

XTRAMUS

NuWIN-RM_{v1.0b052}

User's Manual

Foreword

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Revision History

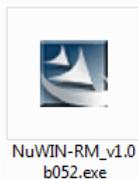
Date	Version	Software Ver.	History
2011/07/06	1.0		First draft version
2011/08/31	1.1	0.9b038	<ol style="list-style-type: none">1. Changing Revision History format: adding Software Ver.2. Updating system requirements.3. Change all pictures and descriptions accordingly.4. Adding media type setting sections for all supporting module cards.
2011/10/05	1.2	v0.9b041	<ol style="list-style-type: none">1. Page 6, change FPGA/Firmware version.2. Change pictures according to the latest NuWIN-RM.3. Page 21, change Quick Launch Buttons descriptions.4. Page 22, adding Ping Function descriptions.5. Add 4.7. Layer 3 Reply Setup.6. Add 4.10. Layer 3 Ping.7. Delete 4.6.3. Browse Setup – ARP Reply.8. Delete 4.6.4. Browse Setup – Ping9. Page 26~37, change table format.
2011/11/18	1.3	v1.0b007	<ol style="list-style-type: none">1. Page 6, change supporting module cards' FPGA/firmware version.
2015/01/13	1.4	v1.0b052	<ol style="list-style-type: none">1. Update the descriptions to NuWIN-RMv1.0b052.2. Optimize the outlines of the manual.

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1. NuWIN-RM Overview



NuWIN-RM provides a powerful and sophisticated virtual front panel to manage the NuStreams-2000i and NuStreams-600i chassis. Each test port can be independently configured with parameters to define streams, filters, and capture capabilities. Traffic for various network protocols can be customized, transmitted, and received on each port.

Comprehensive statistics provide users an in-depth analysis of the performance of the DUT (Device under Test).

NuWIN-RM has a flexible and intuitive interface to control test modules in a single or multiple chassis through a click of the mouse. Any combination of test modules can be inserted into NuStreams chassis and be instantly identified.

Each port can be configured to analyze and count packets to match user-defined criteria, such as source and destination MAC addresses, custom patterns, errors, and frame size ranges. Each port is equipped with capture memory, which can store packets in real time. A comprehensive set of user-defined triggers and filters are available based on source and/or destination MAC and/or IP addresses, data patterns, and error conditions.

NuWIN-RM is designed to allow multiple users to access individual ports of every test module installed. This feature enables users to execute their own tests on the ports assigned to them without disrupting other users on the system.

NuWIN-RM is designed for Xtramus XM-RM series module cards. The table down below contains the XM-RM module cards, FPGA/Firmware/PROM versions that are supported by NuWIN-RM.

Module Cards Support NuWIN-RM		
Module Card	FPGA Version	Firmware Version
XM-RM661/671/681	V3.0b016	v1.5b059
XM-RM751/761/781	V3.0b016	v1.5b059
XM-RM731	v2.0b004	v1.4b062
XM-RM881	v1.3b005	v0.1b106
XM-RM891	v1.3b003	v1.4b011

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

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

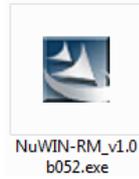
OS	Windows 2000/Windows XP	Windows Vista/Windows 7
RAM	512MB RAM	1GB RAM
CPU	Pentium 1.3GHz or Higher	
HDD	10 GB Available Space	

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

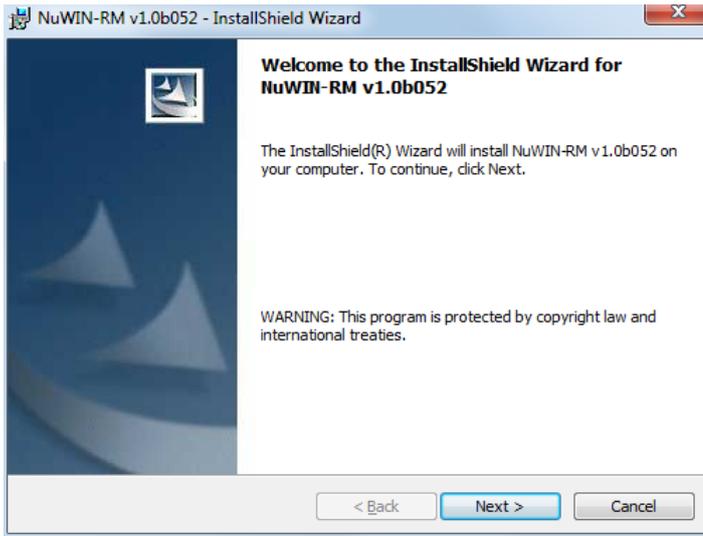
2. Installing/Uninstalling NuWIN-RM

Please follow the steps down below to install NuWIN-RM.

Installing NuWIN-RM



1. Double-click NuWIN-RM installation program and start the installation process.

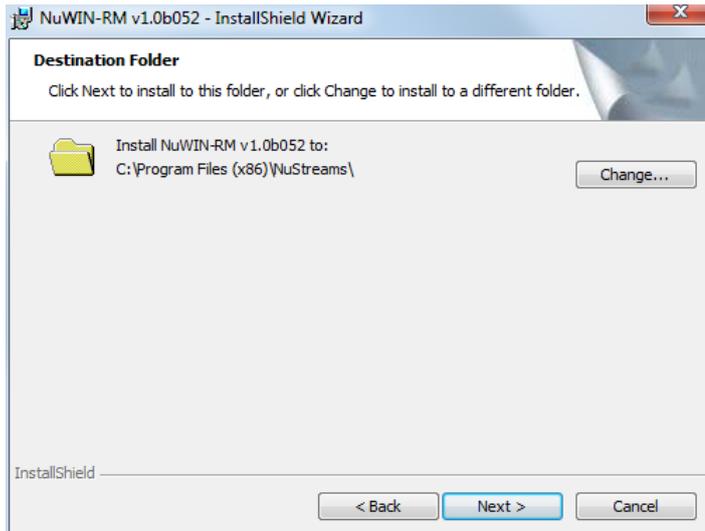


2. InstallShield Wizard is starting to install NuWIN-RM. If you would like to cancel installation, click "**Cancel**", or Click "**Next**" to continue installation.

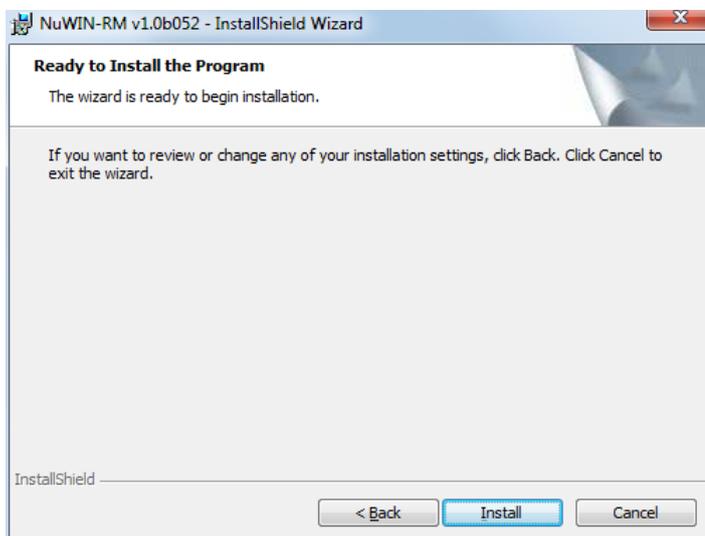


3. Choose "**I accept the terms in the license agreement**" and click **Next** to continue the installation. Click **Back** to return to the previous step. Or if you do not agree with the end user license agreement, please click "**Cancel**" to exit the InstallShield Wizard.

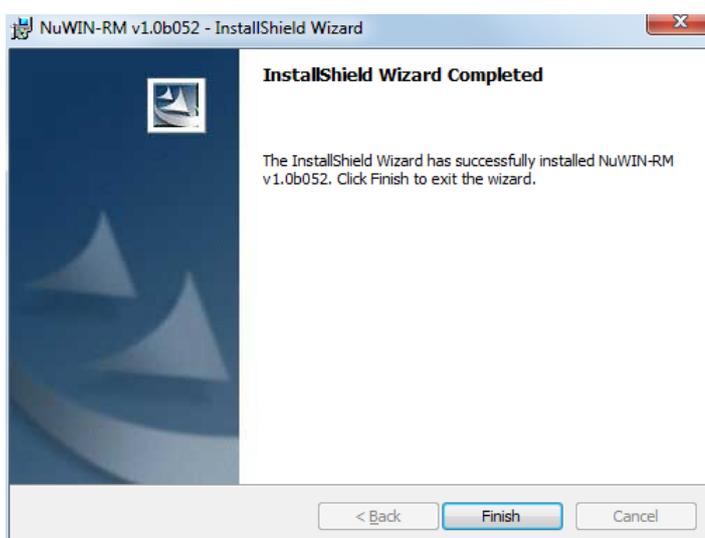
Installing NuWIN-RM



4. Set the file path where you want to install NuWIN-RM.



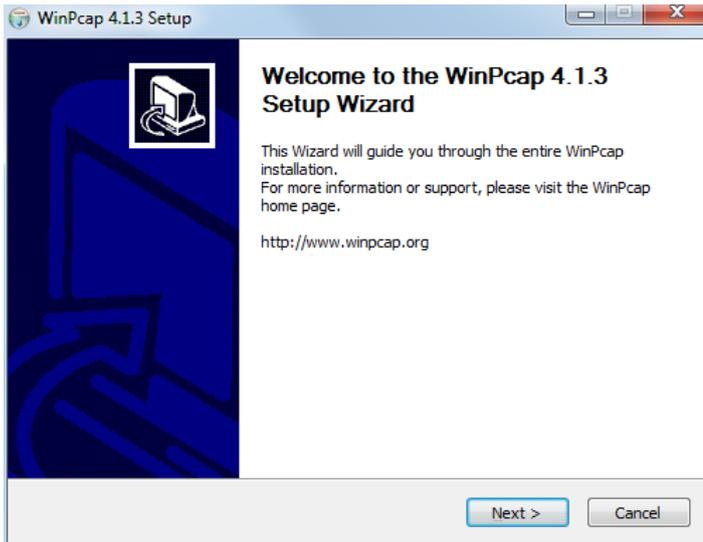
5. Click **Install** to continue the installation. If you want to review or change any of your installations settings, click **Back**. Or **Click** Cancel to exit the wizard.



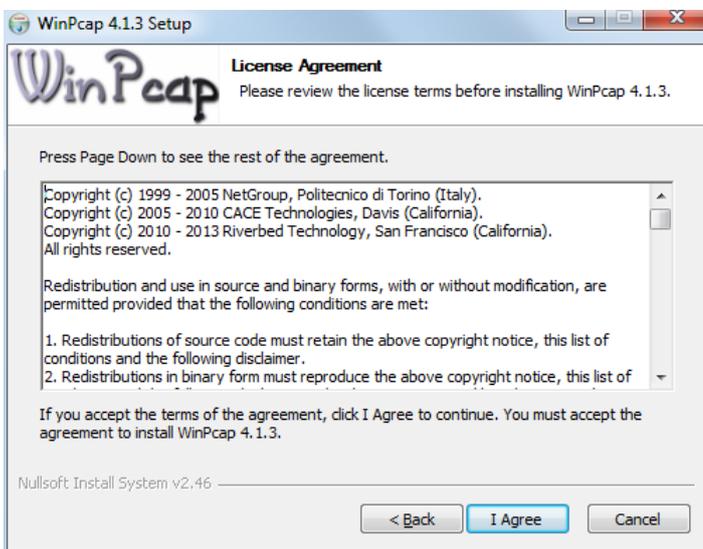
6. Click Finish, then the installation of NuWIN is completed.

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

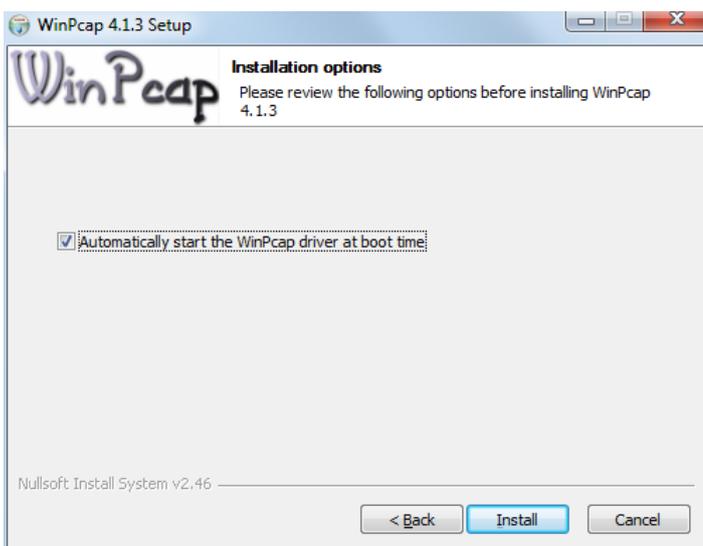
Installing NuWIN-RM



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

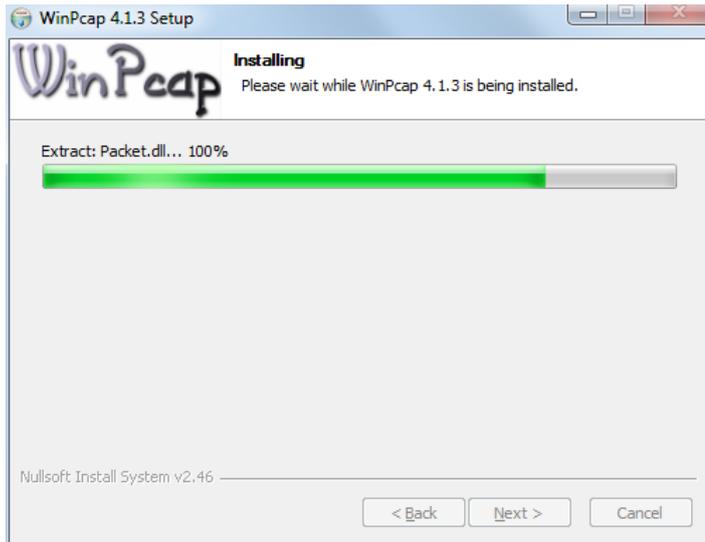


8. Review the license agreement before installing. Click **I Agree** button to continue. It is necessary to accept the agreement to install WinPcap.

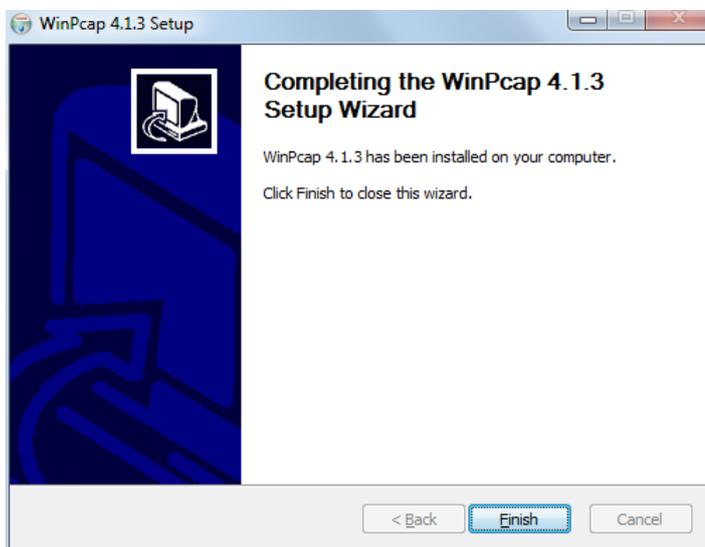


9. You can set if you would like to start WinPcap driver when booting PC by clicking the check-box. Click "**Install**" to continue.

Installing NuWIN-RM



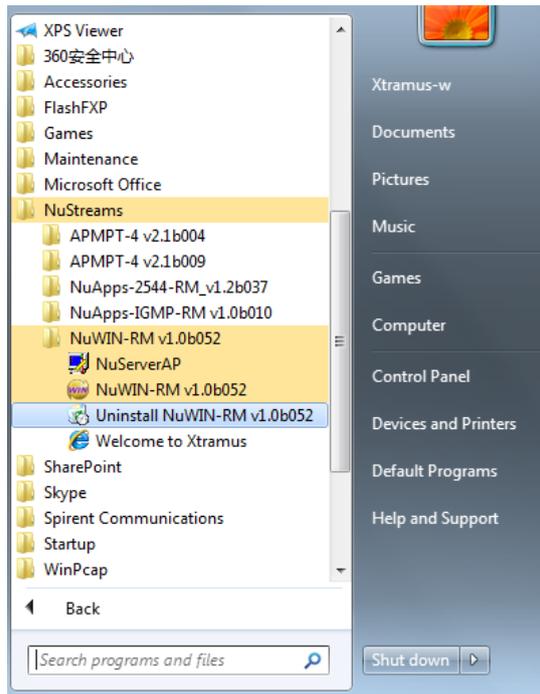
10. WinPcap is installing.



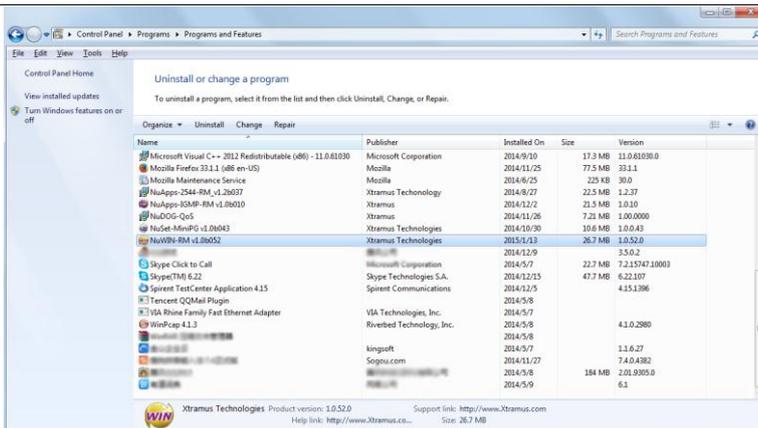
11. WinPcap installation completes. Click **Finish** button to close the wizard.

You can uninstall NuWIN-RM by:

Uninstalling NuWIN-RM



- Click **Start** → **All Programs** → **NuStreams** → **NuWIN-RM v1.0b052** → **Uninstall NuWIN-RM v1.0b052**.

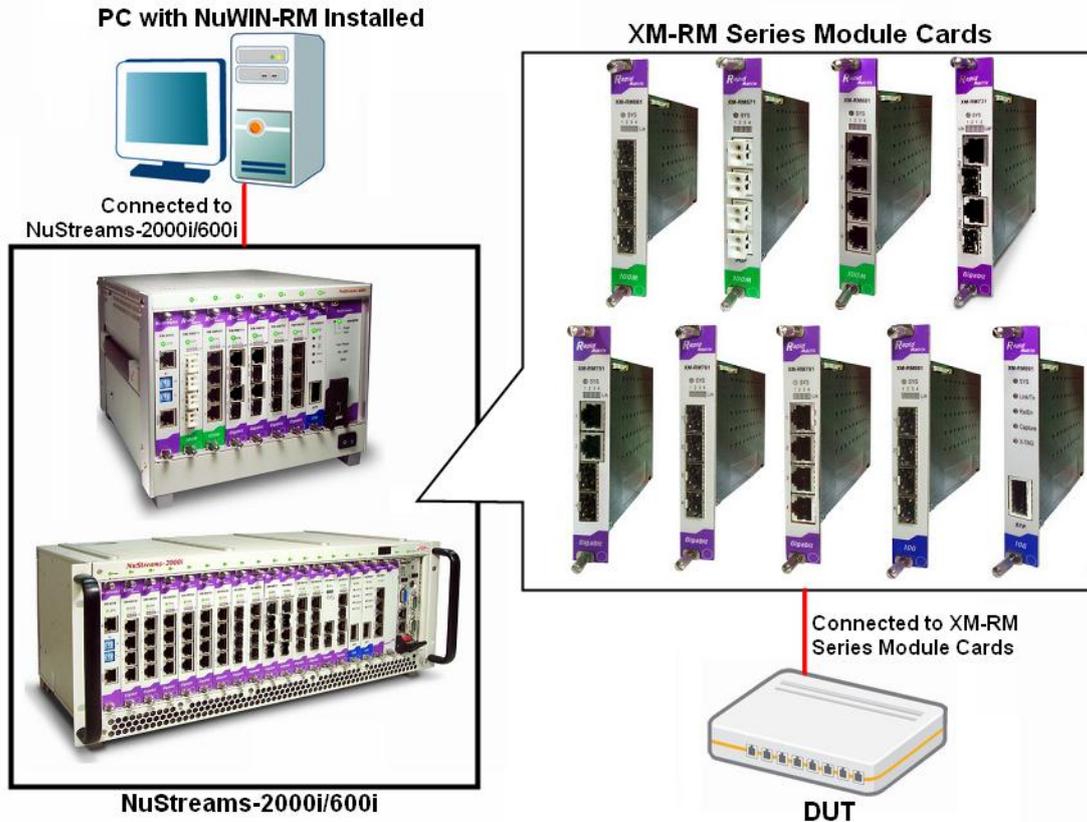


- Go to the **Control Panel** and uninstall the program.

3. NuWIN-RM Function Overview

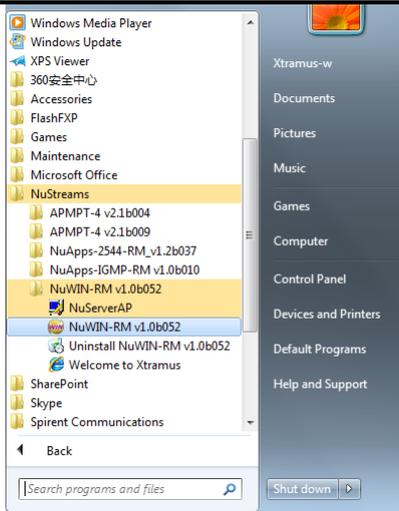
3.1. Starting NuWIN-RM

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



There are two ways to start NuWIN-RM:

Starting NuWIN-RM



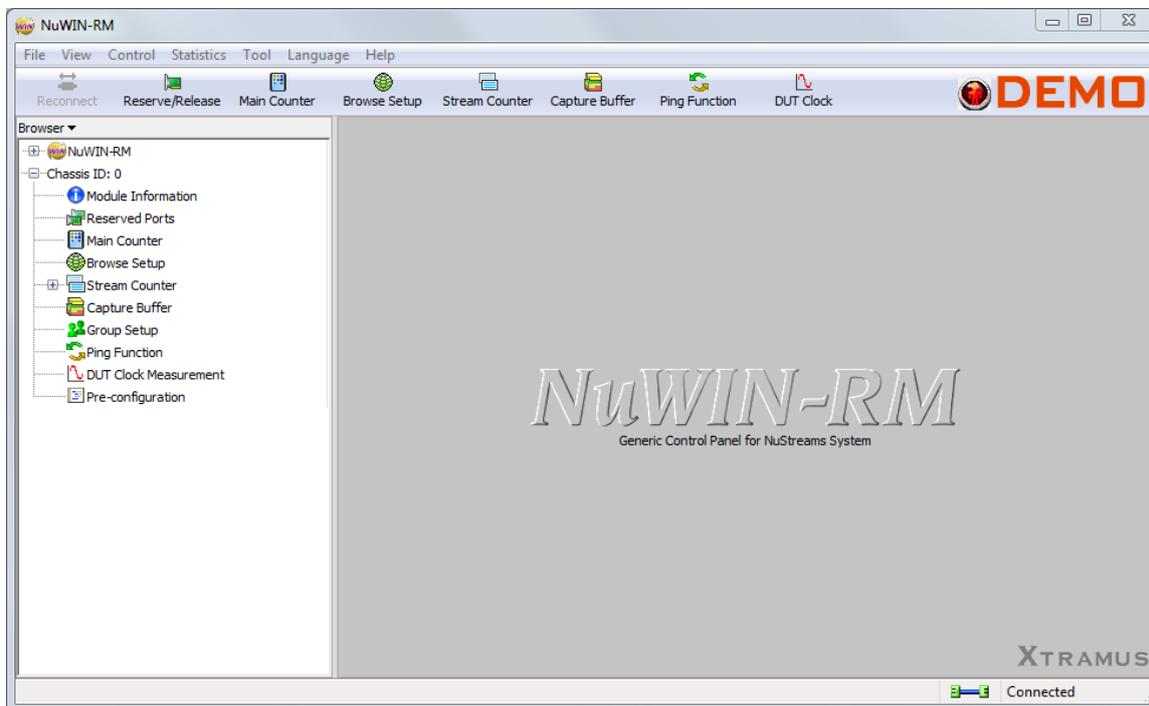
- Click Start → All Programs → NuStreams → NuWIN-RM v1.0b052 → NuWIN-RM v1.0b052.

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

NuWIN-RM Demo Mode

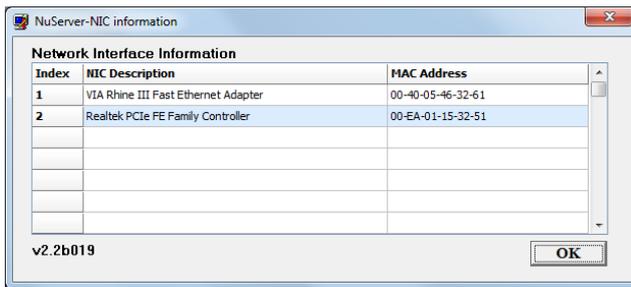
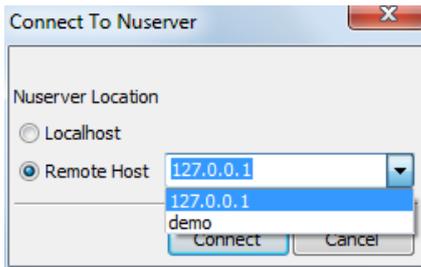
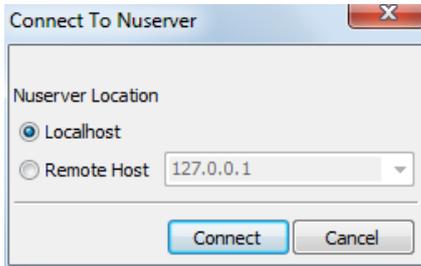
If your PC is not connected with NuStreams-2000i/600i, you can still run NuWIN-RM under **Demo Mode**. Almost all NuWIN-RM's functions are available under **Demo Mode**.

Note: Demo Mode is for system demo purposes only, and does not serve any testing purposes at all.



Please follow the steps down below to start NuWIN-RM and NuServer properly.

Starting NuServer



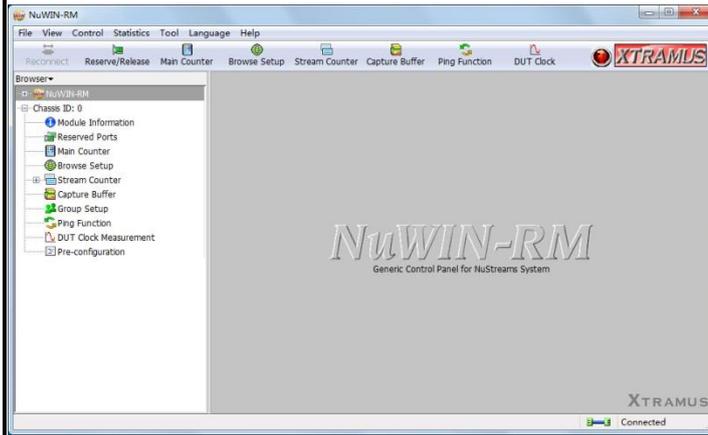
When starting NuWIN-RM, a “**Connect To NuServer**” window will pop up and ask how you are going to connect to NuServer.

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

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

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

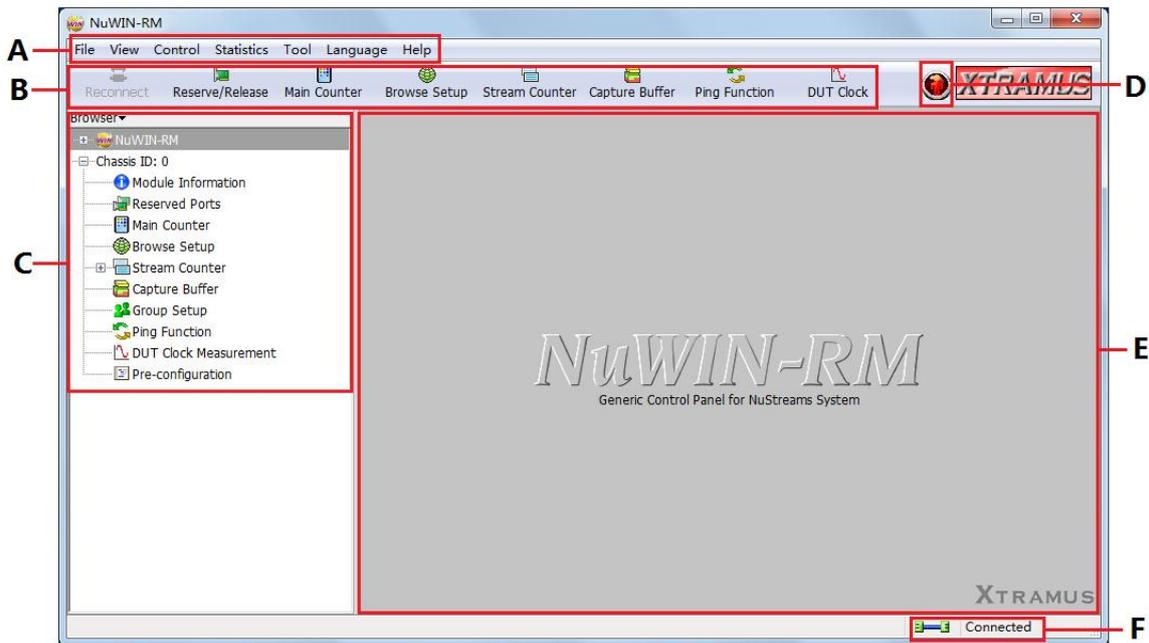
Starting NuServer



You now have accessed to NuWIN-RM's main display window.

3.2. NuWIN-RM/NuServer Overview

NuWIN-RM Main Window



NuWIN-RM Functions Overview		
A	Menu Bar	The Menu Bar allows you to make settings about test criteria, load/save settings you've made, and change language displayed.
B	Quick Launch Buttons	The Quick Launch Buttons allow you to reconnect your PC to NuStream-2000i/600i, open/save test settings, make test configurations, and view test reports.
C	Module Info/Configuration List	By clicking the Module Info/Configuration List , you can view system information, making test configurations, or view test reports on the Main Display Screen .
D	Status Icon	The Status Icon shows the running status of NuWIN-RM.  No test is underway.  Test is running.
E	Main Display Screen	You can make detail configurations and view real-time testing diagrams on the Main Display Screen .
F	System Connection Status	This icon shows the connection status between your PC and NuStreams-2000i/600i.

NuServer

The screenshot shows the NuServer application window. It features a table for module cards, a section for connection functions, and a section for NIC information. Red boxes and arrows highlight specific elements: the table, the 'Force Disconnect' and 'ReConnect' buttons, the NIC description and MAC address, and the version number 'v2.2b019'.

Num	ID (Chassis, Slot, Port)	Card Type
1	(0, 1, 1)	XM-2S10
2	(0, 8, 1)	XM-RM781
3	(0, 8, 2)	XM-RM781
4	(0, 8, 3)	XM-RM781
5	(0, 8, 4)	XM-RM781

Module Card Information

Selected NIC Information

Force Disconnect ReConnect

Connection Function

NIC Description	MAC Address
Realtek PCIe GBE Family Controller	00-E0-4C-68-00-24

NIC Information

v2.2b019

NuServer Version

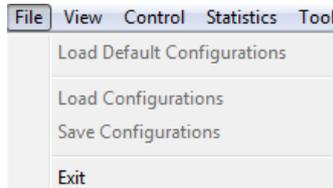
Description	
Module Card Information	This section displays the information regarding to the module cards that are installed on NuStreams-2000i/600i. Module Card IDs are showed as the format of (X, Y, Z) while X is the chassis ID (which is displayed on NuStreams-2000i/600i), Y is the slot number where this module card is installed, and Z is the available port number located on the module card.
Connection Function	You can reconnect a link down status or force to disconnect your NuStreams-600i/2000i to your PC.
NIC Information	This section displays the detail information (including NIC Model name, NIC's MAC address) regarding to the selected NIC.
NuServer Version	This section displays the version of your NuServer.

4. Menu Bar

File View Control Statistics Tool Language Help

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

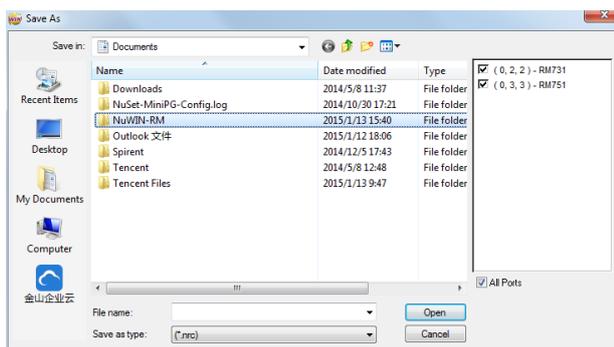
4.1. File



File		
<p>Load Default Configurations</p>		<p>Reset all the settings to default, including settings in the Module Info/Configuration List, as shown in the picture on the left.</p>
<p>Load Configurations</p>		<p>If you have a previously saved configuration setting file in your PC, you can load it and apply all the setting you've made by choosing "Load Configurations" from the Menu Bar.</p> <p>All configuration files are saved in the format of "*.cfg".</p>

File

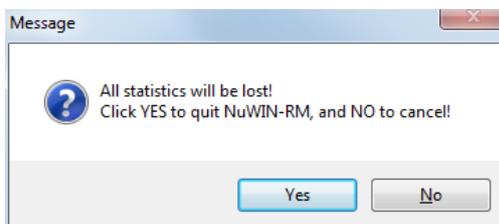
Save Configurations



You can save the current configuration settings to your PC by choosing “**Save Configurations**” from the **Menu Bar**.

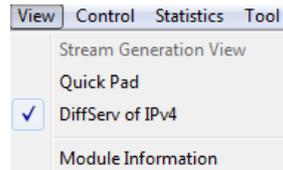
All configuration files are saved in the format of “***.cfg**”.

Exit



A prompt pop-up window will ask if you would like to close NuServer as well. Click **Yes** to exit NuWIN-RM, or click **No** to cancel.

4.2. View



View		
<p>Stream Generation View</p>		<p>Click Stream Generation View, then the View Settings window will pop up. The settings you make here will be applied to all the reserved ports.</p>
<p>Group Setup</p>		<p>Click Quick Pad, then the small Quick Pad window will pop up. The icons of the currently opened or minimized configuration window will be displayed here to facilitate the use of next time.</p>
<p>DiffServ of IPv4</p>		<p>Check Diffserv of IPv4 here, the QoS priority settings will be DSCP, shown as the upper picture on the left.</p> <p>Uncheck Diffserv of IPv4 here, the QoS priority settings will be ToS, shown as the lower picture on the left.</p>

View

Module Information

Browser

- Root
- Chassis ID: 0
- Module Information
- Reserved Ports
- (0, 3, 4): XM-RM751
- Main Counter
- Browse Setup
- Stream Counter
- Capture Buffer
- Group Setup
- Ping Function
- OUT Clock Measurement
- Pre-configuration

Module Information

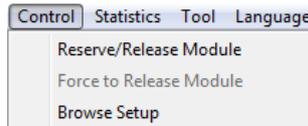
Refresh

Slot No.	FPGA Version	Hardware Version	Lock Status	Serial Number	MAC Address
Slot 1					
Slot 2	v0.30000	MP01	UnLock	0N9RM771003	00-22-A2-00-02-01
Slot 3	v0.30000	MP01	Lock	0N9RM751003	00-22-A2-00-03-01
Slot 4	v0.30000	MP01	Lock	0N9RM761004	00-22-A2-00-04-01
Slot 5	v0.30000	MP01	UnLock	0N9RM781005	00-22-A2-00-05-01
Slot 6	v0.30000	MP01	UnLock	0N9RM661006	00-22-A2-00-06-01
Slot 7	v0.30000	MP01	UnLock	0N9RM671007	00-22-A2-00-07-01
Slot 8	v0.30000	MP01	UnLock	0N9RM681008	00-22-A2-00-08-01
Slot 9	v0.30000	MP01	UnLock	0N9RM811009	00-22-A2-00-09-01
Slot 10	v0.30000	MP01	UnLock	0N9RM881010	00-22-A2-00-0A-01
Slot 11	v0.30000	MP01	UnLock	0N9RM891011	00-22-A2-00-0B-01
Slot 12	v0.30000	MP01	UnLock	0N9RM991012	00-22-A2-00-0C-01
Slot 13	v0.30000	MP01	UnLock	0N9RM881201	00-22-A2-00-0D-01
Slot 14					
Slot 15					
Slot 16					
Slot 17					
Slot 18	v0.30000	n/a	n/a	n/a	n/a

The module cards with the red icon need to be upgraded FPGA/Firmware versions to match system requirements.

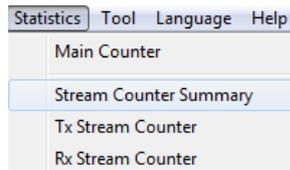
Check **Module Information** here, the detailed module information will be displayed in the main display screen.

4.3. Control



Control																				
<p>Reserve/Release Module</p>		<p>A Reserve/Release Modules window will pop up if you choose Reserve /Release Module from the Menu Bar.</p> <p>You can choose the module cards you would like to reserve or release on the Reserve/Release Modules window.</p> <p>For detailed information, please refer to 7. Reserve/Release Module.</p>																		
<p>Force to Release Module</p>		<p>Generally, the Force to Release Module function is gray. But if the function turns black, it means some active ports are locked so as to not available to use. In this case, please click this function to pop up the window on the left to force release the locked ports.</p>																		
<p>Browse Setup</p>	<table border="1"> <thead> <tr> <th>Port Overview</th> <th>MAC Address</th> <th>IPv4 Address</th> <th>IPv6 Address</th> <th>ARP Reply</th> <th>Current Speed</th> </tr> </thead> <tbody> <tr> <td>(0, 3, 4) - XM-RM751</td> <td>00-22-42-00-04-04</td> <td>192.168.2.4</td> <td>n/a</td> <td><input type="radio"/></td> <td>Auto 1000M Full</td> </tr> <tr> <td>(0, 4, 4) - XM-RM761</td> <td>00-22-42-00-04-04</td> <td>192.168.4.4</td> <td>n/a</td> <td><input type="radio"/></td> <td>Auto 1000M Full</td> </tr> </tbody> </table>	Port Overview	MAC Address	IPv4 Address	IPv6 Address	ARP Reply	Current Speed	(0, 3, 4) - XM-RM751	00-22-42-00-04-04	192.168.2.4	n/a	<input type="radio"/>	Auto 1000M Full	(0, 4, 4) - XM-RM761	00-22-42-00-04-04	192.168.4.4	n/a	<input type="radio"/>	Auto 1000M Full	<p>A Browse Setup Window will pop up if you choose Browse Setup from the Menu Bar.</p> <p>You can view or change test settings on the Browse Setup window.</p> <p>For detailed information, please refer to 6.4. Browse Setup.</p>
Port Overview	MAC Address	IPv4 Address	IPv6 Address	ARP Reply	Current Speed															
(0, 3, 4) - XM-RM751	00-22-42-00-04-04	192.168.2.4	n/a	<input type="radio"/>	Auto 1000M Full															
(0, 4, 4) - XM-RM761	00-22-42-00-04-04	192.168.4.4	n/a	<input type="radio"/>	Auto 1000M Full															

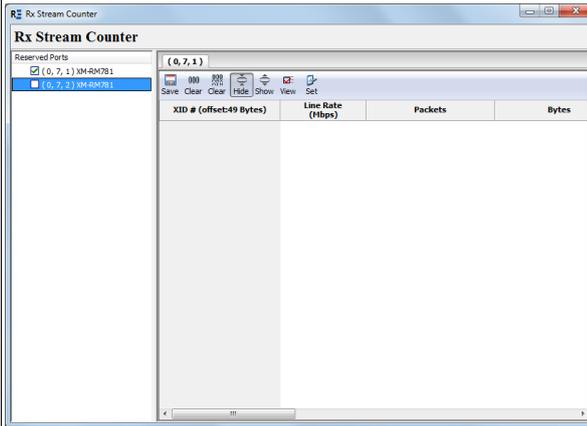
4.4. Statistics



<p>Statistics</p> <p>Main Counter Window</p>		<p>A Main Counter window will pop up if you choose Main Counter from the Menu Bar.</p> <p>You can view counter reports, start/stop packet counts on the Main Counter window.</p> <p>For detailed information, please refer to 6.3. Main Counter.</p>
<p>Stream Counter Summary</p>		<p>Stream Counter Summary allows the user to view the test data of his interest.</p> <p>For detailed information, please refer to 6.5.1 SC Summary.</p>
<p>Tx Stream Counter</p>		<p>Tx Stream Counter allows the user to view the Tx test data of his interest.</p> <p>For detailed information, please refer to 6.5.2 Tx SC/ Tx Stream Counter.</p>

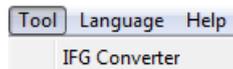
Statistics

Rx Stream Counter

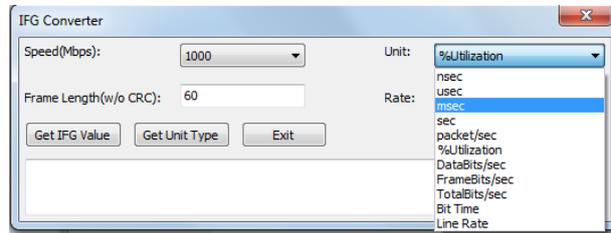


Rx Stream Counter allows the user to view the Rx test data of his interest. For detailed information, please refer to **6.5.3 Rx SC/ Rx Stream Counter**.

4.5.Tool



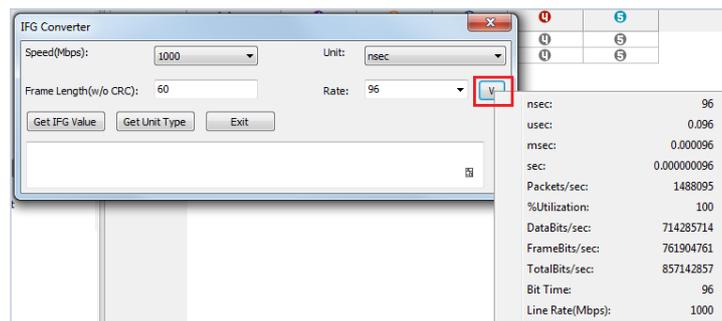
Tool



IFG Converter allows the user to convert the frame gap among different units.

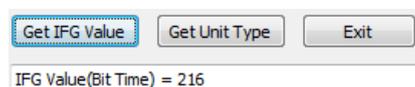
- **Speed:** set the network speed from the scroll down menu.
- **Frame Length (w/o CRC):** Set the length of the packet by inputting the desired value.
- **Unit:** Select a unit of frame gap from the scroll down menu.
- **Rate:** Select a value for the **Unit**. For example, if you select **nsec** for Unit and **96** for rate, it means 96 nsec.

IFG Converter

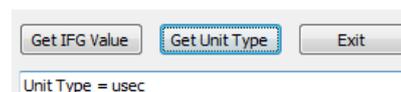


Click the  button on the right, you can view the frame gap in other units automatically converted by this tool and displayed in the pop-up window.

- **Get IFG value:** Click this button, the frame gap in unit of Bit Time will be displayed in the down area.



- **Get Unit Type:** Click this button, the unit type will be displayed in the down area.



- **Exit:** Exit this function and close **IFG Converter** window.

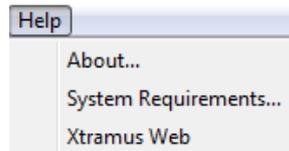
4.6. Language



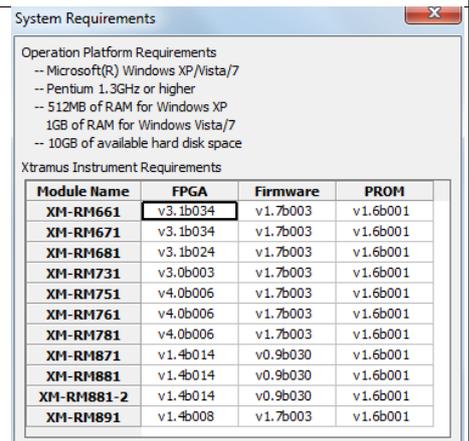
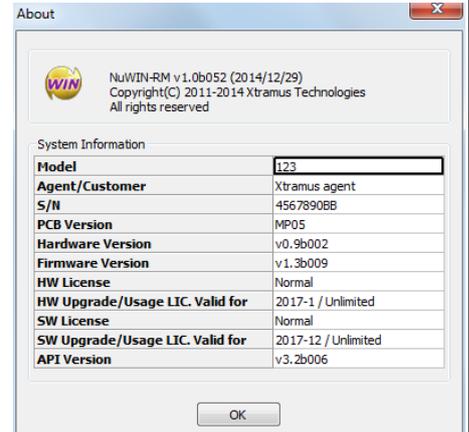
Language	
English	NuWIN-RM supports 4 different languages for its UI.

Note: As to the current version of NuWIN-RM, only English UI is supported.

4.7. 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/PROM of the module cards.</p> <p>➤ OK: Click this button to exit the “System Requirements” pop-up window.</p>
Xtramus Web	Access Xtramus Website (www.xtramus.com).



5. Quick Launch Buttons



These **Quick Launch Buttons** allow you to reconnect NuStreams-2000i/600i, reserve/release module cards, view counter statistics, browse/configure system settings, and perform Ping commands. Please refer to the section down below for more detail descriptions regarding to **Quick Launch Buttons**.

Reconnect

If the connection between your PC and NuStreams-2000i/600i is down, a **"Disconnected"** icon will be shown in **"System Connection Status"**.

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

Reserve/Release

A **Reserve/Release Modules** window will pop up if you choose **Reserve /Release Module** from the **Menu Bar**.

You can choose the module cards you would like to reserve or release on the **Reserve/Release Modules** window.

For detailed information, please refer to **7. Reserve/Release Module**.

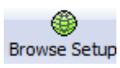
Main Counter

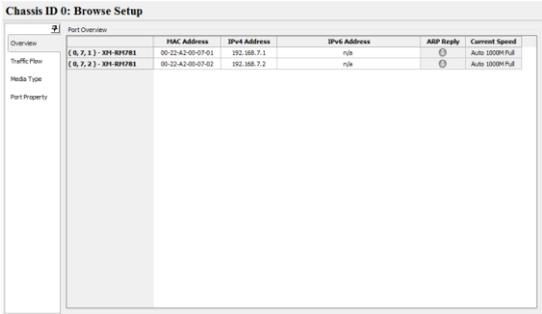
A **Main Counter** window will pop up if you press the **Main Counter** button on the **Quick Launch Buttons**.

You can view counter reports, start/stop packet counts on the **Main Counter** window.

For detailed information, please refer to **6.3. Main Counter Window**.

Browse Setup Window





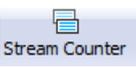
Port Overview	MAC Address	IPv4 Address	IPv6 Address	ARP Reply	Current Speed
(0, 7, 1) - XM-RM781	00-22-A2-00-07-01	192.168.7.1	nil	<input type="radio"/>	Auto 1000M Full
(0, 7, 2) - XM-RM781	00-22-A2-00-07-02	192.168.7.2	nil	<input type="radio"/>	Auto 1000M Full

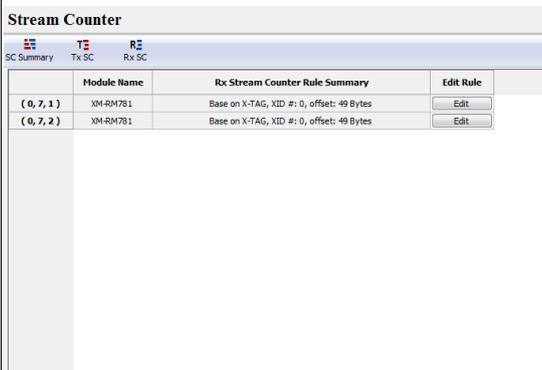
A **Browse Setup** window will pop up if you press the **Browse Setup** button on the **Quick Launch Buttons**.

You can view or change test settings on the **Browse Setup** window.

For detailed information, please refer to **6.4. Browse Setup Window**.

Stream Counter





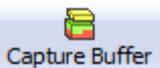
Module Name	Rx Stream Counter Rule Summary	Edit Rule
(0, 7, 1) XM-RM781	Base on X-TAG, XID #: 0, offset: 49 Bytes	<input type="button" value="Edit"/>
(0, 7, 2) XM-RM781	Base on X-TAG, XID #: 0, offset: 49 Bytes	<input type="button" value="Edit"/>

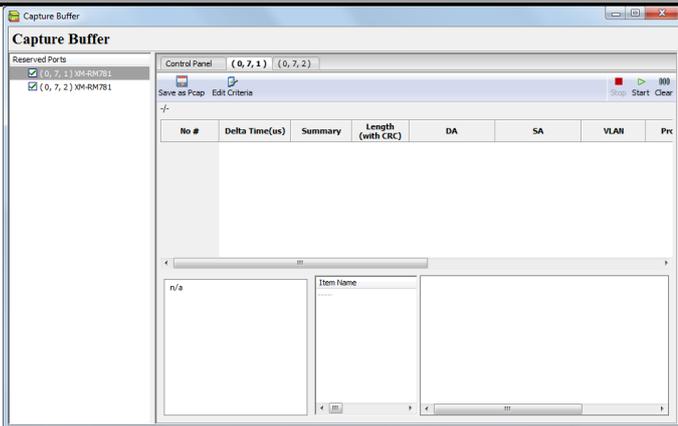
A **Stream Counter** window will pop up if you press the **Ping Function** on the **Quick Launch Buttons**.

You can view the packet transmission and receiving statistics and edit the packet receiving rules here.

For detailed information, please refer to **6.5. Stream Counter**.

Capture Buffer





A **Capture Buffer** window will pop up if you press the **Capture Buffer** on the **Quick Launch Buttons**.

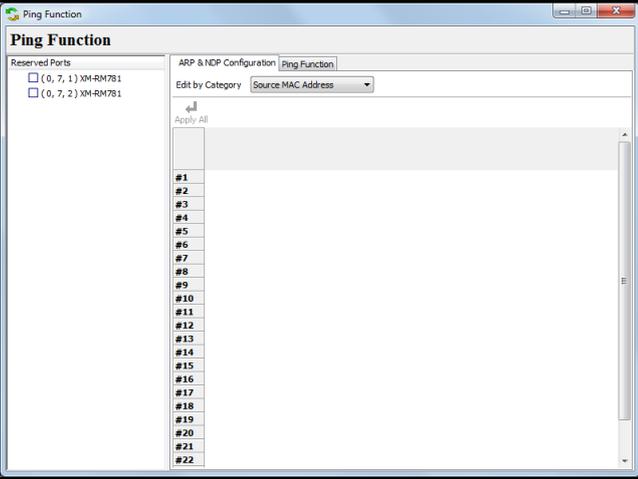
You can set capture buffer criteria or start/stop capturing packets here.

For detailed information, please refer to **6.6. Capture Buffer**.

Ping Function Window



Ping Function



A **Ping Function** window will pop up if you press the **Ping Function** on the **Quick Launch Buttons**.

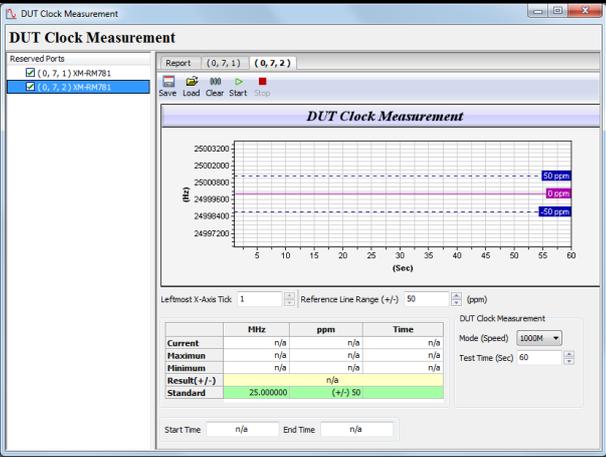
You can perform layer 3 Ping on the **Ping Function** window.

For detailed information, please refer to **6.8. Ping Function**.

DUT Clock Measurement Window



DUT Clock

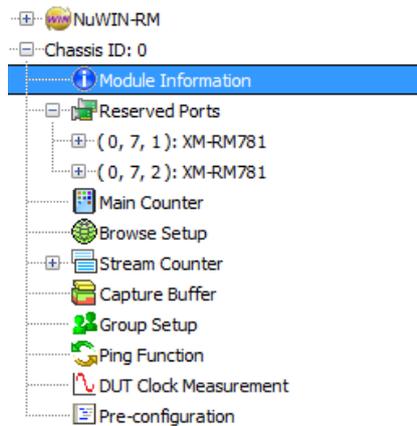


A **DUT Clock Measurement** window will pop up if you press the **DUT Clock** on the **Quick Launch Buttons**.

You can test the Crystal Oscillator's frequency of the DUT and see if it's either faster or slower than standard speed in ppm scale.

For detailed information, please refer to **6.9. DUT Clock**.

6. Module Info/Configuration List



The **Module Info/Configuration List** allows you to view system information, making configurations, and check test reports. You can fold/unfold the tree style tab by clicking / icons on the System Info /Configuration List.

As shown in the picture above, Module Info/Configuration's tree style tab menu are divided into two categories: **NuWIN-RM** and **Chassis ID**.

➤ NuWIN-RM

Unfold **NuWIN-RM** , You can see the figure down below.



About

System Information	
Model	123
Agent/Customer	Xtramus agent
S/II	4567890BB
PCB Version	MP05
Hardware Version	v0.9b002
Firmware Version	v1.3b009
HW License	Normal
HW Upgrade/Usage LIC. Valid for	2017-1 / Unlimited
SW License	Normal
SW Upgrade/Usage LIC. Valid for	2017-12 / Unlimited
API Version	v3.2b006

An **"About"** window will pop up and show detailed system information.

Please note that to view system information on the **About** pop-up window, you have to reserve module cards installed in your NuStreams-2000i/600i chassis first.

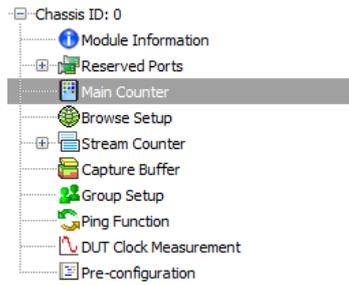
For detailed information regarding to how to reserve module cards, please refer to **7. Reserve/Release Module**.

Connect to NuServer

If the connection between your PC and NuServer is down, a **"Disconnected"** icon will be shown in **"System Connection Status"**.

Press **Connect to NuServer** to re-establish the connection between your PC and NuServer. If the connection has been established successfully, a message window will pop up, and the **"System Connection Status"** will be shown as **"Connected"** .

➤ Chassis ID



Chassis ID means the ID number of the chassis, which will exactly be displayed behind the colon. The **Chassis ID list** contains the main functions of NuWIN-RM, including **Module Information**, **Reserved Ports**, **Main Counter**, **Browse Setup**, **Stream Counter**, **Capture Buffer**, **Group Setup**, **Ping Function**, **DUT Clock Measurement** and **Pre-configuration**. For detailed information about these functions, please see the sections down below.

6.1. Module Information

Module Information

Module Information

Reload

Slot No.	Module Name	Firmware Version	FPGA Version	PROM Version	Hardware Version	Lock Status	Serial Number	MAC Address
Slot. 1	XM-ZS10	v1.3b009	n/a	v1.6b011	n/a	n/a	n/a	n/a
Slot. 2	n/a							
Slot. 3	n/a							
Slot. 4	n/a							
Slot. 5	n/a							
Slot. 6	n/a							
Slot. 7	XM-RM781	v1.8b030	v4.1b003	v1.6b011	MP07	Lock	0NRM78340820	00-22-A2-06-A4-58
Slot. 8	n/a							
Chassis ID: 0	XM-600IEB	n/a	v0.9b002	n/a	MP05	n/a	4567890BB	n/a

If you click **Module Information** from the **Module Info/Configuration List**, the **Main Display Screen** will display **Module Information** as shown in the picture above.

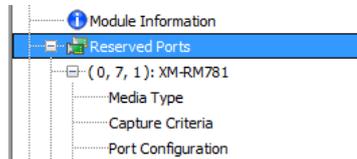
The following information can be viewed on **Module Information**:

- **Slot No.:** This field displays the slot number of the module card.
- **Module Name:** This field displays the module name of the module card.
- **Firmware Version:** This field displays module card's firmware version.
- **FPGA Version:** This field displays module card's FPGA version.
- **PROM Version:** This field displays module card's PROM version
- **Hardware Version:** This field displays module card's hardware version.
- **Lock Status:** This field display module card's current status. If a port has been reserved for tests, the **Lock Status** field will show **Lock**. If a port is not selected and reserved for tests, the **Lock Status** field will show **Unlock**.
- **Serial Number:** This field displays the serial number of the device.
- **MAC Address:** This field displays the serial number of the module card.

6.2. Reserved Ports

All reserved ports that you've reserved for tests will be listed here as shown in the picture right. For detailed information about how to reserve/release ports, please refer to **7. Reserve/Release Module**.

6.2.1 Reserved Ports



Click Reserved Ports on the **Module Info/Configuration List**, the following interface will be displayed on the **Main Display Screen**, shown as the picture down below. The interface can be divided into two parts: **A. Control Buttons** and **B. Port Info & Operation**.



A. Control Buttons



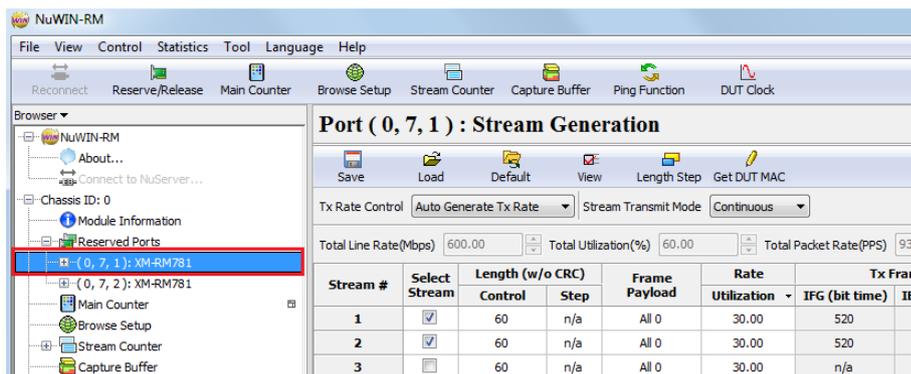
- **Save:** This button allows you to save the current module settings.
- **Load:** This button allows you to load previously saved module settings.
- **Learning All:** Learning packets will be transmitted from **all ports** and keep a table contains Source MAC Address of each received packets.
- **Learning Marked:** Learning packets will be transmitted from **marked ports** and keep a table contains Source MAC Address of each received packets.
- **Apply All:** Apply changes you've made to **all ports**.
- **Apply Marked:** Apply changes you've made to **marked ports**.

B. Port Info & Operation

	Mark	Module Name	Link Status	Tx Control	Capture	Streams	Current Speed	Apply
(0, 7, 1)	●	XM-RM781	Link Up			3	Auto 1000M Full	<input type="button" value="Apply"/>
(0, 7, 2)	●	XM-RM781	Link Up			1	Auto 1000M Full	<input type="button" value="Apply"/>
(0, 7, 3)	●	XM-RM781	Link Up			1	Auto 1000M Full	<input type="button" value="Apply"/>
(0, 7, 4)	●	XM-RM781	Link Up			1	Auto 1000M Full	<input type="button" value="Apply"/>

- **Mark:** You can mark the specific port by clicking the **Mark** icon.
- **Module Name:** This field displays the module name of the module card.
- **Link Status:** This field displays the link status of the module card.
- **Tx Control:** You can start/stop transmitting test packets through the designated port by the control buttons in this field.
 - **Stop:** To stop transmitting test packets, press button. If the designated port is not transmitting packets, the button will be instead.
 - **Start:** To start transmitting test packets, press button. If the designated port is transmitting packets, the button will be instead.
 - **Pause:** To pause, press button. If the designated port is pausing, the button will be instead.
- **Capture:** You can start/stop capturing packets that meets the filtering settings by the control buttons in this field.
 - **Stop:** To stop capturing test packets, press button. If the designated port is not capturing packets, the button will be instead.
 - **Start:** To start capturing test packets, press button. If the designated port is capturing packets, the button will be instead.
- **Streams:** This field displays the number of data stream contained in the port.
- **Current Speed:** This field displays the speed of the designated port.
- **Apply:** Click this button to apply all the settings you've made for the port.

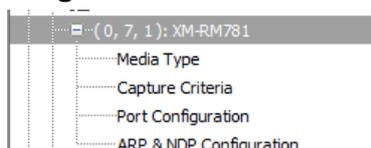
6.2.2 (X, Y, Z):XM-RMxxx



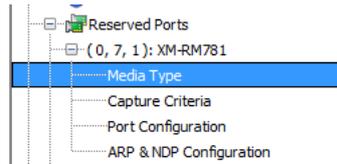
When clicking **(X, Y, Z):XM-RMxxx**, the Stream Generation page of the port will be displayed on the **Main Display Screen**, as shown in the picture above.

For detailed information about configuring the data stream, please refer to **8.Stream Generation**.

Under each port, there are four sub-functions to configure the port, namely **Media Type**, **Capture Criteria**, **Port Configuration** and **ARP&NDP Configuration**. Please see the section down below for details.



6.2.2.1 Media Type



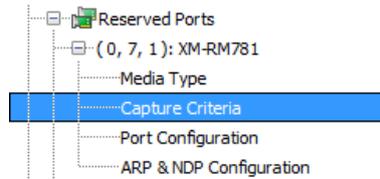
When clicking **Media Type**, a **(X, Y, Z): Media Configuration** window will pop up, where **(X, Y, Z)** is module card's port ID. You can make media settings for the designated port here on pop-up **Media Type Setup** window.

The **Media Type Setup** window varies from different module cards you've reserved for the tests. Please refer to the sections down below for media type settings.

The functions and operations on the **Media Configuration** window are concluded as follows:

- **Manual Speed Mode:** This function allows you to manually set the transmitting rate. **Force** here means the transmitting rate of the port will be switched to the selected mode even if the connection fails.
- **Auto Negotiation Mode:** This function allows automatically negotiate the transmitting rate between the two communication ports. You can select the transmitting rate in the **Auto Negotiation Mode** area.
- **Auto-MDIX:** MDIX is a technology that automatically detects the required cable connection type (straight-through or crossover) and configures the connection appropriately. Click the **Auto-MDIX** scroll-down menu to enable or disable this function.
- **Force MDI-II:** force the port to be **Force MDI-II** type.
- **Force MDI-X:** force the port to be **Force MDI-X** type.
- **Copper/Fiber Mode:** Only when the Manual Speed Mode is set to be **Manual Speed Mode**, this function is available. Please set the media type according to the practical type of the port. If the port is electrical, please select **Copper Mode**, and if the port is optical, please select **Fiber Mode**.
- **Master/Slave Mode:** Only when the Manual Speed Mode is set to be **Manual Speed Mode**, this function is available. The two ends of the connection will be set as **Master** or **Slave**. If both ends of the connection are set to the same, the link of that connection will be down. Please set the module card's port accordingly here, or choose **Auto Detect** so NuWIN-RM will detect and set the transmitting mode automatically.
- **Link Down:** If this function is selected, this port will be closed and unable to use. All connections to this port will be cut off.
- **Link Up:** Select this function to enable this port. The connections to this port are available to be established.
- **OK:** Press this button to apply all the changes you've made and exit.
- **Cancel:** Press this button to cancel all the changes you've made and exit.

6.2.2.2 Capture Criteria



When clicking **Capture Criteria**, a **Port (X, Y, Z): Capture Criteria** window will pop up, where (X, Y, Z) is the module card's port ID. You can set packet capturing criteria for the designated port here on the pop-up **Capture Criteria** window.

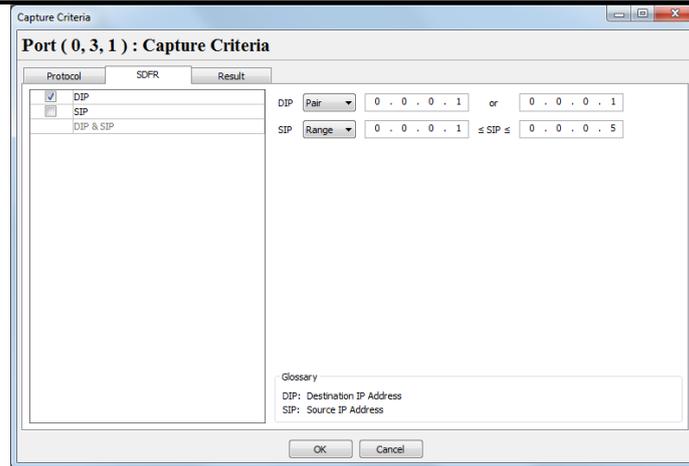
The **Capture Criteria** contains 3 menu tabs: **A. Protocol**, **B. SDFR**, and **C. Result**. Please see the sections down below for details.

A. Protocol

Protocol allows you to set the criteria for packet capturing.

- **Capture All Packets:** Click this check box to capture all packets.
- **Criteria:** The capture criteria supported here includes **Pause Packet**, **ARP**, **ICMP**, **CRC Error**, **IPv4 Checksum Error**, **Oversize**, and **Under 64 Bytes**.

B. SDFR



SDFR (Self-Discover Filtering Rules) is a technology that makes packet capturing/filtering over Ethernet easy and convenient. SDFR parameters include filter of Layer 3 Destination IP Address (**DIP**) and Source IP Address (**SIP**)

Each filter is independent and can be activated in any combinations. You can choose the criteria by clicking the check boxes.

You can set and input the value of **DIP** and **SIP** on the upper-right part of the **SDFR Menu**. The value of SDFR parameters can be set as **Single**, **Pair**, and **Range**. The following descriptions will use **DA** as example.

- **Single:** A single value will be used as SDFR parameter.

DIP

- **Pair:** Two values will be used as SDFR parameters.

DIP or

- **Range:** Values within the range of the two values set here will be used as SDFR parameters.

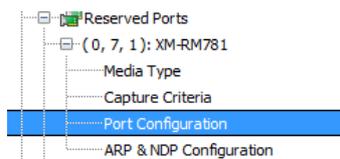
➤ DIP ≤ DIP ≤

C. Result



The **Result** page will display the settings you've made in **Protocol** and **SDFR** pages.

6.2.2.3 Port Configuration



When clicking **Port Configuration**, a **Port (X, Y, Z): Port Configuration** window will pop up, where **(X, Y, Z)** is module card's port ID. You can make port configurations for the designated port here on the Port Configuration pop-up window.

The **Port Configuration** window contains 6 menu tabs: **A. Flow Control**, **B. Random Packet Length**, **C. X-TAG Offset**, **D. BERT**, **E. Data Integrity (DI)**, and **F. Elongated Frame Gap**. Please see the sections down below for more detailed descriptions.

A. Flow Control

Flow Control
Random Packet Length
X-TAG Offset
BERT
Data Integrity (DI)
Elongated Frame Gap

Tx Flow Control

 Enable Disable

Rx Flow Control

 Enable Disable

Rx Rate Control

 Enable Disable
 Rate Limited: Mbps

- **Flow Control:** This function is used to release the network congestion situations. Including **Tx Flow Control** and **Rx Flow Control**.
- **Rx Rate Control:** Enable this function to control the rate of receiving data. You can input the maximum receiving speed of the port in **Rate Limited**.

B. Random Packet Length

Force All Streams to Random Length

 Enable Disable

Dynamic Random Seed

 Enable Disable

Random Packet Length (w/o CRC)

Minimum:

Maximum:

- **Force All Streams to Random Length:** when this function is enabled, all streams of the port will be in a random length between the **Minimum** value and the **Maximum** value set in **Random Packet Length (w/o CRC)**.
- **Dynamic Random Seed:** Enable this function, then the random packet of different streams will be different, or packet lengths of all streams may be the same.
- **Random Packet Length (w/o CRC):** Set the range of the random packet length.

C. X-TAG Offset

Flow Control | Random Packet Length | X-TAG Offset | BERT | Data Integrity (DI) | Elongated Frame Gap

X-TAG Offset

Tx Offset: 49 Bytes

Check Offset: 49 Bytes

X-TAG is a 12-byte tag developed by Xtramus, embedded in the transmitted packets, which is an enhance measure to check the validation of data transmission on the network. When the starting position of the X-TAG in the received packet by the other port of the two communication ends coincides with the **Byte** set in **Check Offset**, then the data transmission between the two communication ends is supposed to be validate. The **Byte** in **Check Offset** should be set based on the **Byte** in **Tx Offset**.

- **Tx Offset:** Set the starting position of the X-TAG in the transmitted packet from the scroll down menu.

Tx Offset: 49 Bytes

Check Offset: 45 Bytes
49 Bytes
65 Bytes

- **Check Offset:** Set the starting position of the X-TAG in the received packet from the scroll down menu. **Auto Check** means the system will automatically select the right **Byte** for this function.

Check Offset: 49 Bytes

Auto Check
41 Bytes
45 Bytes
49 Bytes
53 Bytes
57 Bytes
61 Bytes
65 Bytes
69 Bytes

D. BERT

Port Configuration

Port (0, 3, 4) : Port Configuration

Flow Control | Random Packet Length | X-TAG Offset | BERT | Data Integrity (DI) | Elongated Frame Gap

Transmit BERT: Enable Disable

Check BERT: Enable Disable

BERT Illustration

In Layer 2 BERT, testing data streams comprising Ethernet frames, which carries BERT pattern as payload, are generated and transmitted across NUT (Network under Test) and DUT. These testing data streams will be sent back to their original source for data corruption comparisons.

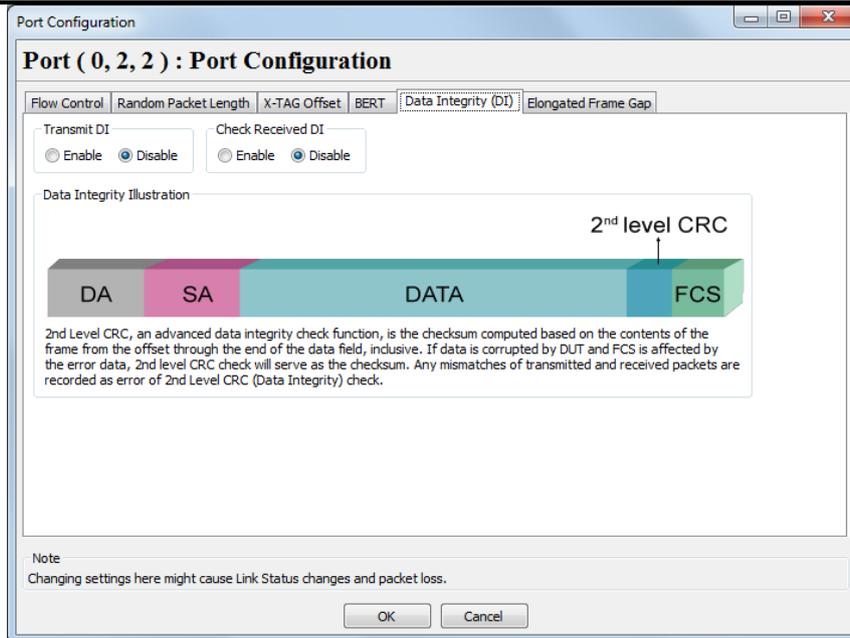
Note
Changing settings here might cause Link Status changes and packet loss.

OK Cancel

BERT stands for **Bit Error Rate Test**.

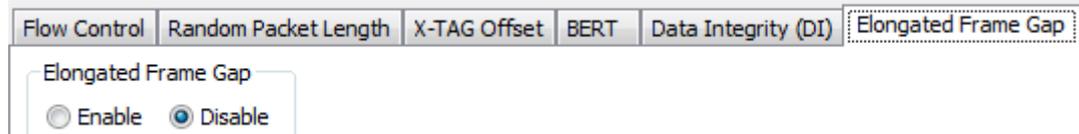
- **Transmit BERT:** Adding BERT patterns to transmitted packets if this is enabled.
- **Check BERT:** NuWIN-RM will check if BERT patterns are in received packets.

E. Data Integrity (DI)



- **Transmit DI:** When enabled, NuWIN-RM will check data integrity of transmitted packets.
- **Check Received DI:** When enabled, NuWIN-RM will check data integrity of received packets.

F. Elongated Frame Gap



When this function is enabled and the transmitting packet flow reaches wirespeed, a 1 byte-time of frame gap will be inserted after a certain amount of packets are transmitted. This can reduce packet loss caused by crystal frequency differentials between DUT and test instrument. Enabling Elongated Frame Gap can compensate crystal frequency differentials by around 30 ppm as simulation.

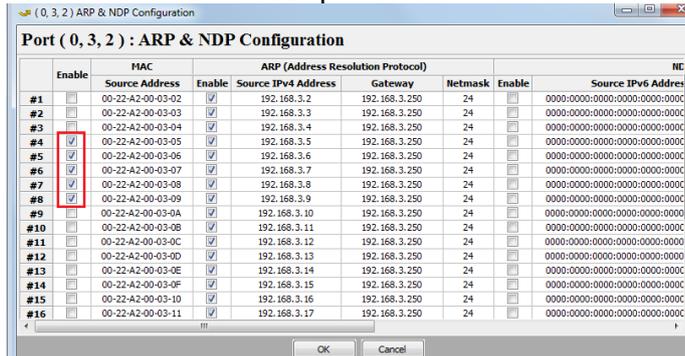
6.2.2.4 ARP&NDP Configuration

ARP&NDP Configuration – Assign MAC address and IP address pairs to one port

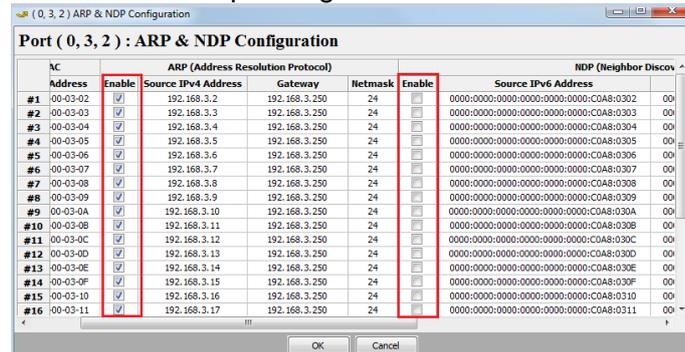
ARP, namely address resolution protocol, is a TCP/IP protocol to obtain the MAC address based on the IP address. NDP, namely neighbor discovery protocol, is a replacement of ARP in IPv6.

You can assign multiple MAC address and IP address pairs to one port. As long as the IP address in the ARP request fits one of the assigned pairs, the port will response the ARP request.

To assign a specific MAC address and IP address pair to the port, check the corresponding line in the most left **Enable** column. For example, in the picture down below, the MAC address and IP address pairs from line 4 to line 8 are selected.

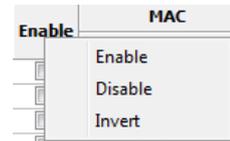
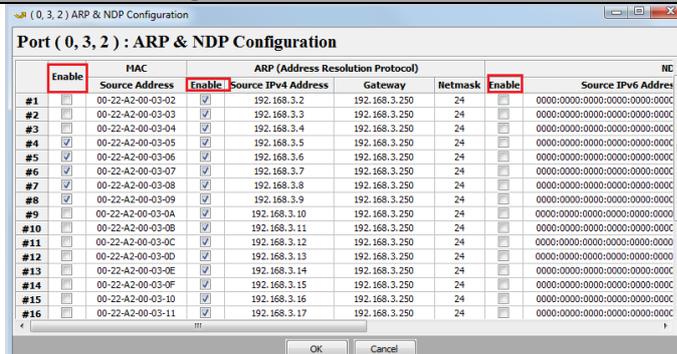


Meanwhile, you must enable the ARP or NDP according the type of the IP address (IPv4 or IPv6) by check the corresponding line in the ARP or NDP **Enable** column.



Note: please check the ARP **Enable** column for IPv4 and check the NDP **Enable** column for IPv6. Or, the MAC address and IP address pair is not successfully assigned to the port.

ARP&NDP Configuration – Buttons



➤ **Enable:** right-click the **Enable** area shown in the above left picture, a menu will pop up to facilitate the enabling operations, shown as the above right picture.

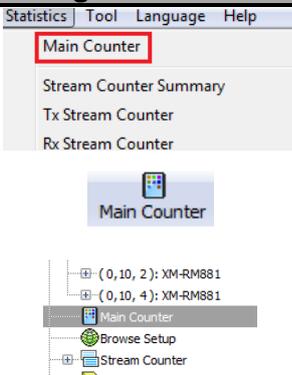
- **Enable:** check all the lines of the column.
- **Disable:** uncheck all the lines of the column.

	<ul style="list-style-type: none">● Invert: If the line is checked, then uncheck it or reverse.➤ OK: Press this button to apply all the changes you've made and exit.➤ Cancel: Press this button to cancel all the changes you've made and exit.
--	---

6.3. Main Counter

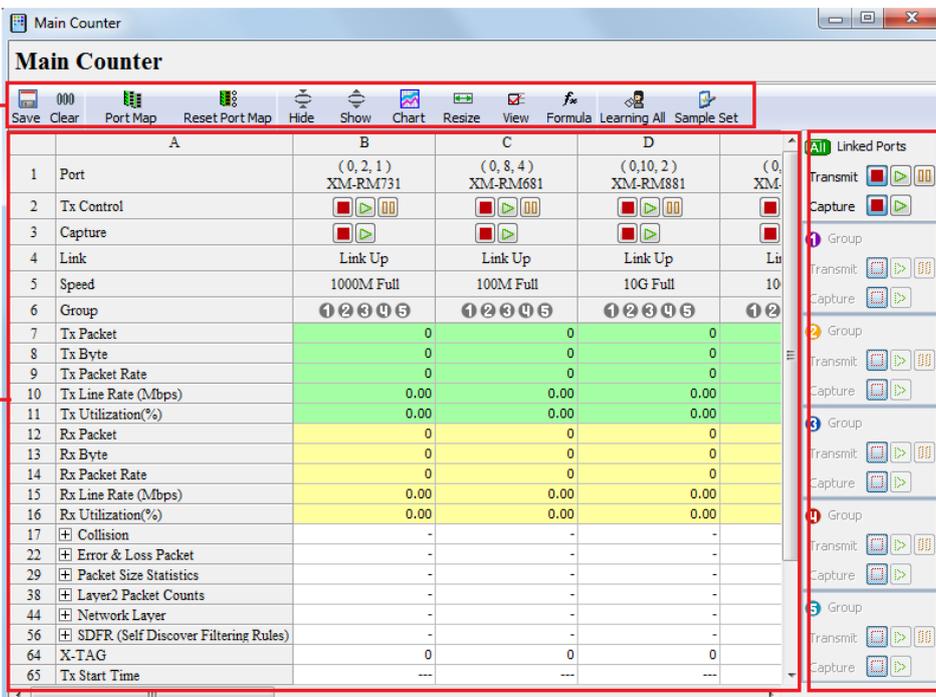
The **Main Counter** window allows you to start/stop transmitting/capturing packets. You can access the **Main Counter** window by:

Accessing Main Counter Window



- Choose **Main Counter** from the **Menu Bar**
- Press the **Main Counter** button on the **Quick Launch Buttons**
- Click **Main Counter Window** on the **Module Info/Configuration List**

A **Main Counter** window will pop up as shown in the picture below.



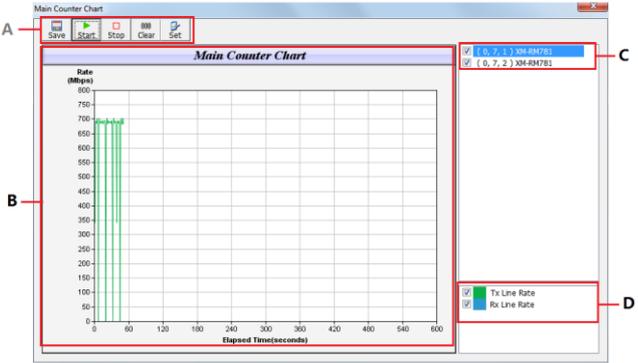
Main Counter Window Descriptions		
A	Control Buttons	These buttons allow you to save the counter report, clear all statistics, hide/show counter information, resize the Main Counter Window, and export the current counter to Microsoft Excel.
B	Main Display Screen	You can view counter statistics or start/stop transmitting/capturing packets here in this section.
C	Group Control Buttons	These buttons allow you to start/stop transmitting/capturing packets in groups.

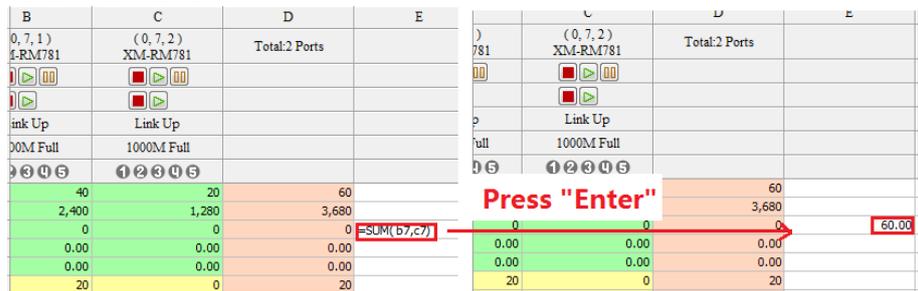
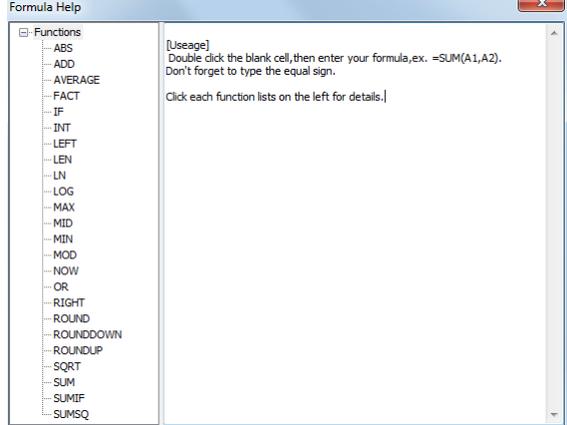
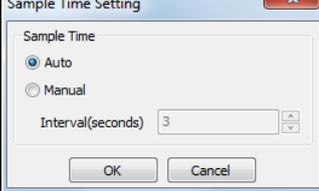
Please see the following sections for detail descriptions.

6.3.1. Control Buttons



Please refer to the section down below for more detail descriptions regarding to the following contents.

Control Buttons Descriptions	
	The Save button allows you to save the current counter reports to Microsoft Excel® format files.
	The Clear button allows you to clear all statistics displayed on the Main Display Screen .
	The Port Map button allows you set the ports the statistics of which you want to view. Only the statistics of the selected ports will be displayed in the Main Display Screen .
	The Reset Port Map button allows you to clear all the ports you selected in the Port Map .
	The Hide button allows you to hide some of the TX/Rx statistics, as well as fold all tree style tab statistics on the Main Display Screen .
	The Show button allows you to show all TX/Rx statistics, as well as unfold all tree style tab statistics on the Main Display Screen .
	<p>The Chart button allows you to intuitively view the general trend of the TX/Rx line rate of the reserved port, shown as the picture down below.</p>  <p>You can select the ports in C and choose the rate type in D. The rate type including Tx Line Rate and Rx Line Rate. And the colors of the corresponding rate are shown in D. Then click the Start button in A to plot the chart.</p> <p>Taking the above figure for an example, the Elapsed time-Rate chart of port (0, 7, 1) XM-RM781 will be plotted in B after click the Start button and in the chart, there will be one green line and a blue line, respectively representing the Tx Line Rate and Rx Line Rate. And you can operate the chart through the operation buttons in A. For more information, see Operation buttons.</p>
Operation buttons	
	Save the current chart in “.bmp” format.
	Start to plot the chart.
	Stop to plot the chart.

Control Buttons Descriptions	
	Clear the chart.
	Set x-axis scale and y-axis scale of the chart.
	The Resize button allows you to set the width of Main Counter window. The maximum/minimum value for the Main Counter window width is from 80 to 300 .
	The View button allows you to set the detailed terms that will be displayed on the Main Display Screen . Click the View button and then a three style list will pop up. You can select the terms you want to display from the list.
	<p>The Formula function provides some formulas to allow you to do the corresponding operations on the Main Display Screen. This is a tool for the user to judge the performance of the DUT. Double Click the write blank cell, and then enter your formula, eg. SUM (A1, A2). Or right-click the write blank cell, then choose Insert Formula. See the picture down below for more information.</p>  <p>Click the Formula button, the Formula Help window will pop up. You can refer the function lists on the left for details.</p> 
	Learning packets will transmit to all the ports.
	<p>The Sample Set function allows you to set data updating interval of the main counters. Click the Sample Set button, the following window will pop up.</p> <ul style="list-style-type: none"> ➤ Auto: the data updating interval will be default value. ➤ Manual: you can set the data updating interval in the Interval (seconds) textbox. 

6.3.2. Main Display Screen

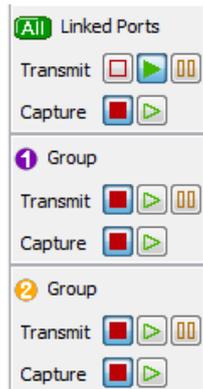
	A	B	C	D	
1	Port	(0, 7, 1) XM-RM781	(0, 7, 2) XM-RM781	(0, 7, 3) XM-RM781	(0, 7, 4) XM-RM781
2	Tx Control				
3	Capture				
4	Link	Link Up	Link Up	Link Up	Link Up
5	Speed	1000M Full	1000M Full	1000M Full	1000M Full
6	Group				
7	Tx Packet	1,915,674,634	30	282,237,784	2
8	Tx Byte	114,940,479,300	1,920	18,063,218,368	144
9	Tx Packet Rate	1,072,112	0	169,801	
10	Tx Line Rate (Mbps)	686.15	0.00	114.11	
11	Tx Utilization(%)	68.62	0.00	11.41	
12	Rx Packet	30	0	2,257,902,124	
13	Rx Byte	1,920	0	144,505,743,616	18
14	Rx Packet Rate	0	0	1,358,404	
15	Rx Line Rate (Mbps)	0.00	0.00	912.85	
16	Rx Utilization(%)	0.00	0.00	91.28	
17	⊕ Collision	-	-	-	-
22	⊕ Error & Loss Packet	-	-	-	-
29	⊕ Packet Size Statistics	(Sum: 30)	-	(Sum: 2,257,902,136)	(Sum: -)
38	⊕ Layer2 Packet Counts	(Sum: 30)	-	(Sum: 2,257,902,080)	(Sum: -)
44	⊕ Network Layer	-	-	-	-
56	⊕ SDFR (Self Discover Filtering Rules)	-	-	-	-
64	X-TAG	0	0	0	
65	Tx Start Time	2015-Feb-12 14:36:37	2015-Feb-12 14:39:04	2015-Feb-12 14:39:03	2015-Feb-12 14:39:03

Main Display Screen Descriptions

The **Main Display Screen** displays counter report statistics of all ports you've selected for test. Also, you can start/stop capturing packets or start/stop transmitting packets by the control buttons in this field.

- **Stop:** To stop capturing test packets or transmitting packets, press button. If the designated port is not capturing packets or transmitting packets, the button will be instead.
- **Start:** To start capturing test packets or transmitting packets, press button. If the designated port is capturing packets or transmitting packets, the button will be instead.

6.3.3. Group Control Buttons



Group Control Buttons Descriptions

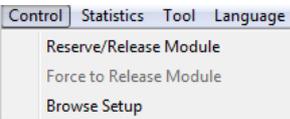
The **Group Control Buttons** allow you to start/stop capturing packets or start/stop transmitting packets in groups. You can assign a group ID number to reserved ports for test managements.

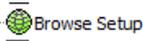
- **Stop:** To stop capturing test packets or transmitting packets, press  button. If the designated group is not capturing packets or transmitting packets, the button will be  instead.
- **Start:** To start capturing test packets or transmitting packets, press  button. If the designated group is capturing packets or transmitting packets, the button will be  instead.

6.4. Browse Setup

The **Browse Setup** window allows you to view/configure test settings. You can access the **Browse Setup** window by:

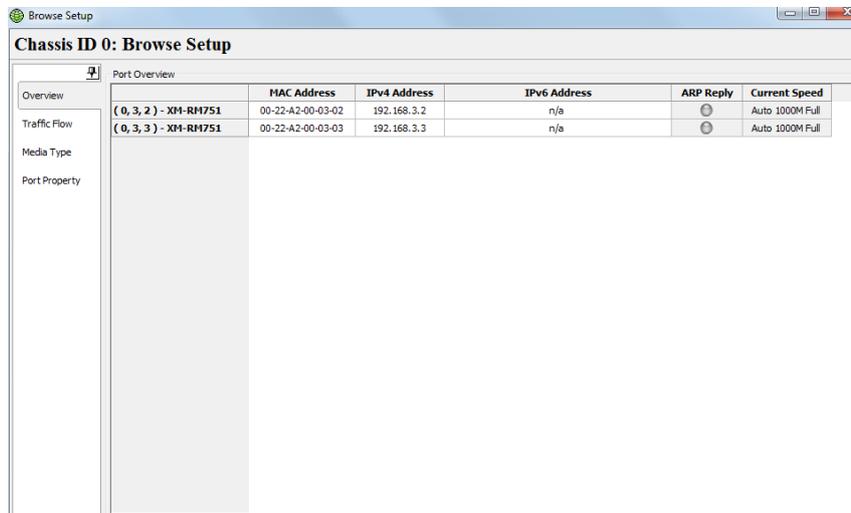
Accessing Browse Setup Window





- Choose **Browse Setup** from the **Menu Bar**
- Press the **Browse Setup** button on the **Quick Launch Buttons**
- Click **Browse Setup** on the **Module Info/Configuration List**

Please note that you have to reserve ports for test (which is mentioned in **7. Reserve/Release Module**) before accessing the **Browse Setup** window.

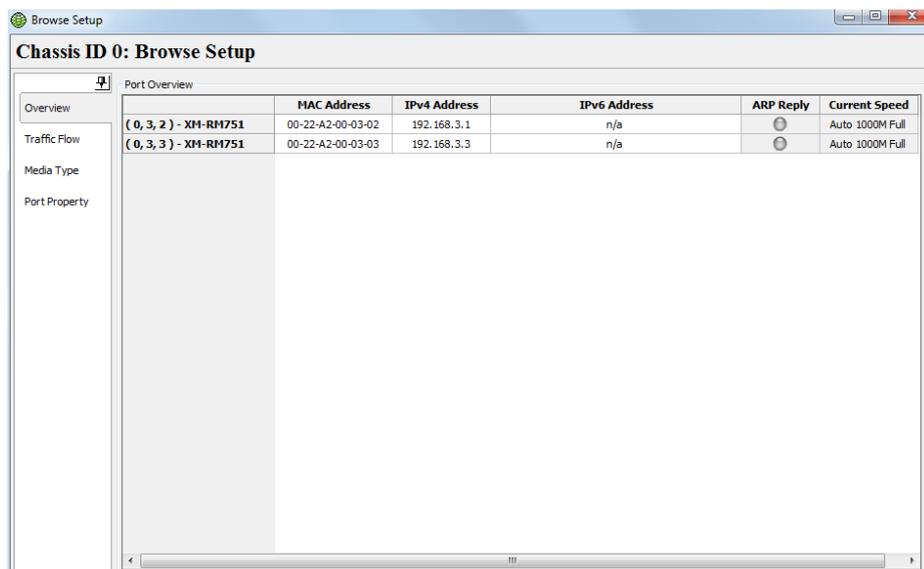


Browse Setup Window Overview	
	This icon allows you to hide Browse Setup window menu list on the left side.
Overview	You can view/configure MAC Address and IP Address here. Also, you can view each port's ARP Reply status and Current Speed here as well.
Traffic Flow	You can set the network type here. NuWIN-RM supports One to Multi , Pair , Rotate , and Mesh . Also, you can edit frame here as well.
Media Type	You can set reserved ports' media type here.
Port Property	The Port Property allows you to access settings that are available in Port Configuration of Module Info/Configuration List .

Please see the sections down below for more detailed information about **Browse Setup** window.

Note: When you press the **Apply** button and apply all settings you've made, NuWIN-RM will save all the current settings and apply these settings when you run NuWIN-RM next time.

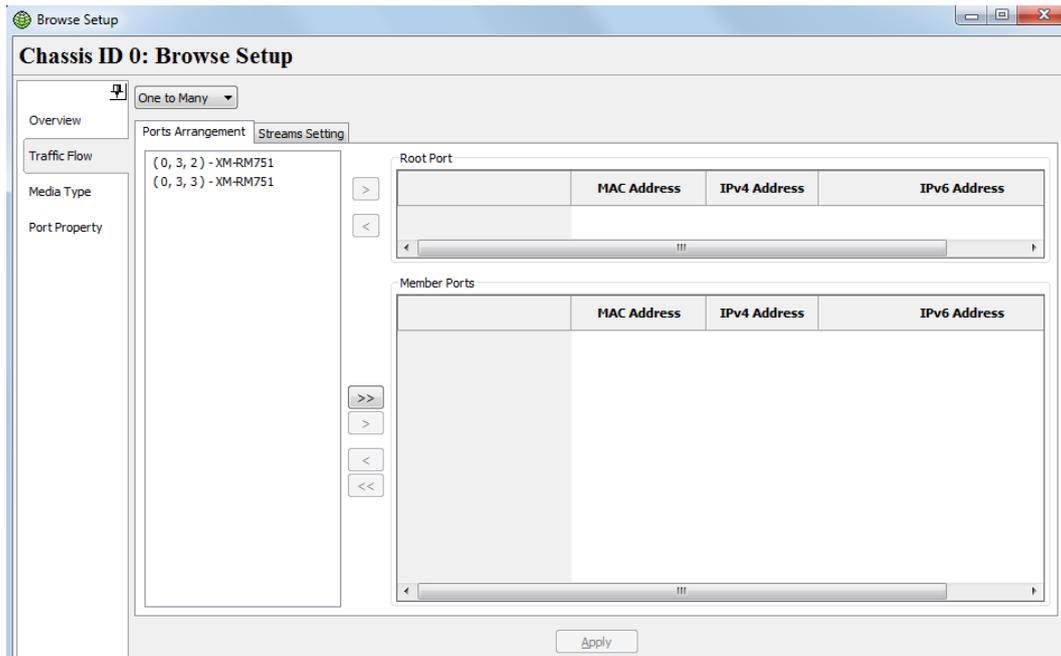
6.4.1. Overview



You can view/configure **MAC Address** and **IP Address** here. Also, you can view each port's **ARP Reply** status and **Current Speed** here as well.

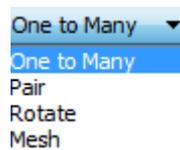
Browse Setup – Overview	
(X, Y, Z) – Module Name	All available ports will be displayed here in the format of (X, Y, Z) – Module Name , where (X, Y, Z) is module card's port ID.
MAC Address	This field displays the MAC addresses of the preserved ports. Also, you can click the MAC address field of a specific port to change its MAC address.
IP Address	This field displays the IP addresses of the preserved ports. Also, you can click the IP address field of a specific port to change its IP address.
ARP Reply	This field shows if the ARP Reply is enabled or not. If enabled, the icon will turn green  ; if not, the icon will turn gray  .
Current Speed	This field displays the preserved ports' current transmitting speed.

6.4.2. Traffic Flow



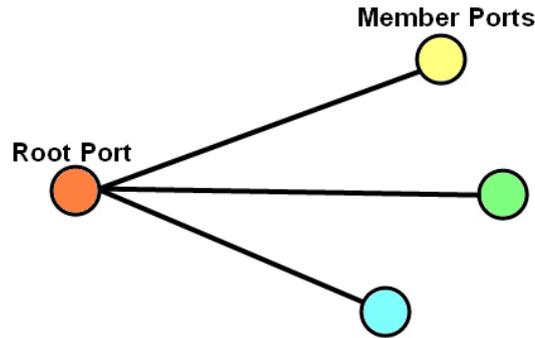
You can set the network type here. NuWIN-RM supports **One to Multi**, **Pair**, **Rotate**, and **Mesh**. Also, you can edit frame here as well.

You can set NuWIN-RM's network mode by clicking the scroll-down menu located on the upper-left part of the **Browse Setup** window, as shown in the picture on the right.

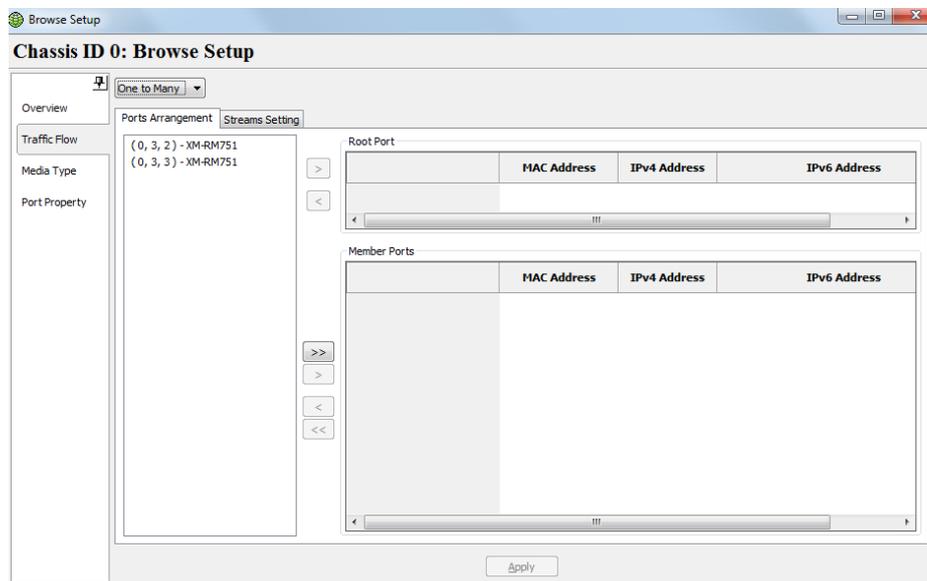


Settings available here will change according to the network type you've selected here. Please see the sections down below for detailed descriptions.

A. One to Multi Network



In **One to Multi** network mode, packets will be sent from one **Root Port** to multiple **Member Ports** as shown in the picture above. Also, these **Member Ports** can send packets to the source **Root Port** as well.



There are two menu tabs available here: **Ports Arrangement** and **Streams Setting**:

- **Ports Arrangement:** this tab allows you to assign **Root Port** and **Member Ports**. To know more about assigning Root Port and Member Ports, please see the “**One to Multi –Ports Arrangement**” section.
- **Stream Setting:** this tab allows you to edit packet frames. To know more about edit packet frames, please refer to **E. Editing Frame**.

One to Multi –Ports Arrangement

Up Stream (Member to Root)

Port	SeL.	Line Rate (Mbps)	Length (w/o CRC)		Frame Payload	Enable	X-TAG X-ID	Frame D
(0, 3, 3)			Control	Step				
(0, 4, 1) - XM-RM761	<input checked="" type="checkbox"/>	500.00	60	n/a	All 0	<input type="checkbox"/>	n/a	Edit
(0, 5, 4) - XM-RM781	<input checked="" type="checkbox"/>	500.00	60	n/a	All 0	<input type="checkbox"/>	n/a	Edit

2 streams

1. You can configure the streams transmitted from the **Member Ports** to the **Root Port** in the **Up Stream** area.

Down Stream (Root to Member)

Port	SeL.	Line Rate (Mbps)	Length (w/o CRC)		Frame Payload	Enable	X-TAG X-ID	Frame D
(0, 3, 3)			Control	Step				
(0, 4, 1) - XM-RM761	<input checked="" type="checkbox"/>	500.00	60	n/a	All 0	<input type="checkbox"/>	n/a	Edit
(0, 5, 4) - XM-RM781	<input checked="" type="checkbox"/>	500.00	60	n/a	All 0	<input type="checkbox"/>	n/a	Edit

2 streams

2. The port you've assigned will be displayed on the **Root Port** field. If you would like to remove that port as root port, click the **<** button.

Ports Arrangement | Streams Setting

(0, 3, 3) - XM-RM751

Root Port

MAC Address	IP
(0, 3, 2) - XM-RM751	00-22-A2-00-03-02

Member Ports

MAC Address	IP
-------------	----

>> > < <<

3. To assign an available port as the **Member Port**, click the port and press the **>** button as shown in the picture on the left. If you would like to assign all available ports as the **Member Port**, press the **>>** button.

Member Ports

MAC Address	IPv4 Address
(0, 3, 3) - XM-RM751	00-22-A2-00-03-03

>> > < <<

4. The port you've assigned will be displayed on the **Member Port** field. If you would like to remove a port from the **Member Port** field, click the port you would like to remove, and press the **<** button. If you would like to remove all ports from the **Member Port** field, press the **<<** button.

Root Port

MAC Address	IPv4 Address	IPv6 Address
(0, 3, 2) - XM-RM751	00-22-A2-00-03-02	192.168.3.1

Member Ports

MAC Address	IPv4 Address	IPv6 Address
(0, 3, 3) - XM-RM751	00-22-A2-00-03-03	192.168.3.3
(0, 4, 1) - XM-RM761	00-22-A2-00-04-01	192.168.4.1

5. You can view the MAC Address and IPv4 Address of **Root Port** and **Member Ports**. You can manually input the IPv6 Address by double click the **IPv6 Address** column.

Apply

6. Press the **Apply** button to apply all the settings you've made.

One to Multi –Stream Setting

Up Stream (Member to Root)

Port (0, 3, 3)	Sel.	Line Rate (Mbps)	Length (w/o CRC)		Frame Payload	X-TAG		Frame D
			Control	Step		Enable	X-ID	
(0, 4, 1) - XM-RM761	<input checked="" type="checkbox"/>	500.00	60	n/a	All 0	<input type="checkbox"/>	n/a	Edit
(0, 5, 4) - XM-RM781	<input checked="" type="checkbox"/>	500.00	60	n/a	All 0	<input type="checkbox"/>	n/a	Edit

2 streams

You can configure the streams transmitted from the **Member Port** to the **Root Port** in the **Up Stream** area.

Down Stream (Root to Member)

Port (0, 3, 3)	Sel.	Line Rate (Mbps)	Length (w/o CRC)		Frame Payload	X-TAG		Frame D
			Control	Step		Enable	X-ID	
(0, 4, 1) - XM-RM761	<input checked="" type="checkbox"/>	500.00	60	n/a	All 0	<input type="checkbox"/>	n/a	Edit
(0, 5, 4) - XM-RM781	<input checked="" type="checkbox"/>	500.00	60	n/a	All 0	<input type="checkbox"/>	n/a	Edit

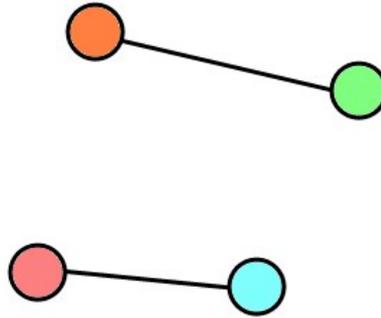
2 streams

You can configure the streams transmitted from the **Root Port** to the **Member Port** in the **Up Stream** area.

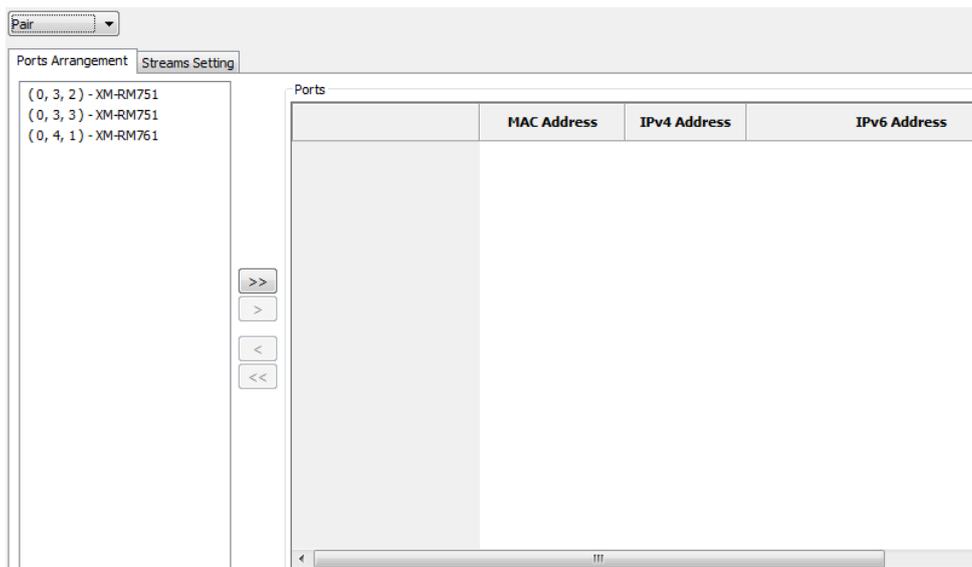
Apply

Press the **Apply** button to apply all the settings you've made.

B. Pair Network



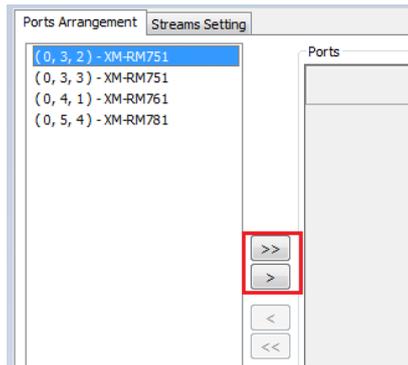
In **Pair** network mode, two reserved ports will work as a pair, transmitting/receiving packets to/from each other as shown in the picture above.



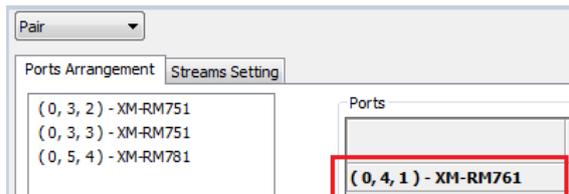
There are two menu tabs available here: **Port Arrangement** and **Stream Setting**:

- **Ports Arrangement:** this tab allows you to assign ports. To know more about assigning ports, please see the “**Pair –Ports Arrangement**” section.
- **Stream Setting:** this tab allows you to edit packet frames. To know more about edit packet frames, please refer to **E. Editing Frame** section.

Pair – Assigning Ports



1. To add an available port for **Pair Network Mode**, click the port and press the **>** button as shown in the picture on the left. If you would like to add all ports, please press the **>>** button.



2. The port you've assigned will be displayed on the **Ports** field. If you would like to remove that port, click the **<** button. If you would like to remove all ports, click the **<<** button.

Ports

	MAC Address	IPv4 Address	IPv6 Address
(0, 3, 2) - XM-RM751	00-22-A2-00-03-02	192.168.3.1	n/a
(0, 3, 3) - XM-RM751	00-22-A2-00-03-03	192.168.3.3	n/a
(0, 4, 1) - XM-RM761	00-22-A2-00-04-01	192.168.4.1	n/a
(0, 5, 4) - XM-RM781	00-22-A2-00-05-04	192.168.5.4	n/a

3. You can view the MAC Address and IPv4 Address of the assigned ports. You can manually input the IPv6 Address by double click the **IPv6 Address** column.

Apply

4. Press the **Apply** button to apply all the settings you've made.

Pair –Stream Setting

Pair

Ports Arrangement | Streams Setting

Streams

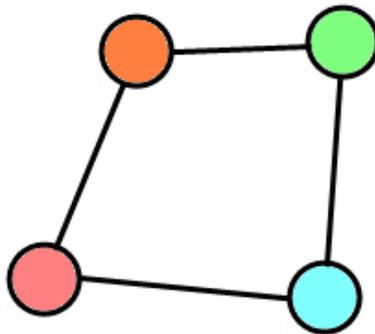
	Sel.	Line Rate (Mbps)	Length (w/o CRC)		Frame Payload	X-TAG		Frame Data	Protocol Type
			Control	Step		Enable	X-ID		
(0, 3, 2) - XM-RM751	<input checked="" type="checkbox"/>	1000.00	60	n/a	All 0	<input type="checkbox"/>	n/a	Edit	LLC 0
(0, 3, 3) - XM-RM751	<input checked="" type="checkbox"/>	1000.00	60	n/a	All 0	<input type="checkbox"/>	n/a	Edit	LLC 0
(0, 4, 1) - XM-RM761	<input checked="" type="checkbox"/>	1000.00	60	n/a	All 0	<input type="checkbox"/>	n/a	Edit	LLC 0
(0, 5, 4) - XM-RM781	<input checked="" type="checkbox"/>	1000.00	60	n/a	All 0	<input type="checkbox"/>	n/a	Edit	LLC 0

You can configure the streams of the assigned ports here.

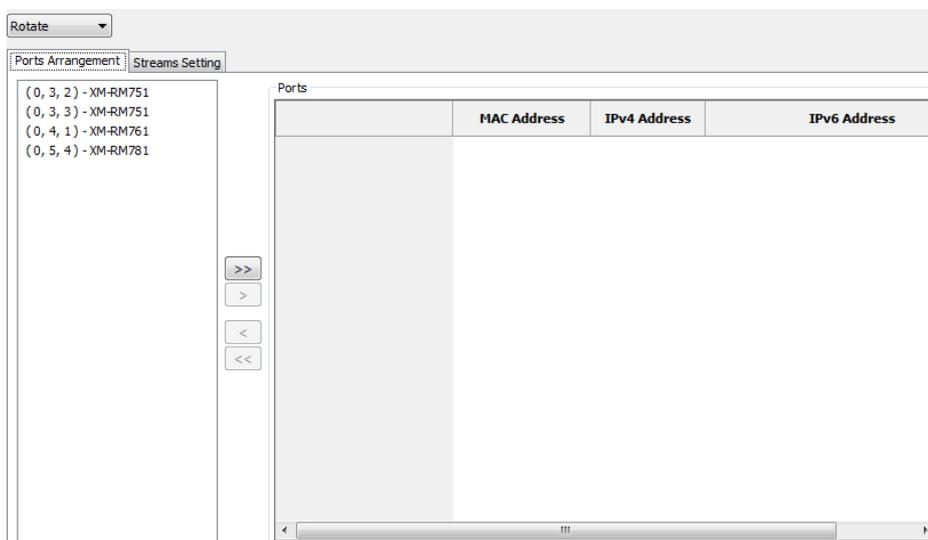
Apply

Press the Apply button to apply all the settings you've made.

C. Rotate Network



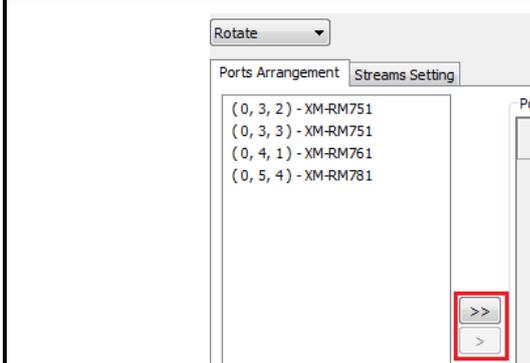
In **Rotate** network mode, packets will be sent from port to port in a loop while the last port will be connected to the first port, as shown in the picture above.



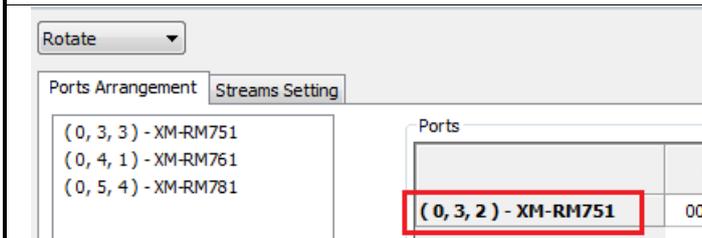
There are two menu tabs available here: **Ports Arrangement** and **Stream Setting**:

- **Ports Arrangement:** This tab allows you to assign ports. To know more about assigning ports, please see the “**Rotate –Ports Arrangement**” section.
- **Stream Setting:** This tab allows you to edit packet frames. To know more about edit packet frames, please refer to **E. Editing Frame**.

Rotate – Assigning Ports



1. To add an available port for **Rotate Network Mode**, click the port and press the **>** button as shown in the picture on the left. If you would like to add all ports, please press the **>>** button.



2. The port you've assigned will be displayed on the **Ports** field. If you would like to remove that port, click the **<** button. If you would like to remove all ports, click the **<<** button.

	MAC Address	IPv4 Address	IPv6 Address
(0, 3, 2) - XM-RM751	00-22-A2-00-03-02	192.168.3.1	n/a
(0, 3, 3) - XM-RM751	00-22-A2-00-03-03	192.168.3.3	n/a
(0, 4, 1) - XM-RM761	00-22-A2-00-04-01	192.168.4.1	n/a
(0, 5, 4) - XM-RM781	00-22-A2-00-05-04	192.168.5.4	n/a

3. You can view the MAC Address and IPv4 Address of the assigned ports. You can manually input the IPv6 Address by double click the **IPv6 Address** column.

Apply

4. Press the **Apply** button to apply all the settings you've made.

Rotate –Stream Setting

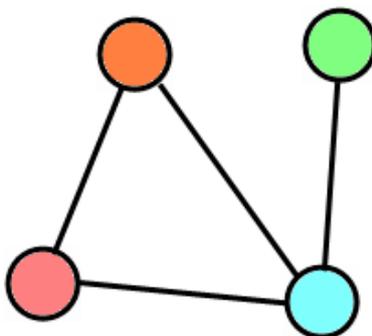
	Sel.	Line Rate (Mbps)	Length (w/o CRC)		Frame Payload	X-TAG		Frame Data	Protocol Type
			Control	Step		Enable	X-ID		
(0, 3, 2) - XM-RM751	<input checked="" type="checkbox"/>	1000.00	60	n/a	All 0	<input type="checkbox"/>	n/a	Edit	LLC 0
(0, 3, 3) - XM-RM751	<input checked="" type="checkbox"/>	1000.00	60	n/a	All 0	<input type="checkbox"/>	n/a	Edit	LLC 0
(0, 4, 1) - XM-RM761	<input checked="" type="checkbox"/>	1000.00	60	n/a	All 0	<input type="checkbox"/>	n/a	Edit	LLC 0
(0, 5, 4) - XM-RM781	<input checked="" type="checkbox"/>	1000.00	60	n/a	All 0	<input type="checkbox"/>	n/a	Edit	LLC 0

You can configure the streams of the assigned ports here.

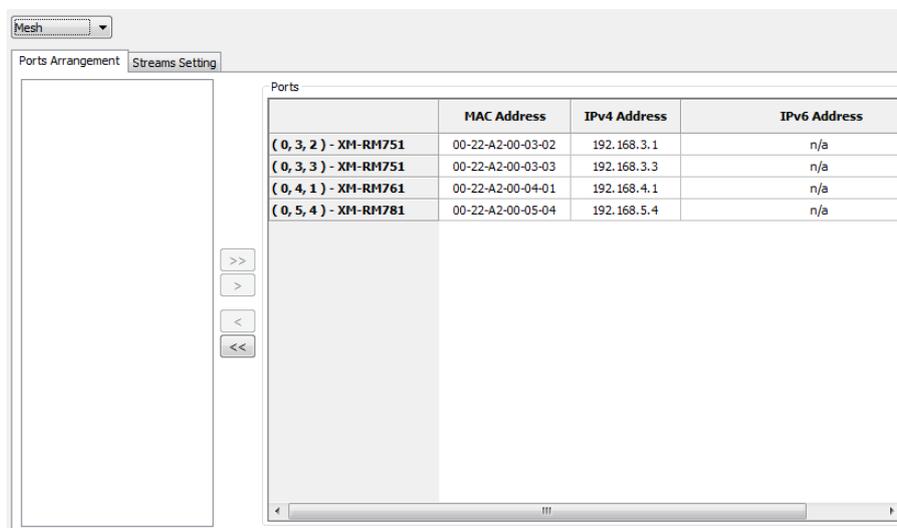
Apply

Press the Apply button to apply all the settings you've made.

D. Mesh Network



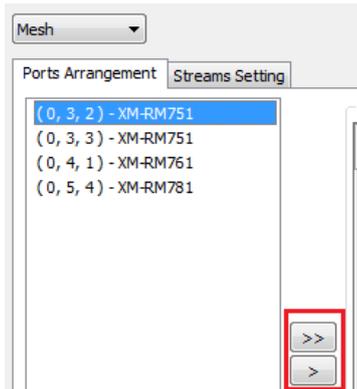
In **Mesh** network mode, packets will be sent from port to port in a loop while the last port will be connected to the first port, as shown in the picture above.



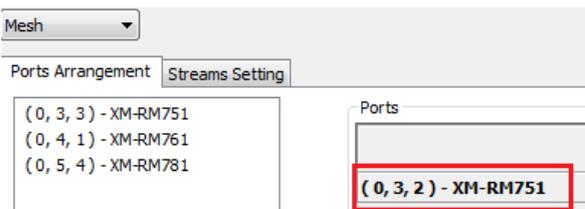
There are two menu tabs available here: **Ports Arrangement** and **Stream Setting**:

- **Ports Arrangement:** This tab allows you to assign ports. To know more about assigning ports, please see the “**Mesh –Ports Arrangement**” section.
- **Stream Setting:** This tab allows you to edit packet frames. To know more about edit packet frames, please refer to **E. Editing Frame**.

Mesh –Ports Arrangement



1. To add an available port for **Mesh Network Mode**, click the port and press the **>** button as shown in the picture on the left. If you would like to add all ports, please press the **>>** button.



2. The port you've assigned will be displayed on the **Ports** field. If you would like to remove that port, click the **<** button. If you would like to remove all ports, click the **<<** button.

Ports	MAC Address	IPv4 Address	IPv6 Address
(0, 3, 2) - XM-RM751	00-22-A2-00-03-02	192.168.3.1	n/a
(0, 3, 3) - XM-RM751	00-22-A2-00-03-03	192.168.3.3	n/a
(0, 4, 1) - XM-RM761	00-22-A2-00-04-01	192.168.4.1	n/a
(0, 5, 4) - XM-RM781	00-22-A2-00-05-04	192.168.5.4	n/a

3. You can view the MAC Address and IPv4 Address of the assigned ports. You can manually input the IPv6 Address by double click the **IPv6 Address** column.

Apply

4. Press the **Apply** button to apply all the settings you've made.

Mesh –Stream Setting

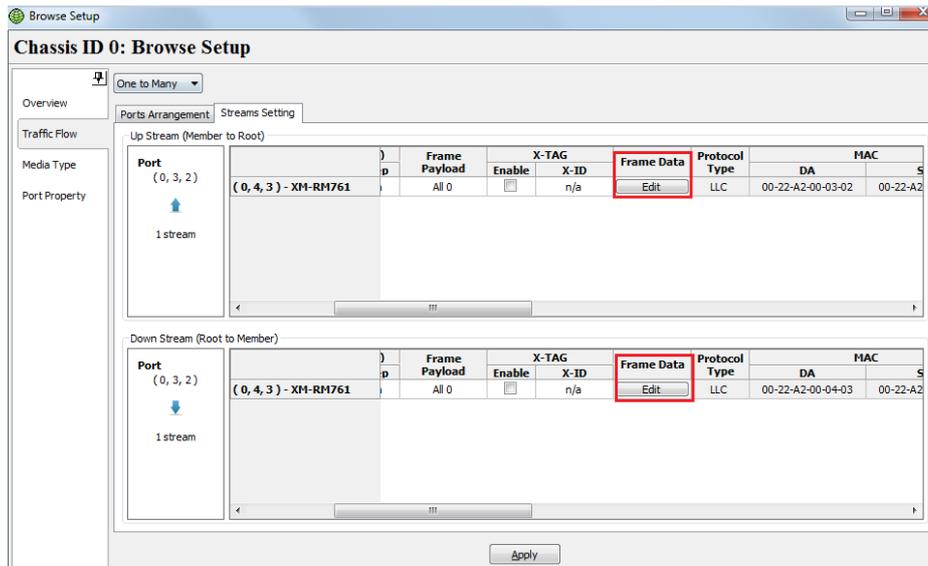
Streams	Sel.	Line Rate (Mbps)	Length (w/o CRC)		Frame Payload	Enable	X-TAG	X-ID	Frame Data	Protocol Type
(0, 3, 2) - XM-RM751	<input checked="" type="checkbox"/>	1000.00	60	n/a	All 0	<input type="checkbox"/>	n/a		Edit	LLC 0
(0, 3, 3) - XM-RM751	<input checked="" type="checkbox"/>	1000.00	60	n/a	All 0	<input type="checkbox"/>	n/a		Edit	LLC 0
(0, 4, 1) - XM-RM761	<input checked="" type="checkbox"/>	1000.00	60	n/a	All 0	<input type="checkbox"/>	n/a		Edit	LLC 0
(0, 5, 4) - XM-RM781	<input checked="" type="checkbox"/>	1000.00	60	n/a	All 0	<input type="checkbox"/>	n/a		Edit	LLC 0

You can configure the streams of the assigned ports here.

Apply

Press the Apply button to apply all the settings you've made.

E. Editing Frame

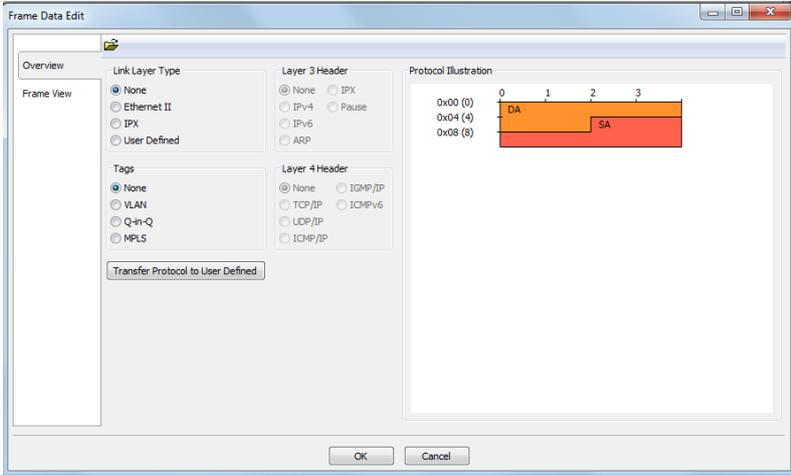


To access the **Editing Frame** function, please click **Traffic Flow >Streams Setting**. For different network modes, the **Streams Setting** pages might be different.

Reserved ports are showed as the format of **(X, Y, Z)**, while X is the number of the chassis (which is displayed on NuStreams-2000i/600i), Y is the slot number where this module card is installed, and Z is the available port number located on the module card.

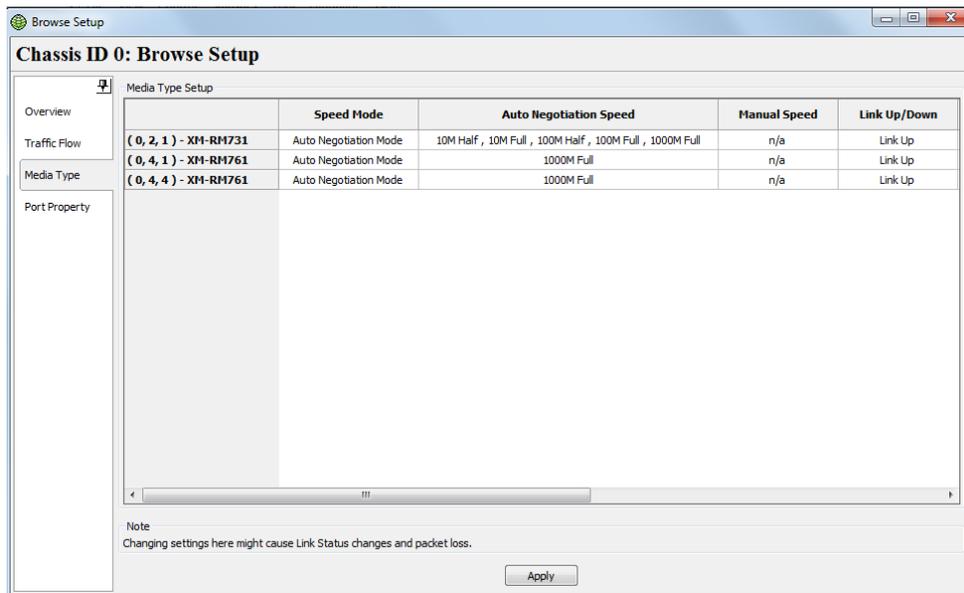
Please see the sections down below for detail descriptions about setting frames for the specific port.

Editing Frames	
	<p>Click the Sel. check box of each port to select and enable that port. If the Sel. check box is un-checked, the specific port won't send any streams during the test.</p>
	<p>The Line Rate (Mbps) fields allow you to set the transmitting rate for the specific port. To set the transmitting rate, please double-click the Line Rate (Mbps) field of the specific port, and input the transmitting rate manually.</p>
	<p>The Length (w/o CRC) fields allow you to set the frame length of the packets transmitted via the specific port. Double-click the Control column, and then you can set the frame length from the scroll-down menu or input the frame length manually, shown as the down-left picture.</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> </div> <div> <ul style="list-style-type: none"> ➤ 60: set a fixed frame length of 60, or you can manually input a value in the above box. The range of the frame length is from 48 to 16300. ➤ Random: set the frame length to be random. ➤ Increase: the frame length will be in an increased mode. ➤ Decrease: the frame length will be in a decreased mode. ➤ Step: the frame length will be in a step mode. And you can select the step </div> </div>

		<p>value from the scroll down menu by double clicking the step column.</p> <p>➤ IMIX: a specific frame length mode, which is “7*64+4*570+1518 bytes”. The packets will be transmitted by this mode cyclically.</p>						
<p style="text-align: center;">Frame Payload</p> <p style="text-align: center;">All 0</p>	<p>Set the payload of the frame.</p>							
<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2" style="text-align: center;">X-TAG</th> </tr> <tr> <th style="text-align: center;">Enable</th> <th style="text-align: center;">X-ID</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">n/a</td> </tr> </tbody> </table>	X-TAG		Enable	X-ID	<input type="checkbox"/>	n/a	<p>The X-TAG field allows you to enable/disable the X-TAG that will be added into the frames. Click and check the “Enable” check box to enable the X-TAG function, or uncheck the “Enable” check box to disable this function. Also, to set the XID (X-TAG ID), please check the “Enable” check box, and input the XID manually in the XID field. The range of the XID is from 0 to 511.</p>	
X-TAG								
Enable	X-ID							
<input type="checkbox"/>	n/a							
<p style="text-align: center;">Frame Data</p> <p style="text-align: center;"><input type="button" value="Edit"/></p>	<p>The Frame Data Edit field allows you to set the frame protocol or view the contents of the frames. To set the frame protocol or view the contents of the frames, please click the “Edit” button of the specific port.</p> <div style="text-align: center;">  </div> <p>A “Frame Data Edit” window will pop up as shown in the picture above.</p> <p>For more detailed descriptions about editing protocols of reserved ports, please refer to 9. Editing Protocol with Frame Data Edit Window.</p>							

Editing Frames																									
<table border="1"> <thead> <tr> <th>Protocol Type</th> </tr> </thead> <tbody> <tr> <td>Ethernet</td> </tr> </tbody> </table>	Protocol Type	Ethernet	<p>Display the protocol type of the network.</p>																						
Protocol Type																									
Ethernet																									
<table border="1"> <thead> <tr> <th colspan="2">MAC</th> </tr> <tr> <th>DA</th> <th>SA</th> </tr> </thead> <tbody> <tr> <td>00-22-A2-00-04-02</td> <td>00-22-A2-00-03-01</td> </tr> <tr> <td>00-22-A2-00-03-01</td> <td>00-22-A2-00-04-02</td> </tr> </tbody> </table>	MAC		DA	SA	00-22-A2-00-04-02	00-22-A2-00-03-01	00-22-A2-00-03-01	00-22-A2-00-04-02	<p>The MAC field displays the DA (Destination MAC Address) and SA (Source MAC Address) of the reserved ports.</p>																
MAC																									
DA	SA																								
00-22-A2-00-04-02	00-22-A2-00-03-01																								
00-22-A2-00-03-01	00-22-A2-00-04-02																								
<table border="1"> <thead> <tr> <th colspan="3">VLAN</th> </tr> <tr> <th>Enable</th> <th>VID</th> <th>Enable</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td>n/a</td> <td><input type="checkbox"/></td> </tr> </tbody> </table>	VLAN			Enable	VID	Enable	<input type="checkbox"/>	n/a	<input type="checkbox"/>	<p>The VLAN field allows you to enable/disable the VLAN that will be added into the frames. Click and check the “Enable” check box to enable the VLAN function, or uncheck the “Enable” check box to disable this function. Also, to set the VID (VLAN ID), please check the “Enable” check box, and input the VID manually in the VID field. The range of the VID is from 0 to 511.</p>															
VLAN																									
Enable	VID	Enable																							
<input type="checkbox"/>	n/a	<input type="checkbox"/>																							
<table border="1"> <thead> <tr> <th colspan="3">IPv4</th> </tr> <tr> <th>Enable</th> <th>DIP</th> <th>SIP</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td><input type="checkbox"/></td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="3">IPv6</th> </tr> <tr> <th>Enable</th> <th>DIP</th> <th>SIP</th> </tr> </thead> <tbody> <tr> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	IPv4			Enable	DIP	SIP	<input type="checkbox"/>	n/a	n/a	<input type="checkbox"/>	n/a	n/a	IPv6			Enable	DIP	SIP	n/a	n/a	n/a	n/a	n/a	n/a	<p>The IP field displays the DIP (Destination IP Address) and SIP (Source IP Address) of the reserved ports. Also, to add DIP and SIP to the frames, click and check the “Enable” check box.</p>
IPv4																									
Enable	DIP	SIP																							
<input type="checkbox"/>	n/a	n/a																							
<input type="checkbox"/>	n/a	n/a																							
IPv6																									
Enable	DIP	SIP																							
n/a	n/a	n/a																							
n/a	n/a	n/a																							
<div style="text-align: center;"> <input type="button" value="Apply"/> </div>	<p>Press the Apply button to apply all the changes you’ve made here.</p>																								

6.4.3. Media Type

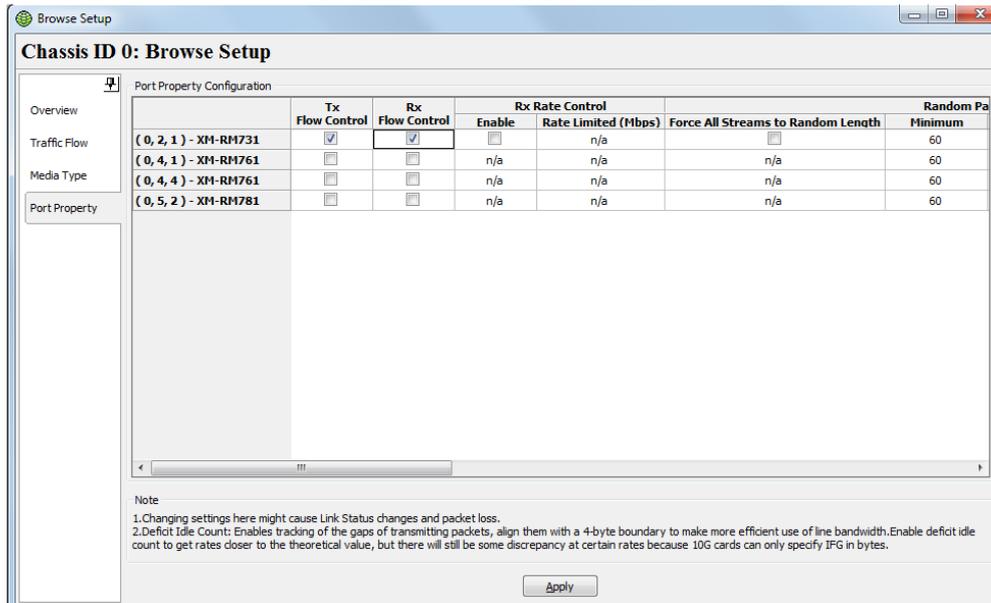


You can set/view the media types for all reserved ports here.

Browse Setup – Media Type	
Speed Mode	<p>Double-click this column, and then you can set the speed mode of the port in the scroll-down menu. There are two speed modes, Auto Negotiation Mode and Manual Speed Mode.</p> <ul style="list-style-type: none"> ➤ Auto Negotiation Mode: In this mode, the two communication ports will automatically negotiate a transmitting rate that they both support. ➤ Manual Speed Mode: In this mode, you need to manually input a required transmitting rate in the Manual Speed column.
Auto Negotiation Speed	This field displays the transmitting rates supported by the port in Auto Negotiation Mode .
Manual Speed	<p>Double click this column, and you can set the transmitting rate from the scroll-down menu, show as the right picture. Force here means the transmitting rate is forced to be the set value no matter whether the communication is successful.</p>
Link Up/Down	Link Up/Down corresponding means enable/disable this port.
Cable MDI-II / MDI-X Selection	<p>Double click this column and then you can set the required cable connection type from the scroll down menu.</p> <ul style="list-style-type: none"> ➤ Auto-MDIX: a technology that automatically detects the required cable connection type (straight-through or crossover) and configures the connection appropriately. ➤ Force MDI-II: straight-through connection. ➤ Force MDI-X: crossover connection.
Copper/Fiber Mode	Select the transmitting media. This function is specially designed for XM-RM731 modules and only when the transmitting rate is manually set to be Force 1000M Full , this function is available.
Master/Slave Mode	This function is specially designed for 1000M electrical ports, which ensures the successful connection of the two communication ports at this speed. For now we have XM-RM731 modules and XM-RM781 modules to support this function.

	If you set one communication to Master/Slave , then the other communication must be set to Slave/Master . Only in this way, the two communication ports can be successfully connected.
Current Speed	This field displays the transmitting speed of the reserved port.
<input type="button" value="Apply"/>	To apply all the changes you've made here, please press the Apply button.

6.4.4. Port Property



You can set/view the media types for all reserved ports here.

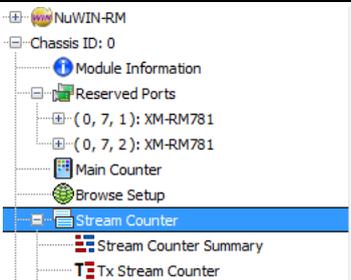
Browse Setup – Media Type																
<div style="border: 1px solid gray; padding: 5px; width: fit-content;"> <p style="text-align: center; margin: 0;">Tx Flow Control</p> <p style="text-align: center; margin: 0;"><input checked="" type="checkbox"/></p> </div>	Enable/disable the Tx Flow Control of this port.															
<div style="border: 1px solid gray; padding: 5px; width: fit-content;"> <p style="text-align: center; margin: 0;">Rx Flow Control</p> <p style="text-align: center; margin: 0;"><input checked="" type="checkbox"/></p> </div>	Enable/disable the Rx Flow Control of this port.															
<div style="border: 1px solid gray; padding: 5px; width: fit-content;"> <p style="text-align: center; margin: 0;">Rx Rate Control</p> <p style="margin: 0;"><input type="checkbox"/> Enable <input type="text" value="Rate Limited (Mbps)"/></p> </div>	The Rx Rate Control allows you to set the limit of receiving rate for the specific port. To enable this function, click the check box on the “ Enable ” field, and input the limit rate (Mbps) manually.															
<div style="border: 1px solid gray; padding: 5px; width: fit-content;"> <p style="text-align: center; margin: 0;">Random Packet Length (w/o CRC)</p> </div>	<p>You can set length for packets (without CRC) generated randomly by NuWIN-RM.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="5" style="text-align: center;">Random Packet Length (w/o CRC)</th> </tr> <tr> <th style="text-align: center;">Force All Streams to Random Length</th> <th style="text-align: center;">Minimum</th> <th style="text-align: center;">Maximum</th> <th style="text-align: center;">Soft Random Length</th> <th style="text-align: center;">Dynamic Random Seed</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table> <ul style="list-style-type: none"> ➤ Force All Streams to Random Length: Check this function, then the packet lengths of all streams of this port will be random. ➤ Minimum: set the minimum packet length of the random packet length. ➤ Maximum: set the maximum packet length of the random packet length. ➤ Soft Random Length: this function is only available for the XM-RM 8xx series modules. If you enable this function, the random packet length will fluctuate in a small range, to avoid big vibrations in packet length. ➤ Dynamic Random Seed: If you enable this function, the packet lengths of all streams will be different, or it could be the same. 	Random Packet Length (w/o CRC)					Force All Streams to Random Length	Minimum	Maximum	Soft Random Length	Dynamic Random Seed	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
Random Packet Length (w/o CRC)																
Force All Streams to Random Length	Minimum	Maximum	Soft Random Length	Dynamic Random Seed												
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>												
<div style="border: 1px solid gray; padding: 5px; width: fit-content;"> <p style="text-align: center; margin: 0;">X-TAG Offset</p> <p style="margin: 0;"><input type="text" value="Tx Offset"/> <input type="text" value="Check Offset"/></p> </div>	X-TAG is a 12-byte tag developed by Xtramus, embedded in the transmitted packets, which is an enhance measure to check the validation of data transmission on the network. When the starting position of the X-TAG in the received packet by the other port of the two communication ends coincides with the Byte set in Check Offset , then the data transmission between the two communication ends is supposed to be validate. The Byte in Check Offset should be set based on the Byte in Tx Offset .															
<div style="border: 1px solid gray; padding: 5px; width: fit-content;"> <p style="text-align: center; margin: 0;">BERT</p> <p style="margin: 0;"><input type="checkbox"/> Transmit <input type="checkbox"/> Check</p> </div>	BERT stands for Bit Error Rate Test . You can perform BERT for transmitted/received packets. To enable BERT for transmitted packets, check the check box in the Transmit field. To enable BERT for received packets, check the check box in the Receive field.															

<table border="1"> <tr> <th colspan="2">Data Integrity (DI)</th> </tr> <tr> <td>Transmit</td> <td>Receive</td> </tr> </table>	Data Integrity (DI)		Transmit	Receive	<p>The Data Integrity (DI) allows you to check data integrity of transmitted/received packets. To enable the data integrity check of transmitted packets, check the check box in the Transmit field. To enable the data integrity check of received packets, check the check box in the Receive field.</p>
Data Integrity (DI)					
Transmit	Receive				
<table border="1"> <tr> <th colspan="2">Elongated Frame Gap</th> </tr> <tr> <td>Enable</td> <td>ppm</td> </tr> </table>	Elongated Frame Gap		Enable	ppm	<p>When this function is enabled and the transmitting packet flow reaches wirespeed, a 1 byte-time of frame gap will be inserted after a certain amount of packets are transmitted. This can reduce packet loss caused by crystal frequency differentials between DUT and test instrument. Enabling Elongated Frame Gap can compensate crystal frequency differentials by around 30 ppm as simulation.</p>
Elongated Frame Gap					
Enable	ppm				
<table border="1"> <tr> <th>Deficit Idle Count</th> </tr> </table>	Deficit Idle Count	<p>This function is specially designed for XM-RM881. Enable this function to ensure the packets not of an integer multiple of 4 bytes to approximate the wire speed. Or these packets may fail to reach the wire speed.</p>			
Deficit Idle Count					
<table border="1"> <tr> <td>Apply</td> </tr> </table>	Apply	<p>To apply all the changes you've made here, please press the Apply button.</p>			
Apply					

6.5. Stream Counter

You can view the packet transmission and receiving statistics and edit the packet receiving rules here. You can access the **Stream Counter** by:

Accessing Layer 3 Auto Reply Configuration



NuWIN-RM
Chassis ID: 0
Module Information
Reserved Ports
 (0, 7, 1): XM-RM781
 (0, 7, 2): XM-RM781
Main Counter
Browse Setup
Stream Counter
 Stream Counter Summary
 Tx Stream Counter

- Click **Stream Counter** on the **Module Info/Configuration List**

Browse Setup

Stream Counter

Capture Buffer

- Press **Stream Counter** on the **Quick Launch Buttons**.

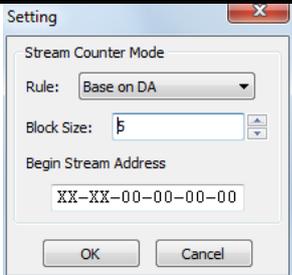
Stream Counter			
	SC Summary	Tx SC	Rx SC
	Module Name	Rx Stream Counter Rule Summary	
(0, 7, 1)	XM-RM781	Base on DA, DA #: XX:XX:00:00:00:00 ~ XX:XX:00:00:00:04	
(0, 7, 2)	XM-RM781	Base on X-TAG, XID #: 0, offset: 49 Bytes	

As it can be seen from the above picture, there are three sub-functions for **Stream Counter**, which are respectively **SC Summary**, **Tx SC**, **Rx SC**.

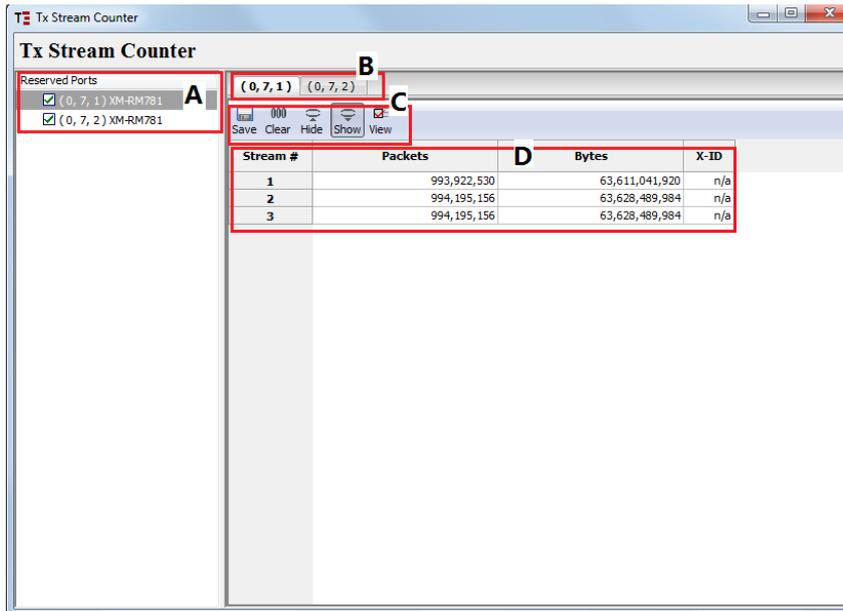
6.5.1. SC Summary

	Module Name	Rx Stream Counter Rule Summary	Edit Rule
(0, 7, 1)	XM-RM781	Base on DA, DA #: XX:XX:00:00:00:00 ~ XX:XX:00:00:00:04	Edit
(0, 7, 2)	XM-RM781	Base on X-TAG, XID #: 0, offset: 49 Bytes	Edit

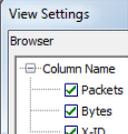
You can make stream counter settings here. Module card IDs are listed on the left part of the **SC Summary** tab page and are showed as the format of **(X, Y, Z)**, while X is the number of the chassis (which is displayed on NuStreams-2000i/600i), Y is the slot number where this module card is installed, and Z is the available port number located on the module card.

SC Summary	
Module Name	The model of the reserved port.
Rx Stream Counter Rule Summary	The rules to receive packet for the port.
Edit Rule	<p>Click the Edit button, then the window on the left will pop up, allowing you to set the rules to receive packet for the port.</p> <ul style="list-style-type: none"> ● Rule: to set the rule from the scroll down menu. ● Block Size: to set the range based on the rule. ● Begin Stream Address: to set the beginning address based on the rule. ● OK: click this button to apply your settings. ● Cancel: click this button to give up your settings. <p>For further illustrating the above functions, take the following instance for an example. Select the Rule as Base on DA, the Block Size as 5, the Begin Stream Address as XX-XX-00-00-00-00, then the packets satisfying to be received by the port will the packets with DA from XX-XX-00-00-00-00 to XX-XX-00-00-00-04.</p> 

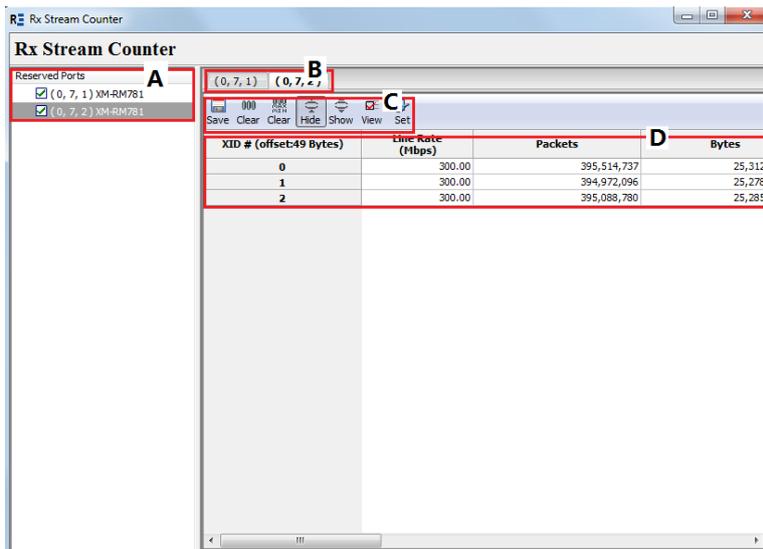
6.5.2. Tx SC/Tx Stream Counter



Click **Tx SC** on the **Stream Counter** or **Tx Stream Counter** on the **Module Info/Configuration List**, the **Tx Stream Counter** will pop up to allow you to view the data transmission items of your interest.

Tx SC/Tx Stream Counter	
A	A list of the reserved ports. The checked ports here will be listed in B as an independent tab and only the transmission data information of the checked can be displayed.
B	The tabs of every checked port in A . Click each tab, then the corresponding transmission data of the port will be displayed.
C	 Save The Save button allows you to save the current module information.
	 Clear The Clear button allows you to clear the current transmission information.
	 Hide The Hide button allows you to hide the lines with values of all zeros.
	 Show The Show button allows you to show the lines with values of all zeros.
	 View A View Setting window will pop up if you press this button. Check the items you want to view here, then the data information of the item will be displayed in D . 
D	The transmission data information list of the items checked in the View Settings window will be displayed here.

6.5.3. Rx SC/Rx Stream Counter



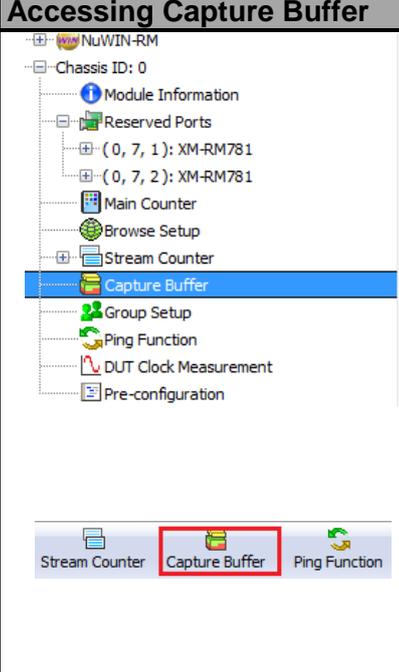
Click **Rx SC** on the **Stream Counter** or **Rx Stream Counter** on the **Module Info/Configuration List**, the **Rx Stream Counter** will pop up to allow you to view the data receiving items of your interest.

Tx SC/Tx Stream Counter	
A	A list of the reserved ports. The checked ports here will be listed in B as an independent tab and only the receiving data information of the checked ports can be displayed.
B	The tabs of every checked port in A . Click each tab, then the corresponding transmission data of the port will be displayed.
C	 Save The Save button allows you to save the current module information.
	 Clear The Clear button allows you to clear the current data receiving information.
	 Hide The Hide button allows you to hide the lines with values of all zeros.
	 Show The Show button allows you to show the lines with values of all zeros.
	 View A View Setting window will pop up if you press this button. Check the items you want to view here, then the data information of the item will be displayed in D . <div style="float: right; border: 1px solid gray; padding: 5px; margin-top: 10px;"> View Settings Browser Column Name <input checked="" type="checkbox"/> Line Rate (Mbps) <input checked="" type="checkbox"/> Packets <input checked="" type="checkbox"/> Bytes <input checked="" type="checkbox"/> Loss Event <input checked="" type="checkbox"/> S/N Miss <input checked="" type="checkbox"/> S/N Miss Rate (%) <input checked="" type="checkbox"/> IPCS Error <input checked="" type="checkbox"/> Latency(us) </div>
D	Please refer to Edit Rule in 6.5.1 SC Summary for detailed information. The receiving data information list of the items checked in the View Settings window will be displayed here.

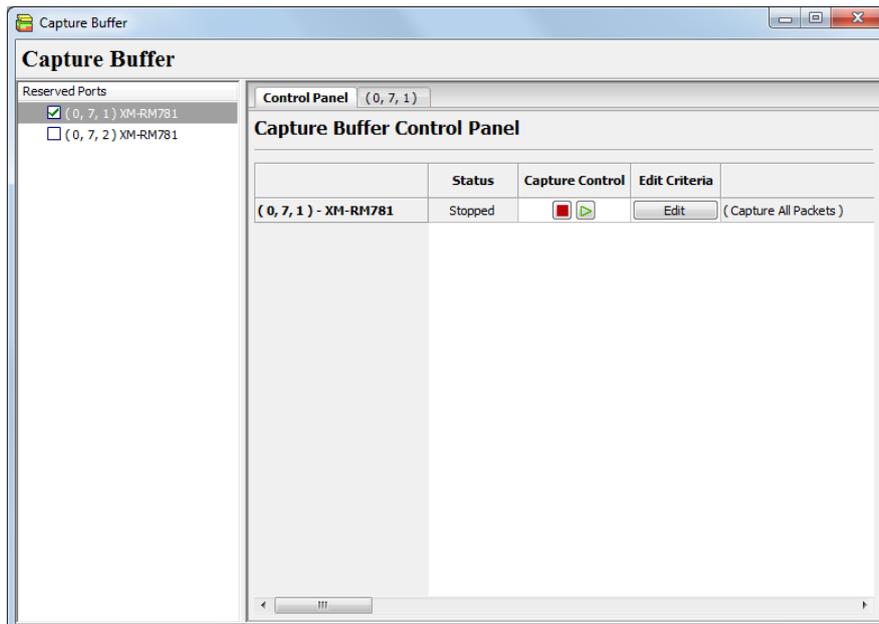
6.6. Capture Buffer

You can access the **Capture Buffer** by:

Accessing Capture Buffer

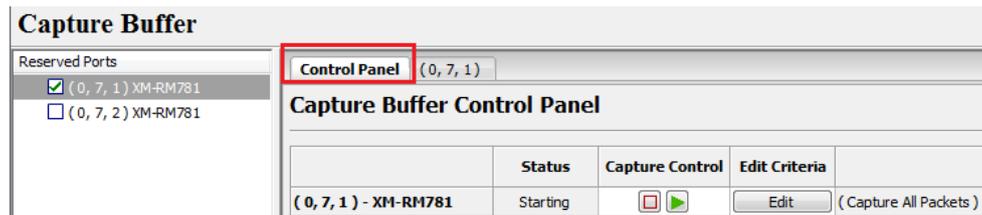


- Click **Capture Buffer** on the **Module Info/Configuration List**
- Press **Capture Buffer** on the menu bar.



All available ports will be displayed on the **Reserved Ports** list in the format of **(X, Y, Z)**, where **(X, Y, Z)** is module card's port ID. The **Capture Buffer** window mainly contains two kinds of tab menus, which are **Control Panel** and **Port ID Tab** (named by the port ID). For detailed description of the two tab menus, please refer to the section down below.

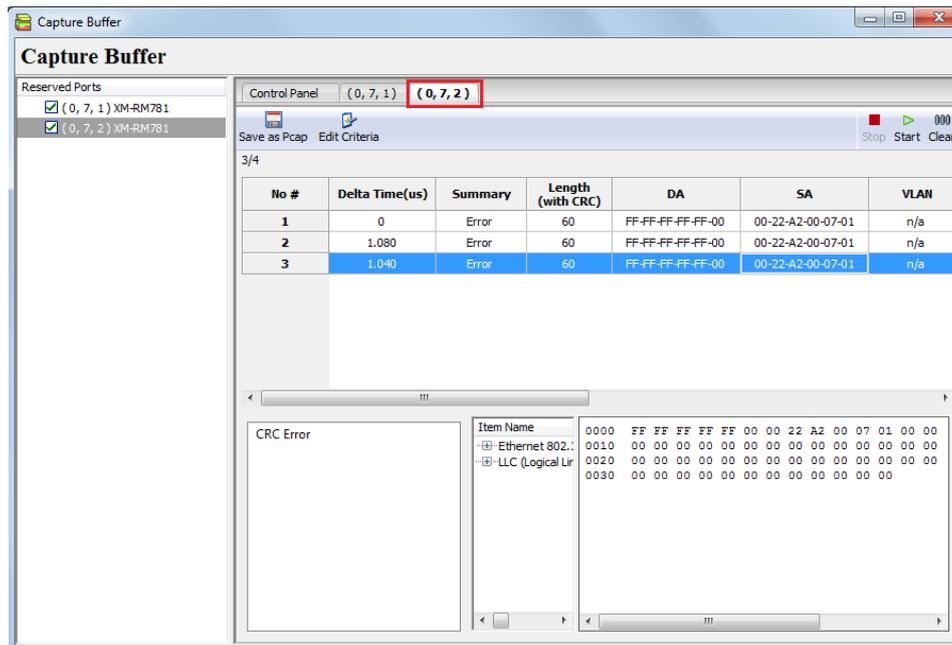
6.6.1. Control Panel



Capture Buffer –Control Panel

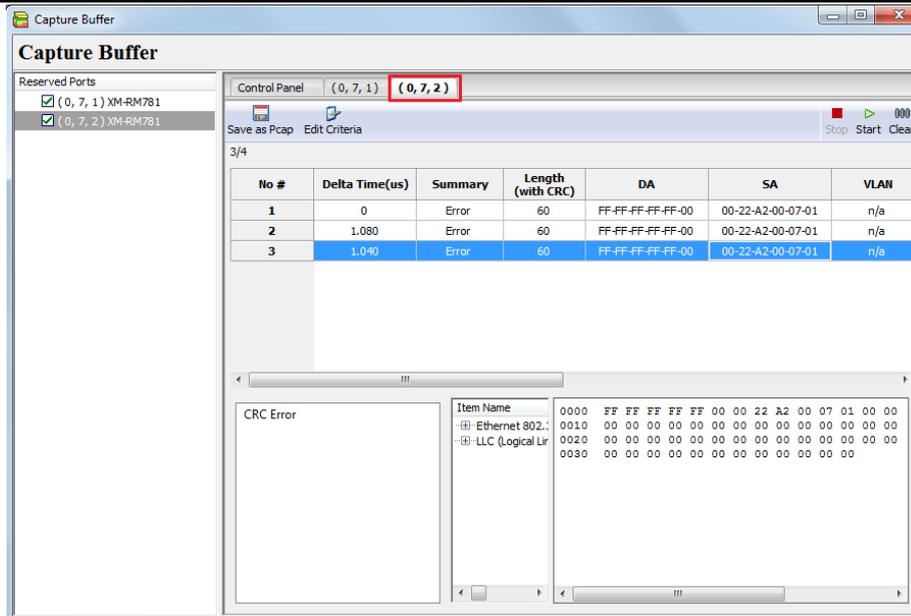
- **Status:** This field displays the capture buffer status.
- **Capture Control:** You can start/stop capturing packets that meets the filtering settings by the control buttons in this field.
 - **Stop:** To stop capturing test packets, press  button. If the designated port is not capturing packets, the button will be  instead.
 - **Start:** To start capturing test packets, press  button. If the designated port is capturing packets, the button will be  instead.
- **Edit Criteria:** When the Edit button is clicked, a Port (X, Y, Z): Capture Criteria window will pop up, where (X, Y, Z) is module card's port ID. You can set packet capturing criteria for the designated port here on the Capture Criteria pop-up window. For more information, please refer to Capture Criteria on page 34.
- **Criteria Summary:** This field will display the capture criteria.

6.6.2. Port ID Tab

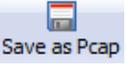


As it shown in the picture above, the ports checked in the **Reserved Ports** list will generate an independent **Port ID Tab**, which allows you to see the detailed information of the captured packet.

Capture Buffer –Port ID TAB



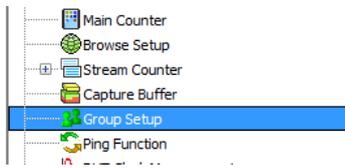
You can view detail information about all packets captured. Also, the control buttons allows you to perform various tasks:

Control Buttons	 Save as Pcap	Save all captured packets as Pcap file.	 Edit Criteria	Edit the packet capture criteria.
	 Stop	Stop capturing packets.	 Start	Start capturing packets.
	 Clear	Clear all captured packets stored in the capture buffer.		

6.7. Group Setup

You can access the **Group Setup** by:

Accessing Group Setup



- Click **Group Setup** on the **Module Info/Configuration List**

Group Setup

Group Setup

	Module Name	1	2	3	4	5
(0, 7, 1)	XM-RM781	1	2	3	4	5
(0, 7, 2)	XM-RM781	1	2	3	4	5

If you click **Group Setup** from the **Module Info/Configuration List**, the **Main Display Screen** will display **Group ID Setup** as shown in the picture above.

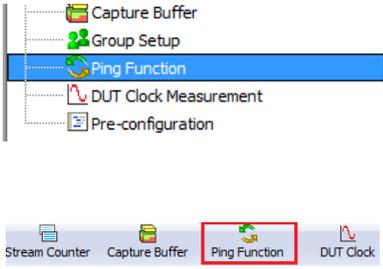
You can assign a group ID number to reserved ports for test managements here. To assign an ID to the designated port, please click the number you would like to assign.

For example, to assign port (0, 2, 1) to group 1, please click the group number **1**.

6.8. Ping Function

As a network utility, **Ping** is widely used for testing if one specific host is reachable through its IP address. Also, **Ping** can be used to measure the time it takes to transmit packets from a local host to the designated computer located on a network and back.

Accessing Ping Function



- Click **Ping Function** on the **Module Info/Configuration List**
- Press **Ping Function** button on the **Quick Launch Buttons**.

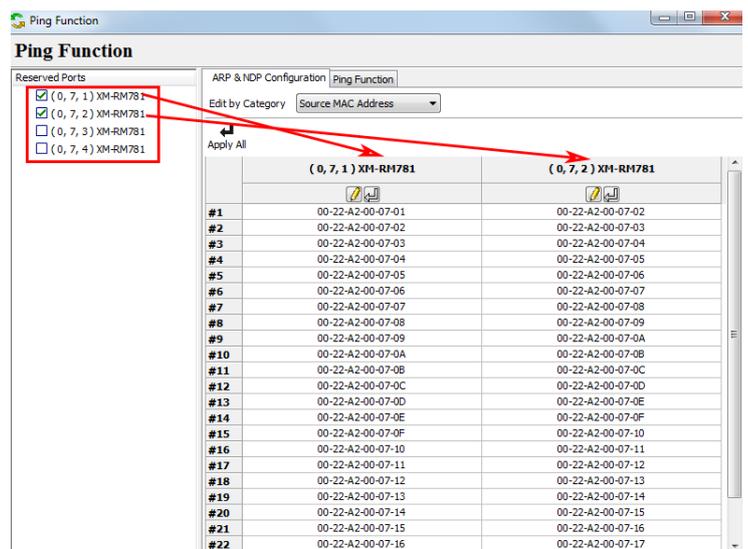
A **Ping Function** window will pop up, as shown in the picture down below.

To perform the ping command via specific port, please check the check-boxes on the **Reserved Ports** list. The port you've selected will be displayed on the main display screen located on the right side of the **Ping Function** window, as shown in the picture on the right side.

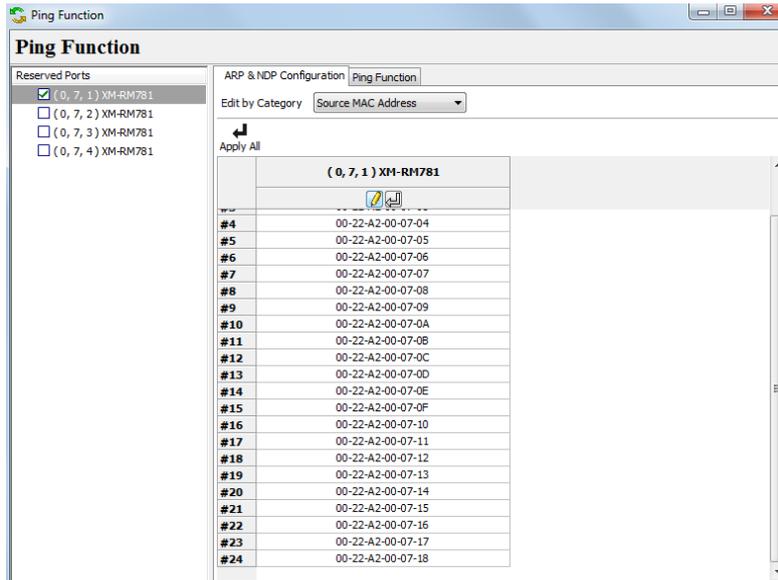
Each port you've chosen contains 24 sets of different MAC Addresses, IPv4 addresses, IPv6 addresses, and VLAN IDs.

There are two tab-menus available for you to make layer 3 testing configurations, including

ARP&NDP Configuration, and **Ping Function**. Please see the sections down below for more details.



6.8.1. ARP&NDP Configuration



You can view/set MAC Addresses, IPv4 addresses, IPv6 addresses, and VLAN IDs for NuWIN-RM's auto reply function or enable or disable the **ARP** or **NDP** function here.

Auto Reply Setup	
<p>Edit by Category</p>	<p>Select the items from the Edit by Category scroll-down menu, and you can edit and modify the corresponding item.</p> <p>Select the Enable (Disable) ARP/NDP from the scroll down menu, and you can enable/disable the ARP/NDP reply for corresponding address set.</p> <p>Click the ARP/NDP button for each address set, and then you can enable/disable the ARP/NDP reply. When the ARP reply is enabled, the button color will be yellow while then NDP reply is enabled, the button color will be blue. When ARP/NDP button present gray, it means the function is disabled.</p>
<p>Apply All/Edit/Apply Buttons</p>	<ul style="list-style-type: none"> ➤ Apply All: the location of the Apply All button is shown as the picture below. Click this button to apply the changes for all ports. ➤ Edit: If you press this button, a Port(X, Y, Z): ARP&NDP Configuration window will pop up. You can make the ARP&NDP configuration here. For more details, please refer to 6.2.2.4 ARP&NDP Configuration. ➤ Apply: Press this button apply the changed for a specific port which the button lies in.

6.8.2. Ping Function

ARP & NDP Configuration		Ping Function
000		
Clear	Apply All	Execute Ping
	* (0, 7, 1) XM-RM781	
Ping Count	4	
Ping Timeout (Sec.)	1	
Ping Interval (ms)	1000	
Source MAC Address	00-22-A2-00-07-01	
Destination IP Address	192.168.1.1	
Source IP Address	192.168.7.1	
Gateway	192.168.7.250	
Netmask	24	
Progress State		
ICMP Reply	0	
ICMP Timeout	0	
ARP Reply	0	
ARP Timeout	0	
DUT MAC	n/a	

You can perform **Ping** here, or view detailed information here.

Ping Function	
<p>Control Buttons for All Ports</p>	<p> Clear</p> <p>Press the Clear button to set all counters to zero.</p> <p> Apply All</p> <p>Press the Apply All button to apply all setting you've made for all ports.</p> <p> Execute Ping</p> <p>Press the Execute Ping button to make all ports starting pinging.</p>
<p>Control Buttons for Specific Port</p>	<p>These two buttons allow you to apply all the settings to a specific port, or to execute ping command on a specific port.</p> <p> Press this button to apply all the settings you've made for that specific port.</p> <p> Press this button to execute ping command for that specific port.</p>
<p>Ping Settings/Report</p>	<p>You can change variables or view detailed information here. If you would like to change the value displayed here, please do so by double-click the column you would like to modify, and input the value manually.</p> <ul style="list-style-type: none"> ➤ Ping Count: The number of times to ping. ➤ Ping Timeout: Ping timeout setup. ➤ Ping Interval (ms): The time between each ping. ➤ Source MAC Source: The source MAC address. ➤ Destination IP Address: The destination IP address. ➤ Source IP Source: The source IP address. ➤ Gateway: The IP address for the network gateway. ➤ Netmask: The IP address for net mask. ➤ Progress State: After pressing the Ping button, the icon here will be changing accordingly. <ul style="list-style-type: none"> • NuWIN-RM is idle • system is perform ping command • System got reply from destination IP • Destination IP is not replying ➤ ICMP Reply: Number of ICMP (Internet Control Message Protocol) reply that occurs.

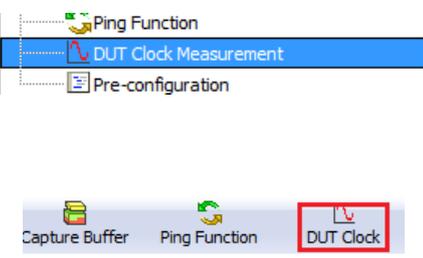
Ping Function

- **ICMP Timeout:** Number of ICMP (Internet Control Message Protocol) timeout that occurs.
- **ARP Reply:** Number of ARP (Address Resolution Protocol) reply that occurs.
- **ARP Timeout:** Number of ARP (Address Resolution Protocol) timeout that occurs.
- **DUT MAC:** MAC address of DUT.

6.9. DUT Clock Measurement

The **DUT Clock Measurement** function tests the crystal oscillator's frequency of the DUT and checks if it's either faster or slower than standard speed in ppm scale.

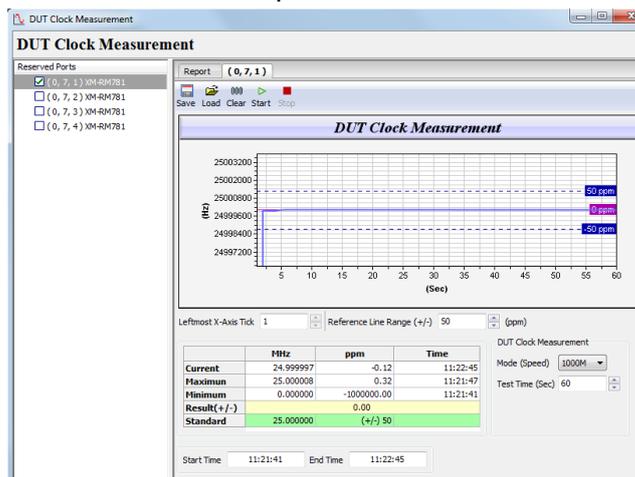
Accessing DUT Clock Measurement



- Click **DUT Clock Measurement** on the **Module Info/Configuration List**
- Press **DUT Clock Measurement** on the **Quick Launch Buttons**.

A **DUT Clock Measurement** window will pop up, as shown in the picture down below.

The port you've selected will be displayed on the main display screen located on the right side of the **DUT Clock Measurement** window, as shown in the picture down below.



There are two tab-menus available for you on the **DUT Clock Measurement** window, including **Report**, and **(X, Y, Z)**. Please see the sections down below for more details.

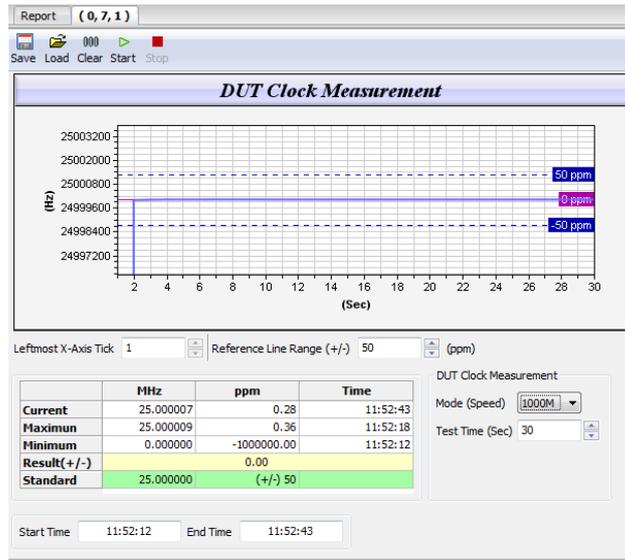
6.9.1 Report

Report						
Report	(0, 7, 1)					
	Current Value			Maximum Value		
	MHz	ppm	Time	MHz	ppm	Time
(0, 7, 1) - XM-RM781	25.000007	0.28	11:52:43	25.000009	0.36	

This tab page displays the test result of clock statistics.

- **Current Value:** the current clock information. The **MHz**, **ppm** and **Time** here respectively mean the current oscillating frequency, current oscillating frequency deviation and the current time.
- **Maximum Value:** the maximum clock information. The **MHz**, **ppm** and **Time** here respectively mean the maximum oscillating frequency, maximum oscillating frequency deviation and the maximum time.
- **Minimum Value:** the minimum clock information. The **MHz**, **ppm** and **Time** here respectively mean the minimum oscillating frequency, minimum oscillating frequency deviation and the minimum time.

6.9.2 (X, Y, Z)

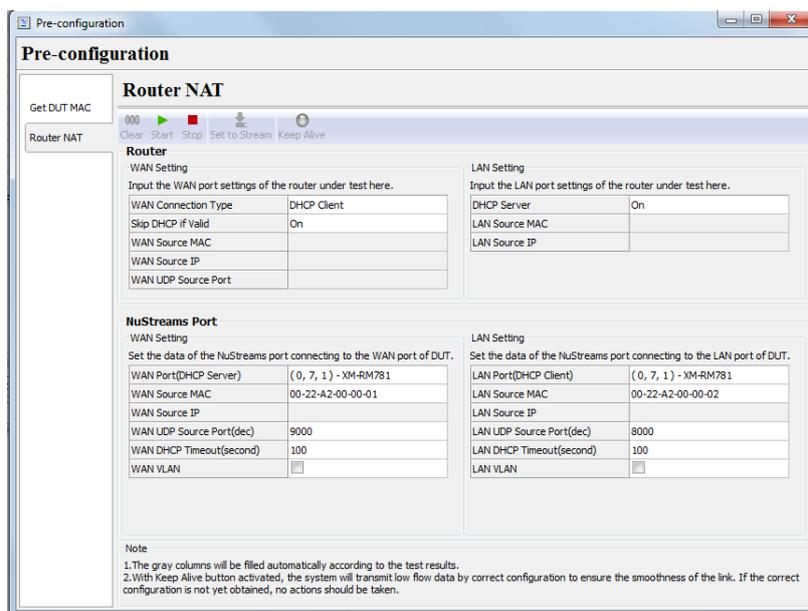


(X, Y, Z) stands for the chassis ID, slot number and port ID, respectively.

(X, Y, Z)																									
<p>Control Buttons</p>	<p>Press the Save button to save the test result in “.csv” file.</p> <p>Press the Load button to load in the saved “.csv” file.</p> <p>Press the Clear button to clear the test result.</p> <p>Press the Start button to start the clock test.</p> <p>Press the Stop button to start the clock test.</p>																								
<p>Coordination Chart Display</p>	<p>This area intuitively displays the clock test result in a coordination chart. The x-axis represents the elapsed time and y-axis represents the oscillating frequency. There are two reference lines in the chart, which can be configure in Reference Line Range (+/-).</p>																								
<p>Test Result statistics</p>	<table border="1"> <thead> <tr> <th></th> <th>MHz</th> <th>ppm</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>Current</td> <td>25.000007</td> <td>0.28</td> <td>11:52:41</td> </tr> <tr> <td>Maximum</td> <td>25.000009</td> <td>0.36</td> <td>11:52:18</td> </tr> <tr> <td>Minimum</td> <td>24.999981</td> <td>-0.76</td> <td>11:52:13</td> </tr> <tr> <td>Result(+/-)</td> <td colspan="2">0.00</td> <td></td> </tr> <tr> <td>Standard</td> <td>25.000000</td> <td>(+/-) 50</td> <td></td> </tr> </tbody> </table> <p>This table is the statistics of the clock test. For detailed information, please refer to 6.8.1 Report.</p>		MHz	ppm	Time	Current	25.000007	0.28	11:52:41	Maximum	25.000009	0.36	11:52:18	Minimum	24.999981	-0.76	11:52:13	Result(+/-)	0.00			Standard	25.000000	(+/-) 50	
	MHz	ppm	Time																						
Current	25.000007	0.28	11:52:41																						
Maximum	25.000009	0.36	11:52:18																						
Minimum	24.999981	-0.76	11:52:13																						
Result(+/-)	0.00																								
Standard	25.000000	(+/-) 50																							

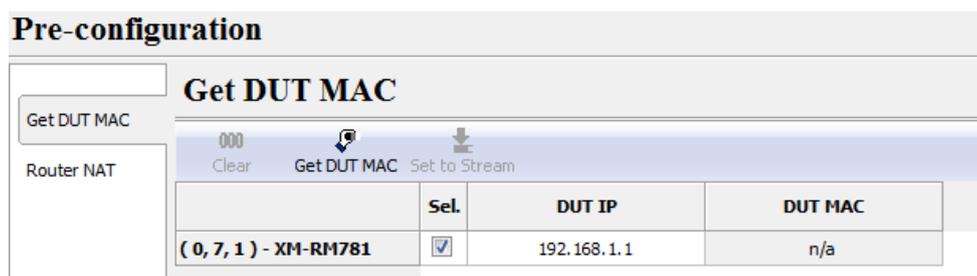
(X, Y, Z)	
Configuration/Function	<ul style="list-style-type: none">➤ Leftmost X-Axis Tick: In this filed you can set the starting time of the chart described above.➤ Reference Line Range (+/-): In this filed, you can set the two reference lines of the chart described above.➤ Mode (Speed): Set the transmitting speed here.➤ Test Time (Sec): Set the total testing time. The settings here will be reflected in the chart described above.➤ Start Time: This area will display the test start time after the test is finished.➤ End Time: This area will display the test end time after the test is finished.

6.10. Pre-configuration



This is a function provided to facilitate the users to conduct the network address configuration. There are two sub-functions, **Get DUT MAC** and **Router NAT**.

6.10.1. Get DUT MAC



Get DUT MAC allows the user to automatically get the DUT MAC of the port and apply it to the packet settings of the stream.

Note: This function is available only when the DUT has an ARP reply function.

Get DUT MAC													
	<p> Clear</p> <p>Clear the content in the DUT MAC column.</p>												
	<p> Get DUT MAC</p> <p>The MAC address of the DUT will be displayed in the DUT MAC column by clicking this button.</p>												
	<p> Set to Stream</p> <p>The settings of the DUT will be applied to the packet settings of the stream by clicking this button. You can check the result by view Stream Generation. For detailed information of Stream Generation, please refer to 8. Stream Generation.</p>												
	<p>The most left column shows the port ID in a format of (X, Y, Z), respectively stands for the chassis ID, slot number and port ID.</p>												
<table border="1"> <thead> <tr> <th></th> <th>Sel.</th> <th>DUT IP</th> <th>DUT MAC</th> </tr> </thead> <tbody> <tr> <td>(0, 3, 1) - XM-RM751</td> <td><input checked="" type="checkbox"/></td> <td>192.168.1.1</td> <td>n/a</td> </tr> <tr> <td>(0, 3, 4) - XM-RM751</td> <td><input checked="" type="checkbox"/></td> <td>192.168.1.1</td> <td>n/a</td> </tr> </tbody> </table>		Sel.	DUT IP	DUT MAC	(0, 3, 1) - XM-RM751	<input checked="" type="checkbox"/>	192.168.1.1	n/a	(0, 3, 4) - XM-RM751	<input checked="" type="checkbox"/>	192.168.1.1	n/a	<ul style="list-style-type: none"> ➤ Sel.: only the ports check here can be further conducted functions as Get DUT MAC and Set to Stream. ➤ DUT IP: double-click the cell in this column, and then you can manually set the IP address of the DUT. ➤ DUT MAC: This column will display the MAC addresses obtained by the Get DUT MAC function.
	Sel.	DUT IP	DUT MAC										
(0, 3, 1) - XM-RM751	<input checked="" type="checkbox"/>	192.168.1.1	n/a										
(0, 3, 4) - XM-RM751	<input checked="" type="checkbox"/>	192.168.1.1	n/a										

6.10.2. Router NAT

Router NAT

000
Clear Start Stop
Set to Stream
Keep Alive

Router

WAN Setting
Input the WAN port settings of the router under test here.

WAN Connection Type	DHCP Client
Skip DHCP if Valid	On
WAN Source MAC	56-14-DE-00-F5-16
WAN Source IP	192.168.2.2
WAN UDP Source Port	8000

LAN Setting

Input the LAN port settings of the router under test here.

DHCP Server	On
LAN Source MAC	56-14-DE-00-F5-17
LAN Source IP	192.168.1.1

NuStreams Port

WAN Setting
Set the data of the NuStreams port connecting to the WAN port of DUT.

WAN Port(DHCP Server)	(0, 3, 1) - XM-RM751
WAN Source MAC	00-22-A2-00-00-01
WAN Source IP	192.168.2.1
WAN UDP Source Port(dec)	9000
WAN DHCP Timeout(second)	100
WAN VLAN	<input type="checkbox"/>

LAN Setting

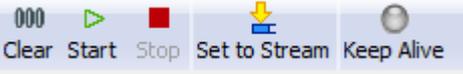
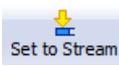
Set the data of the NuStreams port connecting to the LAN port of DUT.

LAN Port(DHCP Client)	(0, 3, 4) - XM-RM751
LAN Source MAC	00-22-A2-00-00-02
LAN Source IP	192.168.1.2
LAN UDP Source Port(dec)	8000
LAN DHCP Timeout(second)	100
LAN VLAN	<input type="checkbox"/>

Note

- 1.The gray columns will be filled automatically according to the test results.
- 2.With Keep Alive button activated, the system will transmit low flow data by correct configuration to ensure the smoothness of the link. If the correct configuration is not yet obtained, no actions should be taken.

Router NAT is specially used when the DUT is a router. This function provides complete configuration information for testing the routers, which greatly facilitate the configuration work. The settings areas are divided into two types, the white areas and the gray areas. The content in the white area can be configured as the user's expectations while the content of the gray area is automatically obtained after running this function.

Router NAT																																									
	 <p>Clear the settings in the gray cells.</p>																																								
	 <p>Start running this function.</p>																																								
	 <p>Stop running this function.</p>																																								
	 <p>The settings here will be applied to the packet settings of the stream by clicking this button. You can check the result by view Stream Generation. For detailed information of Stream Generation, please refer to 8. Stream Generation.</p>																																								
	 <p>With Keep Active button activated, the system will transmit low flow data by correct configuration to ensure the smoothness of the link. If the correct configuration is not yet obtained, no actions should be taken.</p>																																								
<p>Router</p> <p>WAN Setting Input the WAN port settings of the router under test here.</p> <table border="1"> <tr><td>WAN Connection Type</td><td>DHCP Client</td></tr> <tr><td>Skip DHCP if Valid</td><td>On</td></tr> <tr><td>WAN Source MAC</td><td>56-14-DE-00-F5-16</td></tr> <tr><td>WAN Source IP</td><td>192.168.2.2</td></tr> <tr><td>WAN UDP Source Port</td><td>8000</td></tr> </table> <p>LAN Setting Input the LAN port settings of the router under test here.</p> <table border="1"> <tr><td>DHCP Server</td><td>On</td></tr> <tr><td>LAN Source MAC</td><td>56-14-DE-00-F5-17</td></tr> <tr><td>LAN Source IP</td><td>192.168.1.1</td></tr> </table> <p>NuStreams Port</p> <p>WAN Setting Set the data of the NuStreams port connecting to the WAN port of DUT.</p> <table border="1"> <tr><td>WAN Port(DHCP Server)</td><td>(0, 3, 2) - XM-RM751</td></tr> <tr><td>WAN Source MAC</td><td>00-22-A2-00-00-01</td></tr> <tr><td>WAN Source IP</td><td>192.168.2.1</td></tr> <tr><td>WAN UDP Source Port(dec)</td><td>9000</td></tr> <tr><td>WAN DHCP Timeout(second)</td><td>100</td></tr> <tr><td>WAN VLAN</td><td><input type="checkbox"/></td></tr> </table> <p>LAN Setting Set the data of the NuStreams port connecting to the LAN port of DUT.</p> <table border="1"> <tr><td>LAN Port(DHCP Client)</td><td>(0, 4, 2) - XM-RM761</td></tr> <tr><td>LAN Source MAC</td><td>00-22-A2-00-00-02</td></tr> <tr><td>LAN Source IP</td><td>192.168.1.2</td></tr> <tr><td>LAN UDP Source Port(dec)</td><td>8000</td></tr> <tr><td>LAN DHCP Timeout(second)</td><td>100</td></tr> <tr><td>LAN VLAN</td><td><input type="checkbox"/></td></tr> </table>	WAN Connection Type	DHCP Client	Skip DHCP if Valid	On	WAN Source MAC	56-14-DE-00-F5-16	WAN Source IP	192.168.2.2	WAN UDP Source Port	8000	DHCP Server	On	LAN Source MAC	56-14-DE-00-F5-17	LAN Source IP	192.168.1.1	WAN Port(DHCP Server)	(0, 3, 2) - XM-RM751	WAN Source MAC	00-22-A2-00-00-01	WAN Source IP	192.168.2.1	WAN UDP Source Port(dec)	9000	WAN DHCP Timeout(second)	100	WAN VLAN	<input type="checkbox"/>	LAN Port(DHCP Client)	(0, 4, 2) - XM-RM761	LAN Source MAC	00-22-A2-00-00-02	LAN Source IP	192.168.1.2	LAN UDP Source Port(dec)	8000	LAN DHCP Timeout(second)	100	LAN VLAN	<input type="checkbox"/>	<p>The upper Router table shows the configurations of the router.</p> <p>The lower NuStreams Port table shows the configurations of the testing ports.</p>
WAN Connection Type	DHCP Client																																								
Skip DHCP if Valid	On																																								
WAN Source MAC	56-14-DE-00-F5-16																																								
WAN Source IP	192.168.2.2																																								
WAN UDP Source Port	8000																																								
DHCP Server	On																																								
LAN Source MAC	56-14-DE-00-F5-17																																								
LAN Source IP	192.168.1.1																																								
WAN Port(DHCP Server)	(0, 3, 2) - XM-RM751																																								
WAN Source MAC	00-22-A2-00-00-01																																								
WAN Source IP	192.168.2.1																																								
WAN UDP Source Port(dec)	9000																																								
WAN DHCP Timeout(second)	100																																								
WAN VLAN	<input type="checkbox"/>																																								
LAN Port(DHCP Client)	(0, 4, 2) - XM-RM761																																								
LAN Source MAC	00-22-A2-00-00-02																																								
LAN Source IP	192.168.1.2																																								
LAN UDP Source Port(dec)	8000																																								
LAN DHCP Timeout(second)	100																																								
LAN VLAN	<input type="checkbox"/>																																								

7. Reserve/Release Module

As mentioned previously, before making any test configurations, you have to reserve the ports. You can reserve/release the ports by:

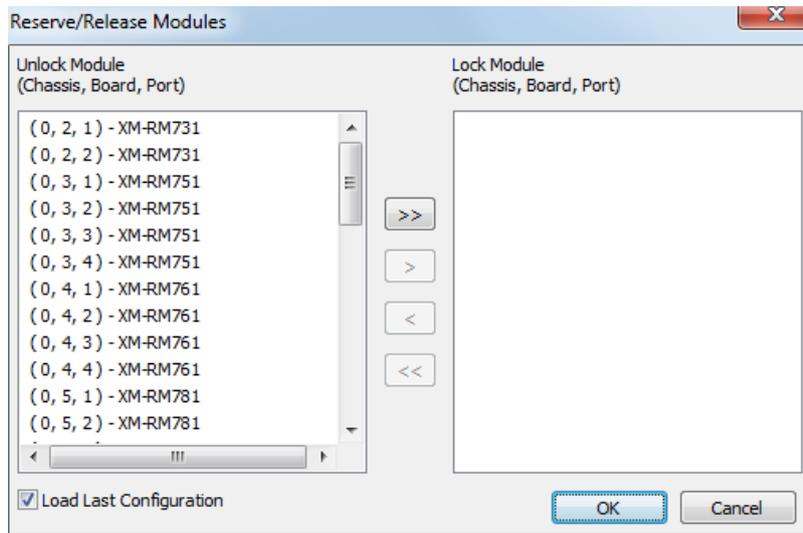
Accessing Reserve/Release Module Pop-up Window

Control | Statistics | Tool | Language

- Reserve/Release Module
- Force to Release Module
- Browse Setup



- Choose **Reserve/Release Module** from the **Menu Bar**
- Press the **Reserve/Release** button on the **Quick Launch Buttons**

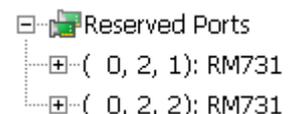


All available ports will be displayed in the **Unlock Module** field in the format of **(X, Y, Z) – Module Name**, where **(X, Y, Z)** is module card's port ID.

To reserve a port for tests, please click a port listed in the **Unlock Module** field, and click the **>** button. The port you've selected will be added to the **Lock Module** field. If you would like to reserve all ports available, click the **>>** button instead.

To release a port, please click a port listed in the **Lock Module** field, and click the **<** button. The port you've selected will be removed from the **Lock Module** field. If you would like to release you selected, click the **<<** button instead.

Please press **OK** to apply all the settings you've made, or press **Cancel** to cancel all the setting you've made.

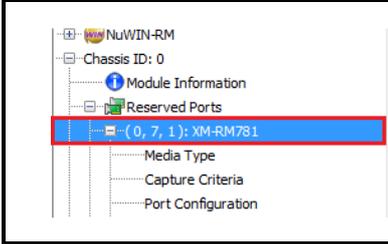


A **Processing...** window will pop up, displaying the port reserving/releasing process. All ports you've reserved will be displayed on **Module Info/Configuration List** as shown left.

8. Stream Generation

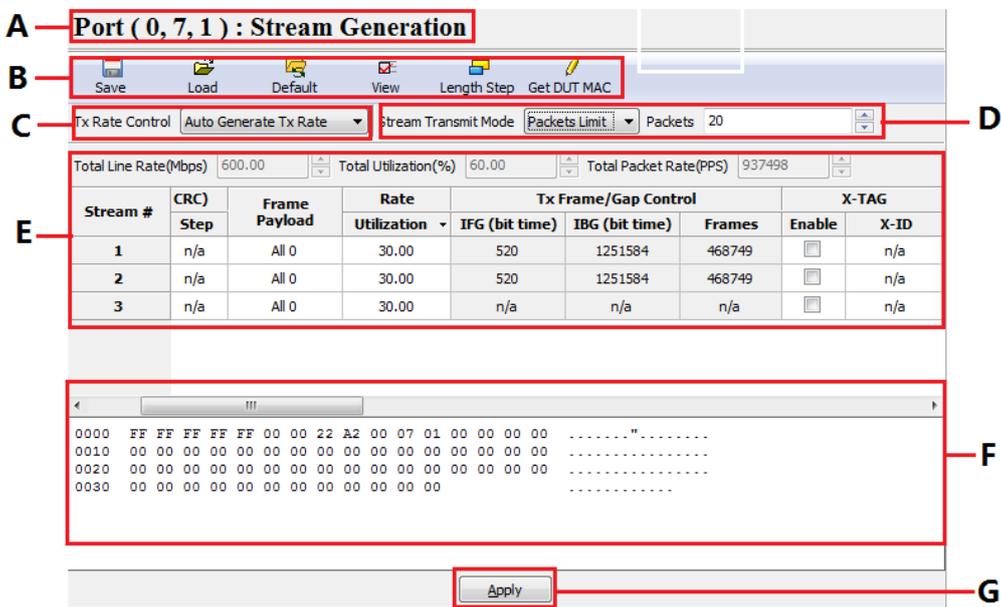
The **Stream Generation** allows you to add multiple streams for the specific reserved port and editing contents of these streams. You can access the **Stream Generation** by:

Accessing Multi Stream Generation



- Click the specific reserved port you would like to configure in the **Module Info/Configuration List** as shown in the picture on the left.

The **Stream Generation** will be displayed in the **Main Display Screen** as shown in the picture down below.



A — Port (0, 7, 1) : Stream Generation

B — Save, Load, Default, View, Length Step, Get DUT MAC

C — Tx Rate Control | Auto Generate Tx Rate | Stream Transmit Mode | Packets Limit | Packets 20

D — Packets 20

E — Main Display Table:

Stream #	CRC Step	Frame Payload	Rate		Tx Frame/Gap Control			X-TAG	
			Utilization	IFG (bit time)	IBG (bit time)	Frames	Enable	X-ID	
1	n/a	All 0	30.00	520	1251584	468749	<input type="checkbox"/>	n/a	
2	n/a	All 0	30.00	520	1251584	468749	<input type="checkbox"/>	n/a	
3	n/a	All 0	30.00	n/a	n/a	n/a	<input type="checkbox"/>	n/a	

F — Packet Content

```

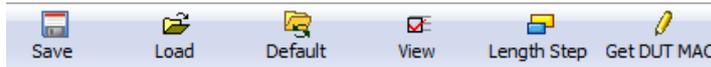
0000 FF FF FF FF FF 00 00 22 A2 00 07 01 00 00 00 00 .....
0010 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0020 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0030 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
    
```

G — Apply

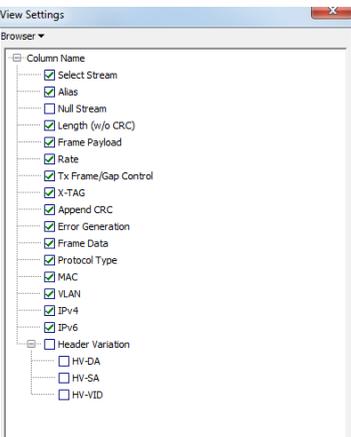
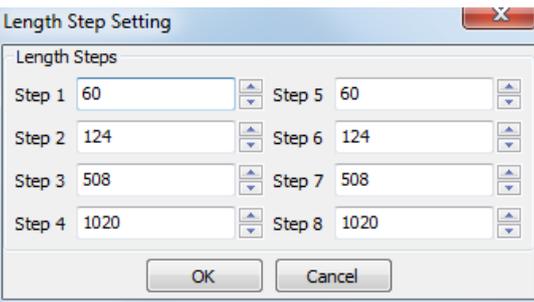
Stream Generation Descriptions		
A	Port Number	This field displays the ID of the reserved port you're setting.
B	Control Buttons	These buttons allow you to save the current settings, load previously saved settings, apply the default settings and set frame length steps.
C	Tx Rate Control	This scroll-down menu allows you to set the stream transmitting rate.
D	Stream Transmit Mode	You can set the stream transmitting mode here.
E	Main Display	The Main Display displays the settings of each stream. Also, you can add more streams and editing their contents here as well.
F	Packet Content	This field displays the contents of the stream you've selected.
G	Apply	Apply and save all the changes you've made here.

Please see the sections down below for detail information regarding to **Stream Generation**.

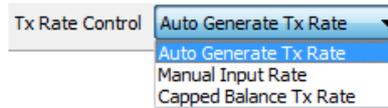
8.9.1. Control Buttons



These buttons allow you to save the current settings, load previously saved settings, apply the default settings, set frame length steps and get DUT MAC address. Please refer to the section down below for more detail descriptions regarding to **Control Buttons**.

Control Buttons Descriptions	
	<p>The Save button allows you to save the current settings to “*.nrx” format files.</p>
	<p>The Load button allows you to load previously saved settings. Please note that the settings you load should be in “*.nrx” format.</p>
	<p>The Default button allows you to load the default stream generation settings.</p>
	<div style="display: flex; align-items: center;">  <div style="width: 70%;"> <p>After pressing the View button, a View Settings window will pop up, showing the stream options. You can hide/show these options by check/uncheck the check boxes of these options. The checked items will be displayed in the Main Display area.</p> </div> </div>
	<div style="display: flex; align-items: center;">  <div style="width: 70%;"> <p>After pressing the Length Step button, a Length Step Setting window will pop up, showing the frame lengths of different steps.</p> <p>You can set the frame length for each step here.</p> <p>Press OK to save all the changes you’ve made and exit or press Cancel to directly exit.</p> </div> </div>
	<p>For detailed information about Get DUT MAC, please refer to 6.10.1. Get DUT MAC.</p>

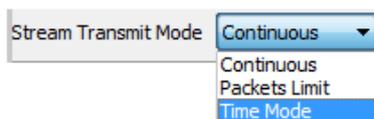
8.9.2. Tx Rate Control



You can set the transmitting rate control mode with the **Tx Rate Control** scroll-down menu.

Tx Rate Control																																	
Auto Generated Tx Rate	<p>When the Tx Rate Control is set to Auto Generated Tx Rate, you will have to input the Line Rate on the Main Display of every stream manually.</p> <table border="1"> <thead> <tr> <th rowspan="2">Stream #</th> <th rowspan="2">Select Stream</th> <th colspan="2">Length (w/o CRC)</th> <th rowspan="2">Frame Payload</th> <th colspan="2">Rate</th> </tr> <tr> <th>Control</th> <th>Step</th> <th>Line Rate</th> <th>IFG (bit time)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><input checked="" type="checkbox"/></td> <td>60</td> <td>n/a</td> <td>8'0 8'1</td> <td>300.00</td> <td>96</td> </tr> <tr> <td>2</td> <td><input checked="" type="checkbox"/></td> <td>60</td> <td>n/a</td> <td>All 0</td> <td>400.00</td> <td>96</td> </tr> <tr> <td>3</td> <td><input checked="" type="checkbox"/></td> <td>60</td> <td>n/a</td> <td>All 0</td> <td>300.00</td> <td>96</td> </tr> </tbody> </table>	Stream #	Select Stream	Length (w/o CRC)		Frame Payload	Rate		Control	Step	Line Rate	IFG (bit time)	1	<input checked="" type="checkbox"/>	60	n/a	8'0 8'1	300.00	96	2	<input checked="" type="checkbox"/>	60	n/a	All 0	400.00	96	3	<input checked="" type="checkbox"/>	60	n/a	All 0	300.00	96
Stream #	Select Stream			Length (w/o CRC)			Frame Payload	Rate																									
		Control	Step	Line Rate	IFG (bit time)																												
1	<input checked="" type="checkbox"/>	60	n/a	8'0 8'1	300.00	96																											
2	<input checked="" type="checkbox"/>	60	n/a	All 0	400.00	96																											
3	<input checked="" type="checkbox"/>	60	n/a	All 0	300.00	96																											
Manual Input Rate	<p>When the Tx Rate Control is set to Manual Input Rate, you will have to input the Tx Frame/Gap Control on the Main Display manually.</p> <table border="1"> <thead> <tr> <th rowspan="2">Stream #</th> <th rowspan="2">Select Stream</th> <th>Rate</th> <th colspan="3">Tx Frame/Gap Control</th> </tr> <tr> <th>Line Rate</th> <th>IFG (bit time)</th> <th>IBG (bit time)</th> <th>Frames</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><input checked="" type="checkbox"/></td> <td>n/a</td> <td>96</td> <td>528</td> <td>468749</td> </tr> <tr> <td>2</td> <td><input checked="" type="checkbox"/></td> <td>n/a</td> <td>96</td> <td>520</td> <td>625000</td> </tr> <tr> <td>3</td> <td><input checked="" type="checkbox"/></td> <td>n/a</td> <td>96</td> <td>520</td> <td>468749</td> </tr> </tbody> </table>	Stream #	Select Stream	Rate	Tx Frame/Gap Control			Line Rate	IFG (bit time)	IBG (bit time)	Frames	1	<input checked="" type="checkbox"/>	n/a	96	528	468749	2	<input checked="" type="checkbox"/>	n/a	96	520	625000	3	<input checked="" type="checkbox"/>	n/a	96	520	468749				
Stream #	Select Stream			Rate	Tx Frame/Gap Control																												
		Line Rate	IFG (bit time)	IBG (bit time)	Frames																												
1	<input checked="" type="checkbox"/>	n/a	96	528	468749																												
2	<input checked="" type="checkbox"/>	n/a	96	520	625000																												
3	<input checked="" type="checkbox"/>	n/a	96	520	468749																												
Capped Balance Tx Rate	<p>When the Tx Rate Control is set to Capped Balance Tx Rate. You only need to set the Total Line Rate (Mbps) of all streams, and then the system will automatically assign the line rate for each port.</p> <div style="border: 1px solid gray; padding: 5px; margin-bottom: 5px;"> Tx Rate Control: Capped Balance Tx Rate Stream Transmit Mode: Continuous </div> <div style="margin-bottom: 5px;"> Total Line Rate(Mbps): 700.00 Total Utilization(%): 70.00 Total Pac: </div> <table border="1"> <thead> <tr> <th rowspan="2">Stream #</th> <th rowspan="2">Select Stream</th> <th colspan="2">Length (w/o CRC)</th> <th rowspan="2">Frame Payload</th> <th colspan="2">Rate</th> </tr> <tr> <th>Control</th> <th>Step</th> <th>Line Rate</th> <th>IFG (bit time)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><input checked="" type="checkbox"/></td> <td>60</td> <td>n/a</td> <td>8'0 8'1</td> <td>n/a</td> <td></td> </tr> <tr> <td>2</td> <td><input checked="" type="checkbox"/></td> <td>60</td> <td>n/a</td> <td>All 0</td> <td>n/a</td> <td></td> </tr> </tbody> </table>	Stream #	Select Stream	Length (w/o CRC)		Frame Payload	Rate		Control	Step	Line Rate	IFG (bit time)	1	<input checked="" type="checkbox"/>	60	n/a	8'0 8'1	n/a		2	<input checked="" type="checkbox"/>	60	n/a	All 0	n/a								
Stream #	Select Stream			Length (w/o CRC)			Frame Payload	Rate																									
		Control	Step	Line Rate	IFG (bit time)																												
1	<input checked="" type="checkbox"/>	60	n/a	8'0 8'1	n/a																												
2	<input checked="" type="checkbox"/>	60	n/a	All 0	n/a																												

8.9.3. Stream Transmit Mode



You can set the stream transmitting mode with the **Stream Transmit Mode** scroll-down menu.

Stream Transmit Mode	
Continuous	NuWIN-RM will transmit streams continuously.
Packets Limit	When the Stream Transmit Mode is set to Packet Limit , a Packets field will be displayed right next to the Stream Transmit Mode scroll-down menu. NuWIN-RM will stop transmitting packets when the set amounts of packets are transmitted. <div style="float: right; border: 1px solid #ccc; padding: 2px;">Packets 10</div>
Time Mode	When the Stream Transmit Mode is set to Time Mode , a Second field will be displayed right next to the Stream Transmit Mode scroll-down menu. NuWIN-RM will stop transmitting packets when the set amount of time is passed. <div style="float: right; border: 1px solid #ccc; padding: 2px;">Second(s) 10</div>

8.9.4. Main Display

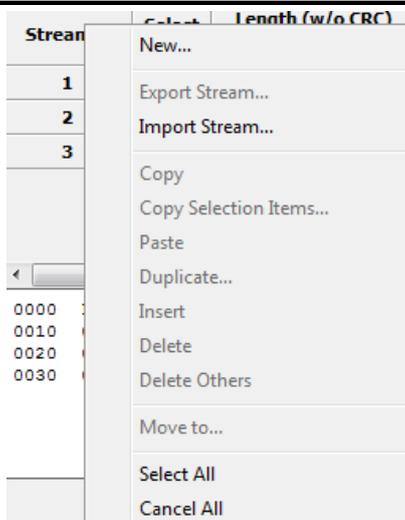
Stream #	Select Stream	Length (w/o CRC)		Frame Payload	Rate	Tx Frame/Gap Control		
		Control	Step		Line Rate ▾	IFG (bit time)	IBG (bit time)	Frames
1	<input checked="" type="checkbox"/>	60	n/a	8'0 8'1	n/a	96	368	1
2	<input checked="" type="checkbox"/>	60	n/a	All 0	n/a	96	368	1
3	<input type="checkbox"/>	60	n/a	All 0	n/a	96	736	1

The **Main Display** displays the settings of each stream. Also, you can add more streams and editing their contents here as well.

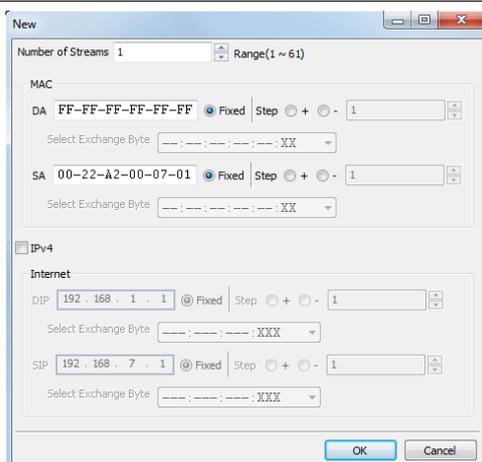
The default setting contains only one stream. However, you can add more streams here. Please see the sections down below to see how to add new streams on **Main Display**.

8.9.4.1. Adding New Streams

Adding Streams



1. Right-click on the far left side of the **Main Display**, a menu will pop up. Please choose **New** to add new streams. Also, you can import previously saved stream files (in ***.nrl** file format) as well.



2. A **New** window will pop up, allowing you to add new streams.



3. Please set the number of streams you would like add. You can add **61** more ports here.

Adding Streams

4. You can input the DA (Destination MAC Address) and SA (Source MAC Address) here in the **MAC** field.

5. If you need your new streams have the same MAC address, please choose **Fixed** as shown in the picture on the left.

6. NuWIN-RM allows you to set new streams' MAC addresses in an increasing or decreasing manner.

- **+**: Set the MAC address values in an increasing manner.
- **-**: Set the MAC address values in a decreasing manner.

Please set the value of the steps in the field on the right hand.

7. Also, you can set which section you would like to change with the **Select Exchange Byte** scroll-down menu.

8. If you would like to set the IPv4 addresses for your streams, please check the **IPv4** check box.

Setting DIP (Destination IP Address) and SIP (Source IP Address) for new streams are quite like setting MAC address and can be related. Please refer to step 4~7.

9. Click **OK** to save all the settings you've made and exit, or **Cancel** to exit without saving.

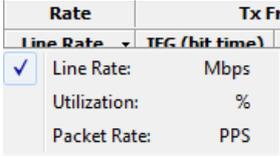
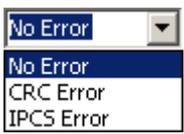
Stream #	Select Stream	Length (w/o CRC)		Frame Payload	Rate Line Rate	Tx Frame/Gap Control		
		Control	Step			IFG (bit time)	IBG (bit time)	Frames
1	<input checked="" type="checkbox"/>	60	n/a	80 8'1	n/a	96	368	1
2	<input checked="" type="checkbox"/>	60	n/a	All 0	n/a	96	368	1
3	<input type="checkbox"/>	60	n/a	All 0	n/a	96	736	1
4	<input checked="" type="checkbox"/>	60	n/a	All 0	n/a	96	384	1

10. The newly added streams will be displayed on the **Main Display**.

11. To **Export, Copy, Paste, Insert, Delete, or Move** the specific streams, right-click on the stream you would like to edit, and choose the operation you would like to perform from the pop-up menu.

8.9.4.2. Stream Settings

Please see the section down below for detail descriptions regarding to options available for setting streams.

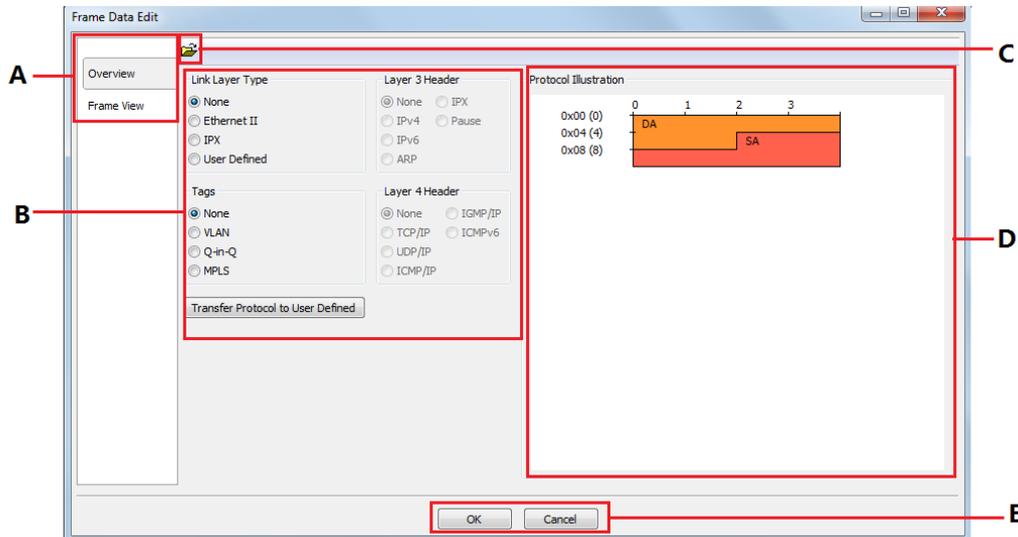
Stream Settings	
Select Stream	Click the check box here to select the stream.
Length (w/o CRC)	<p>You can set how the values of packet lengths (without CRC) are changing here in this field. To set the changing mode of packet length, please double click on the column to access the scroll-down menu.</p> <p>The scroll-down menu contains the following modes:</p> <ul style="list-style-type: none"> ➤ 60: set a fixed frame length of 60, or you can manually input a value in the above box. The range of the frame length is from 48 to 16300. ➤ Random: set the frame length to be random. ➤ Increase: the frame length will be in an increased mode. ➤ Decrease: the frame length will be in a decreased mode. ➤ Step: the frame length will be in a step mode. And you can select the step value from the scroll down menu by double clicking the step column. ➤ IMIX: a specific frame length mode, which is “7*64+4*570+1518 bytes”. The packets will be transmitted by this mode cyclically.
Frame Payload	Click the Frame Payload scroll-down menu to set packet contents as All 0 , Increase , Random , Decrease , Word Increase , Word Decrease , 55AA , 5555AAAA , 8'0 8'1 , 16'0 16'1 , 32'0 32'1 , 64'0 64'1 , Random , and All 1 .
Rate	<p>You can set the transmitting rate here in this field. There are three different modes available for setting transmitting rate:</p> <ul style="list-style-type: none"> ➤ Packet Rate: This option will set the rate as PPS, amount of packets sent per second. ➤ Line Rate: This option will set the rate as the line rate (in Mbps). ➤ Utilization: This option will set the rate as utilization percentage (%). <p>To access the transmitting rate setting mode menu, please click the ▼ icon as shown in the picture above. Also, please note that if you would like to set transmitting rate here manually, you have to set Tx Rate Control to Auto Generated Tx Rate.</p> 
Tx Frame/Gap Control	The Tx Frame/Gap Control allows you to set the IFG (bit time) , IBG (bit time) , and Frames . Please note that if you would like to set Tx Frame/Gap Control here manually, you have to set Tx Rate Control to Manual Input Rate .
X-TAG	The X-TAG field allows you to enable/disable the X-TAG that will be added into the frames. Click and check the “ Add ” check box to enable the X-TAG function, or uncheck the “ Add ” check box to disable this function. Also, to set the X-ID (X-TAG ID), please check the “ Add ” check box, and input the XID manually in the X-ID field. The range of the XID is from 0 to 511 .
Append CRC	You can set if you would like to add CRC headers in your stream by check the check box.
Error Generation	<p>The Error Generation allows you to insert frame errors to the stream.</p> <ul style="list-style-type: none"> ➤ No Error: No error frames will be generated. ➤ CRC Error: Streams with CRC Error will be generated. ➤ IPCS Error: Streams with IPCS Error will be generated. <p>To access the scroll-down menu, please click the Error Generation field.</p> 
Frame Data	If you press the Frame Edit button, a Frame Data Edit window will pop up, allowing you to edit frames. For more detailed information, please refer to 9. Editing Protocol with Frame Data Edit window.
Protocol Type	This field displays the protocol you've set with Frame Data Edit window.
MAC	The MAC field displays the DA (Destination MAC Address) and SA (Source MAC Address) of the reserved ports. If you would like to edit the destination/source MAC addresses listed here, please double-click the DA and SA (Source MAC Address) of

Stream Settings	
	each stream.
VLAN	The VLAN field allows you to enable/disable the VLAN that will be added into the frames. Click and check the “ Enable ” check box to enable the VLAN function, or uncheck the “ Enable ” check box to disable this function. Also, to set the VID (VLAN ID), please input the VID manually in the VID field.
IPv4/IPv6	The IP field displays the DIP (Destination IP Address) and SIP (Source IP Address) of the reserved ports. If you would like to add DIP and SIP to the frames, click and check the “ Enable ” check box. Please note IPv6 is available for part of the XM-RM modules, not all of them.

9. Editing Protocol with Frame Data Edit Window

You can set the frame protocol or view the contents of the frames with the **Frame Data Edit** window.

A **Frame Data Edit** window will pop up as shown in the picture down below:



Descriptions	
A	The tab menu allows you to access to various setting pages for editing frames. Also, please note that the tab menu changes according to the settings you made.
B	This field allows you to set Link Layer type and add tags, Layer 3/4 headers for transmitting packets. Also, you can change all protocols you've set here to UDF (User Defined Function) by pressing the Transfer Protocol to User Defined button.
C	The  button allows you to save the protocol settings you made as WinPcap files.
D	The Protocol Illustration displays an illustration of the frame. Please note that the Protocol Illustration changes dynamically and new menu tabs will be added here if your make any changes on B.
E	Click the OK button to apply all the settings or Cancel to cancel and exit.

The following sections will be focusing on settings available for various protocols.

9.1. Link Layer Type

9.1.1. Ethernet II

MAC Address

Destination Address:

Source Address:

The Ethernet II setting page allows you to set MAC Addresses.

MAC Address	
Destination Address	You can set the Destination MAC Address here in this field.
Source Address	You can set the Source MAC Address here in this field.
Broadcast	Press the Broadcast button to set the Destination MAC Address to broadcast MAC Address (FF-FF-FF-FF-FF-FF).

9.1.2. IPX

MAC Address

Destination Address:

Source Address:

LLC Parameters

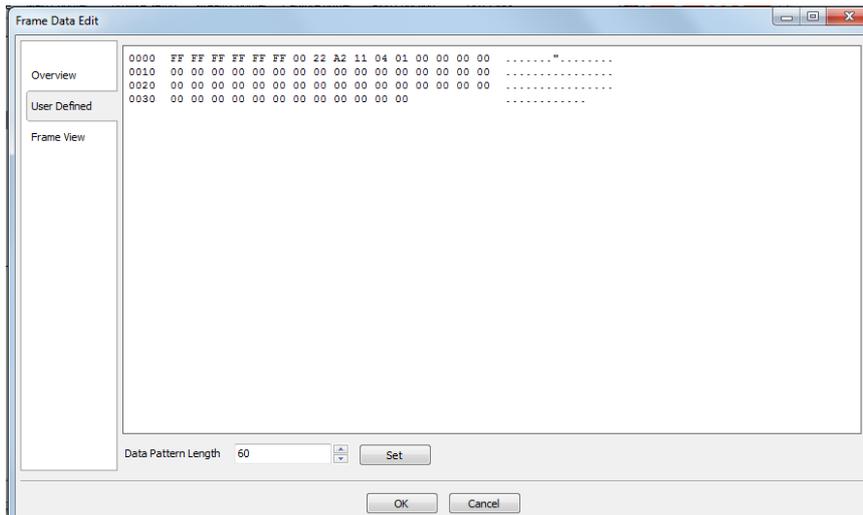
Length: DSAP:

Control Field: SSAP:

IPX stands for **Internetwork Packet Exchange**, an OSI-model Network layer protocol in the IPX/SPX protocol stack. Also, you can set LLC (Logical Link Control) headers on packets here as well.

MAC Address	
Destination Address	You can set the Destination MAC Address here in this field.
Source Address	You can set the Source MAC Address here in this field.
LLC Parameters	
Length	The length of LLC headers.
Control Field	The Control Field allows you to input codes that represent command, response, and sequence number information.
DSAP	DSAP stands for Destination Service Access Point . Service Access Point (SAP) is an identifying label for network endpoints.
SSAP	SSAP stands for Source Service Access Point . Service Access Point (SAP) is an identifying label for network endpoints

9.1.3. User Defined



You can edit packets manually here. To input values, please click the value you would like to change.

User Defined	
Data Pattern Length	You can set the frame length here in this field. The range of the Data Pattern Length is from 54 to 2048 .
Set	Save and apply all the settings you've made here.
OK	Save and apply all the settings you've made here and exit.
Cancel	Give up all the settings you've made here and exit.

9.2. Tags

9.2.1. VLAN

VLAN (Virtual LAN) is a group of hosts with common requirements that communicate within the same Broadcast domain regardless of the physical location.

VLAN Tag Parameters (L1/L2/L3)	
User Priority	VLAN Priority (IEEE P802.1p) indicates the priority level of frames transmitted from each port. The value can be set from 0 to 7.
CFI	CFI stands for Canonical Format Indicator , a 1-bit field of the Ethernet frame that indicates if the packets' MAC addresses are non-canonical format or canonical format. To set the inserting packets as non-canonical format, please click the scroll-down menu and choose Set , and vice versa.
VID	VID stands for Virtual ID , an ID number for identifying different virtual LANs on the network. You can set the VID for each port.
Tag	You can add VLAN Tag Parameter (L2/L3) by check the VLAN L2/L3 check boxes.

9.2.2. Q-in-Q

Q-in-Q is an Ethernet networking standard that allows multiple VLAN headers to be inserted into a single frame. You can set the S-TAG (Service-Tag) and C-TAG (Customer-Tag) here.

S-Tag/C-Tag	
Ether Type	You can input the EtherType for the inserting packets here in this field. EtherType is a two-octet field in an Ethernet frame, used to indicate which protocol is encapsulated in the PayLoad of an Ethernet Frame.
User Priority	VLAN Priority (IEEE P802.1p) indicates the priority level of frames transmitted from each port. The value can be set from 0 to 7.
CFI	CFI stands for Canonical Format Indicator , a 1-bit field in frames for compatibilities of Ethernet and Token Ring networks.
VID	VID stands for Virtual ID , an ID number for identifying different virtual LANs on the network. You can set the VID for each port.

9.2.3 MPLS

MPLS stands for **Multiprotocol Label Switching**, a mechanism in high-performance telecommunications networks which directs and carries data from one network node to the next with the help of labels.

MPLS Labels	
MPLS Label	You can add the MPLS label here in this field. The range of the MPLS Label is from 0 to 1048575 .
Experiential Use	This field allows you to set the VLAN priority. The value can be set from 0 to 7.
Time to Live	This field allows you to set the life span of the MPLS label. The range of the Time to Live is from 0 to 255 .
Append	Press this button to add the current settings to the Label field on the left part of MPLS Labels .
Remove	Press this button to remove the selected label from the Label field on the left part of MPLS Labels .

9.3. Layer 3 Header

9.3.1. IPv4

The screenshot shows the 'Frame Data Edit' window with the IPv4 tab selected. The 'Internet Protocol Address' section contains 'Destination Address' (192.168.1.1) and 'Source Address' (192.168.4.1). The 'DSCP (HEX)' field is set to '00', and the 'DSCP Preview (binary)' field shows '000000'. The 'Identification' field is '0'. The 'Fragment' dropdown is set to 'May Fragment', and the 'Last Fragment' dropdown is also visible. The 'Fragment Offset (x8)' is '0', 'Time to Live' is '64', and 'Protocol' is '255 - Reserved'. An unchecked 'Router Alert' checkbox is present. A note at the bottom states: 'For Differentiated Services, the two-bit currently unused(CU) field is set to 0.'

IPv4 stands for **Internet Protocol version 4**, a connectionless protocol for use on packet-switched Link Layer networks. You can set destination/source IPv4 addresses here, as long as related headers here.

IPv4	
Internet Protocol Address	You can set the destination/source IPv4 addresses here in these fields.
DSCP(HEX)/ DSCP Preview(Binary)	DSCP stands for Differentiated Services Code Point. You can set the DSCP value in hex here. And the hex DSCP value will be automatically converted to binary in the down below DSCP Preview (Binary) field.
Identification	This field allows you to set the identification primarily used for uniquely identifying fragments of an original IP datagram. The range of the Identification is from 0 to 65535 .
Fragment	These two fields allow you to set the field that control or identify fragments.
Fragment Offset (x8)	The fragment offset field, measured in units of eight-byte blocks, is 13 bits long and specifies the offset of a particular fragment relative to the beginning of the original unfragmented IP datagram. The range of the fragment offset is from 0 to 8191.
Time to Live	This field allows you to set the life span of the data. The range of the Time to Live is from 0 to 255 .
Protocol	This field allows you to set the protocol tag. You can set the protocol as 1-ICMP, 2-IGMP, 6-TCP, 17-UDP, 255-Reserved, and User Select.
Router Alert	

9.3.2. IPv6

IPv6 Address

Source IP Address

Destination IP Address

Traffic Class

Flow Label

Hop Limit

Next Header

IPv6 stands for **Internet Protocol version 6**, an Internet Layer protocol for packet-switched internetworking and provides end-to-end datagram transmission across multiple IP networks. You can set destination/source IPv6 addresses here, as long as related headers here.

IPv4	
IPv6 Address	You can set the destination/source IPv6 addresses here in these fields.
Traffic Class	This field allows you to set the IPv6 protocol Traffic Class header. The range of the Traffic Class is from 0 to 255 .
Payload Length	This field allows you to set the IPv6 protocol Payload Length header. The range of the Payload Length is from 0 to 65535 .
Next Header	This field allows you to set the IPv6 protocol Next Header. You can set the protocol as 1-ICMP, 2-IGMP, 6-TCP, 17-UDP, 58-ICMPv6, and 255-Reserved.
Flow Label	This field allows you to set the IPv6 protocol Flow Label header.
Hop Limit	This field allows you to set the IPv6 protocol Hop Limit header.

9.3.3. ARP

Hardware Type	1 - Ethernet	Sender Hardware Address	00-00-00-00-00-00
Protocol Type	08:00	Sender Protocol Address	0 . 0 . 0 . 1
Hardware Address Length	6	Target Hardware Address	00-00-00-00-00-00
Protocol Address Length	4	Target Protocol Address	0 . 0 . 0 . 1
Operation	1 - ARP Request		

ARP stands for **Address Resolution Protocol**, a protocol used for resolution of Layer 3 addresses into Layer 2 addresses during internetwork transmissions.

ARP	
Hardware Type	This field specifies the network protocol type. You can set the Hardware Type as 0-Unknown or 1-Ethernet.
Protocol Type	The Protocol Type field allows you to set the Ethernet frame which is used to indicate which protocol is encapsulated in the PayLoad of an Ethernet Frame. For example, Protocol Type as 08:00 indicates IPv4 protocol.
Hardware Address Length	This field allows you to set length (in octets) of a hardware (MAC) address.
Protocol Address Length	This field allows you to set length (in octets) of a protocol (IP) address.
Operation	This field allows you to set the operations the sender will take. The operations include 0-Unknown, 1-ARP Request, 2-ARP Reply, 3-RARP Request, and 4-RARP Reply.
Sender Hardware/Protocol Address	You can set the sender's (source) MAC/IP addresses here.
Target Hardware/Protocol Address	You can set the target's (destination) MAC/IP addresses here.

9.3.4. Pause

MAC Address	
Destination Address:	01-80-C2-00-00-01
Source Address:	00-22-A2-00-02-01
Pause Quanta	
Type:	88:08 Opcode: 00:01
Pause:	32767

The PAUSE frame is a frame that halts the transmission of the sender for a specified period of time.

Pause	
Destination Address	This field displays the destination MAC address.
Source Address	This field displays the source MAC address.
Type	This field displays the protocol type of the Pause Frame (88:08).
Opcode	This field displays the Operation Code (opcode).
Pause	You can set the pause value here in this field.

9.4. Layer 4 Header

9.4.1. TCP/IP

TCP stands for **Transmission Control Protocol**, one of the two original components of the suite, complementing the Internet Protocol (IP), and therefore the entire suite is commonly referred to as TCP/IP.

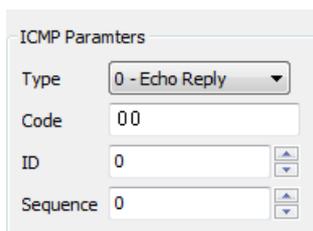
TCP/IP	
Source Port	You can set the source port number here in this field.
Destination Port	You can set the destination port number here in this field.
Sequence Number	This field allows you to set the TCP sequence number.
Acknowledgement Number	This field allows you to set the TCP acknowledgement (ACK) number.
Header Length (x4)	This field allows you to set the header length.
Urgent Pointer	This field displays the Urgent Pointer. If you would like to set the urgent pointer, please check the Urgent Pointer Valid check box.
Flags	This field contains various flags of TCP, including Urgent Pointer Valid , Acknowledge Valid , Push Function , Reset Connection , Synchronize Sequence , and No More Data From Sender . To add a flag to the TCP header, please check the check box in the Flags field.

9.4.2. UDP/IP

UDP stands for **User Datagram Protocol**, one of the core members of the Internet Protocol Suite that allows computer applications send messages (referred to as datagrams) to other hosts on an Internet Protocol (IP) networks without requiring prior communications to set up special transmission channels or data paths.

UDP/IP	
Source Port	You can set the UDP source port number here in this field.
Destination Port	You can set the UDP destination port number here in this field.
Length	The length in bytes of the entire datagram including header and data.
Checksum	You can set the checksum of the datagram, including Null , Correct and Incorrect .

9.4.3. ICMP/IP



ICMP Parameters

Type: 0 - Echo Reply

Code: 00

ID: 0

Sequence: 0

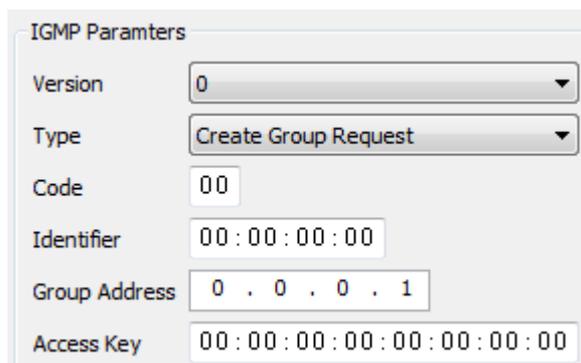
ICMP stands for **Internet Control Message Protocol**, one of the core protocols of the Internet Protocol Suite that is used by the operating systems of networked computers to send error messages indicating, for example, that a requested service is not available or that a host or router could not be reached.

ICMP/IP	
Type	You can set the ICMP type here with the scroll-down menu. The ICMP types available here include 0-Echo Reply and 8-Echo Request.
Code	You can set the subtype to the given type here in this field.
ID	You can set the ICMP ID here in this field.
Sequence	You can set the ICMP sequence number here in this field.

9.4.4. IGMP/IP

IGMP stands for **Internet Group Management Protocol**, a communications protocol used by hosts and adjacent routers on IP networks to establish multicast group memberships.

There are three different versions available here: **IGMP version 0** (defined in RFC 988), **IGMP version 1** (defined in RFC 1054, 1112, 1122, and 1812), and **IGMP version 2** (defined in RFC 2236 and 2113). The IGMP parameter setting pages will change according to the IGMP version you've chosen on the **Version** scroll down menu.



IGMP Parameters

Version: 0

Type: Create Group Request

Code: 00

Identifier: 00:00:00:00

Group Address: 0 . 0 . 0 . 1

Access Key: 00:00:00:00:00:00:00:00

IGMP/IP Version 0	
Version	The Version scroll-down menu allows you to set the IGMP version.
Type	You can set the IGMP type here. The IGMP types in the scroll-down menu include Create Group Request/Reply, Join Group Request/Reply, Leave Group Request/Reply, and Confirm Group Request/Reply.
Code	You can input Max Resp Code here in this field.
Identifier	You can input the Identifier here in this field.
Group Address	You can set the group multi-cast address here in this field.
Access Key	You can set the access key values here in this field.

IGMP Parameters

Version: 1

Type: Group Membership Query

Group Address: 0 . 0 . 0 . 1

IGMP/IP Version 1	
Version	The Version scroll-down menu allows you to set the IGMP version.
Type	You can set the IGMP type here. The IGMP types in the scroll-down menu include Create Group Request/Reply, Join Group Request/Reply, Leave Group Request/Reply, and Confirm Group Request/Reply.
Group Address	You can set the group multi-cast address here in this field.

IGMP Parameters

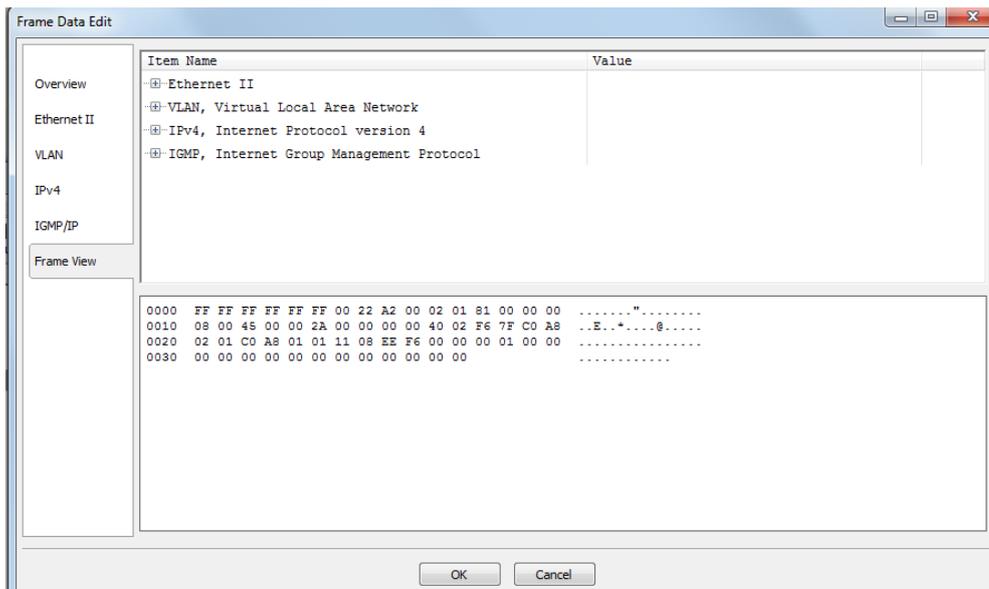
Version: 1

Type: Group Membership Query

Group Address: 0 . 0 . 0 . 1

IGMP/IP Version 2	
Version	The Version scroll-down menu allows you to set the IGMP version.
Type	You can set the IGMP type here. The IGMP types in the scroll-down menu include Create Group Request/Reply, Join Group Request/Reply, Leave Group Request/Reply, and Confirm Group Request/Reply.
Max Response Time	This field allows you to set the maximum allowed time before sending a responding report.
Group Address	You can set the group multi-cast address here in this field.

9.5. Frame View



You can view the headers/tags you've configured here. Also, you can high-light and manually edit the specific code for the headers/tags here as well.

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