



**XL-HCW224C-4**



**XL-HC224Cv2**



HPNA3.1 Ethernet over Coaxial (EOC) MDU  
Master and End Point

USER'S MANUAL

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Maximum signal rate derived from IEEE Standard specifications. Actual data throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead lower actual data throughput rate.

## Foreword

XtendLan's XL-HCW224C-4 and XL-HC224Cv2 are the latest technological innovation of HomePNA3.1 Ethernet over coaxial managed MDU master and endpoint (client) respectively. XL-HCW224C-4 EOC managed MDU master is designed to connect with XL-HC224Cv2 MDU endpoint for MDU and MTU applications that leverage the two most popular network connections for home use: 10/100Mbps Ethernet connection and coaxial cable connection.

It is a norm that MDU and MTU are equipped with wired network that simply transfer small files and shared applications, but the need for triple play services like transferring large multimedia files such as music, video, photo and deliver high speed VOIP data are ever increasing.

This is why XL-HCW224C-4 and XL-HC-224Cv2 is designed to be a cost effective MDU and MTU solution. With plug & play, this simply eliminates the pain in modification and high infrastructure cost. With the data transmission up to 200Mbps and up to -145dBm/Hz noise floor, it meets the growing demand for high speed multimedia services. Most importantly, with MDU and MTU applications, it allows networking for any locations such as buildings, apartments, hotels, resorts, sports center and other places that need a high bandwidth network.

## Safety Warnings

For your safety, be sure to read and follow all warning notices and instructions before device use.

- DO NOT open the device or unit. Opening or removing covers can expose you to dangerous high voltage points or other risks. ONLY qualified service personnel can service the device. Please contact your vendor for further information.
- Use ONLY the dedicated power supply for your device. Connect the power cord or power adapter to the right supply voltage (110V AC in North America or 230V AC in Europe).
- DO NOT use the device if the power supply is damaged as it might cause electrocution. If the power supply is damaged, remove it from the power outlet. DO NOT attempt to repair the power supply. Contact your local vendor to order a new power supply.
- Place connecting cables carefully so that no one will step on them or stumble over them. DO NOT allow anything to rest on the power cord and do NOT locate the product where anyone can work on the power cord.
- DO NOT install nor use your device during a thunderstorm. There may be a remote risk of electric shock from lightning.
- DO NOT expose your device to dampness, dust or corrosive liquids.
- DO NOT use this product near water, for example, in a wet basement or near a swimming pool.
- Connect ONLY suitable accessories to the device. Make sure to connect the cables to the correct ports.
- DO NOT obstruct the device ventilation slots, as insufficient airflow may harm your device.
- DO NOT store things on the device.
- DO NOT use the device outside, and make sure all the connections are indoors. There may be a remote risk of electric shock from lightning.
- Be careful when unplugging the power, because the transformer may be very hot.
- Keep the device and all its parts and accessories out of children's reach.
- Clean the device using a soft and dry cloth rather than liquid or atomizers. Power off the equipment before cleansing it.
- This product is recyclable. Dispose of it properly.

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# 1. Unpacking Information

## Check List

Carefully unpack the package and check its contents against the checklist.

Package Contents

- XL-HCW224C-4 or XL-HC224Cv2 Modem
- Four rubber feet already attached
- User's Manual CD
- 12VDC/1A Power Adapter

Please inform your dealer immediately for any missing or damaged parts.

If possible, retain the carton, including the original packing materials.

Use them to repack the unit in case there is a need to return for repair.

## 2. Hardware Description

This section describes the important parts of the modem. It features the front indicators and rear connectors.



### Front Panel

The following figure shows the front panel. (Figure 1)

Figure 1 XL-HCW224C-4 and XL-HC224Cv2  
Front Panel



## Front Indicators

The XL-HCW224C-4 Modem has Six LED indicators. The following Table shows the description. (Table 1)

Table 1 LED Indicators Description and Operation

LEDs	Color	Status	Descriptions
Power	Green	On	The HCNA is receiving the power and also functioning properly
		Off	The HCNA is not ready or has malfunctioned
LAN1 (Ethernet LED)	Green	On	The LAN port is connected to Ethernet devices
		Blinking	The HCNA is transferring data
LAN2 (Ethernet LED)	Green	Off	The LAN port is not connected to any Ethernet devices
		On	The LAN port is connected to Ethernet devices
LAN3 (Ethernet LED)	Green	Blinking	The HCNA is transferring data
		Off	The LAN port is not connected to any Ethernet devices
LAN4 (Ethernet LED)	Green	On	The LAN port is connected to Ethernet devices
		Blinking	The HCNA is transferring data
HCNA (HCNA LED)	Green	Off	The LAN port is not connected to any Ethernet devices
		On	The HCNA is link to another HCNA device
		Blinking	The HCNA is active and it is transferring data

The XL-HC224Cv2 Modem has **Six** LED indicators. The following Table shows the description. (Table 2)

Table 2 LED Indicators Description and Operation

LEDs	Color	Status	Descriptions
Power	Green	On	The HCNA is receiving the power and also functioning properly
		Off	The HCNA is not ready or has malfunctioned
LAN1 (Ethernet LED)	Green	On	The LAN port is connected to Ethernet devices
		Blinking	The HCNA is transferring data
		Off	The LAN port is not connected to any Ethernet devices
LAN2 (Ethernet LED)	Green	On	The LAN port is connected to Ethernet devices
		Blinking	The HCNA is transferring data
		Off	The LAN port is not connected to any Ethernet devices
HCNA (HCNA LED)	Green	On	The HCNA is link to another HCNA device
		Blinking	The HCNA is active and it is transferring data
		Off	The HCNA is not connected
Link Quality (HCNA LED)	Green	On	Actual HCNA link speed is $\geq 128\text{MB}$
	Green Yellow	On	Actual HCNA link speed is $\geq 64\text{MB}$ and $< 128\text{MB}$
	Yellow	On	Actual HCNA link speed is $> 64\text{MB}$

## Rear Panel

The following figure shows the rear side of the XL-HCW224C-4 Modem.

(Figure 2) And the table shows the description. (Table 2)

Figure 2 Rear side of the XL-HCW224C-4



Table 3 Connectors shown on the rear side of the Modem

Connectors	Type	Description
HCNA	F-type female coaxial cable	For connecting HCNA port to another HCNA port with RG59 cable
TV	F-type female coaxial cable	For connecting to TV or STB
LAN1/LAN2/ LAN3/LAN4	RJ-45	For connecting to an Ethernet equipped device
Power	Power plug	For connecting to 12V/1A power adapter

The following figure shows the rear side of the XL-HC224Cv2 Modem.

(Figure 2) And the table shows the description. (Table 2)

Figure 3 Rear side of the XL-HC224Cv2



Table 4 Connectors shown on the rear side of the Modem

Connectors	Type	Description
HCNA	F-type female coaxial cable	For connecting HCNA port to another HCNA port with RG59 cable
TV	F-type female coaxial cable	For connecting to TV or STB
LAN1/LAN2	RJ-45	For connecting to an Ethernet equipped device
Power	Power plug	For connecting to 12V/1A power adapter

## 3. Installation

### Hardware Installation

This chapter describes how to install the modem and establishes network connections. You may install the modem on any level surface (ex. table or shelf). However, please take note of the following minimum site requirements before you begin. Stick the 4 rubber feet at the bottom.

### Pre-installation Requirements

Before the start of actual hardware installation, make sure to provide the right operating environment, including power requirements, sufficient physical space, and proximity to other network devices that are to be connected. Verify the following installation requirement:

- Power requirements: 12VDC 1A or above
- The modem should be located in a cool dry place, with at least 10cm/4in of space at the front and back for ventilation.
- Place the modem out of direct sunlight, and away from heat sources or areas with a high amount of electromagnetic interference.

Check if network cables and connectors needed for installation are available.

### General Rules

Before making any connections to the modem, take note the following rules:

- Ethernet Port (RJ-45)

All network connections to the Ethernet port of modem must use minimal Category 5 UTP for 100Mbps, and Category 3, 4 UTP for 10Mbps.

No more than 100 meters of cabling may be used between the MUX or HUB and an end node.

- HCNA Port (Coaxial)

All Home network connections must use RG59 75ohm coaxial cable and must not exceed -145dBm/Hz noise floor.

## HCNA Connections

The modem has been designed to operate on the coaxial cable installed in homes throughout the world. They utilized the same cable and connectors commonly used for television.

The 2x Coaxial connectors are used to connect to TV or coaxial wall socket to another modem that connects its RJ-45 to the LAN card of another set of PC, notebook, or other internet access device or coaxial connector to TV or set top box.

The modem's coaxial connector must support the transmission of data up to 200Mbps across the existing coaxial cable and can reach up to -145dBm/Hz noise floor. But make sure that the connector is inserted properly and lock.

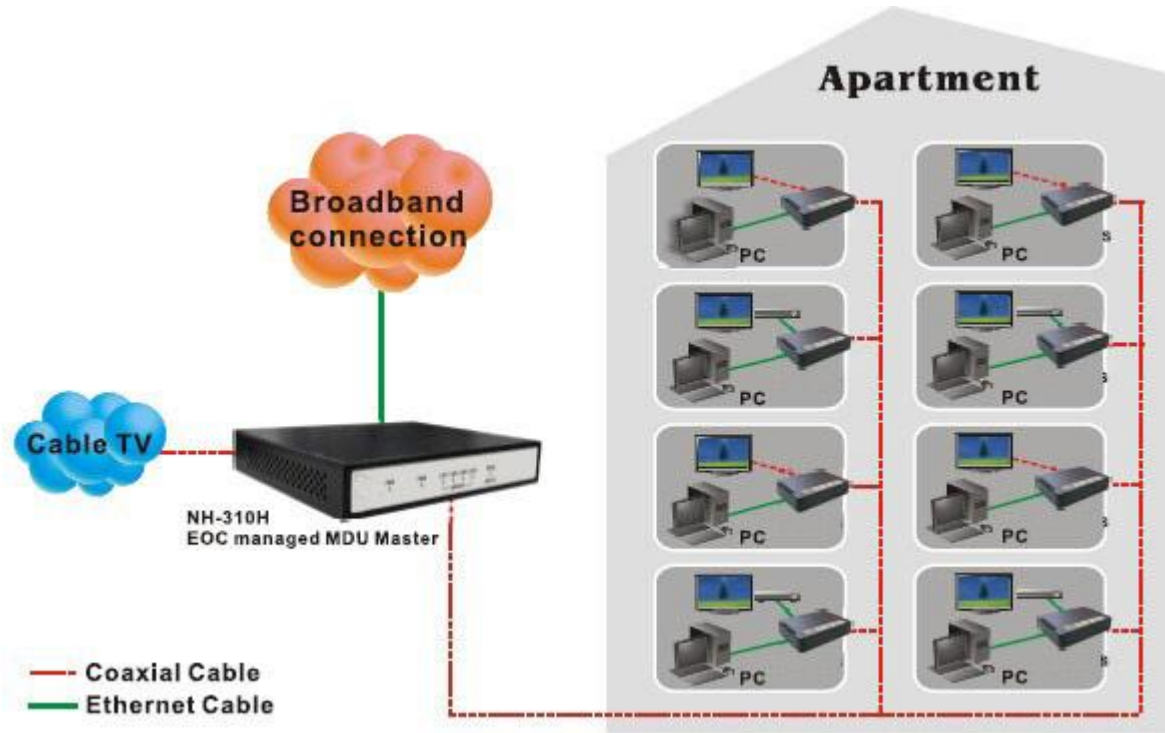
Ethernet cable used must conform to FCC standard to ensure data integrity and it should not exceed 100meters

(328feet). The XL-HCW224C-4 EOC (Ethernet over coaxial) managed MDU master can support up to 61 XL-

HC224Cv2 Endpoints (Clients).



Figure 3 HPNA connection diagram



## 4. Configure the XL-HCW224C-4 Via Web Browser

The XL-HCW224C-4 provides a built-in HTML based management interface that allow user configure the XL-HCW224C-4 via Internet Browser. Recommend using Internet Explorer 6.0 or later version and set screen resolution at 1024 x 768.

In order to use the web browser configure the device, you may need to allow:

- Web browser pop-up windows from your device. Web pop-up blocking is enabled by default in windows XP SP2.
- JavaScripts. (Enabled by default)
- Java permissions. (Enabled by default)

Launch your web browser and input the IP address [192.168.16.249](http://192.168.16.249).

### 4.1 Login

The default password is "admin". The password is changeable in Administrator Settings.



The image shows a web browser window with a black title bar containing the text "LOGIN PASSWORD" in yellow. Below the title bar, the word "Password:" is displayed in blue. To the right of "Password:" is a white text input field containing six black dots. Below the input field are two buttons: "LOGIN" and "CANCEL", both in a light gray box with black text.

Figure 4.1 Login Password

### 4.2 Select the Menu Level

There is an easy Setup Wizard for end users at the setup of XL-HCW224C-4 with “SYSTEM”, “LAN”, “ROUTE”, “HPNA” for more detail configurations.

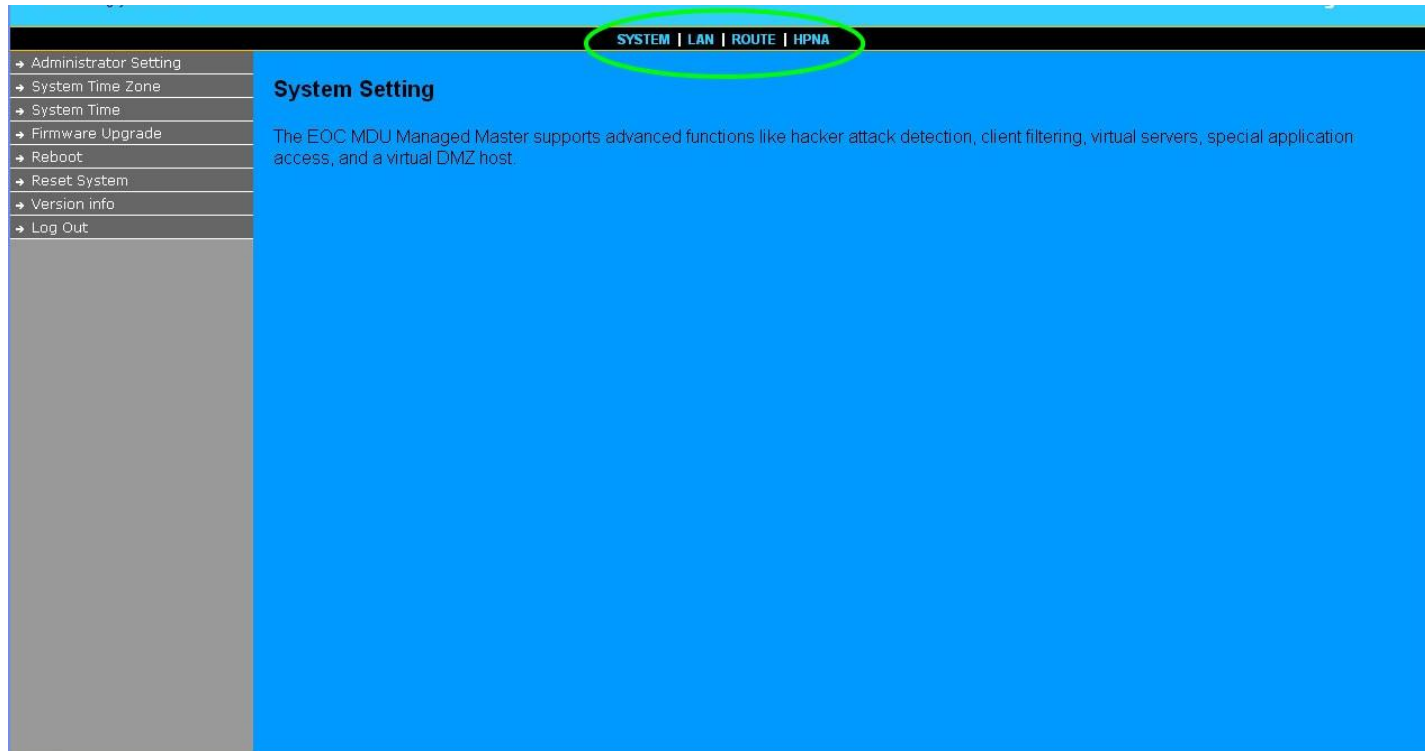


Figure 4.2 Select the Menu Level

### 4.3 Select "SYSTEM"

Select the "SYSTEM". The menu below will be used frequently. It includes the sub-menus of Administrator Setting、System Time Zone、System Time、SNMP、Firmware Upgrade、System Log、Reboot、Reset System、Version Info and Log Out.



Figure 4.3 Select "SYSTEM" in the Entry Screen

### 4.3.1 Administrator Setting

To add a user or change user's password, click on the Administrator Settings link in the left navigation bar. A screen is displayed as shown in Figure 4.3.1.

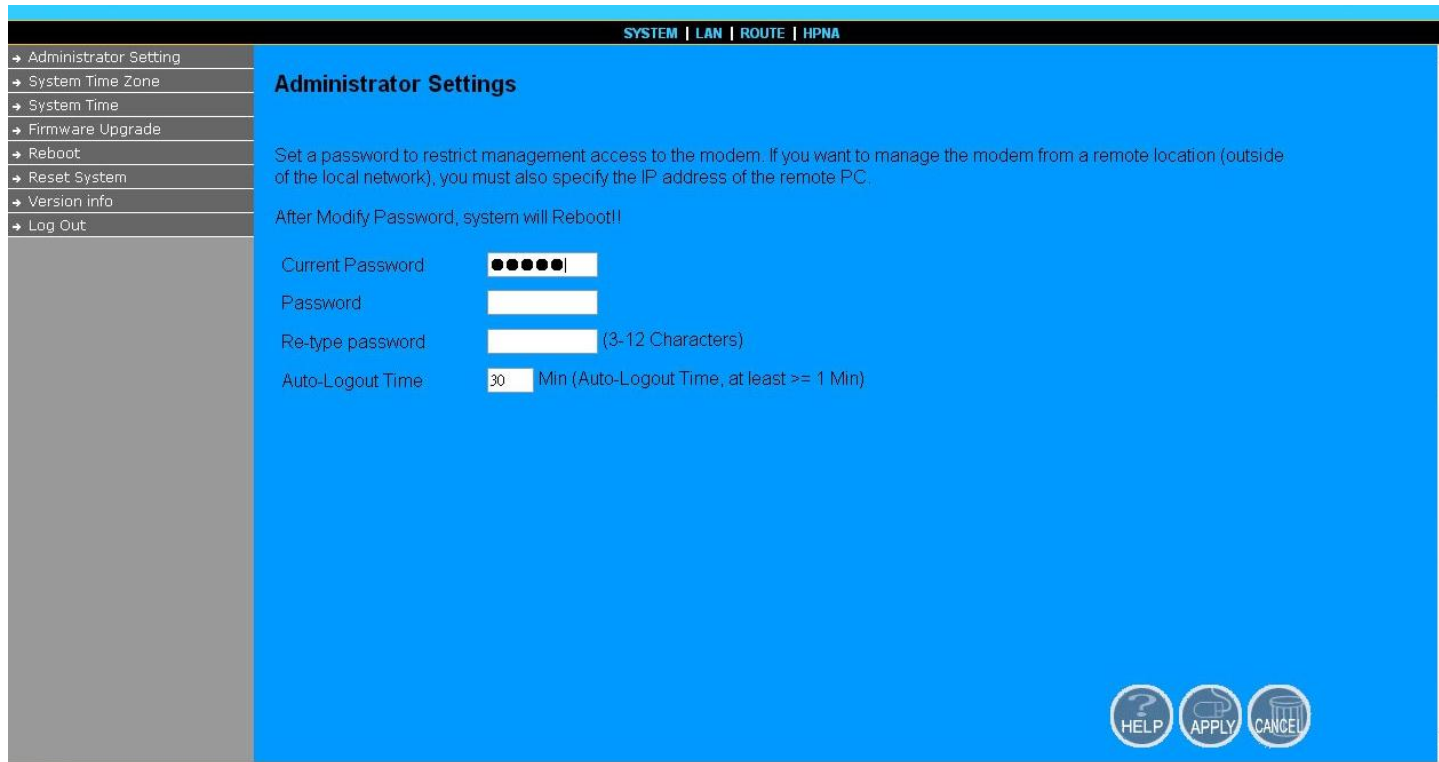


Figure 4.3.1 Administrator Settings Configuration

### 4.3.2 System Time Zone

You can set Time Zone by connecting to a Simple Network Time Protocol (SNTP) server allows the Modem to synchronize the system clock to the global Internet. The synchronized clock in the Modem is used to record the security log and control client filtering.

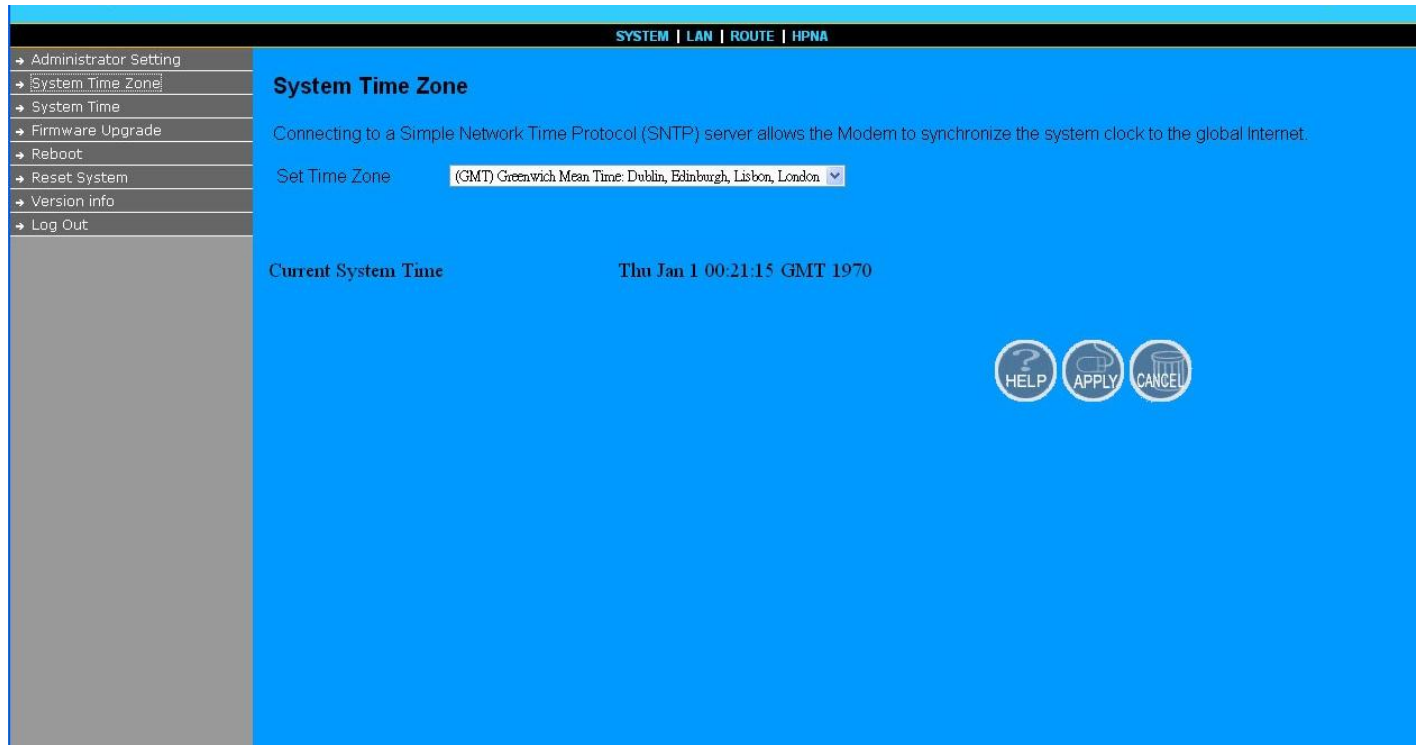


Figure 4.3.2 System Time Configuration

### 4.3.3 System Time

If you can't connect to a SNTP server to allow the Modem to synchronize the system clock to the global Internet. You can setup system time.

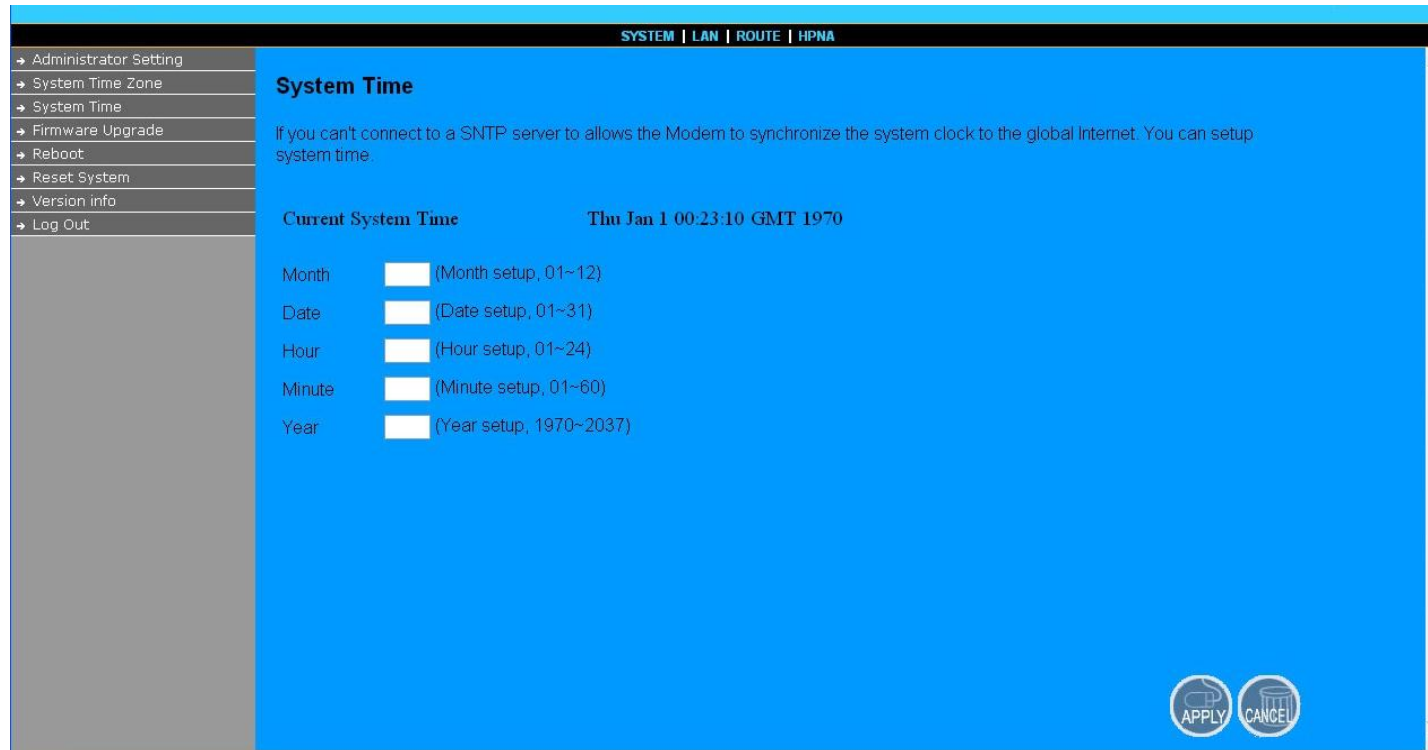


Figure 4.3.3 System Time Configuration

### 4.3.4 Firmware Upgrade

To update the system firmware, click on the Firmware Upgrade link in the left navigation bar. A screen is displayed as shown in [Figure 4.3.3](#)

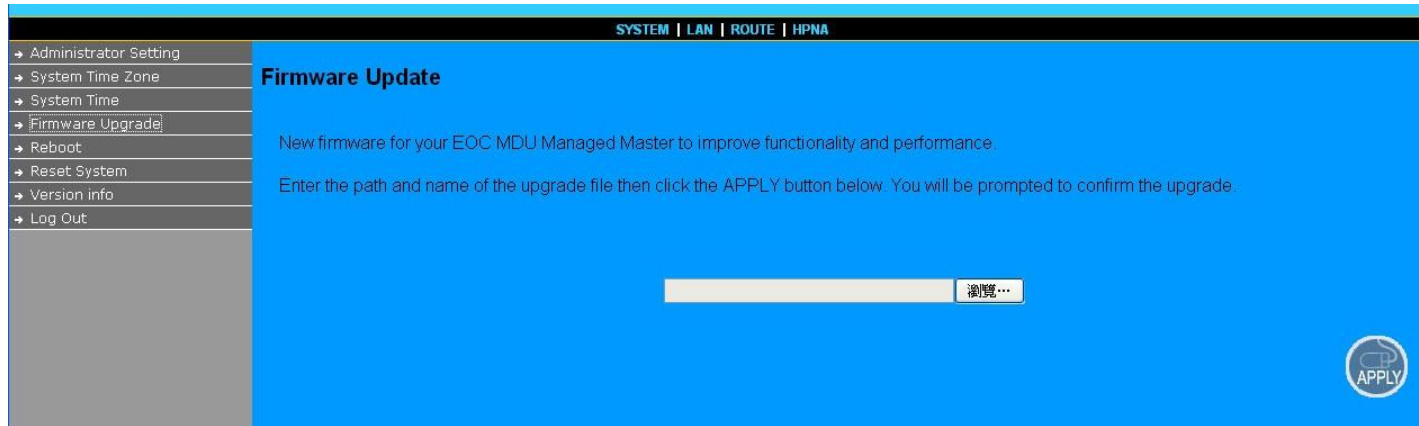


Figure 4.3.4 Firmware Upgrade

The screen contains the following detail:

- Click "APPLY" to start the firmware update
- Click "Browse" to select a specified file name to change the File Name.



### 4.3.5 Reboot

To reboot the unit, click on the Reboot link in the left navigation bar. A screen is displayed as shown in [Figure 4.3.5](#).

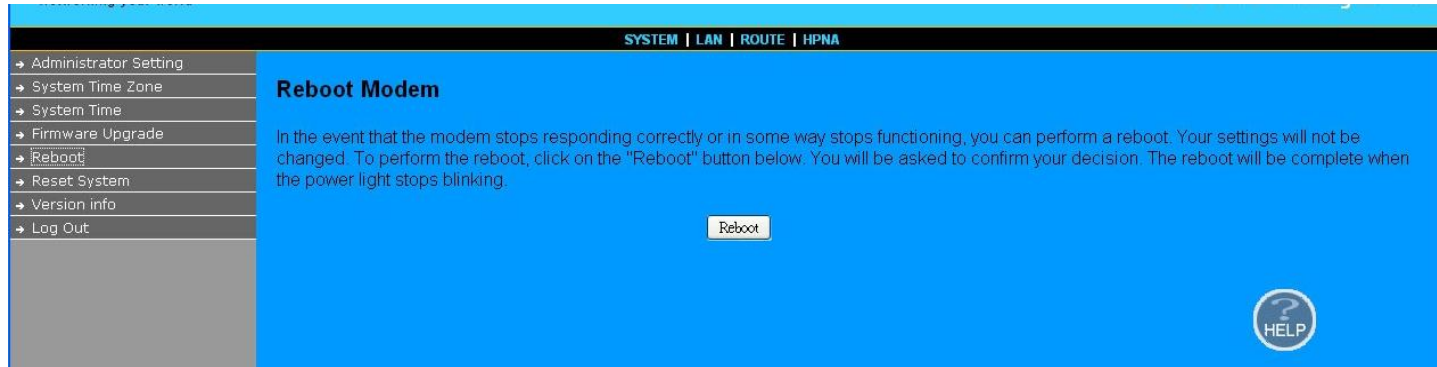


Figure 4.3.5 Reboot XL-HCW224C-4 Modem

- Click Reboot to restart the unit.

### 4.3.6 Reset System

To reset the system, click on the Reset link in the left navigation bar. A screen is displayed as shown in [Figure 4.3.6](#).



Figure 4.3.6 Reset XL-HCW224C-4 Modem

- Click Reset to restart the system to default configuration.

### 4.3.7 Version Info

This function shows the version of Web Interface firmware and EOC Driver.



The screenshot shows a web interface with a blue background. At the top, there is a navigation bar with the text "SYSTEM | LAN | ROUTE | HPNA". On the left side, there is a vertical menu with the following items: "→ Administrator Setting", "→ System Time Zone", "→ System Time", "→ Firmware Upgrade", "→ Reboot", "→ Reset System", "→ Version info", and "→ Log Out". The "Version info" item is highlighted. The main content area displays the title "Version Info" and a table with the following data:

Web Interface Version	B.4
EOC Driver Version	2.8.3

Figure 4.3.7 Version Info

### 4.3.8 SNMP

Any Network Management running the simple Network Management Protocol (SNMP) can manage the switch, provided the Management Information Base (MIB) is installed correctly on the management station. The SNMP is a Protocol that governs the transfer of information between management and agent. A screen is displayed as shown in [Figure 4.3.8](#).

1. Use this page to define management stations as trap managers and to enter SNMP community strings. User can also define a name, location, and contact person for the switch. Fill in the system options data, and then click Apply to update the changes on this page.

Name: Enter a name to be used for the switch.

Location: Enter the location of the switch.

Contact: Enter the name of a person or organization.

2. Community strings serve as passwords and can be entered as one of the following:

RO: Read only. Enables requests accompanied by this string to display MIB-object information.

RW: Read write. Enables requests accompanied by this string to display MIB-object information and to set MIB objects.

3. Trap Manager

A trap manager is a management station that receives traps, the system alerts generated by the switch. If no trap manager is defined, no traps are issued. Create a trap manager by entering the IP address of the station and a community string.

SYSTEM | LAN | ROUTE | HPNA

- Administrator Setting
- System Time Zone
- System Time
- **SNMP**
- Firmware Upgrade
- Reboot
- Reset System
- Version info
- Log Out

### SNMP Settings

To export MDU Master functions in MIB Browser, you must enable SNMP Server settings.

Enable SNMP

System Name

System Location

System Contact

Read only community

Read Write community

Enable trap

Trap host IP

Trap port

Trap community

**SNMP Transport**

UDP IPv4  Port

?
↻
🗑️

Figure 4.3.8 SNMP Settings

#### 4.4 Select "LAN"

Select the "SYSTEM". The menu below includes the sub-menus of LAN Settings , LAN Switch Port Setting , and LAN Port Status.

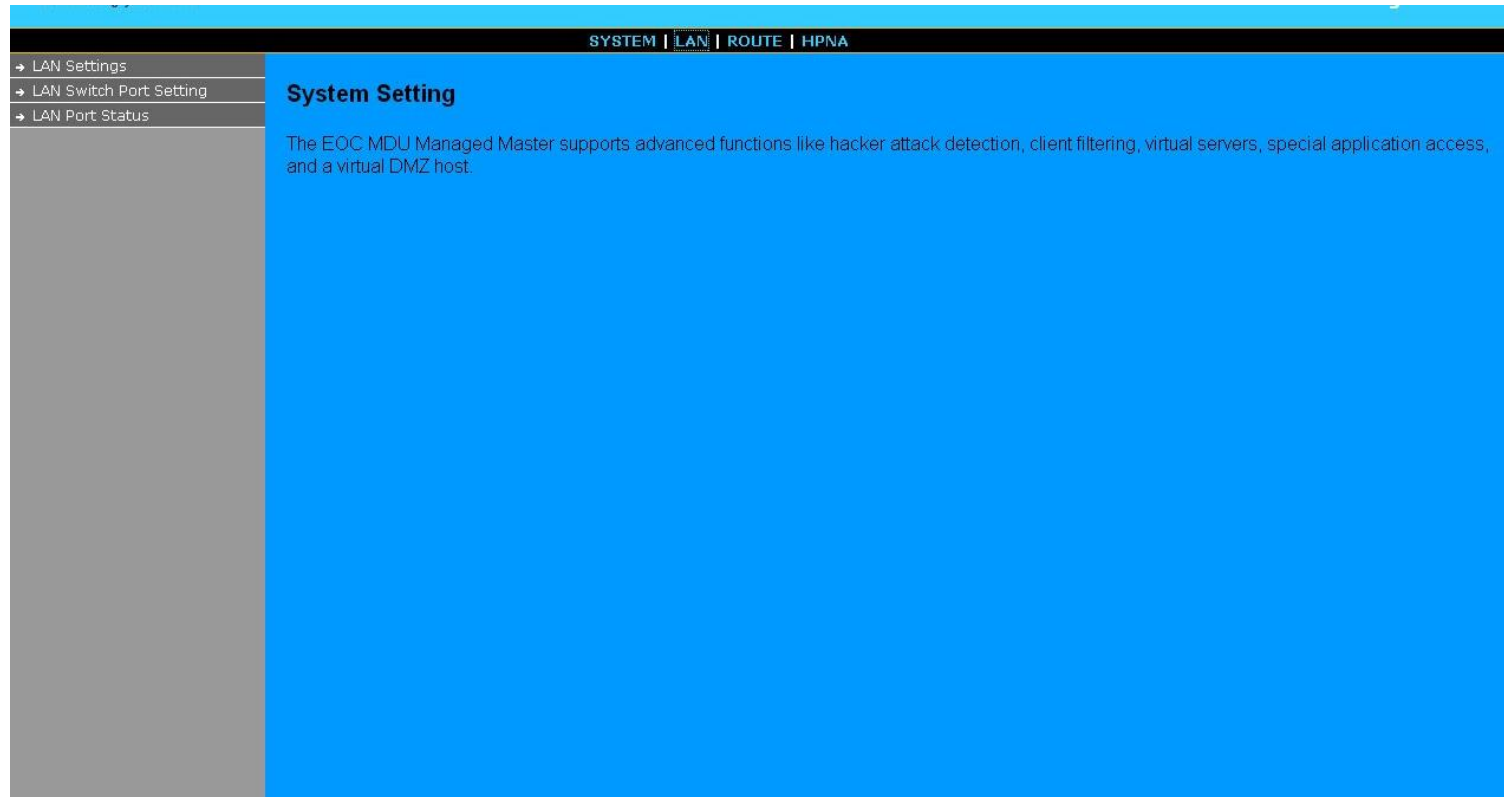
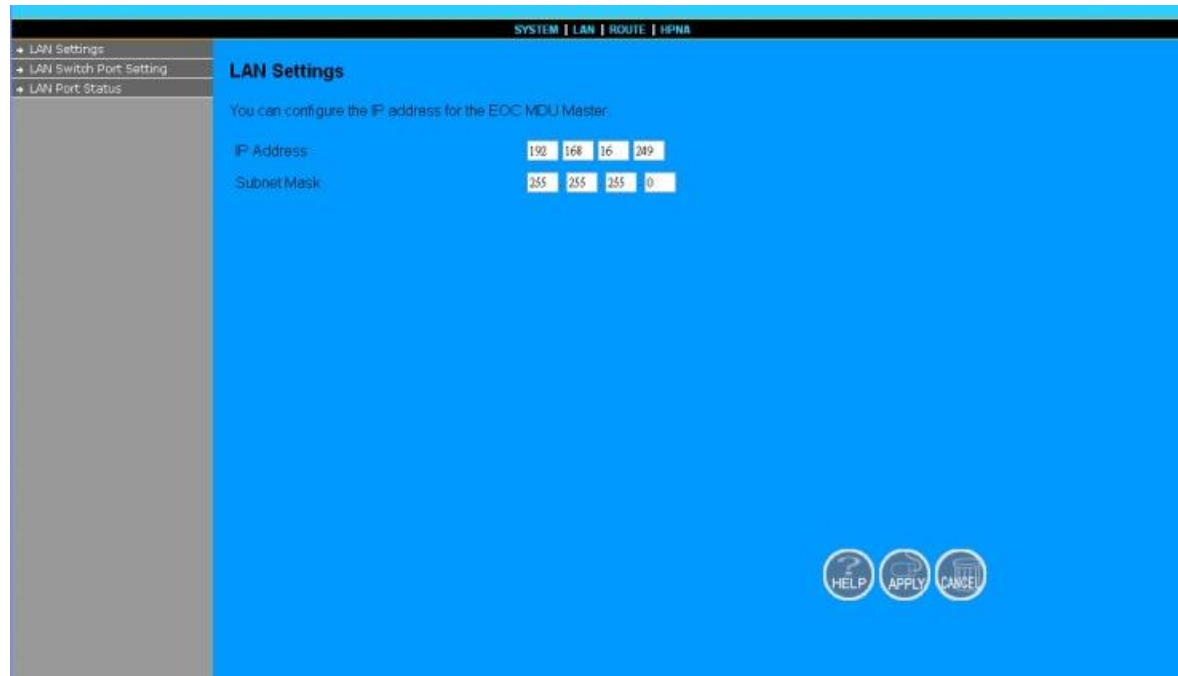


Figure 4.4 Select "LAN" in the Entry Screen

## 4.4.1 LAN Settings

The form below is used to change the IP address of the LAN (Local Area Network) port “adm0” in the XL-HCW224C-4 and the “adm0” IP address is the CPU IP address of XL-HCW224C-4 for PC to remote control the XL-HCW224C-4 with network management.

The proposed IP address is either the default address of adm0 (i.e. 192.168.16.249) or it is the address changed by an ifconfig command via the shell running in the terminal. The Default value of Subnet Mask display is 255.255.255.0.



The screenshot shows a web-based configuration interface for LAN settings. The top navigation bar includes 'SYSTEM | LAN | ROUTE | IPINA'. A left sidebar contains a menu with 'LAN Settings', 'LAN Switch Port Setting', and 'LAN Port Status'. The main content area is titled 'LAN Settings' and contains the text 'You can configure the IP address for the EOC MDU Master:'. Below this text are two rows of input fields: 'IP Address' with values 192, 168, 16, and 249; and 'Subnet Mask' with values 255, 255, 255, and 0. At the bottom right of the main area are three circular buttons labeled 'HELP', 'APPLY', and 'CANCEL'.

Figure 4.4.1 LAN Setting

## 4.4.2 LAN Switch Port Setting

The LAN Port Setting mode allows the user to specify the mode setting for the EOC MDU managed Master. Users can choose 10Mb or 100 Mb modes for cases as “Force 10Mb Full”, ”Auto 10/100 Full/Half”, ”Force 10Mb Half”, ”Force 100Mb Half”, and “Force 100Mb Full”. The default value is ”Auto 10/100 Full/Half”.

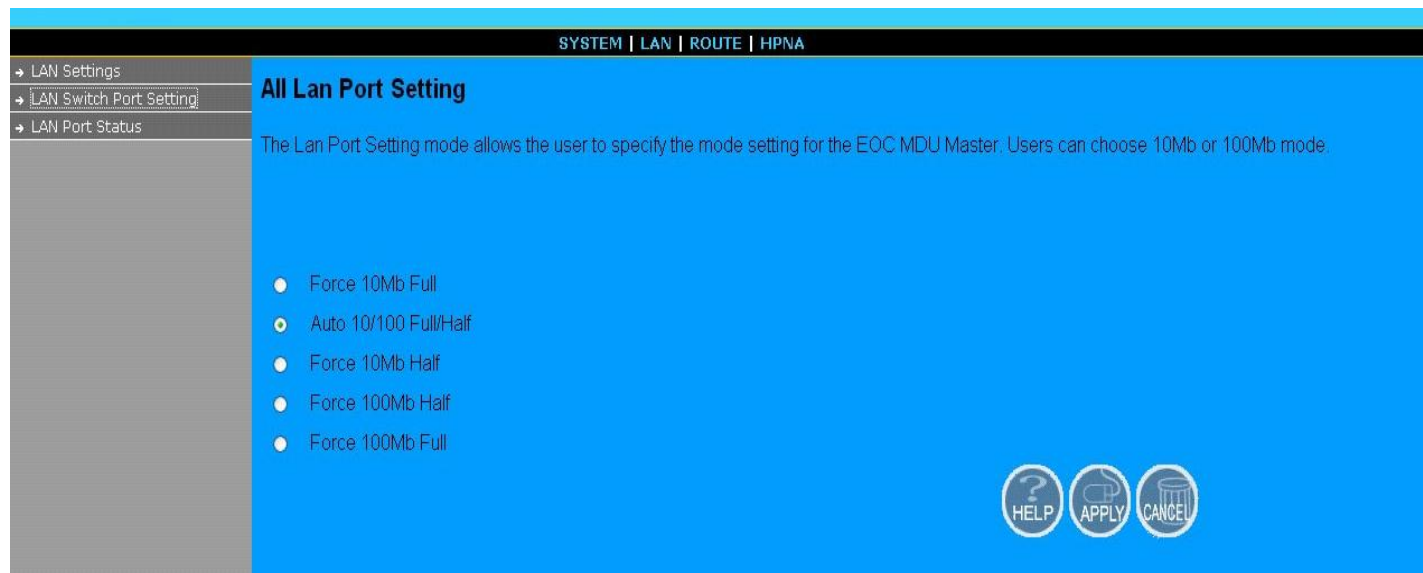


Figure 4.4.2 LAN Switch Port Setting



### 4.4.3 LAN Port Status

The following information provides a view of the current Ethernet ports status of the unit as below:

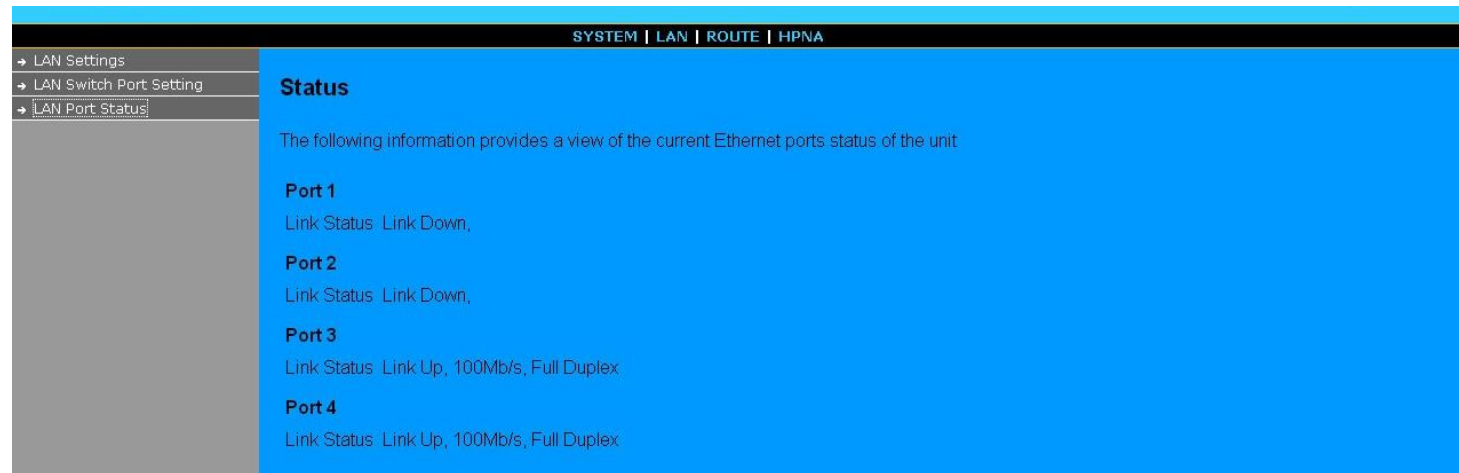


Figure 4.4.3 LAN Port Status

For this example, the XL-HCW224C-4 EOC MDU managed Master is connected to two XL-HC224Cv2 Endpoints with Port 3 and Port 4. It appears Port 3 Link Status Link Up, 100Mb/s, Full Duplex · Port 4 Link Status Link Up, 100Mb/s, Full Duplex · Port 1 Link Status Link Down, and Port 2 Link Status Link Down.

## 4.5 Select "ROUTE"

Select the "ROUTE". The menu below includes the sub-menus of Static Routing, and Routing Table List.

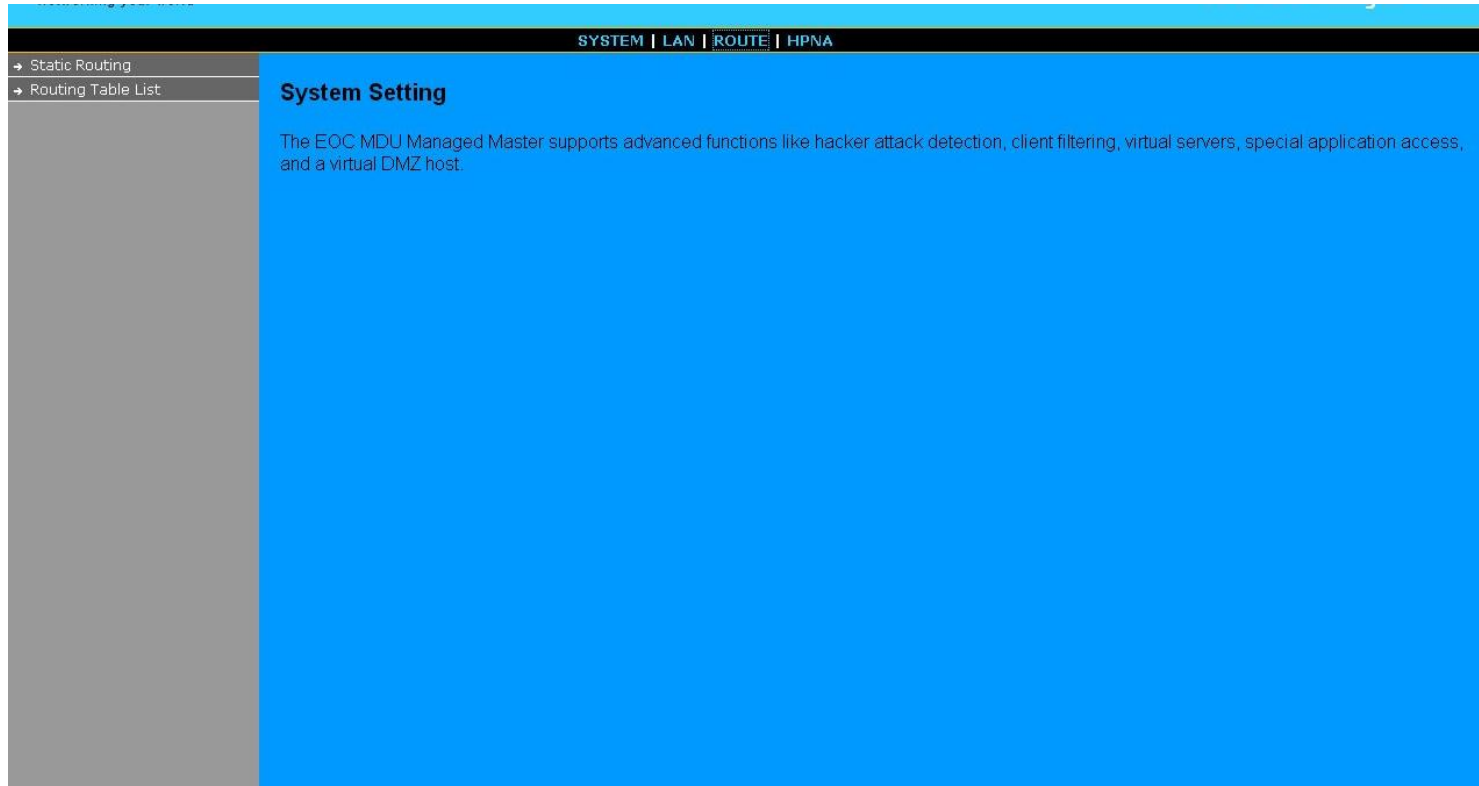


Figure 4.5 Select "LAN" in the Entry Screen

## 4.5.1 Static Routing

To setup Static Routing, click on the Static Routing link in the left navigation bar. A screen is displayed as shown in Figure 4.5.1.

Destination LAN IP	Subnet Mask	Gateway	
<input type="text"/>	<input type="text"/>	<input type="text"/>	<< Add

Figure 4.5.1 Static Routing

The screen contains the following details:

### Fields in Static Routing

Field	Description
Destination LAN IP	Enter the IP Address 0-0-0-0 of routing entry.
Subnet Mask	Enter the Subnet Mask 0-0-0-0 of routing entry.
Gateway	Enter the Gateway address of routing entry.

- Click Add to add the information that has been entered.

Static Routing functionality is used to define the connected Gateway between the LAN and WAN. For example, if we want to activate the Network Time Protocol (NTP) service, and we have to define the Gateway connected to NTP server in the WAN.

### 4.5.2 Routing Table List

To view the Routing entry table list of XL-HCW224C-4 , click on the Routing Table by link in the left navigation bar. A screen is displayed as shown in [Figure 4.5.2](#).

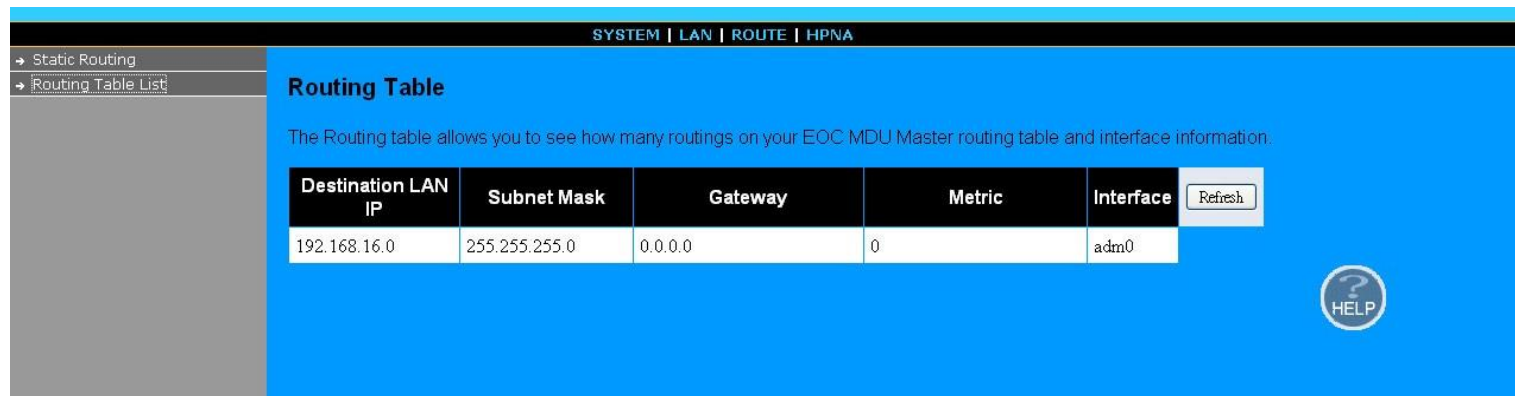


Figure 4.5.2 Routing Table List

The screen contains the following details:

- Click Refresh to update currently routing list of the XL-HCW224C-4.

## 4.6 Select "HPNA"

Select the "HPNA". The menu below includes the sub-menus of Device Info./Test \ Device Control, and User List.

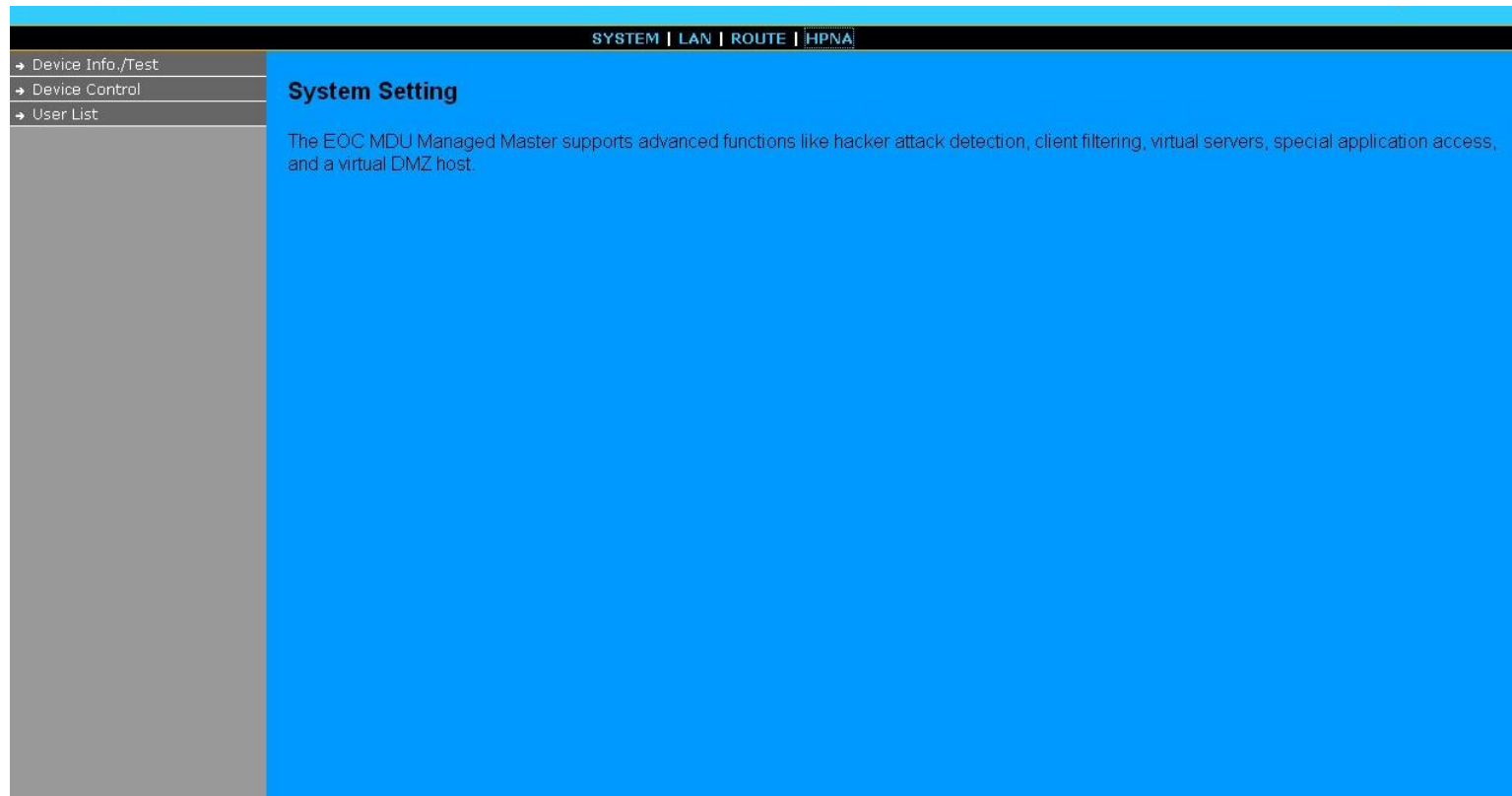


Figure 4.6 Select "HPNA" in the Entry Screen

### 4.6.1 Device Info./Test

This sub-menu for Device Info./Test appears the HPNA Device Information of the Numbers · Mode(Master/EP), MAC Address, Firmware Version , Spectrum for the Master/EP. It also includes Counter test for Master and Net\_Test, PER\_Test(Packet Error Rate), and Counter test for Endpoints.

No.	Mode	MAC Address	Version	Spectrum	User List	Net_Test	PER_Test	Counter
1	Master	00:05:6e:00:12:05	2.8.4	12-44MHz				<input type="button" value="Count"/>
2	EP	00:05:6e:02:00:03	2.8.4	12-44MHz	No.01	<input type="button" value="Test"/>	<input type="button" value="PER"/>	<input type="button" value="Count"/>
3	EP	00:05:6e:02:00:00	2.8.4	12-44MHz	No.03	<input type="button" value="Test"/>	<input type="button" value="PER"/>	<input type="button" value="Count"/>

Figure 4.6.1 Device Info./Test

The screen contains the following details:

Mode	Test	Descriptions
Master	Count	Master Read Packet Counter
EP	User List	End Point User List Table No.
	Net_Test	End Point Net Interface Test
	PER_Test	End Point Netper Test
	Count	End Point Read Packet Counter

### 4.6.1.1 Master Read Packet Counter

Click on “Count” button in the end of line for Master and it appears the window which shows the MAC Address of the Master.

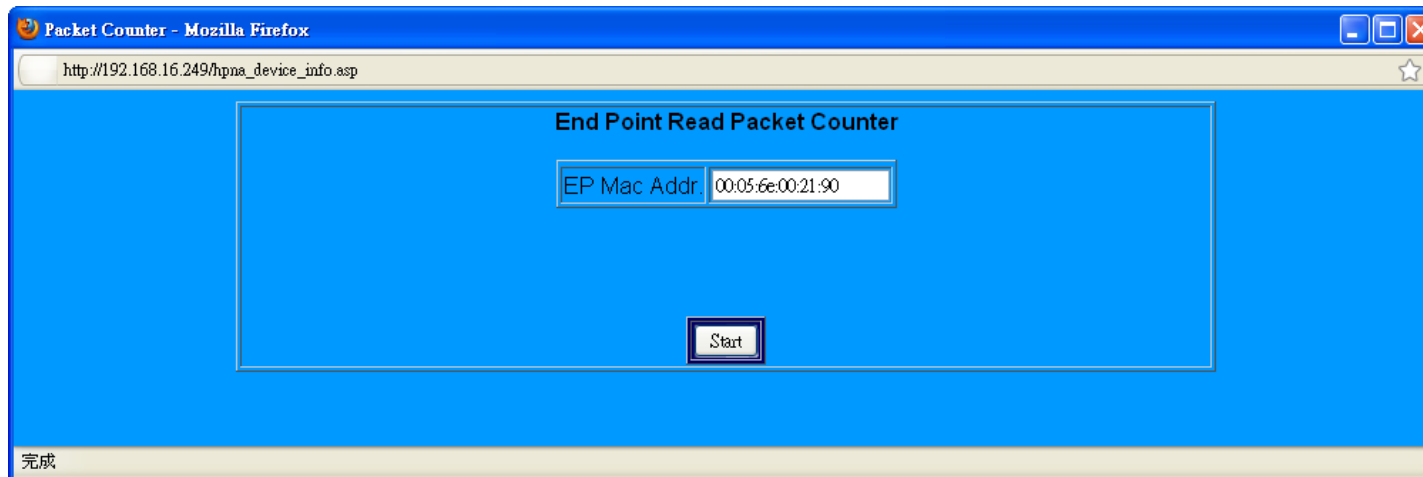


Figure 4.6.1.1.1 Master Read Packet Counter

Click on the "Start" button, and the example for test result of Master Read Packet Counter will be as below:

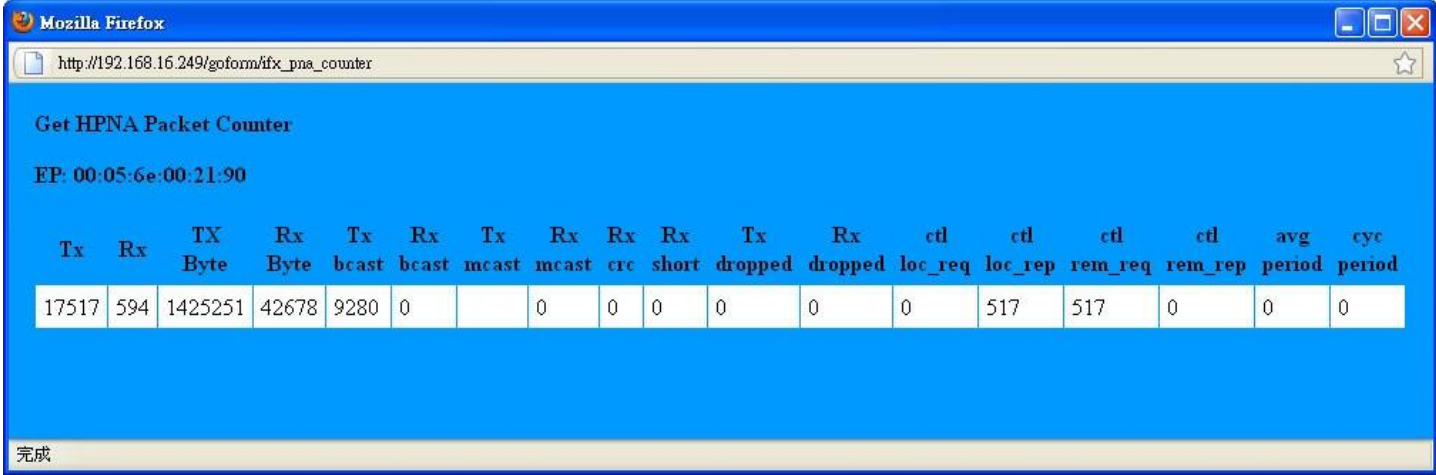


Figure 4.6.1.1.2 Output of Master Read Packet Counter



### 4.6.1.2 End Point Net Interface Test

Click on “Net\_Test “ button in the line for each EP and it appears the window which shows the MAC Address of the EP.

**WARNING!!** All data transmission in the network will pause during the test.

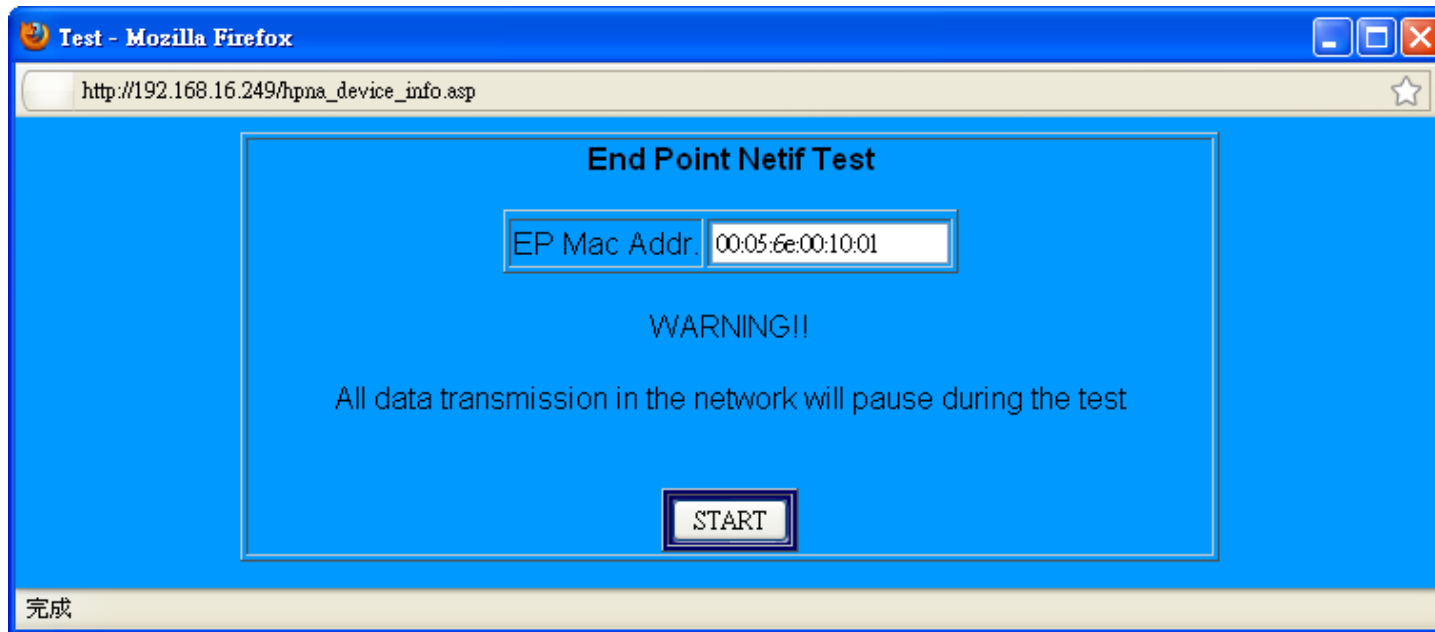
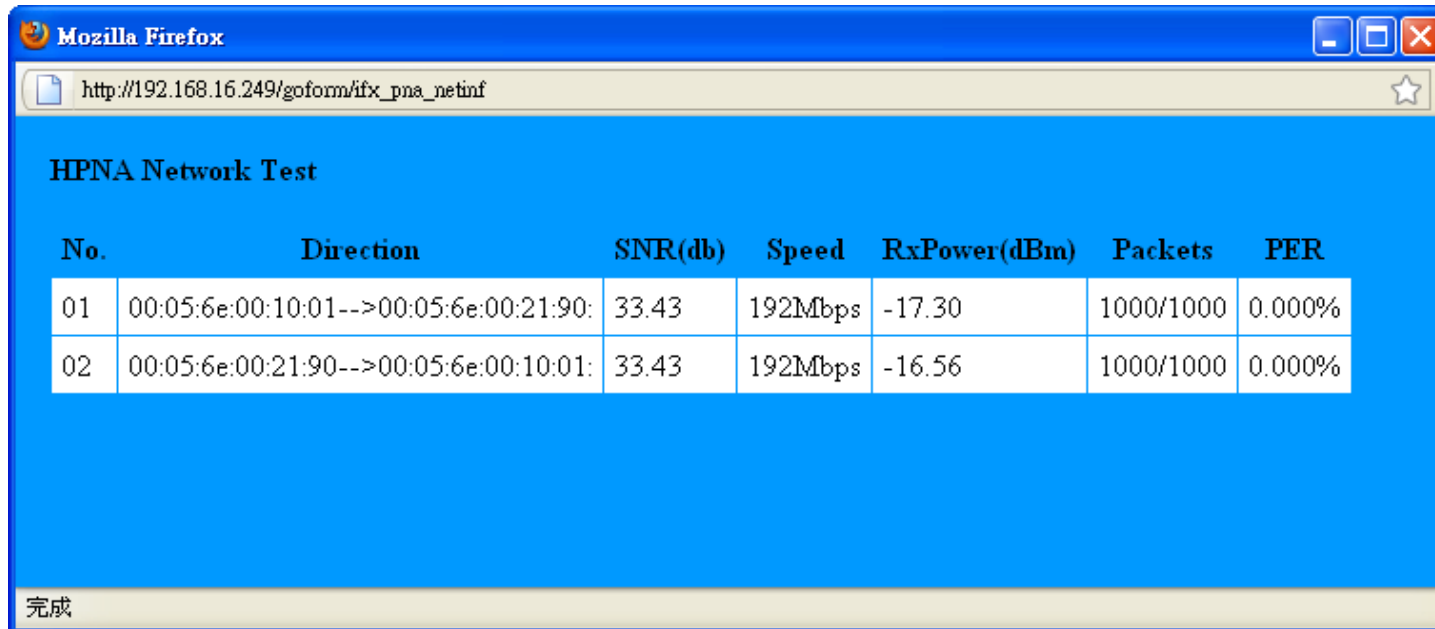


Figure 4.6.1.2.1 End Point Net Interface Test

Click on the “START” button, and the example for test result of Master Read Packet Counter will be as below:



HPNA Network Test

No.	Direction	SNR(db)	Speed	RxPower(dBm)	Packets	PER
01	00:05:6e:00:10:01-->00:05:6e:00:21:90:	33.43	192Mbps	-17.30	1000/1000	0.000%
02	00:05:6e:00:21:90-->00:05:6e:00:10:01:	33.43	192Mbps	-16.56	1000/1000	0.000%

完成

Figure 4.6.1.2.2 Output of End Point Net Interface Test

It shows the network information regarding the network test results for the SNR, the rate, the receive power, transmitted packets, and the PER.

### 4.6.1.3 End Point Netper Test

Click on “Net\_Test “ button in the line for each EP and it appears the window which shows the MAC Address of the EP.

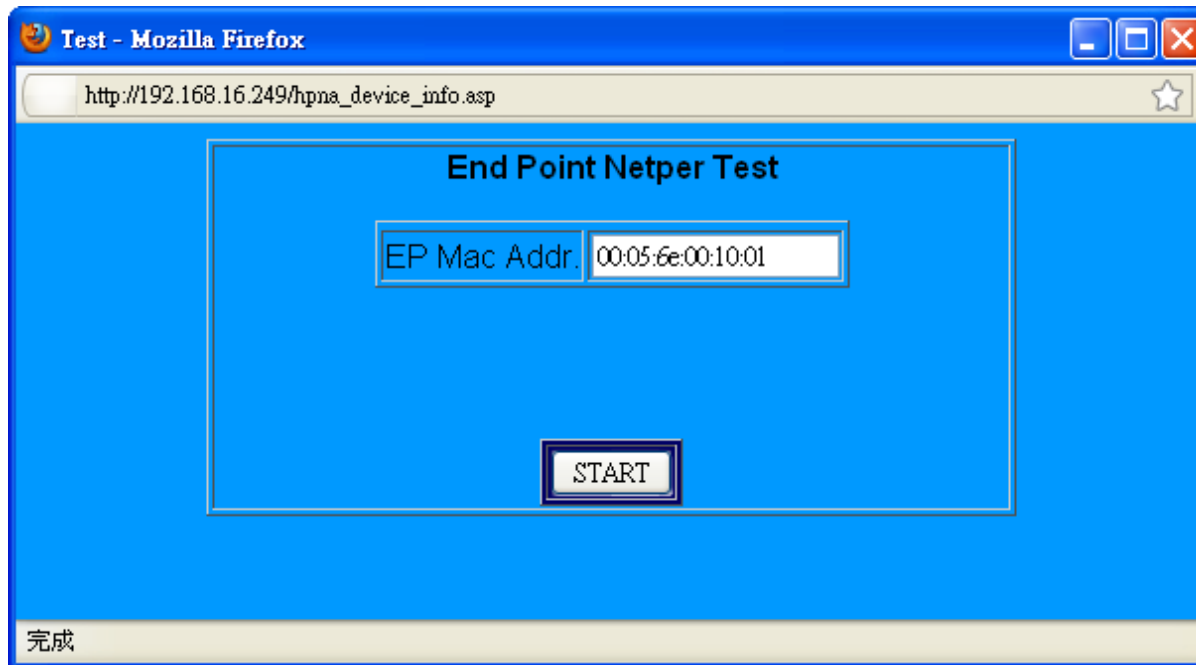


Figure 4.6.1.3.1 End Point Netper Test

Click on the “START” button, and the example for test result of Master Read Packet Counter will be as below:

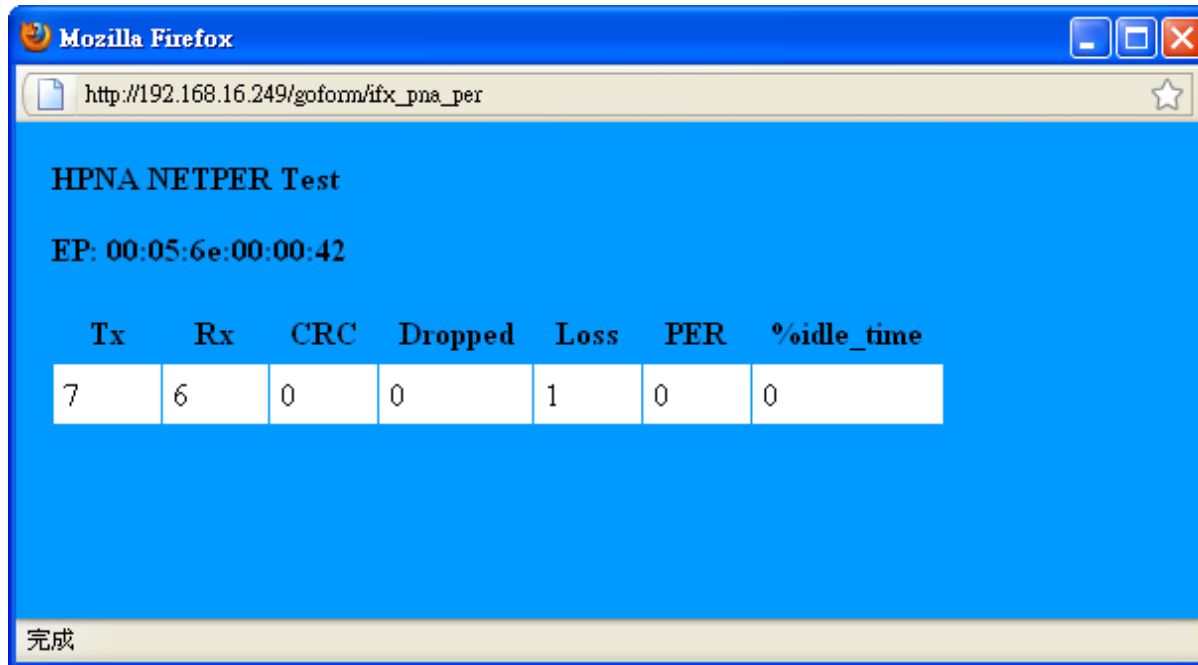


Figure 4.6.1.3.2 Output of End Point Netper Test

It monitors networks Tx, Rx, CRC, dropped, loss, packet error rate (PER), and % idle time.

**NOTE:** In this case, there is one packet loss due to the collision of the real network.

#### 4.6.1.4 End Point Read Packet Counter

Click on “Net\_Test “ button in the end of line for each EP and it appears the window which shows the MAC Address of the EP.

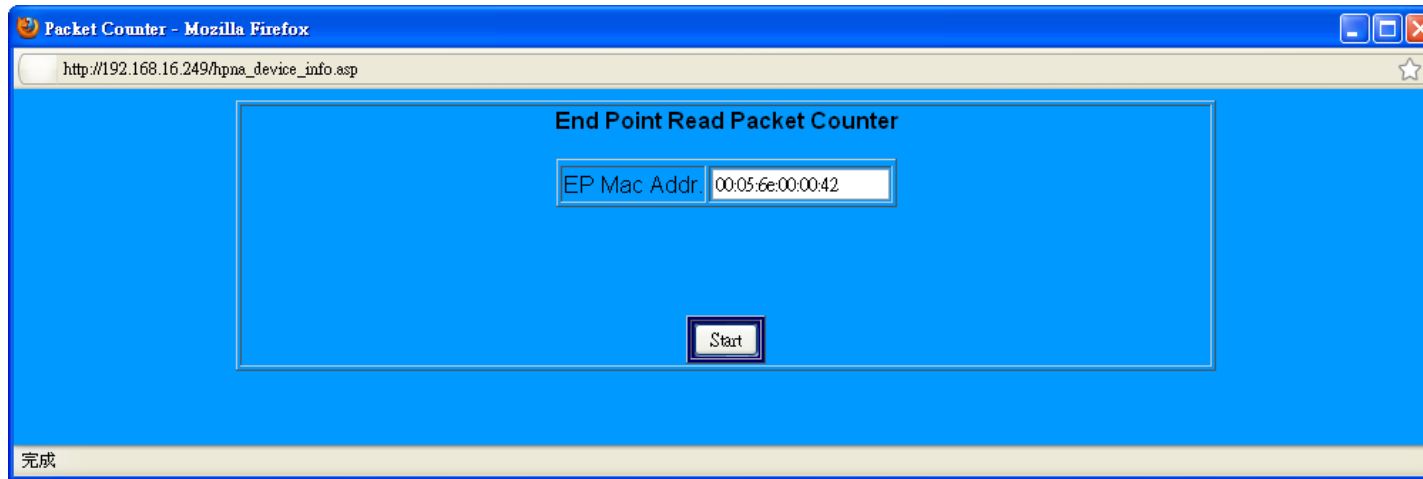
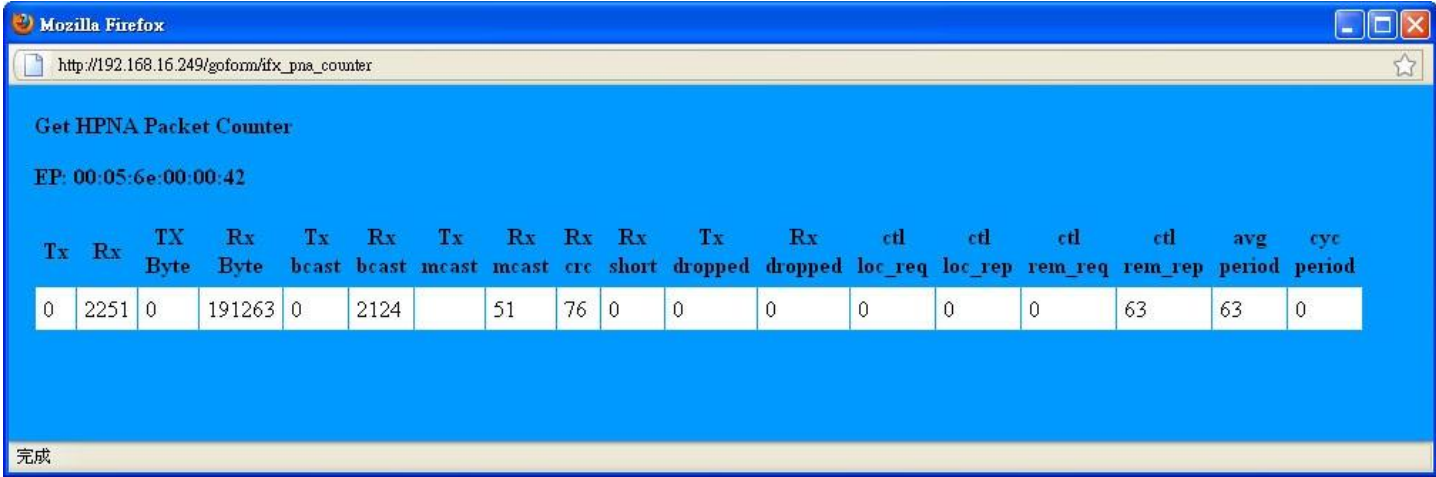


Figure 4.6.1.4.1 End Point Read Packet Counter

Click on the "Start" button, and the example for test result of End Point Read Packet Counter will be as below:



Get HPNA Packet Counter

EP: 00:05:6e:00:00:42


Tx	Rx	Tx	Rx	Tx	Rx	Tx	Rx	Rx	Rx	Tx	Rx	ctl	ctl	ctl	ctl	avg	cyc
Byte	Byte	bcast	bcast	mcast	mcast	crc	short	dropped	dropped	loc_req	loc_rep	rem_req	rem_rep	period	period		
0	2251	0	191263	0	2124		51	76	0	0	0	0	0	0	63	63	0

完成

Figure 4.6.1.4.1 Output of End Point Read Packet Counter

## 4.6.2 Device Control

This sub-menu for Device Control appears the HPNA Device Information of the Numbers, Mode(Master/EP), MAC Address, and Spectrum for the Master/EP. It also includes Firmware driver Upgrade for Master and Speed for Firmware driver Upgrade · Reboot · and User Add for Endpoints.



The screenshot displays a web interface for Device Control. At the top, there is a navigation bar with 'SYSTEM | LAN | ROUTE | HPNA'. On the left, a sidebar menu includes 'Device Info./Test', 'Device Control', and 'User List'. The main content area is titled 'Device Control(Firmware/Rate Control/Reboot)' and contains a table with the following data:

No.	Mode	MAC Address	Version	Spectrum	User List	Firmware	Reboot	User Add
1	Master	00:05:6e:00:12:05	2.8.4	12-44MHz		<input type="button" value="Upgrade"/>		
2	EP	00:05:6e:02:00:03	2.8.4	12-44MHz	No.01	<input type="button" value="Upgrade"/>	<input type="button" value="Reboot"/>	<input type="button" value="Add"/>
3	EP	00:05:6e:02:00:00	2.8.4	12-44MHz	No.02	<input type="button" value="Upgrade"/>	<input type="button" value="Reboot"/>	<input type="button" value="Add"/>

A 'HELP' icon is visible in the bottom right corner of the interface.

Figure 4.6.2 Device Control

The screen contains the following details:

Mode	Function	Descriptions
Master	Upgrade	Firmware driver Upgrade for Master
EP	User List	End Point User List Table No.
	Speed	Firmware driver Upgrade for Endpoints
	Reboot	Reboot for Endpoints
	Add	Add User for Endpoints

Attention: There are three types of firmware and firmware drivers for XL-HCW224C-4 and XL-HC-224Cv2:

(1)The Web Interface Version firmware i.e. version B.4 is the network management firmware image file. (2)The firmware driver for Firmware driver Upgrade for Master is the HPNA driver file for XL-HCW224C-4. (3)The firmware driver for Firmware driver Upgrade for Endpoints is the HPNA driver file for XL-HC224Cv2.



#### 4.6.2.1 Firmware driver Upgrade for Master

Click on “Upgrade” button in the line for Master and it appears the window which shows the MAC Address , the New Version and Band Mode of the firmware which contains the EOC Master driver for upgrading.

To Band Mode, it supports Full Band(12-44MHz), High Band(28-44MHz), Low Band(12-28MHz). User can use band mode to configure HPNA operating band frequency. The window also shows the Firmware New Version i.e. 2.8.4.

**Note:** Change Master Band Mode, all End Points will auto follow Master to same operating band frequency.



Figure 4.6.2.1.1 Firmware driver Upgrade for Master

Click on the "Start" button, and it only takes short time to upgrade the diver.

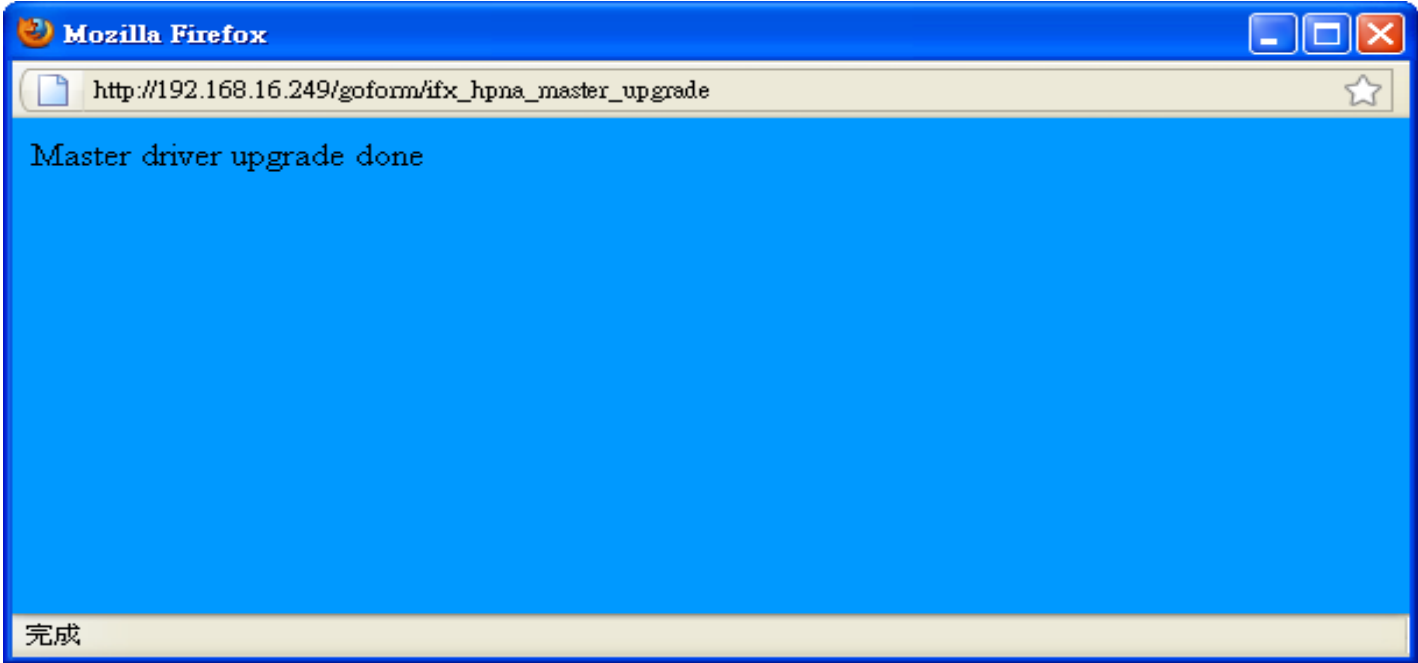


Figure 4.6.2.1.2 Complete the Firmware driver Upgrade for Master

#### 4.6.2.2 Firmware driver Upgrade and user speed control for Endpoints

Click on “Upgrade” button in the line for each EP and it appears the window which shows the MAC Address and Enable/Disable Mode of the EP. It supports Enable or Disable for EOC End Point and also include diver upgrade. The window also shows the Firmware New Version i.e. 2.8.4.



Figure 4.6.2.2.1 Firmware driver Upgrade and user speed control for Endpoints

Click on the “Start” button with the default Enable Mode and it only takes short time to upgrade the diver.

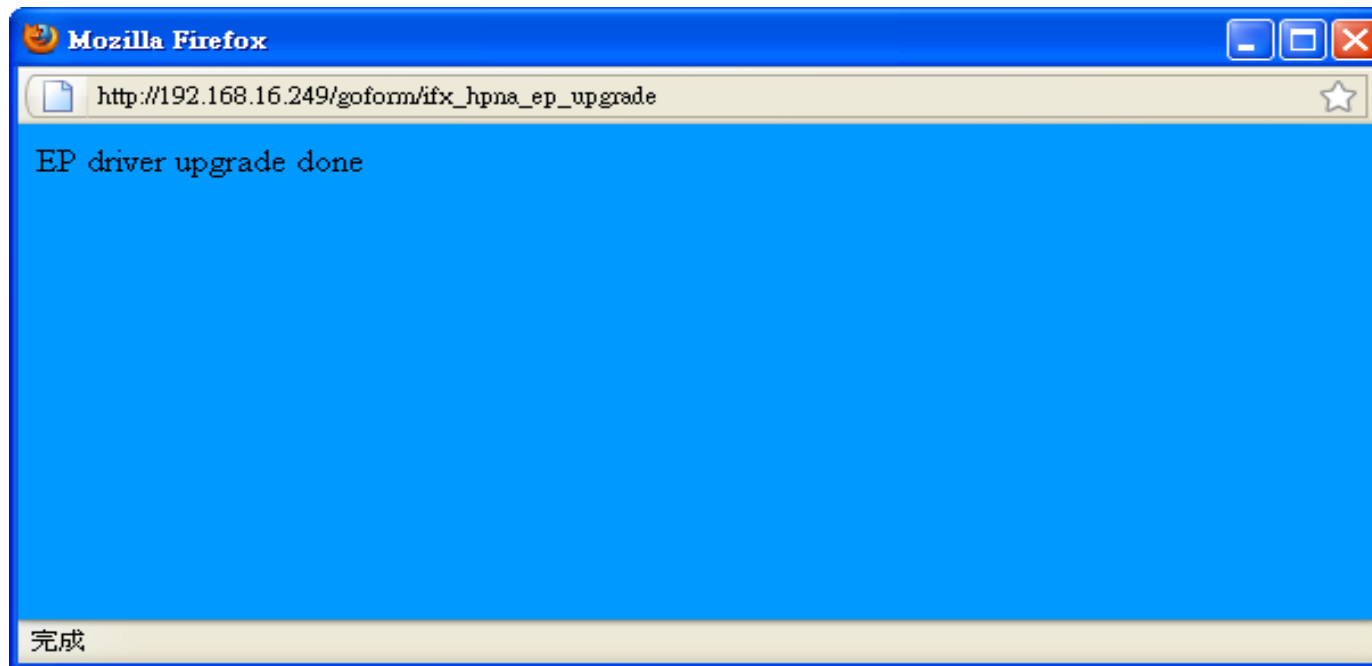


Figure 4.6.2.2.2 Complete the Firmware driver Upgrade for Endpoints

### 4.6.2.3 Reboot for Endpoints

Click on “Reboot” button in the line for each one EP and it appears the window which shows the MAC Address.

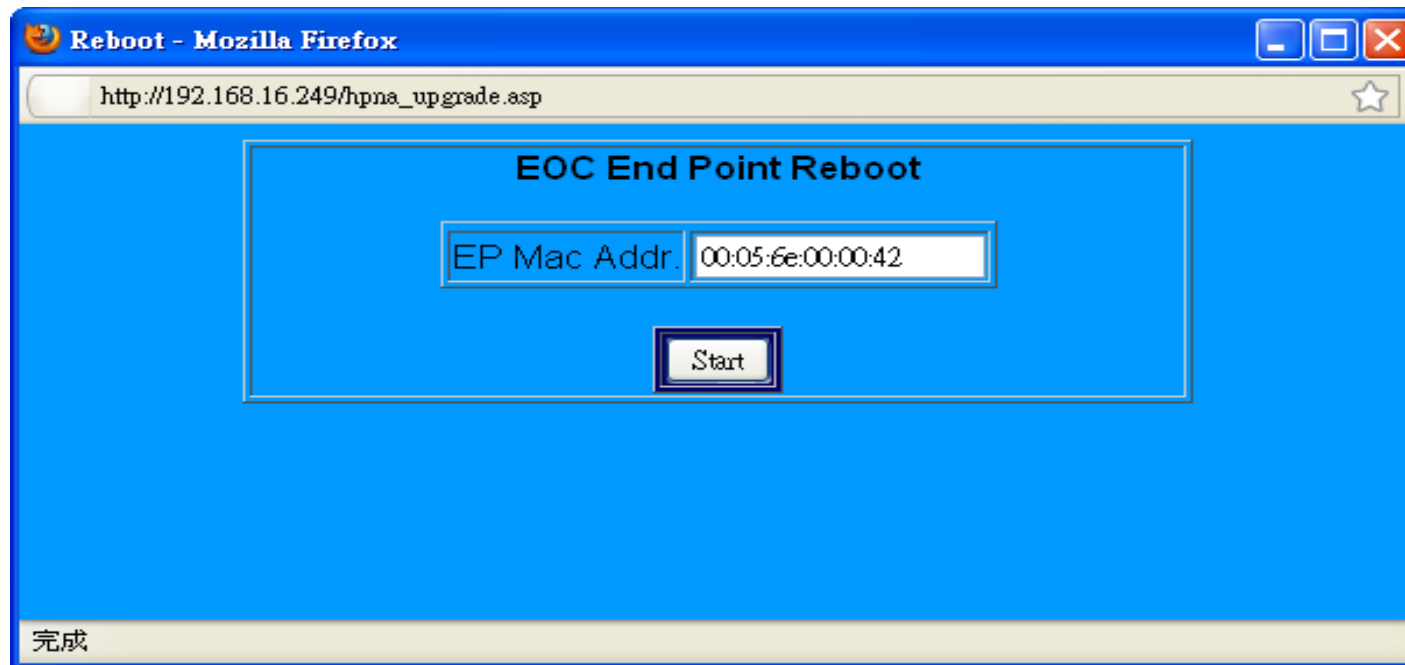


Figure 4.6.2.3.1 Reboot for Endpoints

Click on the "Start" button, and it only takes short time to Reboot for each one Endpoint.

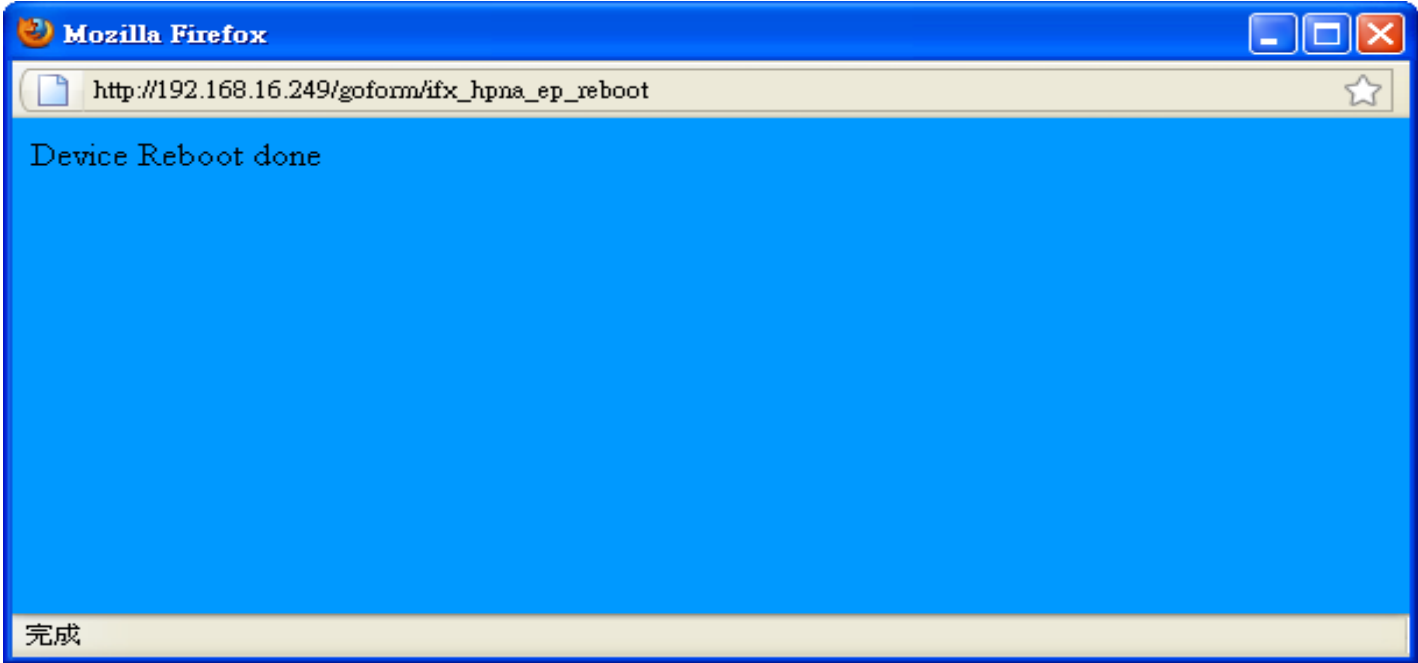


Figure 4.6.2.3.2 Reboot for Endpoints is done

#### 4.6.2.4 Add User for Endpoints

Click on “Add” button in the line for each EP and it appears the window which shows the MAC Address and Number/Remark fields. The Remark field is convenient to apply for the User List information such as address and hotel room number...etc.

The Maximum numbers of characters is sixty.

**Attention:** To the Number field, if you add the new number with the same one, it will replace the older existed one information.

The screenshot shows a web browser window with the title "User Add - Mozilla Firefox" and the address bar containing "http://192.168.16.244/hpna\_upgrade.asp". The main content area is a blue-bordered form titled "Add User to User Table". The form contains the following fields:

No.	<input type="text"/>
EP Mac Addr.	<input type="text" value="00:05:6e:02:00:03"/>
Remark	<input type="text" value="-"/>
E1 Vlan ID	<input type="text"/>
E2 Vlan ID	<input type="text"/>
IGMP	<input type="text" value="Disable"/>
Rate Control Up	<input type="text" value="Full Speed"/>
Rate Control Down	<input type="text" value="Full Speed"/>

At the bottom center of the form is a "Start" button.

Figure 4.6.2.4.1 Add User for Endpoints

Example:

- (1) Fill No. as 1.
- (2) Remark: 9F, NO.208, TATUNG RD, SEC3,HSI CHIH, TAIPEI.
- (3) E1 Vlan ID:0
- (4) E2 Vlan ID:0
- (5) IGMP: Disable
- (6) Rate Control UP:1M
- (7) Rate Control Down:10M
- (8) click "Start".

Note:

1. The No. should be between 1-61. 2.Remark can enter 60 texts.
2. The Vlan ID should be between 0 or 2-4095 . IN HPNA MDU structure, all of the End Points will be isolated. So, if you don't need use 802.1Q Tag Vlan, set Vlan ID=0. When you need IEEE 802.1Q VLAN Tagging application, set Vlan Id during 2~4095.
3. The UP Stream Rate Control have 12 Speed Modes as Full Speed/ 512k/ 1M/ 2M/ 3M/ 4M/ 6M/ 8M/ 10M/ 16M/ 20M/ 30M for EOC End Point
4. The Down Stream Rate Control have 12 Speed Modes as Full Speed/ 512k/ 1M/ 2M/ 3M/ 4M/ 6M/ 8M/ 10M/ 16M/ 20M/ 30M for EOC End Point



User Add - Mozilla Firefox

http://192.168.16.244/hpna\_upgrade.asp

### Add User to User Table

No.	1
EP Mac Addr.	00:05:6e:02:00:03
Remark	9F, NO.208, TATUNG RD, SEC3,HSI CHIH, TAIPEI
E1 Vlan ID	0
E2 Vlan ID	0
IGMP	Disable
Rate Control Up	1M
Rate Control Down	10M

Start

Figure 4.6.2.4.2 Example for adding new user for one Endpoint

The User Add is done.

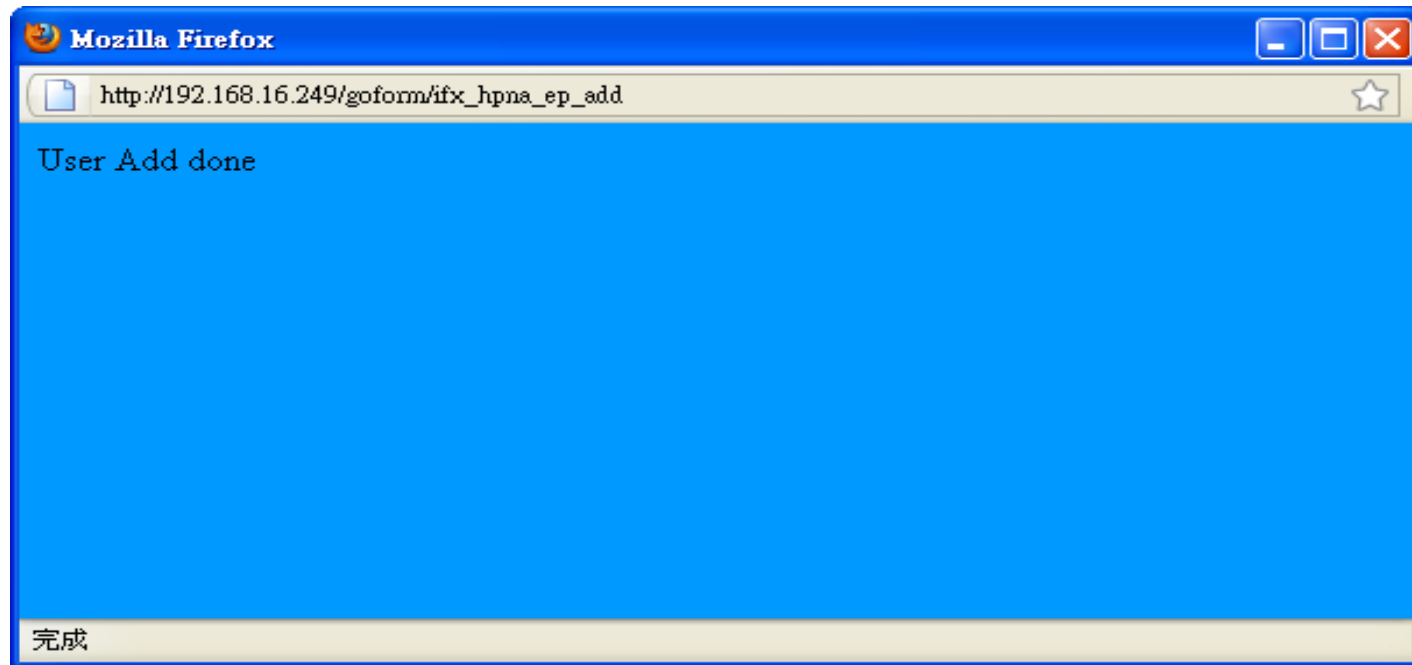


Figure 4.6.2.4.3 Example for adding new user for one Endpoint

### 4.6.3 User List

Follow the example in 4.6.2.4 Add User for Endpoints, there are two lines for No./Remark appeared in User List window.

You can also click the “Apply” button to delete each the EP line information.

No.	MAC Address	Link	Enable	Remark	E1 Vlan ID	E2 Vlan ID	IGMP	Rate Control UP	Rate Control Down	Erase	Edit
1	00:05:6e:02:00:03	Up	Enable	9F, NO.208, TATUNG RD, SEC3,HSI CHIH, TAIPEI	0	0	OFF	1M	10M	Erase	Edit
2	00:05:6e:02:00:00	Up	Enable	-	0	0	OFF	Full	Full	Erase	Edit
3		Down	-	-			OFF	Full	Full	Erase	Edit

Figure 4.6.3 User List

## 5. Configure the XL-HCW224C-4 via Console

### 5.1 Setup on HyperTerminal

Open the HyperTerminal and set the baud rate to 115200, 8N1N to properly set the HyperTerminal.

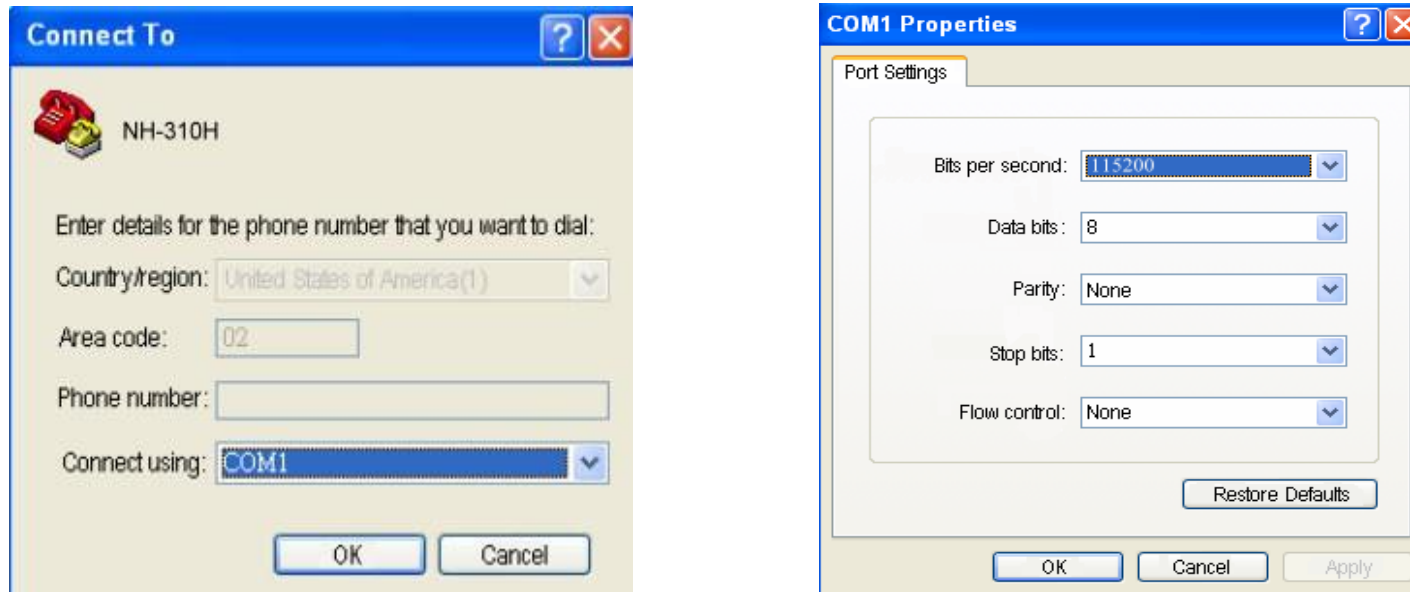


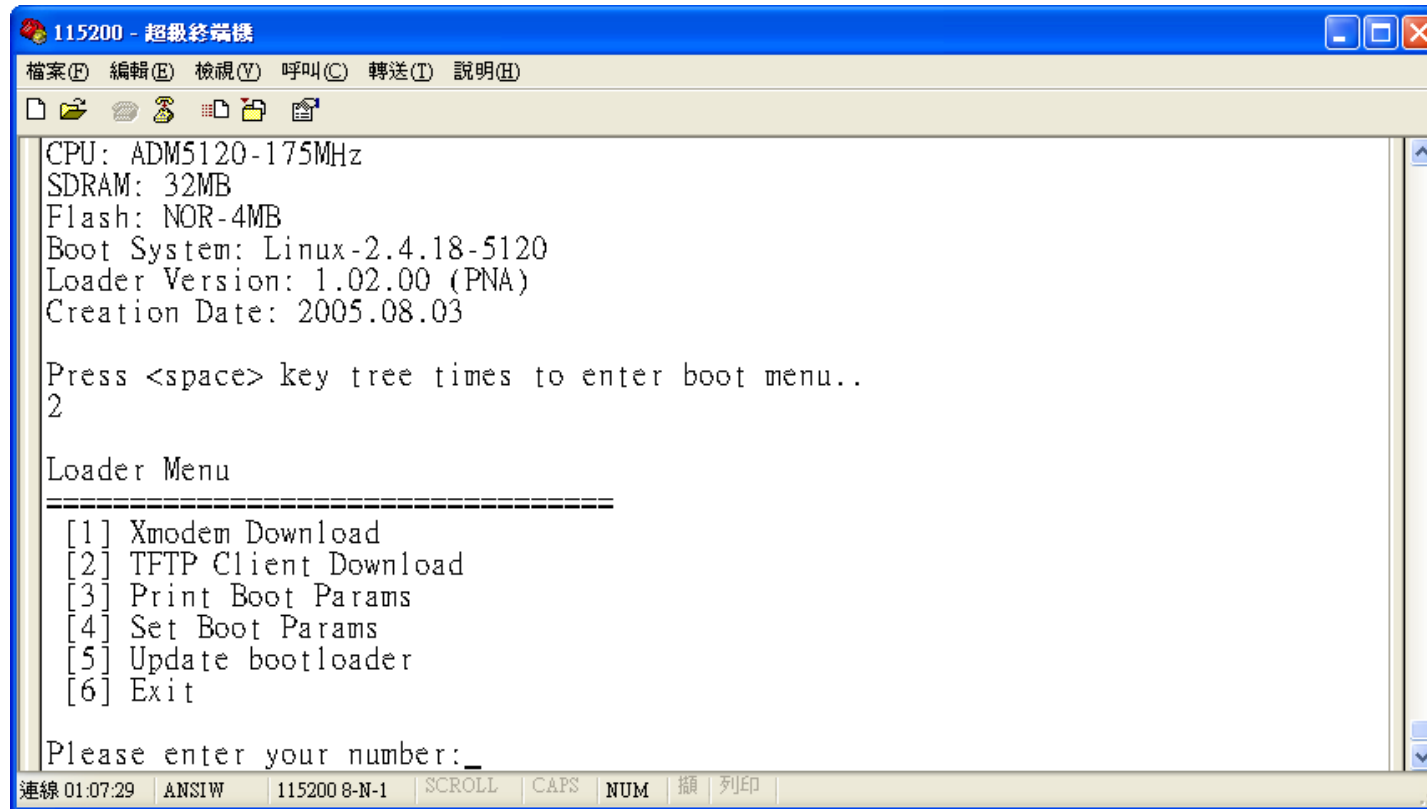
Figure 5.1 HyperTerminal Configuration

### 5.2 Reset the system to default configuration

At the CLI command, write the command “rawaccess –e” to reset the system to default configuration. For it to take effect write the command “reboot” to restart the system.

## 5.3 TFTP Protocol for firmware upgrade

- (1) When Power ON and at the CLI command, press <space> key **tree** times to enter boot menu. You will see the boot Loader Menu with the items of function selection.



The screenshot shows a terminal window titled "115200 - 超級終端機". The window contains the following text:

```
CPU: ADM5120-175MHz
SDRAM: 32MB
Flash: NOR-4MB
Boot System: Linux-2.4.18-5120
Loader Version: 1.02.00 (PNA)
Creation Date: 2005.08.03

Press <space> key tree times to enter boot menu..
2

Loader Menu
=====
[1] Xmodem Download
[2] TFTP Client Download
[3] Print Boot Params
[4] Set Boot Params
[5] Update bootloader
[6] Exit

Please enter your number: _
```

The terminal window also shows a status bar at the bottom with the following information: 連線 01:07:29 ANSIW 115200 8-N-1 SCROLL CAPS NUM 擴 列印

Figure 5.3.1 boot Loader Menu entry

- (2) Open the TFTP tool and direct the current directory which is stored the XL-HCW224C-4 firmware for upgrading. Select the IP address for TFTP server interface. Now the TFTP server is ready for firmware downloading. (Attention: Keep remember it must be set up and will be ready for TFTP tool, do not miss this step!!)

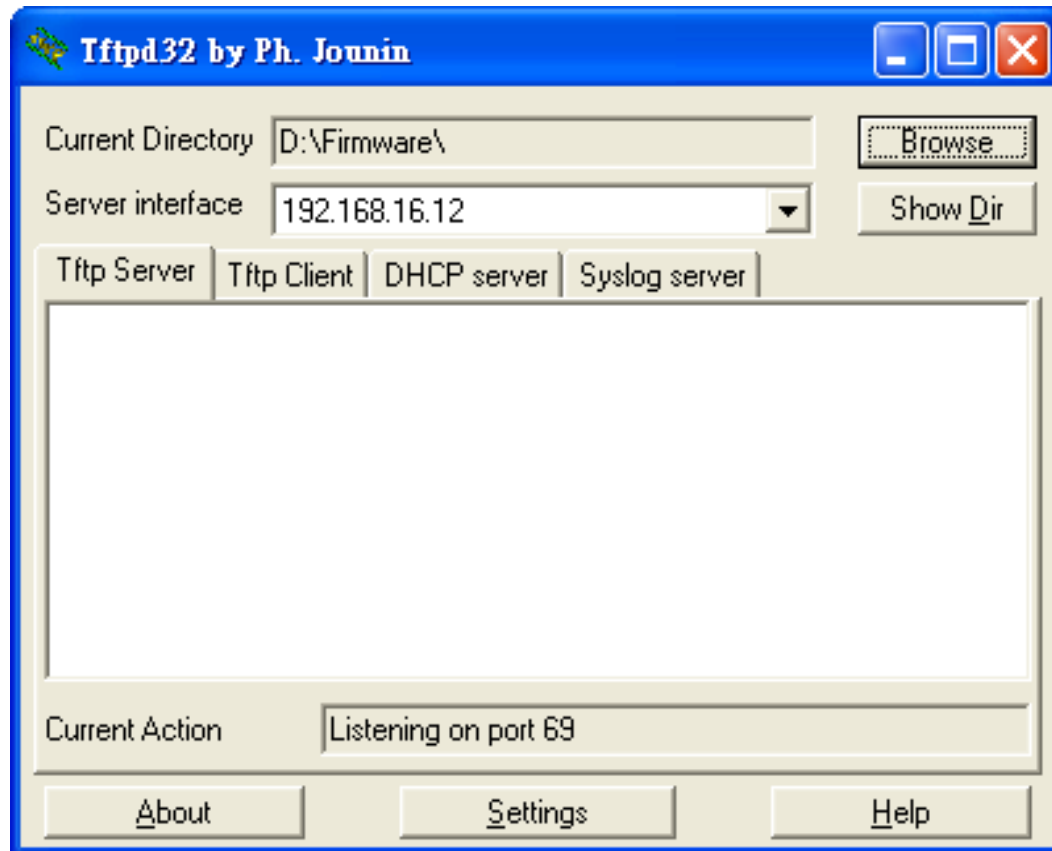


Figure 5.3.2 TFTP tool for f/w upgrading

(3) Enter the number: "2" as the item 2 for TFTP Client Download.

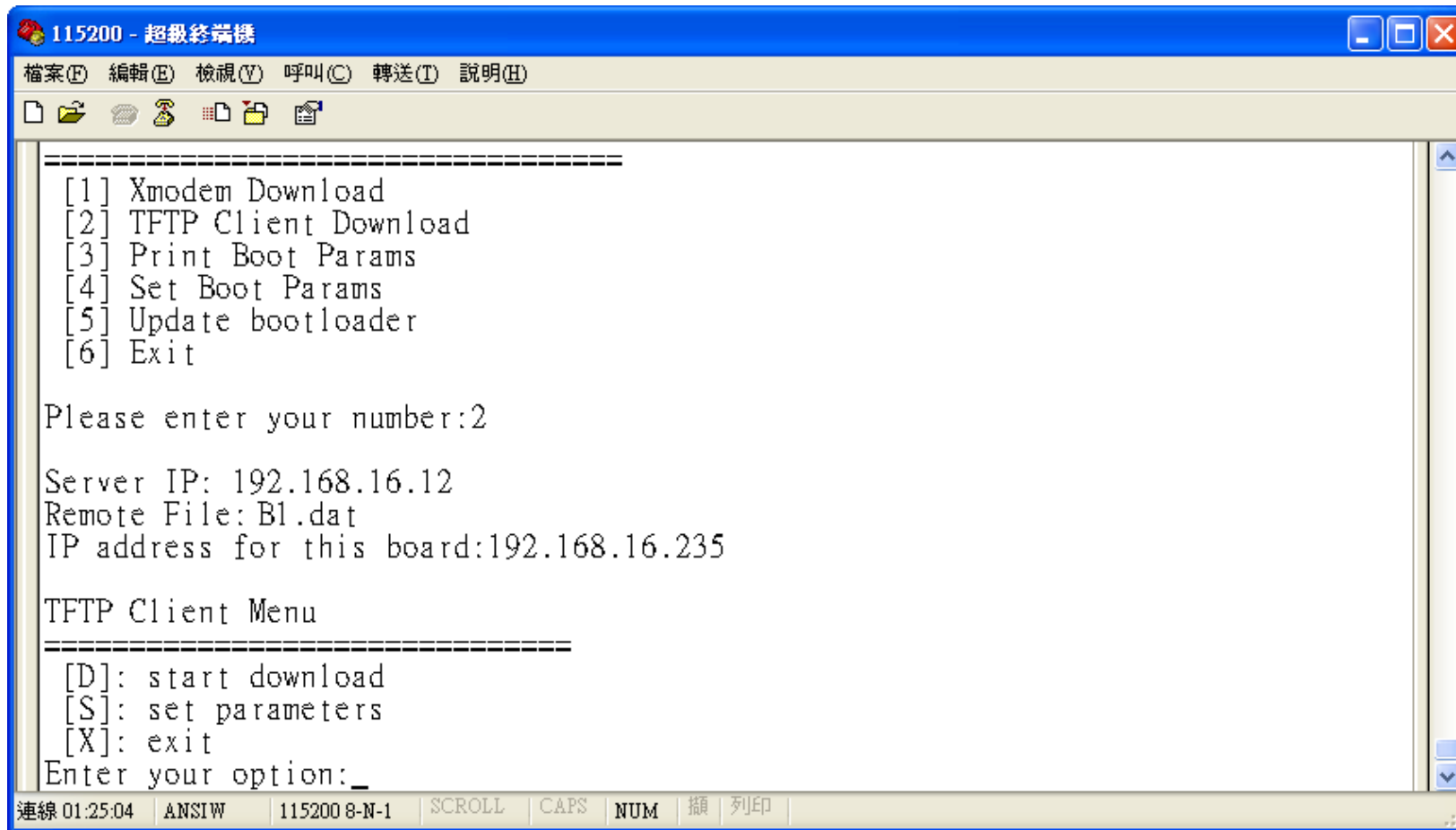


Figure 5.3.3 TFTP Client Download

(4) Enter your option: "S" as set parameters. After then enter TFTP Server IP and Remote File Name as the XL-HCW224C-4 firmware for upgrading.

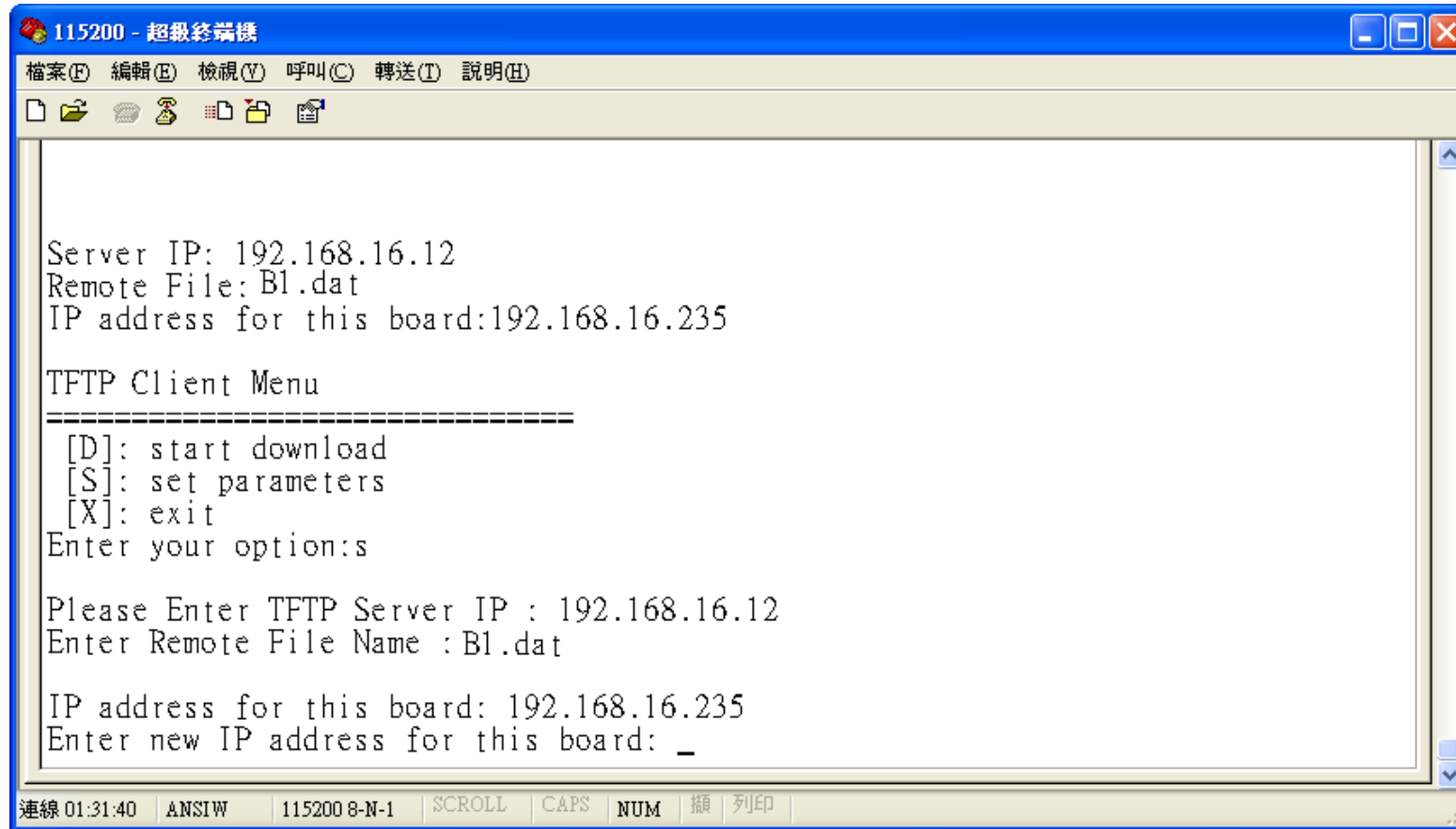


Figure 5.3.4 Set parameters

(5) Enter your option: "D" and it will be starting the TFTP download. After Erasing and Programming flash, and



the new XL-HCW224C-4 firmware upgrade is completed as below:

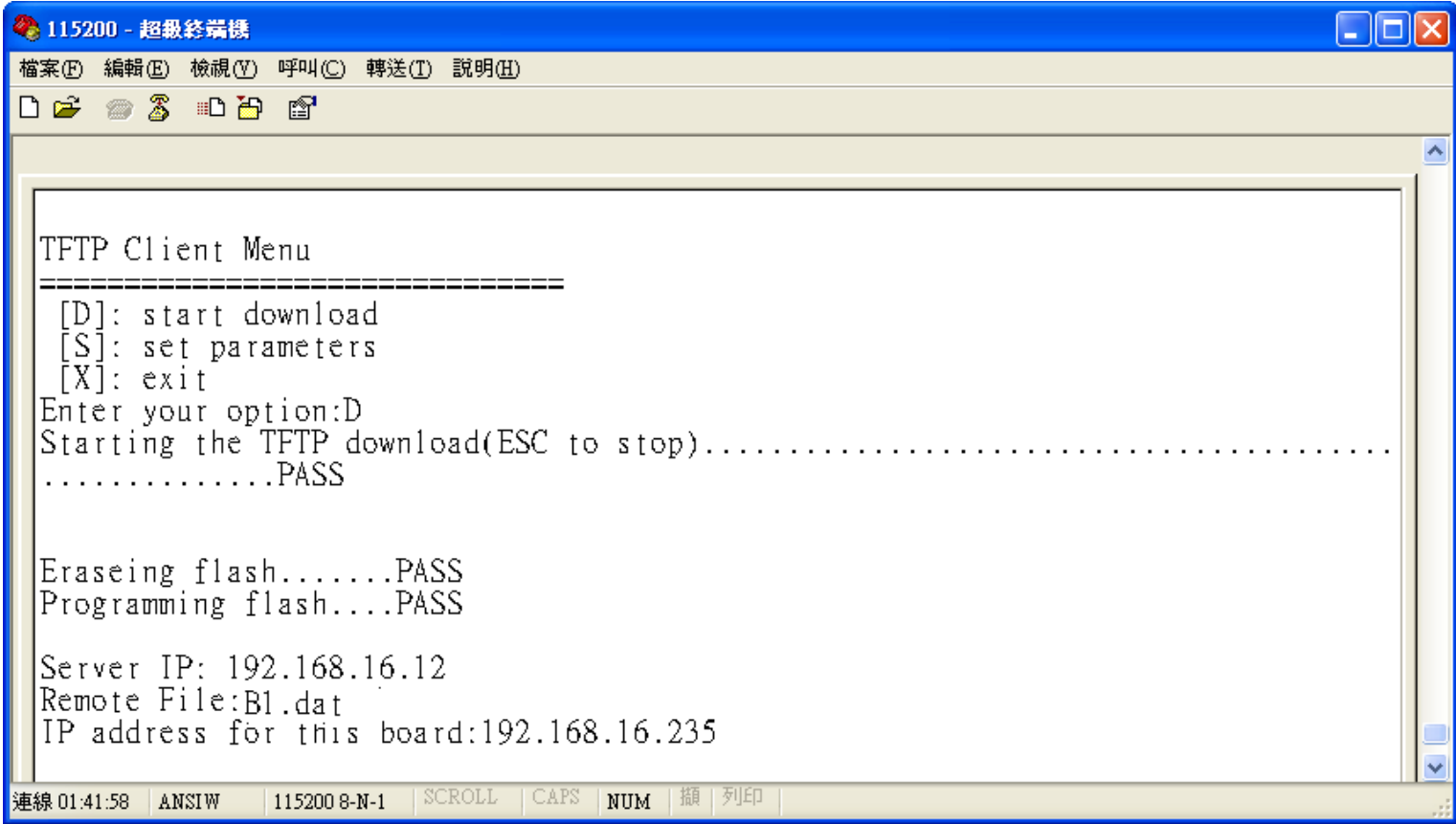


Figure 5.3.5 Firmware upgrade completed

## Appendix A: Cable Requirements

A CAT 3, 4 or 5 UTP (unshielded twisted pair) cable is typically used to connect the Ethernet device to the modem. A 10Base-T cable often consists of four pairs of wires, two of which are used for transmission. The connector at the end of the 10Base-T cable is referred to as an RJ-45 connector and it consists of eight pins. The Ethernet standard uses pins 1, 2, 3 and 6 for data transmission purposes. (Table 3)

Table 3 RJ-45 Ethernet Connector Pin out Assignments

PIN #	Signal	Description
1	TX+	Transmit Data +
2	TX-	Transmit Data -
3	RX+	Receive Data +
4	NC	Data Termination
5	NC	Data Termination
6	RX-	Receive Data -
7	NC	Data Termination
8	NC	Data Termination

## Appendix B: Product Specification

### Key Features & Benefits

- Compliant with HomePNA3.1/ HomePNA3.0 over Coaxial cable(HCNA) specifications (ITU-T G.9954)
- Compliant with IEEE802.3 10Base-T and IEEE802.3u 100Base-Tx standards
- Compliant with IEEE802.3x Flow Control standard
- Provide 4 x 10/100M auto-negotiation RJ-45 Ethernet ports with auto-MDI/MDIX(XL-HCW224C-4 only)
- Provide 2 x 10/100M auto-negotiation RJ-45 Ethernet ports with auto-MDI/MDIX(XL-HC224Cv2 only)
- Provides 2 x F-type female coax connectors for HCNA and TV(Each for XL-HCW224C-4 and XL-HC224Cv2)
- Support transmission speed up to 200Mbps over coaxial cable and up to -145dBm/Hz Noise Floor
- Support point to point and point to multipoint application
- Support IEEE802.1p Priority Mapping and IEEE802.1p/TOS Priority Queue
- Support IEEE802.1Q Tag VLAN Pass Through
- Support HTTP web base remote management(XL-HCW224C-4 only)
- Support HTTP and TFTP protocol for firmware upgrade(XL-HCW224C-4 only)
- Support monitor all endpoint(XL-HC224Cv2) of version, SNR, Rate, RX power, PER(Packet Error Rate), and packet counter (XL-HCW224C-4 only)
- Support max. connecting up to 61 endpoint(client)
- Support rate control of Full Speed (auto), Fix Speed setting
- Support auto logout , user list and each endpoint isolation
- Guaranteed QoS based on HomePNA3.1 Parameterized QoS
- EMI certified by CE and FCC, VCCI

## Product Specification

Standard:	IEEE802.3 / IEEE802.3u / ITU-T G.9954 standard
Max Bandwidth:	Up to 200Mbps
Max Noise Floor	-145dBm/Hz
Max Power Attenuation	-60dBm
SAT HCNA Transmission Spectrum:	12MHz ~ 44MHz and coexist at 47MHz
Dimension:	XL-HCW224C-4: 173mm x 142mm x 30mm(Metal Case) (6.81" x 5.59" x 1.18") (L x W x H) XL-HC224Cv2: 130mm x 94.5mm x 27mm (5.12" x 3.72" x 1.06") (L x W x H)
Temperature:	Operating: 0°C ~ 50°C (32°F ~ 122°F) Storage: -20°C ~ 70°C (-4°F ~ 158°F)
Humidity:	10% ~ 90% non-condensing
External Power Adapter:	12VDC / 1A

## Appendix C: Troubleshooting

## Diagnosing the Modem's Indicators

The Modem can be easily monitored through its comprehensive panel indicators. These indicators assist the network manager in identifying problems the hub may encounter. This section describes common problems you may encounter and possible solutions.

1. Symptom: The link is failed between MDU Master XL-HCW224C-4 and End Point XL-HC224Cv2 and the functionality of End Point XL-HC224Cv2 is abnormal.  
Cause: The output level of voltage is too high for short connection.  
Solution: It must use the attenuator to be connected with MDU Master XL-HCW224C-4 and End Point XL-HC224Cv2 to attenuate the transmission power level to 10db at least.
2. Symptom: POWER indicator does not light up (green) after power on.  
Cause: Defective External power supply  
Solution: Check the power plug by plugging in another that is functioning properly. Check the power cord with another device. If these measures fail to resolve the problem, have the unit power supply replaced by a qualified distributor.
3. Symptom: Link indicator does not light up (green) after making a connection.  
Cause: Network interface (ex. a network adapter card on the attached device), network cable, or HCNA or Ethernet port is defective.

## System Diagnostics

### Power and Cooling Problems

If the POWER indicator does not turn on when the power cord is plugged in, you may have a problem with the power outlet, power cord, or internal power supply as explained in the previous section. However, if the unit power is off after running for a while, check for loose power

connections, power losses or surges at the power outlet, and verify that the fan on back of the unit is unobstructed and running prior to shutdown. If you still cannot isolate the problem, then the internal power supply may be defective. In this case, please contact your local dealer.

### Installation

Verify that all system components have been properly installed. If one or more components appear to be malfunctioning (e.g., the power cord or network cabling), test them in an alternate environment where you are sure that all the other components are functioning properly.

### Transmission Mode

The default method of selecting the transmission mode for RJ-45 ports is 10/100 Mbps Ethernet, for coaxial connectors are 200Mbps HCNA. It supports auto-negotiation and is half-duplex. Therefore, if the link signal is disrupted (e.g. by unplugging the network cable and plugging it back in again, or by resetting the power), the port will try to reestablish communications with the attached device via auto-negotiation. If the device does not support auto-negotiation, communications can be easily lost (i.e., reset to the wrong mode) whenever the attached device is reset or experiences a power fluctuation. The best way to resolve this problem is to upgrade these devices to a version that support Ethernet and 200Mbps HCNA.

### Physical Configuration

If problems occur after altering the network configuration, restore the original connections, and try to track the problem down by implementing the new changes, one step at a time. Ensure that cable distances and other physical aspects of the installation that do not exceed recommendations.

### System Integrity

As a last resort verify the switch integrity with a power-on reset. Turn the power to the switch off and then on several times. If the problem still persists and you have completed all the preceding diagnoses, then contact your dealer.

## Appendix D: FCC and CE Mark Warning

### FCC Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a computing device, pursuant to Part 15 of FCC class B rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generate, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. The equipment and the receiver should be connected to outlets on separate circuits.
4. Consult the dealer or an experienced radio/television technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

If this telephone equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the proper functioning of your equipment. If they do, you will be notified in advance in order for you to make necessary modifications to maintain uninterrupted service.

This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs.

**CE Mark Warning**

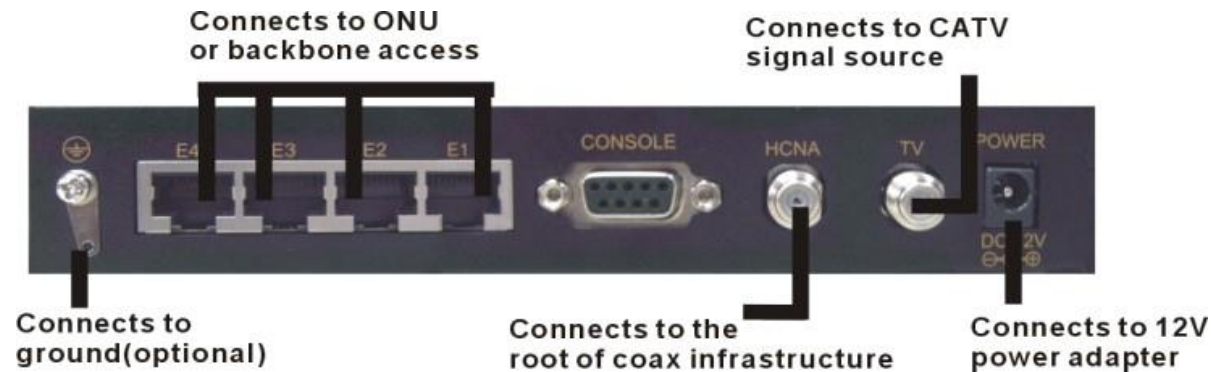
This is a class B product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.



## Appendix E: Installation Guide

### Master Installation:

Before beginning the installation, survey the installation site.



### Site Survey

- Determine the Master's location.
- Draw the connection tree (coax network map of the site).
- Attenuation (map) (depends on the number of splitters/taps and length of the coax cable).
- Locate amplifiers (if exist in the network) and show them in the connection tree.
- Find the location of the main splitter.
- Are there other services connected to the coax cable (TV, SAT, Docsis, Moca)?
- Check that the TV reception is clear (no interference).
- Know the room and outside temperature during summer and winter.
- If possible, check that there is active Internet service to the building.

Tip: Drawing a map of the coax network tree can help you avoid connection issues.

## Pre-Installation Inspection

For the fastest and smoothest installation, address any wiring or connector problems if seen, before starting the installation.

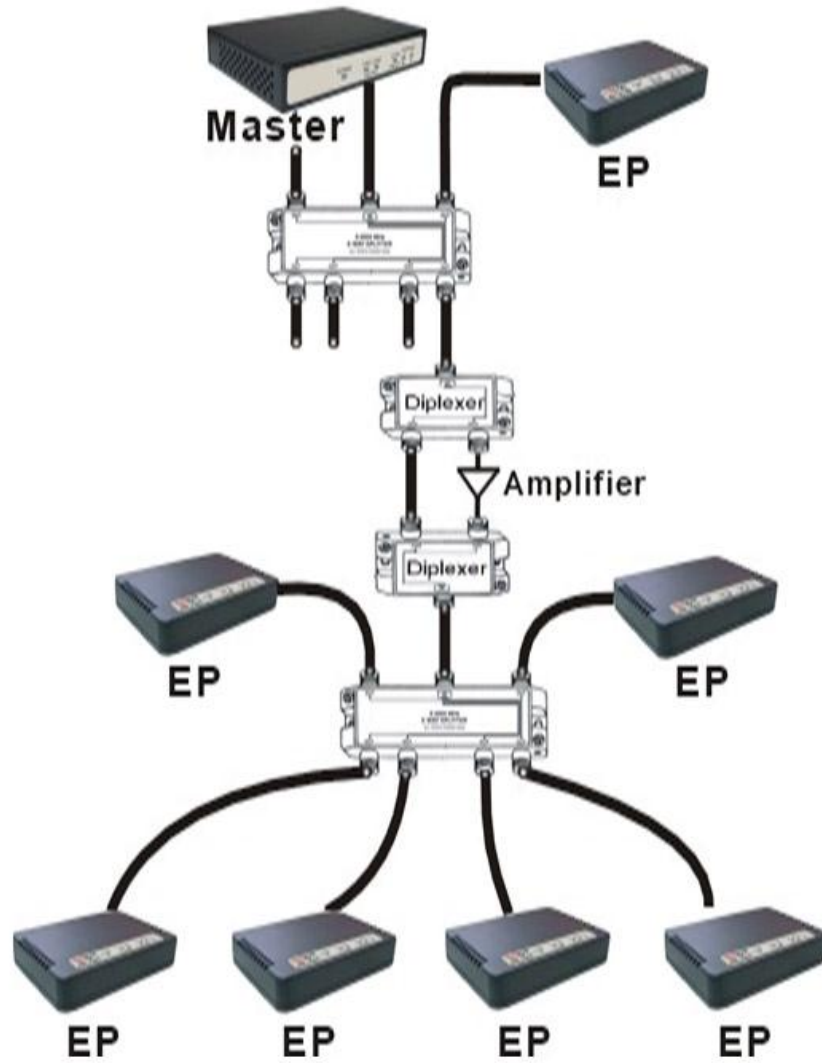
- Inspect and replace damaged splitter and F-connectors.
- Check every coax connector, splitter, tap and amplifier (if exists). Look for missing components, damaged connectors, corrosion and/or other problems.
- Replace any damaged splitters/taps.
- Replace damaged and low-quality coax fittings (crimp, screw-in, others).

Tip: Inspect and replace damaged coax cables. Check every visible coax cable for cracks, nicks, splices and/or other types of coating or shielding damage.

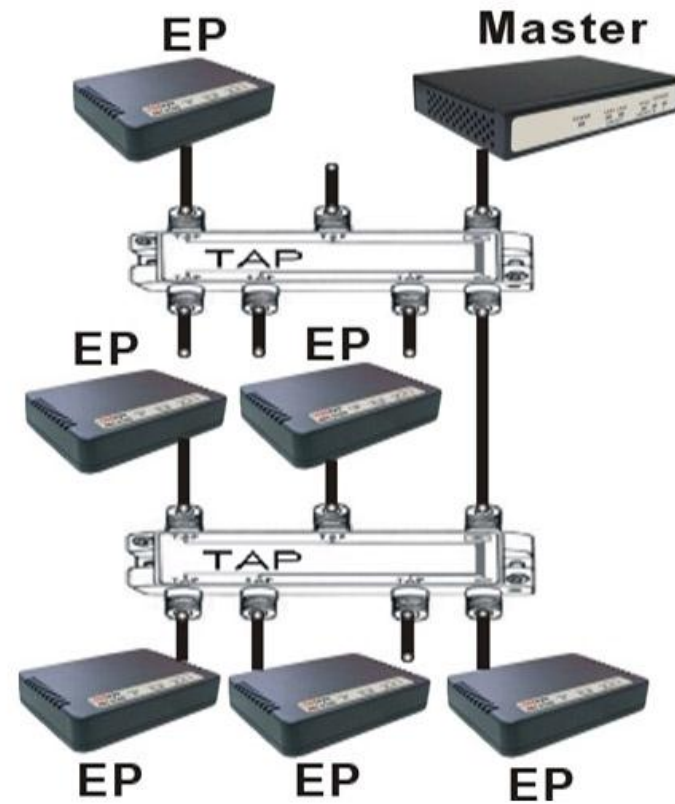
## Installation of the Master

- Connect the Master to the power outlet.
- Connect the Master (coax line) to the main splitter of the building.
- Connect the TV service to the Master TV connection.
- Connect the Broadband or IPTV service to the Master via the LAN (Ethernet) connection.
- If there are any amplifiers in the coax network, check that they are bi-directional and pass the 12-44MHz band. If not, a bypass network must be installed using 2 diplexers (see diagram).
- If there is an apartment which does not have an MDU unit installed and the attenuation between the Master and the (non-HPNA) apartment TV is less than 15dB, an attenuator/ HPF should be installed at the entrance to that apartment/home. (Without this, there will be problems with the TV reception).

Network with Diplexer



Network with TAP



## Verification of Master Installation

- Connect your PC to the Master using Ethernet cable, run 4.6.1 Device Info./Test on the page 36 and check that the details of the Master are listed.
- Still using the PC, open your Internet browser and check if you have Internet access (optional – might require password).
- Check that the TV reception is still clear (no interference).

## Master Troubleshooting

Problem: Device Info./Test fails

- Check to make sure that your PC has a static IP address.
- Check that the power LED and the Ethernet LED are operating. If not, replace the Master.

Problem: Internet access not available

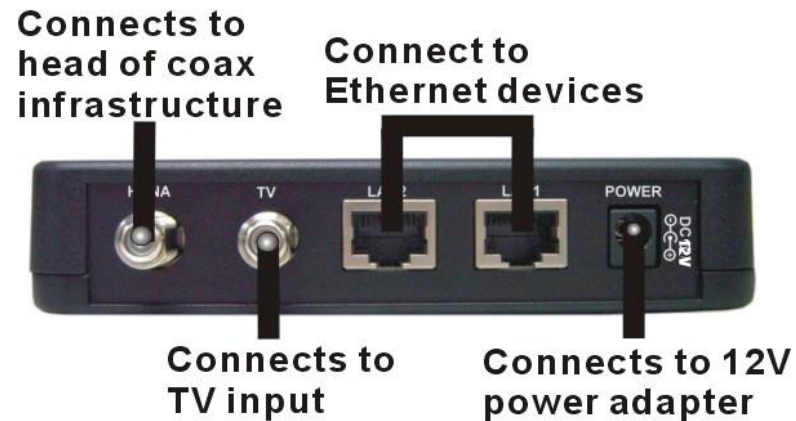
- If no Internet access is available, please check with the service provider.

Problem: TV in the apartment has a poor picture

- If the problem occurred when the Master was connected but without power (electricity), the problem is with the service provider.
- If the problem happens only when the Master is powered on, then a HPF/Attenuator/splitter must be installed between the wall outlet and the TV. Repeat the test to make sure that the TV picture is now clear.

## End Point (EP) Installation:

Before beginning the installation, it is important to survey the installation site.



### Apartment site survey

- If there was a prior MDU installation in the building, check to make sure that there is no HPF connected to the splitter of the specific apartment. If there is a HPF, it should be disconnected before installing the EP.
- Note the location of the main splitter and any secondary splitters. The main splitter usually connects to an outside coax cable.
- Locate the coax connection near where the customer wants the TV (for IPTV applications) and/or where the customer places their computer (for broadband access).
- Check for devices (TVs, etc.) connected directly to coax outlets.

## Pre-Install Inspection

For the fastest and smoothest installation, address any wiring or connector problems before starting the installation.

- Inspect and replace damaged splitters and F-connectors.
- Check every coax connector and splitter. Look for missing components, damaged connectors, corrosion, and/or other problems.
- Replace any damaged splitters.
- Replace damaged and low-quality coax fittings (crimp, screw-in, others).
- Inspect and replace damaged coax cables and wall plates.
- Check every visible coax cable for cracks, nicks, splices, and/or other types of coating or shielding damage.
- Check inside the wall plates for corrosion or poor connections or disconnections.
- Verify that the TV service is clear prior to installing the EP.

## Installation of EP

- Connect the EP to the power outlet. The power LED should be turned ON.
- Connect the EP (coax line) to the wall plate (coax network). The link LED should be turned ON.
- Connect the TV to the EP TV connection.
- Connect the PC/STB to the EP via the LAN (Ethernet) connection.
- Make sure that all coax connections are tight and of good quality and that the coax network in the apartment is in good condition.

## Verification of EP installation

See the section on troubleshooting, if any problems are found.

On Master side

- Check if the Master link LED is ON.
- Run the following tests using the PC:
- Device Info./Test(Refer to 4.6.1 Device Info./Test on the page 36)
- Check to see that all devices appear and have the same firmware version.
- Net Interface Test(Refer to 4.6.1.2 End Point Net Interface Test on the page 39)
- Verify  $PER \leq 1 \times 10^{-5}$  (IPTV) or  $\leq 1 \times 10^{-2}$  (Broadband Access).

On EP side

- Check if your EP link LED is ON.
- Connect to the internet and surf the web. Perform a visual check of each TV to verify good video quality.

## End Point Troubleshooting

- Problem: Device Info./Test / Link LED failure
- Connect the EP directly to the Master with 8dB attenuation and check for a link. If yes, move the EP to the main splitter of the apartment floor and check for a link. If no link, then there is a problem with the coax connection between the Master and the floor and you should continue to debug this by moving closer to the Master with each test.
- If there is a link, then the problem is between the main splitter of the floor and the wall plate in the apartment. Again, you should debug by moving closer to the wall plate with each consecutive test.
- If these tests don't solve the problem, replace the EP and retest.

Problem: Net Interface Test failure

- Tighten all screws and check connectors/jacks/coax cable; replace if necessary.

- Test the Master and EP units back to back with 8dB attenuation. Rx power should receive atleast +8dBm.
- If neither of these actions solves the problem, replace the EP and retest.

Problem: quality LED is yellow (bad connection)

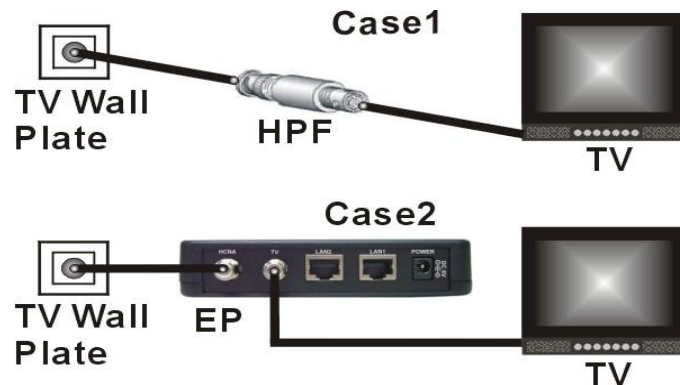
- Wait for 30 seconds. If the quality LED has not changed, check the device if connected properly.
- Tighten all screws and check connectors/jacks/coax cables; replace if necessary. Test the Master and EP units back to back with 8dB attenuation. The quality LED should be Green.
- Check the EP over the coax network until you find the problematic area and fix it. If not change the malfunctioning device.

Problem: No internet access/IPTV service

- If Device Info./Test and Net Interface Test function properly, then the problem is with the service provider. Please check with them to verify that the service is operational.

Problem: Quality of TV Picture is Poor

- (Case 1): In case that TV is not connected directly to the EP, add a HPF or connect the TV directly to the EP's TV connector.
- (Case 2): In case the TV connects directly to the EP and the TV picture is still poor, replace the EP.
- If there are still problems with the TV picture after replacing the EP, then check the connection with the service provider.





## Before leaving

- (Master unit only) Rerun Device Info./Test and Net Interface Test and service tests (TV reception). These tests ensure the performance of the full MDU network.
- When running Device Info./Test , make sure you see all units.
- When running Net Interface Test, make sure the PER is less than  $10e-5$  and that the rates are equal to or higher than 128Mbps.

## Warranty

The original owner that the product delivered in this package will be free from defects in material and workmanship for one year parts after purchase.

There will be a minimal charge to replace consumable components, such as fuses, power transformers, and mechanical cooling devices. The warranty will not apply to any products which have been subjected to any misuse, neglect or accidental damage, or which contain defects which are in any way attributable to improper installation or to alteration or repairs made or performed by any person not under control of the original owner.

The above warranty is in lieu of any other warranty, whether express, implied, or statutory, including but not limited to any warranty of merchantability, fitness for a particular purpose, or any warranty arising out of any proposal, specification, or sample. We shall not be liable for incidental or consequential damages. We neither assume nor authorize any person to assume for any other liability.



**WARNING:**  
DO NOT TEAR OFF OR REMOVE THE WARRANTY STICKER AS SHOWN, OR THE WARRANTY IS VOID.