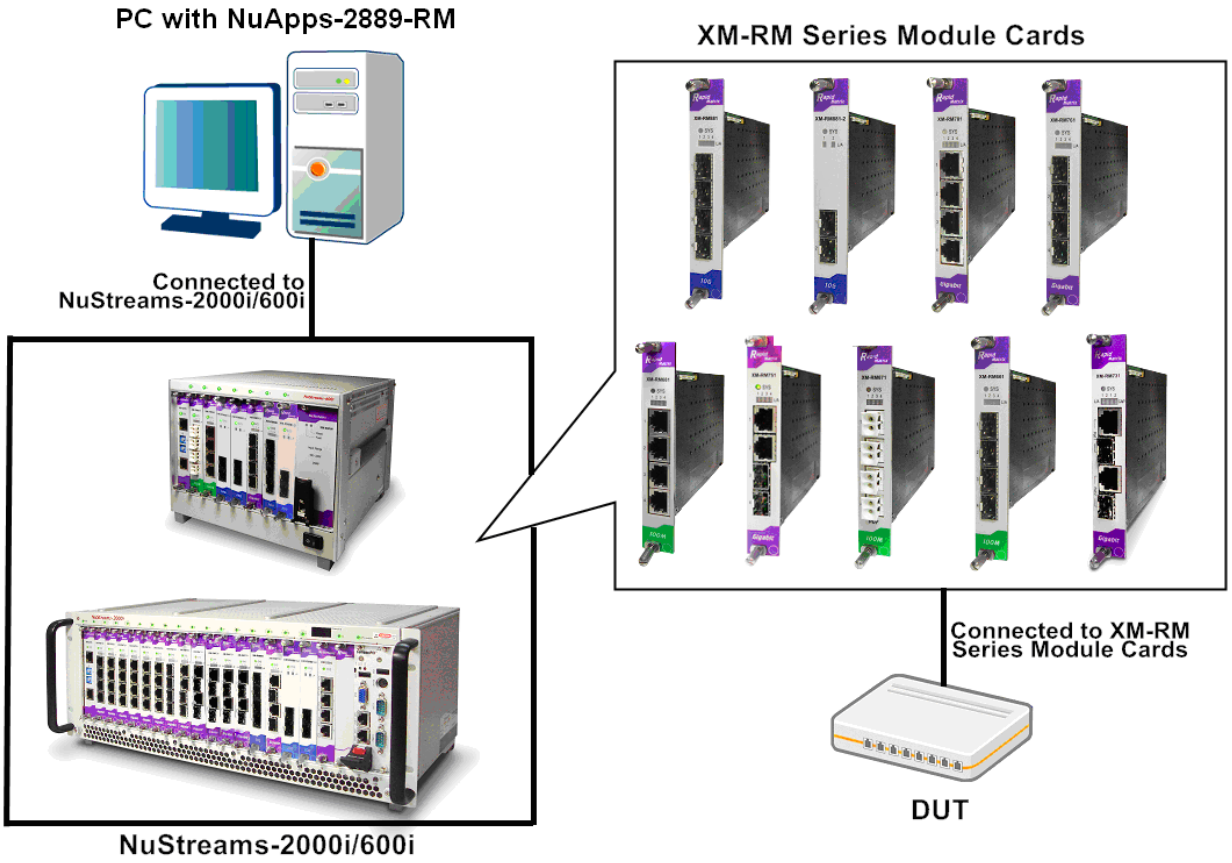
You can uninstall NuApps-2889-RM by:

Uninstalling NuApps-2889-RM	
	➢ Click **Start → Programs → NuStreams → NuApps-2889-RM → Unisntall NuApps-2889-RM**
	➢ Go to the **Control Panel**, choose **NuApps-2889-RM** from installed program list, and click **Remove** to uninstall.

3. NuApps-2889-RM Function Overview

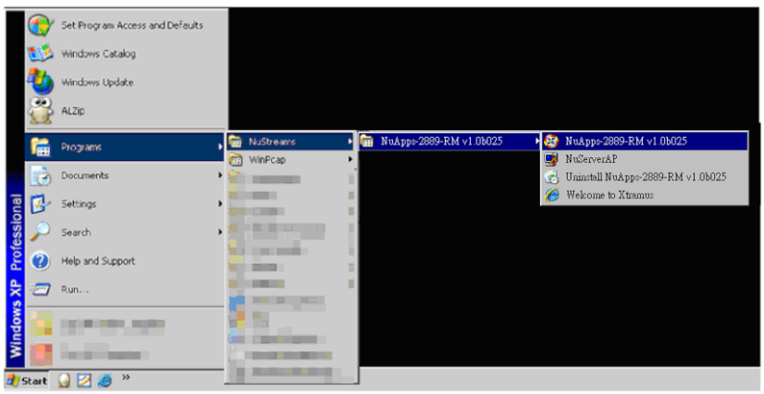
3.1. Starting NuApps-2889-RM

Before starting NuApps-2889-RM, the DUT, your PC, and NuStreams-2000i/600i shall be connected properly as shown in the figure down below:



There are two ways to starts NuApps-2889-RM:

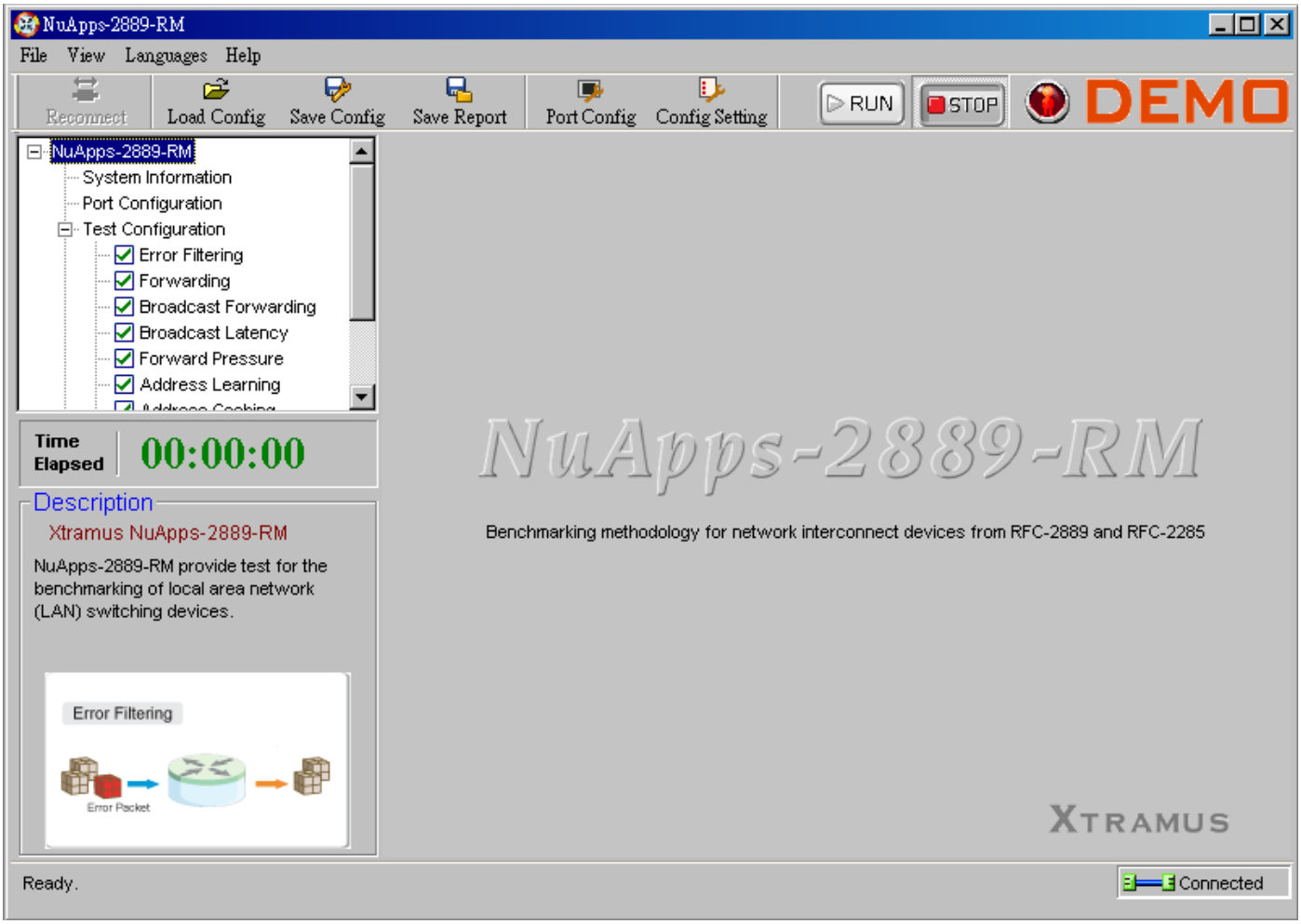
Starting NuApps-2889-RM



- Click **Start** → **Programs** → **NuStreams** → **NuApps-2889-RM**

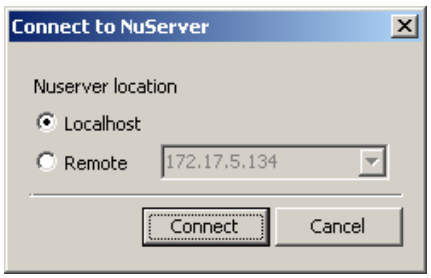
- Double-click NuApps-2889-RM icon located on your PC's desktop.

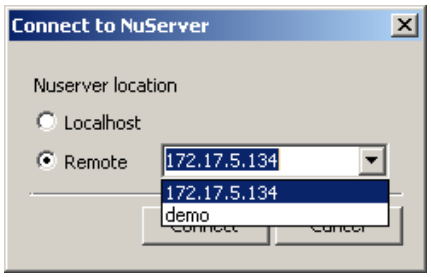
If your PC is not connected with NuStreams-2000i/600i, you can still run NuApps-2889-RM under **Demo Mode**. Almost all NuApps-2889-RM's functions are available under Demo Mode. However, please note that **Demo Mode is for system demo purposes only**, and does not serve any testing at all.



Please follow the steps down below to starts NuApps-2889-RM and NuServer properly.

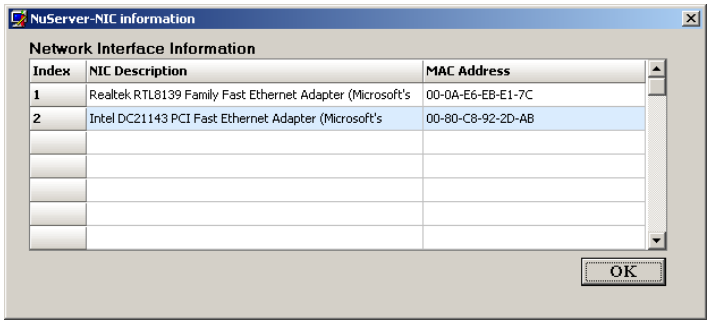
Starting NuServer / NuApps-2889-RM



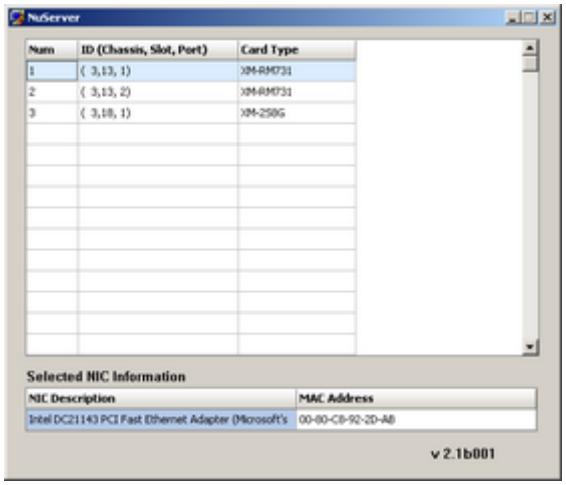


When starting NuApps-2889-RM, a "**Connect to NuServer**" window will pop up and asked how you are going to connect to NuServer.

- **Local Host:** Choose this option when you're running NuApps-2889-RM from NuStreams-2000i IPC module or a PC that's connected to NuStreams-2000i/600i via an RJ45 cable.
- **Remote:** Choose this option when you're running NuApps-2889-RM from other PC located on the network. Choose the IP address which is assigned from NuStreams-2000i/600i from the scroll-down menu, or choose **demo** to enter NuApps-2889-RM's Demo Mode.
- **Connect/Cancel:** Click the Connect/Cancel button to connect to NuStreams-2000i/600i or cancel starting NuApps-2889-RM.

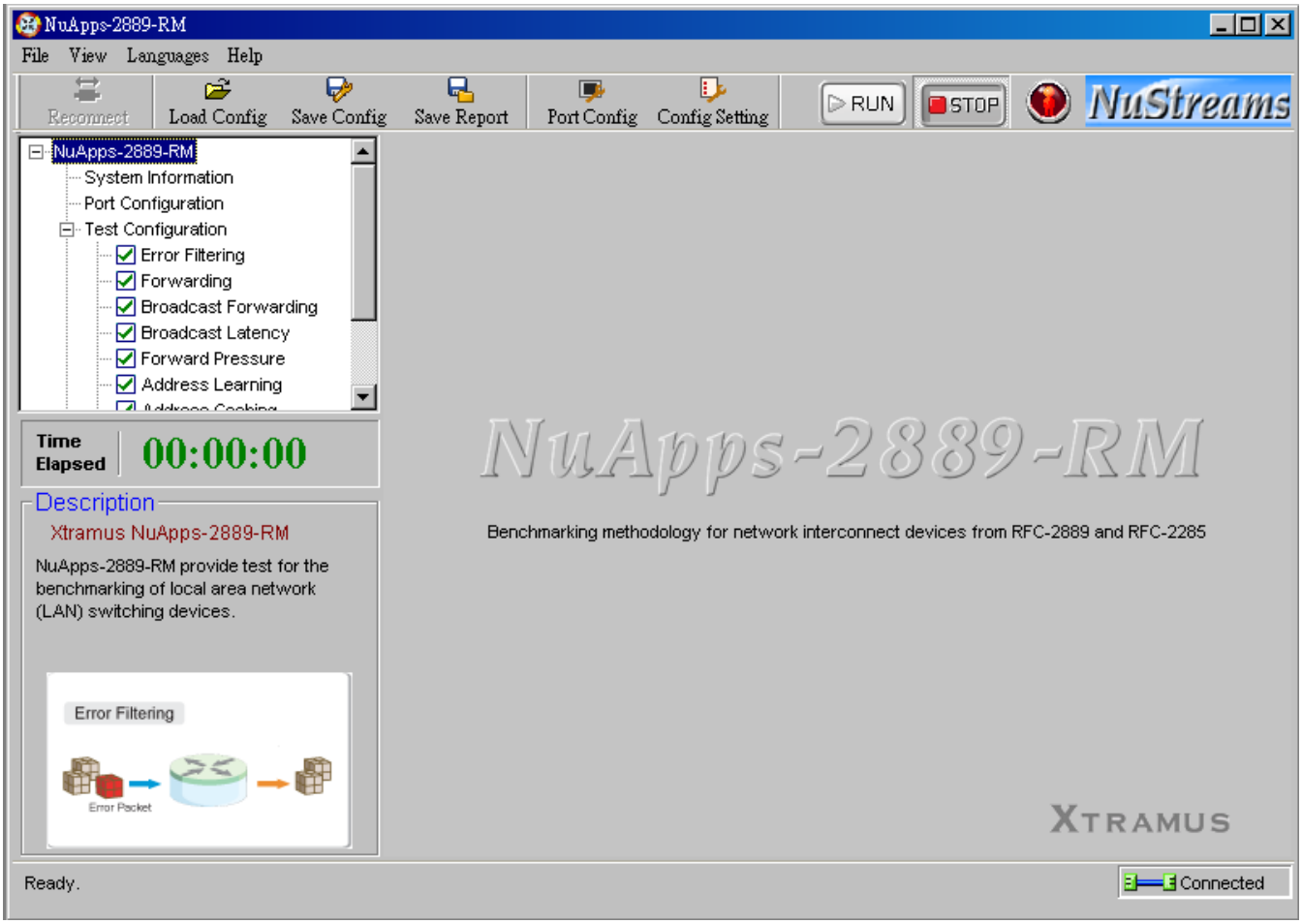


A "**NuServer-NIC Information**" window will pop up. Please select the NIC (Network Interface Card) which is connected to NuStreams -2000i/ 600i's from the **Network Interface Information** table, and click **OK**. If you're using NuStreams-2000i's IPC module, please choose "**Realtek RTL8139 Family Fast Ethernet**".



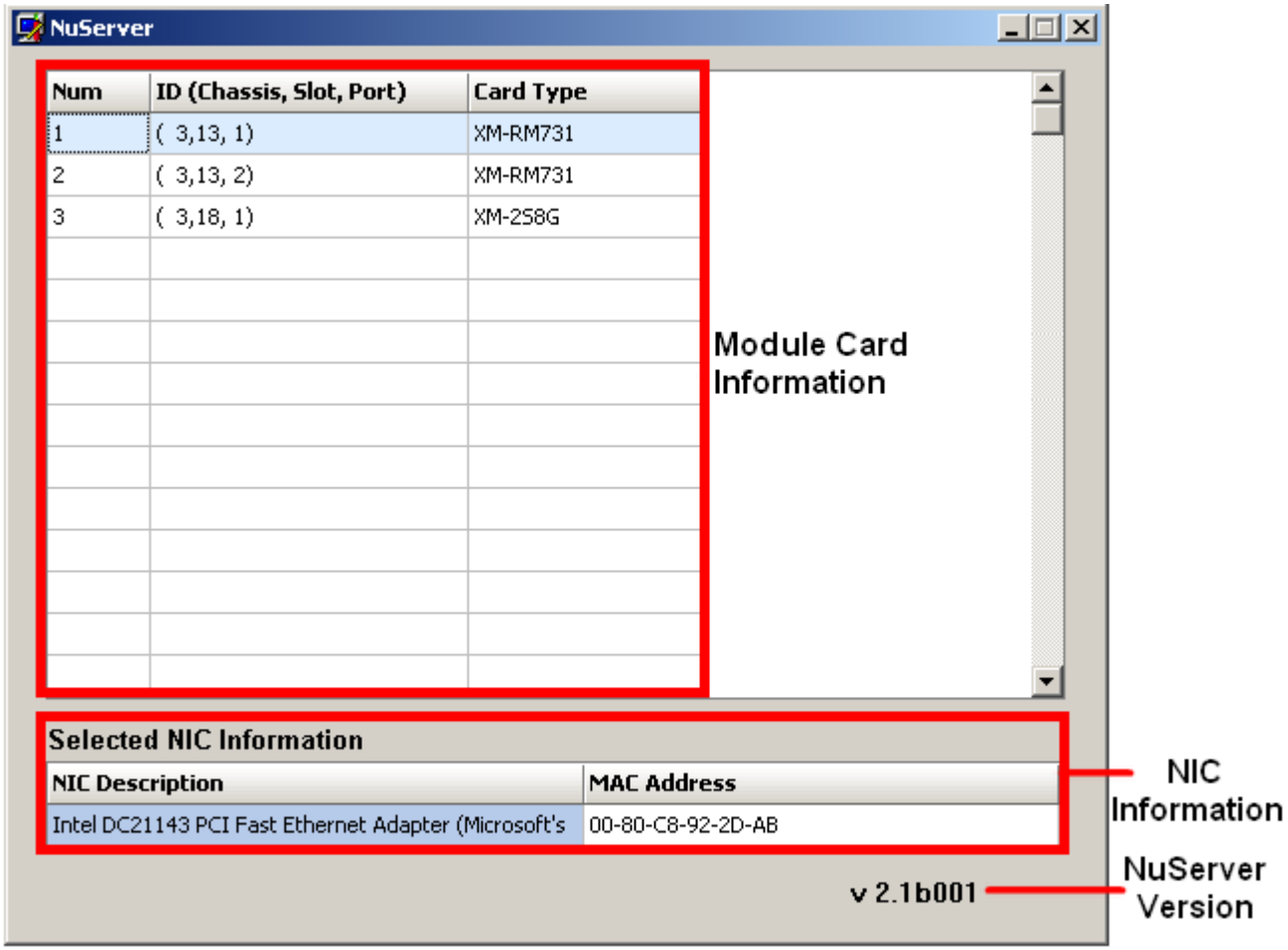
Starting NuServer / NuApps-2889-RM

NuServer will connect to the daughter boards, and NuApps-2889-RM will start as well.



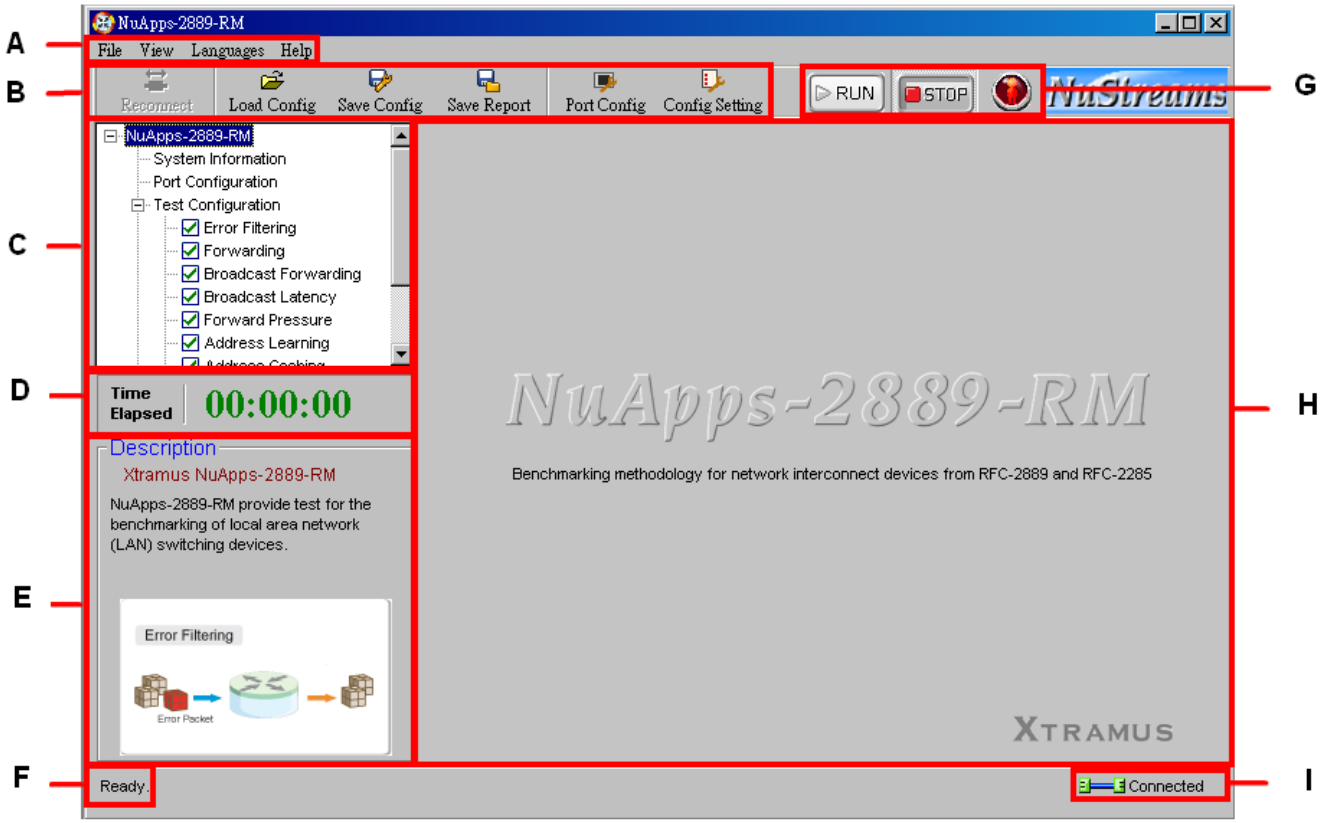
You now have access to NuApps-2889-RM's main display window.

3.2. NuServer Window



Description	
Module Card Information	This section displays the information regarding to the model cards that are installed on NuStreams-2000i/600i. Model Card IDs are showed as the format of **(X, Y, Z)** while X is the number of the chassis (which is displayed on NuStreams-2000i/600i), Y is the slot number where this model card is installed, and Z is the available port number located on the model card.
NIC Information	This section displays the detail information (including NIC Model name, NIC's MAC address) regarding to the selected NIC.
NuServer Version	This section displays the version of your NuServer.

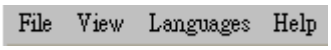
3.3. NuApps-2889-RM Main Window



Function Descriptions		
A	**Menu Bar**	The **Menu Bar** allows you to manage test model settings, show the test report, set the module card/DUT information, set the module cards' port and test configuration, change language displayed and access to **Xtramus** website.
B	**Tool Bar**	The **Tool Bar** contains buttons that allow you to reconnect your PC to NuStreams-2000i/600i, load/save test settings, make test/port configurations, and save test reports.
C	**System Info/Configuration List**	By clicking the **System Info/Configuration List**, you can view system information, making test/ports configurations, or view test reports on right side **Main Display Screen**.
D	**Elapsed Time**	The **Elapsed Time** field displays the elapsed time during test.
E	**Description**	The **Description** field display brief descriptions regarding to tests.
F	**Status Bar**	The **Status Bar** shows the running status of NuApps-2889-RM.
G	**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.
H	**Main Display Screen**	You can make detail configurations and view real-time testing diagrams on the **Main Display Screen**.

I	**System Connection Status**	This icon shows the connection status between your PC and NuStreams-2000i/600i.

3.3.1. Menu Bar

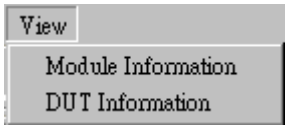


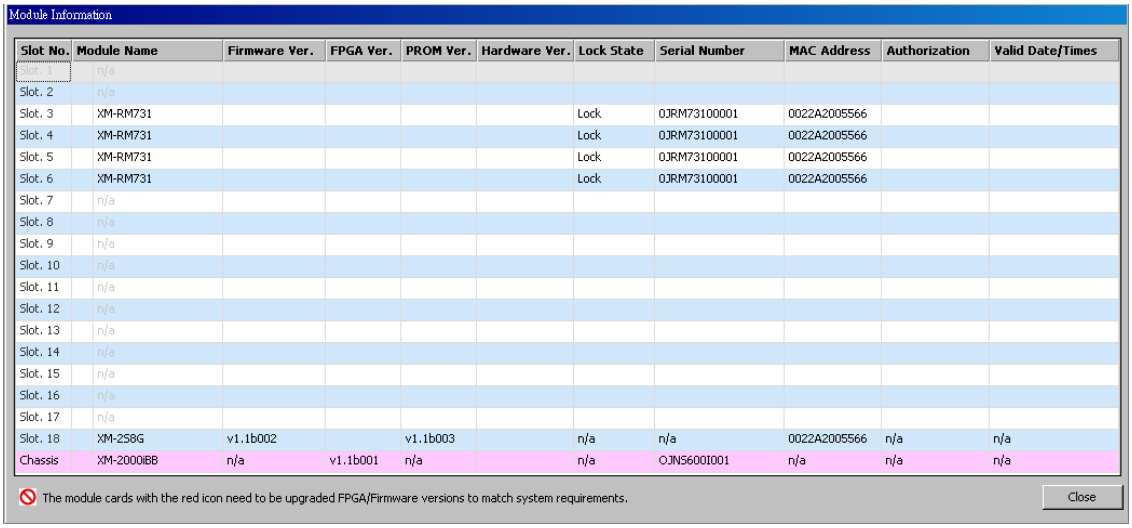
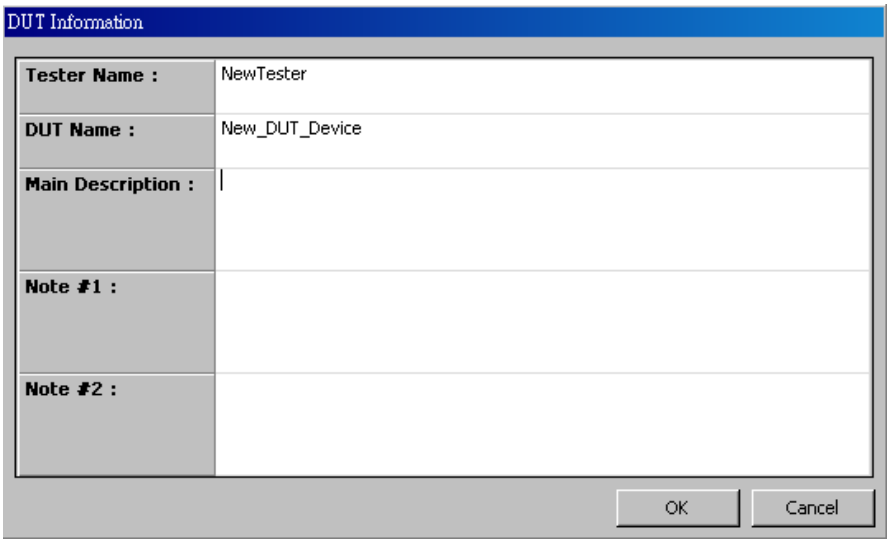
NuApps-2889-RM Menu Bar includes configuration options such as **File**, **View**, **Language**, and **Help**. Please refer to the sections down below for detail information regarding to each configuration option.

A. File

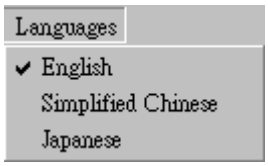
File Menu Bar Overview	
New Testing Configuration	The **New Testing Configuration…** allows the users to lock the ports of your NuStreams-2000i/600i's module cards for task testing. For detail descriptions regarding to the New Testing Configuration and its settings, please refer to"**4.2. Test Configuration**".
Load saved configuration	Load a previously-saved configuration file and applies these settings to NuApps-2889-RM. All the configurations you've made via New Testing Configuration will be saved as a "***.xml**" file, along with several "***.cfg**" files. Please note that these "***.cfg**" files contain test settings as well. Deleting them will cause your "***.xml**" file unable to load properly.
Save current Configuration	Choose this option to save your configuration made on **New Testing Configuration**.
Set Report Save Path to…	To save the test results, choose **Set Report Save Path to…** from the **Menu Bar** 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 "***.xls**" file you saved this way. Please note that you need Microsoft Excel® to view "***.xls**" file.
Report Folder	Open the Folder of the **Set Report Save Path to…**.
Latest Report	Open the latest saved report.
Exit	A prompt pop-up window will ask if you are sure to exit NuApps-2889-RM. Click **YES** to exit NuApps-2889-RM, or click **NO** to cancel.

B. View



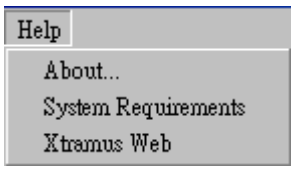
View Menu Bar Overview	
Module Information	 Choosing this option will pop up a window showing the detail information of your module cards. Click the **OK** button to exit this window.
DUT Information	 Choosing this option will pop up a window showing the detail information of your DUT Information. Click the **OK** button to exit this window.

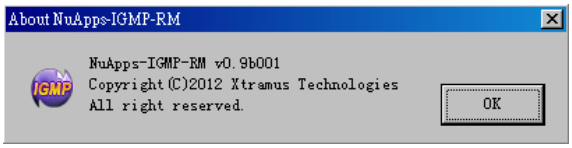
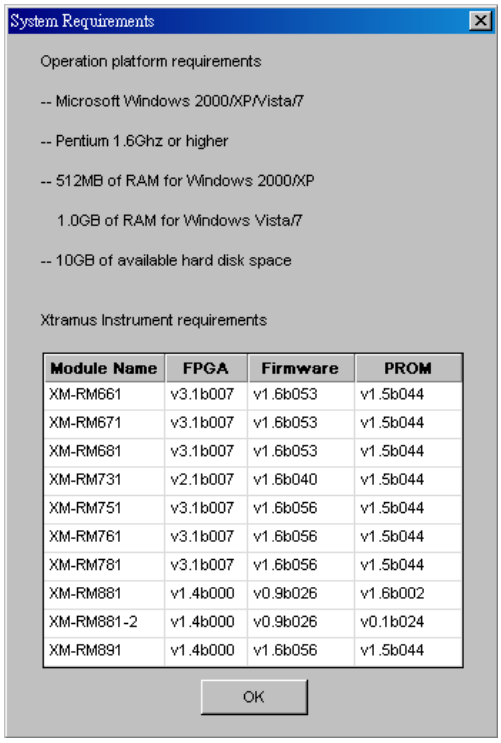
C. Languages



Languages Menu Bar Overview	
English/ Chinese Simplified	NuApps-2889-RM has **3** different languages for its UI available. You can set the language of UI to **English, Simplified Chinese or Japanese**.

D. Help

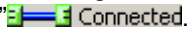


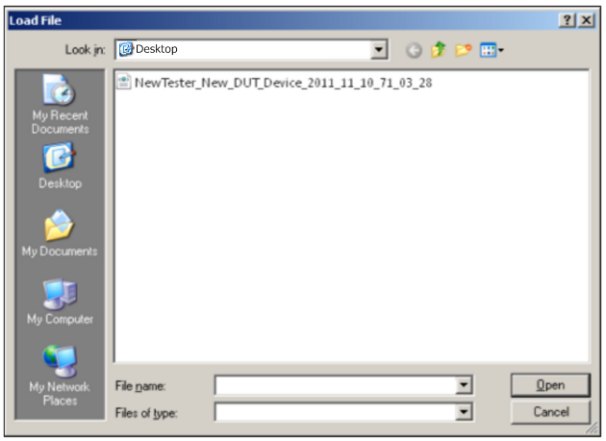
Help Menu Bar Overview		
About…		An "**About**" window will pop up and show detailed system information.
System Requirements		A "**System Requirements**" window will pop up and show the requirements for your PC and the FPGA/Firmware of the module. Click the **OK** button to exit the "**System Requirements**" pop-up window.
Xtramus Web	Click this option to access the Xtramus official website.	

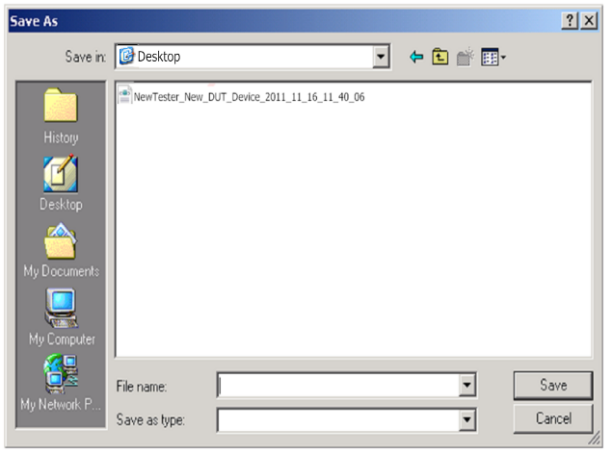
Module Name	FPGA	Firmware	PROM
XM-RM661	v3.1b007	v1.6b053	v1.5b044
XM-RM671	v3.1b007	v1.6b053	v1.5b044
XM-RM681	v3.1b007	v1.6b053	v1.5b044
XM-RM731	v2.1b007	v1.6b040	v1.5b044
XM-RM751	v3.1b007	v1.6b056	v1.5b044
XM-RM761	v3.1b007	v1.6b056	v1.5b044
XM-RM781	v3.1b007	v1.6b056	v1.5b044
XM-RM881	v1.4b000	v0.9b026	v1.6b002
XM-RM881-2	v1.4b000	v0.9b026	v0.1b024
XM-RM891	v1.4b000	v1.6b056	v1.5b044

3.3.2. Tool Bar Buttons

The Quick Launch Buttons allow you to reconnect your NuStreams-2000i/600i, Load/Save the current settings, save the test Report, and set the port/test configuration.

Reconnect	
	If the connection between your PC and NuStreams-2000i/600i is down, a "**Disconnected**" icon will be shown in "**System Connection Status**". Press **Reconnect** button to re-establish the connection between your PC and NuStreams-2000i/600i. If the connection has been established successfully, a message window will pop up, and the "**System Connection Status**" will be shown as "**Connected**"  .

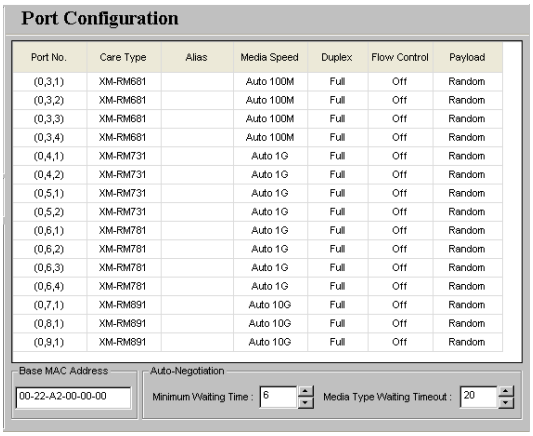
Load Config		
		If you have a previously saved configuration setting file stored in your PC, you can load it and apply all the setting you've made by clicking the "**Open**" button on the **Tool Bar**. All configuration files are saved in the format of " *** .cfg**".

Save Config		
		You can save the current test settings with the **Save** button on the **Quick Launch Buttons**. Configuration files are saved in the format of "***.cfg**".

Save Report

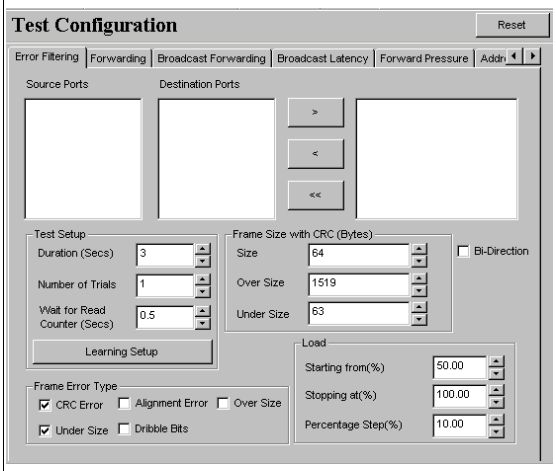
By clicking this button, you can save your current test report on your PC.

Port Config



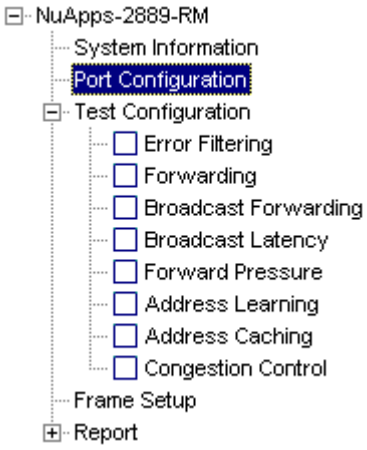
From this option, you can set the Media Speed, Duplex, Flow Control and Payload for each port.

Test Config



From this option, you can set the test parameters of each task test.

3.3.3. System Info/Configuration List



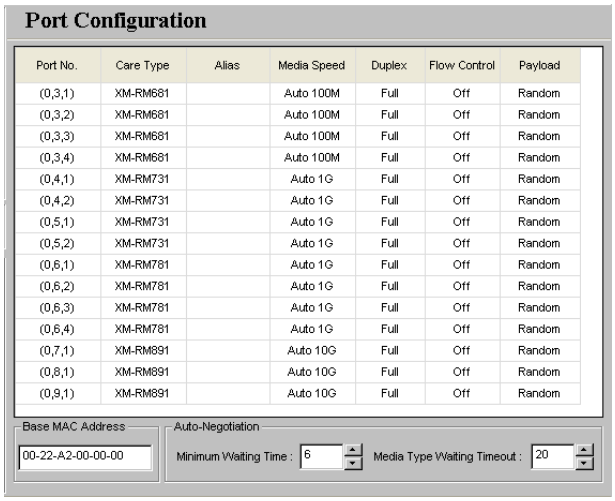
By clicking the **System Info/Configuration List**, you can view system information, making test/port configurations, or view test reports on right side **Main Display Screen**.

System Information

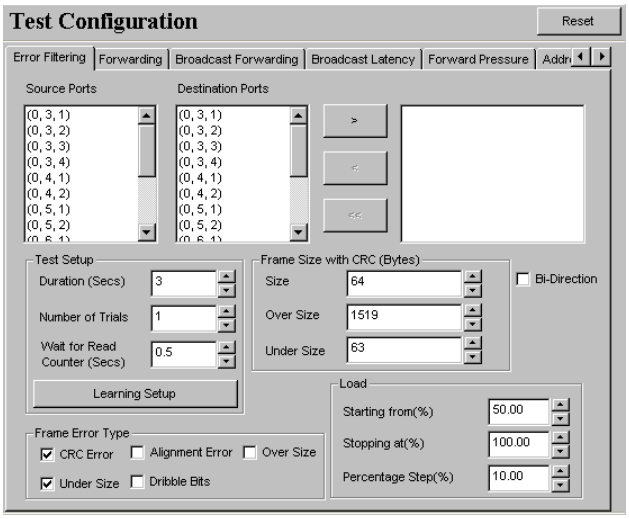
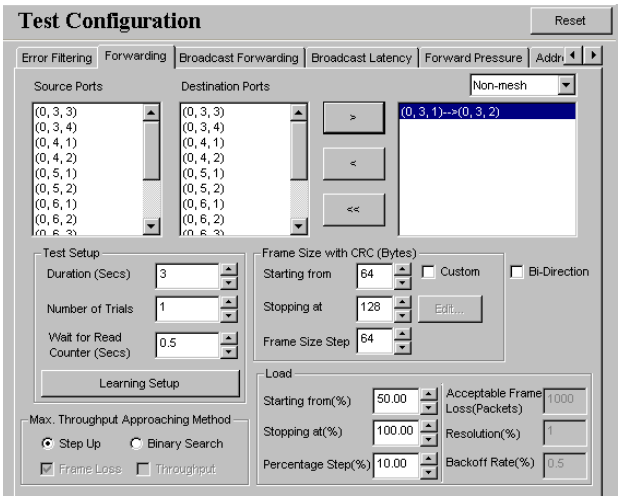
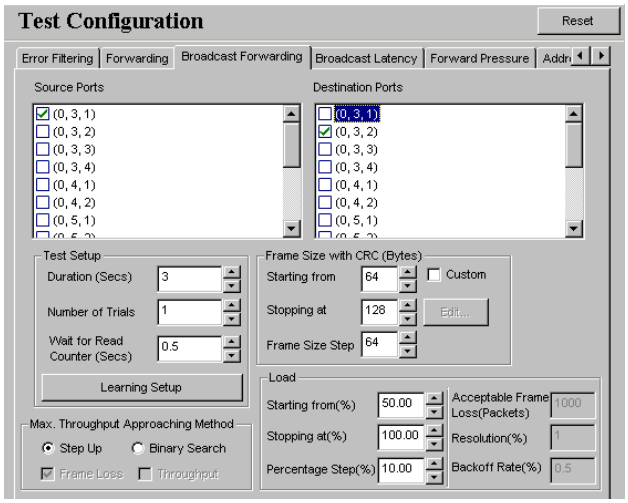
Model	NuStreams-600i
Agent / Customer	Xtramus agent
S/N	0KNS600I0027
MAC	000000000000
PCB Version	v5
Hardware Version	v0.9b002
Firmware Version	v1.3b000
API Version	v2.4b055
Manufacture Date	2011-10-12 11:00
Type	Normal

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 NuApps-2889-RM's main window.

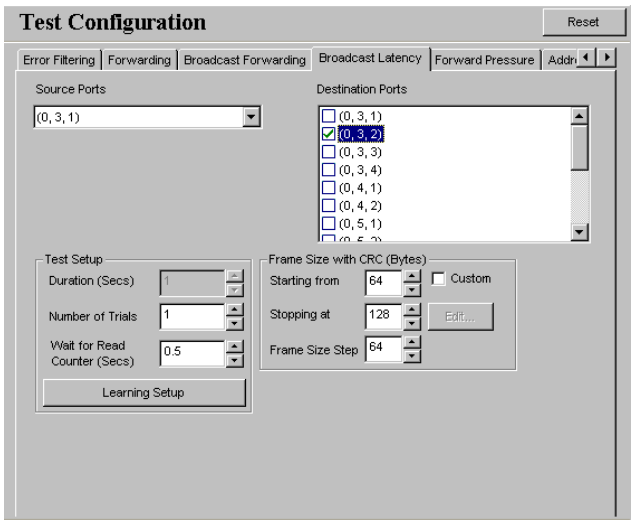
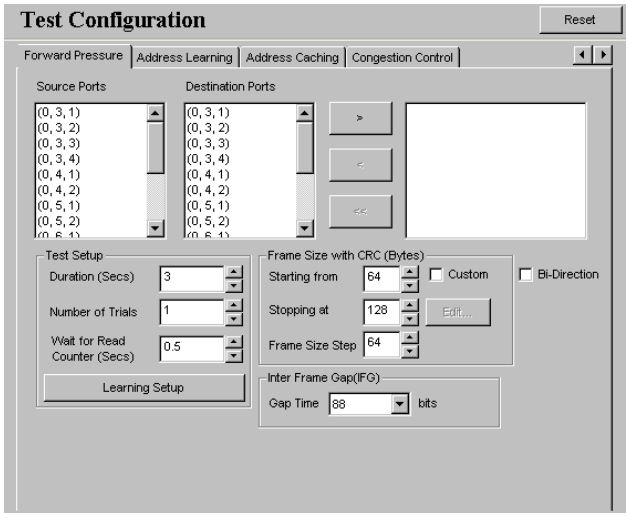
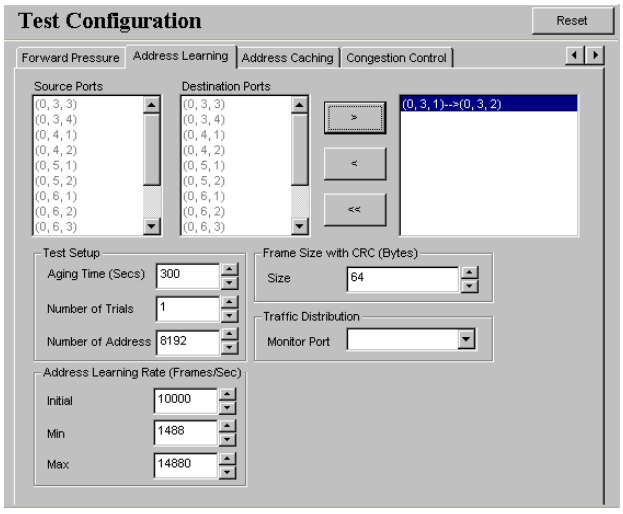
Port-pairing Config



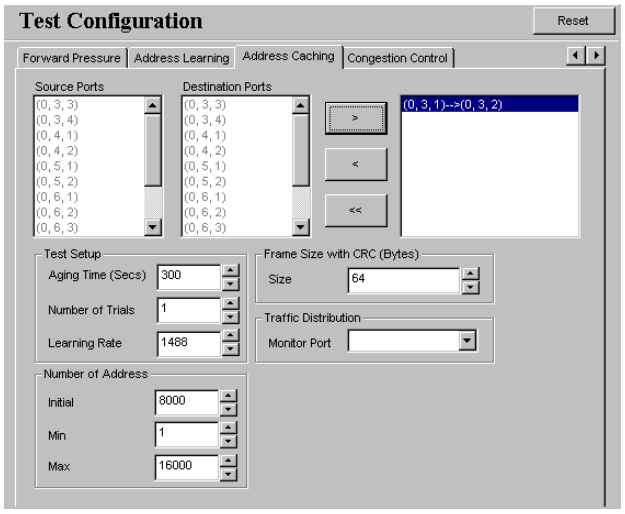
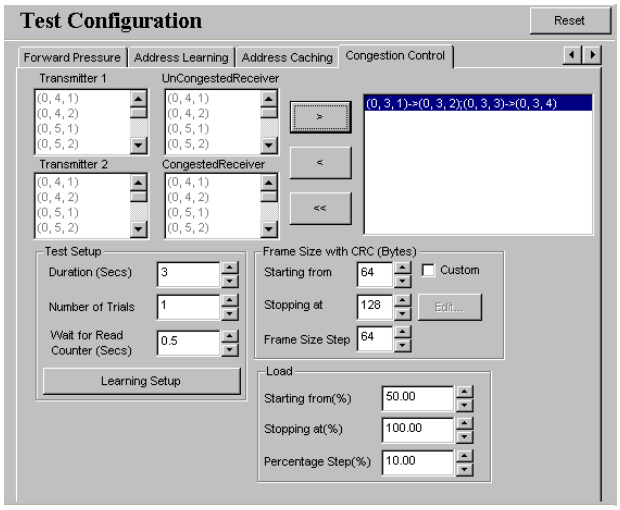
By clicking the **Port-pairing Config** on the **System Info/Configuration List**, the **Port-pairing Configuration** screen will be shown on the **Main Display Screen** located on the right side of NuApps-2889-RM's main window, allowing you to make settings for NuStreams-2000i/600i ports.

Test Config		
Error Filtering		The Error Filtering Test allows to determine the Error Filtering performance of the DUT under different parameters condition.
Forwarding		The Forwarding Test measures the throughput and frame loss rate of the device using various, traffic distribution including fully meshed, partially meshed, and non-meshed. This test allows measuring the frame loss at a specific load and framing size and how the increase in frame size and load affect the frame loss. This test allows measuring the throughput of the layer 2 device.
Broadcast Forwarding		The Broadcast Forwarding tests the performance of the layer 2 devices. This test allows the measurements of the frame loss for broadcast traffic patterns.

Test Config

Broadcast Latency		The Broadcast Latency test allows the measurement of the latency of the layer 2 devices when forwarding Broadcast traffic occurs. This test utilizes a one-to-many traffic pattern and the latency is measured for each port of the device in the test. The Broadcast Latency test is running in the profile mode.
Forward Pressure		The Forward Pressure test determines the device handles capacity of the forward congestion. The Forward Pressure test enables simulating congestion on specific receiving ports of the device to determine if forward pressure occurs.
Address Learning		The Address Learning test determines the optimal address learning rate of the DUT. The address learning rate is the maximum rate at which the device can learn the address without flooding or dropping the frames.

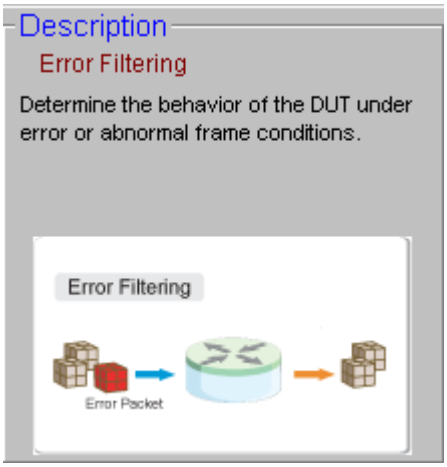
Test Config

Address Caching		The Address Caching test allows you to determine the address caching capacity of the layer 2 devices. The address caching capacity is the maximum number of MAC addresses a device can cache (store) and successfully forward frames to the correct destination without flooding or dropping frames.
Congestion Control		The Congestion Control test enables the user to determine how layer 2 devices handle congestion. Does the device implement congestion control and does congestion on one port affect an uncontested port. It determines whether Head of Line Blocking is present or not.

3.3.4. Elapsed Time

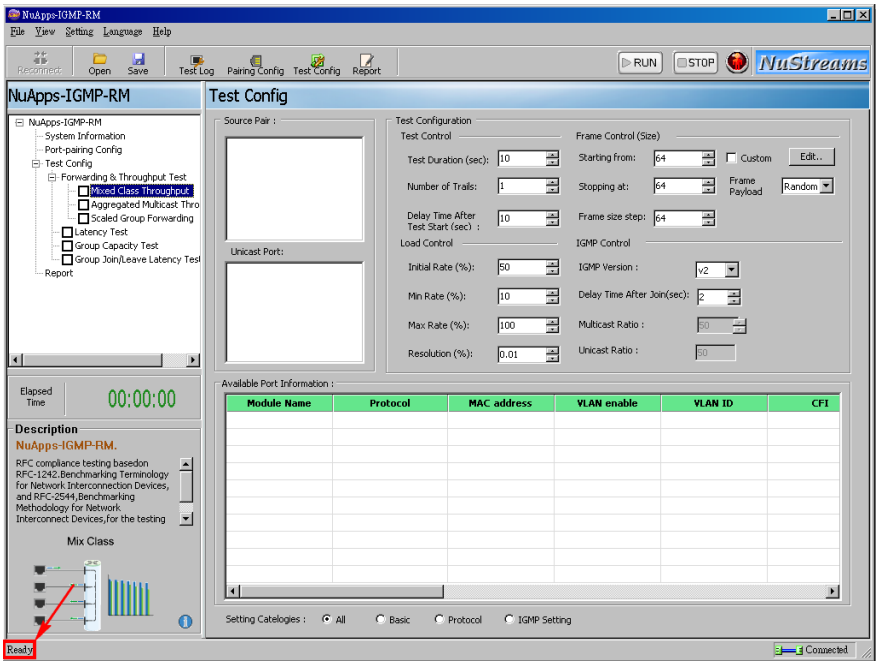
The Elapsed Time allows you to know the time spent during tests.

3.3.5. Description



The Description displays brief descriptions of each task of NuApps-2889-RM. It includes Error Filtering, Forwarding, Broadcast Forwarding, Broadcast Latency, Forward Pressure, Address Learning, Address Caching and Congestion Control, which each task configuration options are showed on the **Main Display Screen** to the right.

3.3.6. Status Bar



The **Status Bar** indicated by the arrow above shows the running status of NuApps-2889-RM. The running status includes: “**Testing**”, “**Performing testing**”, “**Ready**” and others.

3.3.7. 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	
	Start test
	Stop test

Test Running Status Icon	
	No Test is running
	Test is running

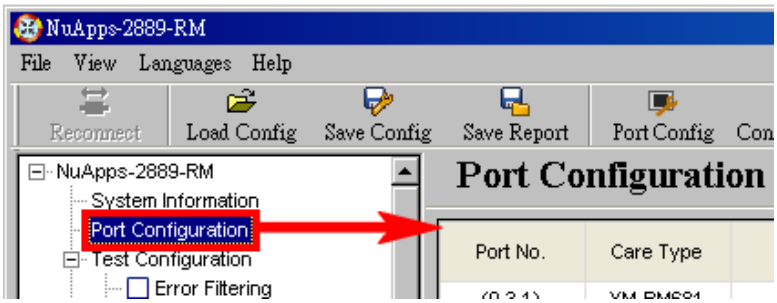
4. Port Configuration and Test Configuration

4.1. Port Configuration

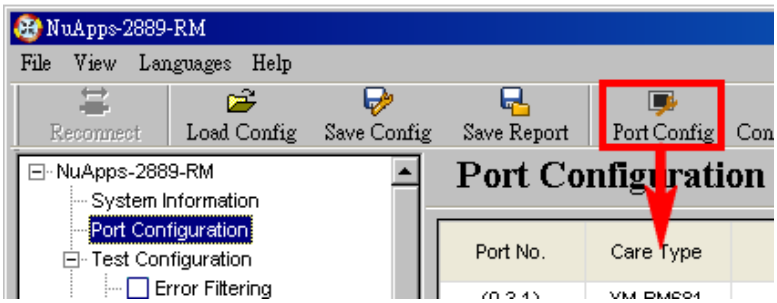
Settings such as auto-negotiation, base MAC address, media speed, duplex, flow control, payload are available and can be configured on the **Port Configuration** displayed on the **Main Display Screen**.

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

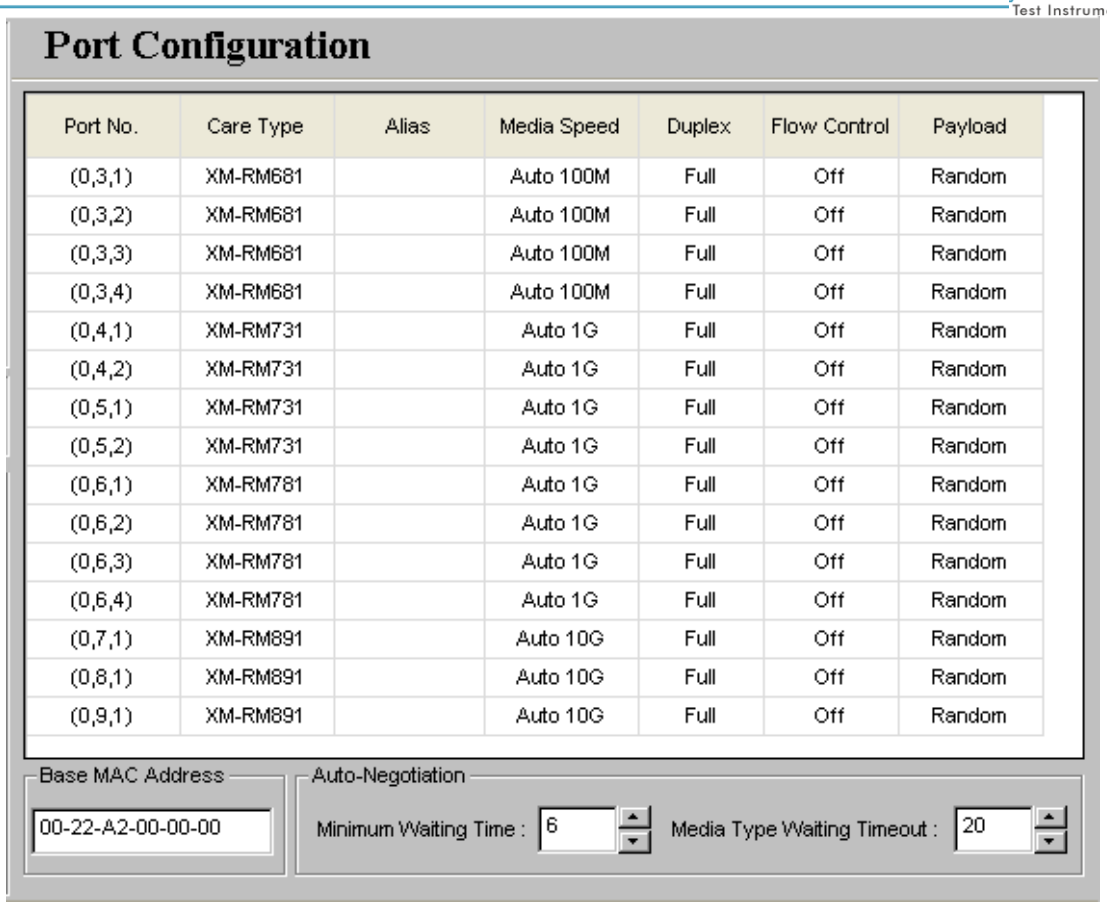
Accessing Port Config



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



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



Port Configuration

Port No.	Care Type	Alias	Media Speed	Duplex	Flow Control	Payload
(0,3,1)	XM-RM681		Auto 100M	Full	Off	Random
(0,3,2)	XM-RM681		Auto 100M	Full	Off	Random
(0,3,3)	XM-RM681		Auto 100M	Full	Off	Random
(0,3,4)	XM-RM681		Auto 100M	Full	Off	Random
(0,4,1)	XM-RM731		Auto 1G	Full	Off	Random
(0,4,2)	XM-RM731		Auto 1G	Full	Off	Random
(0,5,1)	XM-RM731		Auto 1G	Full	Off	Random
(0,5,2)	XM-RM731		Auto 1G	Full	Off	Random
(0,6,1)	XM-RM781		Auto 1G	Full	Off	Random
(0,6,2)	XM-RM781		Auto 1G	Full	Off	Random
(0,6,3)	XM-RM781		Auto 1G	Full	Off	Random
(0,6,4)	XM-RM781		Auto 1G	Full	Off	Random
(0,7,1)	XM-RM891		Auto 10G	Full	Off	Random
(0,8,1)	XM-RM891		Auto 10G	Full	Off	Random
(0,9,1)	XM-RM891		Auto 10G	Full	Off	Random

Base MAC Address: 00-22-A2-00-00-00

Auto-Negotiation: Minimum Waiting Time : 6 Media Type Waiting Timeout : 20

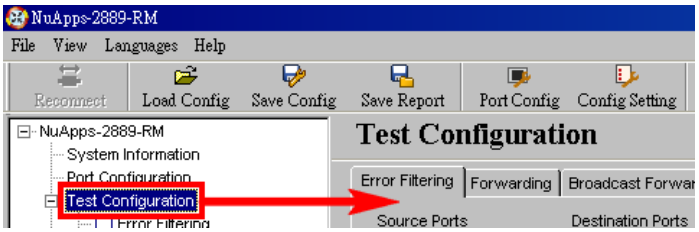
- **Port No./Card Type:** These two fields display each port's Port ID and the model name of this module card.
- **Alias:** You can input alias for identifying active ports here in these fields
- **Media Speed:** The Media Speed scroll-down menu allows you to set each port's transmitting/receiving rate.
- **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.
- **Payload:** You can click and scroll down the field of Payload and select an option. It includes: Random, All Zeros, 0x55AA, FFFF or All Ones.
- **Base MAC Address:** You can modify your connected NuStreams-2000i/600i MAC Address here, but only during test running environment.
- **Auto-Negotiation: The Minimum Waiting Time** is the minimum waiting time (**in seconds**) for auto-negotiation in seconds. The Media Type Waiting Timeout is the time (**in seconds**) NuApps-2889-RM spent for auto-negotiation exceeds the time you set here, the test will stop.

4.2. Test Configuration

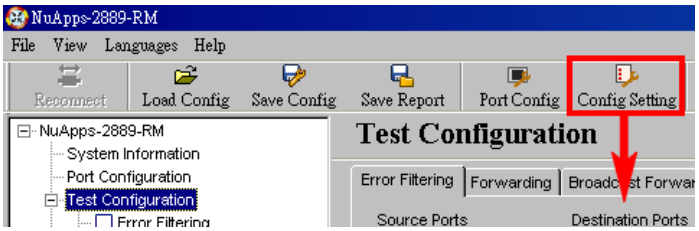
8 different test modes, including **Error Filtering**, **Forwarding**, **Broadcast Forwarding**, **Broadcast Latency**, **Forward Pressure**, **Address Learning**, **Address Caching** and **Congestion Control**, in which can be configured on the **Test Configuration** displayed on the **Main Display Screen**.

There are two ways to access to the **Test Configuration**:

Accessing Test Configuration



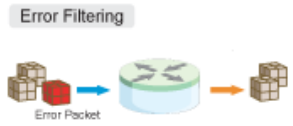
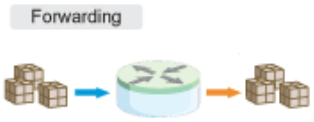
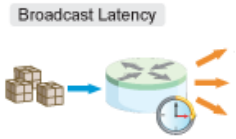
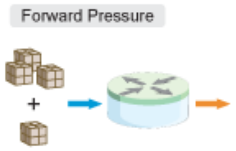
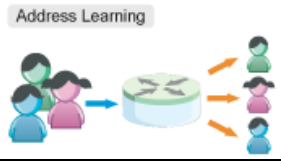
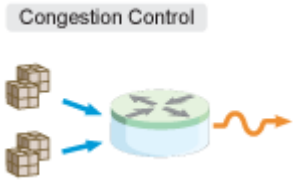
- Click **Test Configuration** located on **System Info/ Configuration List**



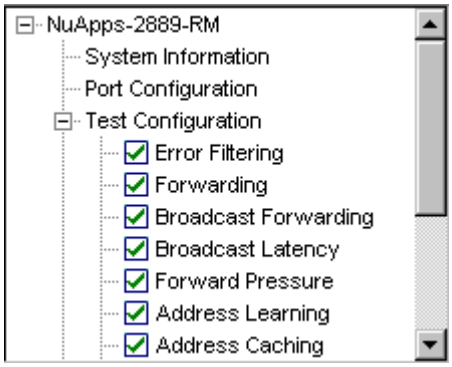
- Click the **Config Setting** button located on **Tool Bar**.

Please see the sections down below for more information regarding to **Test Configuration**.

NuApps-2889-RM supports eight different tests including:

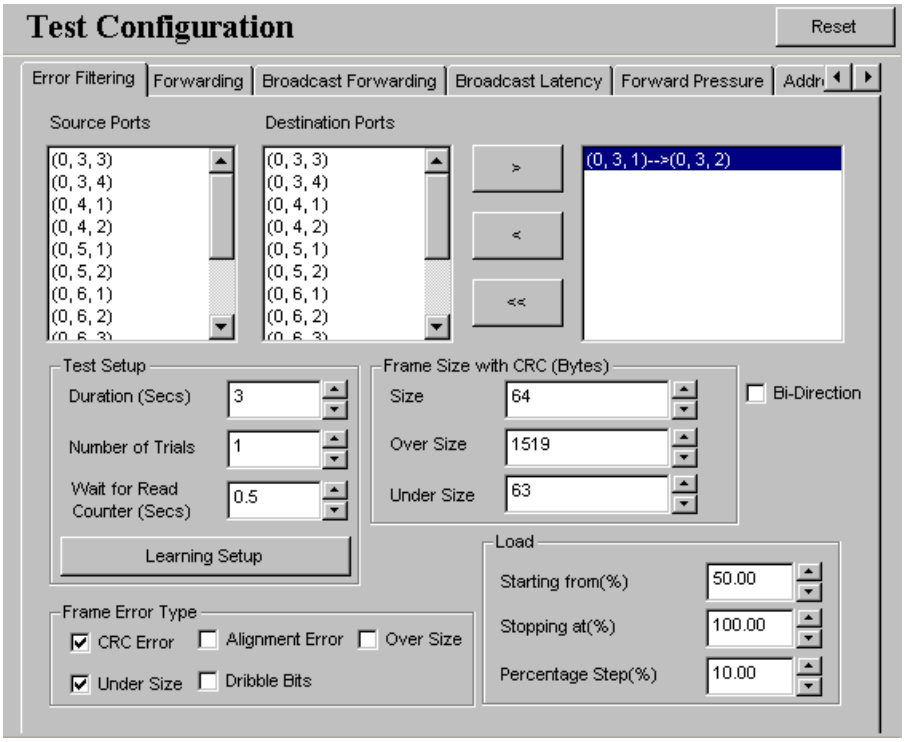
Diagram	Description
	Determine the behavior of the DUT under error or abnormal frame conditions.
	Determine the throughput, frame loss and forwarding rates of DUT/SUT's offered traffics.
	Determine the throughput of the DUT when forwarding broadcast traffic.
	Determine the latency of the DUT when forwarding broadcast traffic.
	The Forward Pressure test overloads a DUT/SUT port and measures the output for forward pressure.
	Determine the rate of address learning of a LAN switching device.
	Determine the address caching capacity of a LAN switching device.
	To determine how a DUT handles congestion.

To start performing tests with NuApps-2889-RM, 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.

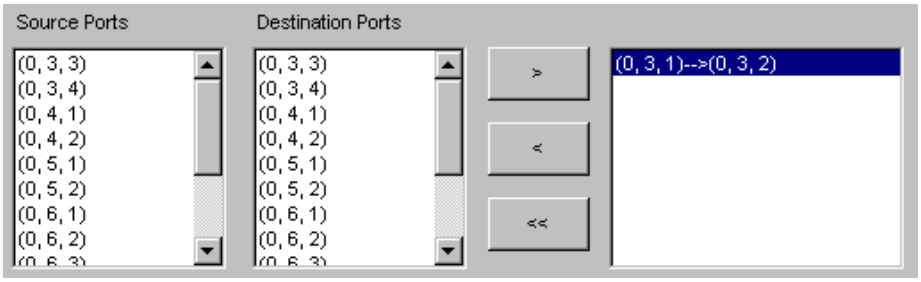


For more detailed setting options regarding to **Error Filtering, Forwarding, Broadcast Forwarding, Broadcast Latency, Forward Pressure, Address Learning, Address Caching and Congestion Control**, please refer to the sections down below.

4.2.1. Error Filtering



Choose your port pair

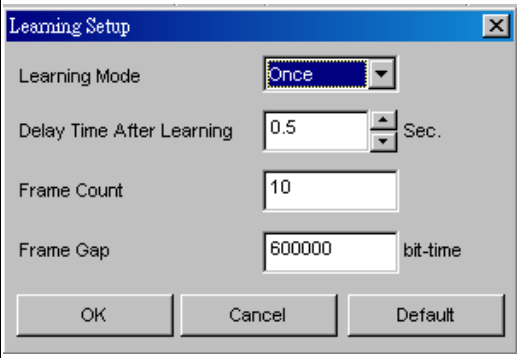


To choose your port pair, please choose a port from Source Ports and Destination Ports, than click the > button to confirm the selection, in which the chosen port pair will be listed in the right field. To undo a port pair selection, please select the port pair from the right field, than click the < button to cancel the selected port pair.

You can also click the << button to cancel all the selected port pair.

You can also click the Reset button to cancel all the settings you made on the **Error Filtering** task window.

***Note: each port is labeled as (x, y, z), where "x" is the number order of the NuStreams-2000i/600i, "y" is the number order of chassis slot and "z" is the number order of port of each module card.**

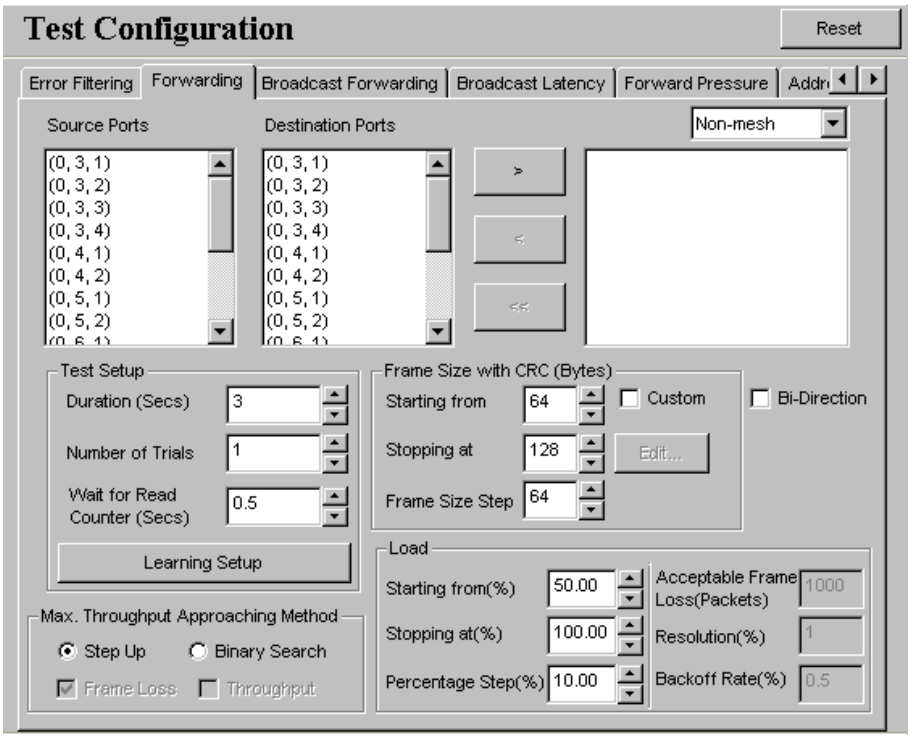
Test Setup	
Duration (Sec)	The time duration of each test.
Number of Trials	The number of the test trial.
Wait for Read Counter (Sec)	The time gap for showing the counter result.
Learning Setup	 ➢ **Learning Mode:** Scroll down to choose Learning Mode as **Never**, **Once** or **Every Trial**. ➢ **Delay Time After Learning:** Set the time gap between Learning and the next step. ➢ **Frame Count:** The number of frame to be sent. ➢ **Frame Gap:** The gap in bits between frames. Click **OK** to save the settings, click **Cancel** to exit this setting window without saving, or click **Default** to recover the setting to the default value.

Frame Error Type	
CRC Error	Enable the CRC Error test of your DUT.
Under Size	Enable the Under Size test of your DUT.
Alignment Error	Enable the Alignment Error test of your DUT.
Dribble Bits	Enable the Dribble Bits test of your DUT.
Over Size	Enable the Over Size test of your DUT.

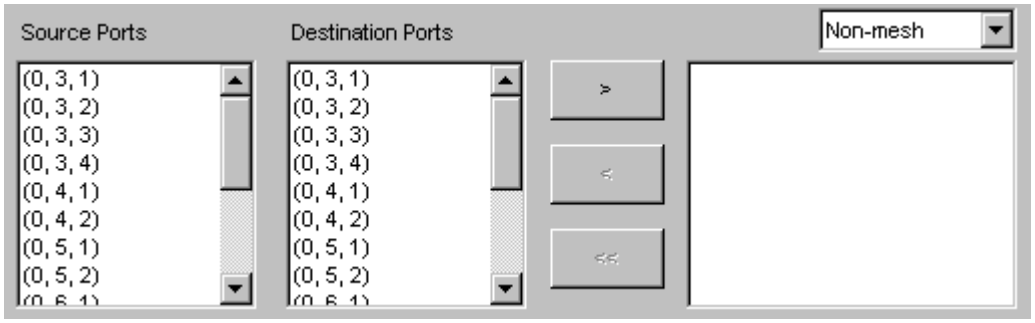
Frame size with CRC (Bytes)	
Size	Set the frame size with CRC on this field.
Over size	Set the maximum frame size with CRC on this field.
Under Size	Set the minimum frame size with CRC on this field.
Bi-Direction	Enabling this function allows two-way direction transmitting during the test.

Load	
Starting from(%)	The initial loading percentage.
Stopping at(%)	The end loading percentage.
Percentage Step(%)	The percentage of loading to be added at each step.

4.2.2. Forwarding



Choose your port pair



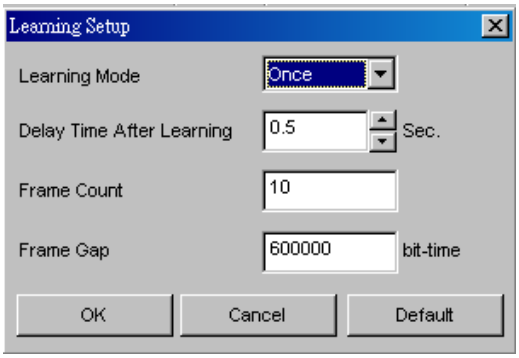
To choose your port pair, please choose a port from Source Ports and Destination Ports, than click the > button to confirm the selection, in which the chosen port pair will be listed in the right field. To undo a port pair selection, please select the port pair from the right field, than click the < button to cancel the selected port pair.

You can also click the << button to cancel all the selected port pair.

Besides, you can choose the task in **Non-mesh**, **partial mesh** or **full mesh** by scrolling down the field on the top right.

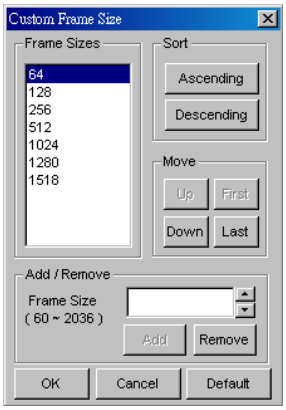
You can also click the Reset button to cancel all the settings you made on the **Forwarding** task window.

***Note: each port is labeled as (x, y, z), where "x" is the number order of the NuStreams-2000i/600i, "y" is the number order of chassis slot and "z" is the number order of port of each module card.**

Test Setup	
Duration (Sec)	The time duration of each test.
Number of Trials	The number of the test trial.
Wait for Read Counter (Sec)	The time gap for showing the counter result.
Learning Setup	 ➢ **Learning Mode:** Scroll down to choose Learning Mode as **Never**, **Once** or **Every Trial**. ➢ **Delay Time After Learning:** Set the time gap between Learning and the next step. ➢ **Frame Count:** The number of frame to be sent. ➢ **Frame Gap:** The gap in bits between frames. Click **OK** to save the settings, click **Cancel** to exit this setting window without saving, or click **Default** to recover the setting to the default value.

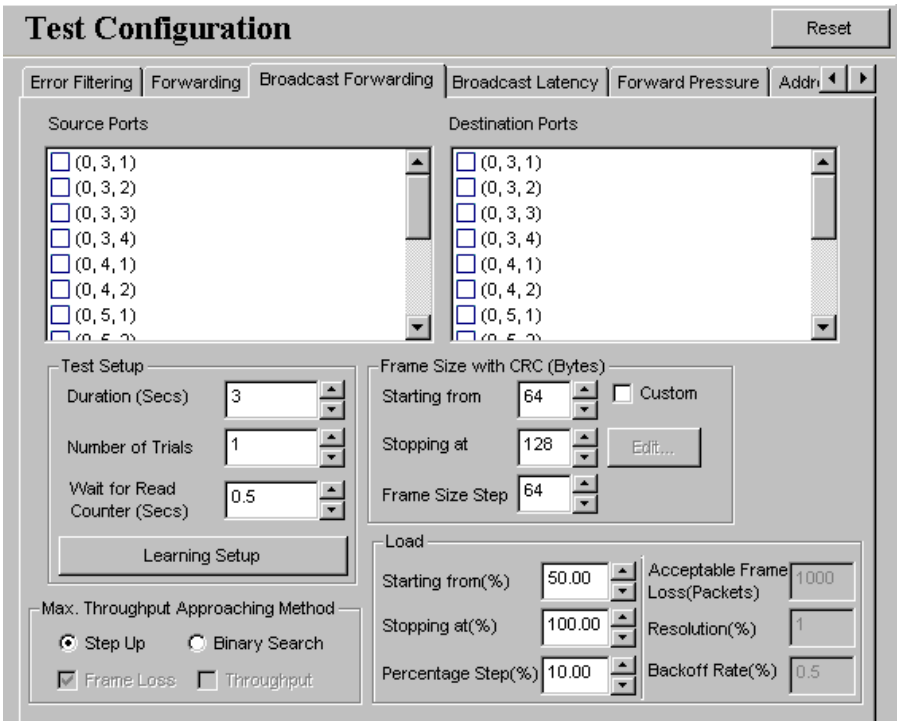
Max. Throughput Approaching Method	
Step up	Selecting this function allows the Frame Size to increase in a step-by-step manner according to the settings you made here.
Binary Search	Selecting this function allows the Frame Size to change according to the test results (Pass/Fail) and the settings you made here.

Frame size with CRC (Bytes)	
Starting from	Set the starting frame size with CRC on this field.
Stopping at	Set the last frame size with CRC on this field.
Frame Size Step	Set the frame size to be added on each step with CRC on this field.

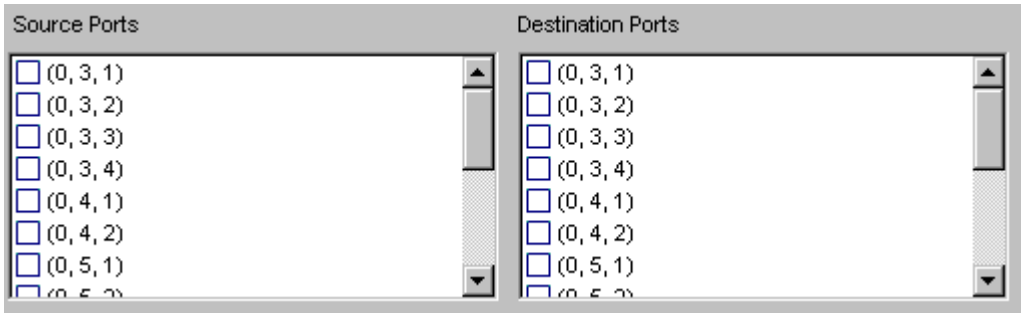
Frame size with CRC (Bytes)		
Custom		Selecting the **Custom** function will enable the **Edit** button. Click the **Edit** button to pop up the **Custom Frame Size** window. ➢ **Frame Sizes:** Shows the default frame size to select. ➢ **Sort:** sort the order of the current frame sizes list as ascending or descending. ➢ **Move:** You can change the order of each frame from the frame sizes list here. ➢ **Add/Remove: Add** a new frame size to the frame sizes list in the range of 60-2036, or select a frame from the frame size list and remove it by clicking the **Remove** button. Click **OK** to save the settings, click **Cancel** to exit this setting window without saving, or click **Default** to recover the setting to the default value.
Bi-Direction	Enabling this function allows two-way direction transmitting during the test.	

Load	
Starting from(%)	The initial loading percentage.
Stopping at(%)	The end loading percentage.
Percentage Step(%)	The percentage of loading to be added at each step.

4.2.3. Broadcast Forwarding



Choose your port pair

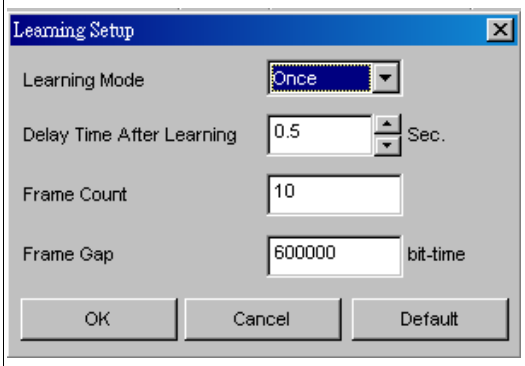


To choose your port pair, please choose a port from Source Ports and Destination Ports.

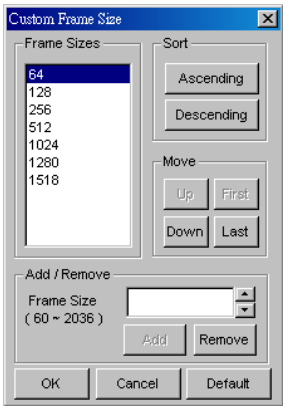
You can also click the Reset button to cancel all the settings you made on the **Broadcast Forwarding** task window.

***Note: each port is labeled as (x, y, z), where "x" is the number order of the NuStreams-2000i/600i, "y" is the number order of chassis slot and "z" is the number order of port of each module card.**

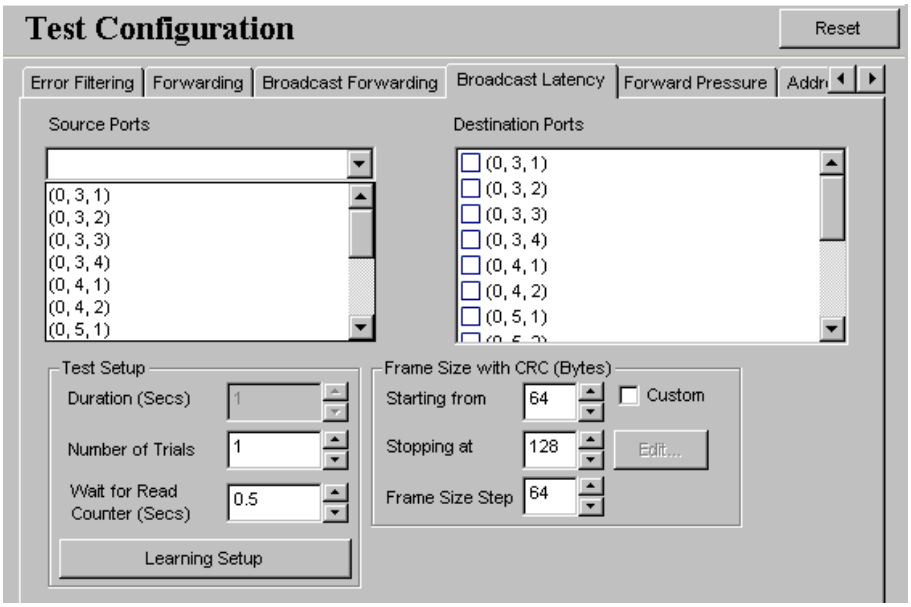
Load	
Starting from (%)	The initial loading percentage.
Stopping at (%)	The end loading percentage.
Percentage Step (%)	The percentage of loading to be added at each step.

Test Setup	
Duration (Sec)	The time duration of each test.
Number of Trials	The number of the test trial.
Wait for Read Counter (Sec)	The time gap for showing the counter result.
Learning Setup	 ➢ **Learning Mode:** Scroll down to choose Learning Mode as **Never**, **Once** or **Every Trial**. ➢ **Delay Time After Learning:** Set the time gap between Learning and the next step. ➢ **Frame Count:** The number of frame to be sent. ➢ **Frame Gap:** The gap in bits between frames. Click **OK** to save the settings, click **Cancel** to exit this setting window without saving, or click **Default** to recover the setting to the default value.

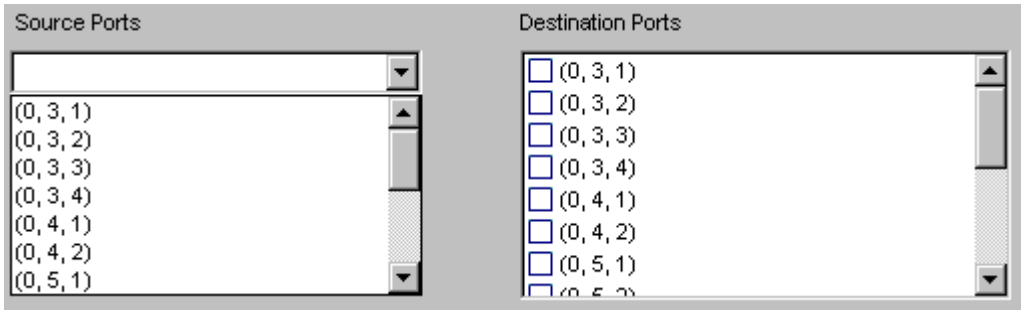
Max. Throughput Approaching Method	
Step up	Selecting this function allows the Frame Size to increase in a step-by-step manner according to the settings you made here.
Binary Search	Selecting this function allows the Frame Size to change according to the test results (Pass/Fail) and the settings you made here.

Frame size with CRC (Bytes)	
Starting from	Set the starting frame size with CRC on this field.
Stopping at	Set the last frame size with CRC on this field.
Frame Size Step	Set the frame size to be added on each step with CRC on this field.
Custom	 Selecting the **Custom** function will enable the **Edit** button. Click the **Edit** button to pop up the **Custom Frame Size** window. ➢ **Frame Sizes:** Shows the default frame size to select. ➢ **Sort:** sort the order of the current frame sizes list as ascending or descending. ➢ **Move:** You can change the order of each frame from the frame sizes list here. ➢ **Add/Remove: Add** a new frame size to the frame sizes list in the range of 60-2036, or select a frame from the frame size list and remove it by clicking the **Remove** button. Click **OK** to save the settings, click **Cancel** to exit this setting window without saving, or click **Default** to recover the setting to the default value.

4.2.4. Broadcast Latency



Choose your port pair

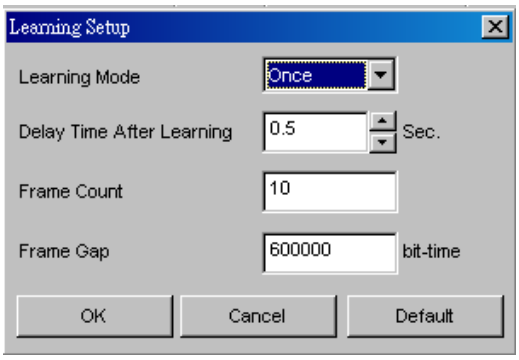


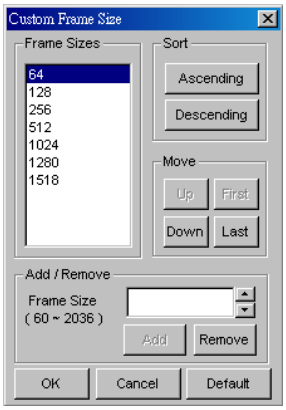
To choose your port pair, please choose a Source Ports by scrolling down the left field and a Destination Ports on the right field.

You can also click the Reset button to cancel all the settings you made on the **Broadcast Latency** task window.

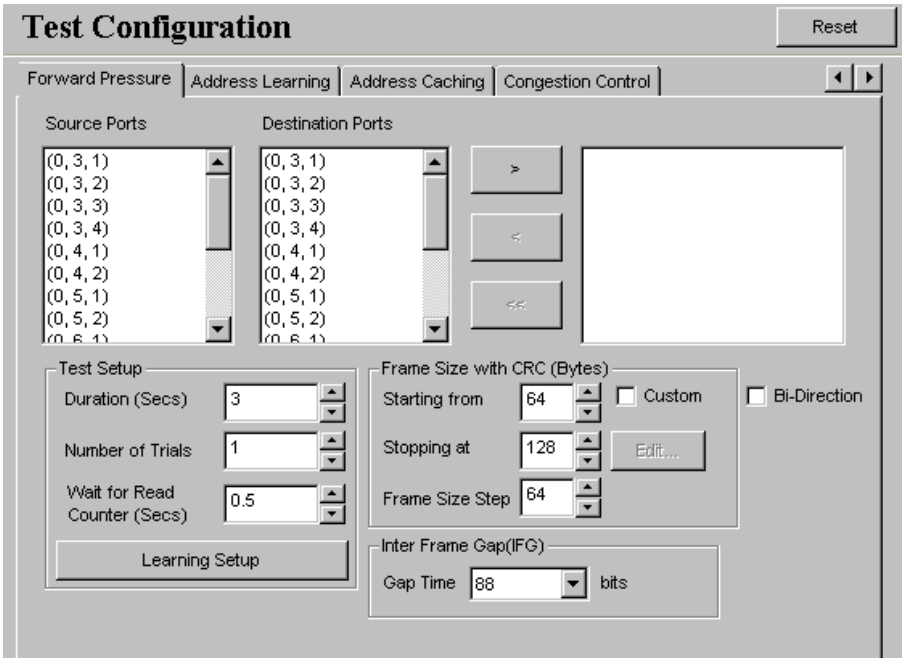
***Note: each port is labeled as (x, y, z), where "x" is the number order of the NuStreams-2000i/600i, "y" is the number order of chassis slot and "z" is the number order of port of each module card.**

Test Setup	
Number of Trials	The number of the test trial.
Wait for Read Counter (Sec)	The time gap for showing the counter result.

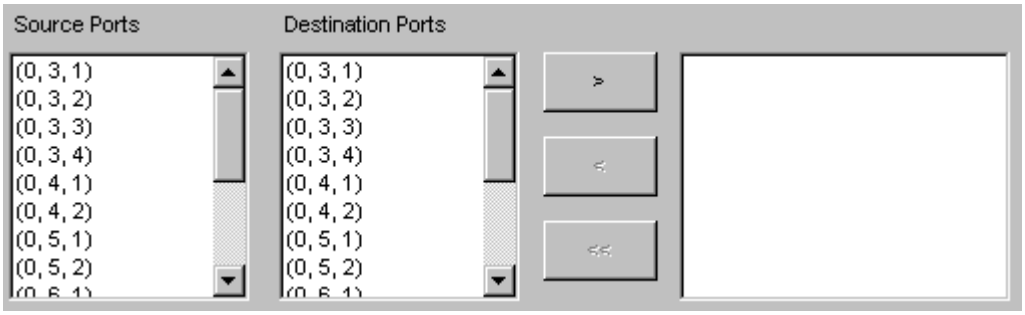
Test Setup		
Learning Setup		➢ **Learning Mode:** Scroll down to choose Learning Mode as **Never**, **Once** or **Every Trial**. ➢ **Delay Time After Learning:** Set the time gap between Learning and the next step. ➢ **Frame Count:** The number of frame to be sent. ➢ **Frame Gap:** The gap in bits between frames. Click **OK** to save the settings, click **Cancel** to exit this setting window without saving, or click **Default** to recover the setting to the default value.

Frame size with CRC (Bytes)		
Starting from	Set the starting frame size with CRC on this field.	
Stopping at	Set the last frame size with CRC on this field.	
Frame Size Step	Set the frame size to be added on each step with CRC on this field.	
Custom		Selecting the **Custom** function will enable the **Edit** button. Click the **Edit** button to pop up the **Custom Frame Size** window. ➢ **Frame Sizes:** Shows the default frame size to select. ➢ **Sort:** sort the order of the current frame sizes list as ascending or descending. ➢ **Move:** You can change the order of each frame from the frame sizes list here. ➢ **Add/Remove: Add** a new frame size to the frame sizes list in the range of 60-2036, or select a frame from the frame size list and remove it by clicking the **Remove** button. Click **OK** to save the settings, click **Cancel** to exit this setting window without saving, or click **Default** to recover the setting to the default value.

4.2.5. Forward Pressure



Choose your port pair

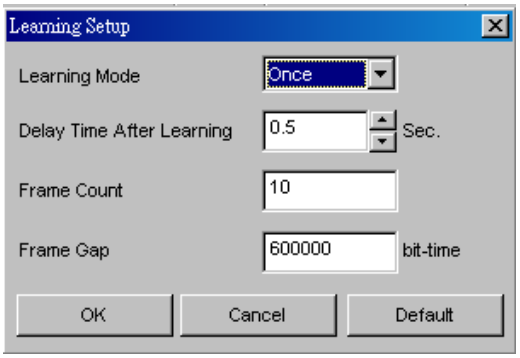


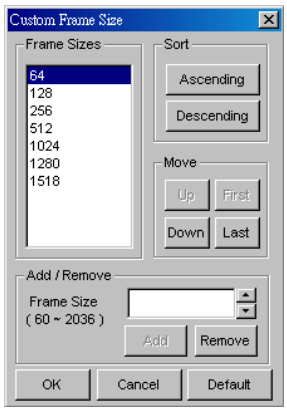
To choose your port pair, please choose a port from Source Ports and Destination Ports, than click the > button to confirm the selection, in which the chosen port pair will be listed in the right field. To undo a port pair selection, please select the port pair from the right field, than click the < button to cancel the selected port pair.

You can also click the << button to cancel all the selected port pair.

You can also click the Reset button to cancel all the settings you made on the **Forward Pressure** task window.

***Note: each port is labeled as (x, y, z), where "x" is the number order of the NuStreams-2000i/600i, "y" is the number order of chassis slot and "z" is the number order of port of each module card.**

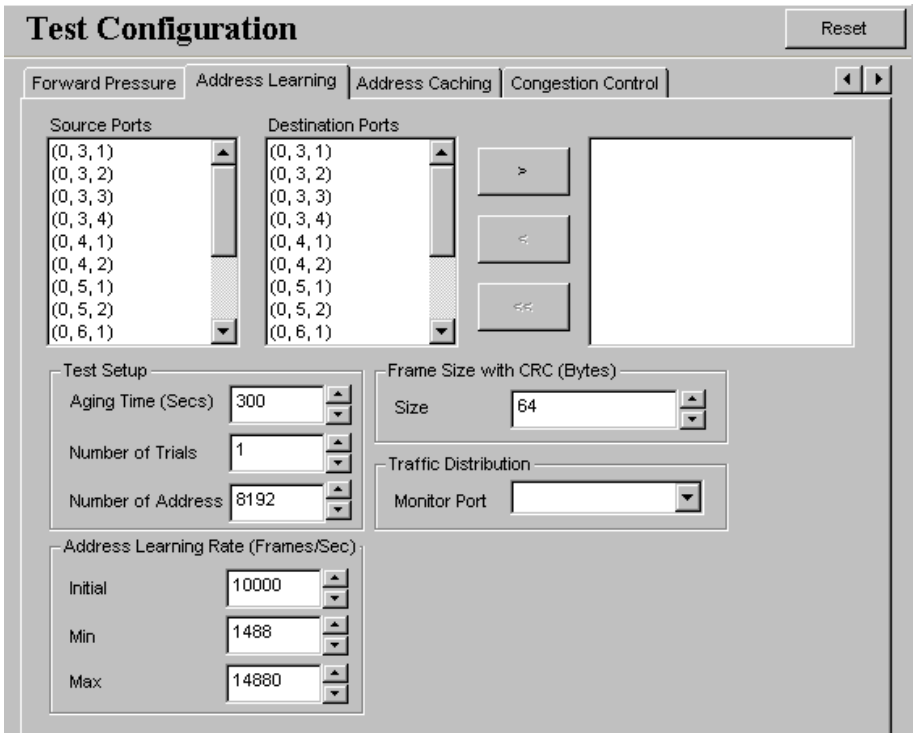
Test Setup	
Duration (Sec)	The time duration of each test.
Number of Trials	The number of the test trial.
Wait for Read Counter (Sec)	The time gap for showing the counter result.
Learning Setup	 ➢ **Learning Mode:** Scroll down to choose Learning Mode as **Never**, **Once** or **Every Trial**. ➢ **Delay Time After Learning:** Set the time gap between Learning and the next step. ➢ **Frame Count:** The number of frame to be sent. ➢ **Frame Gap:** The gap in bits between frames. Click **OK** to save the settings, click **Cancel** to exit this setting window without saving, or click **Default** to recover the setting to the default value.

Frame size with CRC (Bytes)	
Starting from	Set the starting frame size with CRC on this field.
Stopping at	Set the last frame size with CRC on this field.
Frame Size Step	Set the frame size to be added on each step with CRC on this field.
Custom	 Selecting the **Custom** function will enable the **Edit** button. Click the **Edit** button to pop up the **Custom Frame Size** window. ➢ **Frame Sizes:** Shows the default frame size to select. ➢ **Sort:** sort the order of the current frame sizes list as ascending or descending. ➢ **Move:** You can change the order of each frame from the frame sizes list here. ➢ **Add/Remove: Add** a new frame size to the frame sizes list in the range of 60-2036, or select a frame from the frame size list and remove it by clicking the **Remove** button. Click **OK** to save the settings, click **Cancel** to exit this setting window without saving, or click **Default** to recover the setting to the default value.
Bi-Direction	Enabling this function allows two-way direction transmitting during the test.

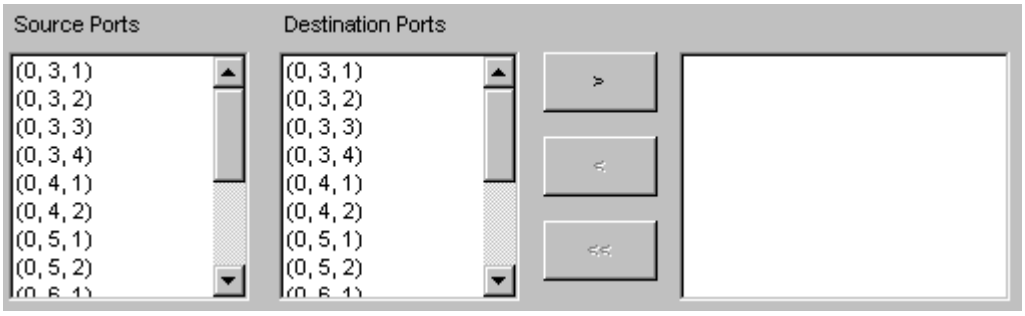
Inter Frame Gap (IFG)	
Gap Time	You can set the gap in bits between two frames.

Note: The current version only supports 88 bits. More value will be available soon.

4.2.6. Address Learning



Choose your port pair



To choose your port pair, please choose a port from Source Ports and Destination Ports, than click the > button to confirm the selection, in which the chosen port pair will be listed in the right field. To undo a port pair selection, please select the port pair from the right field, than click the < button to cancel the selected port pair.

You can also click the << button to cancel all the selected port pair.

You can also click the Reset button to cancel all the settings you made on the **Address Learning** task window.

***Note: each port is labeled as (x, y, z), where "x" is the number order of the NuStreams-2000i/600i, "y" is the number order of chassis slot and "z" is the number order of port of each module card.**

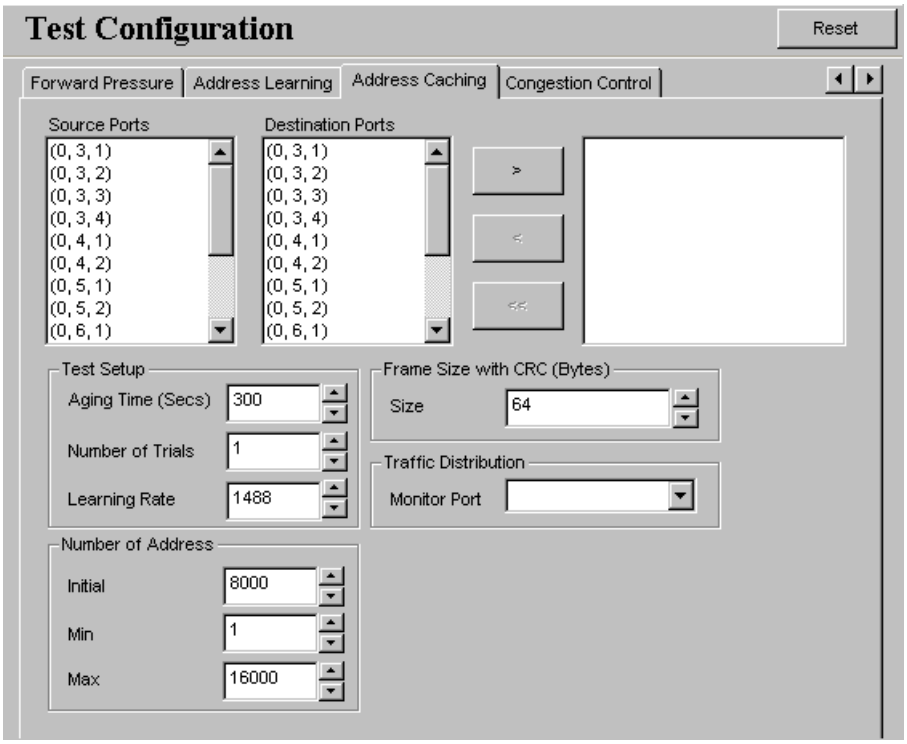
Test Setup	
Aging Time (Secs)	Set on this field the time period for refreshing the Routing Table.
Number of Trials	You can set the number of trails for this task.
Number of Address	Set on this field the number of Address for this task.

Address Learning Rate (Frame/Sec)	
Initial	Set the learning rate for the start of the test.
Min	Set the minimum learning rate for the test.
Max	Set the maximum learning rate for the test.

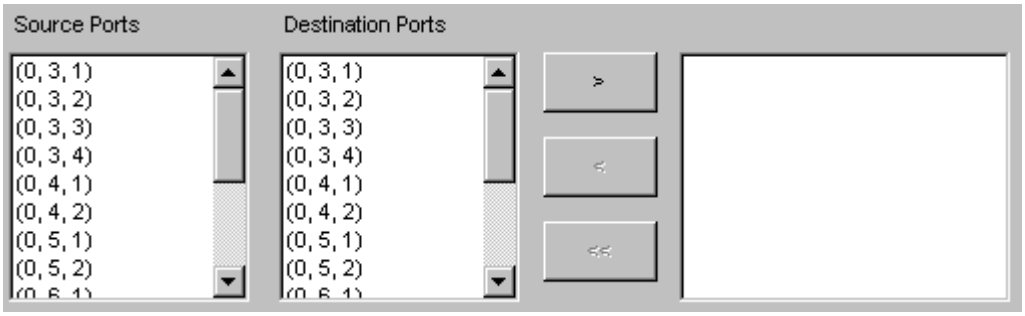
Frame Size with CRC (Bytes)	
Size	You can specify the frame size to be used for the test in which includes CRC packets.

Traffic Distribution	
Monitor Port	Select a monitor port by scrolling down this field and choosing a port from your NuStreams-2000i/600i.

4.2.7. Address Caching



Choose your port pair



To choose your port pair, please choose a port from Source Ports and Destination Ports, than click the > button to confirm the selection, in which the chosen port pair will be listed in the right field. To undo a port pair selection, please select the port pair from the right field, than click the < button to cancel the selected port pair.

You can also click the << button to cancel all the selected port pair.

You can also click the Reset button to cancel all the settings you made on the **Address Caching** task window.

***Note: each port is labeled as (x, y, z), where "x" is the number order of the NuStreams-2000i/600i, "y" is the number order of chassis slot and "z" is the number order of port of each module card.**

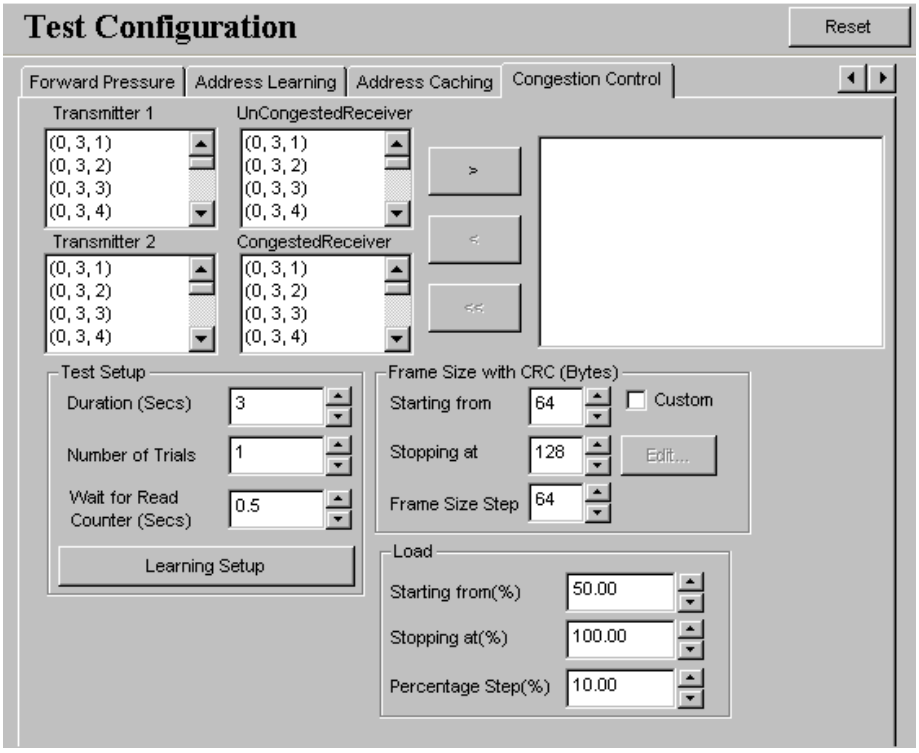
Test Setup	
Aging Time (Secs)	Set on this field the time period for refreshing the Routing Table.
Number of Trials	You can set the number of trails for this task.
Learning Rate	Set the frame rate for this test task.

Number of Address	
Initial	Set the number of MAC address for the start of the test.
Min	Set the minimum number of MAC address for the test.
Max	Set the maximum number of MAC address for the test.

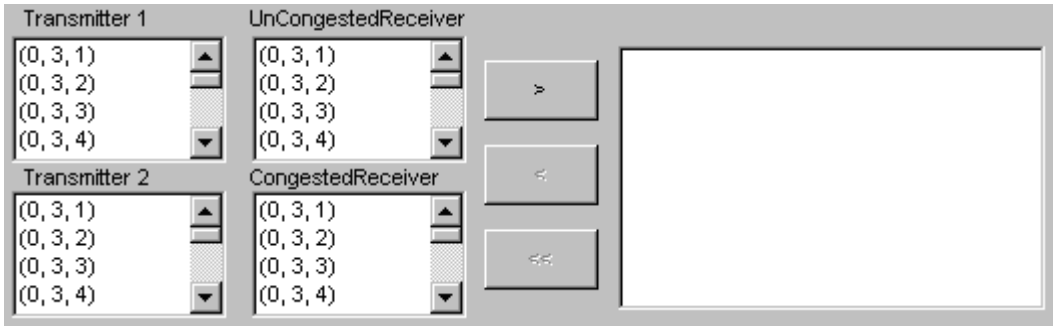
Frame Size with CRC (Bytes)	
Size	You can specify the frame size to be used for the test in which includes CRC packets.

Traffic Distribution	
Monitor Port	Select a monitor port by scrolling down this field and choosing a port from your NuStreams-2000i/600i.

4.2.8. Congestion Control



Choose your port pair

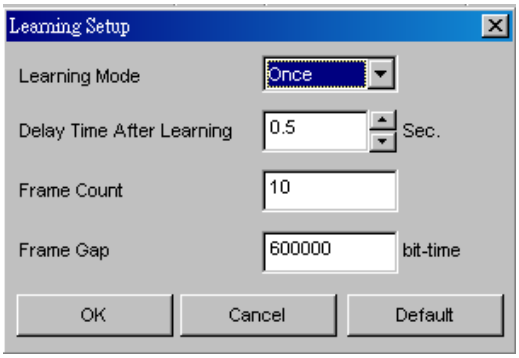


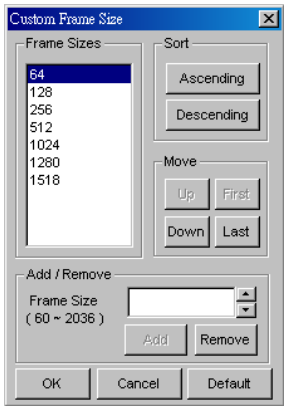
To choose your port pair, please choose a port from Transmitter 1, Transmitter 2, Uncongested Receiver and Congested Receiver field than click the [>] button to confirm the selection, in which the chosen port pair will be listed in the right field. To undo a port pair selection, please select the port pair from the right field, than click the [<] button to cancel the selected port pair.

You can also click the [<<] button to cancel all the selected port pair.

You can also click the [Reset] button to cancel all the settings you made on the **Congestion Control** task window.

***Note: each port is labeled as (x, y, z), where "x" is the number order of the NuStreams-2000i/600i, "y" is the number order of chassis slot and "z" is the number order of port of each module card.**

Test Setup	
Duration (Sec)	The time duration of each test.
Number of Trials	The number of the test trial.
Wait for Read Counter (Sec)	The time gap for showing the counter result.
Learning Setup	 ➢ **Learning Mode:** Scroll down to choose Learning Mode as **Never**, **Once** or **Every Trial**. ➢ **Delay Time After Learning:** Set the time gap between Learning and the next step. ➢ **Frame Count:** The number of frame to be sent. ➢ **Frame Gap:** The gap in bits between frames. Click **OK** to save the settings, click **Cancel** to exit this setting window without saving, or click **Default** to recover the setting to the default value.

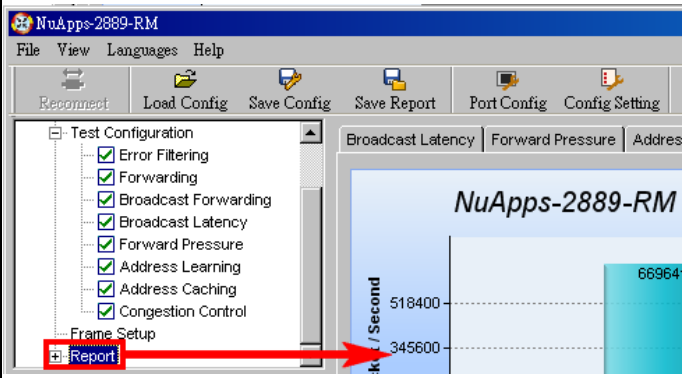
Frame size with CRC (Bytes)	
Starting from	Set the starting frame size with CRC on this field.
Stopping at	Set the last frame size with CRC on this field.
Frame Size Step	Set the frame size to be added on each step with CRC on this field.
Custom	 Selecting the **Custom** function will enable the **Edit** button. Click the **Edit** button to pop up the **Custom Frame Size** window. ➢ **Frame Sizes:** Shows the default frame size to select. ➢ **Sort:** sort the order of the current frame sizes list as ascending or descending. ➢ **Move:** You can change the order of each frame from the frame sizes list here. ➢ **Add/Remove: Add** a new frame size to the frame sizes list in the range of 60-2036, or select a frame from the frame size list and remove it by clicking the **Remove** button. Click **OK** to save the settings, click **Cancel** to exit this setting window without saving, or click **Default** to recover the setting to the default value.

Load	
Starting from(%)	The initial loading percentage.
Stopping at(%)	The end loading percentage.
Percentage Step(%)	The percentage of loading to be added at each step.

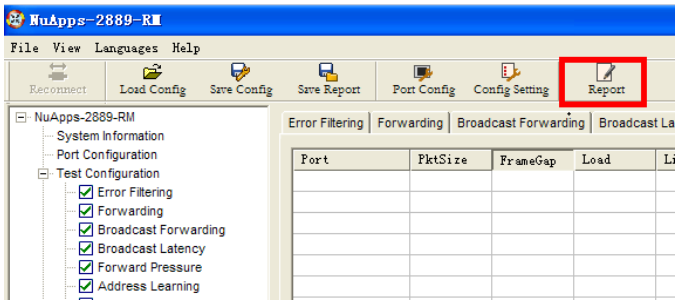
5. Result

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

Accessing Report

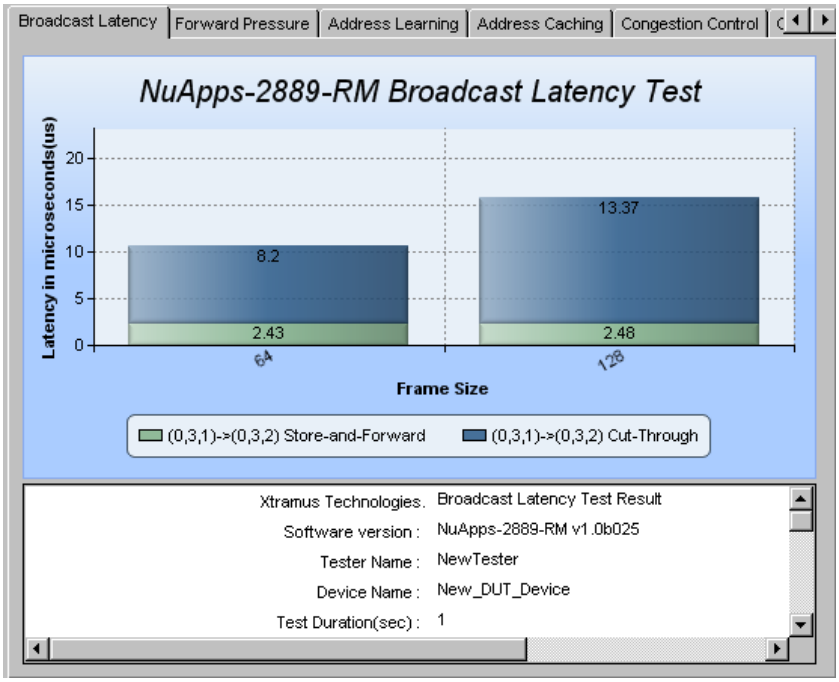


- Click **Report** located on **System Info/ Configuration List**.

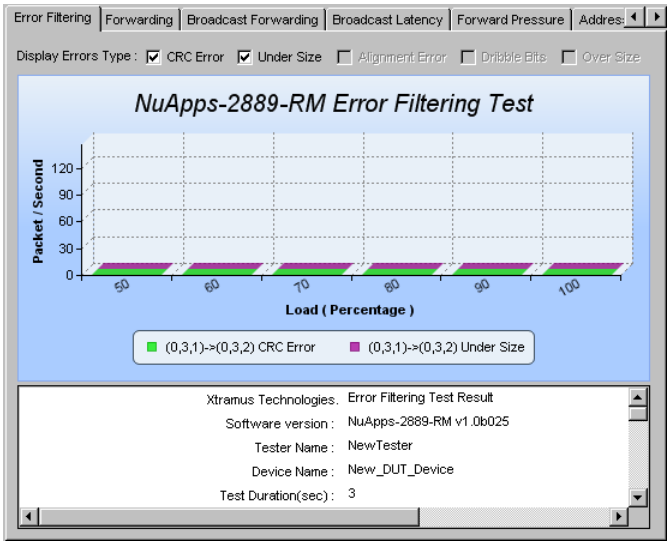


- Click the **Report** button located on **Tool Bar**.

During the tests, charts for the results of each test (**Error Filtering**, **Forwarding**, **Broadcast Forwarding**, **Broadcast Latency, Forward Pressure, Address Learning, Address Caching and Congestion Control**) will be displayed on the **Main Display Screen**. NuApps-2889-RM 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.

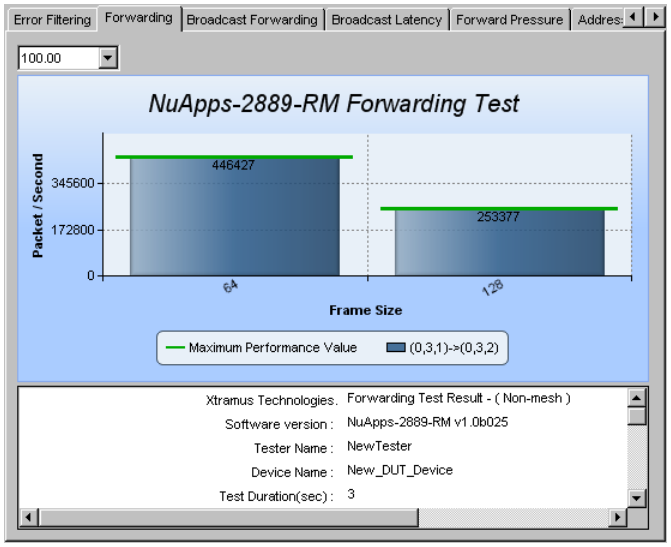


Error Filtering Test Result Chart



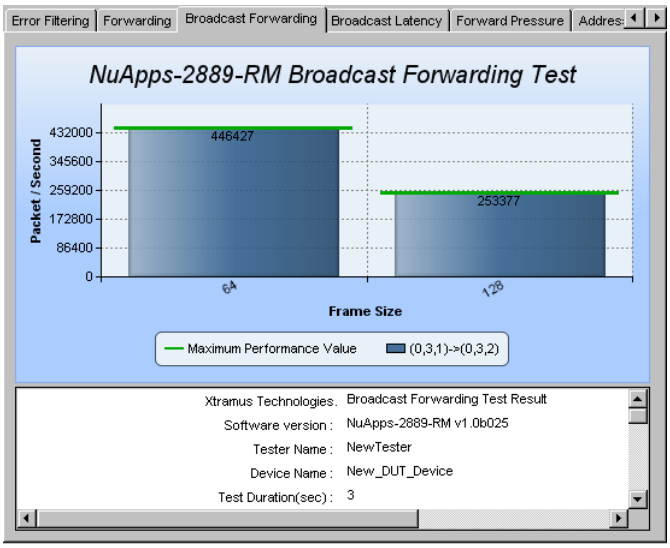
This chart uses **Packet/Second** as Y-Axis, and **Load (Percentage)** as X-Axis to show DUT's Error Filtering performance.

Forwarding Test Result Chart



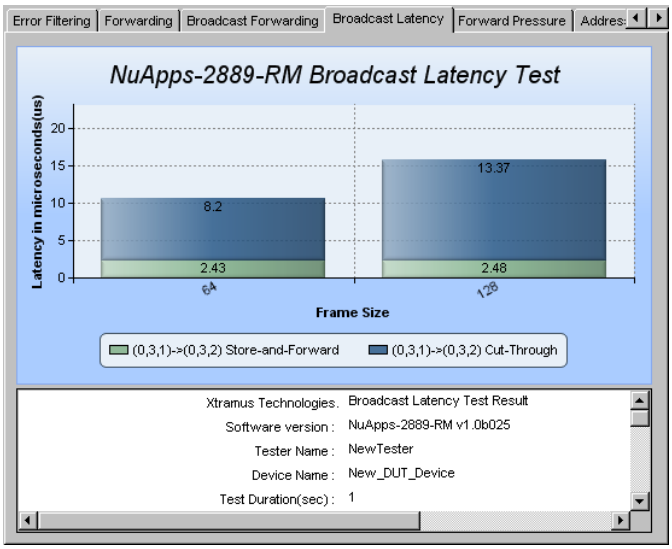
This chart uses **Packet/Second** as Y-Axis, and **Frame Size** as X-Axis to show DUT's Forwarding performance.

Broadcast Forwarding Test Result Chart



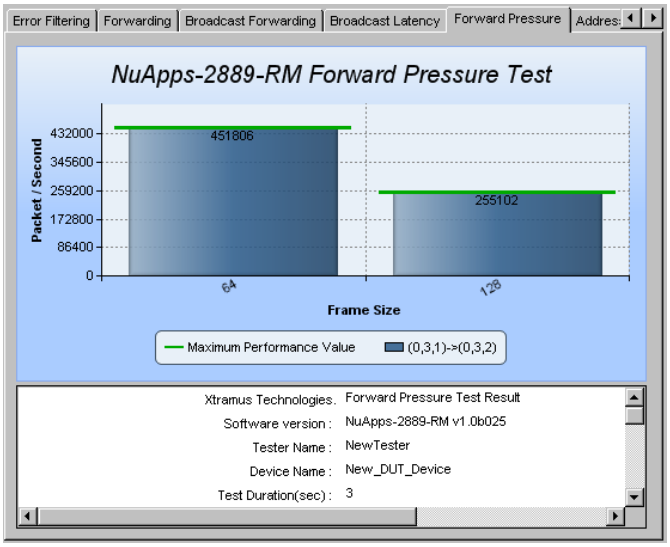
This chart uses **Packet/Second** as Y-Axis, and **Frame Size** as X-Axis to show DUT's Broadcast Forwarding performance.

Broadcast Latency Test Result Chart



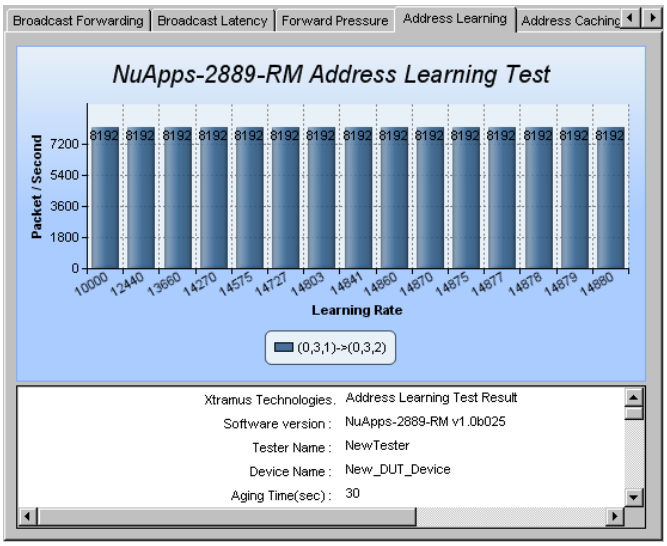
This chart uses **Latency in Microsecond (us)** as Y-Axis, and **Frame Size** as X-Axis to show DUT's Broadcast Latency test result.

Forward Pressure Test Result Chart



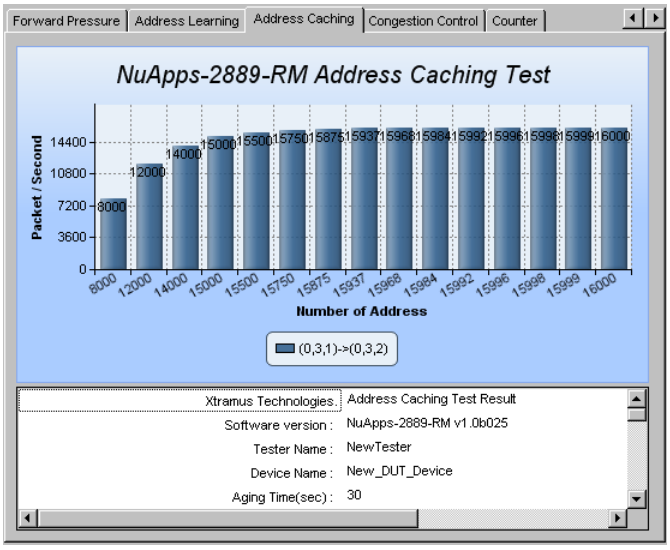
This chart uses **Packet/Second** as Y-Axis, and **Frame Size** as X-Axis to show DUT's Forward Pressure performance.

Address Learning Test Result Chart



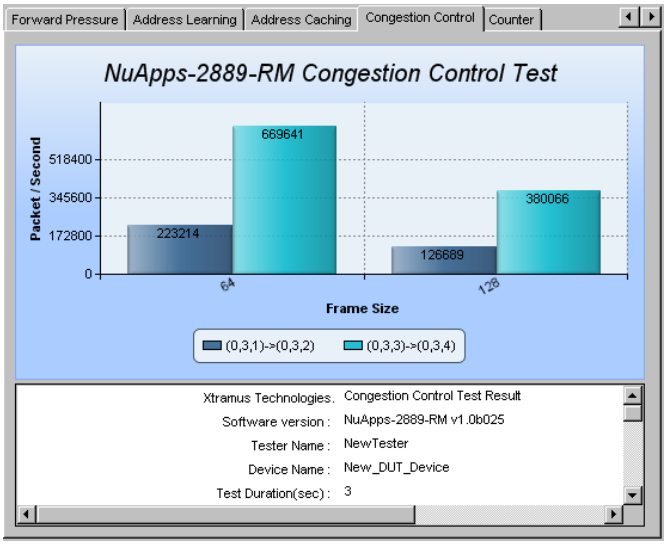
This chart uses **Packet/Second** as Y-Axis, and **Learning Rate** as X-Axis to show DUT's Address Learning performance.

Address Caching Test Result Chart



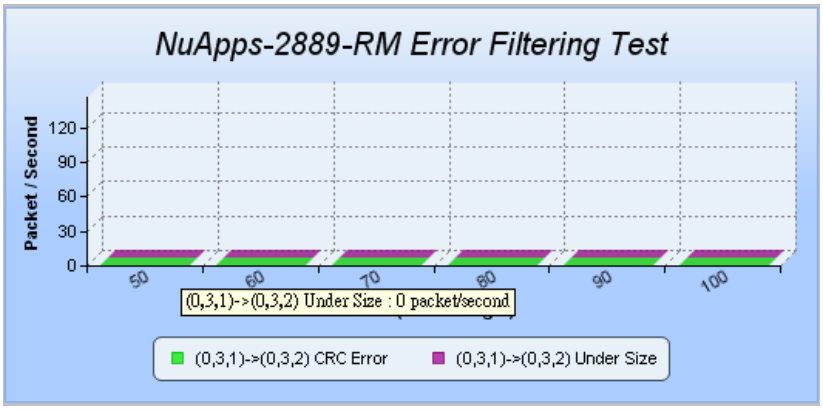
This chart uses **Packet/Second** as Y-Axis, and **Number of Address** as X-Axis to show DUT's Address Caching performance.

Congestion Control Test Result Chart

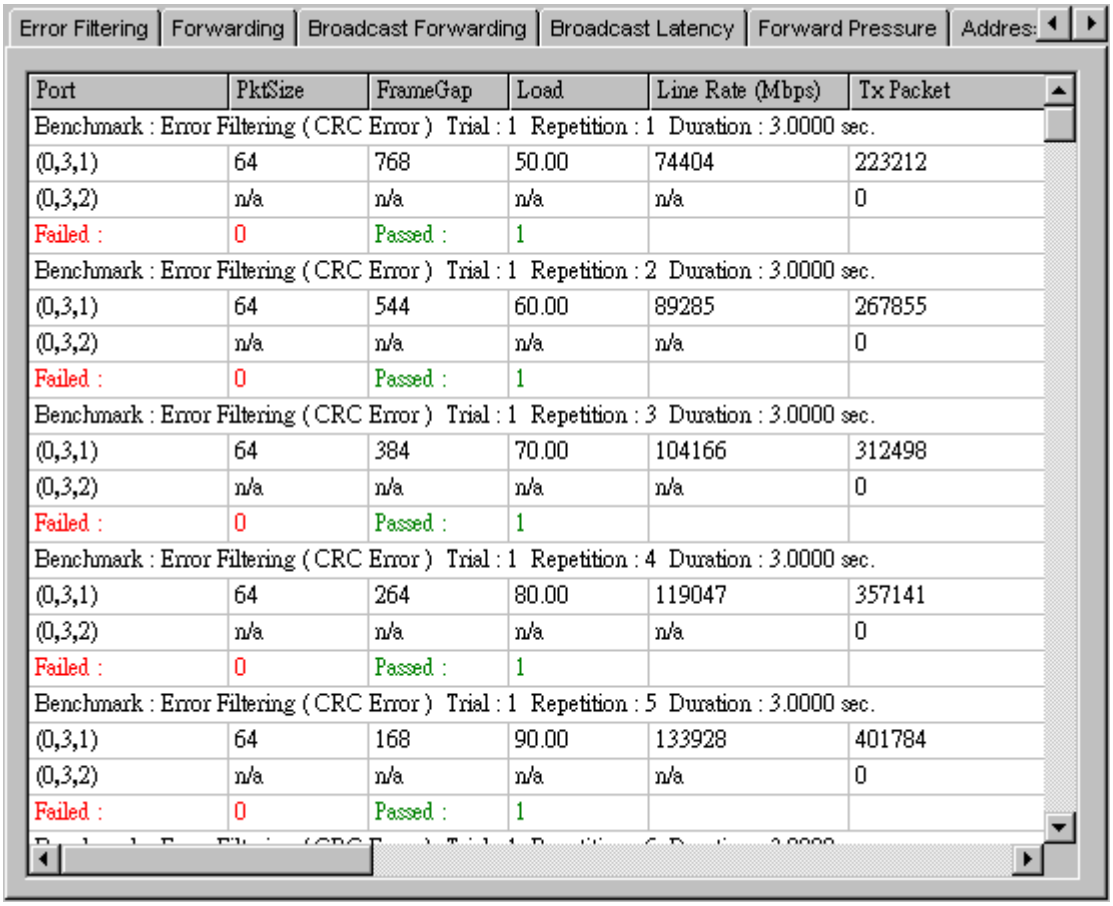


This chart uses **Packet/Second** as Y-Axis, and **Frame Size** as X-Axis to show DUT's Congestion Control test result.

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 right.



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.



Error Filtering | Forwarding | Broadcast Forwarding | Broadcast Latency | Forward Pressure | Addres

Port	PktSize	FrameGap	Load	Line Rate (Mbps)	Tx Packet
Benchmark : Error Filtering (CRC Error) Trial : 1 Repetition : 1 Duration : 3.0000 sec.					
(0,3,1)	64	768	50.00	74404	223212
(0,3,2)	n/a	n/a	n/a	n/a	0
Failed :	0	Passed :	1		
Benchmark : Error Filtering (CRC Error) Trial : 1 Repetition : 2 Duration : 3.0000 sec.					
(0,3,1)	64	544	60.00	89285	267855
(0,3,2)	n/a	n/a	n/a	n/a	0
Failed :	0	Passed :	1		
Benchmark : Error Filtering (CRC Error) Trial : 1 Repetition : 3 Duration : 3.0000 sec.					
(0,3,1)	64	384	70.00	104166	312498
(0,3,2)	n/a	n/a	n/a	n/a	0
Failed :	0	Passed :	1		
Benchmark : Error Filtering (CRC Error) Trial : 1 Repetition : 4 Duration : 3.0000 sec.					
(0,3,1)	64	264	80.00	119047	357141
(0,3,2)	n/a	n/a	n/a	n/a	0
Failed :	0	Passed :	1		
Benchmark : Error Filtering (CRC Error) Trial : 1 Repetition : 5 Duration : 3.0000 sec.					
(0,3,1)	64	168	90.00	133928	401784
(0,3,2)	n/a	n/a	n/a	n/a	0
Failed :	0	Passed :	1		

You can save the test results by:

Saving Test Results	
Save Report	Click the **Save Report** 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.

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