

xtramus

**DApps-NIC
User's Manual**



Foreword

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Revision History

Date	USM Version	History
2012/07/17	1.0	First Draft Version
2012/09/10	1.1	1. Deleting the description of DApps-NIC supports operation system Windows 2000.(Page 5)
2018/02/06	1.2	1. Modify NuDOG-101T speed LED description.(Page 20)
2020/09/22	1.3	1. Add note about connect device to PC. 2. Add NuDOG-802.



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1. DApps-NIC Overview



DApps-NIC is a software that allows NuDOG series to perform simulation of Network Interface Card (NIC). Through DApps-NIC, the network traffic status is showed based on Tx/Rx, CRC error, alignment error, dribble bit, packet size statistics, layer 2 packet counters and network layer conditions. Besides, the DApps-NIC also provides tool to upgrade your NuDOG series' FPGA and License.

Devices Supporting DApps-NIC		
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-NIC.

OS	XP	Windows Vista/7/8/10
CPU	Pentium 1.6 GHz or higher	
RAM	1.0GB RAM	1.5GB RAM
HDD	10GB of available hard disk space	

*** Note: Large amount of data will be generated while running DApps-NIC. 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

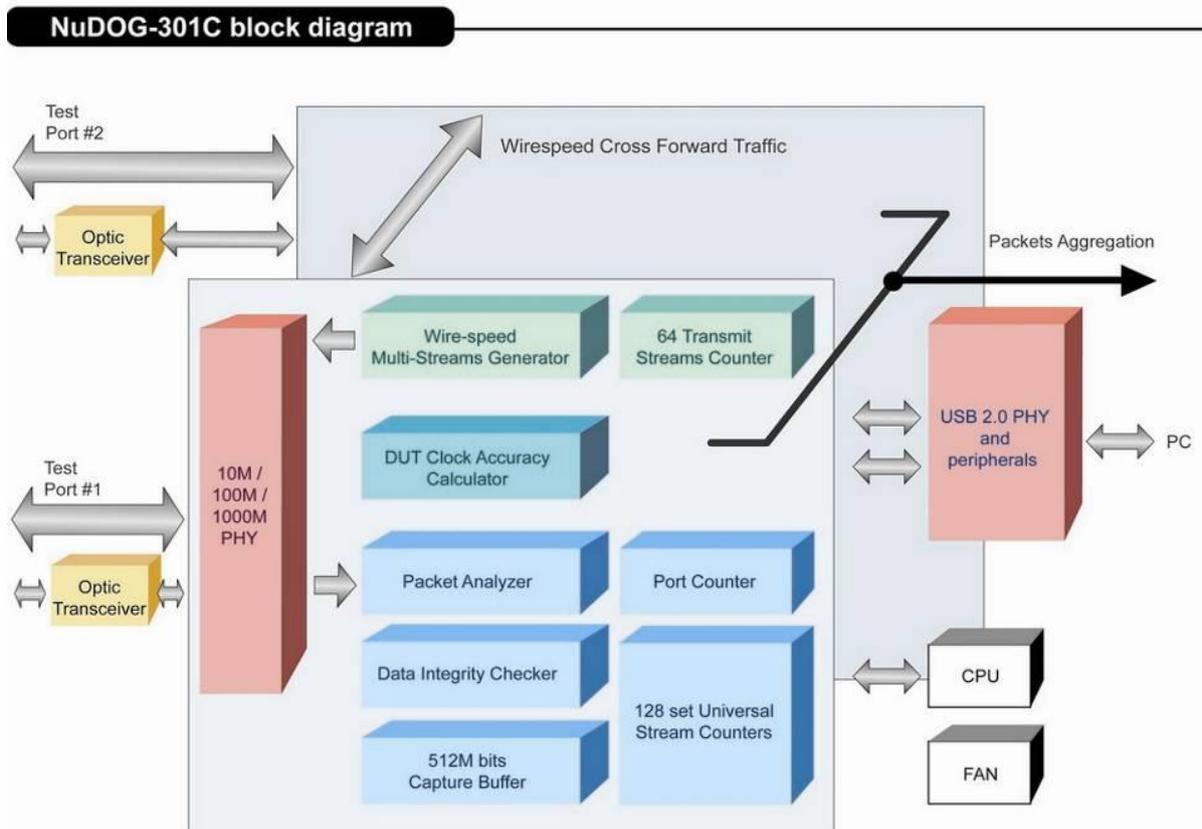
NuDOG-301C is a handheld device with two Gigabit ports for Ethernet testing. The main functions of NuDOG-301C include multi-streams generation, TAP/Loopback test, and NIC emulation.

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.



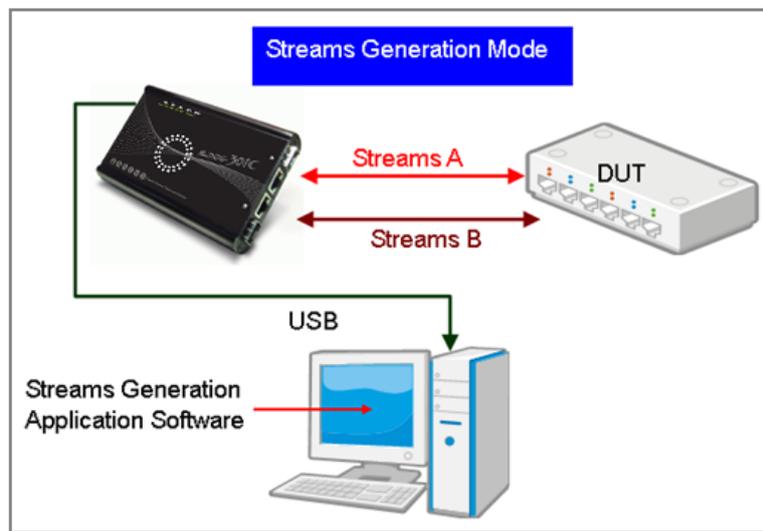


2.2. Features & Advantages of NuDOG-301C

- 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

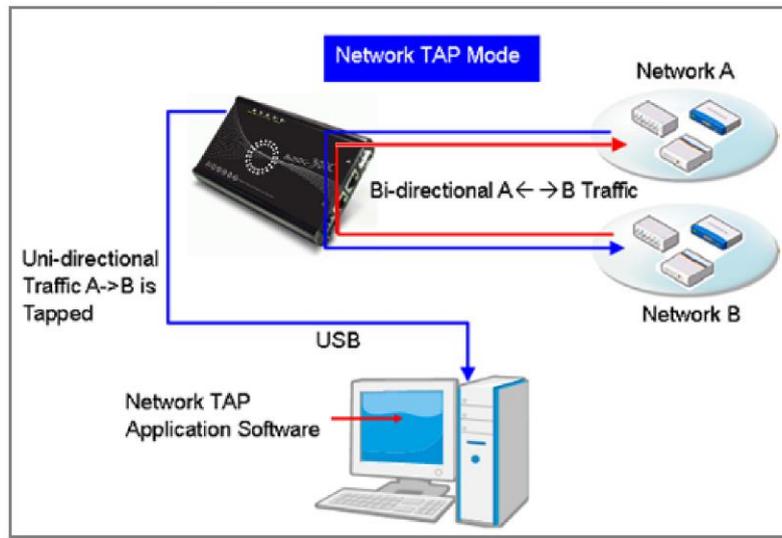


In Streams Generation mode, NuDOG-301C generates bi-directional network streams for test requirements as the illustration above.

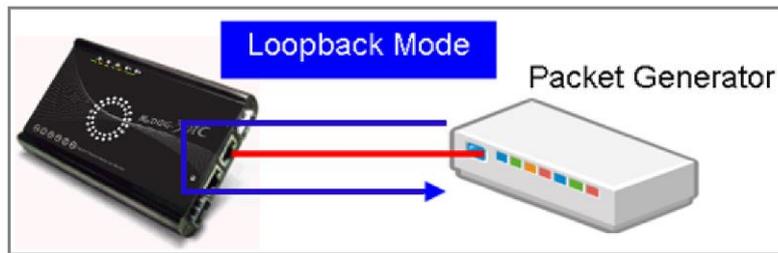
Both NuDOG-301C's Port A and Port B can generate and receive test streams. The test streams are sent and returned to the same NuDOG-301C for DUT (device under test) analysis.



TAP/Loopback Mode



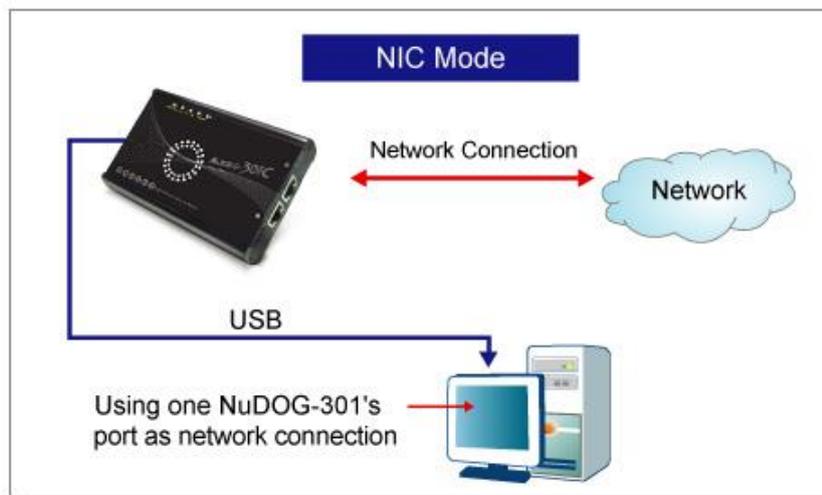
TAP Mode



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.

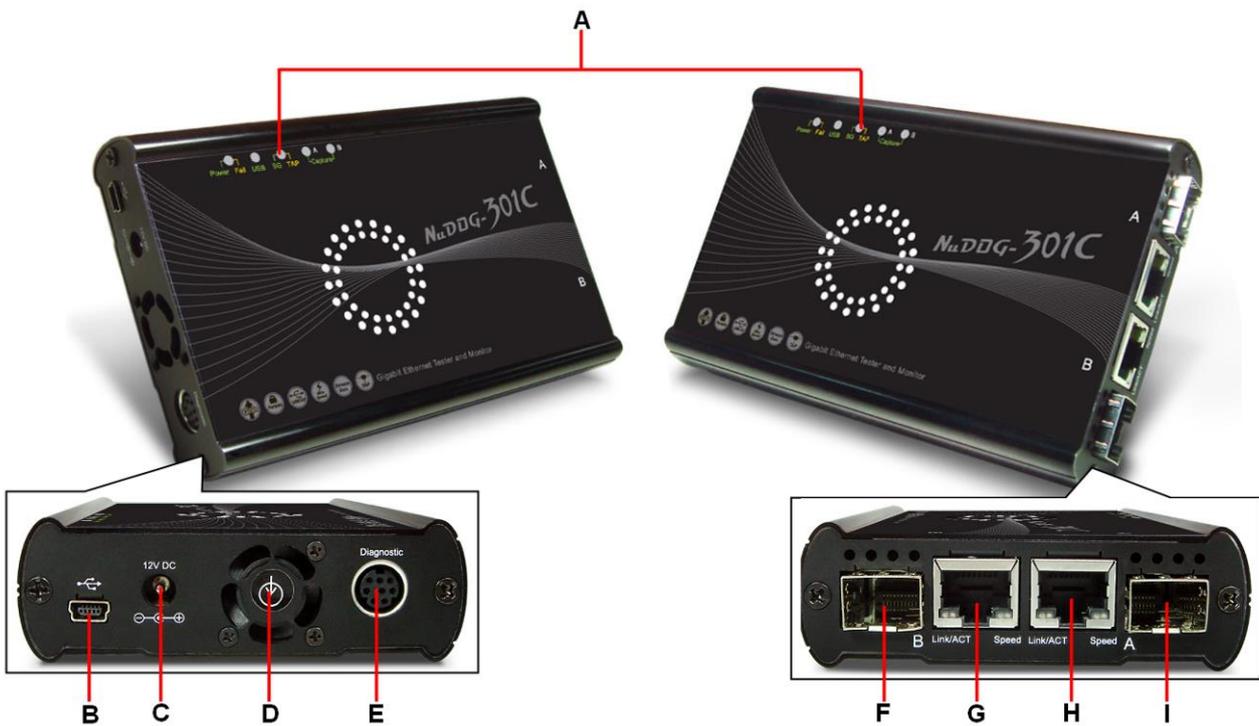
NIC Mode



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



2.4. NuDOG-301C Interface Ports



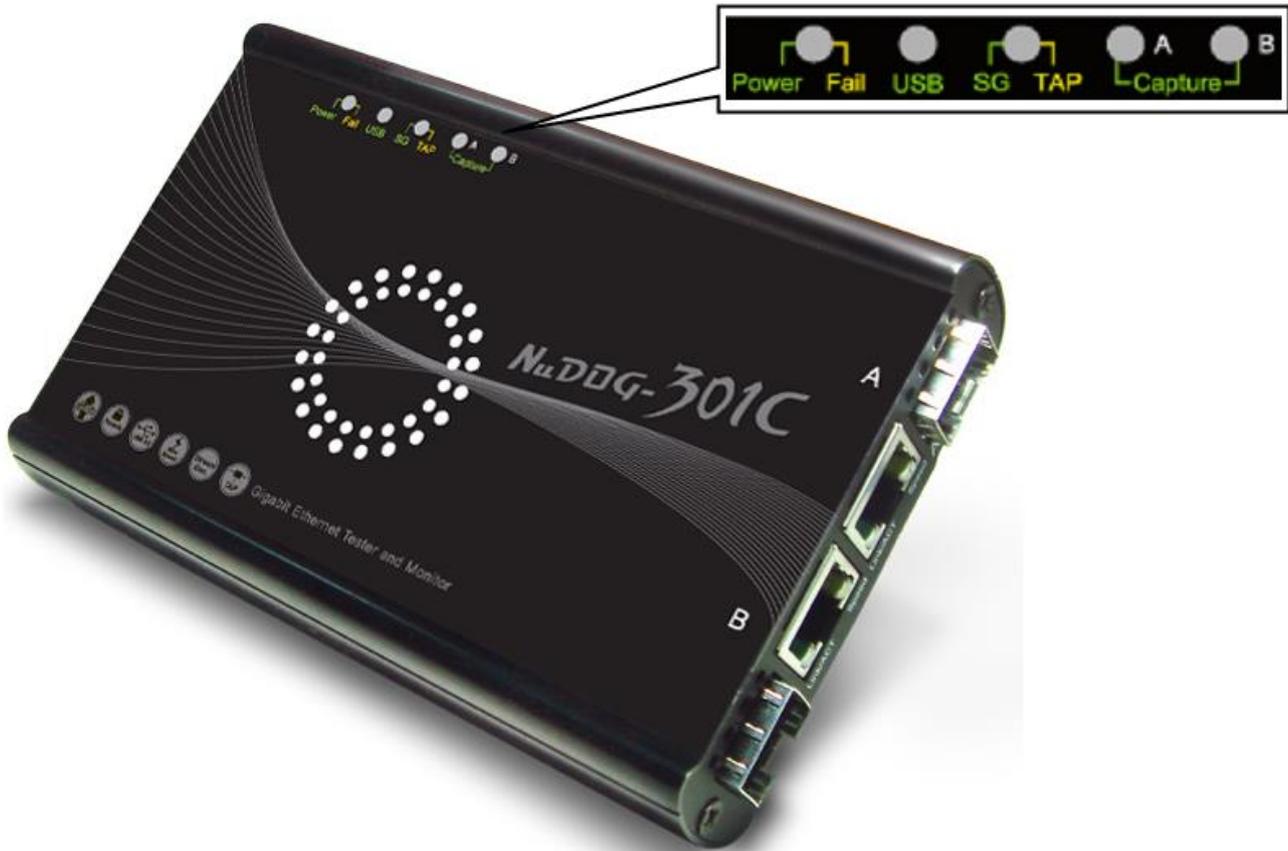
NuDOG-301C Hardware Overview

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.**



2.5. NuDOG-301C 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
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.



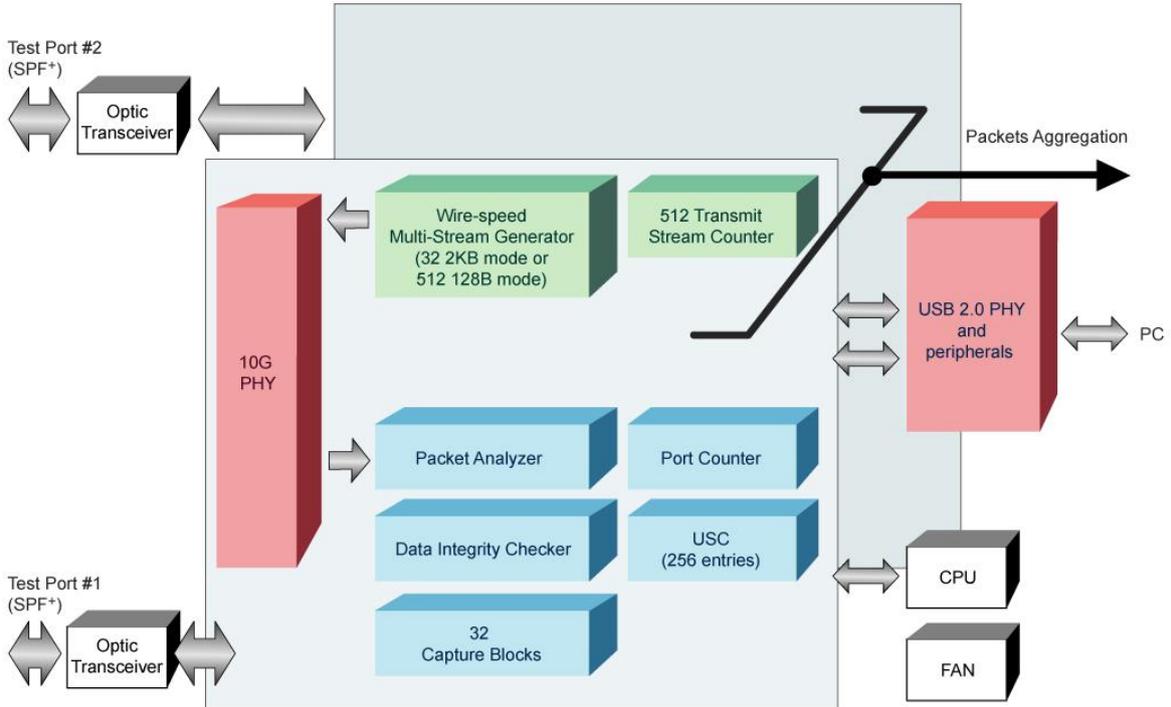
NuDOG-801/802 can work along with a series of utility software that qualify industrial standards such as RFC 2889 and RFC 2544. With these utilities, NuDOG-801/802 is able to conduct throughput test, latency test, error filtering test, forwarding test, and so on. Xtramus' utility software provides a 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



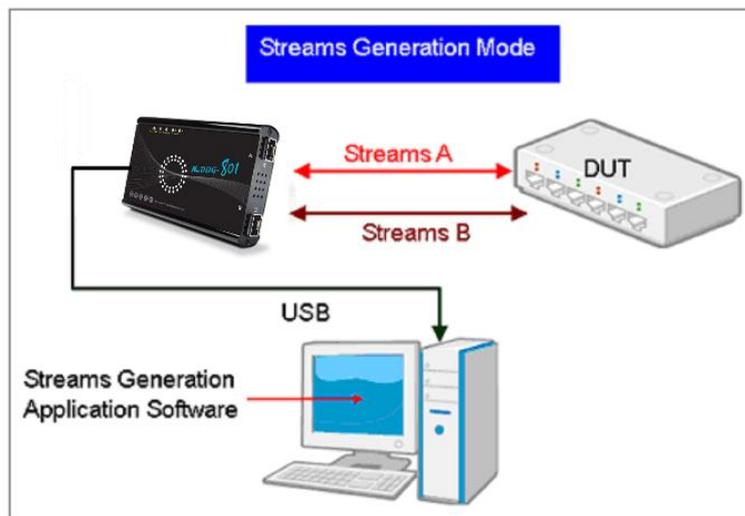


3.2. Features & Advantages of NuDOG-801/802

- 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

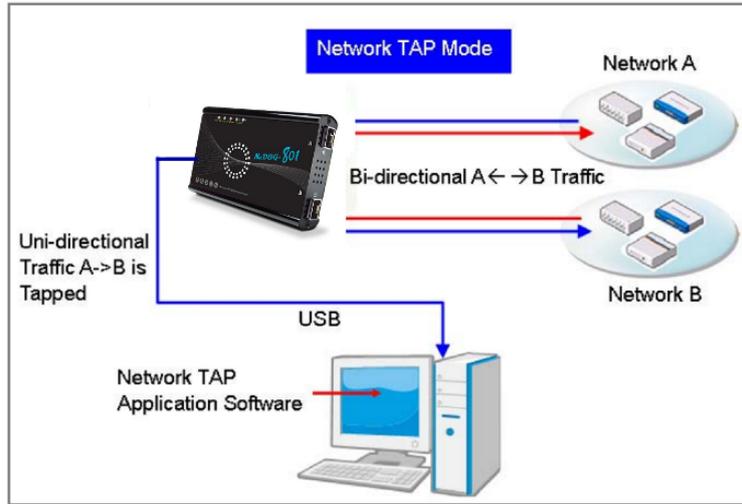


In Streams Generation mode, NuDOG-801/802 generates bi-directional network streams for test requirements as the illustration above.

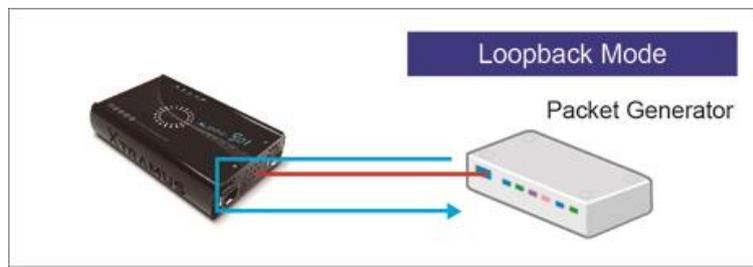
Both NuDOG-801/802's Port A and Port B can generate and receive test streams. The test streams are sent and returned to the same NuDOG-801/802 for DUT (device under test) analysis.



TAP/Loopback Mode



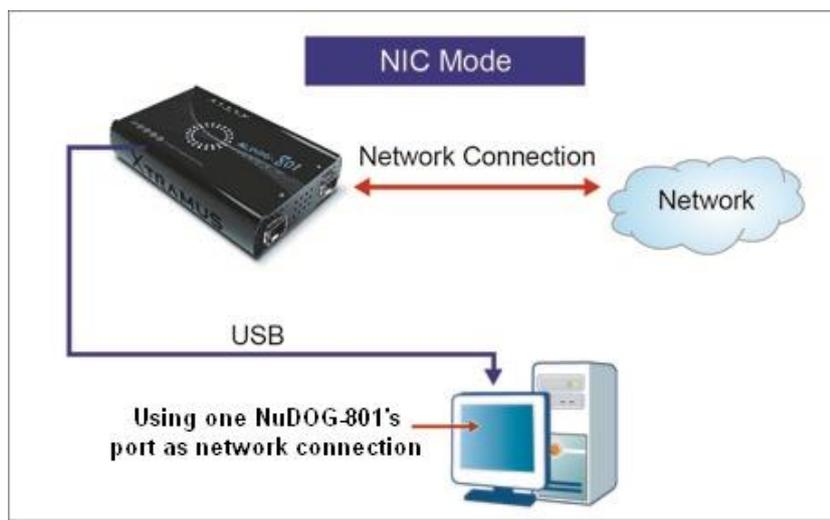
TAP Mode



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

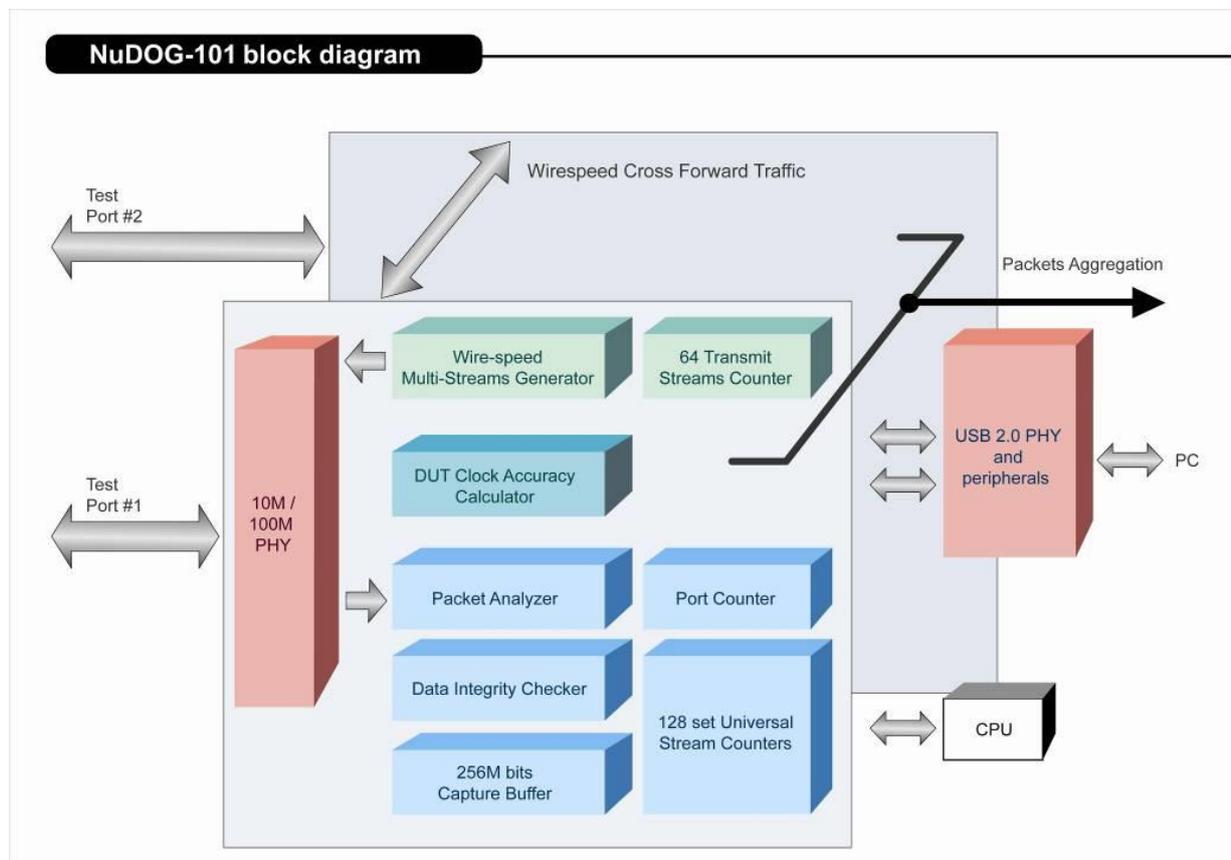
NuDOG-101T is a handheld device with two ports for Ethernet testing. The main functions of NuDOG-101T include multi-streams generation, TAP/Loopback test, and NIC emulation.

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.



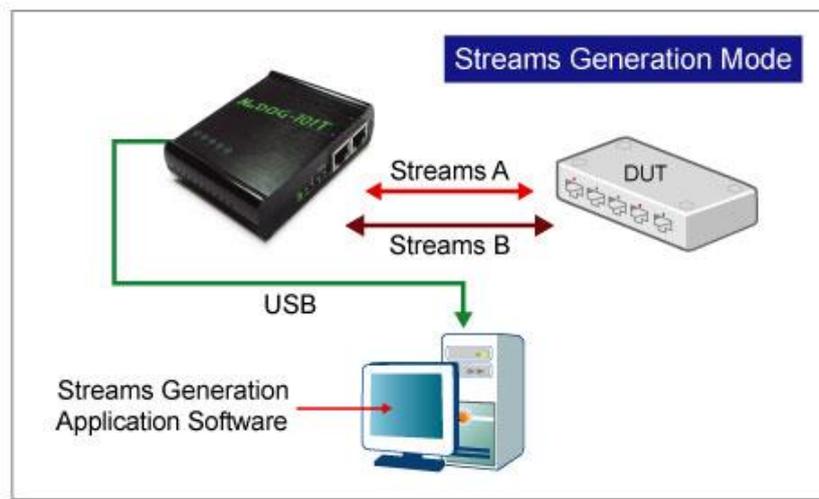


4.2. Features & Advantages of NuDOG-101T

- 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

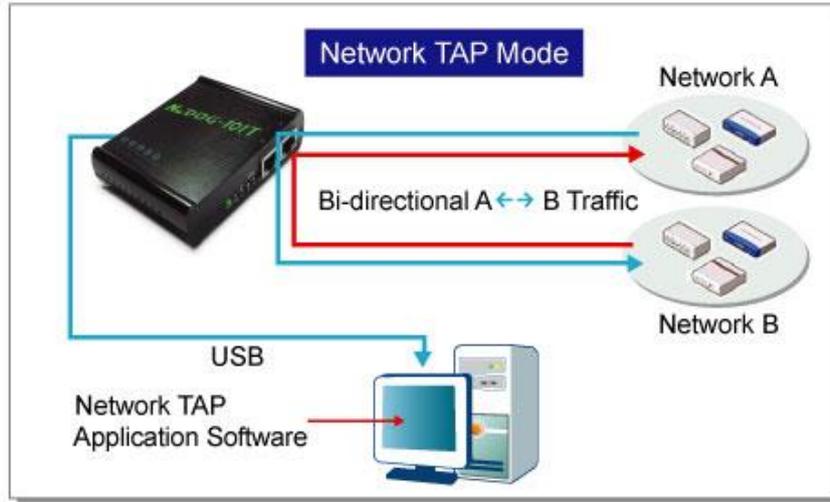
Stream Generation Mode



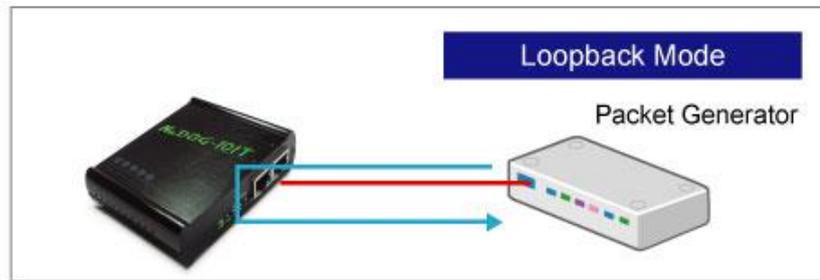
In Streams Generation mode, NuDOG-101T generates bi-directional network streams for test requirements as the illustration above.

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/Loopback Mode



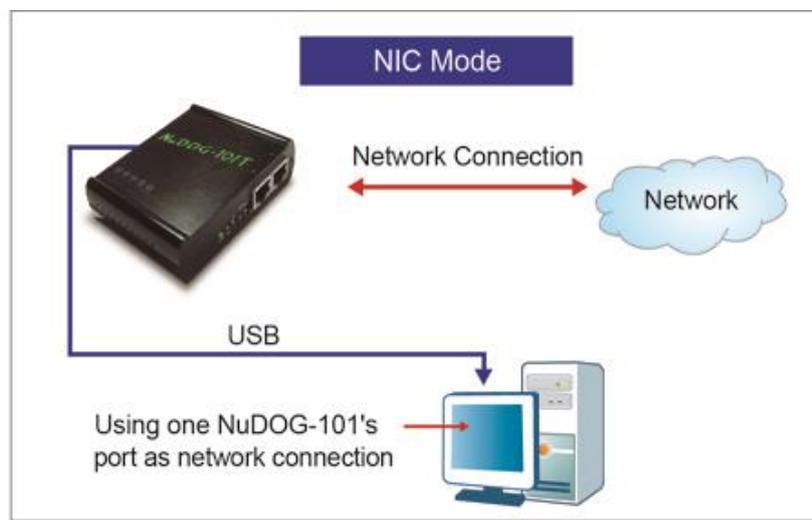
TAP Mode



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

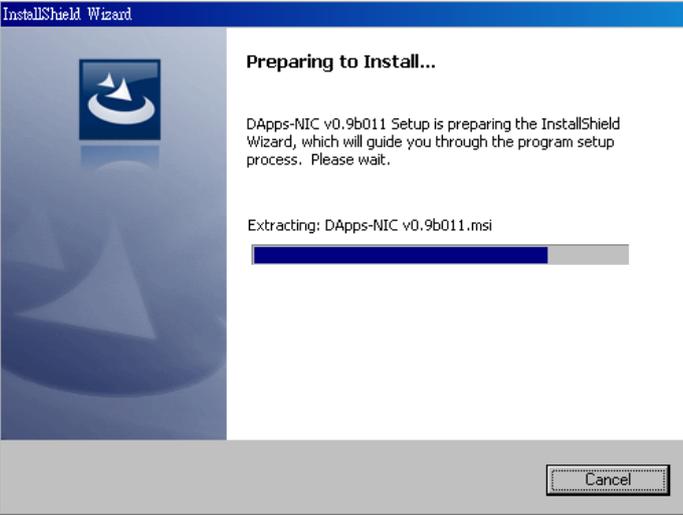
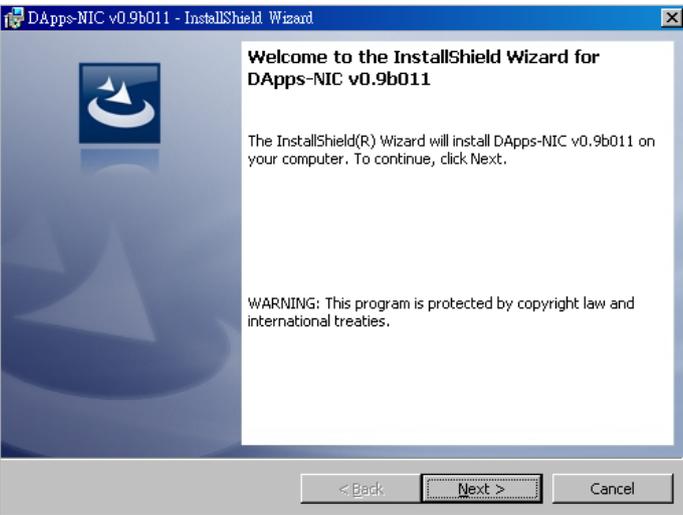


LED	Status	Description
Power	Green Blinking	Power is ON and working properly
	Yellow Blinking	System failed
USB	Green Blinking	USB of this device is linked to PC
PG/TAP	Green	NuDOG-101T is working under Packet Generation Mode
	Yellow	NuDOG-101T is working under TAP Mode
	OFF	NuDOG-101T is working under 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-NIC

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

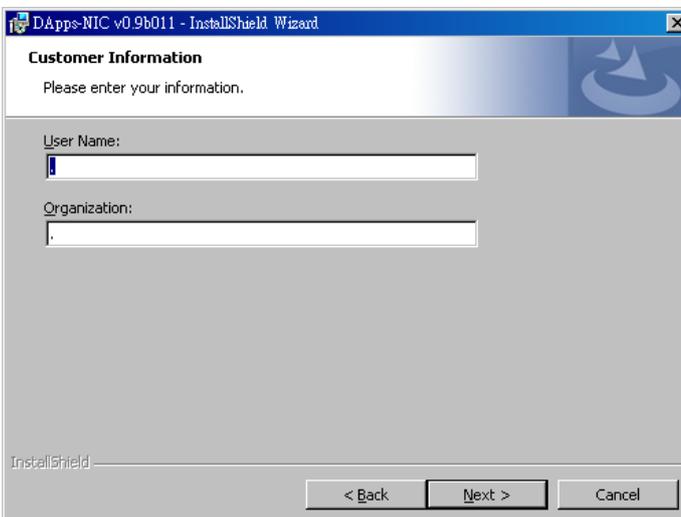
Installing DApps-NIC	
 <p>DApps-NIC v0.9b011</p>	<ol style="list-style-type: none">1. Double-click DApps-NIC installation program and start the installation process.
	<ol style="list-style-type: none">2. InstallShield Wizard is starting to install DApps-NIC. If you would like to cancel installation, click “Cancel”.
	<ol style="list-style-type: none">3. Click “Next” to continue installation.



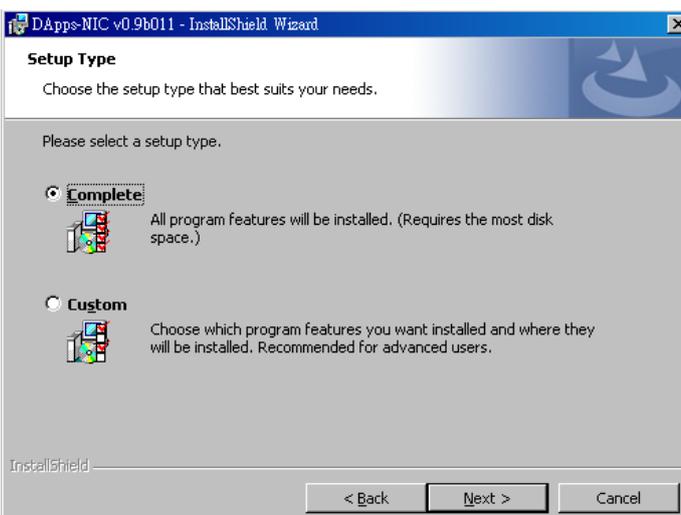
Installing DApps-NIC



4. Click “I accept the terms in the license agreement”, and click “Next” to continue.



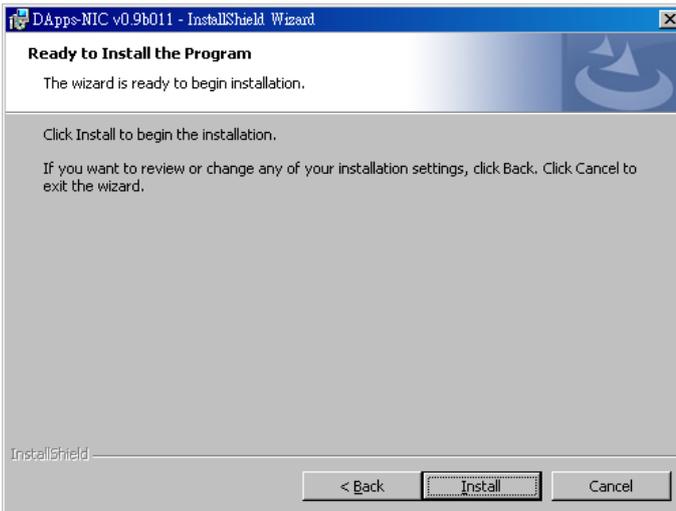
5. You can set your **User Name** and **Organization** here, and click “Next” to continue.



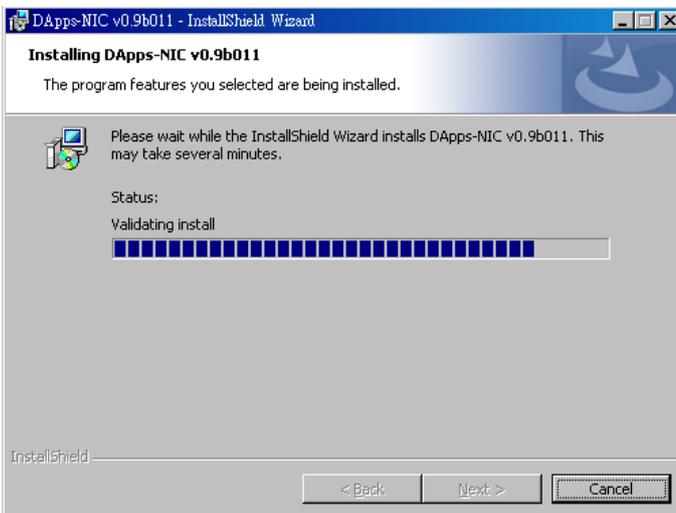
6. You can select the **Complete** option to install all program feature for running DApps-NIC, or select **Custom** option to choose the program feature to be installed.



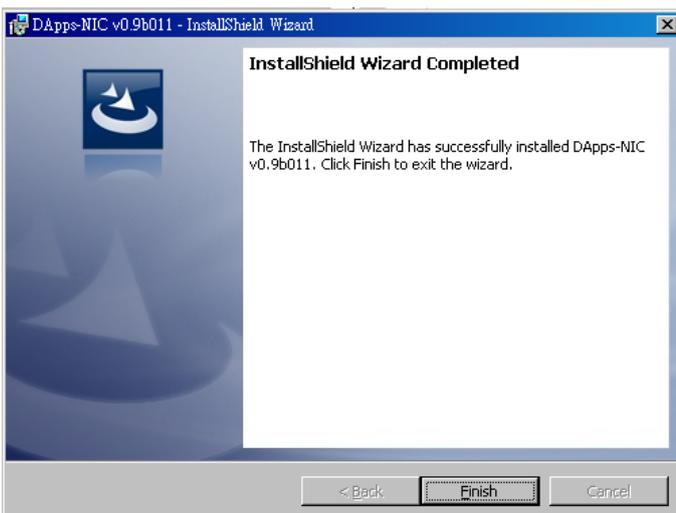
Installing DApps-NIC



7. DApps-NIC InstallShield Wizard will start installing momentarily. Click **Install** button if the information is correct.



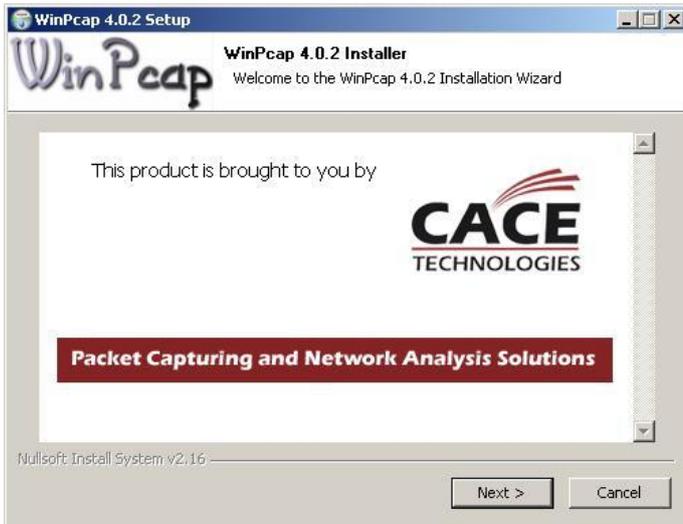
8. InstallShield Wizard is installing DApps-NIC.



9. DApps-NIC installation completes. Click **Finish** button to exit.



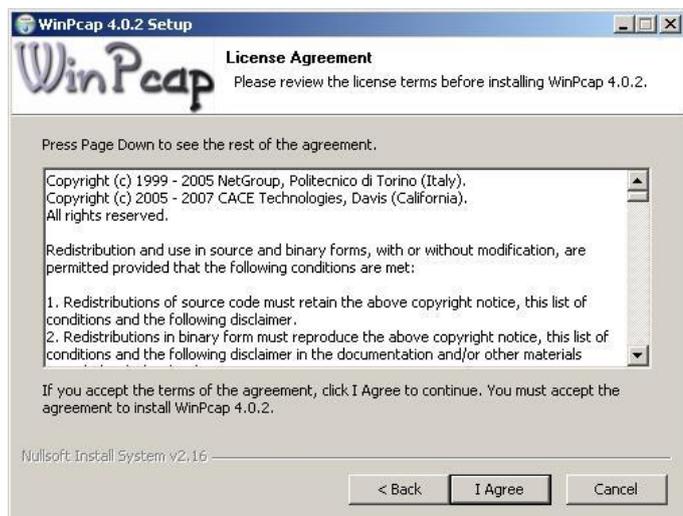
Installing DApps-NIC



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



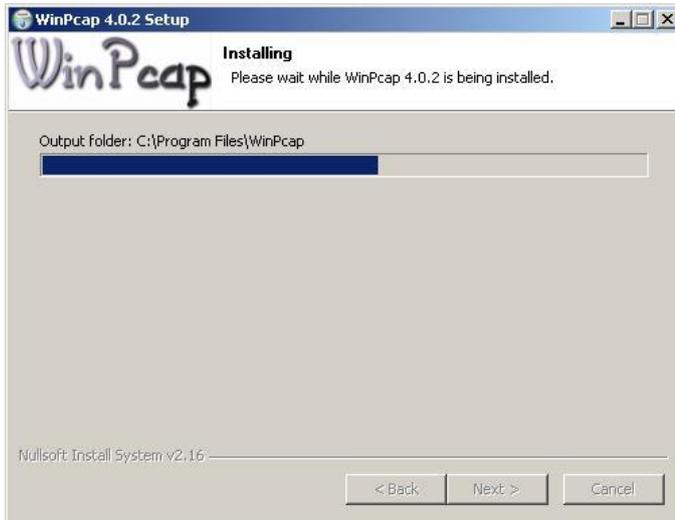
11. WinPcap is preparing to install, or click **Cancel** button to stop at any time.



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



Installing DApps-NIC



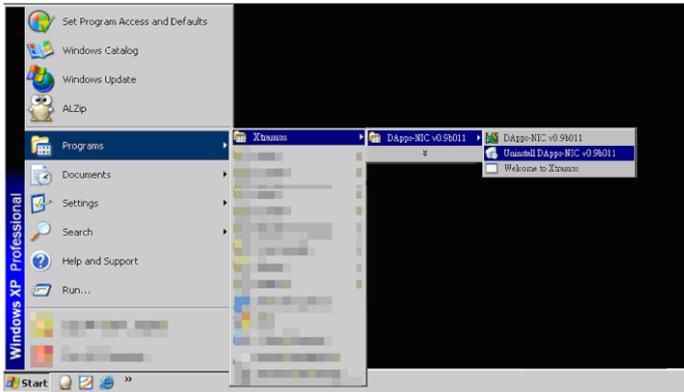
13. WinPcap is installing.



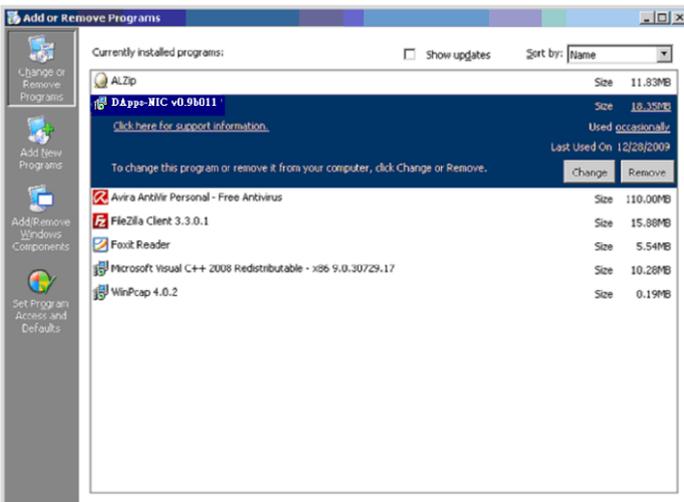
14. WinPcap installation completes. Click **Finish** button to close the wizard.



You can uninstall DApps-NIC by:



- Click Start → Programs → Xtramus → DApps-NIC → Uninstall DApps-NIC



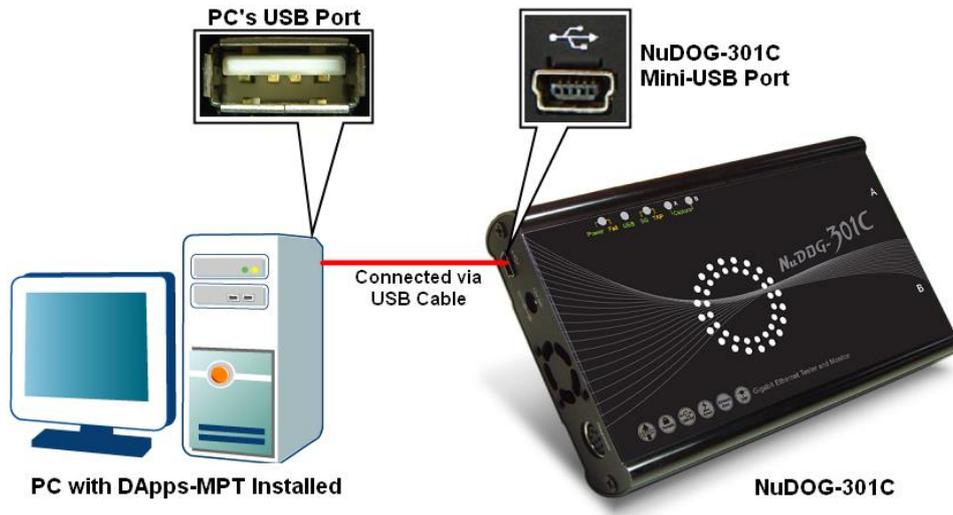
- Go to the Control Panel, choose DApps-NIC from installed program list, and click **“Remove”** to uninstall as well.



6. DApps-NIC Overview

6.1. Hardware Installation

Before starting DApps-NIC, 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-NIC

Before starting DApps-NIC, 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-NIC by:	
	<ul style="list-style-type: none"> ➤ Click Start → Programs → NuStreams → DApps-NIC.
	<ul style="list-style-type: none"> ➤ Double-click DApps-NIC icon located on your PC's desktop.



The screenshot shows the DApps-NIC software interface. The top menu includes File, Config, Tool, Language, and Help. Below the menu are buttons for Reconnect, Clear Counter (000), and Save Counter. A large 'DEMO' watermark is visible in the top right. The left pane shows a tree view for 'NuDOG-301C [DEMO]' with sub-items for System Information and Software License. The right pane is titled 'Counter Window-Port A' and contains a table of statistics.

	Port A
Link	Link Up
IG Speed	1000M Full
Type	Copper
Flow Control	Enable
Tx Packet	178,836
Tx Byte	22,891,008
Tx Line Rate (Mbps)	14
Tx Packet Rate	10,884
Rx Packet	229,212
Rx Byte	19,599,856
Rx Line Rate (Mbps)	17
Rx Packet Rate	9,854
CRC Error	0
Alignment Error	0
Dribble bit	0
Packet Size Statistics	-
Size : Under Size	0
Size : 64 Byte	192,033
Size : 65~127 Byte	12,415
Size : 128~255 Byte	17,325
Size : 256~511 Byte	1,778
Size : 512~1023 Byte	142
Size : 1024~1522 Byte	151
Size : Over Size	0
Layer 2 Packet Counters	-

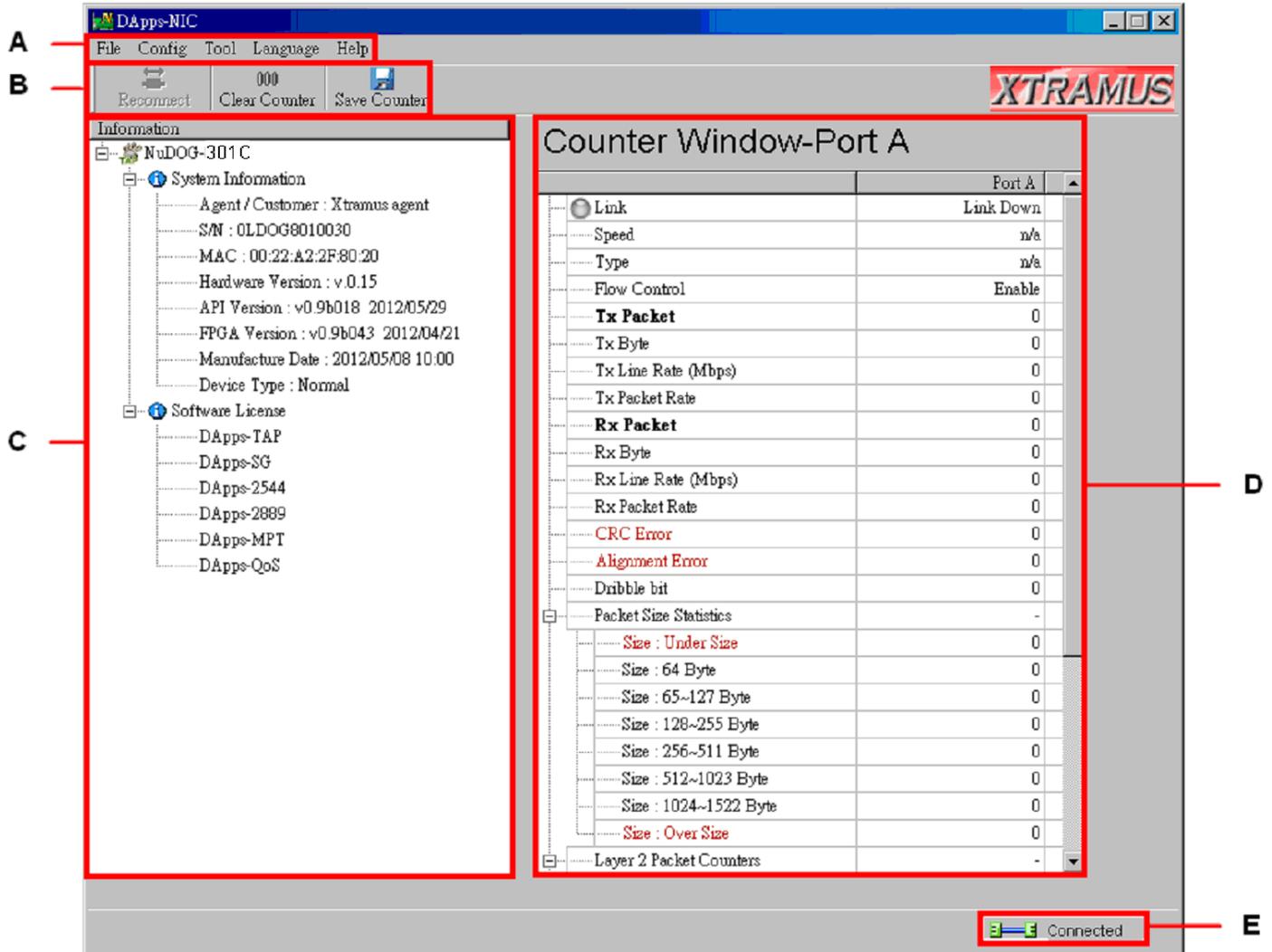
At the bottom right, a status bar shows a green 'E' icon and the text 'Connected'.

If your PC is not connected with NuDOG-301C/801/802/101T, you can still run DApps-NIC under Demo mode. Almost all DApps-NIC'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-NIC/NuServer Main Window Overview

DApps-NIC Main Window



DApps-NIC Functions Overview

A	Menu Bar	The Menu Bar allows you to switch between counter of port A or port B, to enable or disable flow control, to upgrade the FPGA and License of your NuDOG-301C/801/802/101T, 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, clear counter window of port A or B and save the counter result.
C	System Info/Software License	From System Info/Software License you can view the system information and the Software License of your current connected NuDOG.
D	Counter Window	You can view real-time testing diagrams in here.
E	System Connection Status	This icon shows the connection status between your PC and NuDOG-301C/801/802/101T.



6.4. Menu Bar

File Config Tool Language Help

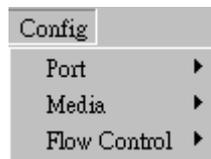
DApps-NIC Menu Bar includes configuration options such as **File**, **Config**, **Tool**, **Language**, and **Help**. Please refer to the sections down below for detail information regarding to each configuration option.

6.4.1. File



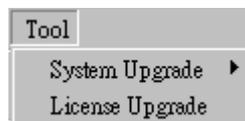
File	
Exit	A prompt pop-up window will ask if you are sure to exit DApps-NIC. Click YES to exit DApps-NIC, or click NO to cancel.

6.4.2. Config



Config		
Port		You can select Port A or Port B counter window to be displayed by clicking Port → Port A or PortB .
Media		You can select your current wire type by selecting between Cooper or Fiber , or you can select Auto for the system to auto detect your wire type.
Flow Control		You can select choose to Enable or Disable the Flow Control here.

6.4.3. Tool



Tool	
System Upgrade	<p>Choosing the option System Upgrade → FPGA upgrade will allow you to upgrade the FPGA version of your NuDOG series.</p> <p>For more detail please refer to the 7.1. Upgrade FPGA.</p>
License Upgrade	<p>Choosing the option License Upgrade will allow you to update your License if your NuDOG series is out of warranty.</p> <p>For more detail please refer to the 7.2. Upgrade License.</p>

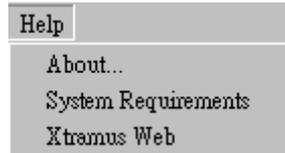


6.4.4. Language



Language	
English/ Japanese	DApps-NIC has 2 different languages for its UI available. You can set the language of UI to English or Japanese .

6.4.5. Help



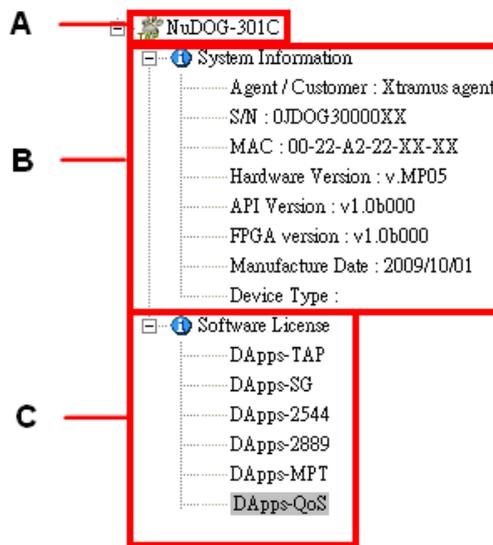
Help	
About...	<p>An "About" window will pop up and show detailed system information.</p>
System Requirements	<p>A "System Requirements" window will pop up and show the requirements for your PC and the FPGA/Firmware of the module.</p> <p>Click the OK button to exit the "System Requirements" pop-up window.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



The **Tool Bar** allows you to reconnect your PC to your NuDOG-301C/801/802/101T, clear counter window of port A or B and save the counter result.

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 ” .
 Clear Counter	Click the Clear Counter button to refresh the Counter Window-Port A and Counter Window-Port B .
 Save Counter	Click the Save Counter button to save the current Counter Window-Port A and Counter Window-Port B results.

6.6. System Info/Software License



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 Info/Software License	
A	Shows the current NuDOG model connected to your PC.
B	Shows the current information of the System
C	Click on the DApps software to pop up a window showing the license information regarding to other Xtramus softwares. For detail information of Software License, please refer to the 7.2. Upgrade License .



6.7. Counter Window

	Port A
Link	Link Up
Speed	1000M Full
Type	Copper
Flow Control	Enable
Tx Packet	10,645,559
Tx Byte	1,362,631,552
Tx Line Rate (Mbps)	11
Tx Packet Rate	10,149
Rx Packet	16,008,023
Rx Byte	1,712,899,159
Rx Line Rate (Mbps)	13
Rx Packet Rate	9,211
CRC Error	0
Alignment Error	0
Dribble bit	0
Packet Size Statistics	-
Size : Under Size	0
Size : 64 Byte	14,272,090
Size : 65~127 Byte	3,350,680
Size : 128~255 Byte	1,123,851
Size : 256~511 Byte	111,523
Size : 512~1023 Byte	10,155
Size : 1024~1522 Byte	10,121
Size : Over Size	0
Layer 2 Packet Counters	-

The Counter Window shows the status of the packets transmission of Port A and Port B of your NuDOG series, when it performs simulation of Network Interface Card (NIC).

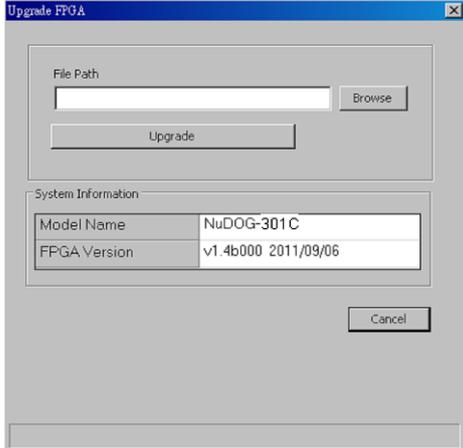
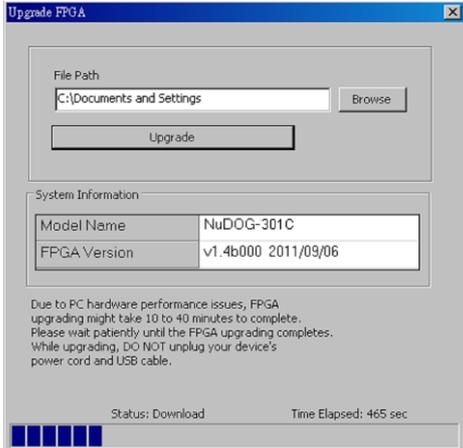
For more details about simulation of Network Interface Card (NIC), please refer to the **8. Simulation of Network Interface Card (NIC)**.



7. FPGA and License upgrade

You can upgrade the FPGA and License of your NuDOG series from DApps-NIC. Please connect your NuDOG series on your PC as shown on the figure of **6.1. Hardware Installation**.

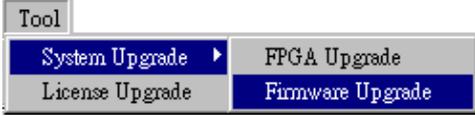
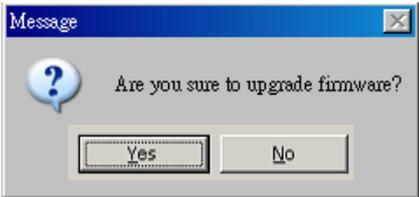
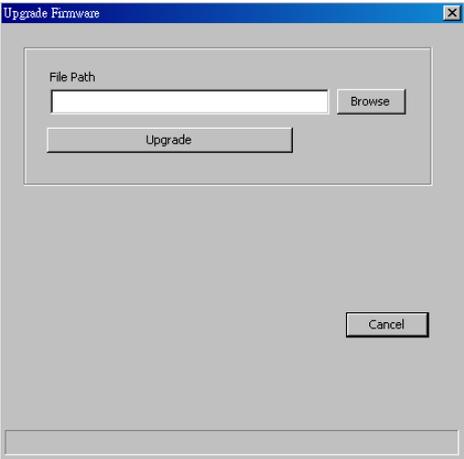
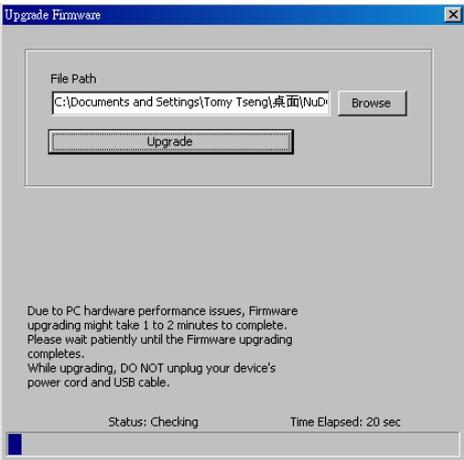
7.1. Upgrade FPGA

Upgrading FPGA	
	<p>1. Choose from the Menu Bar the option Tool → System Upgrade → FPGA Upgrade.</p>
	<p>2. A window will pop up to warn if your NuDOG series is connected or not with your PC. Click Yes for the next step.</p>
	<p>3. Another window will pop up. Please click the Browse button and select your FPGA upgrade file, then click Upgrade button to start the process.</p> <p>The System Information shows the current NuDOG model name and its FPGA version.</p> <p>You can cancel the upgrading process by clicking the Cancel button.</p>
	<p>4. Wait until the system completes the upgrading process. You can follow the upgrading process by referring to the progress bar down side of the window.</p>
	<p>5. When the upgrading process is completed, a window will pop up advising you to reconnect your NuDOG to start the updated FPGA. To confirm if the FPGA version is installed, you can go to Menu Bar → Help → About.</p>



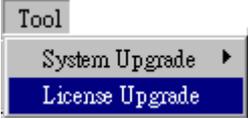
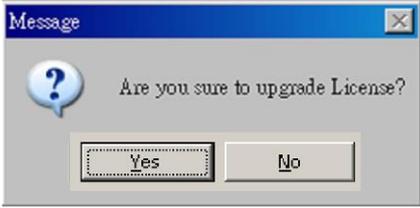
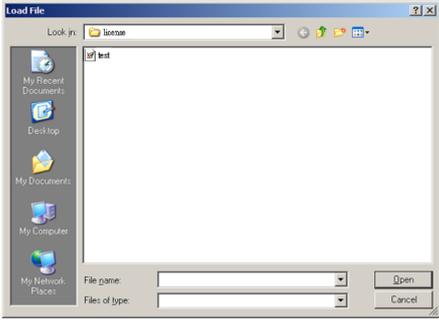
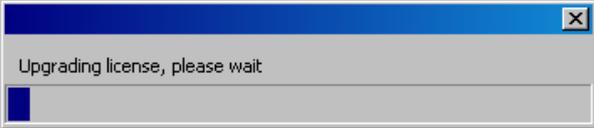
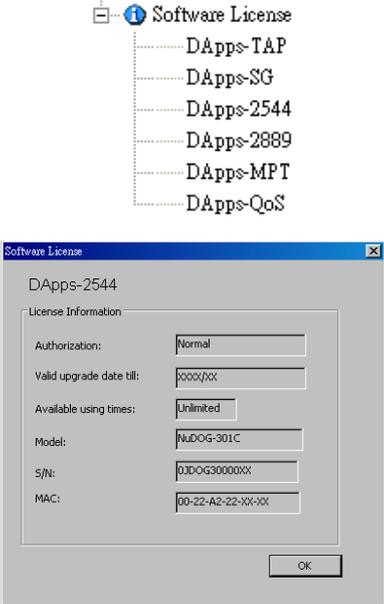
7.2. Upgrade Firmware (for NuDOG-801/802)

DApps-NIC provides NuDOG-801/802 the option for upgrading Firmware, please refer to the steps below:

Upgrading Firmware	
	<p>1. Choose from the Menu Bar the option Tool → System Upgrade → Firmware Upgrade.</p>
	<p>2. A window will pop up to warn if your NuDOG series is connected or not with your PC. Click Yes for the next step.</p>
	<p>3. Another window will pop up. Please click the Browse button and select your Firmware upgrade file, then click Upgrade button to start the process.</p> <p>You can cancel the upgrading process by clicking the Cancel button.</p>
	<p>4. Wait until the system completes the upgrading process. You can follow the upgrading process by referring to the progress bar down side of the window.</p>
	<p>5. When the upgrading process is completed, a window will pop up advising you to reconnect your NuDOG to start the updated Firmware. To confirm if the Firmware version is installed, you can go to Menu Bar → Help → About.</p>



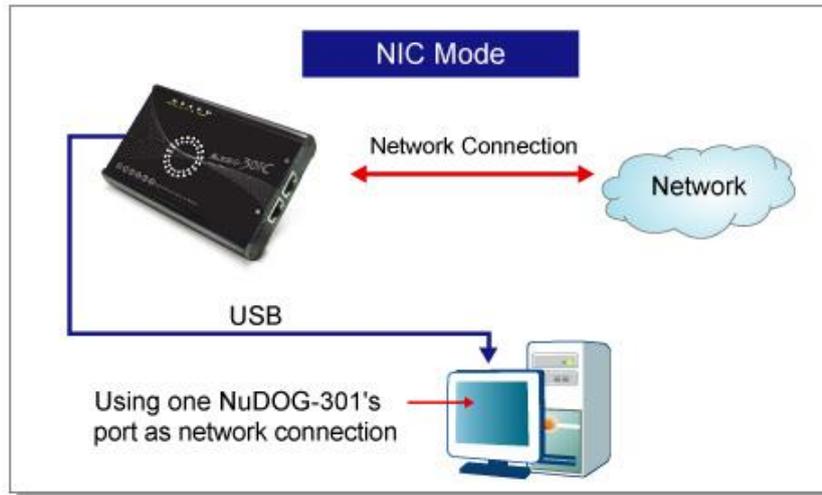
7.3. Upgrade License

Upgrade License	
	<p>1. Choose from the Menu Bar the option Tool→License Upgrade.</p>
	<p>2. A window will pop up to warn if you are ready to upgrade your NuDOG series..Click Yes for the next step.</p>
	<p>3. Select the license upgrade file from next pop up window and click Done.</p>
	<p>4. A progress bar will pop up to show the status of the upgrade process.</p>
	<p>5. When the upgrading process is completed, a window will pop up advising you to reconnect your NuDOG to start the updated License.</p>
	<p>6. You can confirm the license of other Xtramus softwares by clicking the software name on System Info/Software License.</p> <p>A Software License window will pop up showing the detail information of the selected software.</p>



8. Simulation of Network Interface Card (NIC)

DApps-NIC is a software that allows NuDOG series to perform simulation of Network Interface Card (NIC). Please connect your NuDOG series on your PC as shown on the figure below:



Through DApps-NIC, the network traffic status is showed based on Tx/Rx, CRC error, alignment error, dribble bit, packet size statistics, layer 2 packet counters and network layer conditions, please refer to the figure below:

	Port A
Link	Link Up
Speed	1000M Full
Type	Copper
Flow Control	Enable
Tx Packet	10,645,559
Tx Byte	1,362,631,552
Tx Line Rate (Mbps)	11
Tx Packet Rate	10,149
Rx Packet	16,008,023
Rx Byte	1,712,899,159
Rx Line Rate (Mbps)	13
Rx Packet Rate	9,211
CRC Error	0
Alignment Error	0
Dribble bit	0
Packet Size Statistics	-
Size : Under Size	0
Size : 64 Byte	14,272,090
Size : 65~127 Byte	3,350,680
Size : 128~255 Byte	1,123,851
Size : 256~511 Byte	111,523
Size : 512~1023 Byte	10,155
Size : 1024~1522 Byte	10,121
Size : Over Size	0
Layer 2 Packet Counters	-



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-301C/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.