EX19082, EX19164, and EX19244 Smart Managed Switches

User's Guide

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Products Supported by this Manual:

EX19082, EX19164, and EX19244

Preface

Audience

This guide is designed for the person who installs, configures, deploys, and maintains the Ethernet network. This document assumes the reader has moderate hardware, computer, and Internet skills.

Document Revision Level

This section provides a history of the revision changes to this document.

Revision	Document Version	Date	Description
A	Version 1	04/05/2021	Initial release

Changes in this Revision

Initial Release

Document Conventions

This guide uses the following conventions to draw your attention to certain information.

Safety and Warnings

This guide uses the following symbols to draw your attention to certain information.

Symbol	Meaning	Description
	Note	Notes emphasize or supplement important points of the main text.
	Tip	Tips provide helpful information, guidelines, or suggestions for performing tasks more effectively.

References to Switch Models

This guide covers the EX19082, EX19164, and EX19244 Smart Managed Switches from EtherWAN Systems, Inc. When information in this guide applies to all models, the models are referred to collectively as “the switch.” If information applies to specific models only, those models are identified by model name (EX19082, EX19164, or EX19244).

Contents

1 Introduction

Topics:

Congratulations on your purchase of the Smart Managed EX19082, EX19164, or EX19244 Switch from EtherWAN Systems, Inc. Your switch is a state-of-the-art IEEE-compliant network solution designed for users who require high-performance along with the power of management to eliminate bottlenecks and increase productivity.

Your switch is also a Power Sourcing Equipment (PSE) device. All 10/100/1000 Mbps ports support Power over Ethernet (PoE), which detects and supplies power with IEEE 802.3af/at-compliant powered devices automatically. The switch also provides Gigabit-speed connections to servers and other Gigabit Ethernet switches. To simplify installation, the switch is shipped ready for use.

Figure 1-1. EX19082 Series Switch

Figure 1-2. EX19164 Series Switch

Figure 1-3. EX19244 Series Switch

Key Features

This section summarizes the key features of the switches.

Model EX19082 Features

- 8 10/100/1000TX ports supporting (IEEE 802.3af/at) Power over Ethernet (PoE) Power Sourcing Equipment (PSE), with a total PoE power budget of 250 W Max.

Model EX19164 Features

- 16 10/100/1000TX ports supporting (IEEE 802.3af/at) Power over Ethernet (PoE) Power Sourcing Equipment (PSE), with a total PoE power budget of 250 W Max.

Model EX19244 Features

- 24 10/100/1000TX ports supporting (IEEE 802.3af/at) PoE PSE, with a total PoE power budget of 460 W Max.

Common Features

- Full/half-duplex, auto-negotiation, and auto-MDI/MDIX
- Web-based management interface
- 100 – 240 VAC, 50 – 60 Hz internal universal power supply
- 0°C to 50°C (32°F to 122°F) operating temperature range

Quick Start Guide

The following procedure enables advanced users to get their switch up and running in the shortest possible time. For detailed installation instructions, refer to the sections in the right column below.

Step	Description	For Reference, See...
1.	**Find a Location for the Switch** Set the switch on a flat surface or mount it in a standard rack (1 rack unit high).	"Preparing the Site" (page 19)
2.	**Connect to the 10/100/1000 Mbps Switch Ports** • Connect one end of a Category 5e or better Ethernet cable to the Ethernet port of a computer, printer, network storage, IP camera, or other network/PoE device. • Connect the other end to a 10/100/1000 Mbps RJ-45 port on the switch: – Model EX19082: use ports **1** through **8**. Port **9** can be used as a data port. – Model EX19164: use ports **1** through **16**. – Model EX19244: use ports **1** through **24**. • Repeat this step for each additional device you want to connect to the ports.	"Gigabit RJ-45 Ports" (page 15) and "Connecting to the 10/100/1000 Mbps RJ-45 Ports" (page 22)
3.	**Connect to the SFP Ports** Connect to the SFP ports. For EX19164 and EX19244, the last 4 RJ-45 ports are shared with the SFP ports. If a shared RJ-45 or SFP port is being used, the other port cannot be used at the same time. ***SFP Ports:*** • Remove any protector plugs from the SFP transceivers on the front of the switch. • Position and insert a SFP transceiver into one of the SFP ports until it is firmly seated, and then close the latching bale. – Model EX19082: use port **10FX**. – Model EX19164: use ports **13 FX** through **16 FX**. – Model EX19244: use ports **21 FX** through **24 FX**. • Repeat this step to use another SFP port if necessary.	"Gigabit SFP Ports" (page 15) "Connecting to the SFP Ports" (page 22)
4.	**Power On** • Connect the female end of the supplied AC power adapter cable to the power receptacle on the back of the switch. • Connect the 3-pronged end of the AC power adapter cable to a grounded 3-pronged AC outlet. • Move the ON/OFF switch on the rear panel of the switch to the ON position. • Wait for the switch to complete its Power On Self Test. • Confirm that the LEDs for ports connected to a device are on. If not, replace the Ethernet cable, and then check the port LED again.	"Applying AC Power" (page 24)

Step	Description	For Reference, See...
5.	**Configure the Switch** • Configure a PC for subnet 192.168.1.*n*, where *n* is a number other than 1 in the range 0 to 255. • Connect the PC to a RJ-45 port on the switch, launch a browser, and specify the switch's default IP address 192.168.1.10. • At the User Log In page, type **admin** in the **Password** field, click **Apply** and then click **OK** on the popup window. • Enter a new case-sensitive username in the **Name** field and password in the **Password** field, and then click **Apply**. • At the **System Configuration** page, set up **DHCP** or **Static** IP address (enter the IP address, subnet mask, and gateway settings for the network on which you will use the switch). Click **Apply**. • Change any other settings, as necessary.	Chapters 3 and 4

2 Unpacking and Installation

Topics:

This chapter describes how to unpack and install the EX19082, EX19164, and EX19244 switches.

Unpacking the Hardware

Unpack the items and confirm that no items are missing or damaged. Your package should include:

- One EX19082, EX19164, or EX19244 switch
- One AC power cord
- Rack-mounting hardware brackets for EX19164 or EX19244
- Quick Install Guide

If any item is damaged or missing, notify your authorized EtherWAN representative. Keep the carton, including the original packing material, in case you need to store the product or return it.

System Requirements

To complete your installation, you need the following items:

- **Computer with an Ethernet (RJ-45) Interface**

  Managing the switch requires a personal or notebook computer (PC) with a minimum 10/100BASE-TX Ethernet interface and a physical RJ-45 connection and one of the web browsers listed below.

- **Category 5e+ Ethernet Cables**

  An Ethernet cable of at least Category 5e rating is required to connect your PC to the switch. The cable can be configured as "straight-through" or crossover.

- **Web Browser Software**

  Use any of the following web browsers when configuring the switch:

  – Edge

  – Mozilla Firefox

  – Google Chrome

Hardware Features

The following sections describe the hardware features of the EX19082, EX19164, and EX19244 switches.

Front Panel

The figures below show the front panels of the switches.

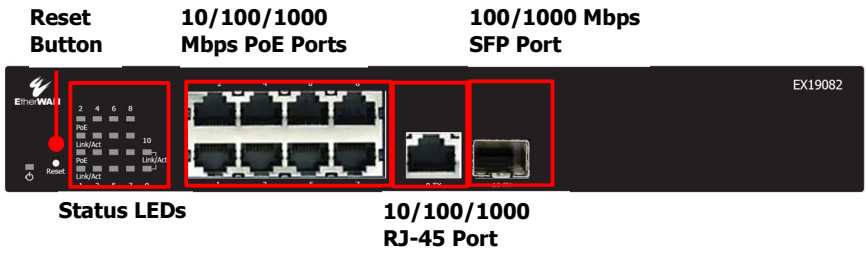


Figure 2-1. Front Panel of the EX19082 Switch

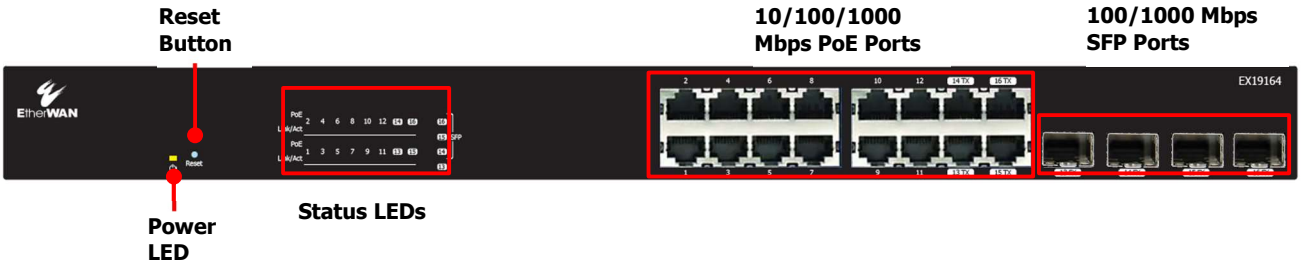


Figure 2-2. Front Panel of the EX19164 Switch

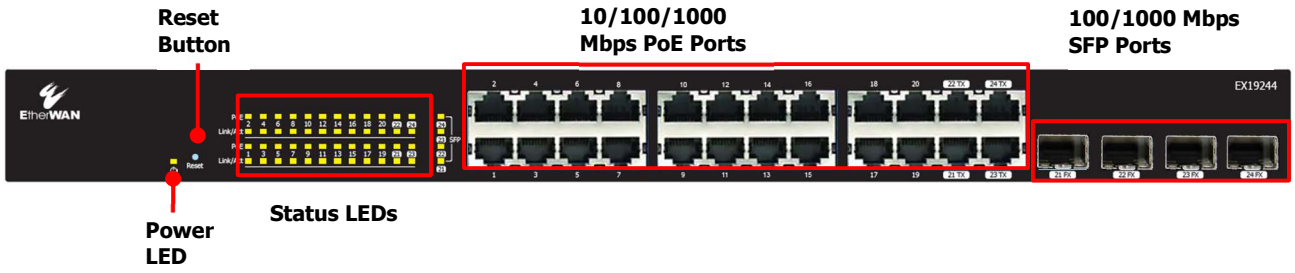


Figure 2-3. Front Panel of the EX19244 Switch

Gigabit RJ-45 Ports

The switches have the following gigabit RJ-45 ports:

Switch Model	Number of 10/100 Mbps RJ-45 Ports	Port Designations
Model EX19082	8	**1** through **8** (see Figure 2-1)
Model EX19164	16	**1** through **16** (see Figure 2-2)
Model EX19244	24	**1** through **24** (see Figure 2-3)

These ports are auto-sensing, auto-MDIX 10/100/1000 Mbps ports. When you insert a cable into an RJ-45 port, the switch:

- Determines whether the cable is a straight-through or crossover cable.
- Automatically ascertains the maximum speed (10, 100, or 1000 Mbps) and duplex mode (half- or full-duplex) of the attached device.

After determining this information, the switch configures the RJ-45 port automatically to enable communications with the attached device, without requiring user intervention.

Gigabit SFP Ports

EX19082, EX19164, and EX19244 switches have SFP (Small Form Factor Pluggable) interfaces. These ports provide a full-duplex 100 or 1000 Mbps connection and can be used to connect upstream to other switches or to other devices.

Table 2-1 shows the port designations for the SFP interfaces. For EX19082, port 9 is a RJ-45 port and port 10 is an SFP port. For EX19164 and EX19244, the last four RJ-45 ports are shared with 4 SFP ports. If a RJ-45 or SFP port is being used, the other port cannot be used simultaneously.

Table 2-1. SFP Port Designations

Switch Model	Port Designations for shared RJ-45 Ports	Port Designations for shared SFP Ports
Model EX19082 (see Figure 2-1)	-	-
Model EX19164 (see Figure 2-2)	**13 TX** through **16 TX**	**13 FX through 16 FX**
Model EX19244 (see Figure 2-3)	**21 TX** through **24 TX**	**21 FX through 24 FX**

Note: These ports have also been referred to as mini-GigaBit or (GBIC) ports, but this term has been made obsolete by SFP.

Reset Button

The EX19082, EX19164, and EX19244 front panels have a reset button to reset the switch to its factory default settings. This button is recessed to prevent accidental resets of the switch.

To reset the switch to its factory default settings and remove all customized overrides you made to the default settings:

1. Leave power cord connected to the switch.
2. Using a pin or paper clip, press and hold the reset button for about 5 seconds, then release the reset button.
3. Wait for the switch to reboot.

Note: You can also reboot the switch using the Reboot Device page in the switch's Web management interface (see "Warm Restart" on page **Error! Bookmark not defined.**).

LEDs

The EX19082, EX19164, and EX19244 front panel LEDs show power, PoE, link/activity, and 1000 Mbps activity status. Table 2-2 summarizes the LEDs on the switches.

Table 2-2. Front Panel LEDs

LED	Color	Status	Description
Power	**Orange**	ON	Power is supplied to the switch.
PoE (the port number)	**Orange**	ON	Powered Device (PD) is connected.
		OFF	PD is disconnected.
Link/ACT (the port number)	**Green**	ON	A valid network connection has been established.
		OFF	Data transmission is not occurring on the port.
		Flashing	Data is being sent or received on the port.
SFP (the port number)	**Green**	ON	A valid network connection has been established on the port.
		OFF	Data transmission is not occurring on the port.

		Flashing	Data is being sent or received on the port.

Rear Panel

The EX19082, EX19164, and EX19244 rear panels have a receptacle for connecting the supplied power cord.

The rear panels also have a fan that allows air to pass through the switch enclosure and exit through the rear of the chassis. Be sure the fan is not blocked.

Side and Bottom Panels

The EX19082, EX19164, and EX19244 side panels have vents for cooling. Be sure these vents are not blocked.

The bottom panels have a product label that shows regulatory compliance, product serial number, and other information.

Installing the Switch

Switch installation involves the following steps:

1. Preparing the site. See page 19
2. Installing the switch. See page 19.
3. Connecting to the 10/100/1000 Mbps RJ-45 ports. See page 22.
4. Connecting to the SFP ports. See page 23.
5. Checking the installation. See page 23.
6. Applying AC power. See page 24.

Preparing the Site

Before you install your switch, be sure your operating environment meets the operating environment requirements in Table 2-3.

Table 2-3. Site Requirements

Characteristics	Requirements
Mounting	
Desktop installations:	Provide a flat table or shelf surface.
Rack-mount installations:	Use a 19-inch (48.3-centimeter) EIA standard equipment rack that is grounded and physically secure. You also need the rack-mount guide supplied with your switch.
Access	Locate the switch in a position that lets you access the front panel RJ-45 ports, view the front panel LEDs, and access the rear-panel power connector.
Power source	Provide a power source within 6 feet (1.8 meters) of the installation location. Power specifications for the switch are shown in Appendix A. Be sure the AC outlet is not controlled by a wall switch, which can accidentally turn off power to the outlet and the switch.
Environmental	
Temperature:	Install the switch in a dry area, with ambient temperature between 0 and 40ºC (32 and 104ºF). Keep the switch away from heat sources such as direct sunlight, warm air exhausts, hot-air vents, and heaters.
Operating humidity:	The installation location should have a maximum relative humidity of 90%, non-condensing.
Ventilation:	Do not restrict airflow by covering or obstructing the vents on the rear and side panels of the switch. Keep at least 2 inches (5.08 centimeters) free on all sides for cooling. Be sure there is adequate airflow in the room or wiring closet where you intend to install the switch.
Operating conditions:	Keep the switch at least 6 ft (1.83 m) away from nearest source of electromagnetic noise, such as a photocopy machine.
Stacking	If you intend to stack two or more switches, be sure: • The mounting surface can safely support the stack. • There is adequate space around the stack for ventilation and cooling.

Installing the Switch

You can install your switch on a flat surface or in a standard EIA 19-inch rack that can be placed in a wiring closet with other equipment.

- If installing the switch on a desktop or shelf, allow sufficient ventilation space between the device and the objects around it.
- If installing the switch in a rack, attach the supplied rack-mounting brackets to the switch's front panel (one on each side), and secure them with the screws provided with the equipment rack. For more information, refer to the documentation that came with the equipment rack.

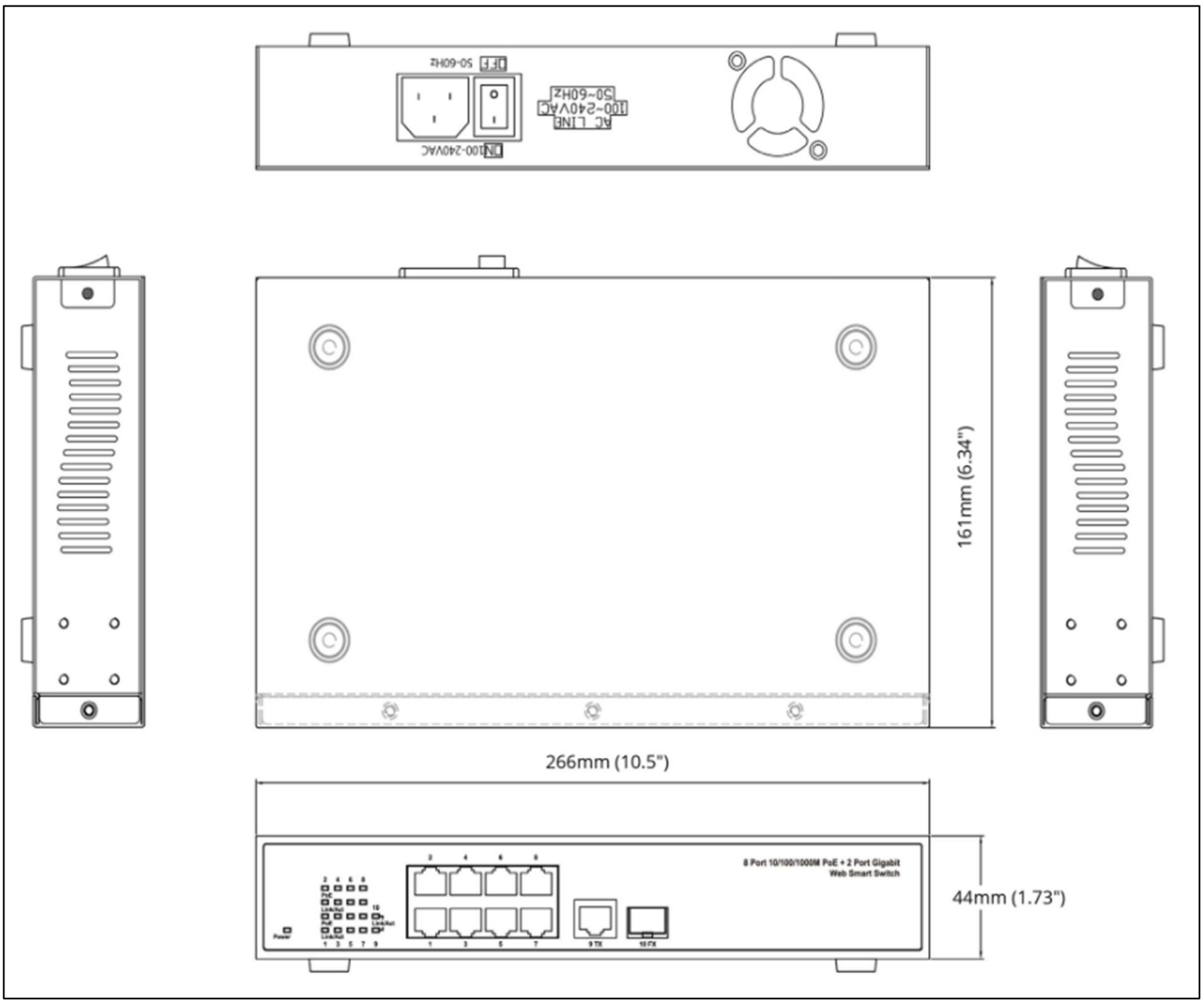


Figure 2-4. EX19082 Switch Dimensions

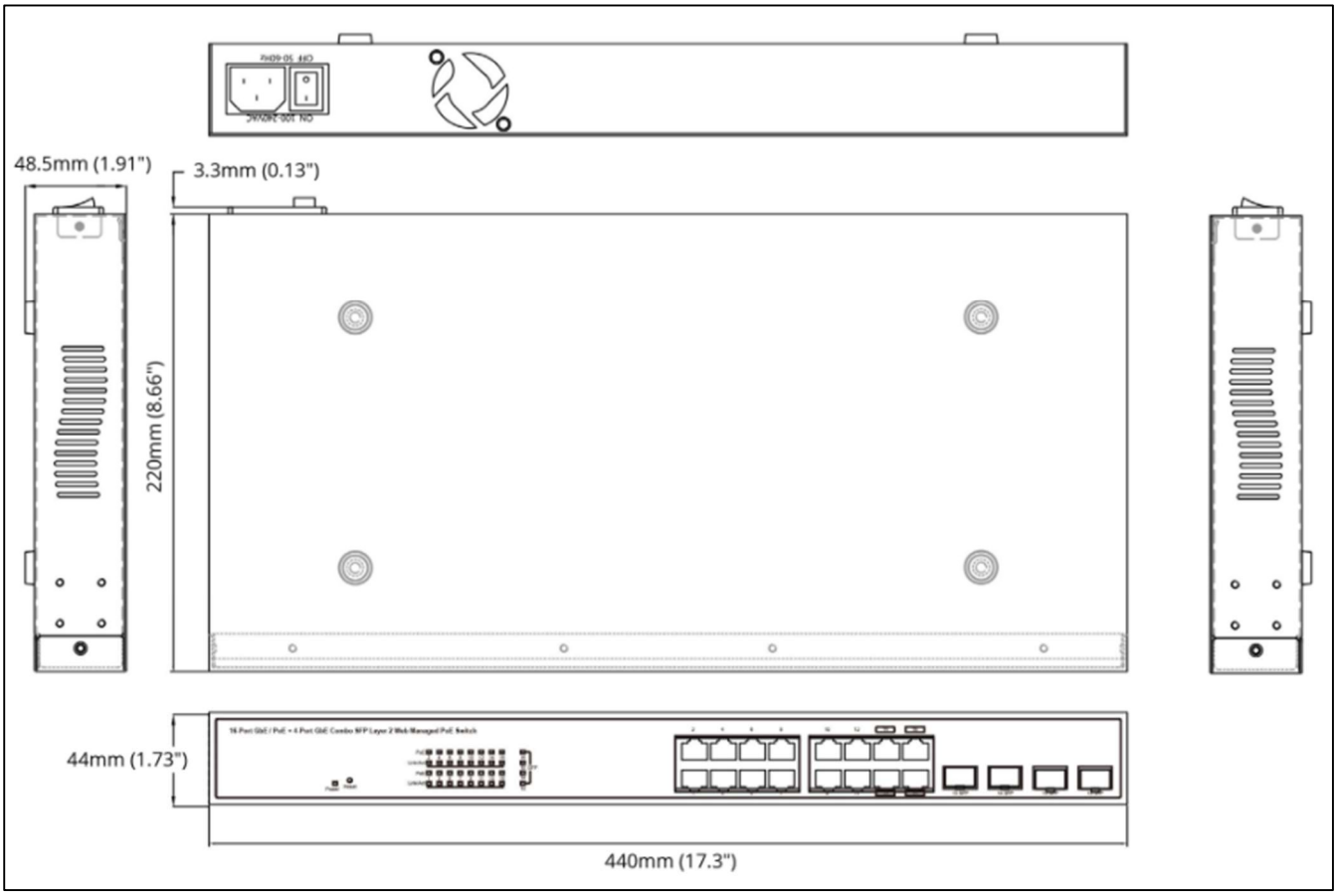


Figure 2-5. EX19164 Switch Dimensions

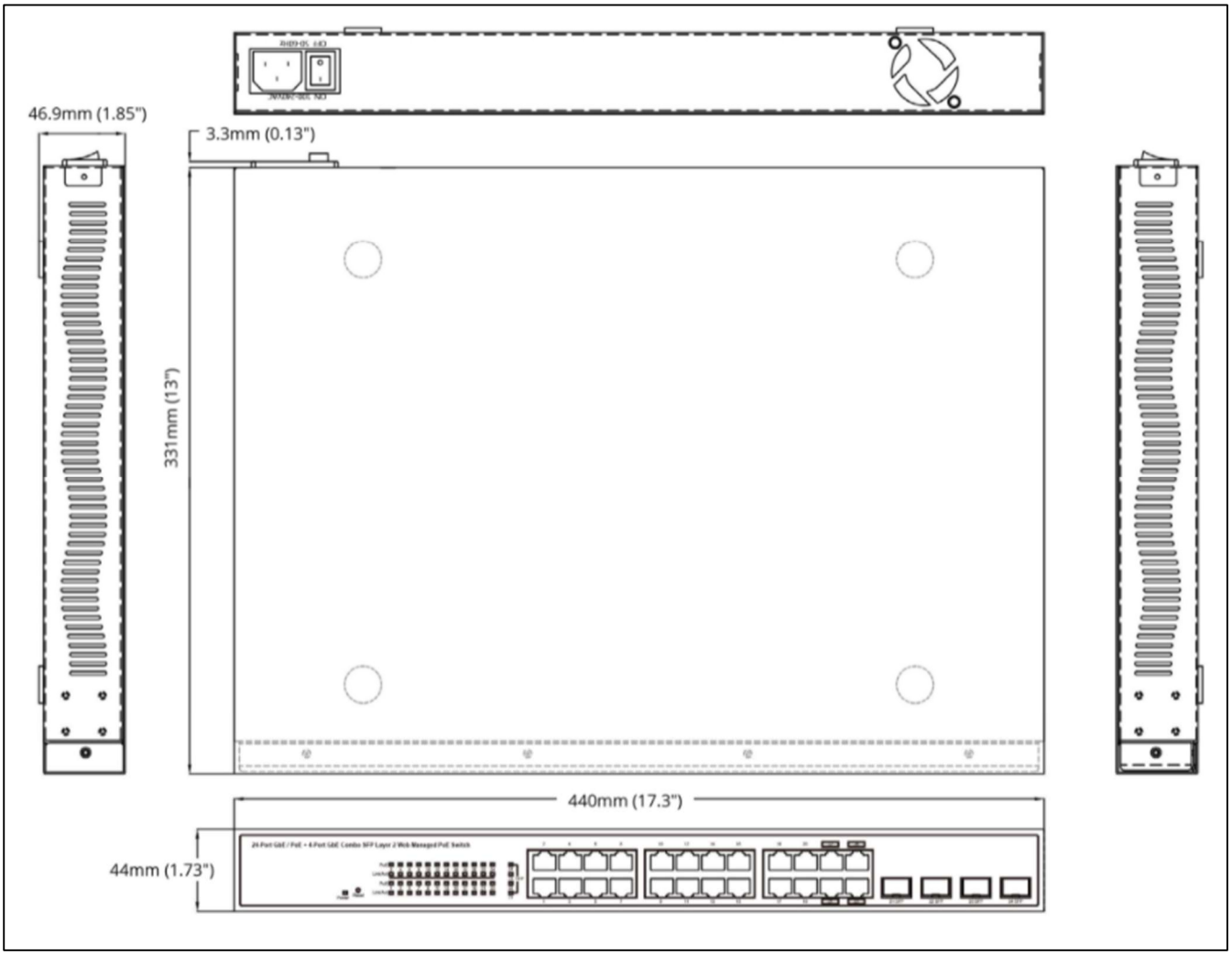


Figure 2-6. EX19244 Switch Dimensions

Connecting to the 10/100/1000 Mbps RJ-45 Ports

The front panel of the switch provides 9, 16, or 24 10/100/1000 Mbps RJ-45 ports, depending on the model (see “Gigabit RJ-45 Ports” on page 15). To prevent ESD damage, follow normal board and component handling procedures.

Note: PoE faults are caused when noncompliant cabling or powered devices are connected to a PoE port. Use only standard-compliant cabling to connect IEEE 802.3af/at-compliant devices to PoE ports. A cable or device that causes a PoE fault must be removed from the network.

To connect devices to the switch’s 10/100/1000 Mbps RJ-45 ports:

1. Insert one end of a Category 5e or better Ethernet cable into a switch port.
2. Insert the other cable end into the Ethernet port of a computer, printer, network storage, or other network device.
3. Repeat steps 1 and 2 for each additional device you want to connect to the switch.

Connecting to the SFP Ports

For EX19164 and EX19244, the last 4 RJ-45 ports are shared with the SFP ports. If a shared RJ-45 or SFP port is being used, the other port cannot be used at the same time.

Connecting to the SFP Ports

To connect devices to the fiber optic SFP ports:

1. Attach an ESD-preventive wrist strap to your wrist and to a bare metal surface on the chassis.
2. Remove the dust plugs from the fiber-optic SFP module ports on the switch and store them in a safe place.
3. Find the send (TX) and receive (RX) markings that identify the top side of the SFP module.

Note: On some SFP modules, the send and receive (TX and RX) markings might be replaced by arrows that show the direction of the connection, either send or receive (TX or RX).

4. Align the SFP module in front of the slot opening.
5. Insert the SFP module into the slot on the switch until you feel the connector on the module snap into place in the rear of the slot.

Checking the Installation

Before you apply power:

- Inspect the equipment thoroughly.
- Verify that all cables are installed correctly.
- Check cable routing to make sure cables are not damaged or create a safety hazard.
- Be sure all equipment is mounted properly and securely.

Applying AC Power

EX19082, EX19164, and EX19244 switches have an ON/OFF switch that controls power to the switch. Before you connect the power cord, select an AC outlet that is not controlled by a wall switch, which can turn off power to the switch. After you select an appropriate outlet, use the following procedure to apply AC power.

1. Connect the female end of the supplied AC power adapter cable to the power receptacle on the back of the switch.
2. Connect the 3-pronged end of the AC power adapter cable to a grounded 3-pronged AC outlet.
3. On the rear panel, move the ON/OFF switch to the ON position ( ).

When you apply power:

- The orange **Power LED** goes ON.
- The fans start.

After the switch turns on, the **Link/ACT** LED for every port connected to a device goes ON. The **PoE** LEDs also go ON if Powered Devices are connected. The switch is now functional and ready to pass data.

If you do not hear the fans, or if the **Power** LED is not ON, check that the power cable is plugged in correctly, the ON/OFF switch is set to the ON position, and that the power source is good and not controlled by a wall switch. If this does not resolve the problem, see Chapter 5, Troubleshooting.

Where to Go from Here

After you power-up the switch for the first time, you configure it using the switch's built-in management software. For more information, see Chapters 3 and 4.

3 Preparing to Configure the Switch

Topics:

After you install the switch, configure it using the switch's built-in Web management interface and a Web browser on a PC.

For the Web browser to access the switch's Web management interface, the PC and switch must be on the same subnet. This means the first time you configure the switch, you must change your PC's TCP/IP settings to match the switch's default subnet of 192.168.1.1.

The procedure for changing your PC's TCP/IP settings depends on the PC's operating system. This chapter describes how to configure TCP/IP settings for PCs that have a Microsoft Windows 10 operating system.

If your PC is running an operating system other than Windows 10, refer to the documentation for your operating system to find out how to change the PC's TCP/IP settings.

Connecting the PC

To connect a PC to the switch:

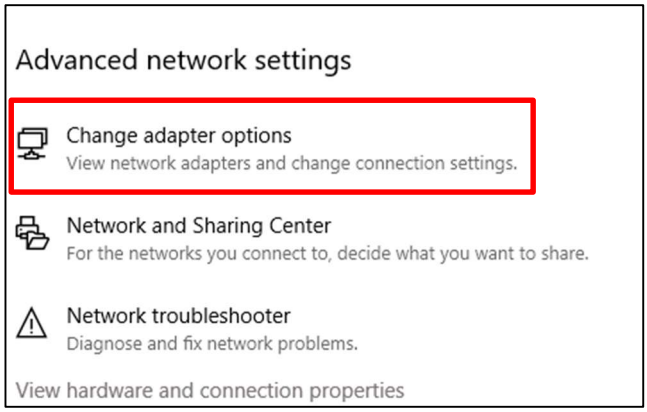
1. Insert one end of a Category 5e or better Ethernet cable into an available 10/100/1000 Mbps RJ-45 port on the front panel of the switch.
2. Connect the other end of the cable to the Ethernet port on the PC you will use to configure the switch.
3. Confirm that the **Link/ACT** LED for the port to which the PC is connected is ON. If the LED is OFF, replace the Ethernet cable connecting your computer and switch.

Configuring TCP/IP Settings for Windows 10

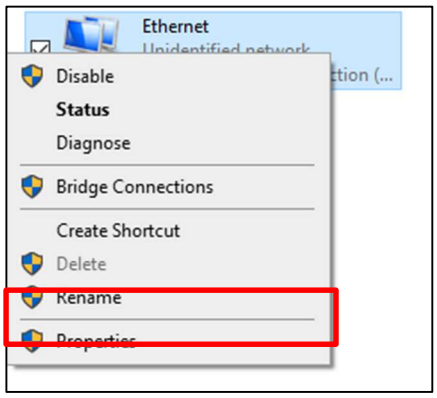
After connecting the PC to the switch, change the PC's TCP/IP settings to the switch's default subnet.

The following procedure describes how to change the TCP/IP settings for a PC running Windows 10.

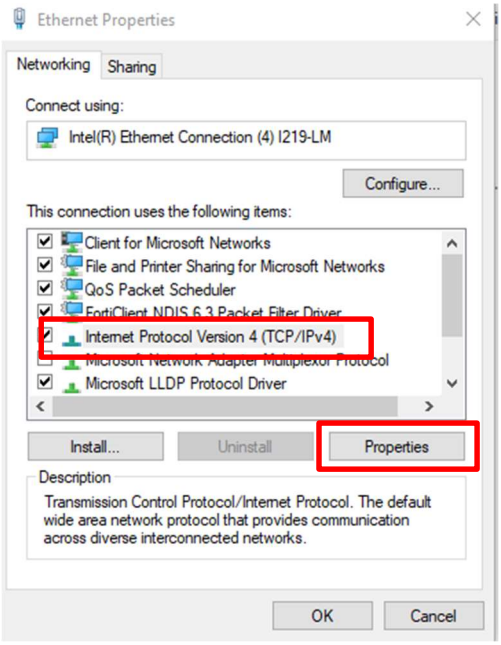
1. Click **Start >Settings > Network & Internet >Status**.
2. At the bottom, click **Change adapter settings**.



3. A new window will pop up with available adapters. Select the applicable connection for your PC's ethernet adapter, right click it, and then select **Properties**.



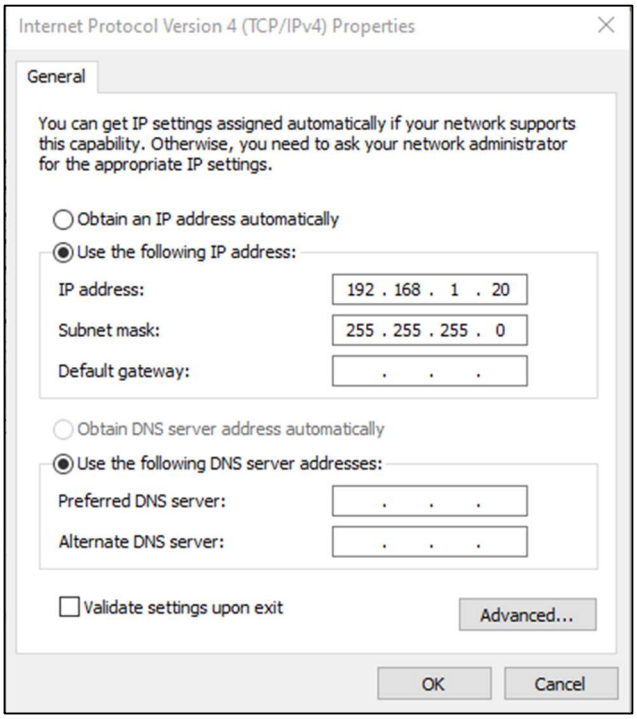
4. Click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.



5. In the **General** tab, click **Use the following IP address**.
6. In the **IP address** field, type 192.168.1.20.

Tip: Although the last digit in the previous step is 20, in reality, this digit can be any number between 0 and 255, except the number 10 because the address 192.168.1.10 is already being used by the switch.

7. Press the Tab key to populate the **Subnet mask** field automatically. You can leave the **Default gateway** field blank.



8. Click **OK** to exit the current dialog box, and then click **OK** again to exit the initial dialog box.

Disabling Firewall and Security Software

If you encounter problems connecting to the switch, disable any firewall or security software that may be running on your PC before configuring the switch. For more information, refer to the documentation for your firewall.

4 Configuring the Switch

Topics:

After you attach a PC to the switch and configure the PC to the same subnet as the switch, use the information in this chapter to configure the switch.

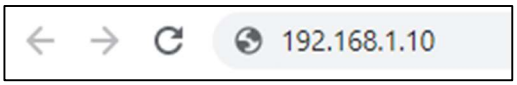
Logging in to the Web Management Interface

To access the switch's configuration settings, launch a Web browser on the PC you configured in Chapter 3 and log in to the switch's Web management interface.

1. Launch a Web browser.

Note: Your computer does not have to be online to configure your switch.

2. In the browser address bar, type the switch's default TCP/IP address of **http://192.168.1.10**:



3. Press the **Enter** key. The initial log in screen appears (see Figure 4-1).

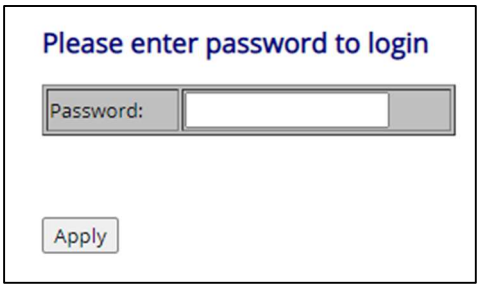
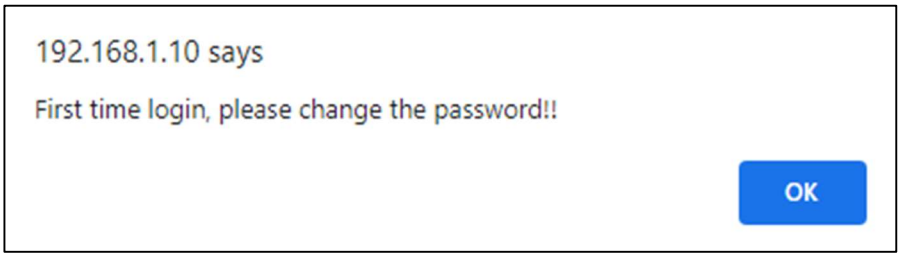
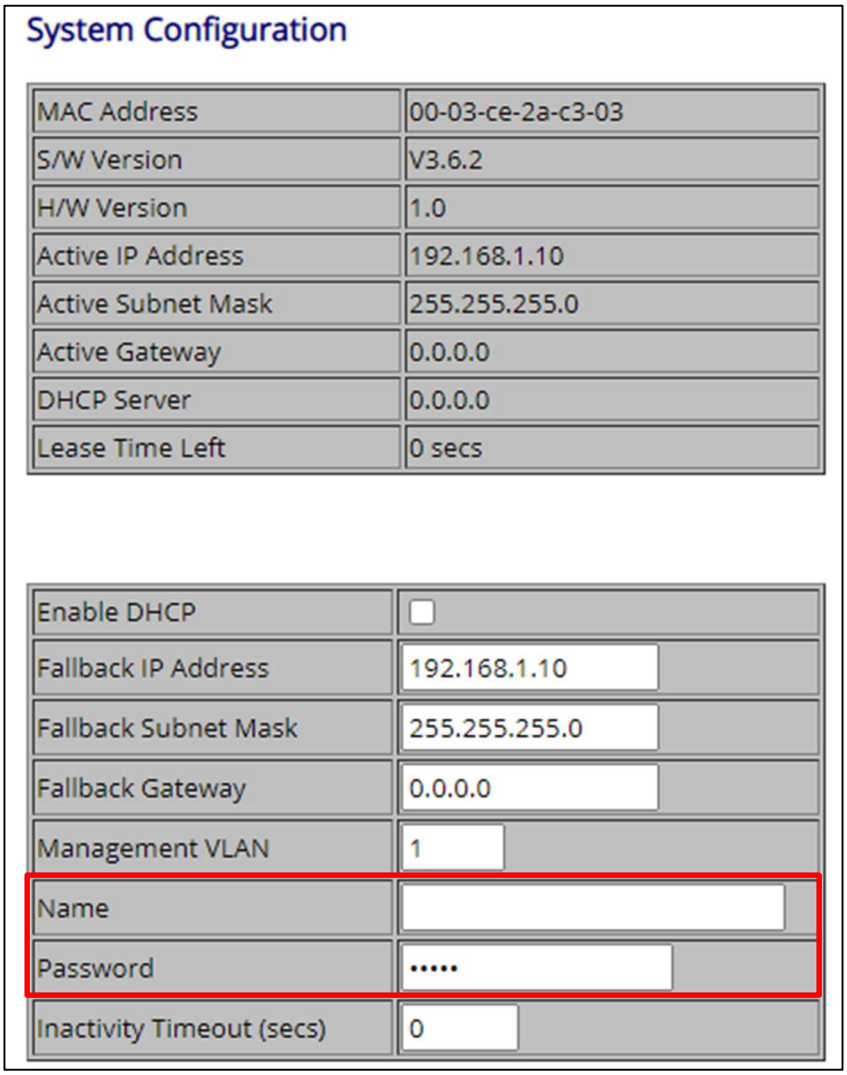


Figure 4-1. User Log In Screen

4. In the log in screen, type **admin** as the password.
5. Click **Apply**. The Web management interface starts and a pop-up message will appear, requiring a password to be set.



6. Click **OK**. In the subsequent System Configuration page, enter a user name and a new password in the **Name** and **Password** fields. Click **Apply**.



7. The password must meet the following complexity requirements
   - Minimum 8 characters and maximum 35 characters without leading or trailing blanks
   - Uppercase English letters (A to Z)
   - Lowercase English letters (a to z)
   - Numbers (0 to 9)
   - Non-alphanumeric characters (e.g. @, #, !)

Idle Time Security

For security, the switch has an idle time security feature that either closes the current Web management session automatically or displays the last management page accessed if the interface is not used for a certain period of time.

By default, this feature is disabled. However, you can use the System Status page to enable this feature and configure the period of inactivity that can occur during a Web management session before the switch ends the session automatically. For more information, see "**Error! Reference source not found.**" on page **Error! Bookmark not defined.**.

Understanding the Web Management Interface

The top of the Web management interface shows the switch ports, with ports in use highlighted in green. In Figure 4-2, for example, the ports for the EX19164 switch are shown, with port 2 in use.

The left side of the Web management interface contains the menus you use to configure the switch. When you click a menu, the configuration settings associated with the menu appear in the workspace (see Figure 4-2).

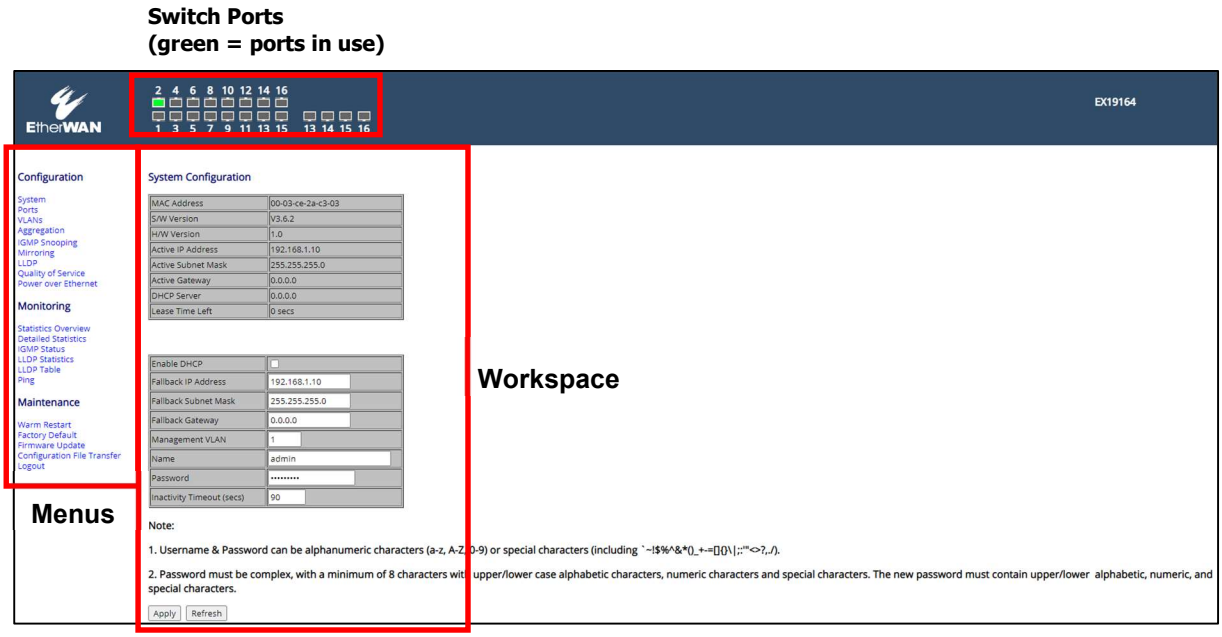


Figure 4-2. Main Areas on the Web Management Interface (EX19164 Switch)

Web Management Interface Menus

Table 4-1 describes the pages in the Web management interface.

Table 4-1. Web Management Interface Menus and Submenus

Menus and Submenus	Description	See Page
Configuration > System	System status and configuration	35
Configuration > Ports	Port configuration	39
Configuration > VLANs	VLAN setup	41
Configuration > Aggregation	Configure aggregation groups	45
Configuration > IGMP Snooping	Enable IGMP snooping and querying	46
Configuration > Mirroring	Set up port mirroring	47
Configuration > LLDP	Set up LLDP parameters	48
Configuration > Quality of Service	Set up QoS	50
Configuration > Power over Ethernet	Enable/Disable PoE per port	53
Monitoring > Statistics Overview	Sends network traffic on a port copied to another port for analysis.	55
Monitoring > Detailed Statistics	Limits the rates at which the switch accepts incoming data and retransmits outgoing data.	56
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Monitoring > LLDP Table	Displays the LLDP neighbor table	59
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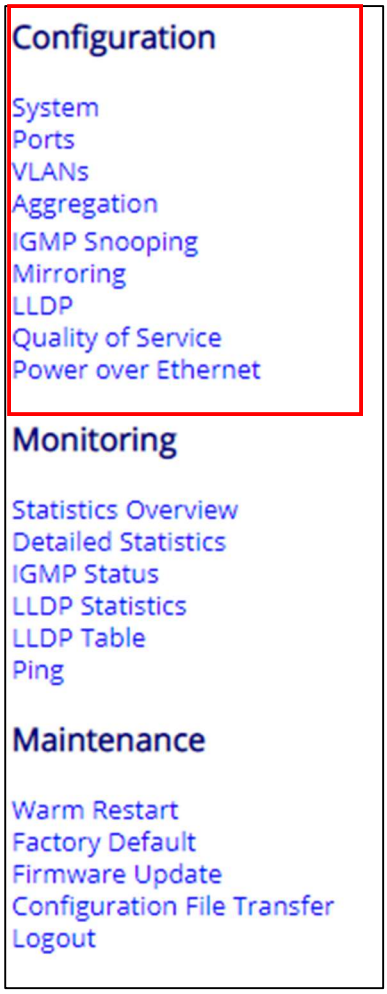
Maintenance > Logout	Log out of the switch	66

Configuration Menu

The **Configuration** menu lets you perform the following tasks:

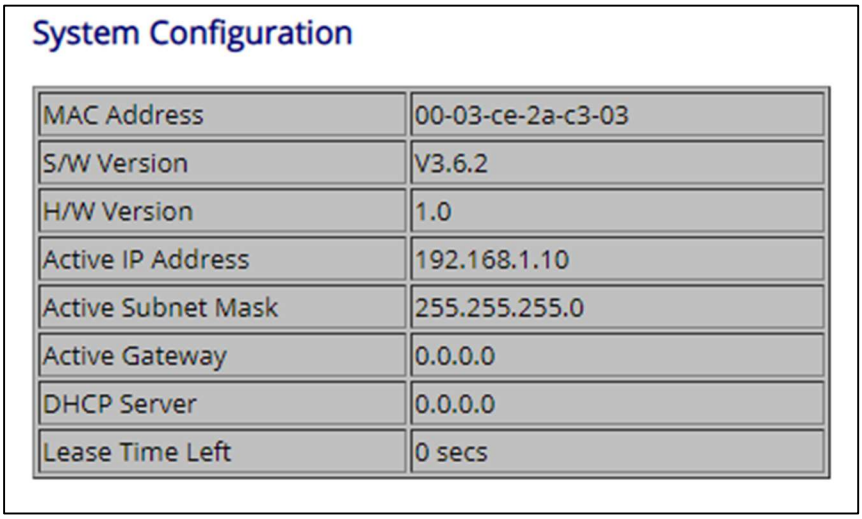


- **System Configuration** — displays the system status, modify IP settings, and change the username and password used to log in to the Web management interface. See page 35.
- **Port Configuration** — set up ports for speed mode. See page 39.
- **VLAN Configuration** — set up VLANs. See page 41.
- **Aggregate/Trunking Configuration** — set up aggregation groups. See page 45.
- **IGMP Snooping** — enable IGMP snooping and querying. See page 46.
- **Mirroring Configuration** — set up port mirroring. See page 47.
- **LLDP Configuration** — set up LLDP parameters. See page 48.
- **QoS Configuration** — set up 802.1p or DSCP QoS modes. See page 50.
- **PoE Configuration** — enable/disable PoE per port. See page 53.

System Status

Path: **Configuration > System**

The System Configuration page shows the current status of the system.

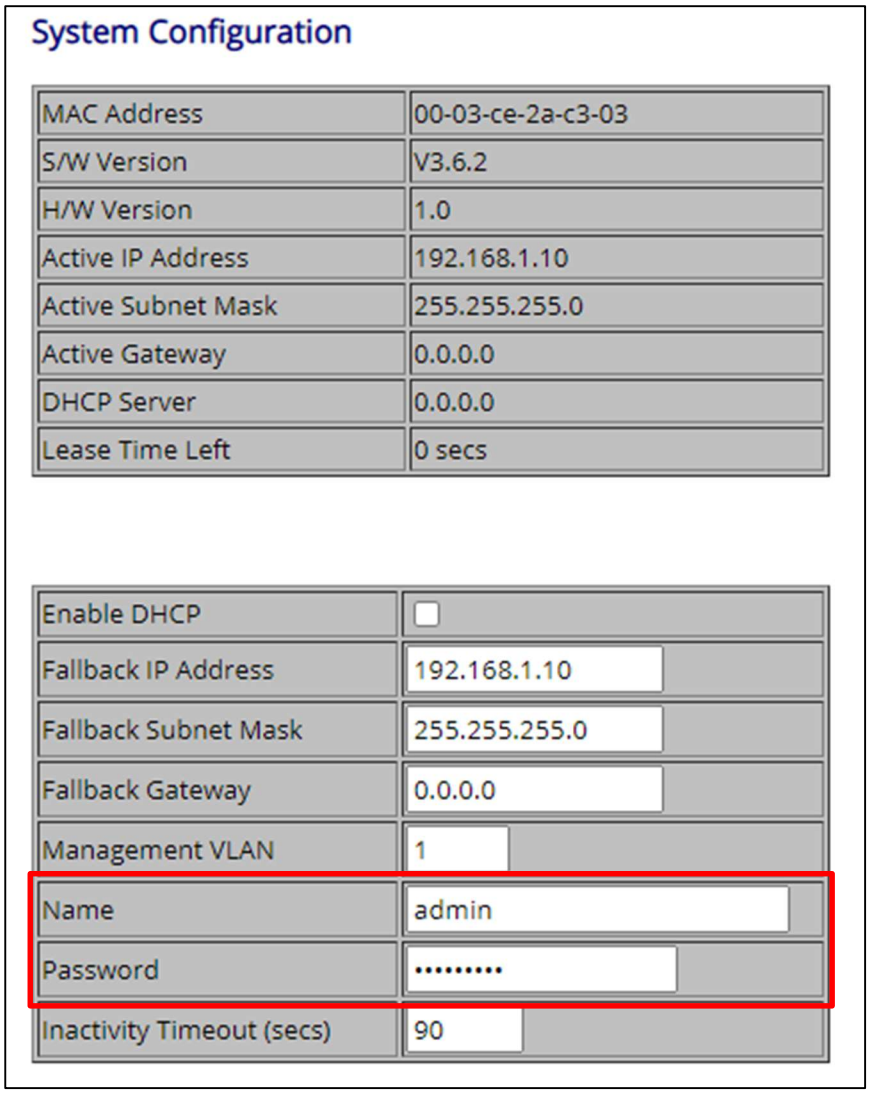


Field	Description
MAC Address	Shows the MAC address of the device
S/W Version	Shows the version of the installed firmware on the device
H/W Version	Shows the hardware version of the device
Active IP Address	Shows the IP address the device is currently set to
Active Subnet Mask	Shows the subnet mask the device is currently set to
Active Gateway	Shows the gateway the device is currently set to
DHCP Server	Shows the IP address of the DHCP server associated with the device. IP address will be displayed only when DHCP mode is enabled on the device
Lease Time Left	Shows the time between when the IP address is assigned to the device and when a new IP address is provided. This applies when DHCP mode is enabled. A lease time of 0 means that the IP address will not be released

Authentication

Path: **Configuration > System**

The System Configuration page lets you change the username and password used to log in to the switch's Web management interface.



When accessing the Web management GUI for the first time, it is required to change the default username and password used to log in to the switch's Web management.

1. In the **Name** field, enter a username. Permitted characters are lower-case characters a-z, upper-case characters A-Z, digits 0-9, and special characters.

2. In the **Password** field, enter a case-sensitive password, minimum of 8 characters. The password must contain characters from the following categories:

   Uppercase English letters, (A to Z)

   Lowercase English letters, (a to z)

   Numbers, (0 to 9)

   Non-alphanumeric characters (e.g. @,#,$)

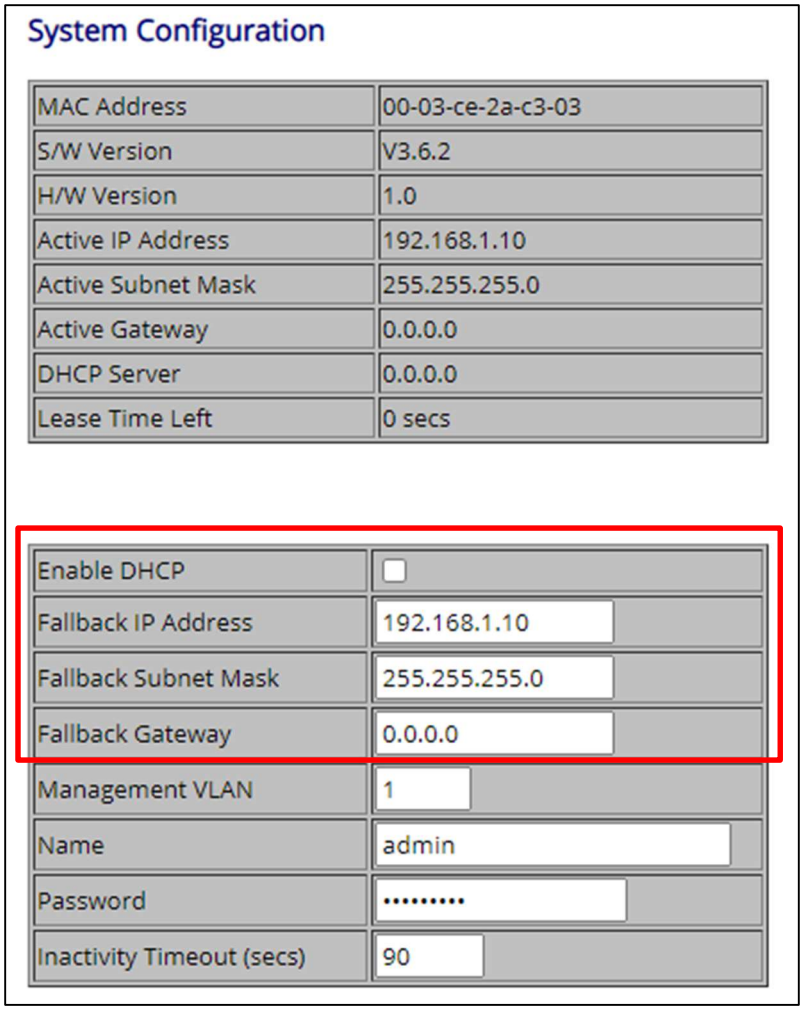
3. Click **Apply**.
4. When prompted by the popup window, click **OK**.

IP Configuration

Path: **Configuration > System**

The System Configuration page lets you configure the switch to use a static or dynamic (DHCP) IP address. The first time you log in, configure these settings to match the settings of the network on which the switch will be used.

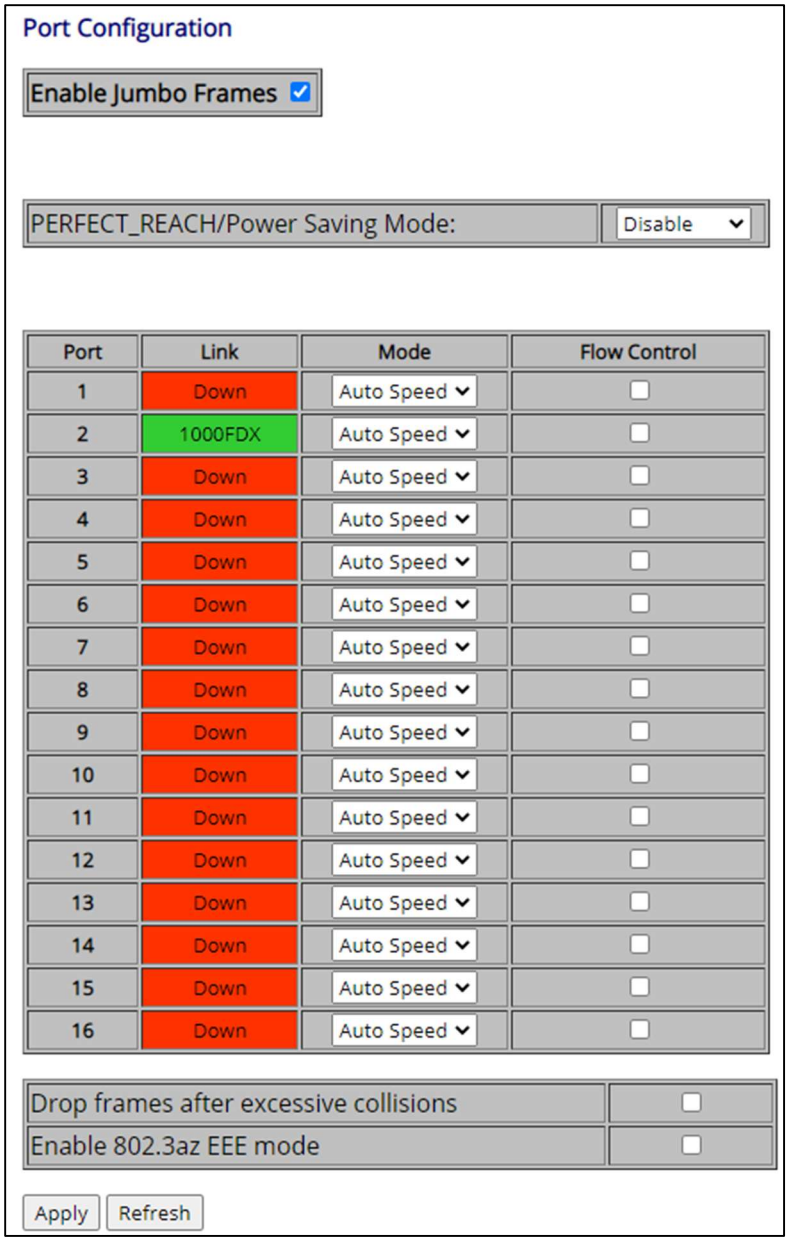
1. If your network uses a Dynamic Host Configuration Protocol (DHCP) server to allocate IP addresses dynamically, click the checkbox for **Enable DHCP**, and then skip to step 3.
2. If your network uses static IP addresses, complete the **IP Address**, **Subnet Mask**, and **Gateway** fields with the static IP address information for the switch. The IP address must be unique and must not be used by any other device on the network.
3. Click **Apply**.



Port Configuration

Path: **Configuration > Ports**

The Port Configuration page displays the status for each port and allows you to configure the ports. Click **Apply** after making changes.



Field	Description
Enable Jumbo Frames	Check the box to enable jumbo frames
PERFECT_REACH / Power Saving Mode	Enable to automatically adjust power provided to ports based on cable length
Link	Displays the current speed of the port. 100 means 100Mbps and 1000 means 1000Mbps. FDX means full duplex and HDX means half duplex
Mode	Set the port to automatically detect speed or manually set the speed
Flow Control	Check the box to enable flow control
Drop frames after excessive collisions	Check the box to enable the switch to drop frames when/if excessive collisions occur
Enable 802.3az EEE mode	Check the box to enable Energy Efficient Ethernet

VLAN Configuration

Path: **Configuration > VLANs**

A Local Area Network (LAN) can be defined as a broadcast domain. Hubs, bridges or switches in the same physical segment or segments connect all end node devices. End nodes can communicate with each other without the need for a router. Routers connect LANs together, routing the traffic to appropriate port.

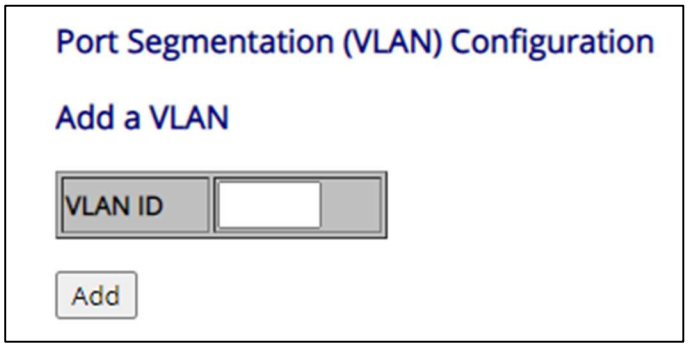
A virtual LAN (VLAN) is a local-area network with a definition that maps workstations on some other basis than geographic location (for example, by department, type of user, or primary application). To communicate between VLANs, traffic must go through a router, just as if they were on two separate LANs.

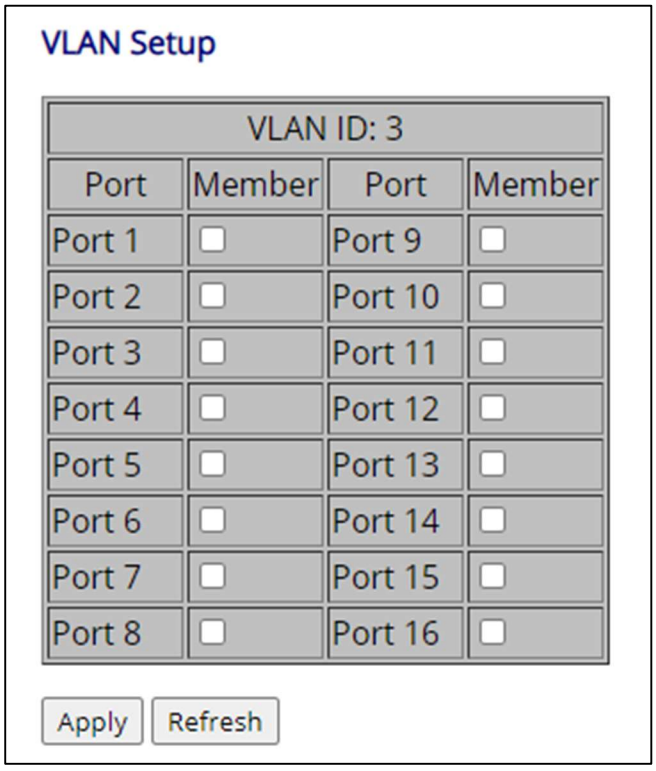
A VLAN is a group of PCs, servers and other network resources that behave as if they were connected to a single, network segment — even though they may not be. For example, all marketing personnel may be spread throughout a building. Yet if they are all assigned to a single VLAN, they can share resources and bandwidth as if they were connected to the same segment. The resources of other departments can be invisible to the marketing VLAN members, accessible to all, or accessible only to specified individuals, depending on how the IT manager has set up the VLANs.

The Advantages of VLANs

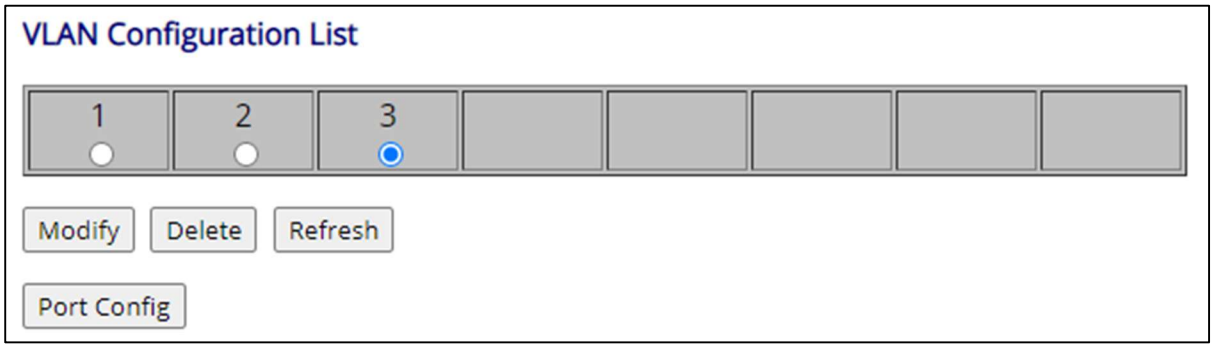
- **Provides network segmentation**. Users who communicate most frequently with each other can be grouped into common VLANs, regardless of physical location. Each group's traffic is largely contained within the VLAN, reducing extraneous traffic and improving the efficiency of the whole network.
- **Improves management**. The addition of nodes, as well as moves and other changes, can be dealt with quickly and conveniently from a management interface rather than the wiring closet.
- **Increases bandwidth and performance**. VLANs free up bandwidth by limiting node-to-node and broadcast traffic throughout the network.
- **Enhances network security**. VLANs create virtual boundaries that can be crossed only through a router. So standard, router-based security measures can be used to restrict access to each VLAN.

To add a VLAN, enter a number in the range of 1 to 4094 and click the **Add** button to enter the setup page for the VLAN.

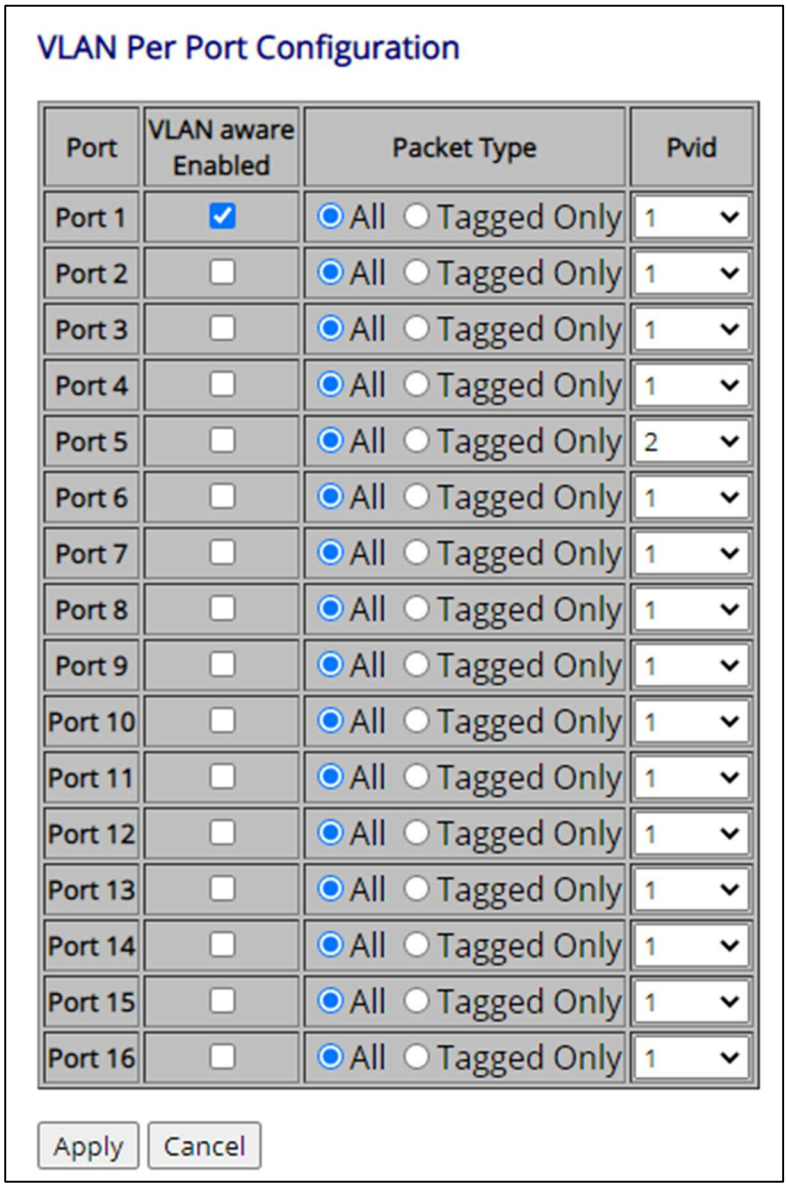




1. Click the checkbox for each port that will be part of the VLAN. Click **Apply** to save the settings and go back to the VLAN Configuration page.
2. The VLAN Configuration List show the VLAN that was just added.



1. To modify or delete a VLAN from the list, select the desired VLAN.
2. Click **Modify** to go back into the VLAN Setup page.
3. Click **Delete** to remove the VLAN from the list.
4. Click **Port Config** to enter the Per Port Configuration page.

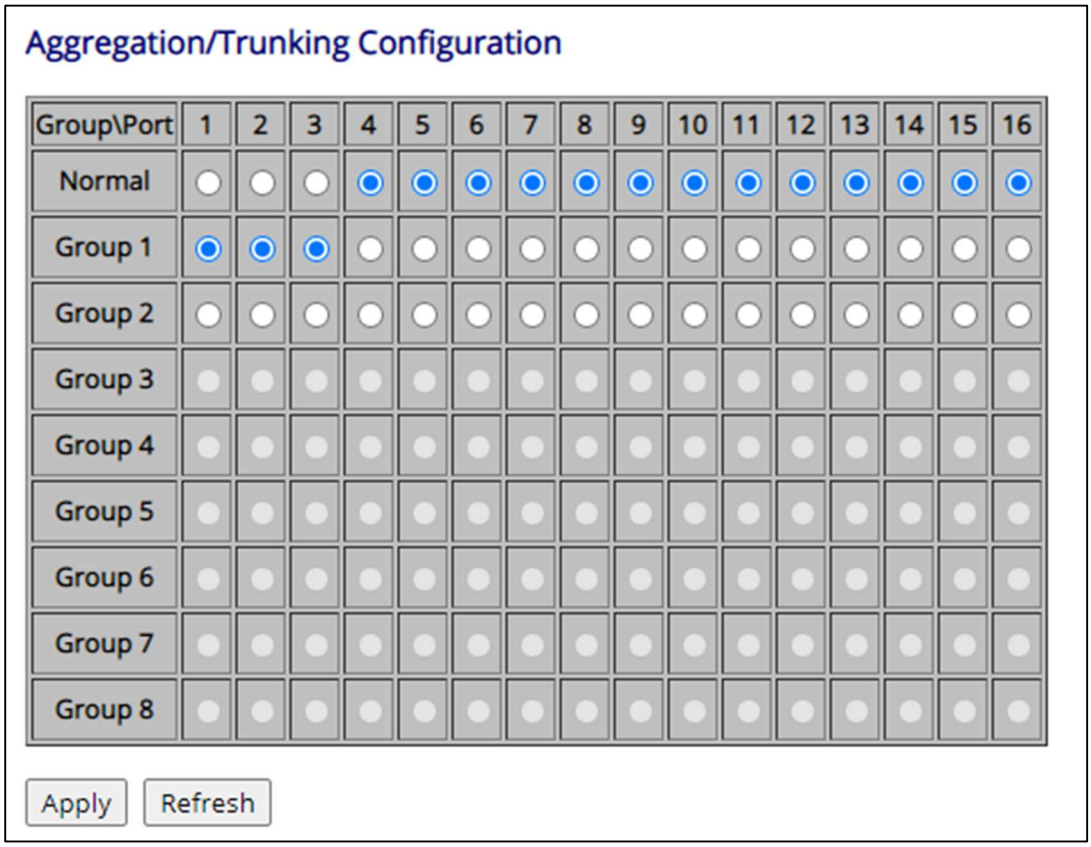


Field	Description
VLAN aware enabled	Check the box to enable the port to recognize tagged frames
Packet Type	Set if the port will accept all packets or only packets that are tagged with the selected PVID
PVID	Select an existing VLAN as the PVID for the port

Aggregation/Trunking Configuration

Path: **Configuration > Aggregation**

Trunking is a feature that increases the bandwidth between network devices by allowing multiple physical links between switches to work as one virtual (or “aggregate”) link. The Trunking page lets you configure the switch ports for use in trunks.



To assign specific ports to a trunk, click on the desired ports to set as the same aggregation/trunking group, as shows in the example above. Click **Apply** to save the settings.

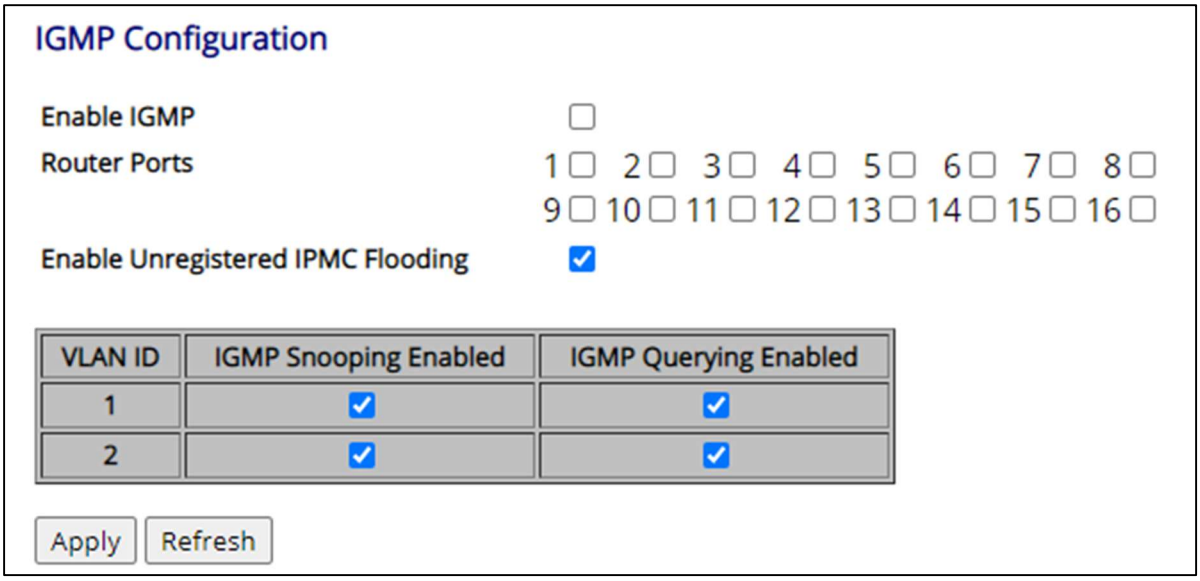
IGMP Configuration

Path: **Configuration > IGMP Snooping**

IGMP Snooping is the process of listening to IGMP network traffic. IGMP Snooping, as implied by the name, is a feature that allows a layer 2 switch to “listen in” on the IGMP conversation between hosts and routers by processing the layer 3 IGMP packets sent in a multicast network.

When IGMP Snooping is enabled in a switch, it analyzes all IGMP packets between hosts connected to the switch and multicast routers in the network. When the switch hears an IGMP report from a host for a given multicast group, the switch adds the host’s port number to the multicast list for that group. And, when the switch hears an IGMP Leave, it removes the host’s port from the table entry.

This prevents flooding of IP multicast traffic and limits bandwidth intensive video traffic to only the subscribers. After setup, click **Apply** to save the settings.



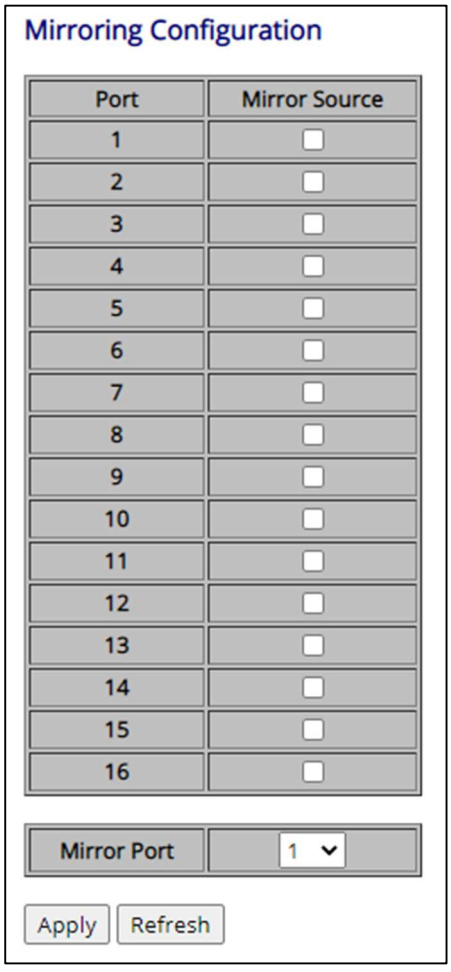
Field	Description
Enable IGMP	When enabled, the switch monitors traffic to determine which hosts receive multicast traffic
Router Ports	Select which ports are connecting to IGMP administrative routers
Enable Unregistered IPMC Flooding	When enabled, multicast traffic will flood. Disable to to forward to router ports only
IGMP Snooping Enabled	When enabled, the port will monitor traffic to determine which hosts receive multicast traffic
IGMP Querying Enabled	When enabled, the port will serve as the querier, responsible for asking hosts if they want to receive multicast traffic

Mirroring Configuration

Path: **Configuration > Mirroring**

Port Mirroring is used on a network switch to send a copy of network packets seen on one port (or an entire VLAN) to a network monitoring connection on another switch port. This is commonly used for network appliances that require monitoring of network traffic, such as an intrusion-detection system.

After setup, click **Apply** to save the settings.

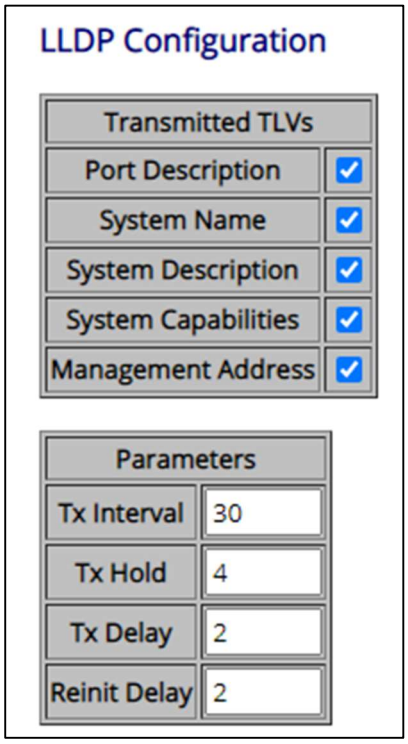


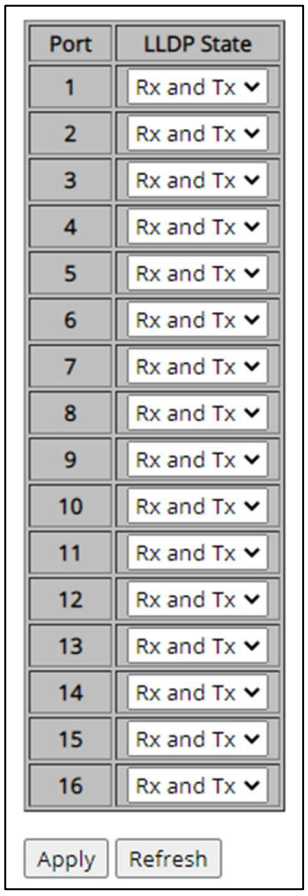
Field	Description
Mirror Source	Select the ports to mirror
Mirror Port	The port that will mirror the traffic on the source port. Only incoming packets can be mirrored.

LLDP Configuration

Path: **Configuration > LLDP**

LLDP (Link Layer Discovery Protocol) allows the switch to send basic information including System Name/Description and IP address to another LLDP-compatible connected device. In this section, you can set which TLVs (type-length-value) to send and set up parameters.



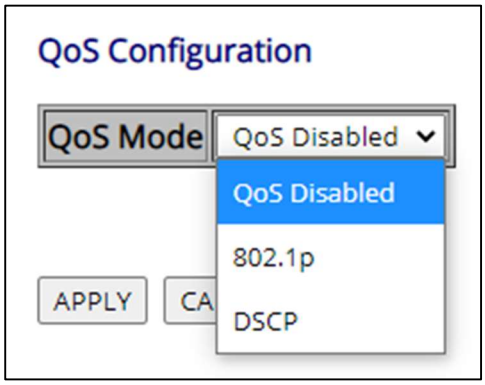


Field	Description
Port Description	Description of the port number
System Name	Name of the switch
System Description	Description of the switch
System Capabilities	Lists the capabilities of the switch
Management Address	Management IP address of the switch
Tx Interval	Specified in seconds, the interval between each LLDP frame that is transmitted by the switch
Tx Hold	Specifies how long the LLDP information is considered valid
Tx Delay	Specifies the time between LLDP frames when some configuration is changed, such as IP address
Reinit Delay	Specifies the time between an LLDP shutdown frame and a new LLDP initialization
LLDP State	Disable: disables the port LLDP function
	Rx and Tx: Port can send and receive LLDP packets
	Tx Only: Port can only send LLDP packets
	Rx Only: Port can only receive LLDP packets

QoS Configuration

Path: **Configuration > Quality of Service**

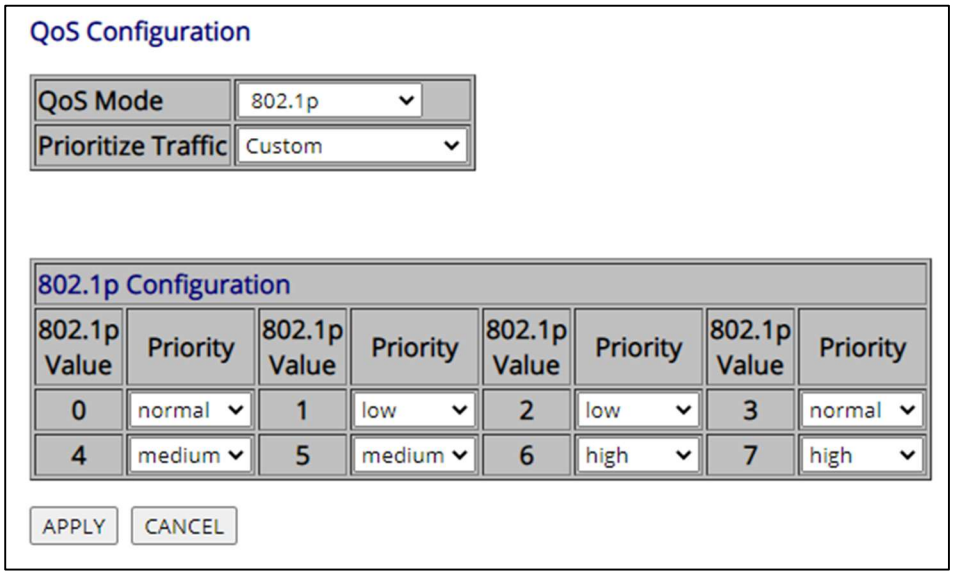
Quality of Service (QoS) provides the switch with a mechanism to queue and service high-priority traffic before low- priority traffic. This switch supports IEEE 802.1p and DSCP for QoS. Click the drop-down menu to select the desired QoS mode.



QoS IEEE 802.1p

The Class of Service Configuration page lets you use the switch's Class of Service (CoS) feature to set up consistent traffic prioritization policies.

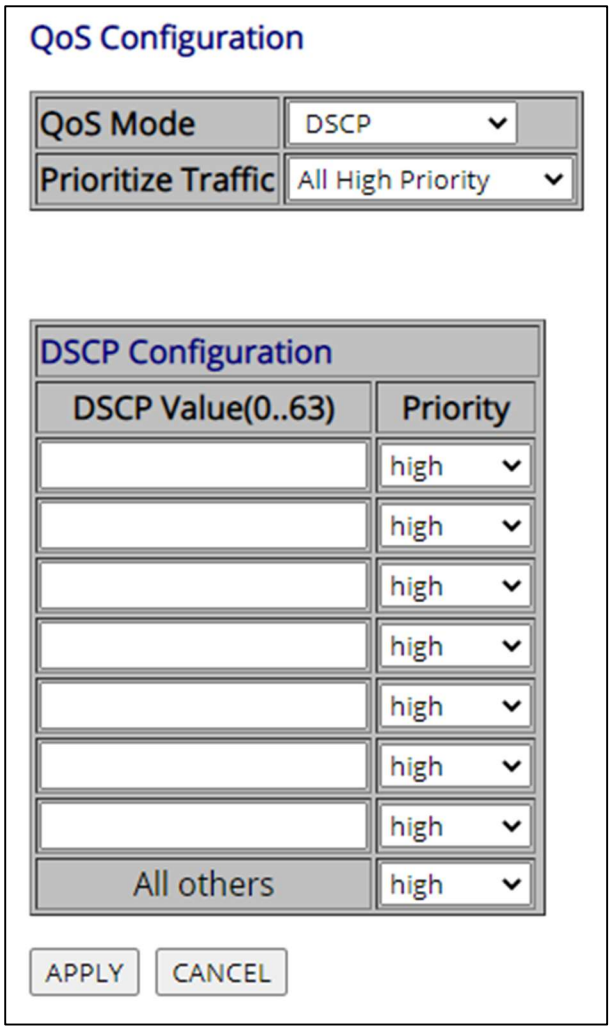
CoS prioritizes traffic to prevent less important traffic from consuming network bandwidth, and slowing down or stopping the delivery of more important traffic. For example, without CoS, most traffic received by the switch is forwarded with the same priority it had when it entered the switch. In many cases, such traffic is ‘‘normal’’ priority and competes for bandwidth with all other normal-priority traffic, regardless of its relative importance to your organization's mission. CoS keeps the most important network traffic moving at an acceptable speed, regardless of current bandwidth usage. This means you can manage available bandwidth so that the switch transmits the most important traffic first.



Packets are prioritized using the 802.1p field in the VLAN tag. This field is three bits long, representing the values 0 - 7. When the QoS Mode is set to 802.1p, the 802.1p Configuration table appears, allowing you to map each of the eight 802.1p values to a local priority queue (low, normal, medium or high). The default settings are shown above.

Click **Apply** to save the settings.

QoS DSCP



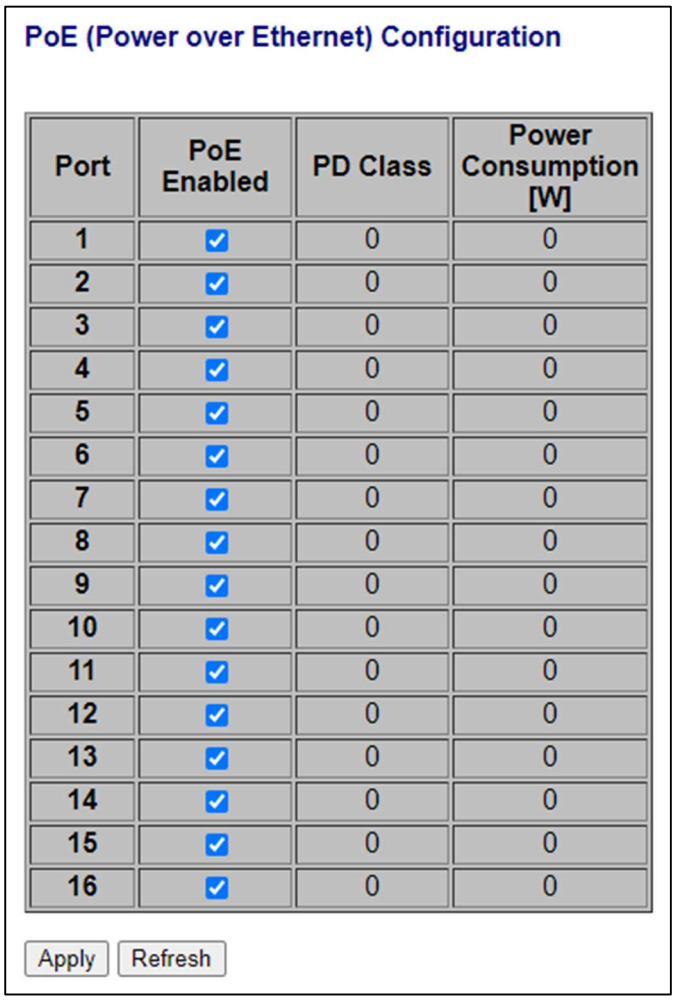
In DSCP mode, packets are prioritized using the DSCP (Differentiated Services Code Point) value. The Differentiated Services Code Point (DSCP) is a six-bit field that is contained within an IP (TCP or UDP) header. The six bits allow the DSCP field to take any value in the range 0 - 63. When QoS Mode is set to DSCP, the DSCP Configuration table is displayed, allowing you to map each of the DSCP values to a hardware output queue (low, normal, medium or high). The default settings map all DSCP values to the high priority egress queue.

User can use the Prioritize Traffic drop-down list to quickly set the values in the DSCP Configuration table to a common priority queue. Use Custom if you want to set each value individually.

PoE (Power over Ethernet) Configuration

Path: **Configuration > Power over Ethernet**

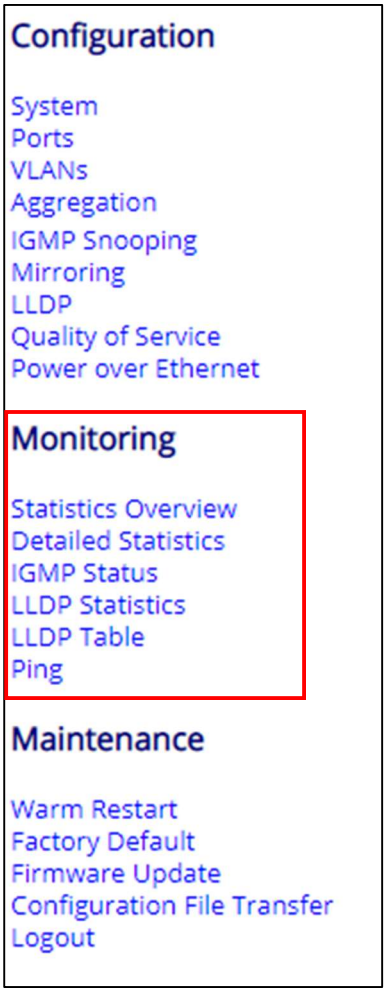
In this section, PoE can be enabled and disabled for each port and the class and power consumption for connected PDs (powered device) will be shown.



Field	Description
PoE Enabled	Click to enable PoE on the port
PD Class	Detects and displays the PoE class of the connected PD
Power Consumption	Displays the power (in watts) that is delivered to the connected PD

Monitoring Menu

The **Monitoring** menu lets you perform the following tasks:



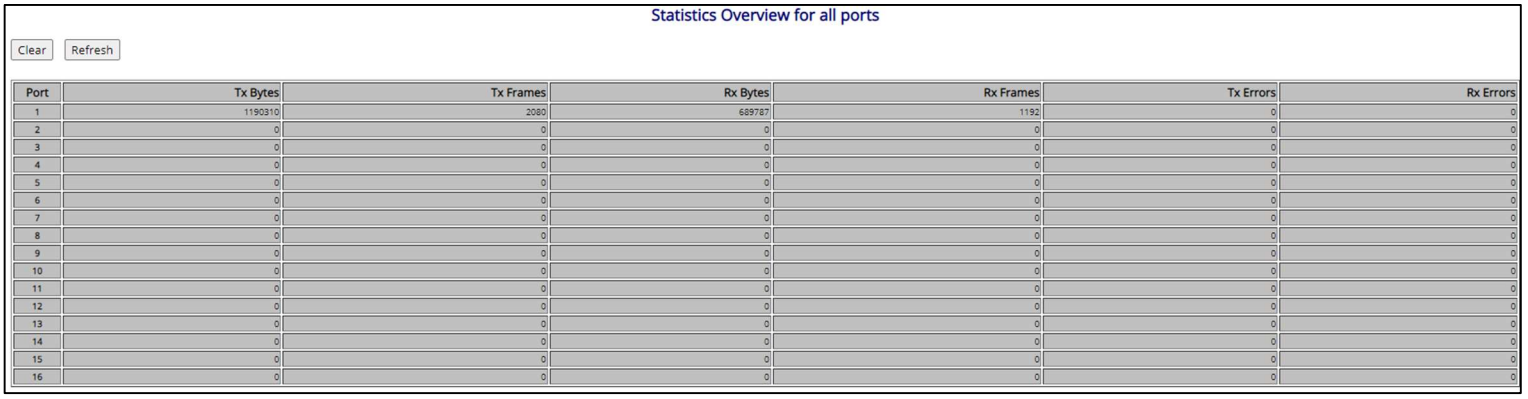
- **Statistics Overview** — displays the statistics overview of the system. See page 55.
- **Port Statistics** — displays the detailed statistics of each port. See page 56.
- **IGMP Status** — displays the IGMP status. See page 57.
- **LLDP Statistics** — displays the LLDP information for each port. See page 58.
- **LLDP Neighbor Table** — displays LLDP neighbor information. See page 59.
- **Ping** — allows you to ping a device on the network. See page 60.

Statistics Overview

Path: **Monitoring > Statistics Overview**

The Statistics Overview page provides an overview of the TX/RX bytes, frames, and errors of the switch.

- Click the **Clear** button to reset the counters.
- Click the **Refresh** button to update the counters.



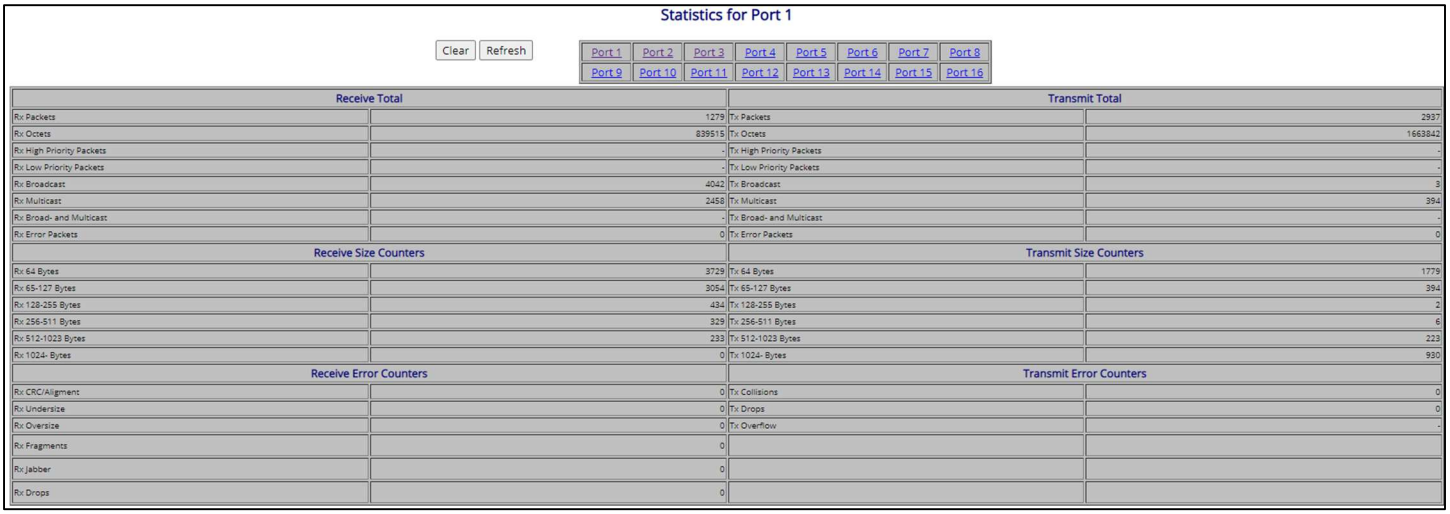
Port	Tx Bytes	Tx Frames	Rx Bytes	Rx Frames	Tx Errors	Rx Errors
1	1190310	2080	689787	1192	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	0	0	0	0	0	0
16	0	0	0	0	0	0

Port Statistics

Path: **Monitoring > Detailed Statistics**

The Port Statistics page provides detailed statistics of each port. Click the link for each port at the top to view the details of the port.

- Click the **Clear** button to reset the counters.
- Click the **Refresh** button to update the counters.



Statistics for Port 1

Clear Refresh

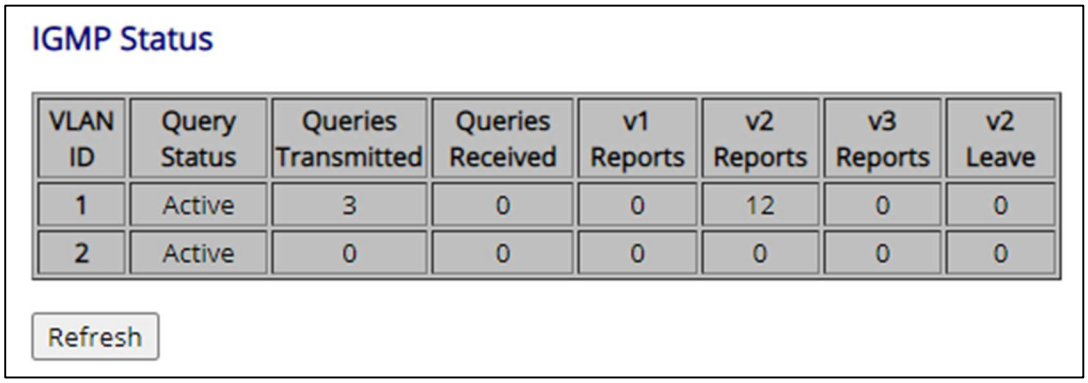
Port 1 Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8
Port 9 Port 10 Port 11 Port 12 Port 13 Port 14 Port 15 Port 16

Receive Total		Transmit Total	
Rx Packets	1279	Tx Packets	2937
Rx Octets	839515	Tx Octets	1663842
Rx High Priority Packets	-	Tx High Priority Packets	-
Rx Low Priority Packets	-	Tx Low Priority Packets	-
Rx Broadcast	4042	Tx Broadcast	3
Rx Multicast	2458	Tx Multicast	394
Rx Broad- and Multicast	-	Tx Broad- and Multicast	-
Rx Error Packets	0	Tx Error Packets	0
Receive Size Counters		**Transmit Size Counters**	
Rx 64 Bytes	3729	Tx 64 Bytes	1779
Rx 65-127 Bytes	3054	Tx 65-127 Bytes	394
Rx 128-255 Bytes	434	Tx 128-255 Bytes	2
Rx 256-511 Bytes	329	Tx 256-511 Bytes	6
Rx 512-1023 Bytes	233	Tx 512-1023 Bytes	223
Rx 1024- Bytes	0	Tx 1024- Bytes	930
Receive Error Counters		**Transmit Error Counters**	
Rx CRC/Aligment	0	Tx Collisions	0
Rx Undersize	0	Tx Drops	0
Rx Oversize	0	Tx Overflow	-
Rx Fragments	0		
Rx Jabber	0		
Rx Drops	0		

IGMP Status

Path: **Monitoring > IGMP Status**

The IGMP Status page shows the IGMP status for each VLAN that has been created

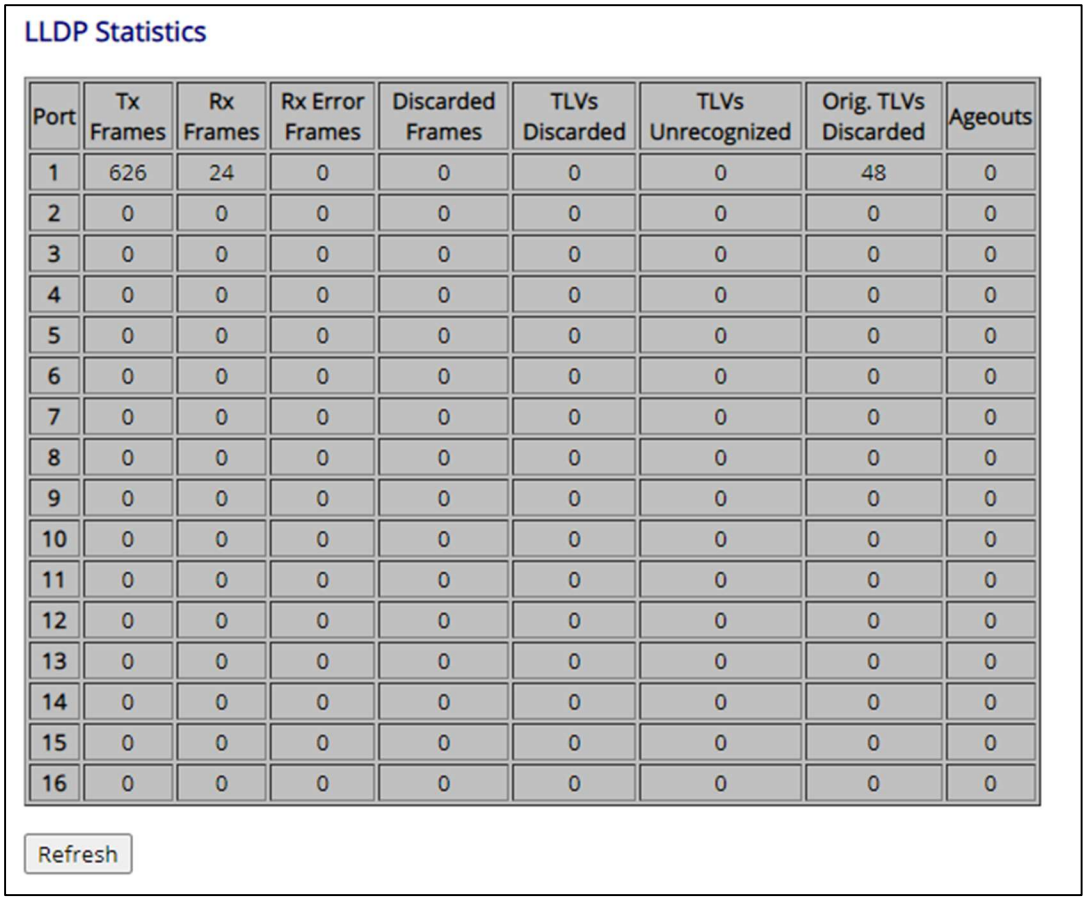


Field	Description
VLAN ID	Displays the VLAN number
Querier	Shows active status of the querier
Queries Transmitted	Shows the number of transmitted query packets
Queries Received	Shows the number of receive query packets
V1 Reports	Shows the number of received v1 report packets
V2 Reports	Showws the number of received v2 report packets
V3 Reports	Shows the number of received v3 report packets
V2 Leave	Shows the number or received v2 leave packets

LLDP Statistics

Path: **Monitoring > LLDP Statistics**

The LLDP Statistics page shows detailed LLDP information for each port



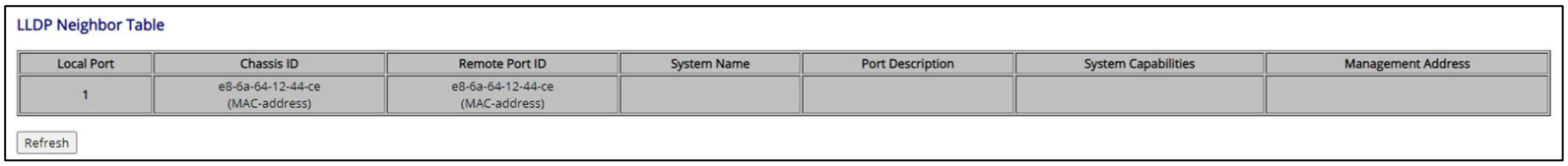
Field	Description
Tx/Rx Frames	Number of LLDP packets (frames) transmitted/received
Rx Error Frames	Number of error packets received
Discarded Frames	Number of discarded packets (frames)
TLVs Discarded	Number of TLV packets discarded
TLVs Unrecognized	Number of unrecognized TLV packets
Orig. TLVs Discarded	Number or original TLV packets discarded
Ageouts	Number of LLDP neighbors dropped

LLDP Neighbor Table

Path: **Monitoring > LLDP Table**

The LLDP Neighbor Table page shows the details for LLDP-compatible devices that are connected

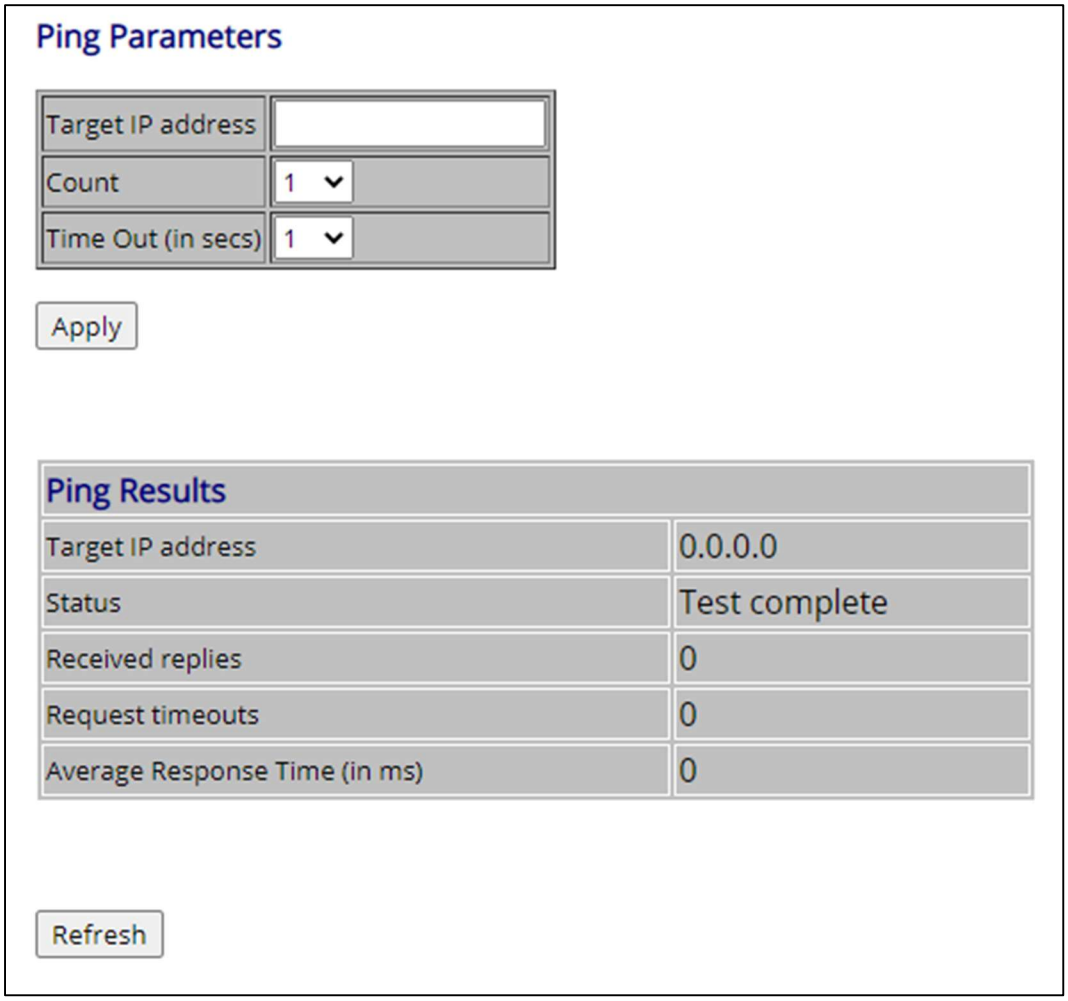
Field	Description
Local Port	Port on the switch that an LLDP neighbor is connected to
Chassis/Remote ID	Shows the identifier of the chassis/remote port (for example, MAC address)
System Name	System name of the LLDP neighbor
Port Description	Description of the LLDP neighbor port
System Capabilities	Shows the capabilities of the LLDP neighbor (for example, bridge/router for wireless)
Management Address	Management IP address of the LLDP neighbor



Ping

Path: **Monitoring > Ping**

The Ping page can be used to check if a device is available on the network.



Field	Description
Target IP Address	IP address of the target device
Count	Number of packets to send (range: 1-20)
Time Out	Duration of the ping

Maintenance Menu

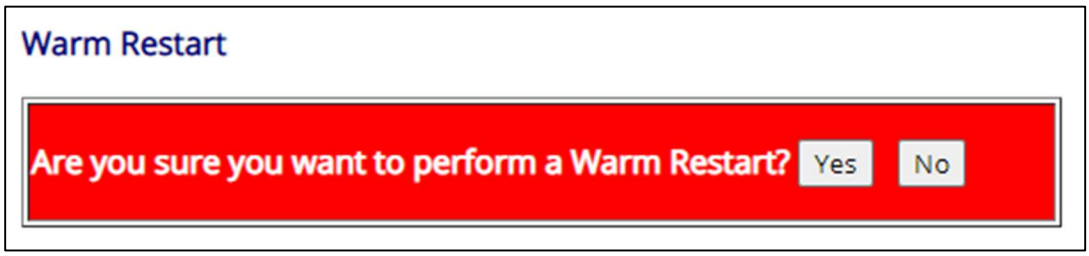
The **Maintenance** menu lets you perform the following tasks:

- **Warm Restart** — reboot the switch. See page 62.
- **Factory Default** — reset the switch to factory default settings. See page 63.
- **Firmware Update** — update the firmware to a newer version. See page 64.
- **Config Transfer** — upload and download config. See page 65.
- **Logout** — Log out of the switch. See page 66.

Warm Restart

Path: **Maintenace > Warm Restart**

The switch can be rebooted from this page. Click **Yes** to reboot the switch and **No** to cancel.



Factory Default

Path: **Maintenace > Factory Default**

The switch can be reset back to factory default settings from this page (except the switch IP address). The switch must remain ON during the reset process.

- Click **Yes** to reset the switch and **No** to cancel.

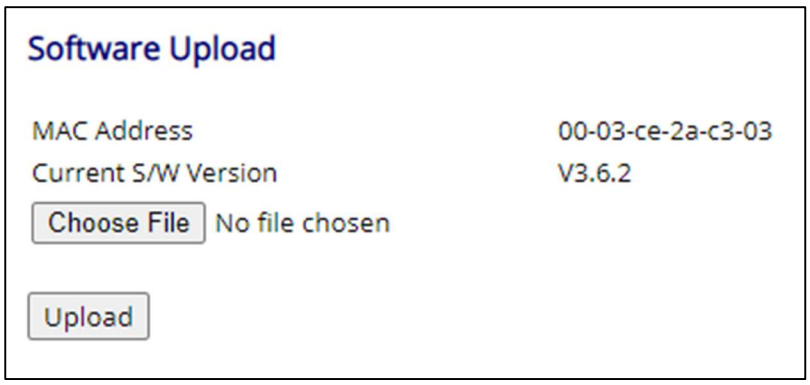
Note: The switch can be reset to factory default settings also by pressing the reset button on the front panel with a pin for at least 5 seconds. In this case, the switch IP address will also be reset to the default value of 192.168.1.10.

Firmware Update

Path: **Maintenace > Firmware Update**

Firmware files can be uploaded from the PC to the switch from this page. For reference, the current installed version of the firmware is shown.

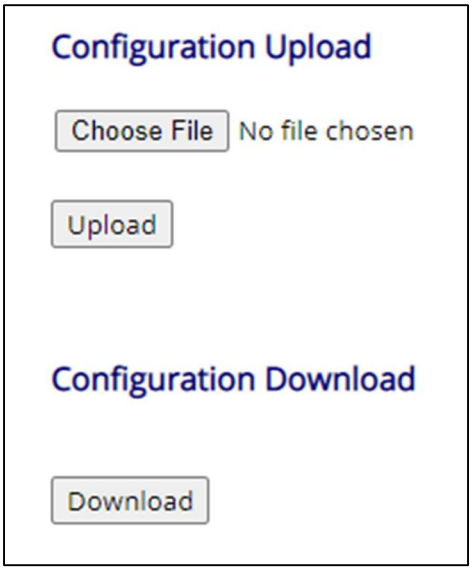
- Click **Choose File** to select the firmware file from the local PC.
- Click **Upload** to start the firmware update process after selecting the applicable firmware file. The switch must remain ON during the update process.



Config Transfer

Path: **Maintenance > Configuration File Transfer**

From this page, pre-saved configuration files can be uploaded to the switch or the current switch settings can be downloaded as a .cfg file.



- Click **Choose File** to select the config file from the local PC.
- Click **Upload** to start the config upload process after selecting the applicable config file. The switch must remain ON during the update process.
- Click **Download** to save all current settings as a .cfg file.

Logout

Path: **Maintenance > Logout**

The **Logout** menu logs you out of the current Web management interface session. After logging out, you will be taken back to the page where the password can be entered to log back in to the switch.

5 Troubleshooting

Topics:

This chapter provides information about troubleshooting the switch.

Troubleshooting Chart

Table 5-1 symptoms, causes, and solutions of possible problems.

Table 5-1. Troubleshooting Chart

Symptom	Cause	Solution
Power LED is OFF.	The switch is not receiving power.	Check the power cord connections for the switch at the switch and the connected device. Be sure all cables used are correct and comply with Ethernet specifications.
Link/ACT LED is OFF or intermittent.	Port connection is not working.	Check the crimp on the connectors and be sure the plug is inserted properly and locked into the port at both the switch and the connecting device. Be sure all cables used are correct and comply with Ethernet specifications. Check for a defective adapter card, cable, or port by testing them in an alternate environment where all products are functioning.
File transfer is slow or performance degradation is a problem.	Half- or full-duplex setting on the switch and the connected device are not the same.	Configure the switch and the attached device to auto-negotiate.
A segment or device is not recognized as part of the network.	One or more devices are not connected properly or cabling does not meet Ethernet guidelines.	Verify that the cabling is correct. Be sure all connectors are securely positioned in the required ports. Equipment may have been disconnected accidentally.
Collisions are occurring on the connected segment.	Some collisions are normal when the connection is operating in half-duplex mode.	Recheck the settings of the device attached to the switch port. Be sure the switch and the attached device are using the same duplex setting. Be sure the switch and the attached device are set to auto-negotiate.
Link/ACT LED is flashing continuously on all connected ports and the network is disabled.	A network loop (redundant path) has been created.	Break the loop by ensuring that there is only one path from any networked device to any other networked device.

Additional Troubleshooting Suggestions

If the suggestions in Table 5-1 do not resolve your problem, refer to the troubleshooting suggestions in this section.

Network Adapter Cards

Be sure the network adapter cards installed in the PC used to configure the switch are in working condition and the latest software driver has been installed.

Configuration

If problems occur after altering the switch's network configuration, restore the original connections and determine the problem by implementing the new changes one step at a time. Be sure cable distances, repeater limits, and other physical aspects of the installation do not exceed the Ethernet limitations.

Switch Integrity

If required, verify the integrity of the switch by resetting it. To reset the switch, use the reset button on the front panel (see "Reset Button" on page 16) or use the **Maintenance > Factory Default** page on the switch's Web management interface (see page 63). If the problem continues, contact EtherWAN Systems technical support.

Auto-Negotiation

The 10/100/1000 Mbps ports negotiate the correct duplex mode and speed if the switch is configured for auto-negotiation (this is the switch's default setting) and the device at the other end of the link supports auto-negotiation. If the device does not support auto-negotiation, the switch determines only the speed correctly and the duplex mode defaults to half-duplex.

Appendix A - Specifications

Technology

Specification	Description
Standards:	• IEEE802.3 10BASE-T • IEEE802.3u 100BASE-TX • IEEE802.3ab 1000BASE-T • IEEE802.3z 1000BASE-SX/1000BASE-LX • IEEE802.3x Full duplex and flow control • IEEE802.1p QoS • IEEE802.3af/at Power over Ethernet (PoE) • IEEE 802.3az EEE (Energy Efficient Ethernet)
Forward and Filtering Rate:	• 10 Mbps: 14,880 pps • 100 Mbps: 148,810 pps • 1000 Mbps: 1,488,100 pps
Packet Buffer Memory:	4 Mbits
Processing Type:	• Store-and-Forward • Half-duplex backpressure and IEEE802.3x full-duplex flow control
MAC Address Table Size:	8K MAC addresses

Power

Specification	Description
Power Input:	100 – 240 VAC, 50 / 60 Hz
Power Consumption: Model EX19082 Model EX19164 Model EX19244	 Device: Max. 23 Watts (without PoE) PoE power budget: 250 Watts Device: Max. 23 Watts (without PoE) PoE power budget: 250 Watts Device: 30 Watts Max. (without PoE) PoE power budget: 460 Watts
PoE Power Output:	
Model EX19082 Model EX19164 Model EX19244	IEEE 802.3at: up to 30W/port, 50 - 57VDC, 600 mA Max.

Mechanical

Specification	Description
Casing:	Metal case
Dimensions: Model EX19082 Model EX19164 Model EX19244	 266mm (W) × 161mm (D) × 44mm (H) (10.5" (W) x 6.34" (D) x 1.73" (H) Desktop 440 × 220 × 44mm (W x D x H) (17.32" x 8.66" x 1.73") Standard 19" rack-mount size, one-unit-height 440 x 331 x 44mm (W x D x H) (17.32" x 13.2" x 1.73") Standard 19" rack-mount size, one-unit-height
Weight: Model EX17082 Model EX19164 Model EX19244	 1.8kg (4 lbs.) 3kg (6.6 lbs.) 4.4 Kg (9.75 lbs.)

Interface

Specification	Description
Ethernet Ports:	
Model EX19082:	10/100/1000BASE-T(X): 8 PoE ports + 1 TX 100/1000BASE SFP: 1 port
Model EX19164:	10/100/1000BASE-T(X): 16 PoE ports (4 shared with SFP) 100/1000BASE SFP: 4 ports (shared)
Model EX19244:	10/100/1000BASE-T(X): 24 PoE ports (4 shared with SFP) 100/1000BASE SFP: 4 ports (shared)
LED Indicators:	• Per unit: Power Status • Per port: Link/Activity, PoE status

Environment

Specification	Description
Operating Temperature:	0°C to 50°C (32°F to 122°F)
Storage Temperature:	-10°C to 70°C (14°F to 158°F)
Ambient Relative Humidity:	10% to 90% (non-condensing)

Regulatory Approvals

Specification	Description
ISO:	Manufactured in an ISO 9001 facility
Emission Compliance:	FCC Part 15, Class B

EtherWAN Systems, Inc.
www.etherwan.com/us

US Headquarters

2301 E. Winston Rd
Anaheim, CA 92806
TEL: +1- 714-779-3800
Email: info@etherwan.com

EX19082, EX19164, and EX19244 Smart Managed Switches User Guide

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