

xtramus

**NuPOE-M16EL
User's Manual**



Foreword

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Revision History

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2015/03/06	1.0	First version
2015/05/19	1.1	Add the description of cascading function
2020/02/26	1.2	Change APMPT-4 to NuApps-MultiUnits-RM
2020/03/20	1.3	Update webpage description.



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1 NuPOE-M16EL Overview

1.1 General Descriptions of NuPOE-M16EL

NuPOE-M16EL is a chassis especially designed for Power over Ethernet (PoE) tests. NuPOE-M16EL offers a prompt and flexible interface to test and monitor different Ethernet power sourcing equipment.

Usually, NuPOE-M16EL is used in combination with the PD simulation modules, which are inserted in the chassis. And up to 16 modules can be supported at one time per chassis. For complete PoE testing solution, Xtramus provides XL-T451 module as the PD simulation module. With the XL-T451 module, NuPOE-M16EL realizes the complete PoE test solution. Also the XL-T451 module can bypass the traffic from the PSE to a packet generator for traffic analysis.





1.2 Features, Key Advantages, and Main Applications of NuPOE-M16EL

Features

- Specialized equipment for production testing of PSE.
- Support cascade of multiple chassis.
- Support Alternative A or B PoE wiring mode.
- Support all 5 power classes (0~4) with one XL-T451 module.
- Integrate PoE Connect, Disconnect, Overload, Short Circuit and Dynamic Loading tests.
- Support up to 45 Watt for loading & overload tests.
- IEEE802.3af and IEEE802.3at compliant.
- Support LLDP.

Key Advantages

- Robust design and abundant ventilation for high power PoE testing requirements, and provide the integrated testing solution for PoE and traffic tests.
- Direct measurements of power, current and voltage.
- Support up to 16 XL-T451 modules per chassis.
- Support up to 45 Watt loading per port.
- Attached with user friendly software to simplify the testing process.
- Small size and able to be cascaded for test of mass production.

Main Applications

- Measurements for PSE Basic parameters.
- PSE conformance test.
- Fast, simple, and effective test program used in production lines.



1.3 Specifications

Model Name		NuPOE-M16EL	
Interfaces	Ethernet: RJ45 connector	Power: Male IEC 320 receptacle	
Ethernet Speed	Support 10/100/1000 Mbps		
Standard	IEEE 802.3-2005 Clause 33 (IEEE802.3af), IEEE802.3at		
Tests	<ul style="list-style-type: none">> Dynamic Loading test> PoE Connect test> PoE Disconnect test> PoE Overload test> PoE Short Circuit test		
Hardware Information			
Dimension	441 mm x 230 mm x 167 mm		
Temperature*	Operating: 0°C~ 40°C (32°F~ 104°F)		Storage: 0°C~ 50°C (32°F~ 122°F)
Humidity	Operating: 0% ~ 85% RH(non-condensing)		
Power Source	AC 100 to 240 V, 47 to 63 Hz		

Note: If the core temperature of [XL-T451](#) reaches 95 °C, the module will halt to avoid overheating damage. And NuPOE-M16EL will alarm when its temperature reaches 90°C. If overheating alarm occurs, please stop the test and reactivate until the temperature cools down to the room temperature. If successive overheating alarms occur, please consider lowering the ambient temperature, load power or load time.

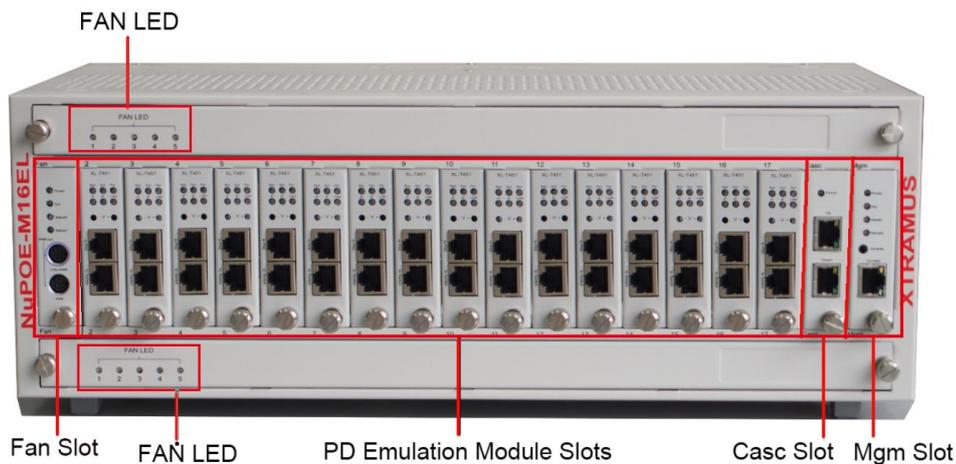


2 Hardware Description

This section describes the general information of the hardware interfaces of the NuPOE-M16EL chassis and its modules.

2.1 Chassis

NuPOE-M16EL has 16 slots for installation of the PD emulation modules ([XL-T451](#)), 1 Fan slot, 1 Casc slot and 1 Mgm slot. Besides, there are two arrays of FAN LEDs, up and down on the panel, to show the running statuses of the fans installed on the top and bottoms of the chassis, respectively. You can see the number or the name of the slot clearly on the front panel. The front panel of NuPOE-M16EL is shown as below.



NuPOE-M16EL Slots	
Fan Slot	Slot for installing XL-SFAN .
PD Emulation Module Slots	16 slots, from slot2 to slot17, for installing XL-T451 .
Casc	Slot for installing XL-CASC .
Mgm Slot	Slot for installing XL-M667 .

Warning: XL-SFAN, XL-T451, XL-CASC, and XL-M667 do not support hot-swap. Do not draw them out of the chassis when the system is power on.



2.2 Modules

2.2.1 XL-T451 Module

XL-T451 is a module specially designed for the NuPOE-M16EL chassis, acting as a PD (powered device) in the test. One NuPOE-M16EL chassis can contain 16 XL-T451 modules at most, from Slot2 to Slot17, which are supposed to simulate 16 PDs.

The main functions of XL-T451 module are described as follows:

- **PoE test:** this is the basic function of XL-T451. In this case, XL-T451 acts like a PD, which loads power from the PSE (DUT). The test result will be analyzed and displayed by the accompany software, namely NuApps-MultiUnits-RM currently.
- **Bypass:** Usually, the test solution is to conduct the PoE test and the traffic tests together, such as the layer2 or layer3 tests. When switching to the traffic tests, XL-T451 will directly forward the data to the downstream device, usually a packet generator.
- **Power supply mode indicator:** when the test system is connected properly and powered on, XL-T451 will check the type of the PSE and indicate it by the af/at LEDs on the top of its front panel.





XL-T451 Panel Information		
LED	Bypass	<ul style="list-style-type: none"> Green on: the system is in bypass mode. Off: the system is in PoE test mode or the power is off.
	Sys	<ul style="list-style-type: none"> Green on: the system is running normally. Red on: the system is in fault. Green-red blinking: the system is in firmware/software upgrading.
	at	<ul style="list-style-type: none"> Green on: the type of PSE is 802.3 at.
	af	<ul style="list-style-type: none"> Green on: the type of PSE is 802.3 af.
	Load	<ul style="list-style-type: none"> Green on: the system is in power loading.
Note: All LEDs will be off when upgrading FPGA/Firmware.		
RJ45 Ports	Power	PoE test is running.
	Data	Traffic test is running.
Voltage Pin	V+/V-	<p>The V+/V- pin provides the user an interface to directly measure the supply voltage of the PSE by using a voltage meter.</p> <p>Warning: During the power loading tests, don't touch the two pins at the same time, or you may suffer electric shock.</p>
XL-T451 Network Specification		
Data Transfer Rate	1000 Mbps	
Ethernet Mode	10Base-T, 100BASE-TX, and 1000BASE-T	

Warning: XL-T451 does not support hot-swap. Please do not draw out the XL-T451 module when the system is power on.



2.2.2 XL-CASC Module

Though XL-CASC module, you can cascade multiple NuPOE-M16EL chassis together. In that way you can manage and operate multiple NuPOE-M16EL chassis simultaneously. The XL-CASC module should be installed in the **Casc** slot of the NuPOE-M16EL chassis.

To cascade the NuPOE-M16EL, please inter-connect the **Up** port or **Down** port of the chassis to be cascaded with the RJ45 cables. For more information, please refer to [Cascade of Multiple NuPOE-M16EL Chassis](#).



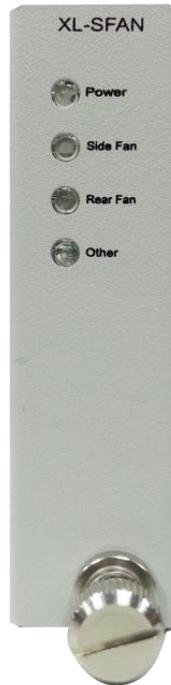
XL-CASC Panel Information		
LED	Power	<ul style="list-style-type: none">● Green on: NuPOE-M16EL is power on.● Off: NuPOE-M16EL is power off.
Ports	Up	For cascading another NuPOE-M16EL chassis.
	Down	For cascading another NuPOE-M16EL chassis.

Warning: XL-CASC does not support hot-swap. Please do not draw out the XL-CASC module when the system is power on.



2.2.3 XL-SFAN Module

XL-SFAN provides ventilation for the NuPOE-M16EL chassis. And XL-SFAN should be installed in the **Fan** slot of the NuPOE-M16EL chassis.



XL-SFAN Panel Information		
LED	Power	<ul style="list-style-type: none"> ● Green on: SFAN is power on. ● Off: SFAN is power off.
	Side Fan	<ul style="list-style-type: none"> ● Green on: SFAN is running normally. ● Orange blinking: the SFAN rotates too slowly, or even not rotating.
	Rear Fan	<ul style="list-style-type: none"> ● Green on: SFAN is running normally. ● Orange blinking: SFAN rotates too slowly, or even not rotating.
	Other	<p>Except the Side Fan and Rear Fan, NuPOE-M16EL is embedded with the two arrays of fans, respectively on the top and bottom panels. Here, we call them Other Fans.</p> <ul style="list-style-type: none"> ● Green on: all of the Other Fans are running normally. ● Orange blinking: any of the Other Fans rotates too slowly, or even not rotating

Warning: XL-SFAN does not support hot-swap. Please do not draw out the XL-SFAN module when the system is power on.



2.2.4 XL-M667 Module

XL-M667 allows you to manage NuPOE-M16EL via the management webpage or operates NuPOE-M16EL via the accompany software. XL-M667 shall be installed on the **Mgm** slot of NuPOE-M16EL chassis.



XL-M667 Panel Information		
LED	Power	<ul style="list-style-type: none">Green on: XL-M667 is power on.Off: SFAN is power off.
	Sys	<ul style="list-style-type: none">Yellow on: XL-M667 is booting and preparing for test.Green on: XL-M667 is booting properly and is ready for test.Off: XL-M667 is power off.
	Master	Reserved for future use.
	Remote	<ul style="list-style-type: none">Green on: Mgm Port is connected to the local network and the chassis can be managed through any PC on the network.
Ports	Console	One 2.5mm Phone Jack Port for managing NuPOE-M16EL via serial port
	10/100M	This is the Mgm Port -10/100M RJ45 Port for managing NuPOE-M16EL via management webpage

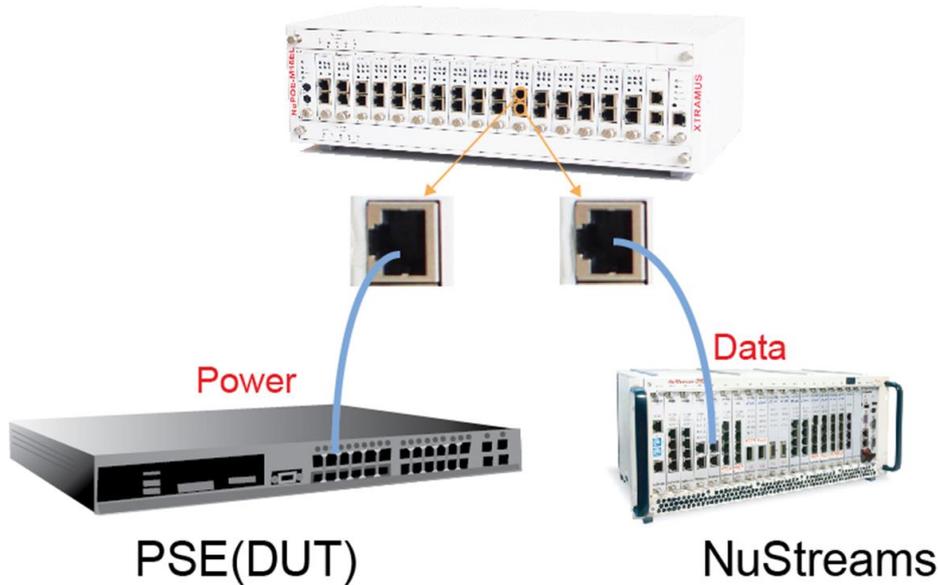
Warning: XL-M667 does not support hot-swap. Please do not draw out the XL-M667 module when the system is power on.



3 Basic Application Illustration

3.1 Test Traffic and PoE Performance Simultaneously

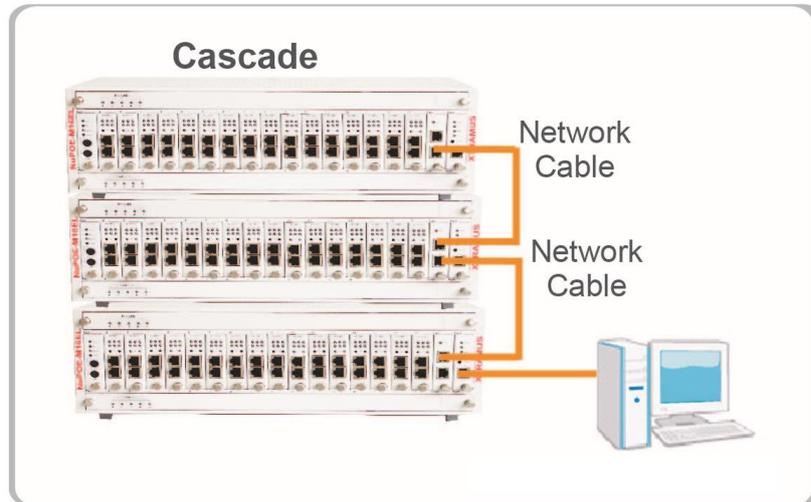
Below is the illustration to the traffic and PoE performance of the DUT simultaneously. In this case, the PSE is connected to the “Power” port of NuPOE_M16EL and the NuStreams chassis is connected to the “Data” port of NuPOE_M16EL. For PoE tests, XL-T451 modules in the NuPOE-M16EL chassis act as PDs loading power from the PSE. For traffic tests, XL-T451 modules bypass the data flow to the packet generator, such as NuStream-2000i.





3.2 Cascade of Multiple NuPOE-M16EL Chassis

Several NuPOE-M16EL can be cascaded and controlled by one PC for test of mass production. The cascade is made by connecting the “Up” and “Down” port on the XL-CASC module of each chassis mutually, shown as the picture down below. Then connect the Manage Port of any of the chassis. And you can manage and operate all the chassis simultaneously.

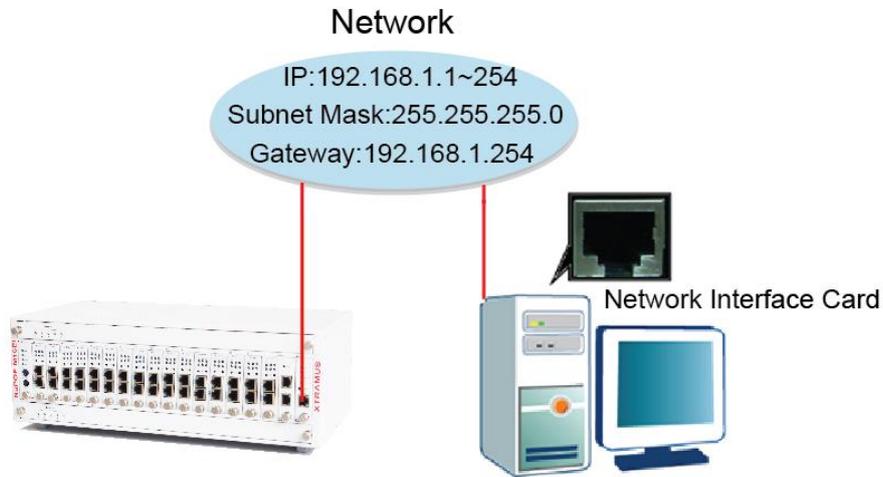


Note: don't connect multi Mgm Ports to the same network segment, or IP conflict may occur. The operation of the chassis might be incorrect.



3.3 Connect to PC for Web Management

To configure the settings and check the running status of NuPOE-M16EL on the web browser, please connect the **Mgm** port of the XL-M667 module to the NIC of the PC, shown as the picture down below.



And you can set the IP, Subnet Mask and Gateway of the NuPOE-M16EL. For more information, please refer to [IP Settings](#).

Since NuPOE-M16EL chassis can be cascaded (refer to [Cascade of Multiple NuPOE-M16EL Chassis](#)), multiple chassis can be managed simultaneously just by connecting the **Mgm** port of one chassis to the PC, shown as the picture down below.





4 Software

There is no control button on NuPOE-M16EL, and all operations need to be done by utility software that runs in Windows system. PC with the utility controls the NuPOE-M16EL via a network cable.

Xtramus provides NuApps-MultiUnits-RM as the accompany utility for PoE tests.

NuApps-MultiUnits-RM: A utility software that displays up to 8 independent windows in 1 user interface, where each window can run different settings with an independent DUT (Device Under Test). All tests of network devices can be pre-configured and arranged in sequential on NuApps-MultiUnits-RM. Accurate and real-time reports show the performance of the DUT in all aspects.

By the control of NuApps-MultiUnits-RM, NuStreams chassis can do the traffic test and PoE test simultaneously.

For detailed information about how to operate the PoE test on NuApps-MultiUnits-RM, refer to NuApps-MultiUnits-RM USM.



5 NuPOE-M16EL Management

You can configure the settings and check the running status of NuPOE-M16EL on the web browser.

5.1 Access to NuPOE-M16EL's Management Webpage

Before accessing to NuPOE-M16EL's management webpage, please properly connect the PC with NuPOE-M16EL and rightly configure the IP address. Please refer to [Connect to PC for Web Management](#) for details. The default IP address is **192.168.1.8**.

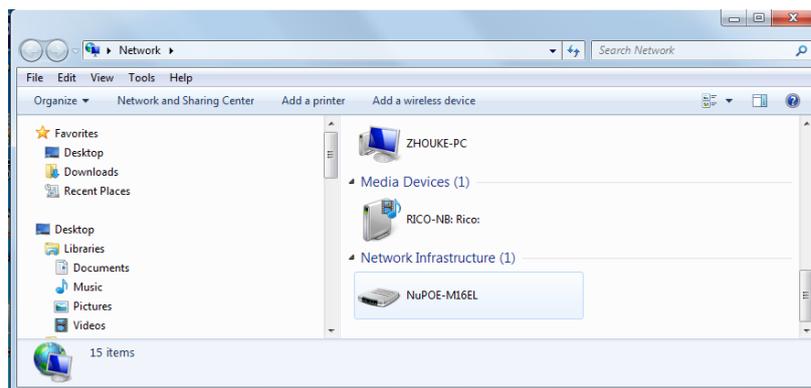
5.1.1 Access with IP address

To access NuPOE-M16EL's management webpage, please open your web browser, and type in NuPOE-M16EL's default IP address (**192.168.1.8**) in the web browser's URL field.

Note: If you've changed NuPOE-M16EL's IP address, please use the IP address you've changed to.

5.1.2 Access with Network

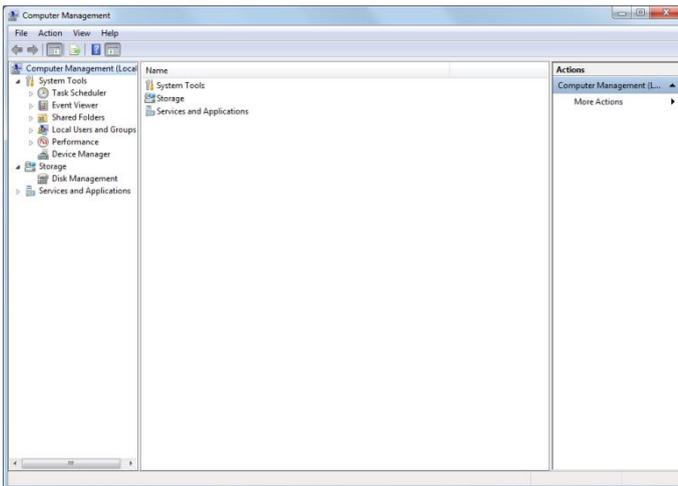
You can access the NuPOE-M16EL's management webpage through the **Network** function provided by windows (windows XP, windows7 or versions above). Click **Network** of the operation system, you can see the NuPOE-M16EL is listed. Then click the icon of the NuPOE-M16EL device to enter the management webpage.



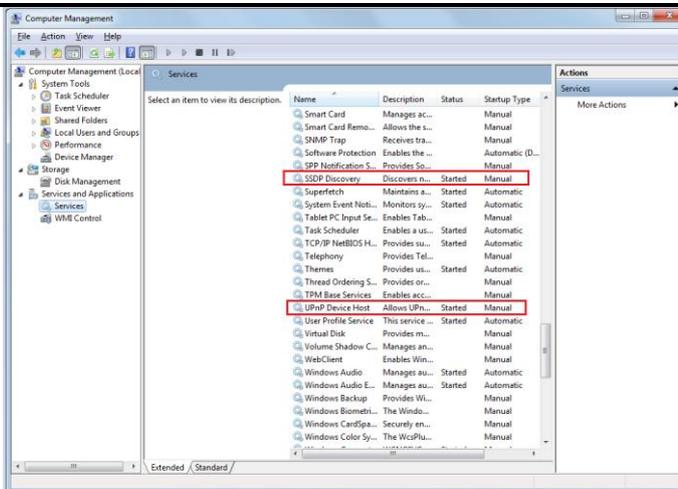
If you can't find the NuPOE-M16EL, you can reset the UPnP settings and then check whether the NuPOE-M16EL device is listed again. This method is very convenient if you forget the IP address you've set or under the condition of not connecting to the console.



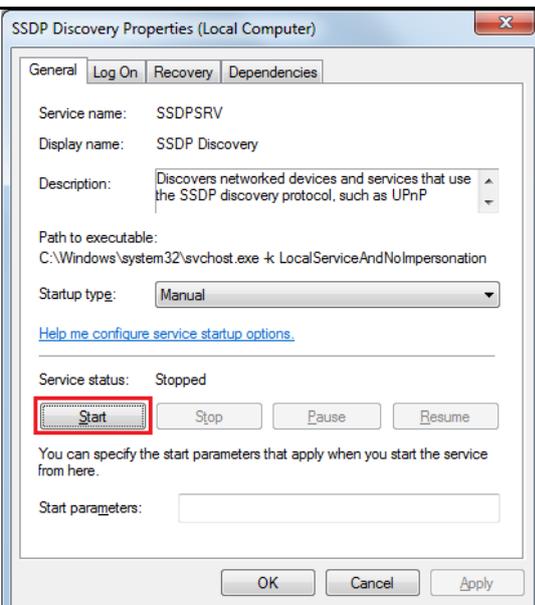
Reset the UPnP service and enter the NuPOE-M16EL's management webpage



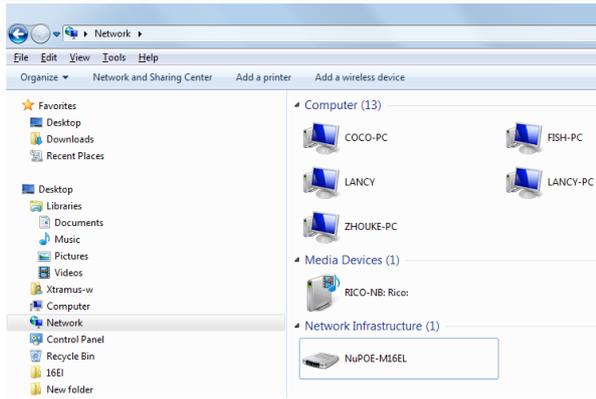
Right-click **Computer>manage** to enter the **Computer Management** interface.



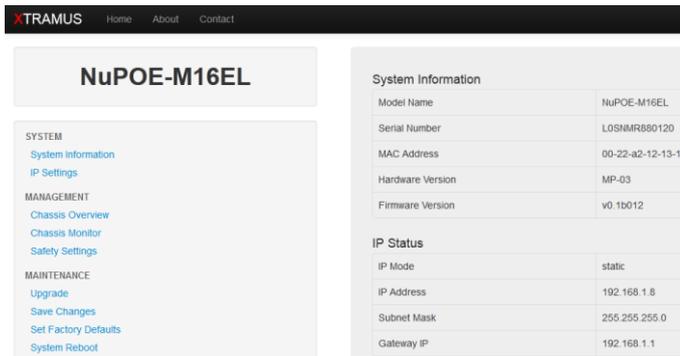
Click **Services and Applications>Services**, then the available services will be listed in the middle pane. Ensure that the “SSDP Discovery” and “UPnP device Host” are started. If the service is not started, double click it and a window will pop up. Then click **start** to activate the service. The picture just takes the **SSDP Discovery Properties** window for an example.



Click **Start** to enable UPnP service.



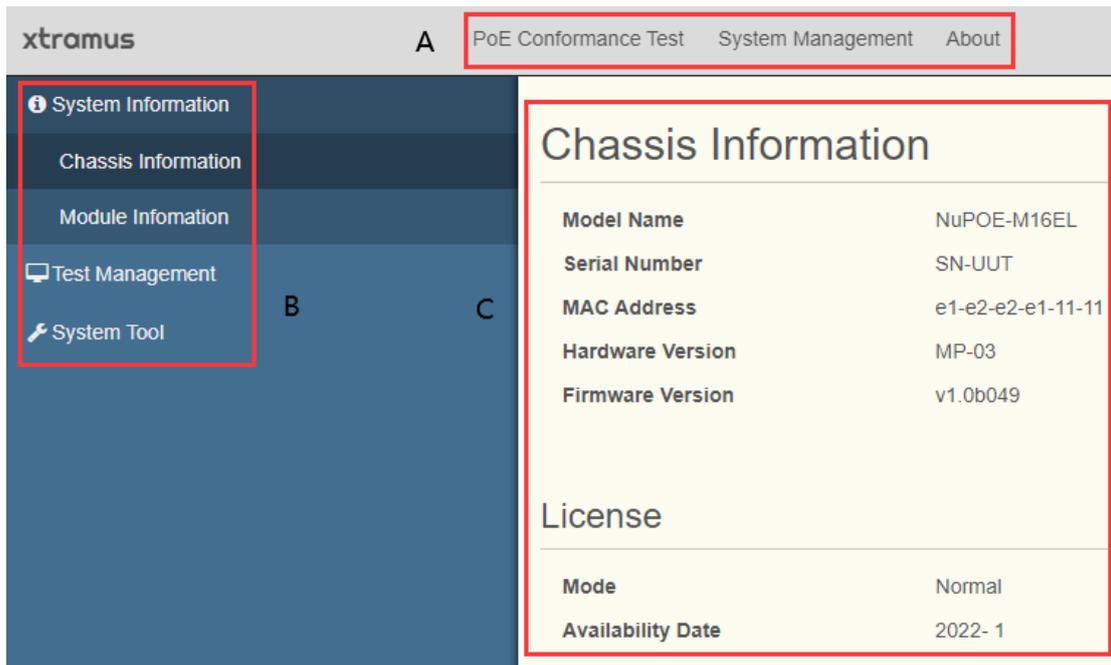
Go to **Network**. You can see the “NuPOE-M16EL” device is listed. If you cannot see the “NuPOE-M16EL”, please turn off your firewall and then try again.



Double click the icon of “NuPOE-M16EL” to enter the management webpage.



5.2 Overview of NuPOE-M16EL Management Webpage



NuPOE-M16EL Management Webpage Overview		
A	Menu Bar	<ul style="list-style-type: none"> • PoE Conformance Test: Reserved. • System Management: View Chassis information. • About: Brief introduction of NuPOE-M16EL.
B	Setting Options	<p>The Setting Options contains options for NuPOE-M16EL settings, information, and statistics, which can be divided into:</p> <ul style="list-style-type: none"> • System Information: You can view system information here in this field. • Test Management: This option allows you to view the chassis status, fan speed and module temperature. • System Tool: This option allows you to set IP, upgrade the firmware/FPGA, save the settings, reset to factory defaults and reboot chassis.
C	Main Display Screen	The Main Display Screen displays the detailed information of the above setting options.



5.3 NuPOE-M16EL management Webpage – System Information

The management page provides two information interfaces: **Chassis Information** and **Module Information**. You can access to the two interfaces by click the links at the upper left corner.

The screenshot shows the xtramus management interface. The top navigation bar includes 'xtramus', 'PoE Conformance Test', 'System Management', and 'About'. The left sidebar contains 'System Information', 'Chassis Information', 'Module Information', 'Test Management', and 'System Tool'. The 'Chassis Information' section is highlighted, showing the following details:

Model Name	NuPOE-M16EL
Serial Number	SN-UUT
MAC Address	e1-e2-e2-e1-11-11
Hardware Version	MP-03
Firmware Version	v1.0b049

The 'License' section shows the following details:

Mode	Normal
Availability Date	2022- 1



5.3.1 Chassis Information

Chassis Information	
Model Name	NuPOE-M16EL
Serial Number	SN-UUT
MAC Address	e1-e2-e2-e1-11-11
Hardware Version	MP-03
Firmware Version	v1.0b049

License	
Mode	Normal
Availability Date	2022- 1

Chassis Information displays NuPOE-M16EL' chassis information including:

Chassis Information	
Model Name	The model of the chassis
Serial Number	NuPOE-M16EL's serial number.
MAC Address	NuPOE-M16EL's MAC address.
Hardware Version	PCB version of the management module.
Firmware Version	NuPOE-M16EL's current firmware version.
License	
Mode	This field displays NuPOE-M16EL's license mode, it can be Normal or Evaluation .
Availability Date	Users can operate NuPOE-M16EL normally before this date.



5.3.2 Module Information

Module Information								
#	Name	FW Ver.	FPGA Ver.	PROM Ver.	HW Ver.	Lock Status	Serial No.	MAC Address
2	XL-T451	v0.9b003	v0.9b169	v0.1b005	MP-06	unlock	0PNST4510057	00-22-a2-3c-80-48
3	XL-T451	v0.9b003	v0.9b169	v0.1b005	MP-06	unlock	0PNST4510058	00-22-a2-3c-80-49
4	XL-T451	v0.9b024	v0.9b169	v0.1b005	MP-09	unlock	0QNST4510031	00-22-a2-3c-80-7c
5	XL-T451	v0.9b025	v0.9b169	v0.1b005	MP-06	unlock	SD1031003	00-22-a2-10-00-03
6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
7	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
8	XL-T451	v0.9b024	v0.9b169	v0.1b005	MP-09	unlock	0QNST4510010	00-22-a2-3c-80-67
9	XL-T451	v0.9b024	v0.9b169	v0.1b005	MP-06	unlock	0OT451001734	00-22-a2-3c-80-08
10	XL-T451	v0.9b024	v0.9b169	v0.1b005	MP-06	unlock	0OT451002334	00-22-a2-3c-80-0e
11	XL-T451	v0.9b029	v0.9b188	v0.1b005	MP-09	unlock	0QNST4510046	00-22-a2-3c-80-8b
12	XL-T451	v0.9b030	v0.9b188	v0.1b005	MP-09	unlock	0PT451006711	00-22-a2-3c-80-54

This screen displays the detailed information of the module, including the slot number, module name, firmware version, FPGA version, PROM version, hardware version, lock status, serial number and MAC address.



5.4 NuPOE-M16EL management Webpage – Test Management

There are 3 options available for **Test Management**, including **Chassis Viewer**, **Chassis Monitor**, and **Module Power Control**.

5.4.1 Chassis Viewer

This page can display the modules installed in the NuPOE-M16EL chassis and show the status of the modules. The page is shown as follows.



Chassis Viewer	
A	Name of the module
B	Display the operation status of each XL-T451 module and the type of PSE (af/at).
C	Display the communication status of the modules: when the module is in normal state, the RJ45 port is like  ; when the module is in fault, the RJ45 port is like 



5.4.2 Chassis Monitor

This page is used to check the fan speed and the temperature of each module.

Chassis Monitor

Fan Speed

Fan Speed	#1	#2	#3	#4	#5	#6	#7	#8	#9
RPM	0	0	0	0	0	2391	2957	2297	2233

Module Temperature

Module Temperature	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12
°C	31	32	33	34	n/a	n/a	33	33	32	32	32

Chassis Monitor	
Fan Speed	This area displays the speed of each fan. If the fan speed is abnormal, the background color will be red.
Module Temperature	This area displays the temperature of each module with the unit of centigrade(°C).



5.4.3 Module Power Control

This page allows the user to switch on and off the power of each slot.

Module Power Control

Single-Module Power Switch

Slot	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Power	ON <input checked="" type="checkbox"/>	OFF <input type="checkbox"/>	ON <input checked="" type="checkbox"/>	ON <input checked="" type="checkbox"/>												

Click the checkbox and click Apply.



5.5 NuPOE-M16EL management Webpage – System Tool

5 options are available in the **System Tool** configuration webpage: **IP Setting**, **FPGA/FW Upgrade**, **Save Changes**, **Set to Factory Default** and **System Reboot**.

5.5.1 IP Setting

IP Setting: Allows you to set how NuPOE-M16EL will acquire its IP, subnet mask, and gateway addresses. Also, you could input these addresses manually here.

Click IP Setting, the following screen appears.

IP Setting	
Mode	You can choose how NuPOE-M16EL acquires its IP, subnet mask, and gateway addresses. There are two modes available: <ul style="list-style-type: none"> • Static: Input NuPOE-M16EL’s IP, subnet mask, and gateway addresses manually in the fields down below. • Dynamic: NuPOE-M16EL acquires its IP, subnet mask, and gateway addresses automatically from network’s DHCP server.
IP Address	Specify NuPOE-M16EL’s IP address here in this field. Note: The default IP address for NuPOE-M16EL is 192.168.1.8.
Subnet Mask	Specify NuPOE-M16EL’s subnet mask here in this field.
Gateway	Specify NuPOE-M16EL’s gateway address here in this field.
Apply	Apply the changes.



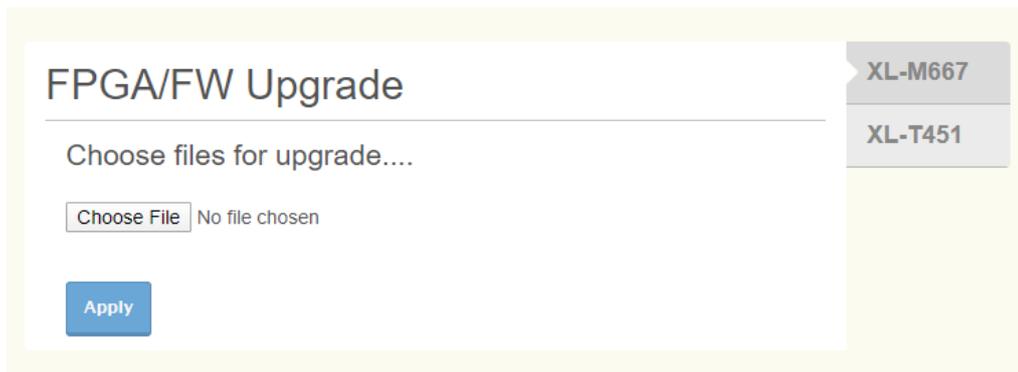
5.5.2 FPGA/FW Upgrade

This function is used to upgrade the firmware/FPGA of the management module (XL-M667) and the XL-T451 modules. There are 2 modes for this function, including **Upgrade XL-M667** and **Upgrade XL-T451**.

Note: The Upgrade function doesn't support cascading. You need to directly connect the PC with the manage port of the specified chassis with a network cable. Only the modules inserted in this chassis can be upgraded.

5.5.2.1 Upgrade XL-M667

This mode is to upgrade the firmware/FPGA of the management module (XL-M667).



Upgrade XL-M667	
Choose File	Click the Choose File button to choose the firmware file for upgrading. XL-M667's firmware file is in the format of "*.bin" .
Apply	Click this button to start upgrading firmware of XL-M667 module.



5.5.2.2 Upgrade XL-T451

This mode is used to upgrade the firmware or FPGA of XL-T451 modules.

FPGA/FW Upgrade

Choose cards and files for upgrade...

2 3 4 5 6 7 8
 9 10 11 12 13 14 15
 16 17

Bin Type: Firmware FPGA

No file chosen

UpgradeXL-T451	
Choose Cards	Select the modules for firmware/FPGA upgrading.
Bin Type	Select which one to upgrade, Firmware or FPGA .
Choose File	Click the Choose File button to choose the firmware or FPGA file for upgrading. NuPOE-M16EL's firmware and FPGA files are in the format of "*.bin" .
Apply	Click this button to start upgrading.



5.5.3 Save Changes

Save Changes

All the settings and alterations you've just made will be saved!

Save Changes	
Save	If you don't save the settings you've made via NuPOE-M16EL's management webpage, all settings will be lost after rebooting NuPOE-M16EL. Click the " Save " button to save the settings.



5.5.4 Set to Factory Default

Set to Factory Default

System will restore all settings to default settings! All data and previous settings will be lost after restore to default settings.

Restore

Set to Factory Default	
Restore	Set all settings to default by clicking the “ Restore ” button.



5.5.5 System Reboot

System Reboot

System will reboot! All unsaved data/settings will be lost after system reboot.

Reboot

System Reboot	
Reboot	Reboot NuPOE-M16EL by clicking the “ Reboot ” button. Please note that all unsaved settings will be lost after system reboot.