xtramus

DApps-2889
User's Manual

Foreword

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Revision History

Date	USM Version	History
2012/07/11	1.0	First Draft Version
2012/09/10	1.1	1. Deleting the description of DApps-2889 supports operation system Windows 2000.(Page 5)
2018/02/06	1.2	1. Modify NuDOG-101T speed LED description.(Page 20)
2020/09/23	1.3	1. Add note about connect device to PC. 2. Add NuDOG-802.

Table of Contents

1. DApps-2889 Overview

DApps-2889 is an accurate and efficient software suite for mass-production scale test or batch network test. Various packet generation and reception testing items could be configured to pre-defined testing modes. The utility of DApps-2889 can load testing models easily. All simple and visualized results and detailed testing logs are available to access upon demand.

Devices Supporting DApps-2889		
NuDOG-301C	NuDOG-801/802	NuDOG-101T

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

OS	Windows XP	Windows Vista/7
CPU	Pentium 1.6 GHz or higher	
RAM	512MB RAM	1GB RAM
HDD	10GB of available hard disk space	

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

Please see the sections down below for detailed information regarding to **NuDOG-301C**, **NuDOG-801/802**, and **NuDOG-101T**.

2. NuDOG-301C Descriptions

2.1. NuDOG-301C Overview

NuDOG-301C is a handheld device with two Gigabit ports for Ethernet testing. The main functions of NuDOG-301C include multi-streams generation, TAP/Loopback test, and NIC emulation.

Connecting NuDOG-301C to its mini-USB port makes it possible for system configurations and managements. NuDOG-301C is an ideal device for in-field testing.

NuDOG-301C can work along with a series of utility software that qualify industrial standards such as RFC 2889 and RFC 2544. With these utilities, NuDOG-301C is able to conduct throughput test, latency test, error filtering test, forwarding test, and so on. Utility software can provide a user-friendly interface for different test configurations when setting test parameters and criteria. More optional software is available for extended test requirements.

With its unique Universal Stream Counter (USC), NuDOG-301C offers real-time statistics of network events during packet monitoring and capturing.

With these advantageous features, NuDOG-301C is your best partner for LAB researching and in-field troubleshooting.
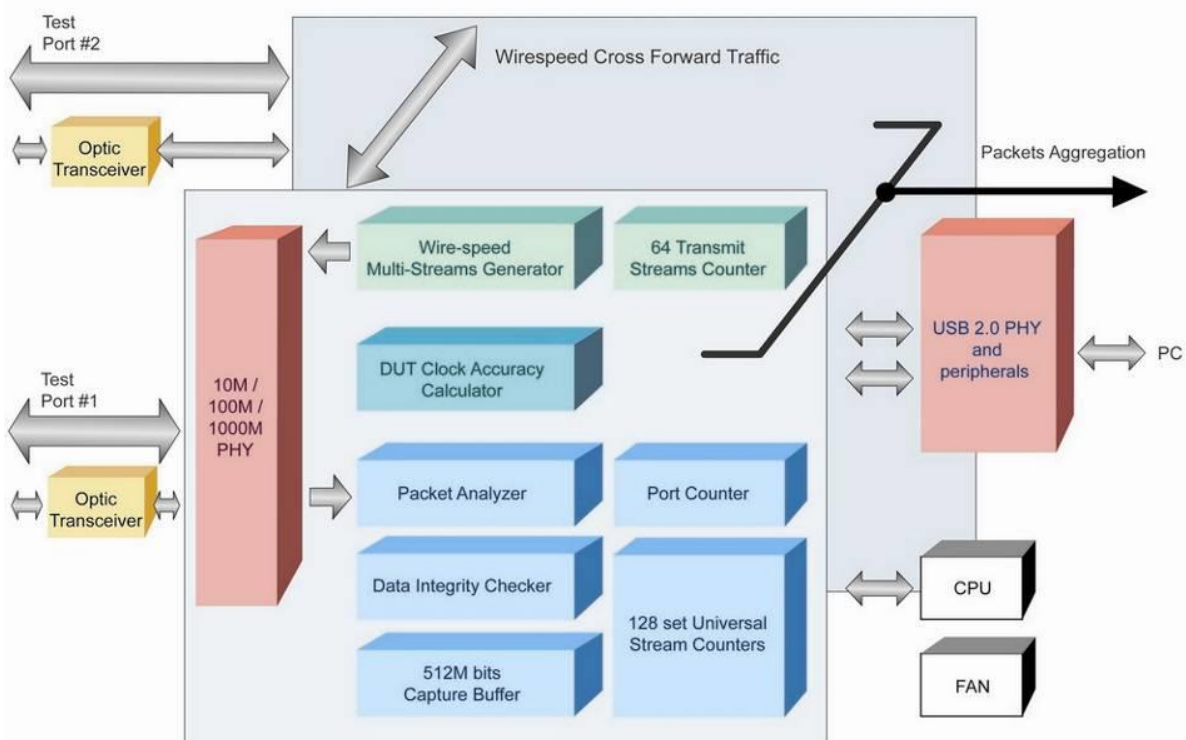
2.2. Features & Advantages of NuDOG-301C

- Hardware based wirespeed streams generation, analysis, network TAP and NIC
- High precision performance for measuring throughput, latency, packet loss and disordered sequence
- Wirespeed traffic capturing with programmable filter and trigger criteria
- Supports Universal Stream Counter (USC) with 128 streams
- RFC 2544 test suite
- RFC 2889 test suite
- Layer 1 and Layer 2 loopback test
- High precision 1 ppm temperature-compensated oscillator provides accurate clock speed to ensure the reliability of the tests
- Adding errors in transmitted traffic to simulate and test abnormal situations
- Real-time statistics for each port, including transmitted/received frame for VLAN, IPv4, IPv4 fragment, IPv4 extension , ICMP, ARP, total bytes/packets, CRC, IPCS error and over-and-under size frames
- Utility software with user-friendly interface that supports various parameter configurations and meets various test requirements
- 512Mbits wirespeed packet capture buffer per port

2.3. NuDOG-301C Applications in Different Modes
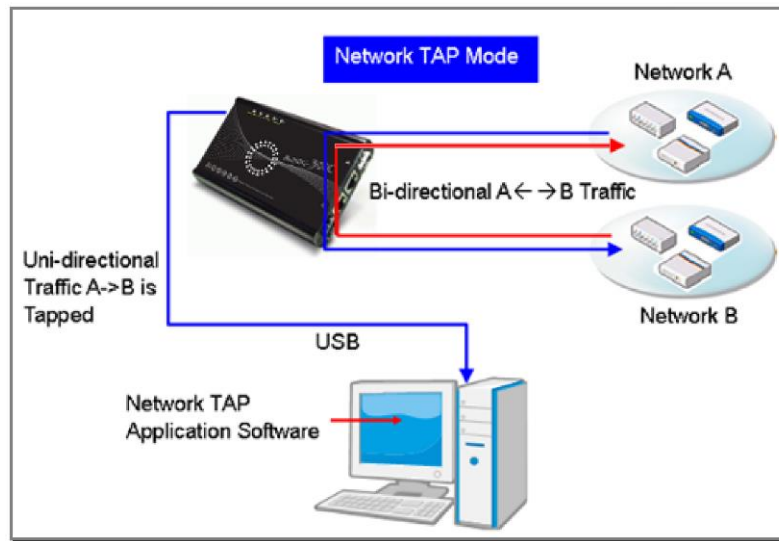
Stream Generation Mode
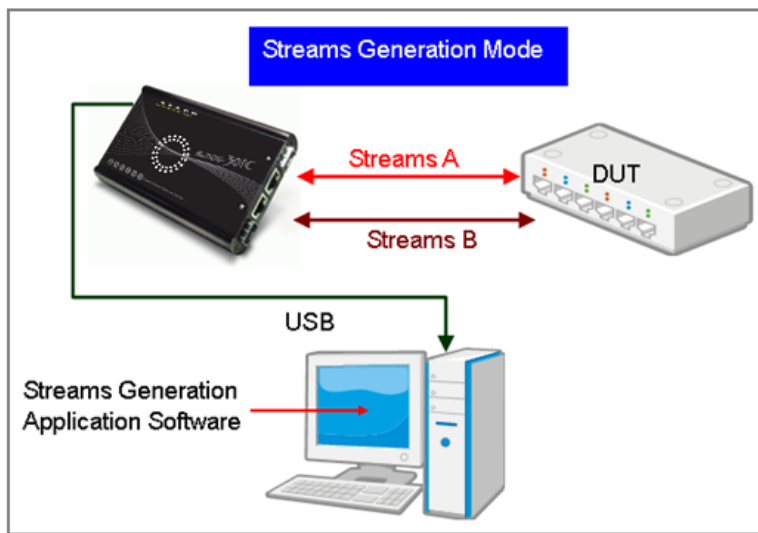
In Streams Generation mode, NuDOG-301C generates bi-directional network streams for test requirements as the illustration above.
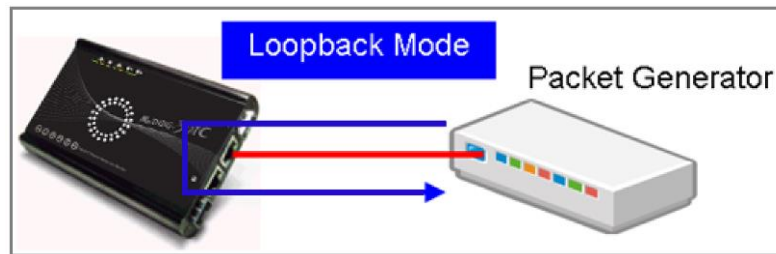
Both NuDOG-301C's Port A and Port B can generate and receive test streams. The test streams are sent and returned to the same NuDOG-301C for DUT (device under test) analysis.

TAP/Loopback Mode

TAP Mode

Loopback Mode

In TAP mode, NuDOG-301C can monitor any data that flows through it. Network TAP is a method of monitoring network's situation dynamically without interference. NuDOG-301C can tap bi-directional or uni-directional traffic from different sides (port A and port B) and also provides abundant packet counters. In Loopback mode, NuDOG-301C resends the incoming streams back to the source.

NIC Mode
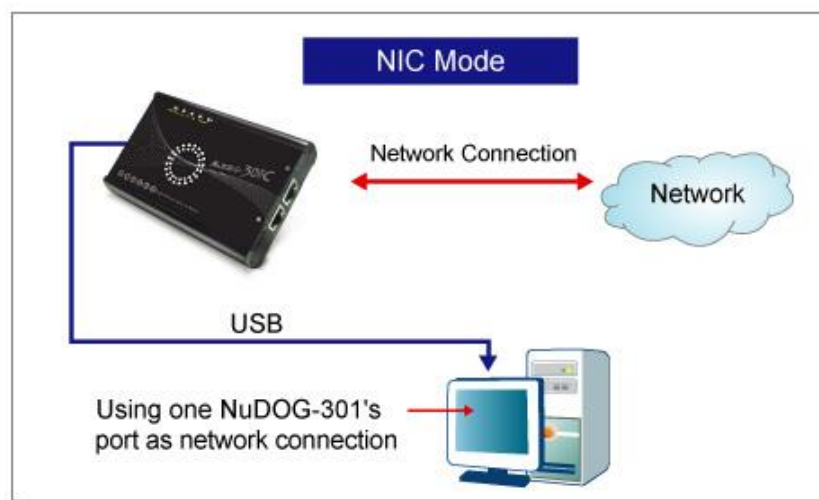
In this mode, NuDOG-301C simulates network interface card (NIC).

2.4. NuDOG-301C Interface Ports

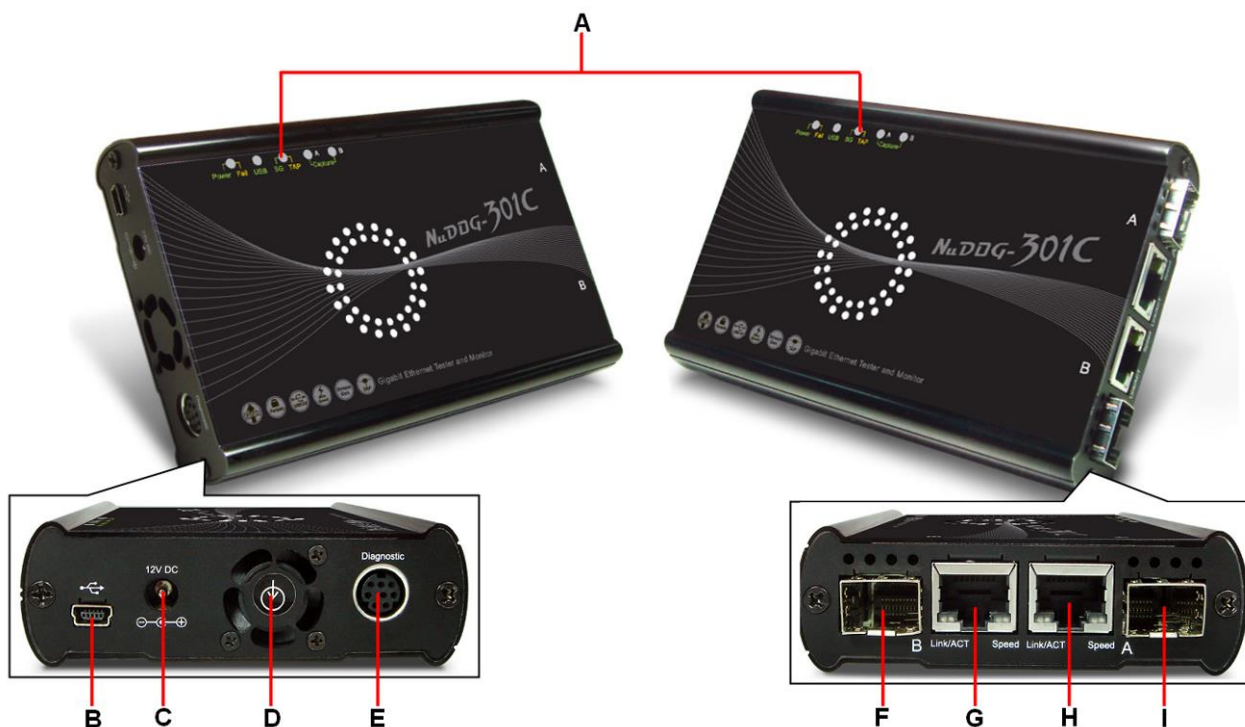| NuDOG-301C Hardware Overview			
A	**LEDs**	LEDs that displays NuDOG-301C's status.	
B	**Mini-USB Port***	5 Pin Mini-B Receptacle USB Port. You can manage, configure, or update firmware/FPGA when connecting NuDOG-301C to your PC. While under TAP mode, this mini-USB port can also re-direct tapped packets to PC.	
C	**Power Jack**	12V DC Power Jack for connecting external power adapter.	
D	**Cooling FAN**	Fan hole with internal fan for ventilation.	
E	**Diagnostic Port**	8-Pin Mini-DIN Receptacle Diagnostic Port	
F	**Port B - SFP Port**	1000 Mbps Full Duplex SFP Port B	Only one port can be used at the same time.
G	**Port B - RJ45 Port**	10/100/1000 Mbps Half/Full RJ45 Port B	
H	**Port A - SFP Port**	1000 Mbps Full Duplex SFP Port A	Only one port can be used at the same time.
I	**Port A - RJ45 Port**	10/100/1000 Mbps Half/Full RJ45 Port A	

*Please note that when connecting NuDOG-301C with PC via its USB port, DO NOT use a USB hub, and DO NOT connect NuDOG-301C with PC before NuDOG-301C is powered on.

LED	Status	Description
Power/Fail	**Green Blinking**	Power is ON and working properly
	Yellow Blinking	System failed
USB	**Green Blinking**	USB of this device is linked to PC
SG/TAP	**Green**	NuDOG-301C is working under Stream Generation Mode
	Yellow	NuDOG-301C is working under TAP Mode
	OFF	NuDOG-301C is working under NIC (Network Interface Card) mode
Capture A/B	**Green**	Port A/B is under Capturing Mode
Link/ACT	**Green ON**	The RJ45 Port is connected to DUT/Network
	Green Blinking	NuDOG-301C is transmitting or receiving data
Speed	**Green ON**	1000Mbps connection
	Green Blinking	100Mbps connection
	OFF	10Mbps connection if Link/ACT is ON or blinking

3. NuDOG-801/802 Descriptions

3.1. NuDOG-801/802 OVERVIEW

NuDOG-801/802 is a handheld device with two 10 Gigabit SFP+ Ports for Ethernet testing, and NuDOG-802 also supports 10G /5G/2.5G/1G/100Mbps electrical port with specific NBase-T copper SFP+ transceiver. The main functions of NuDOG-801/802 include multi-streams generation and NIC emulation.

Connecting NuDOG-801/802 to its Standard-B Receptacle USB Port makes it possible for system configurations and managements. NuDOG-801/802 is an ideal device for in-field testing.

NuDOG-801/802 can work along with a series of utility software that qualify industrial standards such as RFC 2889 and RFC 2544. With these utilities, NuDOG-801/802 is able to conduct throughput test, latency test, error filtering test, forwarding test, and so on. Xtramus' utility software provides a user-friendly interface for different test configurations when setting test parameters and criteria. More optional software is available for extended test requirements.

With its unique Universal Stream Counter (USC), NuDOG-801/802 offers real-time statistics of network events during packet monitoring and capturing.

With these advantageous features, NuDOG-801/802 is your best partner for LAB researching and in-field troubleshooting.


NuDOG-801C block diagram
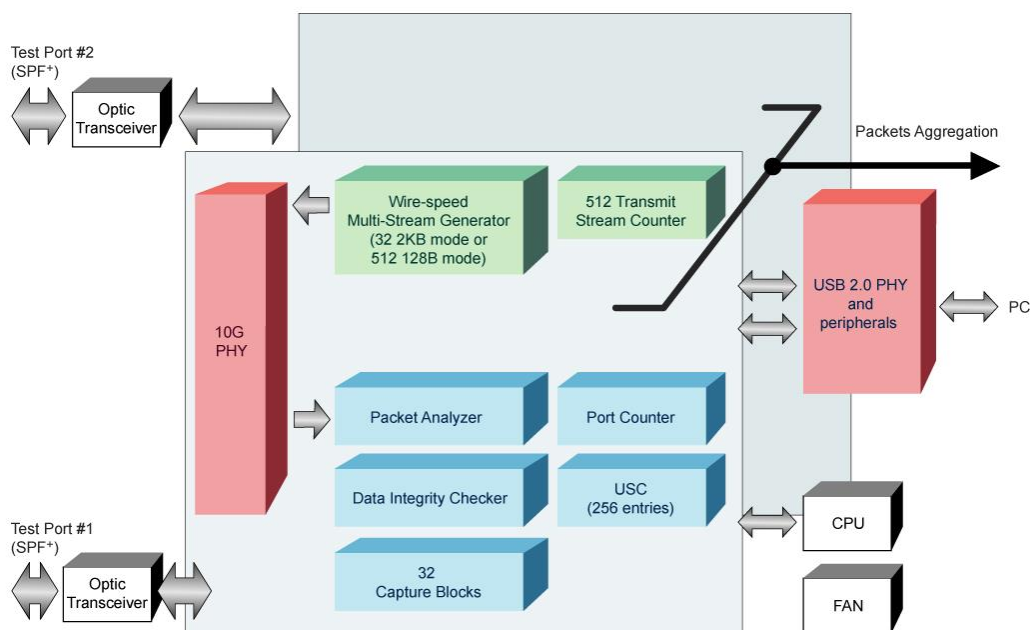
3.2. Features & Advantages of NuDOG-801/802

➢ Hardware based wirespeed streams generation, analysis, and NIC

➢ High precision performance for measuring throughput, latency, packet loss and disordered sequence

➢ Wirespeed traffic capturing with programmable filter and trigger criteria

➢ Supports Universal Stream Counter (USC) with 256 streams

➢ RFC 2544 test suite

➢ RFC 2889 test suite

➢ High precision 1 ppm temperature-compensated oscillator provides accurate clock speed to ensure the reliability of the tests

➢ Adding errors in transmitted traffic to simulate and test abnormal situations

➢ Real-time statistics for each port, including transmitted/received frame for VLAN, IPv4, IPv4 fragment, IPv4 extension , ICMP, ARP, total bytes/packets, CRC, IPCS error and over-and-under size frames

➢ Supports IPv6

➢ Utility software with user-friendly interface that supports various parameter configurations and meets various test requirements

➢ 32 Capture Blocks for each Test Port

3.3. NuDOG-801/802 Applications in Different Modes
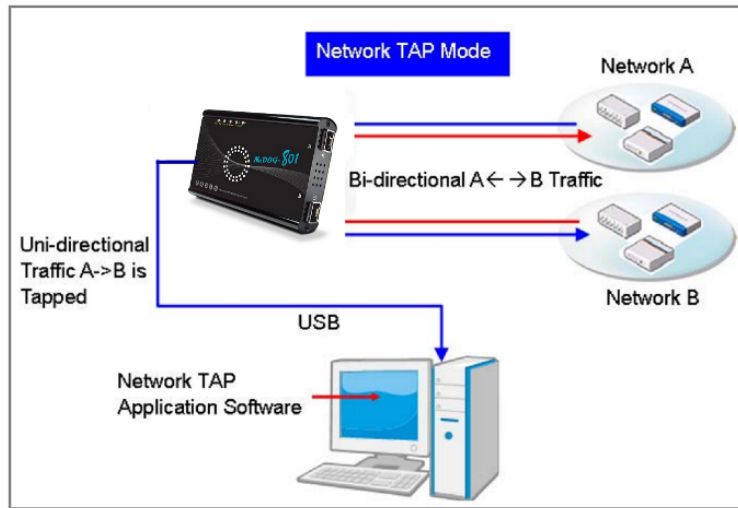
Stream Generation Mode
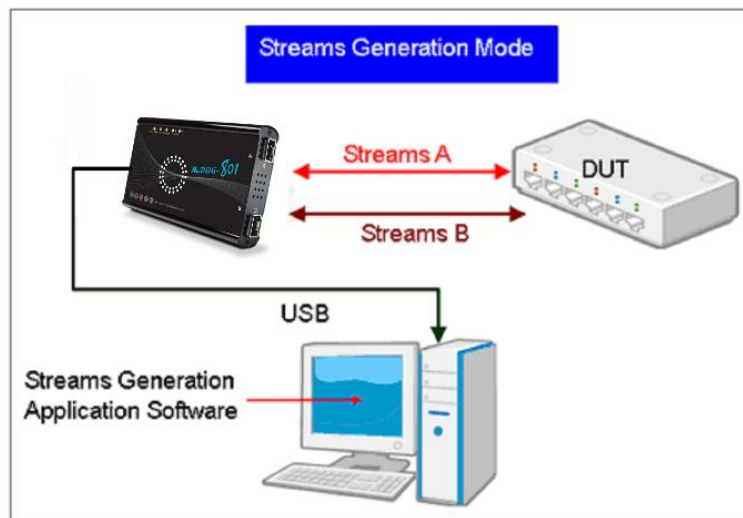
In Streams Generation mode, NuDOG-801/802 generates bi-directional network streams for test requirements as the illustration above.
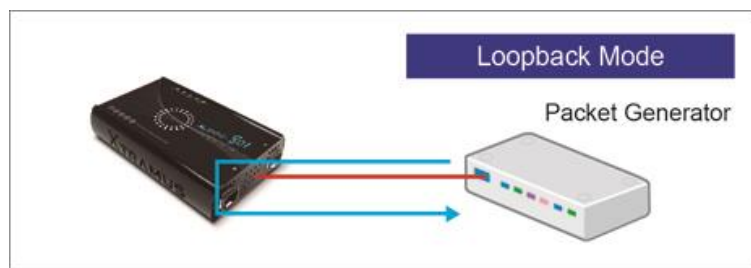
Both NuDOG-801/802's Port A and Port B can generate and receive test streams. The test streams are sent and returned to the same NuDOG-801/802 for DUT (device under test) analysis.

TAP/Loopback Mode

TAP Mode

Loopback Mode

In TAP mode, NuDOG-801/802 can monitor any data that flows through it. Network TAP is a method of monitoring network's situation dynamically without interference. NuDOG-801/802 can tap bi-directional or uni-directional traffic from different sides (port A and port B) and also provides abundant packet counters. In Loopback mode, NuDOG-801/802 resends the incoming streams back to the source.

NIC Mode
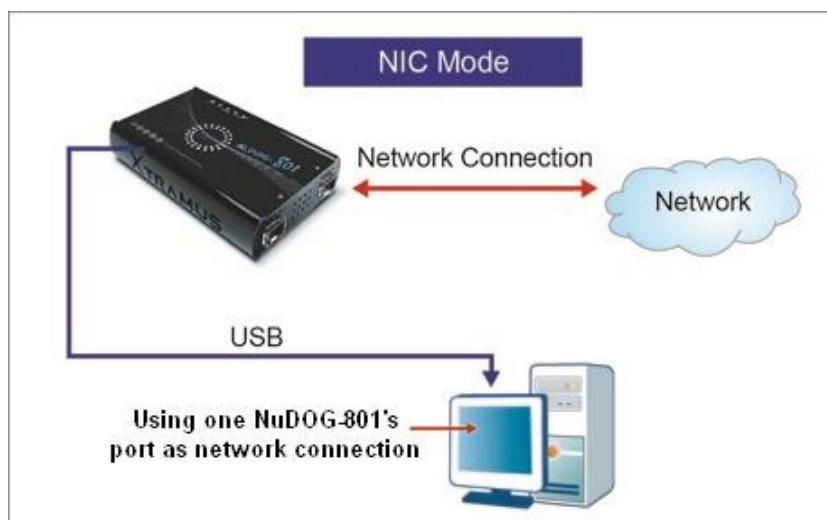
In this mode, NuDOG-801/802 simulates network interface card (NIC).

3.4. NuDOG-801/802 Interface Ports

NuDOG-801/802 Hardware Overview		
A	**LEDs**	LEDs that displays NuDOG-801/802's status.
B	**Mini-USB Port***	5 Pin Mini-B Receptacle USB Port. You can manage, configure, or update firmware/FPGA when connecting NuDOG-801/802 to your PC. While under TAP mode, this mini-USB port can also re-direct tapped packets to PC.
C	**Power Jack**	12V DC Power Jack for connecting external power adapter.
D	**Cooling FAN**	Fan hole with internal fan for ventilation.
E	**Diagnostic Port**	8-Pin Mini-DIN Receptacle Diagnostic Port
F	**10 Gigabit Wirespeed SFP⁺ Port**	10 Gigabit Wirespeed SFP+ Port

*Please note that when connecting NuDOG-801/802 with PC via its USB port, DO NOT use a USB hub, and DO NOT connect NuDOG-801/802 with PC before NuDOG-801/802 is powered on.

3.5. NuDOG-801/802 LED Status

LED	Status	Description
Power/Fail	Green Blinking	Power is ON and working properly
	Yellow Blinking	System failed
USB	Green Blinking	USB of this device is linked to PC
Error/Loss	Yellow Blinking	CRC error or packet loss is occurring
	OFF	No CRC error or packet loss is occurring
Capture A/B	Green	Port A/B is under Capturing Mode
Link/ACT	Green ON	The RJ45 Port is connected to DUT/Network
	Green Blinking	NuDOG-801/802 is transmitting or receiving data

4. NuDOG-101T Descriptions

4.1. NuDOG-101T OVERVIEW

NuDOG-101T is a handheld device with two ports for Ethernet testing. The main functions of NuDOG-101T include multi-streams generation, TAP/Loopback test, and NIC emulation.

Connecting NuDOG-101T to its mini-USB port makes it possible for system configurations and managements. NuDOG-101T is an ideal device for in-field testing.

NuDOG-101T can work along with a series of utility software that qualify industrial standards such as RFC 2889 and RFC 2544. With these utilities, NuDOG-101T is able to conduct throughput test, latency test, error filtering test, forwarding test, and so on. The utility software provides a user-friendly interface for making different test configurations and setting test parameters and criteria. More optional software is available for extended test requirements.

With its unique Universal Stream Counter (USC), NuDOG-101T offers real-time statistics of network events during packet monitoring and capturing.

With these advantageous features, NuDOG-101T is your best partner for LAB researching and in-field troubleshooting.


NuDOG-101 block diagram
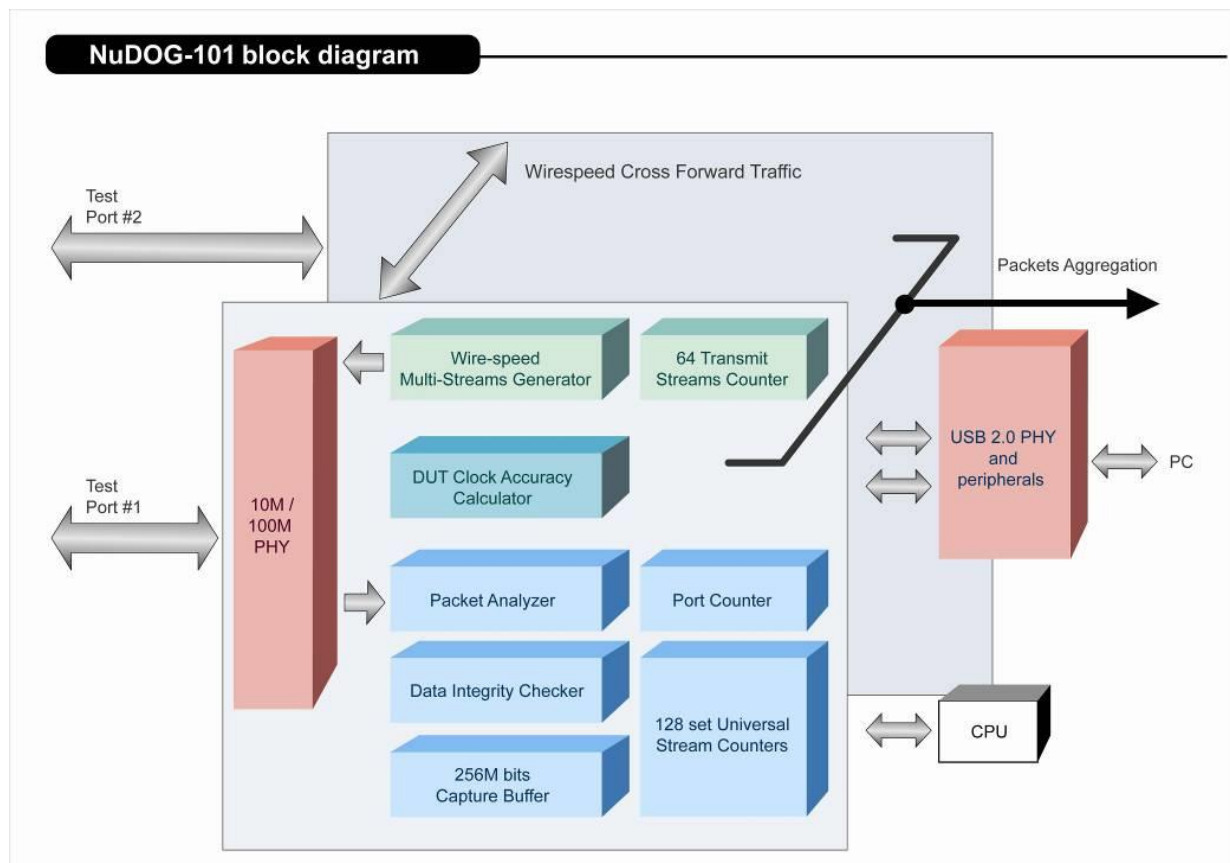
4.2. Features & Advantages of NuDOG-101T

➢ Hardware based wirespeed streams generation, analysis, network TAP and NIC

➢ High precision performance for measuring throughput, latency, packet loss and disordered sequence

➢ Wirespeed traffic capturing with programmable filter and trigger criteria

➢ Supports Universal Stream Counter (USC) with 128 streams

➢ RFC 2544 test suite

➢ RFC 2889 test suite

➢ Layer 1 and Layer 2 loopback test

➢ High precision 1 ppm temperature-compensated oscillator provides accurate clock speed to ensure the reliability of the tests

➢ Injecting errors in transmitted traffic to simulate and test abnormal situations

➢ Real-time statistics for each port, including transmitted /received frame for VLAN, IPv4, IPv4 fragment, IPv4 extension , ICMP, ARP, total bytes/packets, CRC, IPCS error and over-and-under size frames

➢ User-friendly interface that supports various parameter configurations and meets various test requirements

➢ 256Mbits packet capture buffer per port

4.3. NuDOG-101T Applications in Different Modes
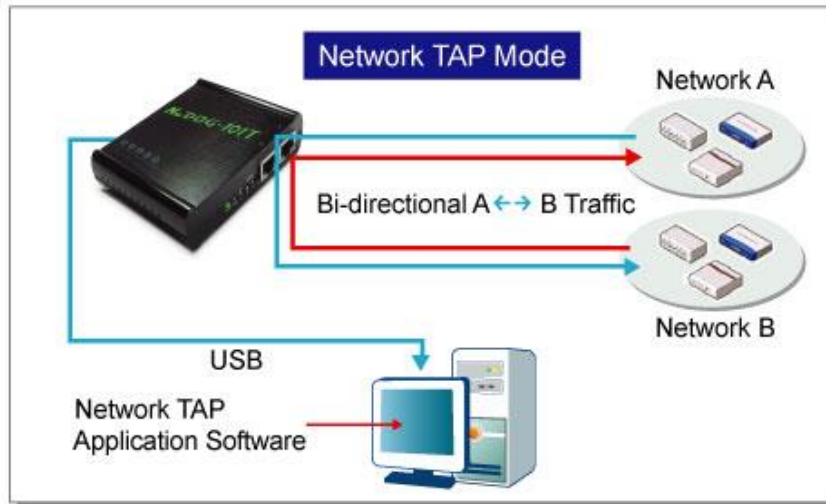
Stream Generation Mode
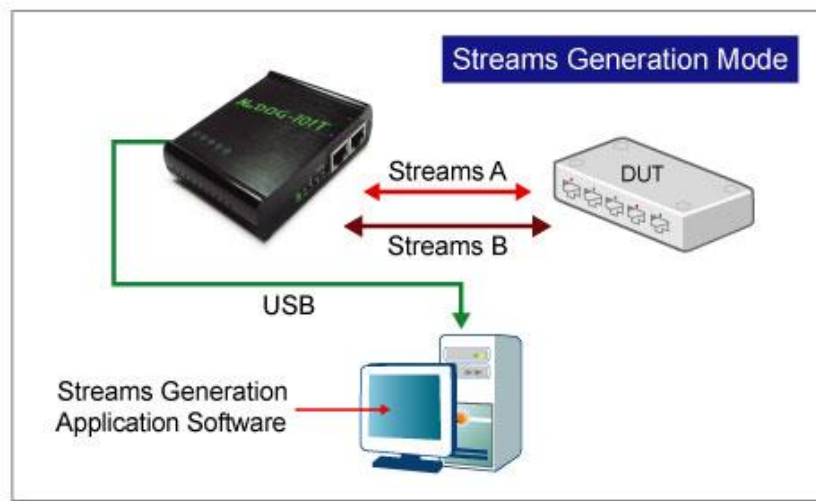
In Streams Generation mode, NuDOG-101T generates bi-directional network streams for test requirements as the illustration above.
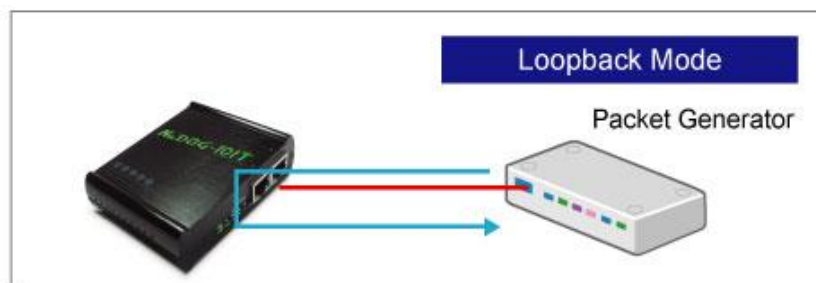
Both NuDOG-101T's Port A and Port B can generate and receive test streams. The test streams are sent and returned to the same NuDOG-101T for DUT (device under test) analysis.

TAP Mode

Loopback Mode

In TAP mode, NuDOG-101T can monitor any data that flows through it. Network TAP is a method of monitoring network's situation dynamically without interference. NuDOG-101T can tap bi-directional or uni-directional traffic from different sides (port A and port B) and also provides abundant packet counters. In Loopback mode, NuDOG-101T resends the incoming streams back to the source.

NIC Mode
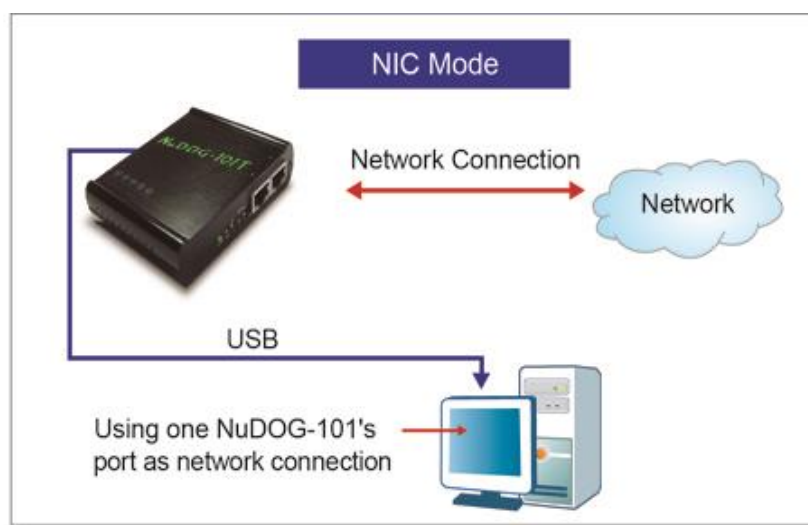
In this mode, NuDOG-101T simulates network interface card (NIC).

4.4. NuDOG-101T Interface Ports

NuDOG-101T Hardware Overview	
A	Mini-USB Port for connecting NuDOG-101T to PC or for power supply.
B	LEDs that display NuDOG-101T's system status.
C	Interface Port A/B for connecting NuDOG-101T to DUT or network.

*Please note that when connecting NuDOG-101T with PC via its USB port, DO NOT use a USB hub.
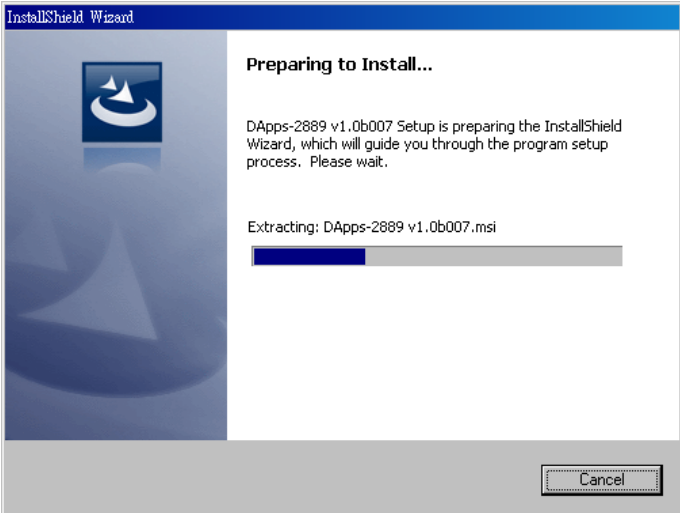
4.5. NuDOG-101T LED Status

LED	Status	Description
Power	Green Blinking	Power is ON and working properly
	Yellow Blinking	System failed
USB	Green Blinking	USB of this device is linked to PC
PG/TAP	Green	NuDOG-101T is working under Packet Generation Mode
	Yellow	NuDOG-101T is working under TAP Mode
	OFF	NuDOG-101T is working under NIC (Network Interface Card) mode
Capture A/B	Green	Port A/B is under Capturing Mode
Link/ACT	Green ON	The RJ45 Port is connected to DUT/Network
	Green Blinking	NuDOG-101T is transmitting or receiving data
Speed	Green ON	100Mbps connection
	OFF	10Mbps connection if Link/ACT is ON or blinking

5. Software Installation and Uninstallation for DApps-2889

Please follow the steps down below to install DApps-2889:

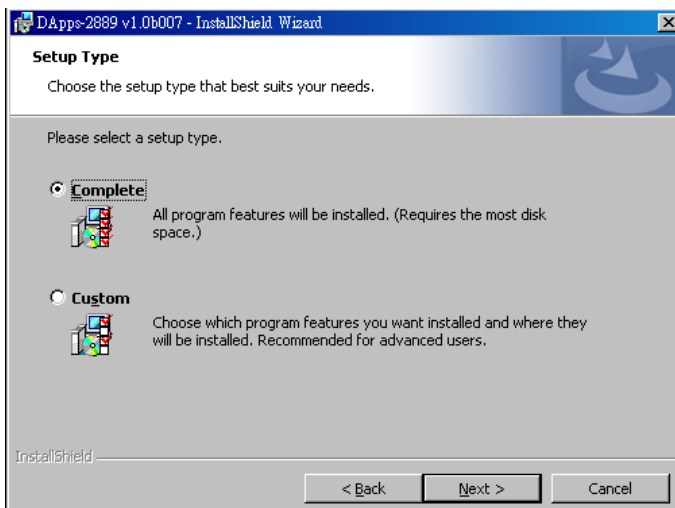| Installing DApps-2889	
  DApps-2889 v1.0b007	1. Double-click DApps-2889 installation program and start the installation process.
	2. InstallShield Wizard is starting to install DApps-2889. If you would like to cancel installation, click "**Cancel**".
	3. Click "**Next**" to continue installation.

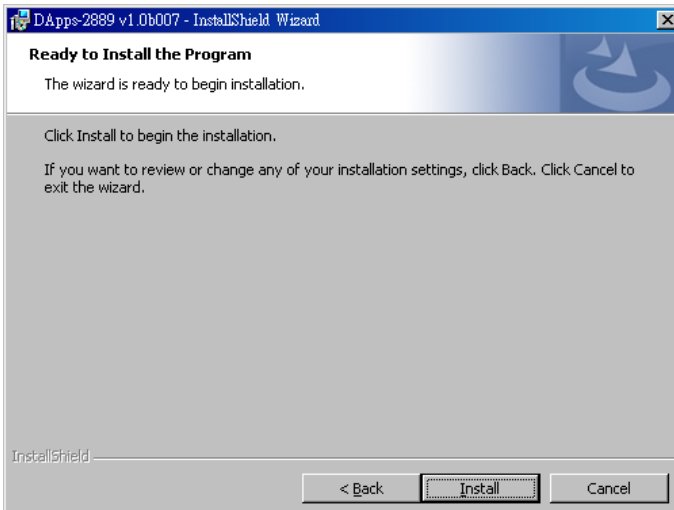4. Click "**I accept the terms in the license agreement**", and click "**Next**" to continue.
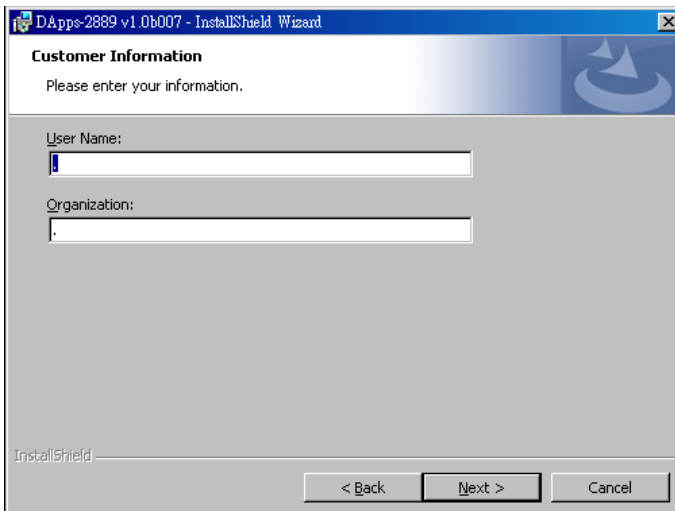
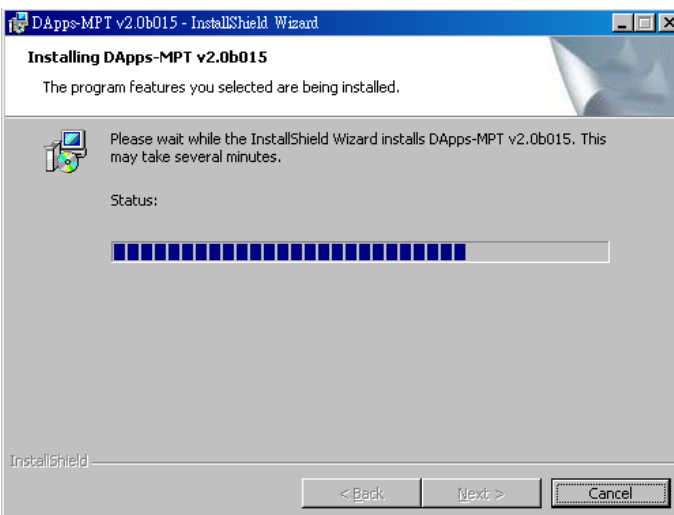5. You can set your **User Name** and **Organization** here, and click "**Next**" to continue.

6. 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.
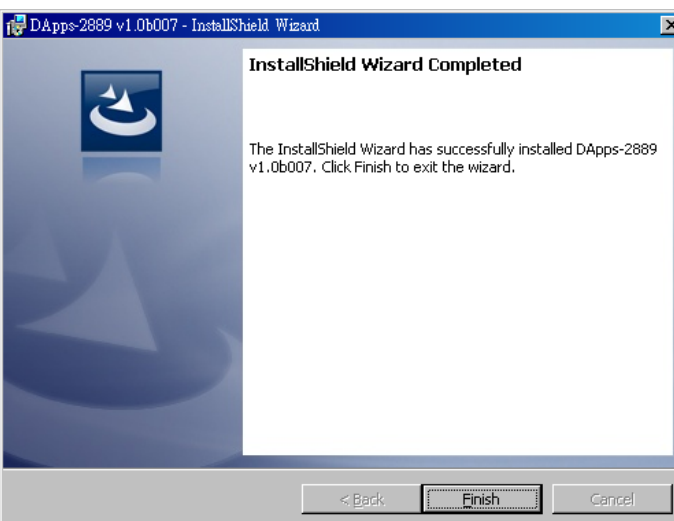
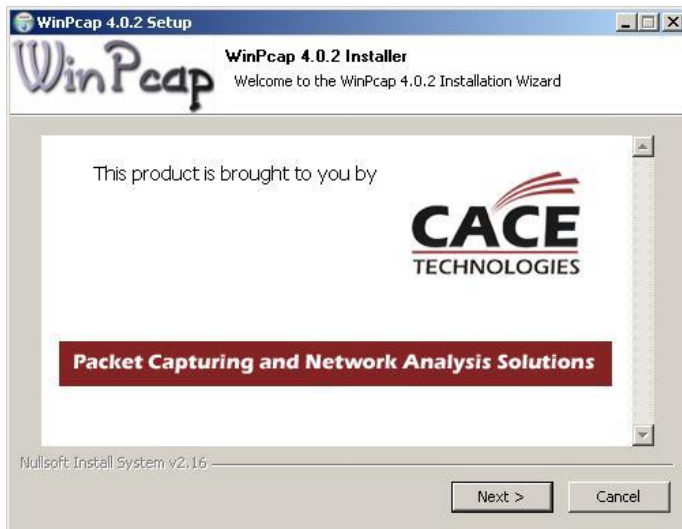|	
	7. DApps-2889 InstallShield Wizard will start installing momentarily. Click **Install** button if the information is correct.
	8. InstallShield Wizard is installing DApps-2889.
	9. DApps-2889 installation completes. Click **Finish** button to exit.

10. WinPcap Installer appears. Click **Next** button to get ready to install, or click **Cancel** button to stop.

11. WinPcap is preparing to install, or click **Cancel** button to stop at any time.
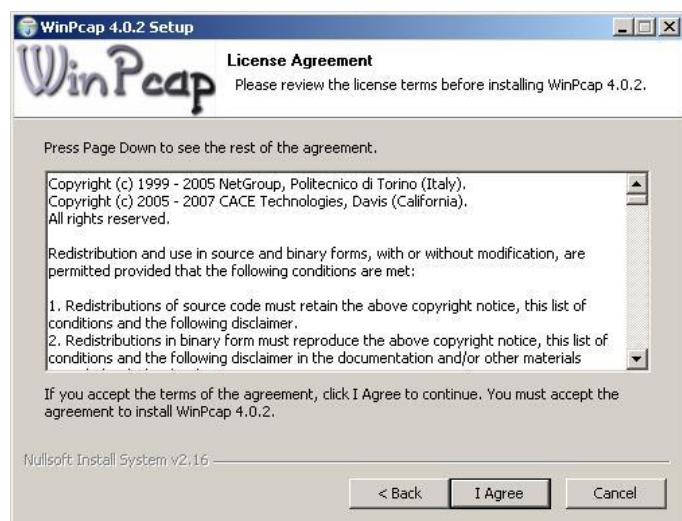
12. Review the license agreement before installing. Click **I Agree** button to continue. It is necessary to accept the agreement to install WinPcap.
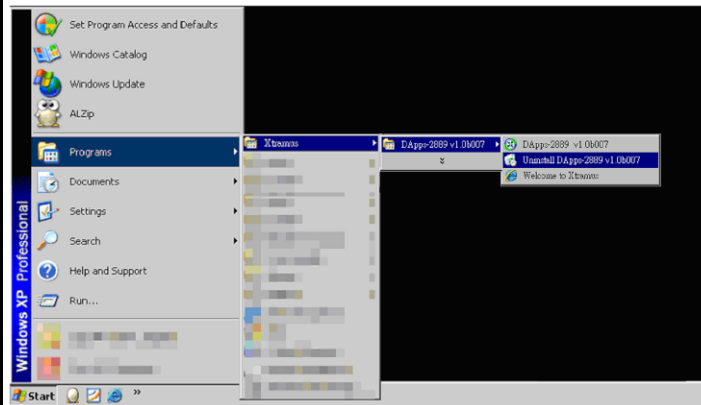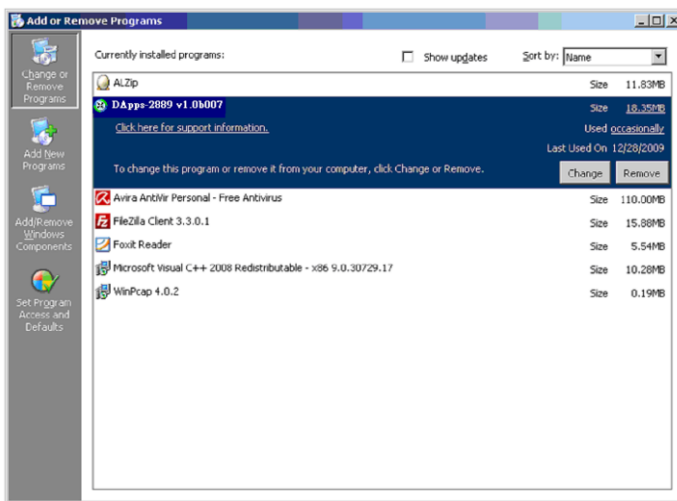
13. WinPcap is installing.

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

You can uninstall DApps-2889 by:

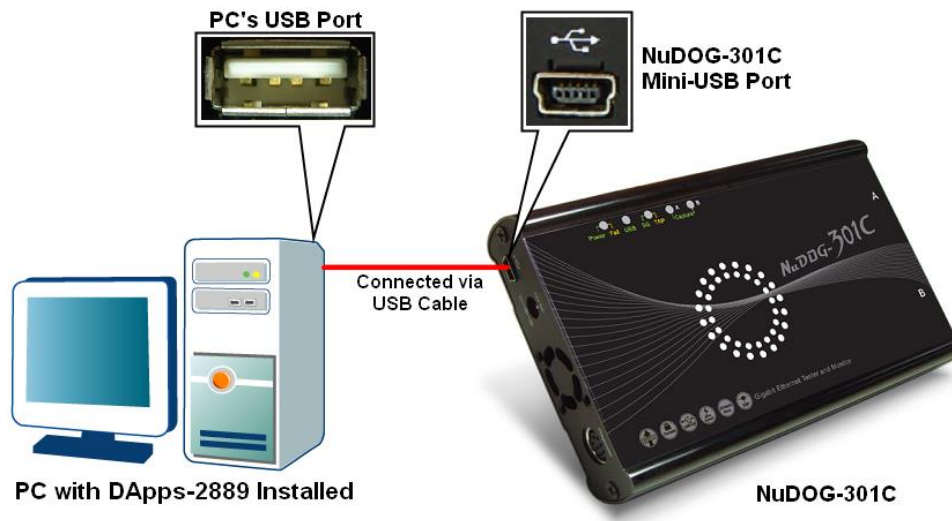➤ Click Start → Programs → Xtramus → DApps-2889 → Uninstall DApps-2889

➤ Go to the Control Panel, choose DApps-2889 from installed program list, and click "**Remove**" to uninstall as well.

6. DApps-2889 Overview

6.1. Hardware Installation

Before starting DApps-2889, your PC and NuDOG-301C/NuDOG-801/802/NuDOG-101T shall be connected properly. The figure down below illustrates connecting PC and NuDOG-301C. You can connect NuDOG-801/802 and NuDOG-101T with PC in the same manner, but **DO NOT connect NuDOG-301C or NuDOG-801/802 with PC before the device is powered on**.

6.2. Starting DApps-2889

Before starting DApps-2889, the DUT, your PC, and NuDOG-301C/801/802/101T shall be connected as shown in "**6.1. Hardware Installation**".

You can start running DApps-2889 by:	
	➢ Click Start → Programs → NuStreams → DApps-2889.
	➢ Double-click DApps-2889 icon located on your PC's desktop.
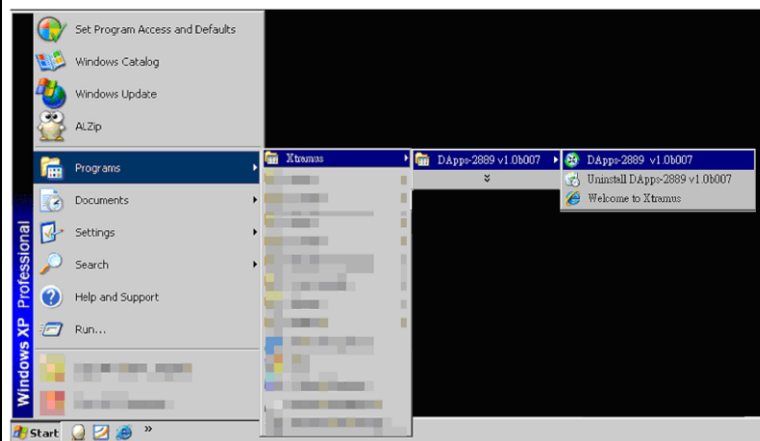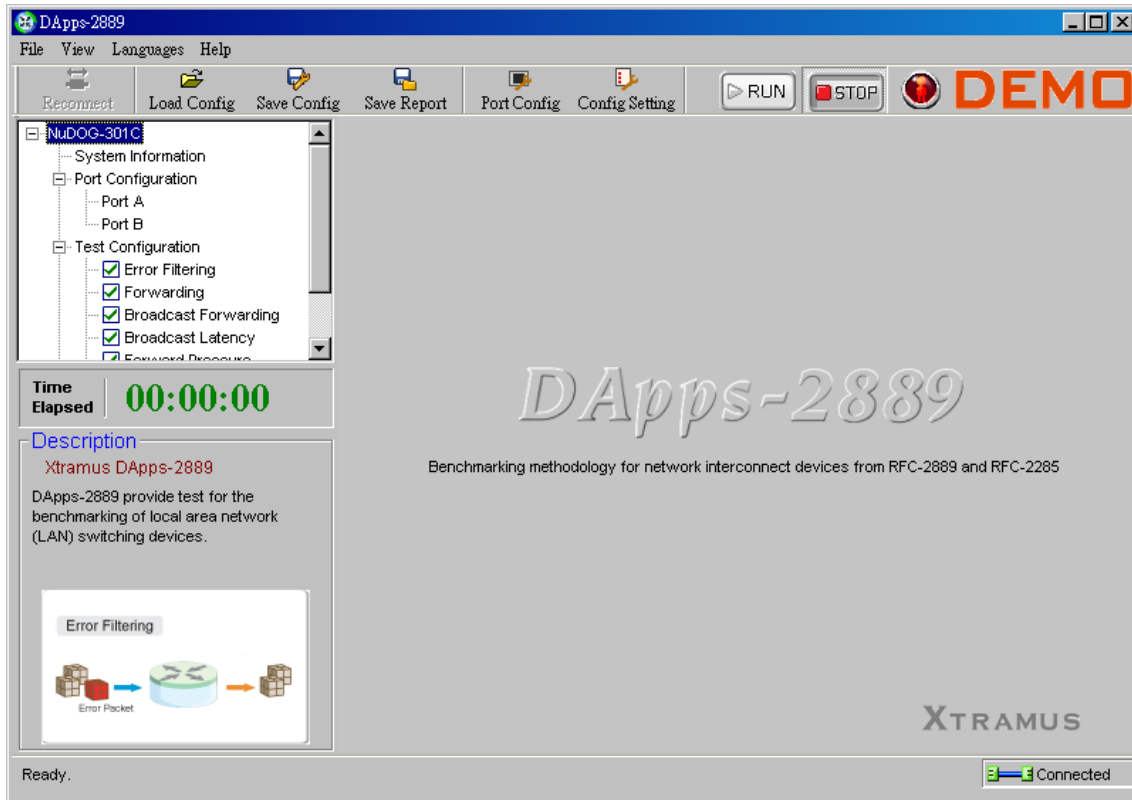
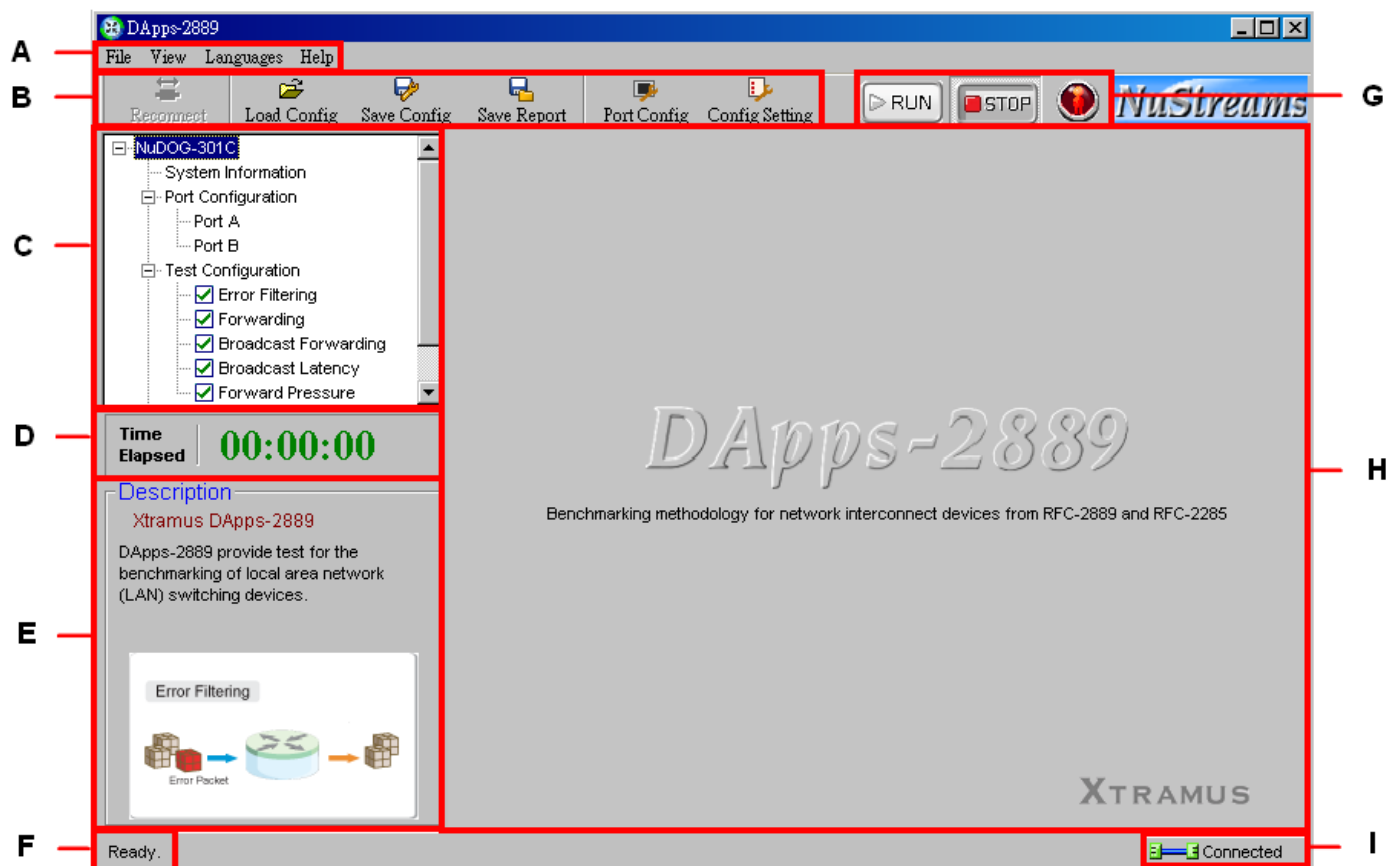If your PC is not connected with NuDOG-101T/801/802/301C, you can still run DApps-2889 under Demo mode. Almost all DApps-2889's functions are available under Demo Mode. However, please note that **Demo Mode is for system demo purposes only**, and does not serve any testing purposes at all.

6.3. DApps-2889/NuServer Main Window Overview

DApps-2889 Main Window

DApps-2889 Functions Overview		
A	Menu Bar	The **Menu Bar** allows you to load/save settings, view the test report, change language displayed, view the version of the software/NuDOG-301C/801/802/101T and system requirement.
B	Tool Bar	The **Tool Bar** allows you to reconnect your PC to your NuDOG-301C/801/802/101T and load/save the configuration, save the test report and configure the port/test settings.
C	System Info/Configuration List	By clicking the **System Info/Configuration List**, you can view system information, making test configurations, or view test reports on **H. 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 DApps-2889's running status.
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	Counter Window	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 NuDOG-301C/801/802/101T.

6.4. Menu Bar

File   View   Languages   Help

DApps-2889 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.

6.4.1. File

File
Load default configuration
Load saved configuration
Save current configuration

Set Report Save Path to...
Report Folder
Latest Report

Exit

File	
Load default/saved configuration	You can load the system default configuration by selecting **Load default configuration**. 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 **Load save configuration**. All configuration files are saved in the format of "***.xml**".
Save current configuration	The **Save current configuration** function on the **Menu Bar** allows you to save the settings you've made. Configuration files are saved in the format of "***.xml**".
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	Choosing this option will allow you to access the Report's Folder and see all the previous saved report.
Latest Report	Choosing this option will allow you to open the latest Report of your test.
Exit	A prompt pop-up window will ask if you are sure to exit DApps-2889. Click **YES** to exit DApps-2889, or click **NO** to cancel.

View		
System Information		Shows the detail information of your system.
DUT Information		You can write the detail information of your device under test (DUT).

6.4.3. Language

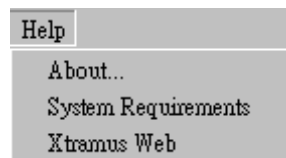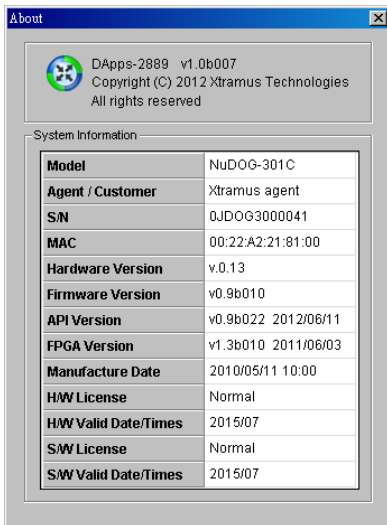| Language	
English/ Chinese Simplified/ Japanese	DApps-2889 has **3** different languages for its UI available. You can set the language of UI to either **English, Simplified Chinese, Japanese**.

6.4.4. Help

Help		
About…		An "About" window will pop up and show detailed system information. Click the **OK** button to exit the "**About DApps-2889**" pop-up window.
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.

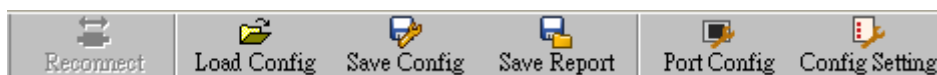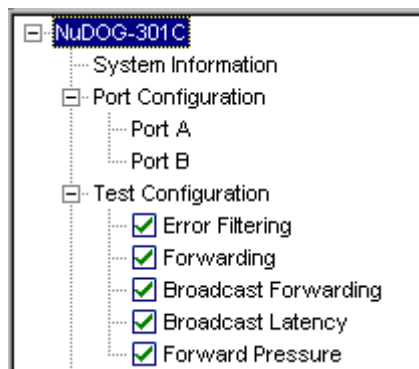The Tool Bar allows you to load/save configuration, save report, configure port/test settings and reconnect the NuDOG-301C/NuDOG-801/802/NuDOG-101T to your PC.

Tool Bar	
Reconnect	If the USB connection between your PC and NuDOG-301C/NuDOG-801/802/NuDOG-101T is down, a "**Disconnected**" icon will be shown in "**System Connection Status**". Press **Reconnect** button to re-establish the connection between your PC and NuDOG-301C/NuDOG-801/802/NuDOG-101T. 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 "***.xml**"
Save Config	The **Save** button on the **Tool Bar** allow you to save the settings you've made or the test results. To save the settings you've made, **click the "Save" button on the Tool Bar before performing any tests**, and choose the file path where you would like to save the configuration file. Configuration files are saved in the format of "***.xml**". To save the test results, **click the "Save" button on the Tool Bar after performing tests**, 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 "**RFC2889TestResult**", and following by the date/time when the file are created. 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.
Port Config	By clicking the **Port Config** button, the **Port Configuration** screen will be shown on the **Main Display Screen** located on the right side of DApps-2889's main window, allowing you to make settings for NuDOG-301C/NuDOG-801/802/NuDOG-101T's ports. Settings such as port transmitting rate, auto-negotiation, and protocol are available and can be set here. For more detail description about **Port Configuration**, please refer to **7.1. Port Configuration**.
Config Setting	By clicking the **Test Config** button, the **Test Configuration** screen will be shown on the **Main Display Screen** located on the right side of DApps-2889's main window, allowing you to make test settings. You can set 5 different test modes here, including **Error Filtering**, **Forwarding**, **Broadcast Forwarding**, **Broadcast Latency** and **Forward Pressure**. For more detail description about **Port Configuration**, please refer to **7.2. Test Configuration**.

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	NuDOG-301C
Agent / Customer	Xtramus agent
S/N	0JDOG3000041
MAC	00:22:A2:21:81:00
Hardware Version	v.0.13
Firmware Version	v0.9b010
API Version	v0.9b022 2012/06/11
FPGA Version	v1.3b010 2011/06/03
Manufacture Date	2010/05/11 10:00
H/W License	Normal
H/W Valid Date/Times	2015/07
S/W License	Normal
S/W Valid Date/Times	2015/07		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 DApps-2889's main window.

Port Configuration	
Port Configuration 	Port No.	Media Speed	Duplex	Flow Control	Payload
Port A	Auto 1G	Full	Off	Random
Port B	Auto 1G	Full	Off	Random | Base MAC Address: 00-22-A2-21-00-00 Auto-Negotiation: Minimum Waiting Time: 6 Media Type Waiting Timeout: 20	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 DApps-2889's main window, allowing you to make settings for NuDOG-301C/801/802/101T's ports. Settings such as port Media Speed, Duplex, Flow Control and Payload are available and can be set here. For more detail description about **Port Configuration**, please refer to **7.1. Port Configuration**.

Test Configuration

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 DApps-2889's main window, allowing you to make test settings.

You can set 5 different test modes here, including Error Filtering, Forwarding, Broadcast Forwarding, Broadcast Latency and Forward Pressure.
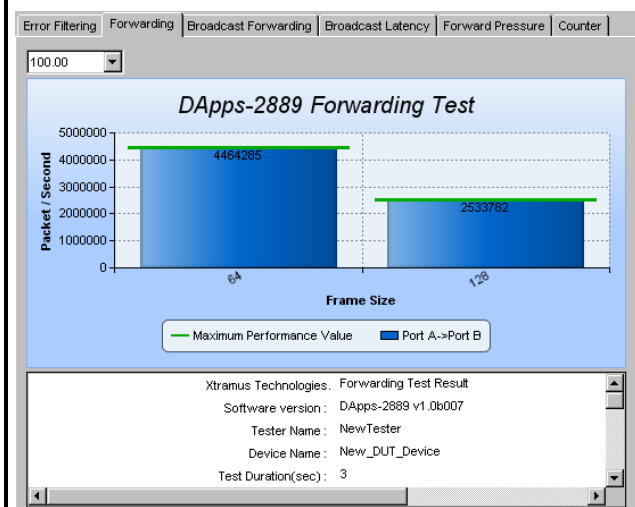
For more detail description about **Port Configuration**, please refer to **7.2. Test Configuration**.

Frame Setup

If you select **Enable VLAN**, you will be able to access **VLAN Priority** and **VLAN ID** function. You can choose between 0 and 7 for VLAN Priority settings. You can write between 0 and 4095 for VLAN ID settings.

Note: Currently, **Protocol Format** has only the option of **IEEE802.1Q**, and **Protocol Type** has only the option of **Default-FFFF**. More options will be available soon.
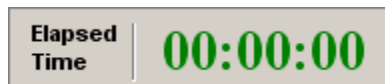
Report

The **Report** on the **System Info/Configuration List** allows you to view test results, charts, and counters on the **Main Display Screen** located on the right side of DApps-2889's main window.

For more detail description about **Report**, please refer to **8. Report**.

6.7. Elapsed Time

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

6.8. Description
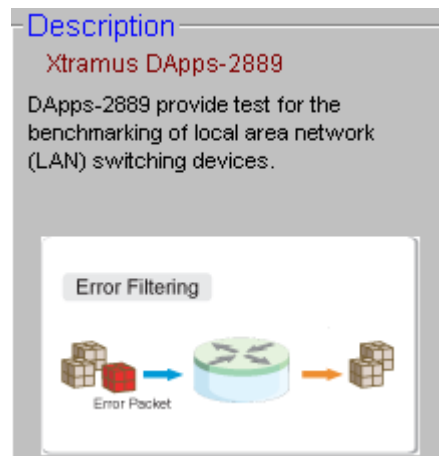
The **Description** displays brief descriptions and figures regarding to **Error Filtering, Forwarding, Broadcast Forwarding, Broadcast Latency** and **Forward Pressure** tests.

6.9 Status Bar

The **Status Bar** shows the running status of DApps-2889.

6.10. 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

7. Port Configuration and Test Configuration

7.1. Port Configuration

Settings such as port transmitting rate, auto-negotiation, and 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**.
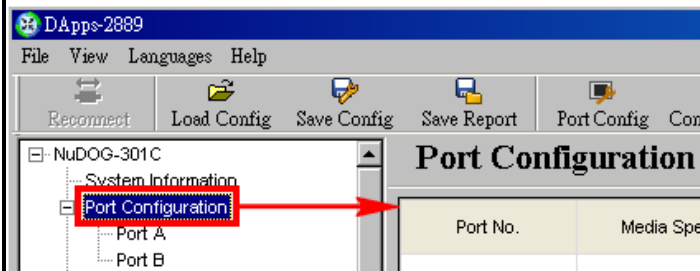
Port Configuration

Port No.	Media Speed	Duplex	Flow Control	Payload
Port A	Auto 1G	Full	Off	Random
Port B	Auto 1G	Full	Off	Random

Base MAC Address
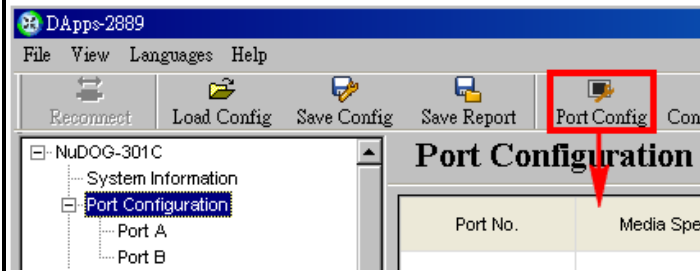00-22-A2-21-00-00

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

➢ **Port No.:** This field lists NuDOG-301C/801/802/101T's Test Port (Port A/B).
➢ **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 NuDOG 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**) DApps-2889 spent for auto-negotiation exceeds the time you set here, the test will stop.
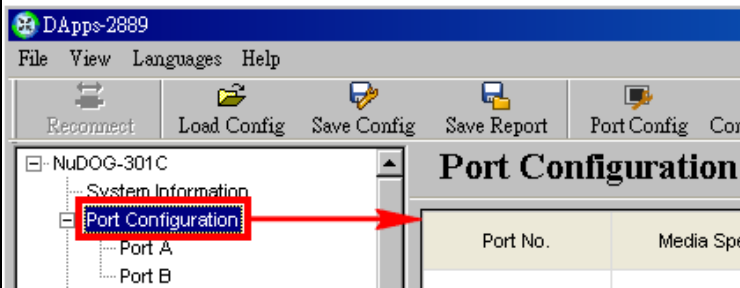
7.2. Test Configuration

5 different test modes, including **Error Filtering, Forwarding, Broadcast Forwarding, Broadcast Latency** and **Forward Pressure**, 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 **Config Setting** located on **System Info/ Configuration List**
• Click the **Test Config** button located on **Tool Bar**.

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

7.2.1. Test Configuration Overview

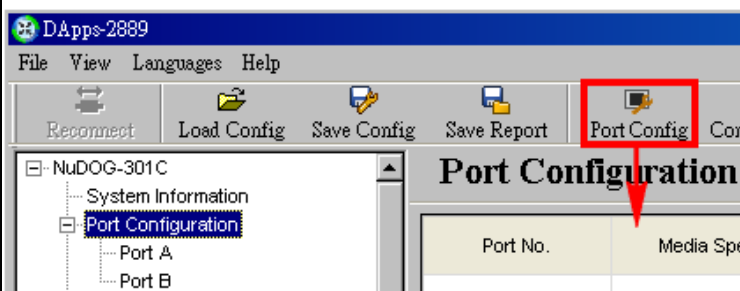The **Test Configuration** contains five different sets of settings: **Error Filtering, Forwarding, Broadcast Forwarding, Broadcast Latency** and **Forward Pressure**, which can be accessed by clicking the test you would like to perform on **System Info/Configuration List** or the tab menu located on **Test Configuration** screen.
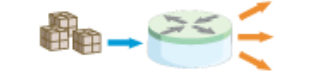
Before making any test configurations on the **Test Configuration** screen, you have to assign the Source Port and Destination Port for DApps-2889 first on the upper part of the **Test Configuration** menu. Please select whether you would like to use NuDOG-301C/801/802/101T's Port A or Port B as the Source Port or Destination Port as shown in the figure down below.

DApps-2889 supports five different tests including:
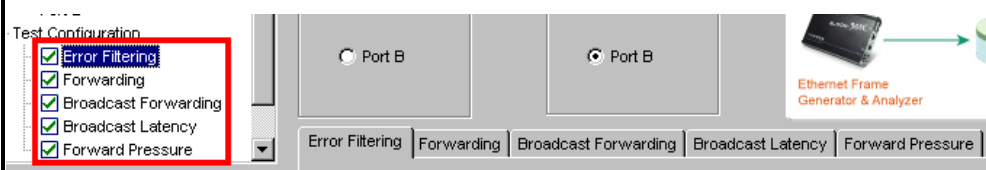
Diagram	Description
Error Filtering Error Packet	Determine the behavior of the DUT under error or abnormal frame conditions.
Forwarding	Determine the throughput, frame loss and forwarding rates of DUT/SUTs offered traffics.
Broadcast Forwarding	Determine the throughtput and latency of the DUT when forwarding broadcast traffic.
Broadcast Latency	Determine the latency of the DUT when forwarding broadcast traffic.
Forward Pressure	The Forward Pressure test overloads a DUT/SUT port and measures the output for forward pressure.

To start performing tests with DApps-2889, 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.
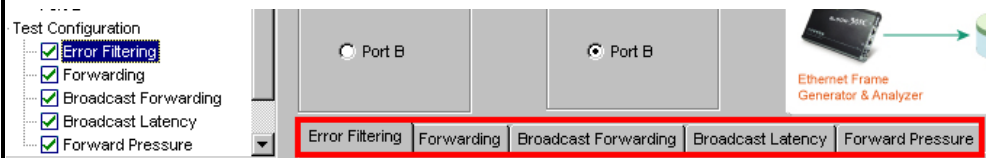
You can access setting options for the tests you would like to perform by:
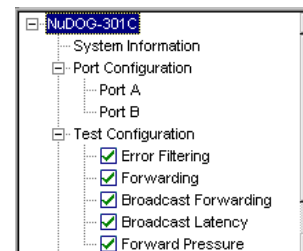
Accessing Test Setting Pages	
	• Click the test you would like to configure located on **System Info/ Configuration List**
	• Click the test you would like to configure located on the test tab menu.
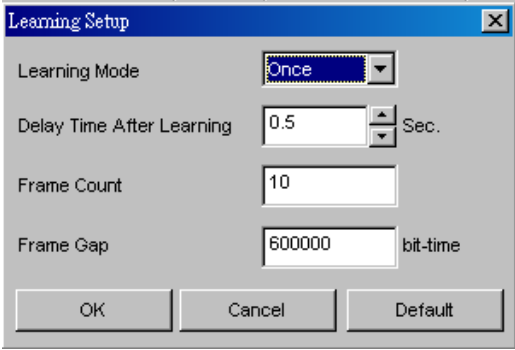
For more detailed setting options regarding to **Error Filtering, Forwarding, Broadcast Forwarding, Broadcast Latency** and **Forward Pressure**, please refer to the sections down below.

7.2.2. Error Filtering

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.
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	Enable Bi-Direction between Port A and Port B as Source/Destination port.

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.

7.2.3. Forwarding

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)

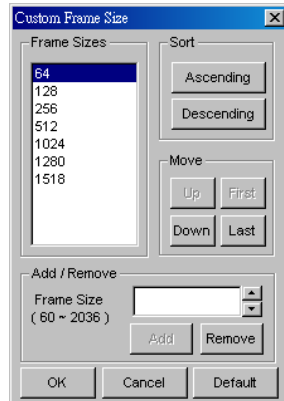| Custom		Selecting the **Custom** function will enable the **Edit** button. Click the **Edit** button to pop up the **Custom Frame Size** window.
		Frame Sizes: Shows the default frame size to select.
		Frame Sizes: Shows the default frame size to select.
		Sort: sort the order of the current frame 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	Enable Bi-Direction between Port A and Port B as Source/Destination port.	

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.

7.2.4. Broadcast Forwarding

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.
Bi-Direction	Enable Bi-Direction between Port A and Port B as Source/Destination port.

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	
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.

7.2.6. Forward Pressure

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.

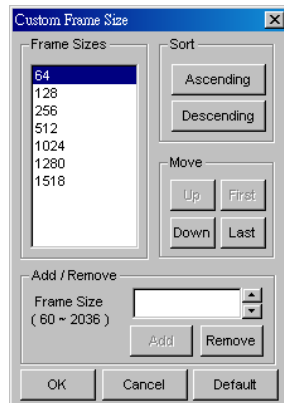| Frame size with CRC (Bytes)		
Custom		Selecting the **Custom** function will enable the **Edit** button. Click the **Edit** button to pop up the **Custom Frame Size** window. ➢ **Frame Sizes:** Shows the default frame size to select. ➢ **Sort:** sort the order of the current frame sizes list as ascending 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	Enable Bi-Direction between Port A and Port B as Source/Destination port.	

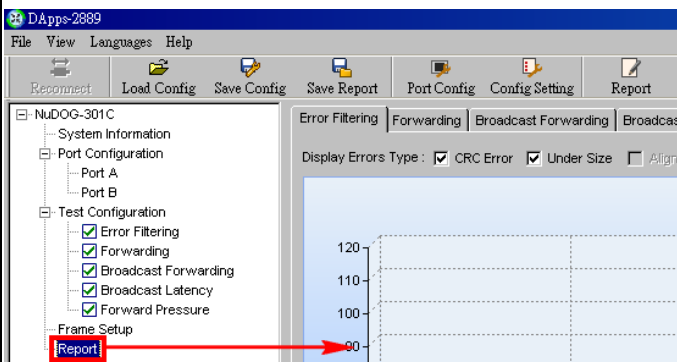| Inter Frame Gap (IFG)	
Gap Time	You can set the gap in bits between two frames.

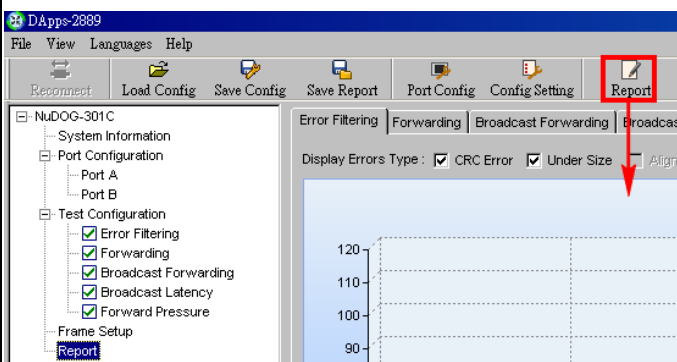**Note: The current version only supports 88 bits. More value will be available soon.**

8. 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** or **Forward Pressure**) will be displayed on the **Main Display Screen**. DApps-2889 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.
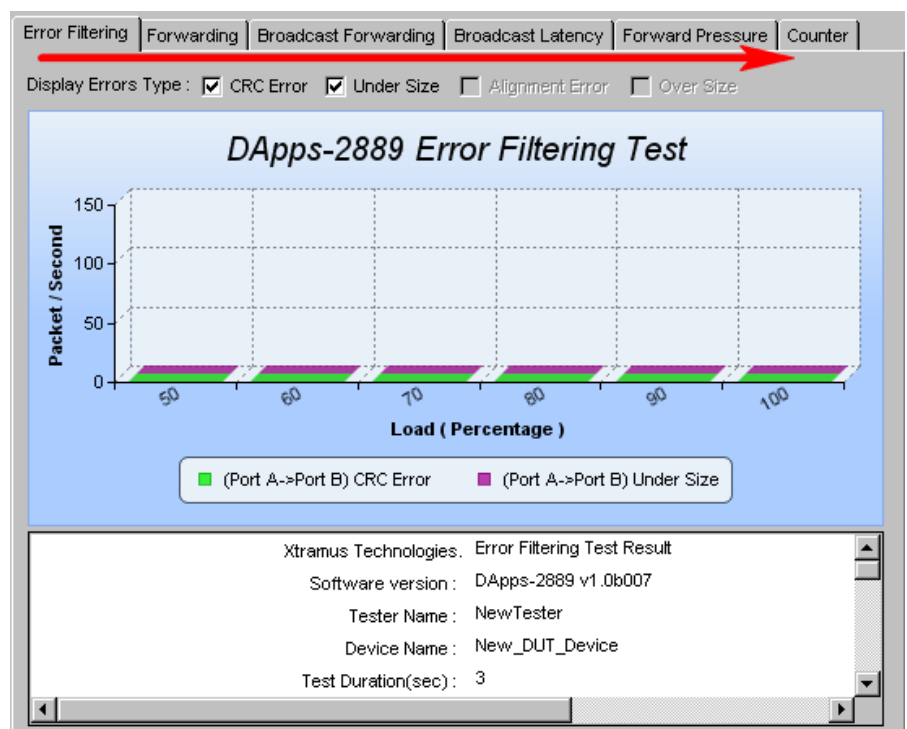
Error Filtering Test Result Chart
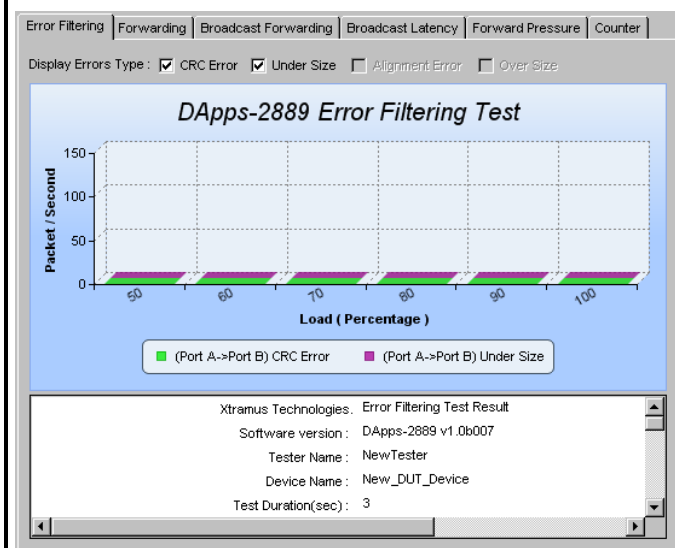
This chart uses **Packet/Second** as Y-Axis, and **Load (Percentage)** as X-Axis to show DUT's Error Filtering performance.

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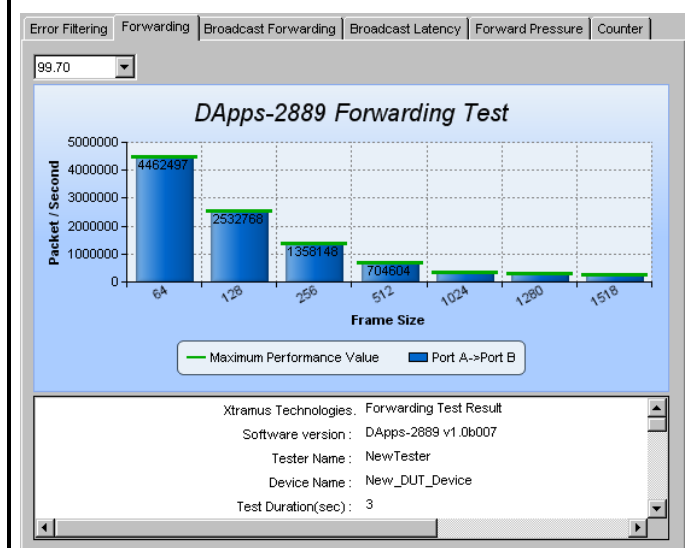
This chart uses **Packet/Second** as Y-Axis, and **Frame Size** as X-Axis to show DUT's Forwarding performance.

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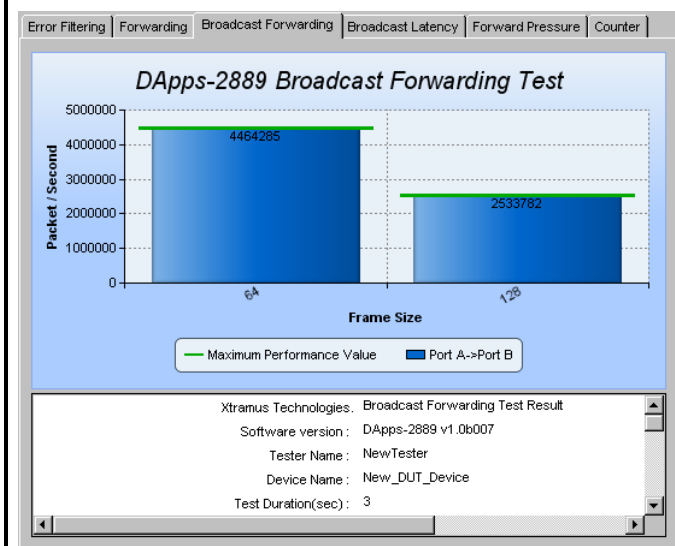
This chart uses **Packet/Second** as Y-Axis, and **Frame Size** as X-Axis to show DUT's Broadcast Forwarding performance.

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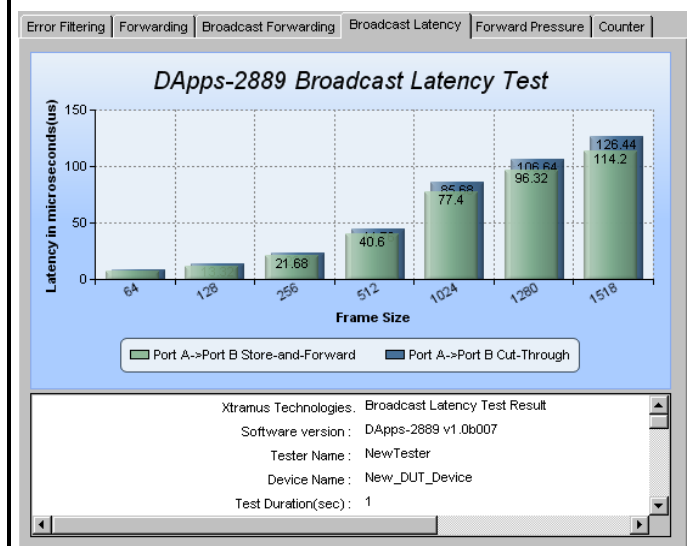
This chart uses **Latency in Microsecond (us)** as Y-Axis, and **Frame Size** as X-Axis to show DUT's Broadcast Latency test result.

Forward Pressure Test Result Chart

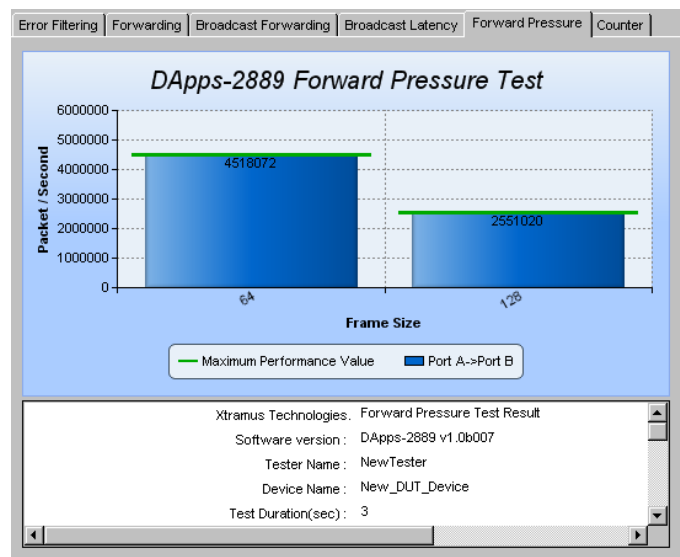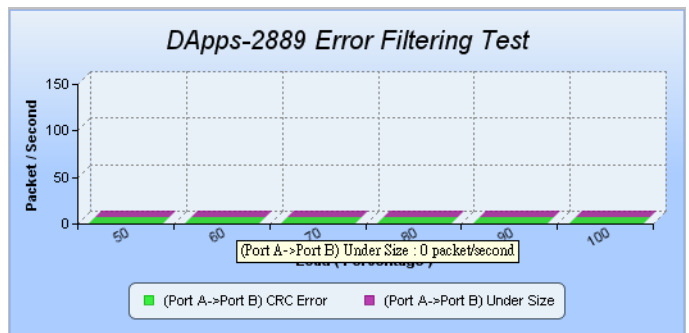This chart uses **Packet/Second** as Y-Axis, and **Frame Size** as X-Axis to show DUT's Forward Pressure performance.

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 | Counter |

Port	PktSize	FrameGap	Load	Line Rate (Mbps)	Tx Packet
Benchmark : Error Filtering (CRC Error) Trial : 1 Repetition : 1 Duration : 3.0000 sec.					
Port A	64	768	50.00	744,047	2,232,141
Port B	n/a	n/a	n/a	n/a	0
(Port A -> Port B) Passed					
Benchmark : Error Filtering (CRC Error) Trial : 1 Repetition : 2 Duration : 3.0000 sec.					
Port A	64	544	60.00	892,857	2,678,571
Port B	n/a	n/a	n/a	n/a	0
(Port A -> Port B) Passed					
Benchmark : Error Filtering (CRC Error) Trial : 1 Repetition : 3 Duration : 3.0000 sec.					
Port A	64	384	70.00	1,041,666	3,124,998
Port B	n/a	n/a	n/a	n/a	0
(Port A -> Port B) Passed					
Benchmark : Error Filtering (CRC Error) Trial : 1 Repetition : 4 Duration : 3.0000 sec.					
Port A	64	264	80.00	1,190,476	3,571,428
Port B	n/a	n/a	n/a	n/a	0
(Port A -> Port B) Passed					
Benchmark : Error Filtering (CRC Error) Trial : 1 Repetition : 5 Duration : 3.0000 sec.					
Port A	64	170	90.00	1,339,285	4,017,855
Port B	n/a	n/a	n/a	n/a	0
(Port A -> Port B) Passed					

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.

9. Appendix – Other Utility Softwares for NuDOG series

There are several other optional utility softwares for NuDOG-301C/NuDOG-801/802/NuDOG-101T for different kinds of test requirements. The following section contains brief descriptions of these utility softwares.

DApps-TAP: Network TAP/Loopback Utility

For NuDOG-301C/NuDOG-801/802/NuDOG-101T, all data streams between two network ports can be duplicated and sent to PC via mini USB port for monitoring and analyzing. The user can specify conditions to filter the packets wanted with DApps-TAP application software. It reduces USB port's network traffic and also cuts down PC resource consumption while dealing with large quantity of packets.

DApps-SG: Control Suite for Multiple Streams Generator

DApps-SG provides a powerful and sophisticated virtual front control panel to manage this device. Two test ports can be configured independently with parameters to define multiple streams and capture capabilities. Traffic for various network protocols can be customized, transmitted, and received on each port. Comprehensive statistics give users an in-depth analysis of the DUT performance.

DApps-NIC: Network Interface Card Simulation Suite

NuDOG-301C/NuDOG-801/802/NuDOG-101T has a mini-USB port for PC connection. In addition to network TAP, system control and system upgrade functions.
NuDOG-301C/NuDOG-801/802/NuDOG-101T can also be used as a network interface card. With control software and NuDOG-301/NuDOG-801/802/NuDOG-101T's hardware conversion, network data streams can flow between NuDOG-301C/NuDOG-801/802/NuDOG-101T's USB and network port.

DApps-2544: Test Suit Based on RFC 2544

DApps-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.

DApps-2889: Test Suit Based on RFC 2889

DApps-2889 is a user-friendly and automatic test suite based on industry-standard RFC 2889 (partial) to test the DUT. RFC 2889 provides methodology for benchmarking for local area network (LAN) switching devices, forwarding performance, congestion control, latency, address handling and filtering. It extends the methodology already defined for benchmarking network interconnecting devices in RFC 2889.