



# **8000 Series User's Manual**

***Release 1.2***

**NPORT Networks, INC.**

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## ABOUT THIS GUIDE

This guide provides instructions to install the NPort Gigabit Ethernet WebSmart Switch **N1-8016/N1-8024/N1-8074**, how to use the Web Utility, and to configure Web-based Management step-by-step.

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**Note:** The model you have purchased may appear slightly different from the illustrations shown in the document. Refer to the Product Instruction and Technical Specification sections for detailed information about your switch, its components, network connections, and technical specifications.\*

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This guide is mainly divided into three parts:

- Hardware Installation: Step-by-step hardware installation procedures.
- Getting Started: A startup guide for basic switch installation and settings.
- Configuration: Information about the function descriptions and configuration settings.

### 1.1 Terms/Usage

In this guide, the term “Switch”(first letter capitalized) refers to the WebSmart Switch, and “switch”(first letter lower case) refers to other Ethernet switches. Some technologies refer to terms “switch”, “bridge”and “switching hubs”interchangeably, and both are commonly accepted for Ethernet switches.

A **NOTE** indicates important information that helps a better use of the device.

A **WARNING** indicates potential property damage or personal injury.

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## **PRODUCT INTRODUCTION**

Thank you and congratulations on your purchase of NPort WebSmart Switch Products. NPort's WebSmart Ethernet switch series blends plug-and-play simplicity with exceptional value and reliability for small and medium-sized business (SMB) networking. All models are housed in a new style rack-mount metal case with easy-to-view front panel diagnostic LEDs.

The brand-new N1-8016/N1-8024/N1-8074 are born to be green by design of IEEE 802.3az Energy Efficient Ethernet compliant (abbreviated as EEE) and NPort Green Technologies. It allows significant power saving during periods of low data activity. In most of use cases and environments, switches are idle in 90% or more of time. While no traffic in a short period of time, ports on these switches get into power saving mode automatically. Once if a packet is received, the switch wakes and works immediately. Connecting to EEE compliant devices, such as PCs and servers, the network can save energy without compromising any performance. While connecting to legacy devices which do not support IEEE 802.3az, NPort Green Technologies can reduce power consumption by detecting short cable and link-down devices.

### **2.1 N1-8016**

16-Port 10/100/1000Mbps WebSmart Switch

#### **2.1.1 Front Panel**

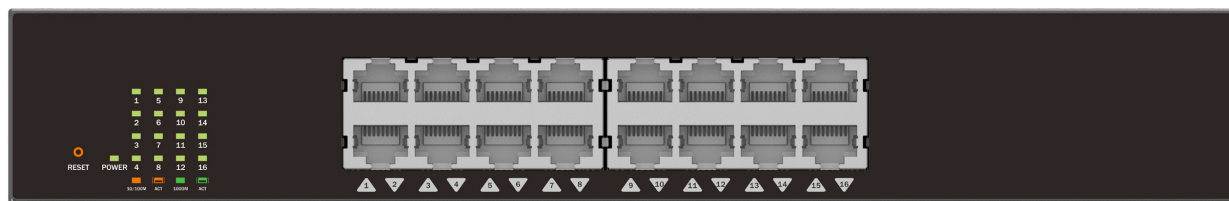


Fig. 2.1: N1-8016 Front Panel

**Power LED:** The Power LED lights up when the Switch is connected to a power source.

**Link/Act/Speed LED (Ports 1-16):**

- Flashing: Indicates a network link through the corresponding port.
- Blinking: Indicates that the Switch is either sending or receiving data to the port.
- Green: Indicates that the port is running at 1000M.

- Amber: Indicates that the port is running at 10/100M.
- Light off: No link.
- Reset: By pressing the Reset button for 5 seconds the Switch will change back to the default configuration and all changes will be lost.

### 2.1.2 Rear Panel

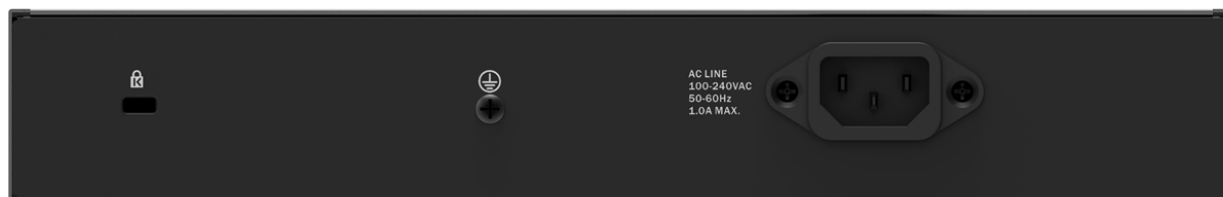


Fig. 2.2: N1-8016 Rear Panel

**Power:** The power port is where to connect the AC power cord.

## 2.2 N1-8024

24-Port 10/100/1000Mbps WebSmart Switch

### 2.2.1 Front Panel

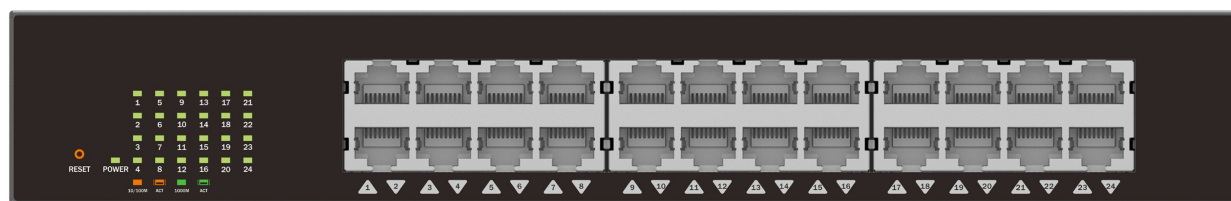


Fig. 2.3: N1-8024 Front Panel

**Power LED:** The Power LED lights up when the Switch is connected to a power source.

Link/Act/Speed LED (Ports 1-24):

- Flashing: Indicates a network link through the corresponding port.
- Blinking: Indicates that the Switch is either sending or receiving data to the port.
- Green: Indicates that the port is running at 1000M.
- Amber: Indicates that the port is running at 10/100M.
- Light off: No link.
- Reset: Press the reset button for 5 seconds to reset the Switch back to the default settings. All previous changes will be lost.



## 2.2.2 Rear Panel



Fig. 2.4: N1-8024 Rear Panel

**Power:** Connect the supplied AC power cable to this port.

## 2.3 N1-8074

24-Port 10/100/1000Mbps WebSmart PoE Switch

### 2.3.1 Front Panel

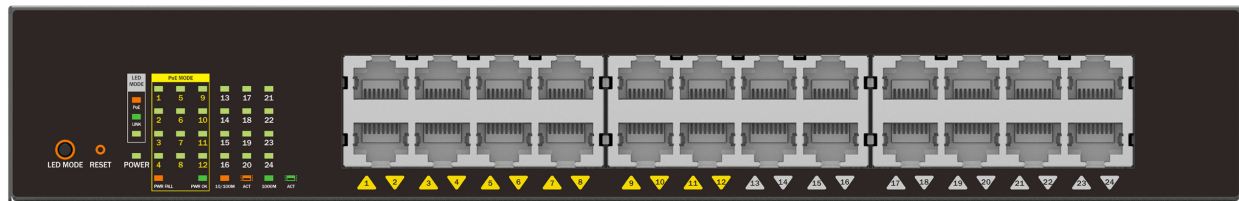


Fig. 2.5: N1-8074 Front Panel

**Power LED:** The Power LED lights up when the Switch is connected to a power source.

**Link/Act/Speed LED (Ports 1-24):**

- Flashing: Indicates a network link through the corresponding port.
- Blinking: Indicates that the Switch is either sending or receiving data to the port.
- Green: Indicates that the port is running at 1000M.
- Amber: Indicates that the port is running at 10/100M.
- Light off: No link.
- Reset: Press the reset button for 5 seconds to reset the Switch back to the default settings. All previous changes will be lost.

### 2.3.2 Rear Panel



Fig. 2.6: N1-8074 Rear Panel

**Power:** Connect the supplied AC power cable to this port.

## **HARDWARE INSTALLATION**

This chapter provides unpacking and installation information for the NPort WebSmart Switch.

### **3.1 Step 1: Unpacking**

Open the shipping carton and carefully unpack its contents. Please consult the packing list located in the User Manual to make sure all items are present and undamaged. If any item is missing or damaged, please contact your local NPort reseller for replacement.

Packing contents of N1-8016/N1-8024/N1-8074

- One NPort WebSmart Switch
- One AC power cord
- Four rubber feet
- Screws and two mounting brackets
- One accessory kit for a ground screw
- One Multi-lingual Getting Started Guide

If any item is found missing or damaged, please contact the local reseller for replacement.

### **3.2 Step 2: Switch Installation**

**For safe switch installation and operation, it is recommended that you:**

- Visually inspect the power cord to see that it is secured fully to the AC power connector.
- Make sure that there is proper heat dissipation and adequate ventilation around the switch.
- Do not place heavy objects on the switch.

#### **3.2.1 Desktop or Shelf Installation**

When installing the switch on a desktop or shelf, the rubber feet included with the device must be attached on the bottom at each corner of the device's base. Allow enough ventilation space between the device and the objects around it.

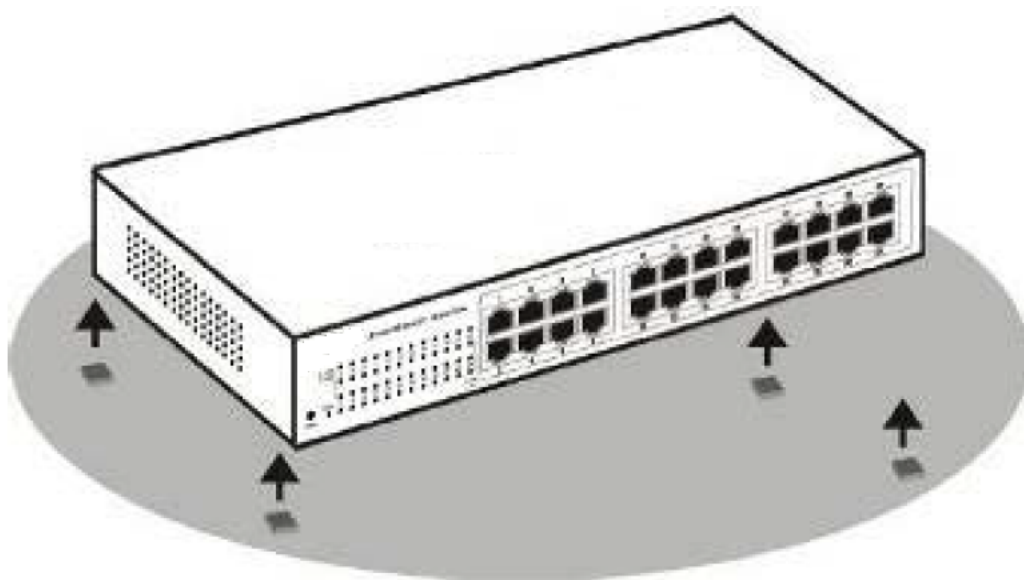


Fig. 3.1: Attach the adhesive rubber pads to the bottom

### 3.2.2 Rack Installation

The switch can be mounted in an EIA standard size 11-inch rack, which can be placed in a wiring closet with other equipment. To install, attach the mounting brackets to the switch's side panels (one on each side) and secure them with the screws provided (please note that these brackets are not designed for palm size switches).

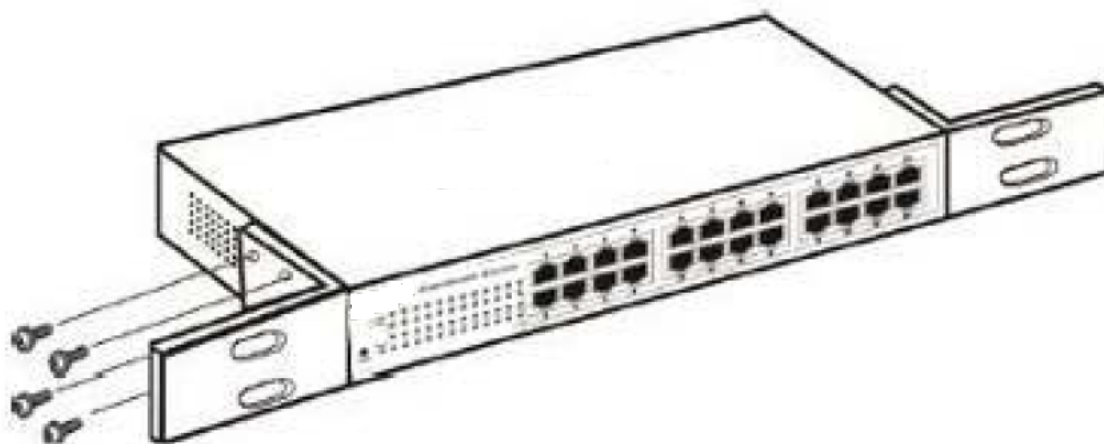


Fig. 3.2: Attach the mounting brackets to the Switch

Then, use the screws provided with the equipment rack to mount the switch in the rack.

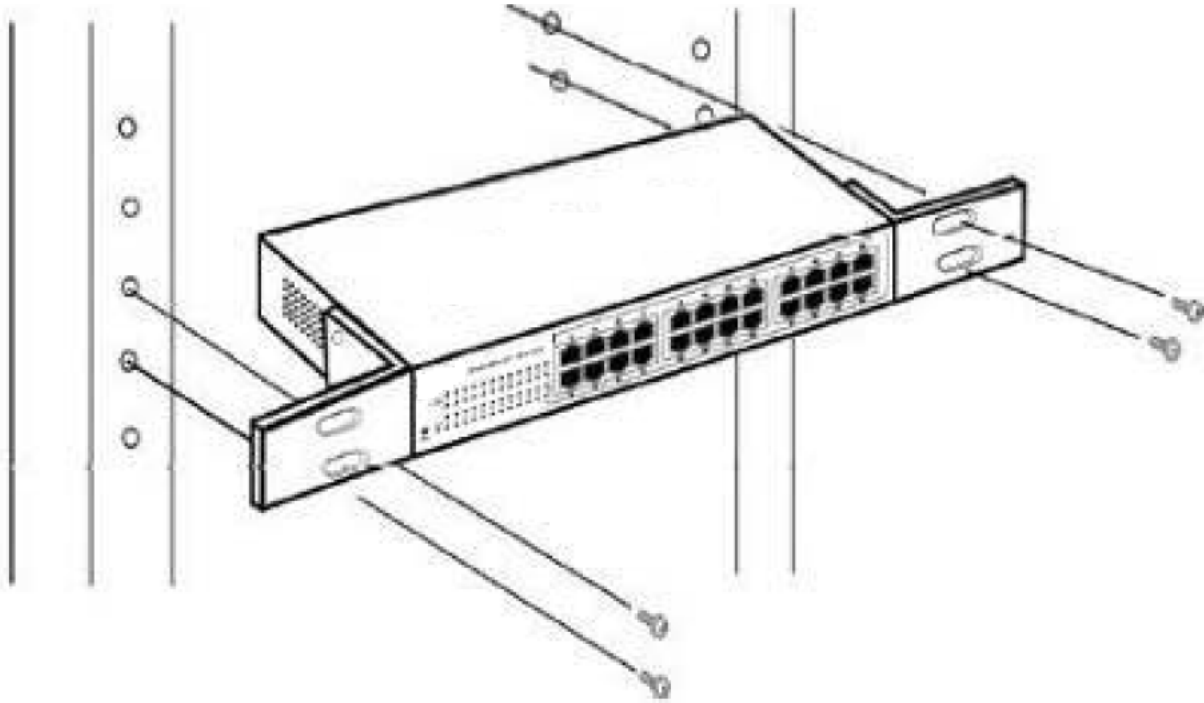


Fig. 3.3: Mount the Switch in the rack or chassis

Please be aware of following safety Instructions when installing:

1. Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T<sub>ma</sub>) specified by the manufacturer.
2. Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
3. Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
4. Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
5. Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips)."

### 3.3 Step 3: Plugging in the AC Power Cord

Users may now connect the AC power cord into the rear of the switch and to an electrical outlet (preferably one that is grounded and surge protected).

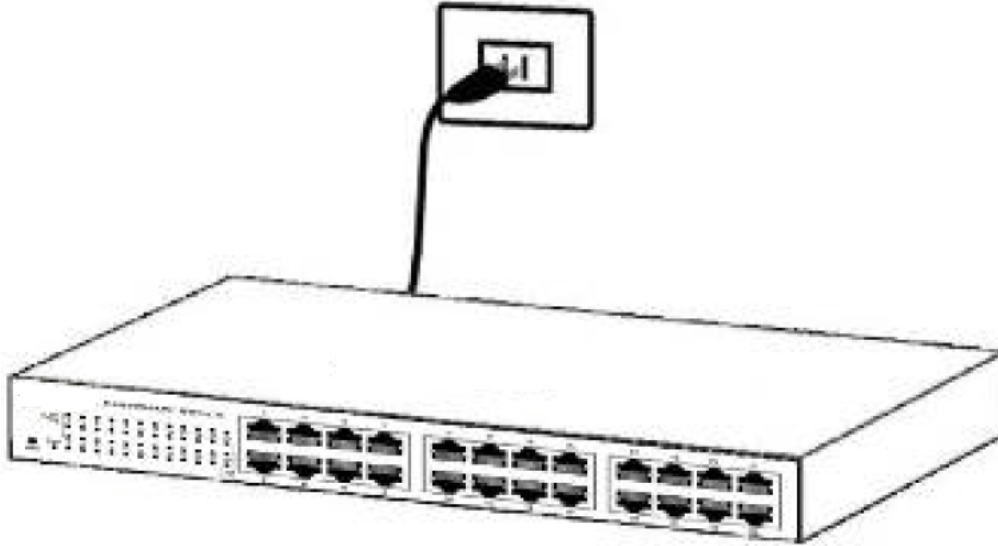


Fig. 3.4: Plugging the switch into an outlet

### 3.3.1 Power Failure

As a precaution, the switch should be unplugged in case of power failure. When power is resumed, plug the switch back in.

### 3.3.2 Grounding the Switch

This section describes how to connect the WebSmart Switch to ground. You must complete this procedure before powering your switch.

#### Required Tools and Equipment

- Ground screws (included in the accessory kit): One M4 x 6 mm (metric) pan-head screw.
- Ground cable (not included in the accessory kit): The grounding cable should be sized according to local and national installation requirements. Depending on the power supply and system, a 12 to 6 AWG copper conductor is required for U.S installation. Commercially available 6 AWG wire is recommended. The length of the cable depends on the proximity of the switch to proper grounding facilities.
- A screwdriver (not included in the accessory kit).

The following steps let you connect the switch to a protective ground:

**Step 1** Verify if the system power is off.

**Step 2** Use the ground cable to place the #8 terminal lug ring on top of the ground-screw opening, as seen in the figure below.

**Step 3** Insert the ground screw into the ground-screw opening.

**Step 4** Using a screwdriver, tighten the ground screw to secure the ground cable to the switch.

**Step 5** Attach the terminal lug ring at the other end of the grounding cable to an appropriate grounding stud or bolt on rack where the switch is installed.

**Step 6** Verify if the connections at the ground connector on the switch and the rack are securely attached.





## **GETTING STARTED**

This chapter introduces the management interface of NPort WebSmart Switch.

### **4.1 Management Options**

The NPort WebSmart Switch can be managed through any port on the device by using the Web-based Management. Each switch must be assigned its own IP Address, which is used for communication with Web-Based Management. The PC's IP address should be in the same range as the switch. Each switch can allow only one user to access the Web-Based Management at a time. The PC should have an IP address in the same range as the switch. Each switch can allow one user to access to the Web-Based Management at a time.

#### **4.1.1 Using Web-based Management**

After a successful physical installation, you can configure the Switch, monitor the network status, and display statistics using a web browser.

##### **Supported Web Browsers**

The embedded Web-based Management currently supports the following web browsers:

- Internet Explorer 6 or later version
- Netscape 8 or later version
- Firefox 3.0 or later version
- Chrome 5.0 or later version
- Safari 4.0 or later version
- Opera 10 or later version

##### **Connecting to the Switch**

You will need the following equipment to begin the web configuration of your device: 1. A PC with a RJ-45 Ethernet connection 2. A standard Ethernet cable Connect the Ethernet cable to any of the ports on the front panel of the switch and to the Ethernet port on the PC.

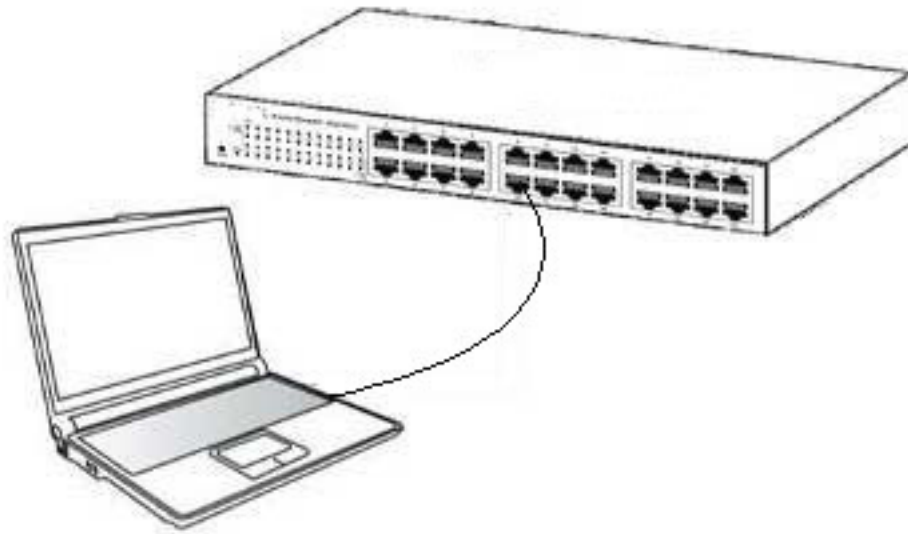


Fig. 4.1: Connected Ethernet cable

### **Login Web-based Management**

In order to login and configure the switch via an Ethernet connection, the PC must have an IP address in the same subnet as the switch. For example, if the switch has an IP address of **192.168.1.1**, the PC should have an IP address of **192.168.1.z** (where z is a number between 2 ~ 254), and a subnet mask of **255.255.255.0**. You can open the web browser and enter **192.168.1.1** (the factory-default IP address) in the address bar. Then press <Enter>.



Fig. 4.2: Enter the IP address 192.168.1.1 in the web browser

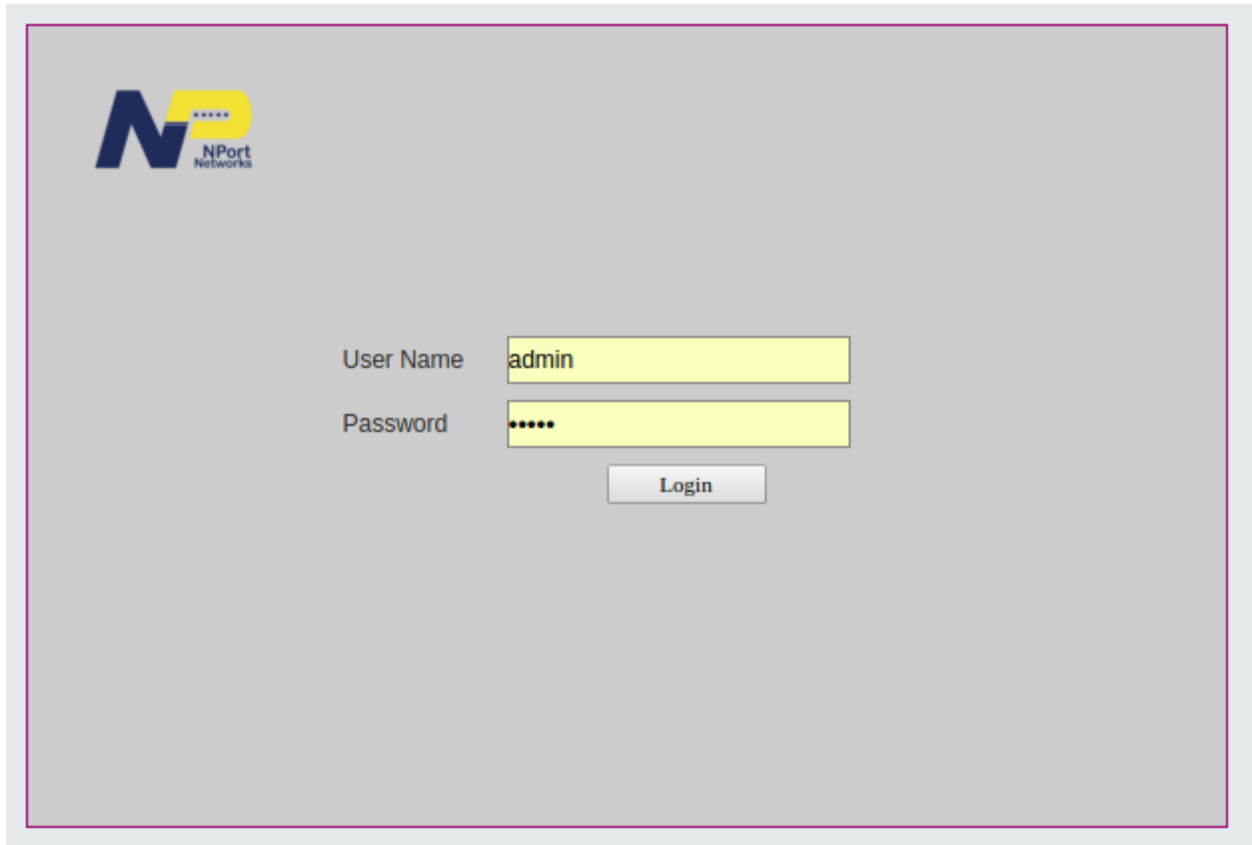


Fig. 4.3: Login page

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**Note:** The switch's factory default IP address is 192.168.1.1 with a subnet mask of 255.255.255.0 and a default gateway of 0.0.0.0.

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## 4.2 Configuration

The features and functions of the NPort WebSmart Switch can be configured for optimum use through the Web-based Management Utility.

### 4.2.1 Web-based Management

After a successful login you will see the screen below:

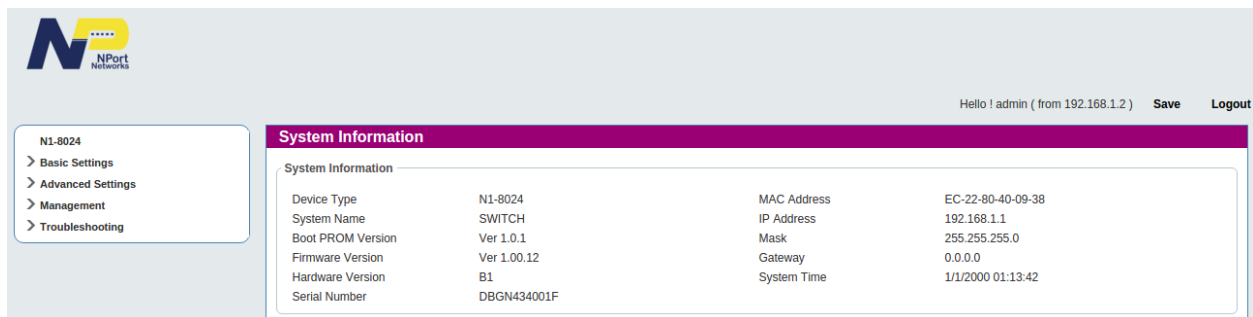


Fig. 4.4: Web-based Management

Above is the Web-based Management screen. The three main areas are the **Tool Bar** on top, the **Function Tree**, and the Main Configuration Screen.

The **Tool Bar** provides a quick and convenient way for essential utility functions like firmware and configuration management.

By choosing different functions in the **Function Tree**, you can change all the settings in the **Main Configuration Screen**. The main configuration screen will show the current status of your Switch by clicking the model name on top of the function tree.

At the upper right corner of the screen the username and current IP address will be displayed.

Under the username is the Logout button. Click this to end this session.

**Note:** If you close the web browser without clicking the Logout button, it will be seen as an abnormal exit and the login session will still be occupied.

Finally, by clicking on the NPort logo at the upper-left corner of the screen you will be redirected to the local NPort website.

**Tool Bar > Save** The Save provides Save Configuration.

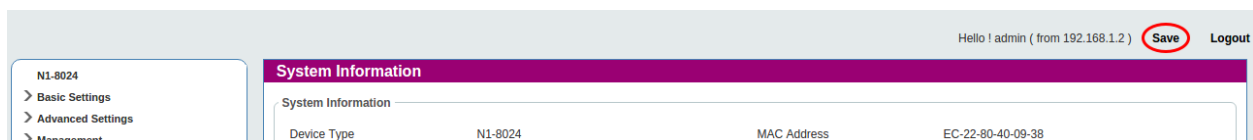


Fig. 4.5: Save

- **Save Configuration** Select to save the entire configuration changes you have made to the device to switch's non-volatile RAM.

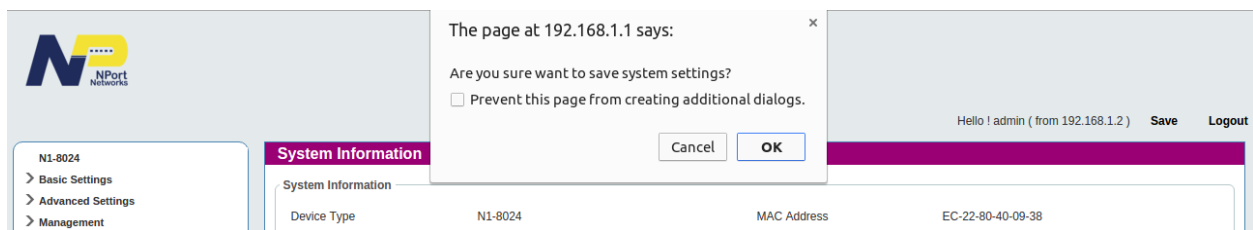


Fig. 4.6: Save Configuration

## 4.3 Function Tree

All configuration options on the switch are accessed through the Setup menu on the left side of the screen. Click on the setup item that you want to configure. The following sections provide more detailed description of each feature and function.

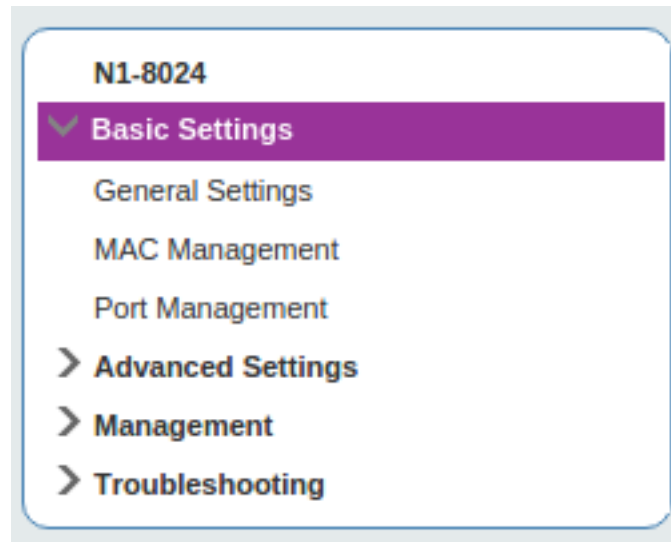


Fig. 4.7: Function Tree

The Maintenance function controls such as Reset System, Reboot Device, Firmware Upgrade and Configuration Backup & Restore.

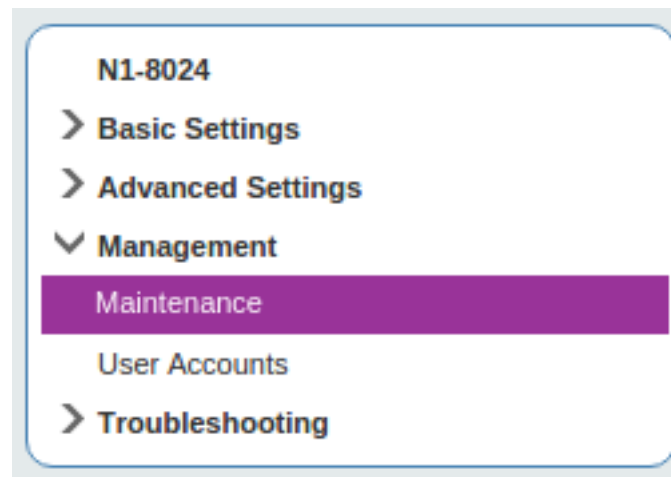


Fig. 4.8: Figure – Advanced Settings > Management

- **Configuration** Provide a safe reset option for the Switch. All configuration settings in non-volatile RAM will be reset to factory default and then the Switch will reboot.

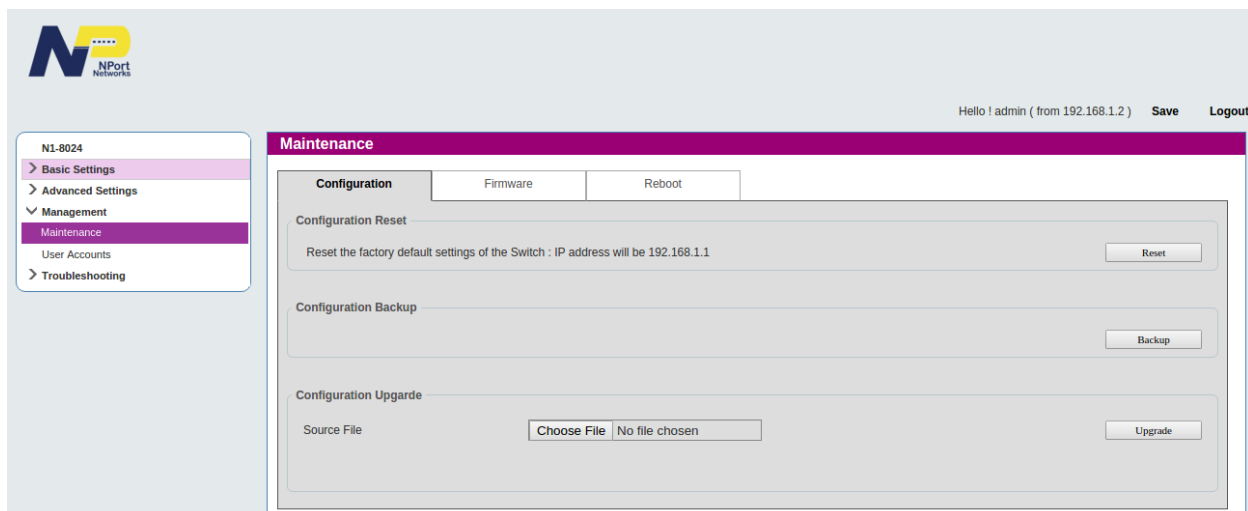


Fig. 4.9: Management &gt; Maintenance &gt; Configuration

- **Firmware Backup & Upgrade**

Click *Backup* to save the firmware to your disk.

Click *Browse* to browse your inventories for a saved firmware file.

Click *Upgrade* after selecting the firmware file you want to restore.

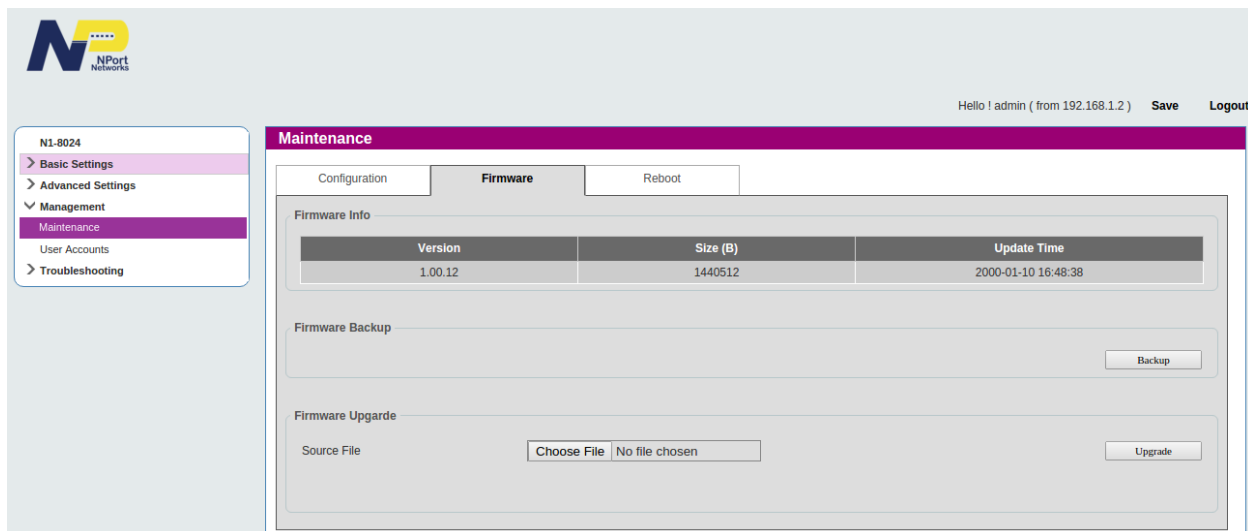


Fig. 4.10: Management &gt; Maintenance &gt; Firmware

**Warning:** Do not disconnect the PC or remove the power cord from device until upgrade is complete. The Switch may crash if the Firmware Upgrade is incomplete.

- **Reboot** Provide a safe way to reboot the system. Click Reboot to restart the switch.

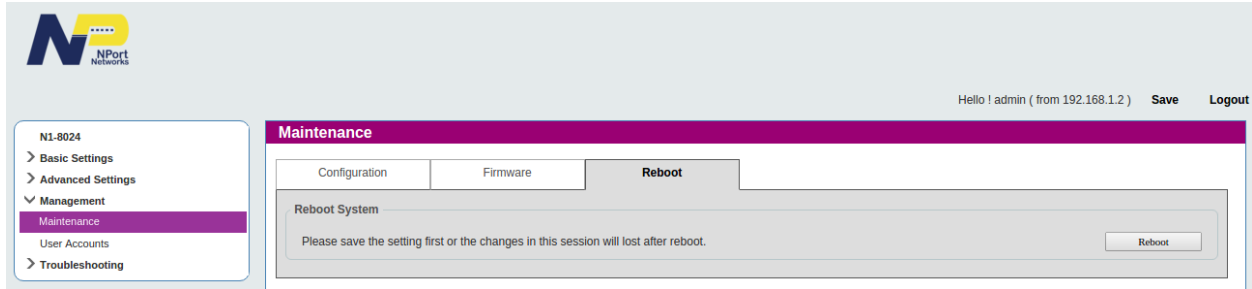


Fig. 4.11: Management &gt; Maintenance &gt; Reboot

## 4.4 System Information

The System Information provides an overview of the switch which includes essential information such as firmware, hardware and IP address. It also offers an overall status of common software features:

**Port Mirroring:** Click *Basic Settings > Port Management > Port Mirroring*. By default this feature is disabled.

**Storm Control:** Click *Advanced Setting > Bandwidth Control > Storm Control*. By default this feature is disabled.

**IGMP Snooping:** Click *Advanced Setting > L2 Multicast Control > IGMP Snooping*. By default this feature is disabled.

**Link Aggregation:** Click *Advanced Setting > Link Aggregation*. By default this feature is disabled.

**802.1Q VLAN:** Click *Advanced Setting > VLAN > 802.1Q VLAN*. By default this feature is disabled.

**Loop Detection:** Click *Advanced Setting > Loop Detection*. By default this feature is disabled.

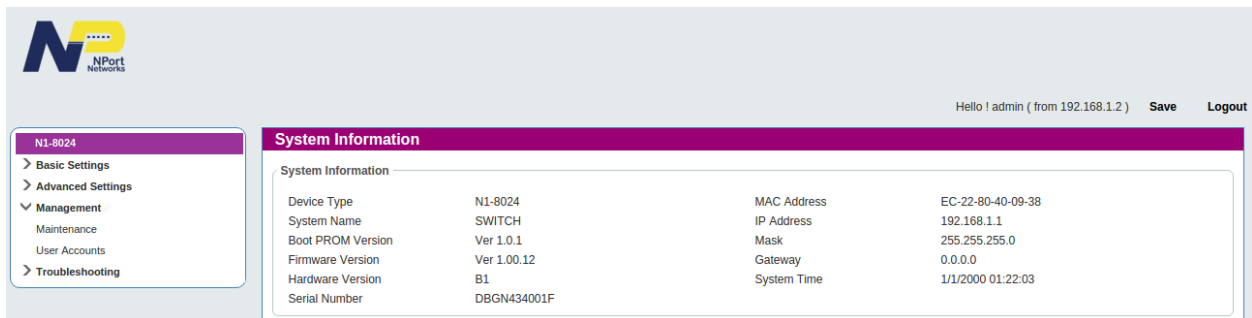


Fig. 4.12: System Information

### 4.4.1 Basic Settings > General Setting

The General Setting allows the user to configure the IP address and the basic system information of the Switch.

**IP Information:** There are two ways for the switch to obtain an IP address: Static and DHCP (Dynamic Host Configuration Protocol).

When using static mode, the IP Address, Subnet Mask and Gateway can be manually configured. When using DHCP mode, the Switch will first look for a DHCP server to provide it with an IP address (including

network mask and default gateway) before using the default or previously entered settings. By default the IP setting is static mode with IP address is 192.168.1.1 and subnet mask is 255.255.255.0.

**System Information:** By entering a System Name, the device can more easily be recognized on the LAN.

Fig. 4.13: Figure – Basic Settings > General Settings > System

## 4.4.2 Basic Settings > Port Management > Port Setting

In the Port Management page, the status of all ports can be monitored and adjusted for optimum configuration. By selecting a range of ports (*From Port* and *To Port*), the Speed can be set for all selected ports, effective by clicking *Apply*.

Port	Link Status	State	MDIX	F/C	Duplex	Speed	Jumbo	Description
1	Down	Enabled	Auto	Off	Auto	Auto	Disabled	
2	Down	Enabled	Auto	Off	Auto	Auto	Disabled	
3	Down	Enabled	Auto	Off	Auto	Auto	Disabled	
4	Down	Enabled	Auto	Off	Auto	Auto	Disabled	

Fig. 4.14: Basic Settins > Port Management > Port Setting

**Speed:** Copper connections can operate in Forced Mode settings (1000M Full, 100M Full, 100M Half, 10M Full, 10M Half), Auto, or Disabled. The default setting for all ports is Auto.

**Note:** Be sure to adjust port speed settings appropriately after changing connected cable media types.

**Link Status:** Reporting Down indicates the port is disconnected.



**Flow Control:** You can enable this function to mitigate the traffic congestion. Ports configured for full-duplex use 802.3x flow control, half-duplex ports use backpressure flow control. The default setting is disabled.

### 4.4.3 Basic Settings > Port Management > Port Counters

The Statistics screen displays the status of each port packet count.

Click *Refresh* button to view the latest information.

Click *Clear All* button to reset the details displayed.

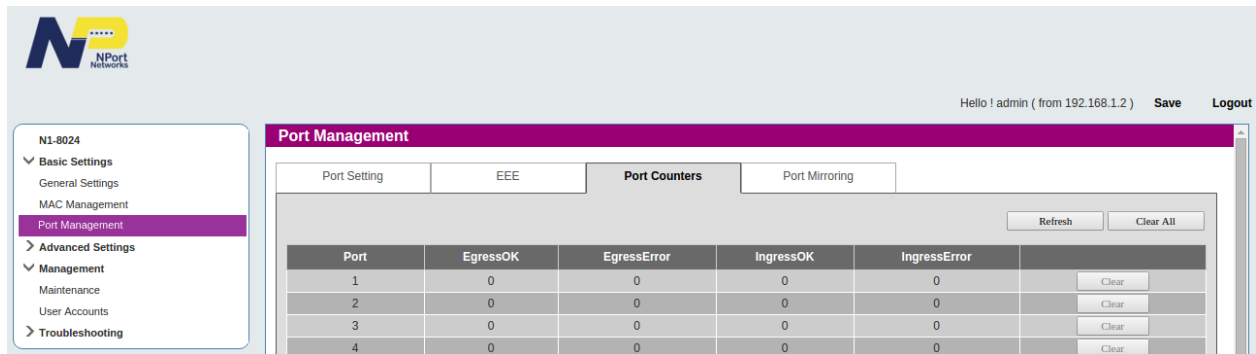


Fig. 4.15: Basic Settings > Port Management > Port Counters

**EgressOK:** Number of packets transmitted successfully.

**IngressOK:** Number of packets received successfully.

**EgressError:** Number of transmitted packets resulting in error.

**IngressError:** Number of received packets resulting in error.

### 4.4.4 Basic Settings > Port Management > Port Mirroring

Port Mirroring is a method of monitoring network traffic that forwards a copy of each incoming and/or outgoing packet from one port of the Switch to another port where the packet can be studied. This enables network managers to better monitor network performances.

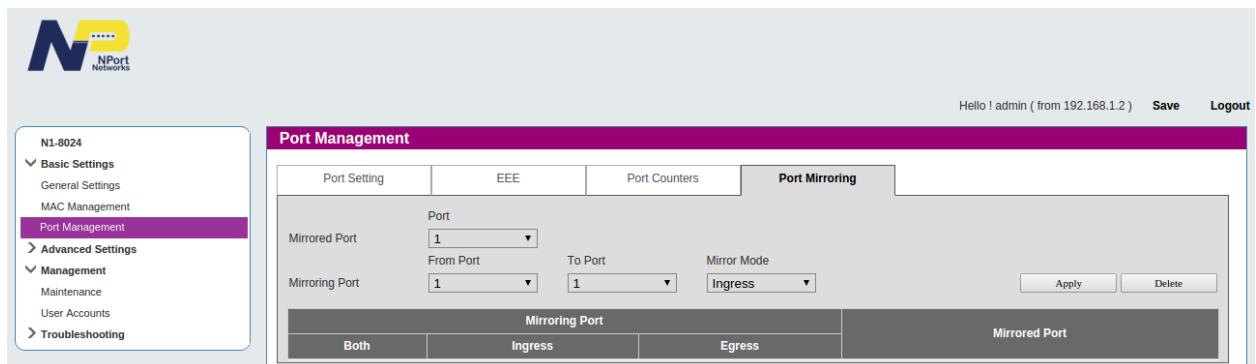


Fig. 4.16: Basic Settings > Port Management > Port Mirroring

Selection *Mirror Mode* for the Source Ports is as follows:

**Ingress:** Duplicates the data transmitted from the source port and forwards it to the Target Port.

Click “all” to include all ports into port mirroring.

**Egress:** Duplicates the data that received from the source port and forwards it to the Target Port.

Click “all” to include all ports into port mirroring.

**Both (transmit and receive) mode:** Duplicate both the data transmitted from and data sent to the source port, and forwards all the data to the assigned Target Port. Click “all” to include all ports into port mirroring.

**Note:** The target ports will stop mirroring packets if there are unknown tags or destination packets sent out by source ports.

### 4.4.5 Advanced Settings > Link Aggregation

The LAG function allows the switch to combine two or four ports together to increase bandwidth. Select the LAG Groups, choose the Members to be grouped together, and then click *Apply* to activate the selected LAG Groups. Up to eight LAG Groups may be created, each supporting up to four ports.

Click *Disable* button to remove all the members in this trunk group.

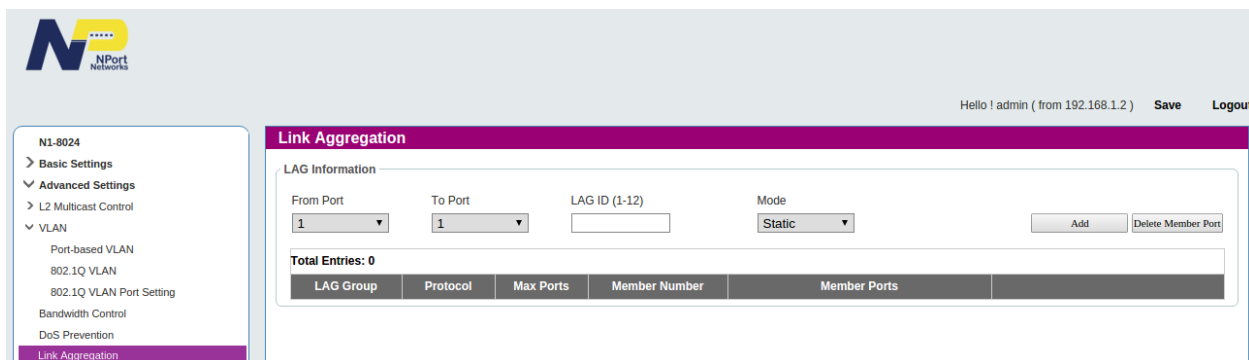


Fig. 4.17: Advanced Settings > Link Aggregation

### 4.4.6 Advanced Settings > L2 Multicast Control > IGMP Snooping

With Internet Group Management Protocol (IGMP) snooping, the WebSmart Switch can make intelligent multicast forwarding decisions by examining the contents of each frame's Layer 2 MAC header.

By default, IGMP is disabled. If enabled, the WebSmart switch can recognize IGMP queries and reports sent between network stations or devices and an IGMP host. With IGMP snooping enabled, the WebSmart switch will forward multicast traffic only to the connections that have members attached

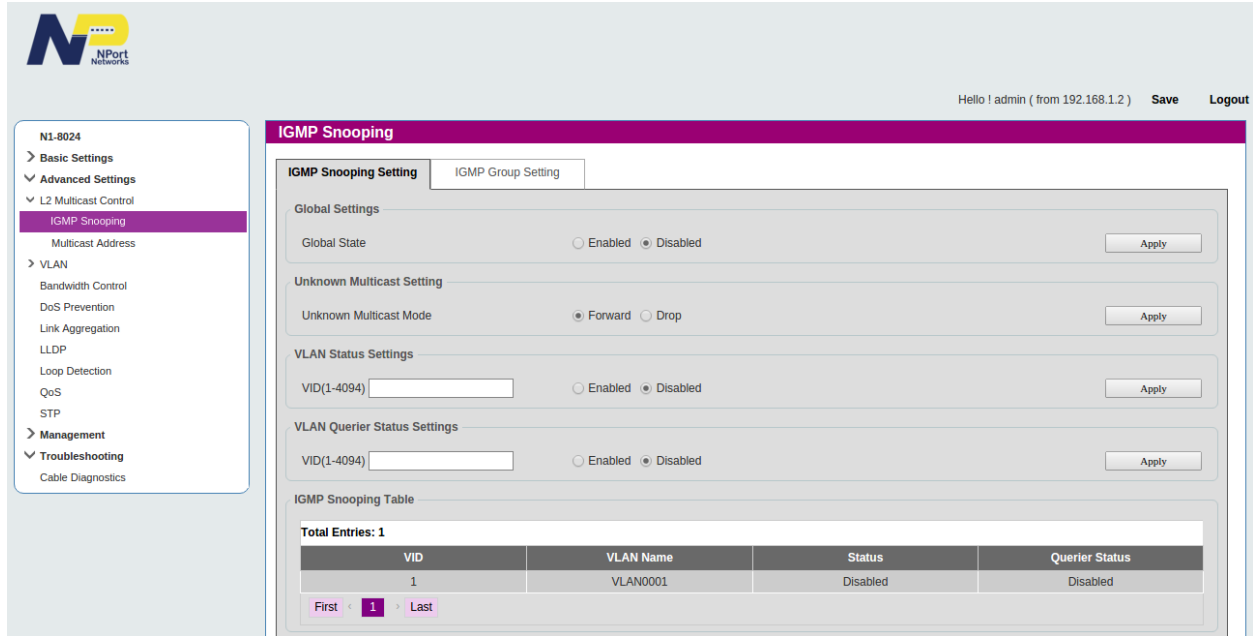


Fig. 4.18: Advanced Settings > L2 Multicast Control > IGMP Snooping> IGMP Snooping setting

#### 4.4.7 Advanced Settings > Loop Detection

The Loopback Detection function is used to detect the loop created by a specific port while Spanning Tree Protocol (STP) is not enabled in the network, especially when the down links are hubs or unmanaged switches. The Switch will automatically shut down the port. The Loopback Detection port will be unlocked when the Loopback Detection *Recover Time* times out. The Loopback Detection function can be implemented on a range of ports at a time.

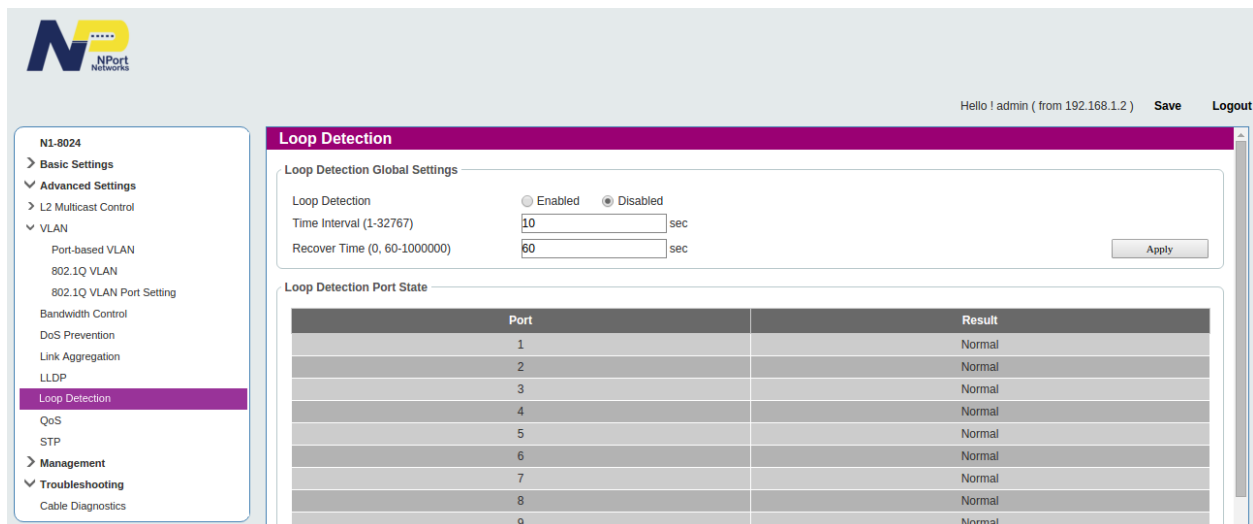


Fig. 4.19: Advanced Settings > Loop Detection

**Loop Detection:** Enable or disable Loopback detection. The default is Disabled.

**Interval (1-32767):** Set a Loop detection Interval between 1 and 32767 seconds. The default is 1 seconds.

**Recover Time (0 or 60-1000000):** Time allowed (in seconds) for recovery when a Loopback is detected.

The Loop Detection Recover Time can be set at 0 seconds, or 60 to 1000000 seconds. Entering 0 will disable the Loop Detection Recover Time. The default is 60 seconds. Click *Apply* to implement changes made.

### 4.4.8 Troubleshooting > Cable Diagnostics

The Cable Diagnostics is designed primarily for administrators and customer service representatives to examine of the copper cable quality. It rapidly determines the type of cable errors occurred in the cable. Select a port and then click the Test button to start the diagnosis.

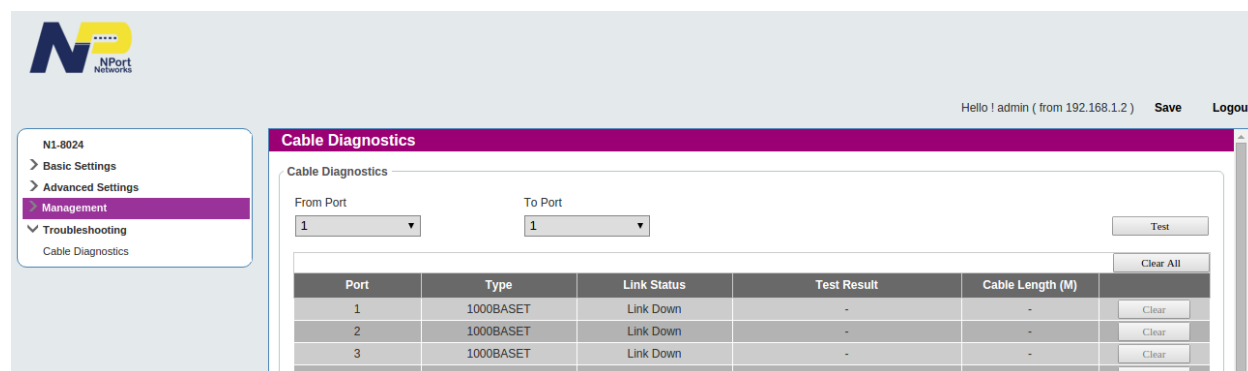


Fig. 4.20: Troubleshooting > Cable Diagnostics

**Test Result:** The description of the cable diagnostic results.

- OK: Means the cable is good for the connection.
- Short in Cable: Means the wires of the RJ45 cable may be in contact somewhere.
- Open in Cable: Means the wires of RJ45 cable may be broken or the other end of the cable is simply disconnected.
- Test Failed: Means some other errors occurred during cable diagnostics. Please select the same port and test again.

**Cable Fault Distance (meters):** Indicates the distance of the cable fault from the Switch port, if the cable is less than 2 meters, it will show “No Cable”. The deviation of “Cable Fault Distance” is +/-2 meters.

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**Note:** Cable length detection is effective at every speed of 10Mbps, 100Mbps and 1Gbps.

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### 4.4.9 Advanced Settings > VLAN > 802.1Q VLAN

A VLAN is a group of ports that can be anywhere in the network, but communicate as though they were in the same area.

VLANs can be easily organized to reflect department groups (such as R&D, Marketing), usage groups (such as e-mail), or multicast groups (multimedia applications such as video conferencing), and therefore help to simplify network management by allowing users to move devices to a new VLAN without having to change any physical connections.

By default, 802.1Q VLAN is disabled. With 802.1Q VLAN enabled, the VLAN VID 1 is created by default with an empty VLAN name field and all ports are configured as “Untagged” members.

The 802.1Q VLAN configuration is accomplished in following steps:

- Creating a new VID group
- Assigning ports as Access or Trunk.
- Configuring the PVID of access VLAN
- Advanced *Settings* > *VLAN* > *802.1Q VLAN*: Click *Apply* to create a new VID group.
- Advanced *Settings* > *VLAN* > *802.1Q VLAN Port Setting* > *Edit*: Change the Port VLAN Mode act as Access or Trunk.
- *PVID settings*: Port VLAN ID (PVID) is an identification that encompasses a particular switch port's identification and VLAN membership. This identification is used to classify the incoming untagged frames.
- Click *Edit* to configure the PVID of a port.

**Delete:** Click to delete the VLAN group.

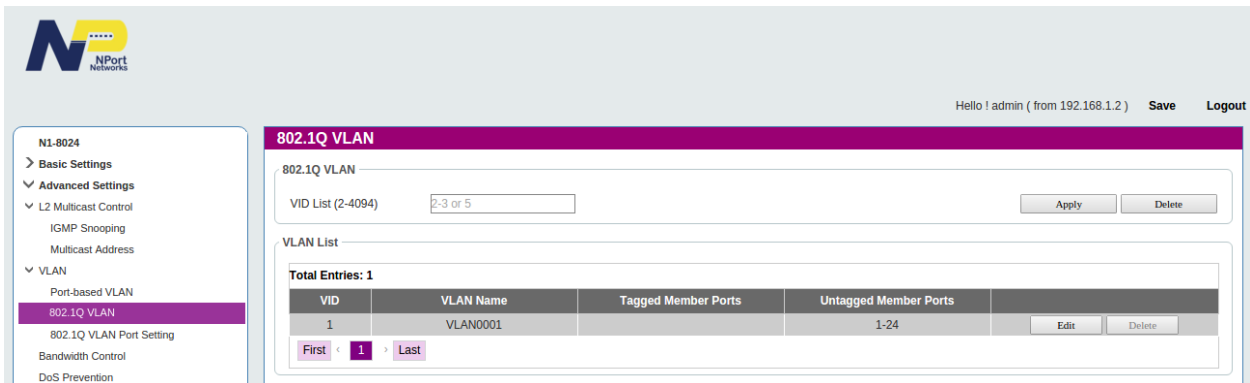


Fig. 4.21: Advanced Settings > VLAN > 802.1Q VLAN

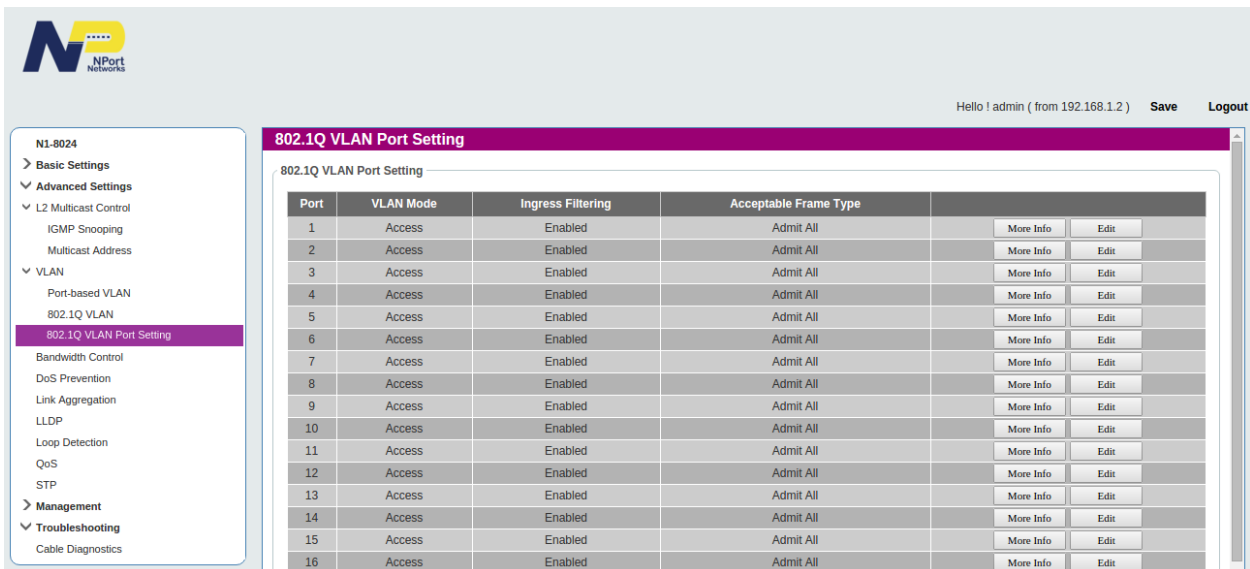


Fig. 4.22: Advanced Settings > VLAN > 802.1Q VLAN Port Setting

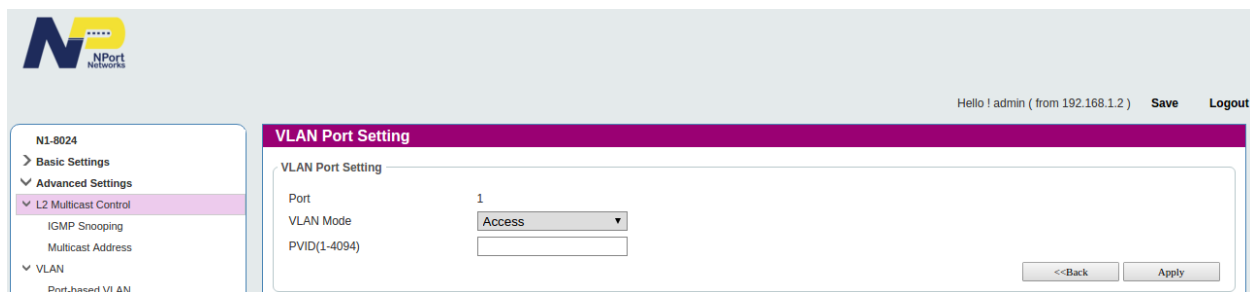


Fig. 4.23: Advanced Settings &gt; VLAN &gt; 802.1Q VLAN Port Setting &gt; Edit

**Note:** When 802.1Q VLAN is enabled, the Port- Based VLAN settings will be set to Disabled.

#### 4.4.10 Basic Settings > General Settings> Management VLAN

802.1Q VLAN is used to decide which VLAN can access the switch.

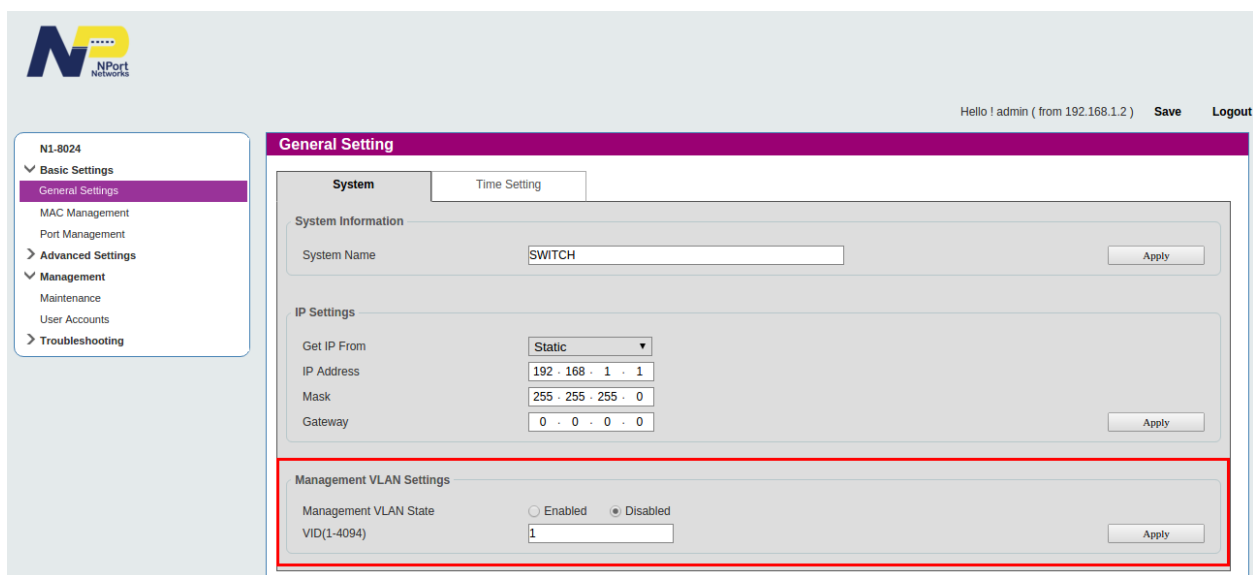


Fig. 4.24: Basic Settings &gt; General Settings

**Note:** When 802.1Q Management VLAN is enabled, the 802.1Q VLAN should be enabled first.

#### 4.4.11 Advanced Settings > VLAN > Port-Base VLAN

Port-Based VLANs are the simplest and most common form of VLAN. It assigns the appliance LAN ports to VLANs, effectively transforming the appliances. You can assign multiple ports to the same VLAN, or each port to a separate VLAN.

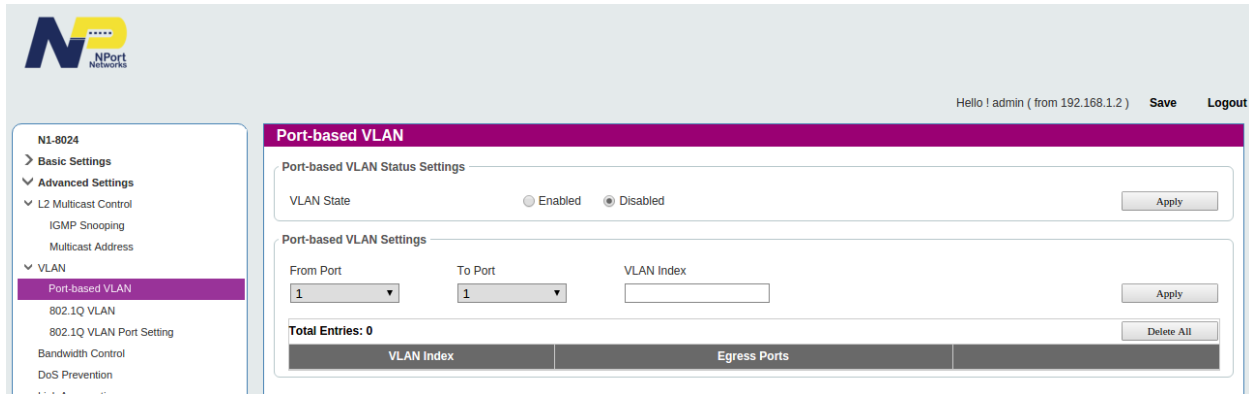


Fig. 4.25: Figure – Advanced Settings > VLAN >Port-Based VLAN Settings

**VLAN State:** Choice Enabled or disable then click the *Apply* to enable or disable the feature.

**Add VLAN Index:** Click to create a new VLAN and to select VLAN ports. To save the members in a group, click *Apply*.

**Delete:** Click to delete the VLAN group.

**Delete All:** Click to delete all the VLAN groups.

**Note:** When **Port-Based VLAN** is enabled, the 802.1Q VLAN settings and 802.1Q management VLAN settings will be set to Disabled as default. By default, all ports are untagged.

#### 4.4.12 Advanced Settings > QoS

QoS is an implementation of the IEEE 802.1p standard that allows network administrators to reserve bandwidth for important functions that require a larger bandwidth or that might have a higher priority, such as VoIP (voice-over Internet Protocol), web browsing applications, file server applications or video conferencing. Thus with larger bandwidth, less critical traffic is limited, and therefore excessive bandwidth can be saved.

The following figure displays the status of Quality of Service priority levels of each port, higher priority means the traffic from this port will be first handled by the switch. For packets that are untagged, the switch will assign the priority depending on your configuration.

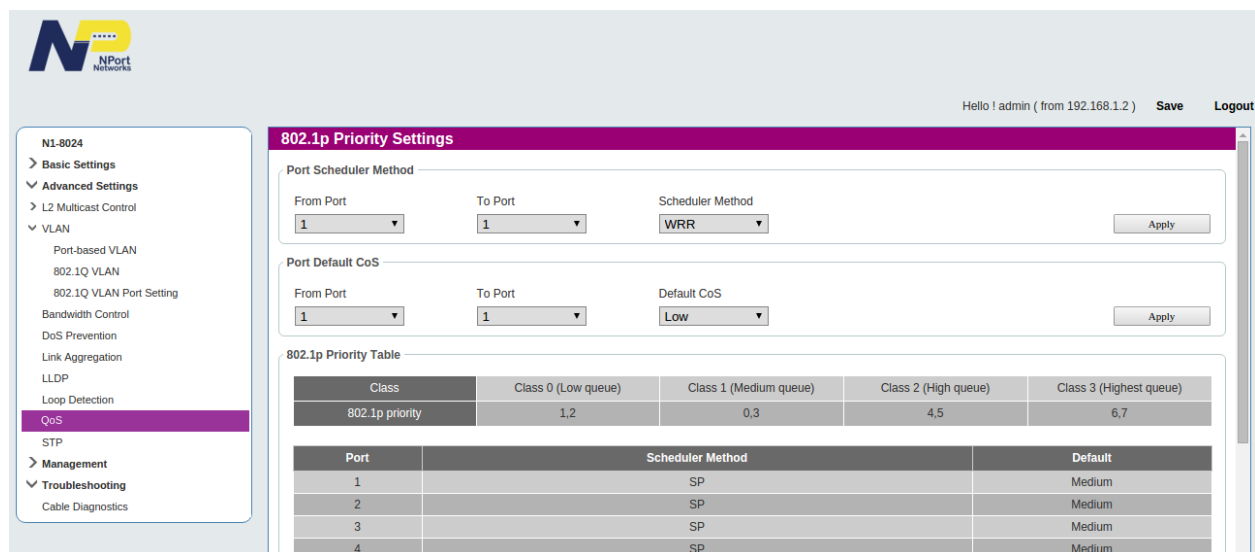


Fig. 4.26: Advanced Settings &gt; QoS

**Scheduler Method:** Select Strict Priority to process the packets with the highest priority first. Select WRR (Weighted Round-Robin) to process packets according to the weight of each priority. When a priority level has reached its egress weight, the system will process the packets in the next level even if there are remaining packets. NPort WebSmart Switch system's weight of priority levels are: 8 (Highest), 4 (High), 2 (Medium) and 1 (Low) packet. By default, the queuing mechanism is **Strict Priority**.

#### 4.4.13 Advanced Settings > Bandwidth Control > Storm Control

The Storm Control feature provides the ability to control the receive rate of broadcast, multicast, and unknown unicast packets. Once a packet storm has been detected, the Switch will drop packets coming into the Switch until the storm has subsided.

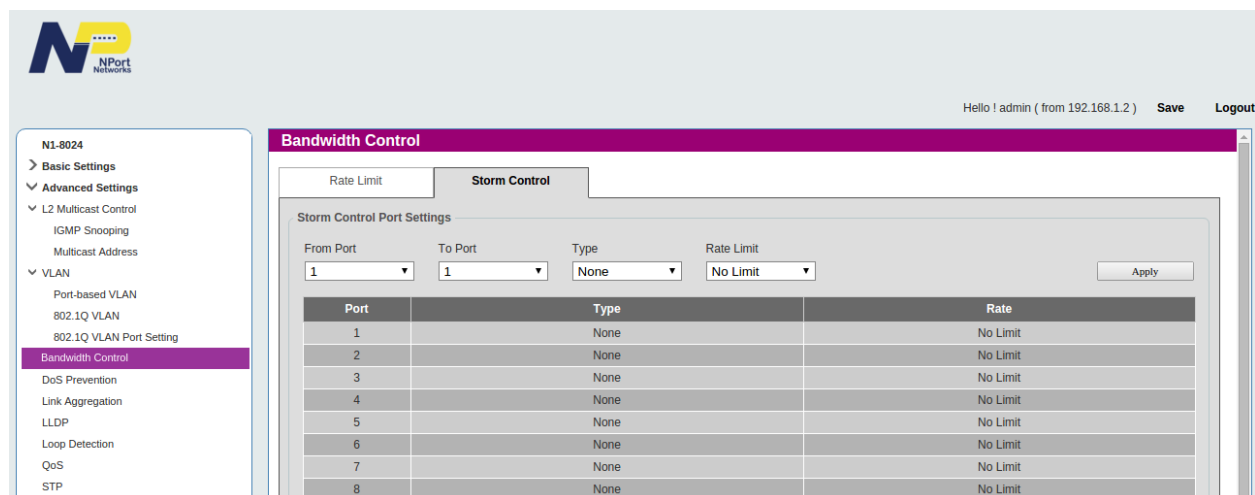


Fig. 4.27: Advanced Settings &gt; Bandwidth Control &gt; Storm Control

**Storm Control Type:** User can select the different Storm type from Broadcast Only, Multicast & Broadcast, and Multicast & Broadcast & Unknown Unicast.



**Threshold (pps):** If storm control is enabled (by default it is disabled), the threshold can be set from 1 to 1,000,000pps.

Click *Apply* for the settings to take effect.

#### 4.4.14 Advanced Settings > Bandwidth Control > Rate Limit

The Bandwidth Control page allows network managers to define the bandwidth settings for a specified port's transmitting and receiving data rates.

NI-8024

- > Basic Settings
- ▼ Advanced Settings
  - ▼ L2 Multicast Control
    - IGMP Snooping
    - Multicast Address
  - ▼ VLAN
    - Port-based VLAN
    - 802.1Q VLAN
    - 802.1Q VLAN Port Setting
    - Bandwidth Control**
    - DoS Prevention
    - Link Aggregation
    - LLDP
    - Loop Detection

Bandwidth Control

Rate Limit Storm Control

Port Rate Limiting

From Port: 1 To Port: 1 Direction: Inbound Rate Limit: No Limit

Apply

Port	Inbound (Rate)	Outbound (Rate)
1	No Limit	No Limit
2	No Limit	No Limit
3	No Limit	No Limit
4	No Limit	No Limit
5	No Limit	No Limit
6	No Limit	No Limit

Fig. 4.28: Advanced Settings > Bandwidth Control > Rate Limit

**From Port / To Port:** A consecutive group of ports may be configured starting with the selected port.

**Direction:** This drop-down menu allows you to select between Inbound (receive) and Outbound (transmit). This setting will determine whether the bandwidth ceiling is applied to receiving, transmitting, or both receiving and transmitting packets.

**No Limit:** This drop-down menu allows you to specify that the selected port will have no bandwidth limit. Enabled disables the limit.

**Rate:** This drop-down menu allows you to select data rate from 64Kbps to 512Mbps.

Click *Apply* to set the bandwidth control for the selected ports.

### 4.4.15 Basic Settings > MAC Management > Static MAC Setting

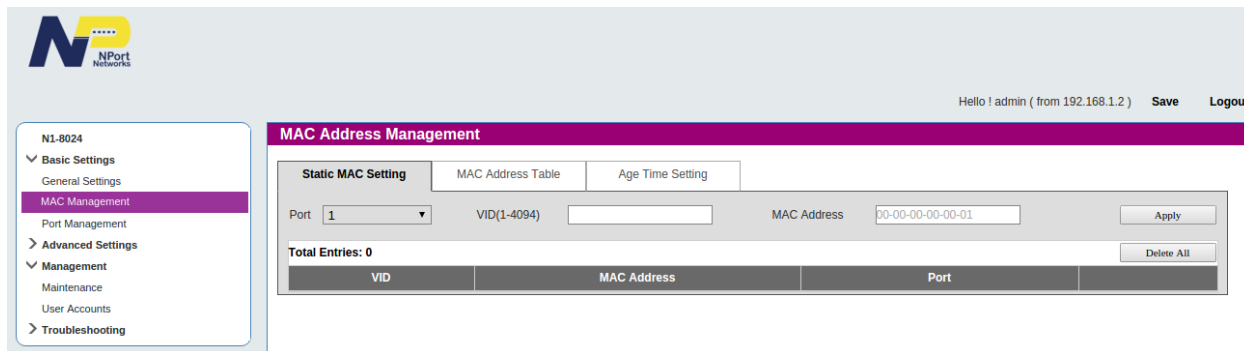


Fig. 4.29: Basic Settings > MAC Management > Static MAC Setting

The *Static MAC Address Setting* table displays the static MAC addresses connected, as well as the VID. Click *Add Mac* to add a new MAC address, you also need to select the assigned Port number, enter both the Mac Address and VID and Click *Apply*. Click *Delete* to remove one entry or click *Delete all* to clear the list. You can also copy a learned MAC address from *Dynamic Forwarding Table* (please refer to *Security > MAC Address Table > Dynamic Forwarding Table* for details).

By disabling Auto Learning capability and specify the static MAC addresses, the network is protected from potential threats like hackers because traffic from illegal MAC addresses will not be forwarded by the Switch.

**Note:** N1-8016/N1-8024/N1-8074 support 128 Static MAC Address entries.

### 4.4.16 Basic Settings > MAC Management > MAC Address Table

For each port, this table displays the MAC address learned by the Switch.

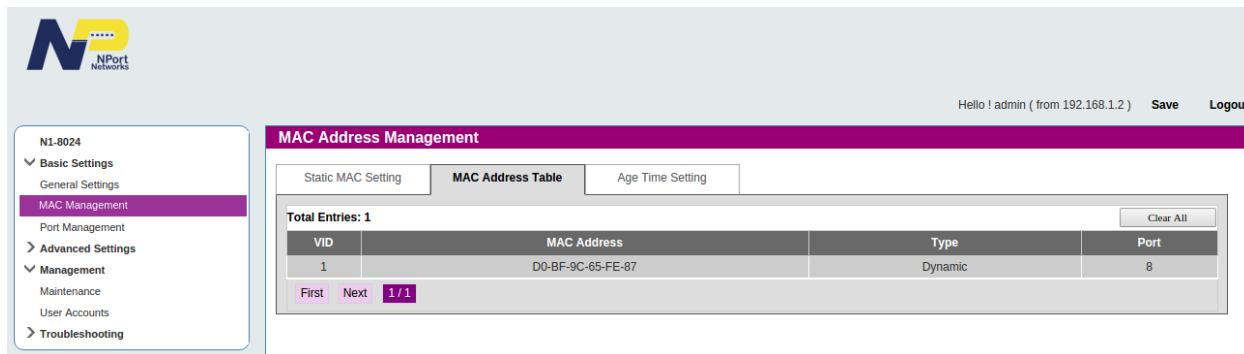


Fig. 4.30: Basic Settings > MAC Management > MAC Address Table

### 4.4.17 Advanced Settings > LLDP

Link Layer Discovery Protocol (LLDP) allows the switch to advertise major capabilities and physical descriptions to adjacent devices. This information can help you identify system topology and detect bad configurations on the LAN. Select Enabled and click *Apply* to enable LLDP.

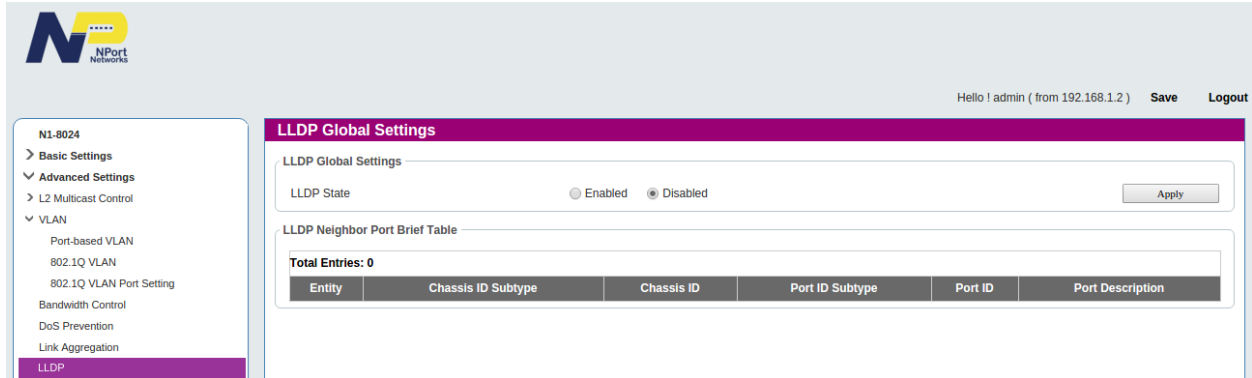


Fig. 4.31: Figure – Advanced Settings &gt; LLDP

#### 4.4.18 Advanced Settings > Multicast Address

Multicast is a limited broadcast that allows one-to-many and many-to-many connections. In Layer 2 multicast, a single frame addressed to a specific multicast address is received, and copies of the frame to be transmitted on each relevant port are created.

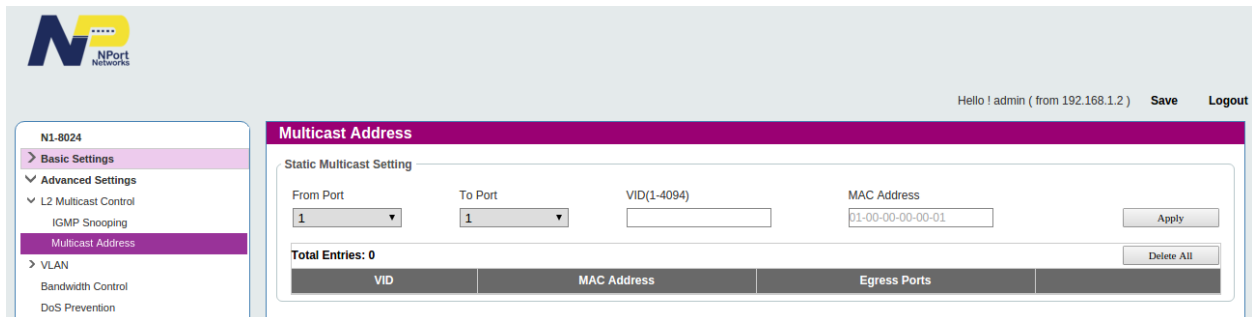


Fig. 4.32: Figure – Advanced Settings &gt; Multicast Address

#### 4.4.19 Advanced Settings > DoS Prevention

The switch supports configurable Denial of Service (DoS) attack protection for many different types of attacks.

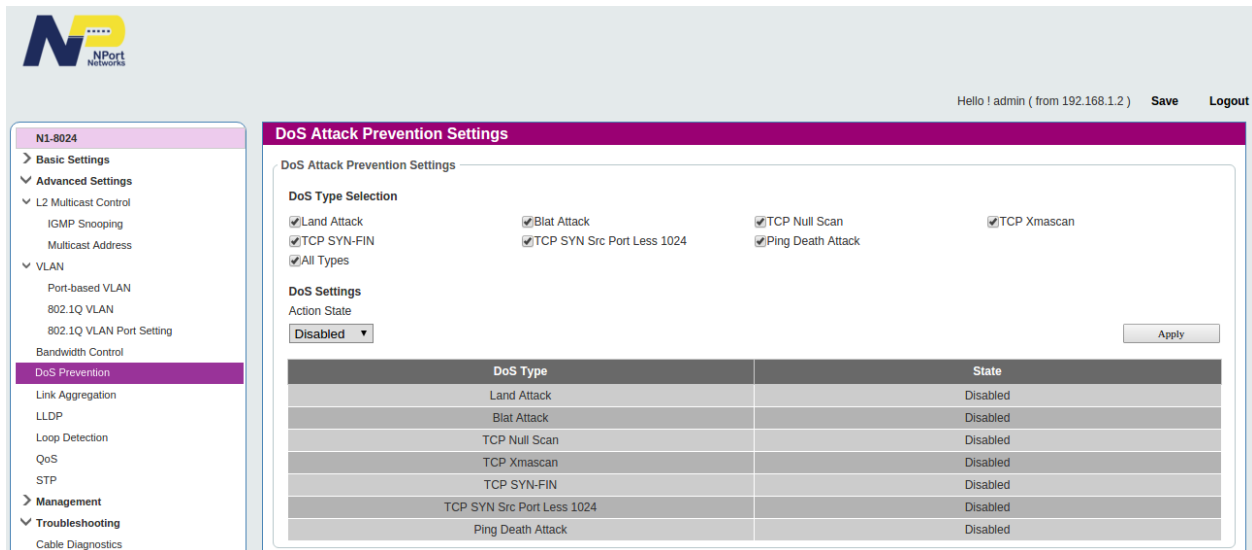


Fig. 4.33: Figure – Advanced Settings &gt; DoS Prevention

#### 4.4.20 Advanced Settings > STP

Spanning Tree Protocol (STP) provides a tree topology for switches on a bridged LAN. STP allows a network to have redundant paths without the risk of network loops.

Rapid Spanning Tree Protocol (RSTP) detects and uses network topologies to enable faster convergence after a topology change, without creating forwarding loops.

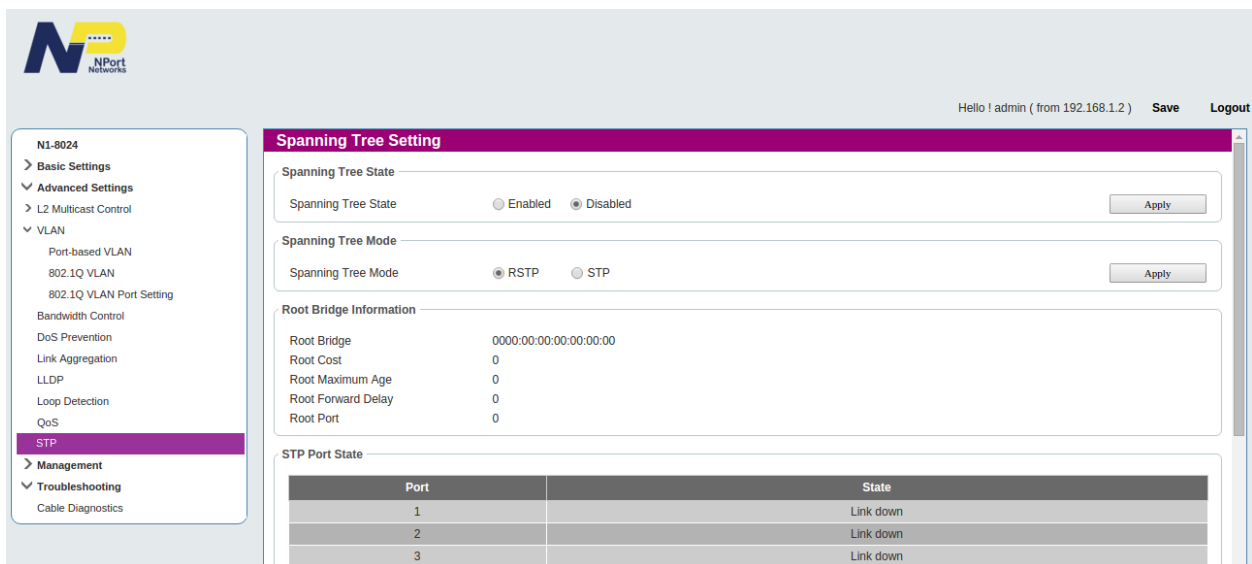


Fig. 4.34: Figure – Advanced Settings &gt; STP

#### 4.4.21 Management > User Accounts

You can modify the username and password in order to refuse unauthorized users.

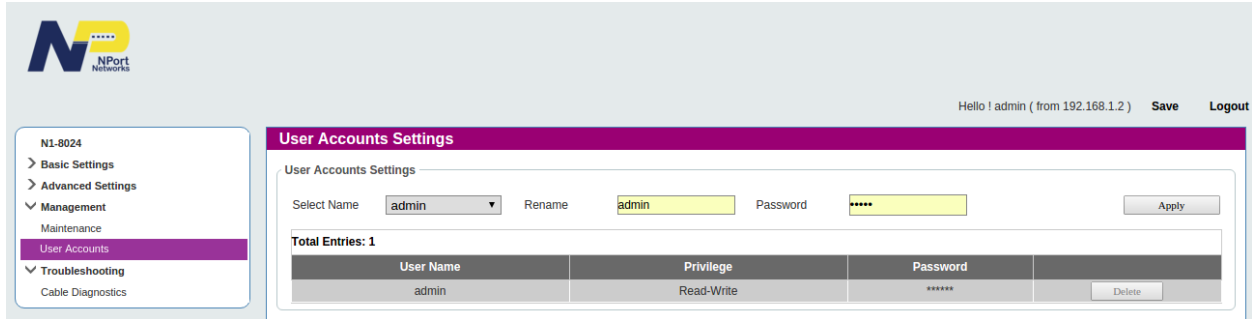


Fig. 4.35: Figure – Management &gt; User Accounts

#### 4.4.22 Advanced > PoE > PoE Setting (N1-8074 only)

N1-8074 supports Power over Ethernet (PoE) as defined by the IEEE Specification. It supplies power to PD device up to 30W for PoE ports (1 – 12), meeting IEEE802.3at standards. This page allows user to configure the global PoE settings of the device.

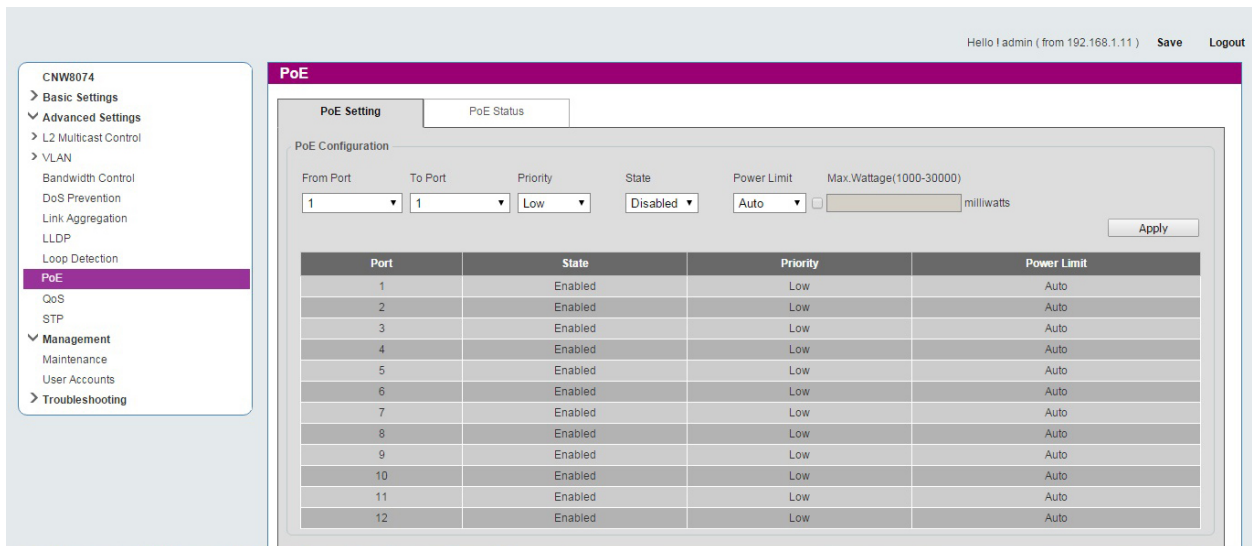


Fig. 4.36: Figure – Advanced Settings &gt; PoE &gt; PoE Setting

**From Port/To Port:** Specifies the PoE function of a port or ports.

**Priority:** Configure the power supply priority as “Low”, “Normal”, or “High” on designated port(s). Default is Normal.

**State:** Select “Enabled” or “Disabled” to configure PoE function for designated port(s). Default is Enabled.

**Power Limit:** This function allows you to manually set the port power current limitation to be given to the PD. To protect the N1-8074 and the connected devices, the power limit function will disable the PoE function of the port when the power is overloaded. Select from “Class 1”, “Class 2”, “Class 3”, “Class 4” and “Auto” for the power limit. “Auto” will negotiate and follow the classification from the PD power current based on the 802.3at standard.

**Max Wattage:** Check the box and input the power budget (from 10000 to 30000 milliwatts) to manually assign an upper limit of port power budget on designated port(s).

Click *Apply* to make the configurations take effects or click Refresh to redisplay the table.

#### **4.4.23 Advaned > PoE > PoE Status (N1-8074only)**

**PoE System Status:** Displays the system power status of device.

- Delivered (W): Displays the current used PoE power.
- Power Budget (Total PoE Power Budget): Displays the total PoE power budget of this switch.

The PoE port table also displays status including, Port, Port State, Class, Max watts, and watts Used.

Class (power limit) The maximum power used by power devices is defined by the following classification

Class	Usage	Output power limit by PSE
0	Default	15.4 W
1	Optional	4 W
2	Optional	7 W
3	Optional	15.4W
4	Optional	30 W

## **APPENDIX A - TECHNICAL**

### **5.1 Specifications**

#### **5.1.1 Hardware Specifications**

Key Components / Performance

- **Switching Capacity:**
  - N1-8016: 32Gbps
  - N1-8024: 48Gbps
- **Max. Forwarding Rate:**
  - N1-8016: 23.8Mbps
  - N1-8024: 35.7Mbps
- Forwarding Mode: Store and Forward
- **Packet Buffer memory:**
  - N1-8016: 3.5 Mbits
  - N1-8024: 3.5 Mbits
- Flash Memory: 2M Bytes

Port Functions

- **16/24 10/100/1000BaseTX ports compliant with the following standards:**
  - IEEE 802.3
  - IEEE 802.3u
  - IEEE 802.3ab
  - Supports Full/half-Duplex operations at 10/100Mbps
  - Supports Full-Duplex operation at 1000Mbps
  - Supports IEEE 802.3x Flow Control
  - Support Auto-Negotiation
  - Compliant to IEEE 802.3az Energy Efficiency Ethernet.

Physical & Environment

- AC input, 100~240 VAC, 50/60Hz, internal universal power supply

- Acoustic Value: 0dB (Fanless)
- Operation Temperature: 0~40°C
- Power Adapter: 0~40°C
- Storage Temperature: -10~70°C
- Operation Humidity: 10%~95% RH
- Storage Humidity: 5%~95% RH

### Emission (EMI) Certifications

- FCC class A
- CE Class A
- VCCI Class A

### Safety Certifications

- CUL, LVD, CE

## 5.1.2 Software Features

### L2 Features

- Supports up to 8K MAC address
- IGMP snooping
- Loop Detection
- Port Mirroring
- Link Aggregation
- Cable Diagnostics

### VLAN

- 802.1Q VLAN standard (VLAN Tagging)
- 802.1Q Management VLAN
- Port-Based VLAN

### QoS (Quality of Service)

- 802.1p priority,
- Up to 4 queues per port
- Bandwidth Control
- Storm Control

### Management

- Web-based GUI
- Configuration backup / restoration via Web-based management
- Firmware backup & upgrade via Web-based management
- Reset, Reboot system
- Factory reset by pressing reset button



#### Power Saving

- IEEE 802.3az Compliant (Energy Efficient Ethernet)
- NPort Green Technologies
  - Power saving by cable length
  - Power saving by link status



## **APPENDIX B - RACK MOUNT**

### **6.1 Instructions**

Safety Instructions - Rack Mount Instructions - The following or similar rack-mount instructions are included with the installation instructions:

1. Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T<sub>ma</sub>) specified by the manufacturer.
2. Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
3. Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
4. Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
5. Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

**Warning:** 此為甲類資訊產品，於居住環境中使用時，可能會造成射頻干擾，在此種情況下，使用者會被要求採取某些適當的對策。