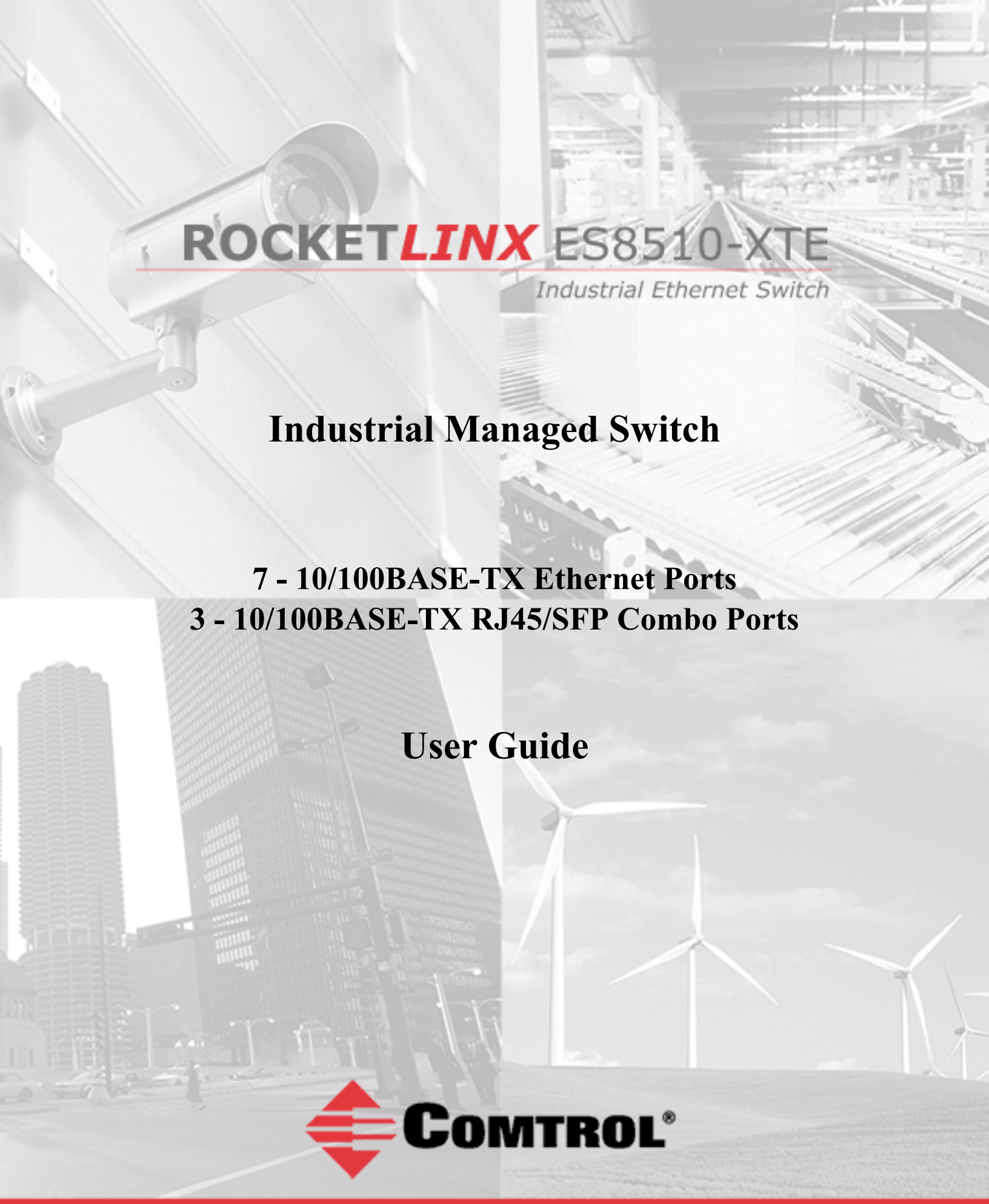

Industrial Managed Switch

7 - 10/100BASE-TX Ethernet Ports
3 - 10/100BASE-TX RJ45/SFP Combo Ports

User Guide

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Fourth Edition, October 12, 2016

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Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user is required to correct the interference at his expense.

The user is cautioned that changes and modifications made to the equipment without approval of the manufacturer could void the user's authority to operate this equipment.

Document Number: 2000574 Rev E

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Introduction

The ES8510-XTE is a managed industrial Ethernet switch that is equipped with ten 10/100BASE-TX ports, which supplies three Combo ports that provide:

- Copper RJ45 Ethernet ports (10BASE-T and 100BASE-TX)
- SFP slots (100BASE-FX)

When the SFP port is active and installed on a Combo port, the corresponding Combo RJ45 port is inactivated. For example, if an SFP transceiver is installed and active on the **8SFP** port, the corresponding RJ45 Port 8 becomes inactive.

The embedded software supports full Layer 2 networking features. In addition, the ES8510-XTE provides ring redundancy, network control, security, and alert features. Security is enhanced with advanced features such as IEEE 802.1Q VLAN and port/IP security. Performance is optimized by QoS and IGMP Snooping/Query. Redundant Ring technology enables superb self-healing capability for network failure and it also provides an advanced redundant network solution; Ring Coupling and Rapid Dual Homing technology. Ring Coupling and Rapid Dual Homing technology means that an Ethernet Ring can be extended more easily whether with Comtrol switches or other managed switches. Event warnings can be sent to the network administrator by email or system log and to field engineers by relay output.

The ES8510-XTE has rugged aluminum housing and was designed for industrial environments. The ES8510-XTE provides a wide operating temperature and is NEMA TS2 certified.

Detailed specifications for the ES8510-XTE are available on the Comtrol web site.

You can refer to *Feature Overview* on Page 35 for web user interface features.

Hardware Installation

You can use the following subsections to install the RocketLinx ES8510-XTE.

- *Connect the Power and Ground*
- *Connect the Digital Input s and Relay Outputs* on Page 10
- *Mount the ES8510-XTE* on Page 11
- *Connect the Ethernet Ports* on Page 12
- *Connect SFP Transceivers (Combo Ports 8-10)* on Page 12
- *LED Descriptions* on Page 13
- *Panel Layout* on Page 14
- *Reset Button* on Page 14

Connect the Power and Ground

Use the following procedure to connect the power and ground.

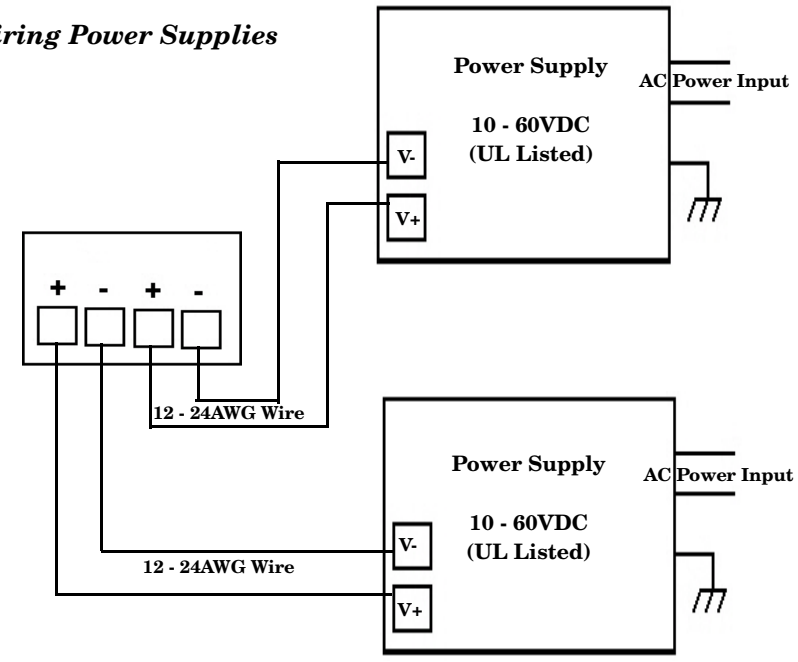
This switch is intended to be installed in a RESTRICTED ACCESS LOCATION ONLY.

You can use the following procedure to connect power and the ground to the ES8510-XTE.

1. Connect the DC power inputs by inserting the positive and negative wires (12-24AWG) into the PW+ and PW- contacts.

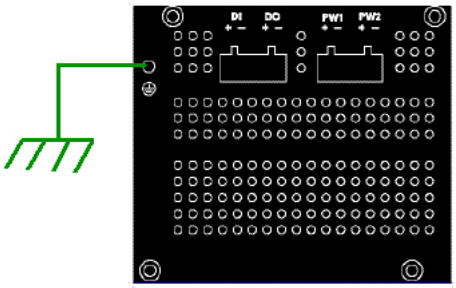
   Note: *Power should be disconnected from the power supply before connecting it to the switch. Otherwise, your screw driver blade can inadvertently short your terminal connections to the grounded enclosure.Tighten the wire-clamp screws to prevent the wires from coming loose.*

Wiring Power Supplies



- PWR1 and PWR2 support power redundancy and reverse polarity protection.
- Accepts a positive or negative power source but PW1 and PW2 must apply to the same mode.
- If both power inputs are connected, the ES8510-XTE is powered from the highest connected voltage.
- The ES8510-XTE can emit an alarm if PW1 or PW2 are no longer receiving power. See the *Warning* discussion on Page 112 to configure an alarm.

2. Connect a ground wire between the chassis and earth ground using 12-24AWG wire to ensure that the ES8510-XTE is not damaged by noise or electrical shock.
   a. Loosen the ground screw on the bottom of the ES8510-XTE.
   b. Insert the ground wire.
   c. Tighten the ground screw after the ground wire is connected.



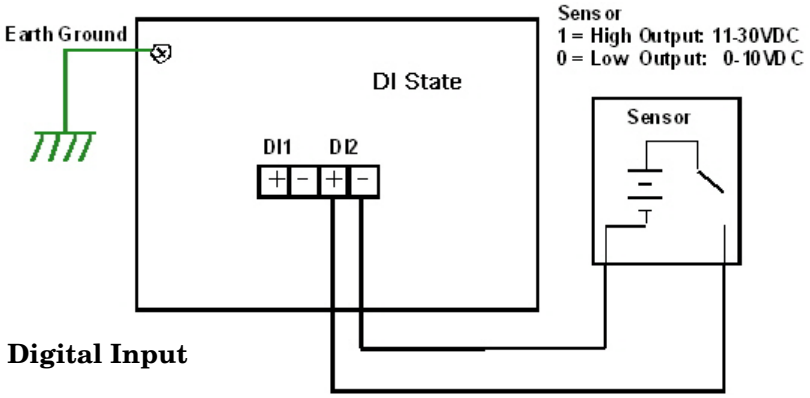
Connect the Digital Input s and Relay Outputs

The ES8510-XTE provides two digital inputs and two digital outputs (dry relay output) on terminal block connectors on the bottom of the unit. The fault conditions can be configured in the web user interface or Command Line Interface (CLI) and include:

- DI State
- Power failure
- Ethernet port link break
- Dry output
- Ping failure
- Super Ring failure

You can configure events using one of the ES8510-XTE user interfaces (*Fault Relay* on Page 112) or the Command Line Interface (*Global Configuration Mode* on Page 135).

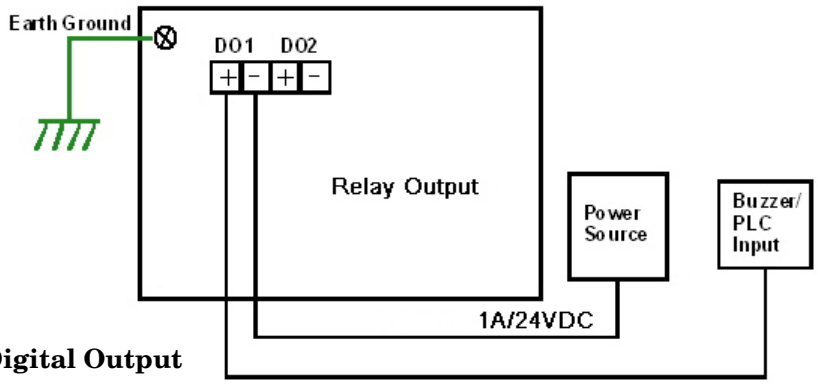
The Digital Input pin can be pulled high or low so that the connected equipment can actively drive these pins. The web user interface allows you to read and set the value to the connected device. The power input voltage of logic low is 0 to 10VDC and logic high is 11 to 30VDC. Do not apply a higher voltage than the specification; it may cause internal circuit damage or a cause an incorrect DI action.



Digital Input

Digital output relay contacts are energized (open) for normal operation and close for fault conditions. The digital output relay contacts support up to 1A at 24VDC. Do not apply voltage and current higher than the specifications.

1. Insert the positive and negative wires (12-24 AWG) into V+ and V-.
2. Tighten the wire-clamp screws to prevent the wires from coming loose.

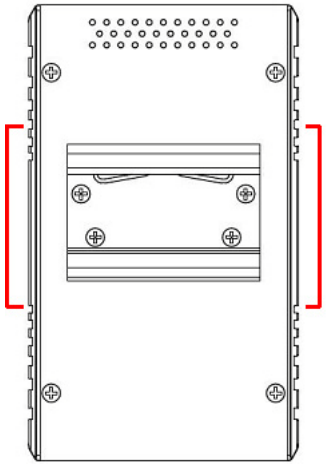


Digital Output

Mount the ES8510-XTE

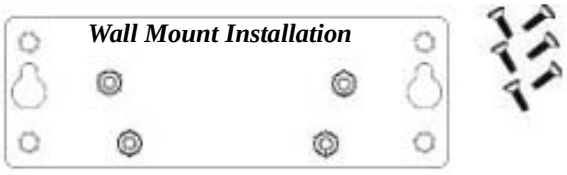
You can use the following procedure to mount the ES8510-XTE on a DIN rail or on the wall.

The DIN rail clip is already attached to the ES8510-XTE. If the DIN rail clip is not screwed onto the ES8510-XTE, follow the instructions and the figure below to attach DIN rail clip to the ES8510-XTE.



DIN Rail Mounting

1. If necessary, use the screws to attach DIN rail clip to the rear panel of the ES8510-XTE. (To remove DIN rail clip, reverse Step 1.)
2. Insert the upper end of DIN rail clip into the back of DIN rail track from its upper side.
3. Lightly push the bottom of DIN rail clip into the track.
4. Verify that the DIN rail clip is tightly attached on the track.
5. To remove the ES8510-XTE from the track, reverse the steps above.



Wall Mount Installation

Follow the steps below to install the ES8510-XTE with the wall mounting plate:

1. To remove the DIN rail clip from the ES8510-XTE, loosen the screws from the DIN rail clip.
2. Place the wall mounting plate on the rear panel of the ES8510-XTE.
3. Use the screws to attach the wall mounting plate to the ES8510-XTE.
4. Use the hook holes at the corners of the wall mounting plate to hang the ES8510-XTE onto the wall.
5. To remove the wall mounting plate, reverse the steps above.

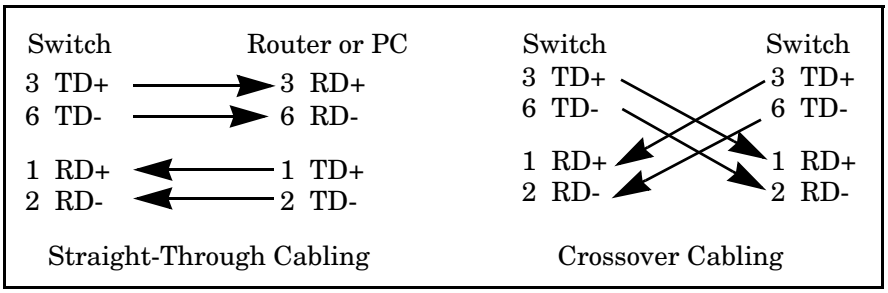
Connect the Ethernet Ports

You can use the following information to connect standard Ethernet cables between the ES8510-XTE Ethernet ports and the network nodes.

- Ports 8-10 are RJ45/SFP Combo ports that support (10/100BASE-TX / 100BASE-FX).

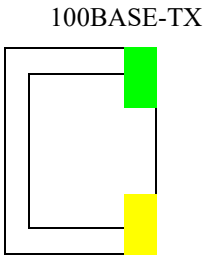
See *Connect SFP Transceivers (Combo Ports 8-10)* on Page 12 for information about SFP installation.

All of the Ethernet ports automatically detect the signal from the connected devices to negotiate the link speed and duplex mode (half- or full-duplex). Auto MDI/MDIX allows you to connect another switch, hub, or workstation without changing straight-through or crossover cables. Crossover cables cross-connect the transmit lines at each end to the received lines at the opposite end.



Connect one side of an Ethernet cable into any switch port and connect the other side to your attached device. The **LNK/ACT** LED is lit when the cable is correctly connected. Always make sure that the cables between the switches and attached devices (for example, switch, hub, or workstation) are less than 100 meters (328 feet) and meet these requirements.

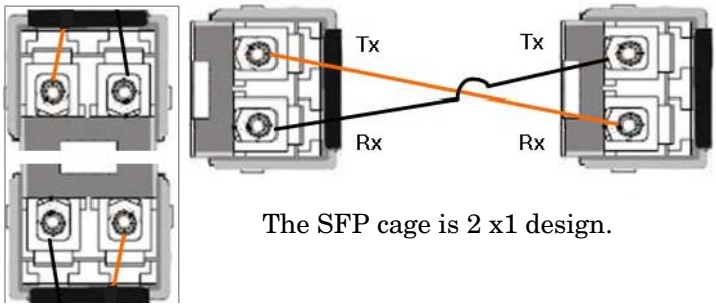
- **10BASE-T**: Category 3 or higher cable
- **100BASE-TX**: Category 5 or higher cable



Connect SFP Transceivers (Combo Ports 8-10)

The ES8510-XTE equips three SFP ports combined with RJ45 Fast Ethernet ports (Ports 8-10), The SFP ports accept standard mini GBIC SFP transceivers. that support 100BASE-FX.

To ensure system reliability, Comtrol recommends using Comtrol certified SFP Transceivers.



The SFP cage is 2 x1 design.

1. Plug the SFP transceiver into the SFP fiber transceiver.
2. Connect the transmit channel to the receive channel at each end.
3. Check the direction/angle of the fiber transceiver and the fiber cable.

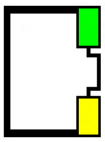
   Note: *This is a Class 1 Laser/LED product. Do not stare at the Laser/LED Beam.*

The SFP port does not function until the fiber cable is linked to another active device. The SFP and corresponding RJ45 ports work in an exclusive mode. Traffic sent or received through the SFP module has priority thus no traffic is sent or received over the corresponding RJ45 connection. To use the RJ45 connection, remove the corresponding SFP.

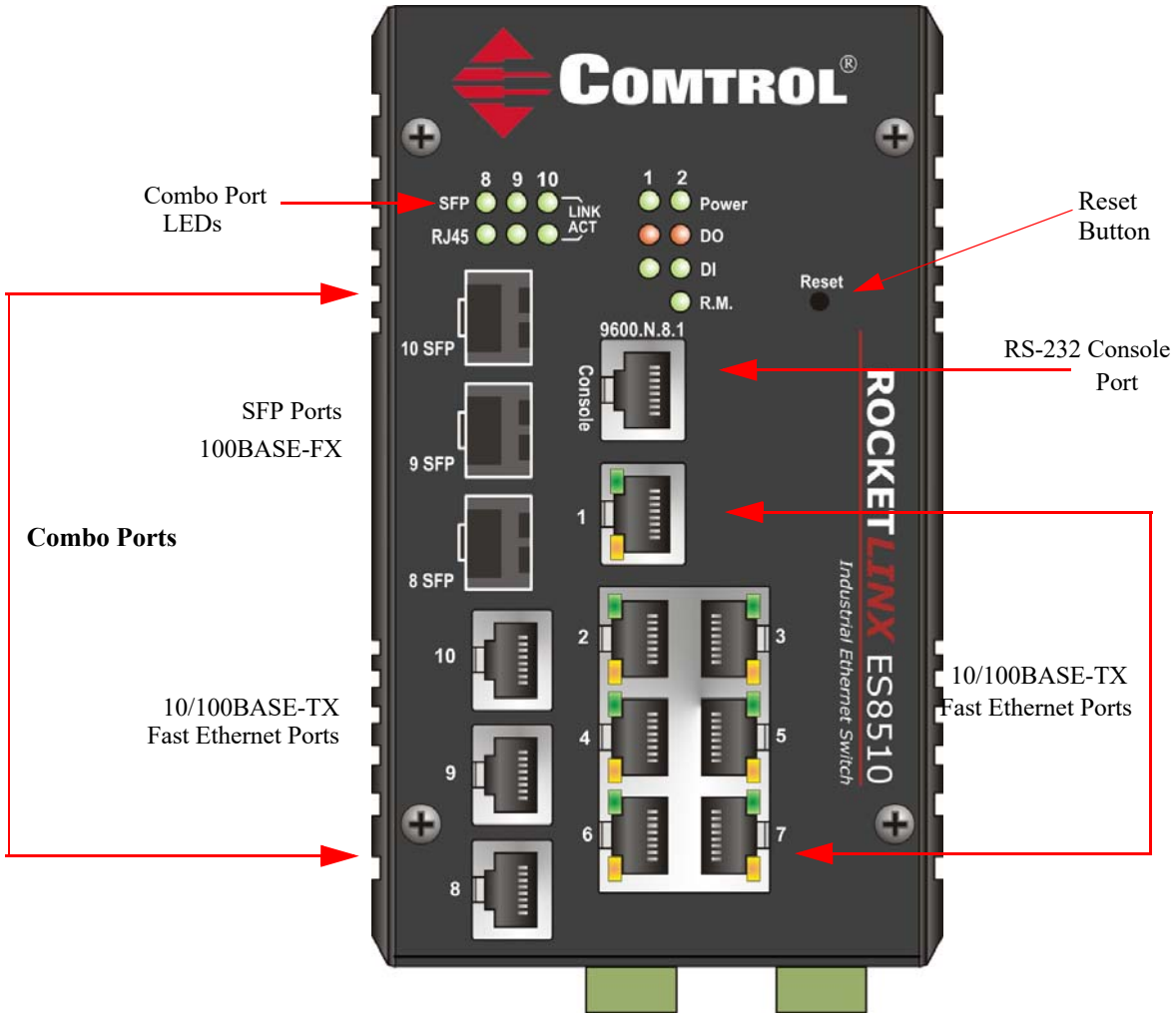
Multi-Mode cables should not exceed 2KM and Single-Mode cables should not exceed 30km.

LED Descriptions

This subsection provides information about the ES8510-XTE LEDs. You can also refer to *Device Front Panel* on Page 123 for information about using the web user interface to remotely view LED information.

LED Name	LED On	LED Blinking	LED Off
Power 1 Power 2	Green: Power available		No power
DO1 (Digital Output) DO2 (Digital Output)	Red: DO activated		DO not activated
DI1 (Digital Input) DI2 (Digital Input)	Green: DI activated		DI not activated
R.M. (ring master)	Green: Working as a Ring Master	Green: Ring failed	Ring function disabled or the ES8510-XTE is on a ring but not the ring master
1 - 7  Link/ Speed	Green: Linked to another device Amber: Full-Duplex	Green: Active traffic	Not connected Collision
8 - 10 SFP RJ45	Green: Connected Green: Active connection	Green: Active connection Green: Active connection	Plugged in but not linked up Not connected

Panel Layout



Reset Button

The ES8510-XTEhas a reset button that you can use to reboot the ES8510-XTE or reset the configuration to the factory default.

Reset Button	Description
Depress 5 Seconds	This reboots the ES8510-XTE without changing the configuration.
Depress > 10 Seconds	This loads the factory default configuration values into the ES8510-XTE including the IP address.

The **Reset** button is located on the front panel of the ES8510-XTE to the right of the **RS** LED.

Using PortVision DX

There are several ways to configure network information. Comtrol Technical Support recommends connecting the ES8510-XTE to a PC or laptop running *Windows* and installing *PortVision DX* for initial configuration.

This section shows how to use PortVision DX for initial network configuration and discusses how to:

- Install PortVision DX (Page 16)
- Configure the network address (Page 18)
- Check the firmware and bootloader version on the ES8510-XTE to verify that the latest versions are loaded (Page 21) before configuration
- Download the latest version firmware and bootloader and upload it to the ES8510-XTE (Page 22)
- Perform other PortVision DX tasks, such as:
  - Uploading firmware to multiple ES8510-XTE switches (Page 23)
  - Adding a new RocketLinx (managed or unmanaged) or a third party device to PortVision DX to maintain device information on your network (Page 24)
  - Using configuration files for use in configuring multiple installations with the same features (Page 25)
  - Using the LED Tracker (Page 26)
- Organize how PortVision DX displays your Comtrol Ethernet attached products (Page 25)
- Access the latest documentation for your Comtrol Ethernet attached product

Optionally, you can use the web user interface or the CLI to perform these tasks on the ES8510-XTE using these subsections:

- *IP Configuration* on Page 47
- *Firmware Upgrade* on Page 61
- *Basic Settings (CLI)* on Page 140

PortVision DX Overview

PortVision DX automatically detects Comtrol Ethernet attached products physically attached to the local network segment so that you can configure the network address, upload firmware, and manage the following products:

- RocketLinx (managed) switches
- DeviceMaster family
  - DeviceMaster PRO/DeviceMaster RTS/DeviceMaster Serial Hub
  - DeviceMaster 500
- DeviceMaster UP
- DeviceMaster LT
- IO-Link Master family

In addition to identifying Comtrol Ethernet attached products, you can use PortVision DX to display any third-party switch and hardware that may be connected directly to those devices. All non-Comtrol products and unmanaged RocketLinx switches are treated as non-intelligent devices and have limited feature support. For example, you cannot configure or update firmware on a third-party switch.

Note: *After initial IP configuration, you may want to disable PortVision DX using the service netvision command to secure your switch. See Securing Interfaces on Page 176 for information about disabling PortVision DX.*

PortVision DX Requirements

Use PortVision DX to identify, configure, update, and manage the ES8510-XTE on Windows XP SP3 through Windows 10 operating systems (at the time of publication).

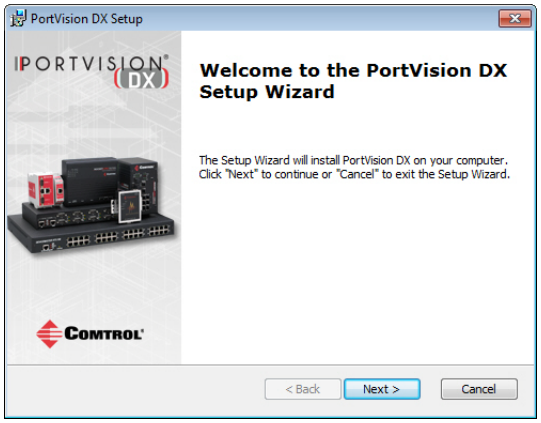
PortVision DX requires that you connect the Comtrol Ethernet attached product to the same network segment as the Windows host system if you want to be able to scan and locate it automatically during the configuration process.

Installing PortVision DX

During initial configuration, PortVision DX automatically detects and identifies ES8510-XTE switches, if they are in the same network segment.

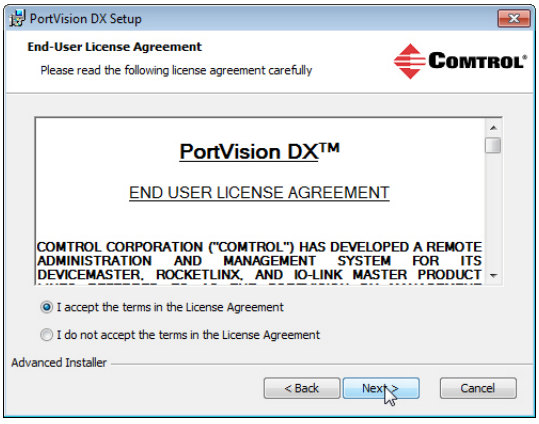
You can download the latest version of PortVision DX from: http://downloads.comtrol.com/rocketlinx/portvision_dx.

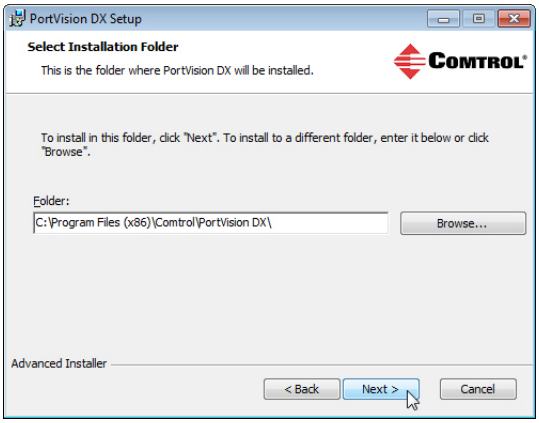
1. Execute the **PortVision_DX[*version*].msi** file.



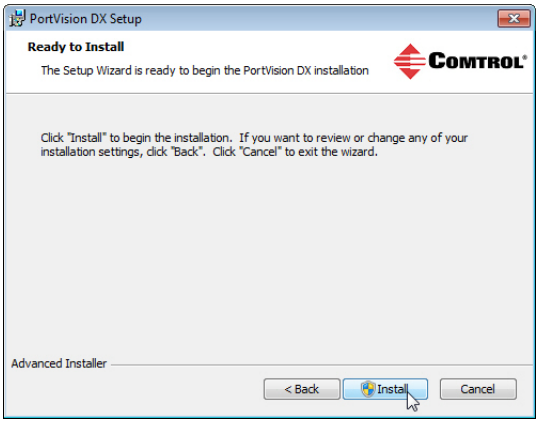
Note: *Depending on your operating system, you may need to respond to a Security Warning to permit access.*

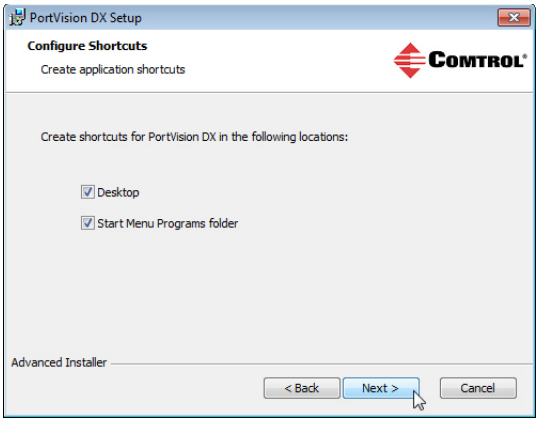
2. Click **Next** on the *Welcome* screen.
3. Click **I accept the terms in the License Agreement** and **Next**.
4. Click **Next** or optionally, browse to a different location and then click **Next**.



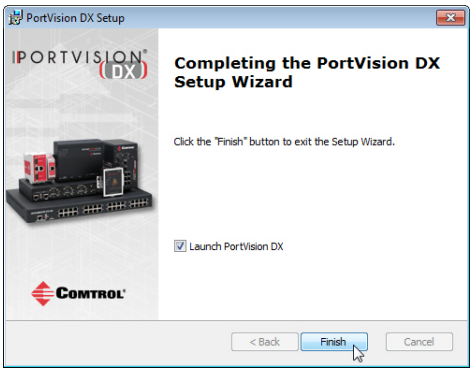


5. Click **Next** to configure the shortcuts.
6. Click **Install**.





7. Depending on the operating system, you may need to click **Yes** to the *Do you want to allow the following program to install software on this computer?* query.
8. Click **Launch PortVision DX** and **Finish** in the last installation screen.
9. Depending on the operating system, you may need to click **Yes** to the *Do you want to allow the following program to make changes to this computer?* query.
10. Go the next subsection to use PortVision DX to program the network information.



Configuring the Network Settings

The ES8510-XTE has the following default values when shipped from the factory:

- IP address: 192.168.250.250
- Subnet mask: 255.255.255.0
- Gateway address: 192.168.250.1

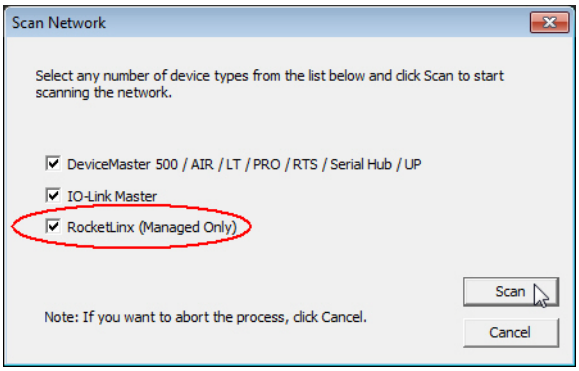
Use the following procedure to change the default network settings on the ES8510-XTE for your network.

1. If necessary, start PortVision DX using the **PortVision DX** desktop shortcut or from the **Start** button, click **All Programs > Comtrol > PortVision DX > PortVision DX**.

   Note: *Depending on your operating system, you may need to click* **Yes** *to the Do you want to allow the following program to make changes to this computer? query.*

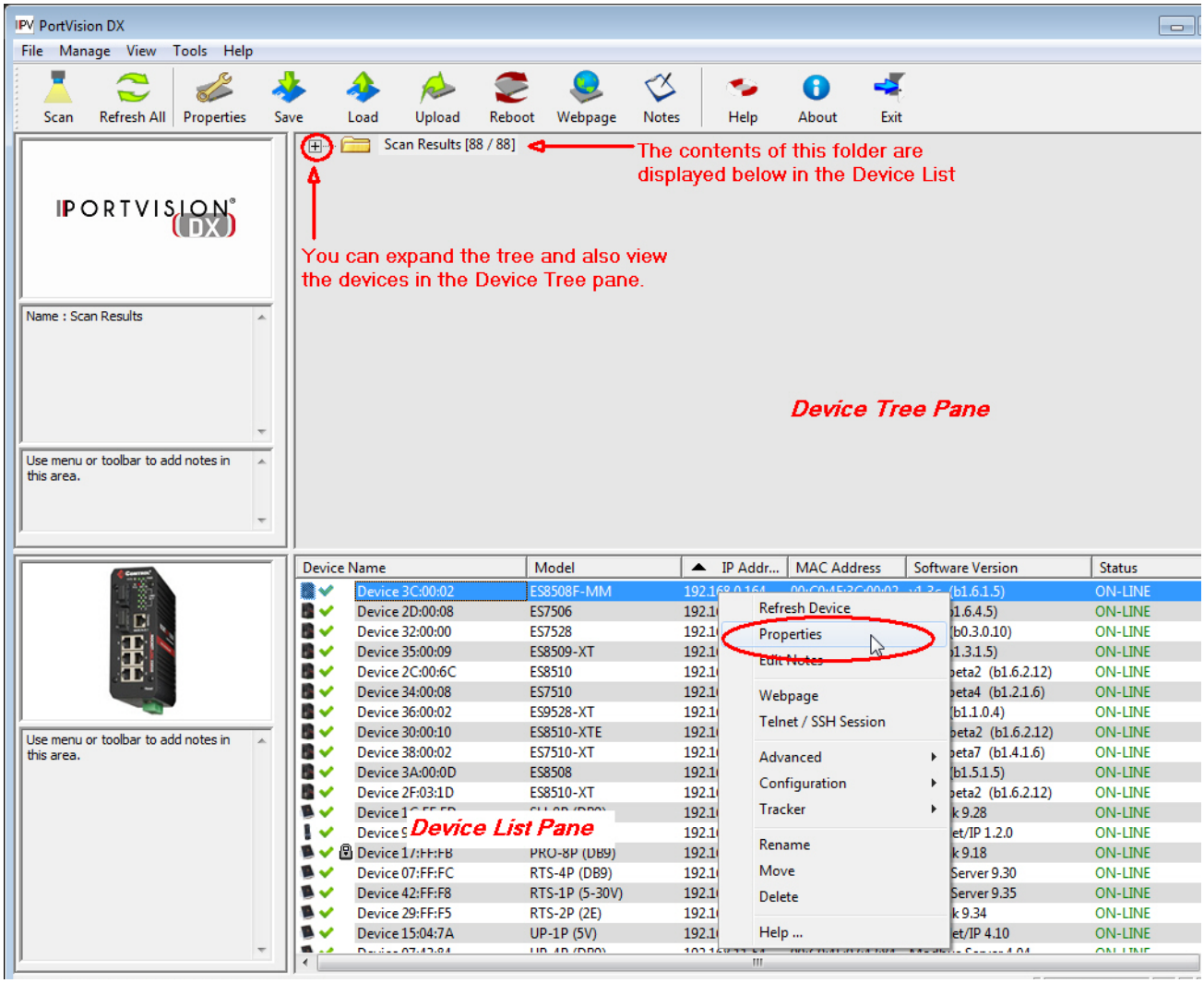
2. Click the **Scan** button in the *Toolbar*.
3. Select the Comtrol Ethernet attached products that you want to locate and then click **Scan**.

   Note: *If the Comtrol Ethernet attached product is not on the local segment and it has been programmed with an IP address, it will be necessary to manually add the Comtrol Ethernet attached product to PortVision DX.*

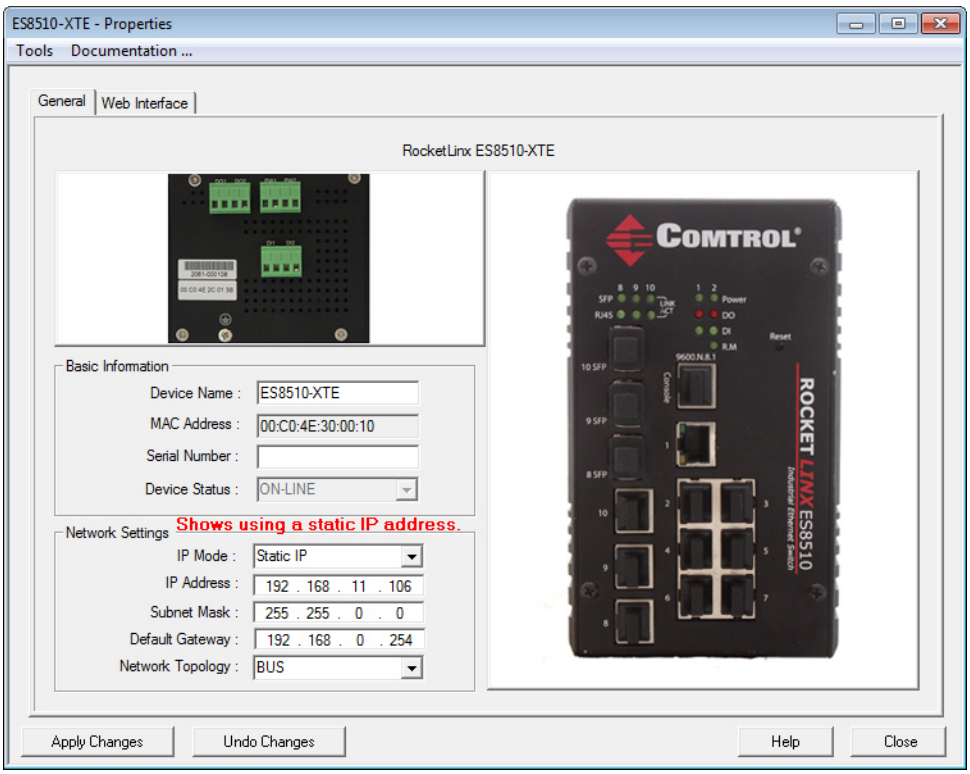


4. Highlight the ES8510-XTE for which you want to program network information and open the **Properties** screen using one of these methods.
   - Double-click the ES8510-XTE in the *Device Tree* or *Device List* pane.
   - Highlight the ES8510-XTE in the *Device Tree* or *Device List* pane and click the **Properties** button.
   - Right-click the ES8510-XTE in the *Device Tree* or *Device List* pane and click **Properties** in the popup menu

- Highlight the ES8510-XTE, click the **Manage** menu and then **Properties**.



5. *Optionally*, rename the ES8510-XTE in the **Device Name** field for a PortVision DX friendly name. The default name displays as *Device* and the last three sets of hex numbers from the MAC address.



Note: *The MAC address and Device Status fields are automatically populated and you cannot change these values.*

6. Optionally, enter the serial number, which is on a label on the ES8510-XTE.
7. Select **DHCP IP** or **Static IP** for the *IP Mode*.
   - If you select **DHCP IP**, go to Step 8.
   - If you select **Static IP**:
     - Enter a unique **IP address** as required for your site.
     - Enter a valid **Subnet Mask** value for your network.
     - Enter a valid **Default Gateway** value for your network.
8. Optionally, select the **Network Topology** type, which is an informational field.
9. Click **Apply Changes** to update the network information on the ES8510-XTE.

   Note: *If you are deploying multiple ES8510-XTE switches that share common values, you can save the configuration file and load that configuration onto other ES8510-XTE switches. See Using Configuration Files on Page 25 for more information.*
10. Click **Close** to exit the *Properties* window.
11. You should verify that you have the latest firmware loaded on the ES8510-XTE because a newer version typically includes feature enhancements and bug fixes. Refer to *Checking the Firmware Version* on Page 21 and if necessary, *Uploading the Latest Firmware or Bootloader* on Page 22.
12. If you have the latest firmware, you can begin feature configuration, see one of these sections:
    - *Configuration Using the Web User Interface* on Page 31
    - *Configuration Using the Command Line Interface (CLI)* on Page 126
    - Right-click the ES8510-XTE in the *Device List* pane and click **Webpage** in the popup menu.

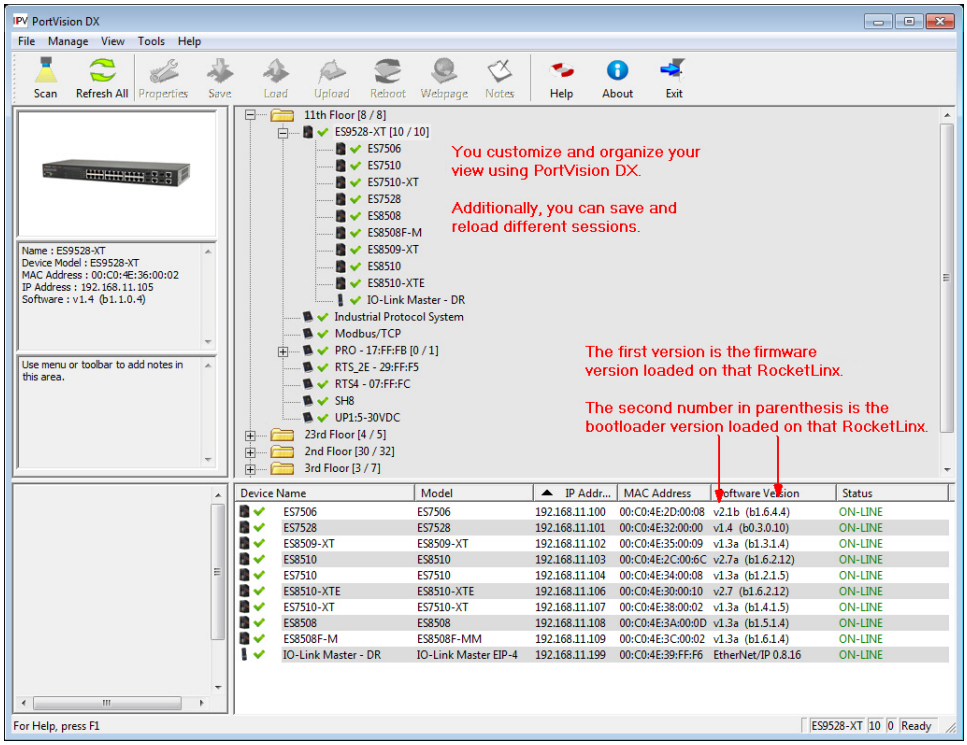
    Note: *The default User Name and Password are both* **admin**.

Checking the Firmware Version

Checking your web interface and bootloader versions is easy in PortVision DX.

Comtrol recommends loading the latest firmware and bootloader so that you have all of the latest feature enhancements and bug fixes.

1. If the ES8510-XTE is not displayed in PortVision DX, click the **Scan** button.
2. Select the Comtrol Ethernet attached product type and click the **Scan** button.
3. Locate the ES8510-XTE in the *Device List* pane. Under *Software Version*: The first number reflects the firmware version and the second number displays the bootloader version.



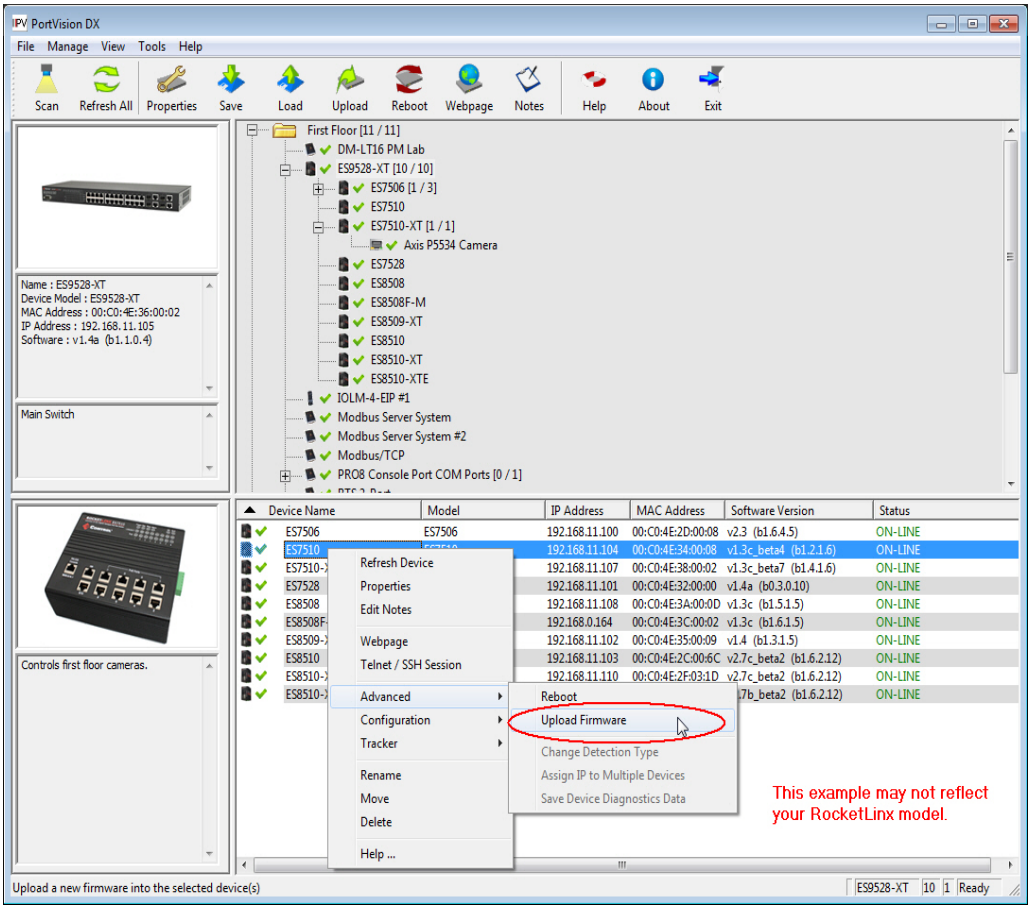
4. Check the Comtrol download site for the latest firmware and bootloader. Simply, click your product type and click the **Software** link and check the latest version against the version on the ES8510-XTE.

Use the next subsection for procedures to upload the firmware (web interface) and bootloader.

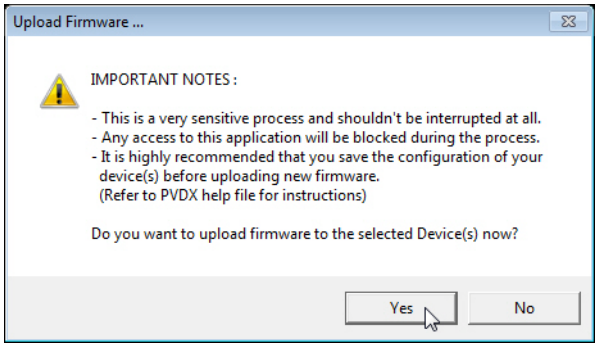
Uploading the Latest Firmware or Bootloader

You can use the following procedure to upload the latest firmware or bootloader.

1. If you have not done so, download the latest firmware and bootloader using the previous subsection.
2. Right-click the ES8510-XTE in the *Device List* pane that you want to update, click **Advanced --> Upload firmware**.



3. Navigate to the location of the firmware files, select the appropriate file, and then click **Open**.
4. Click **Yes** to the *Upload Firmware* message.
5. Click **Ok** to the message notifying you that you should wait to use the ES8510-XTE when the status returns to ON-LINE.
6. Right-click the ES8510-XTE in the *Device List* pane and click **Refresh**. Optionally, you can click the **Refresh** button in the *Toolbar* and that refreshes all devices in PortVision DX.
7. Verify that the version change is reflected in under the *Software Version*.

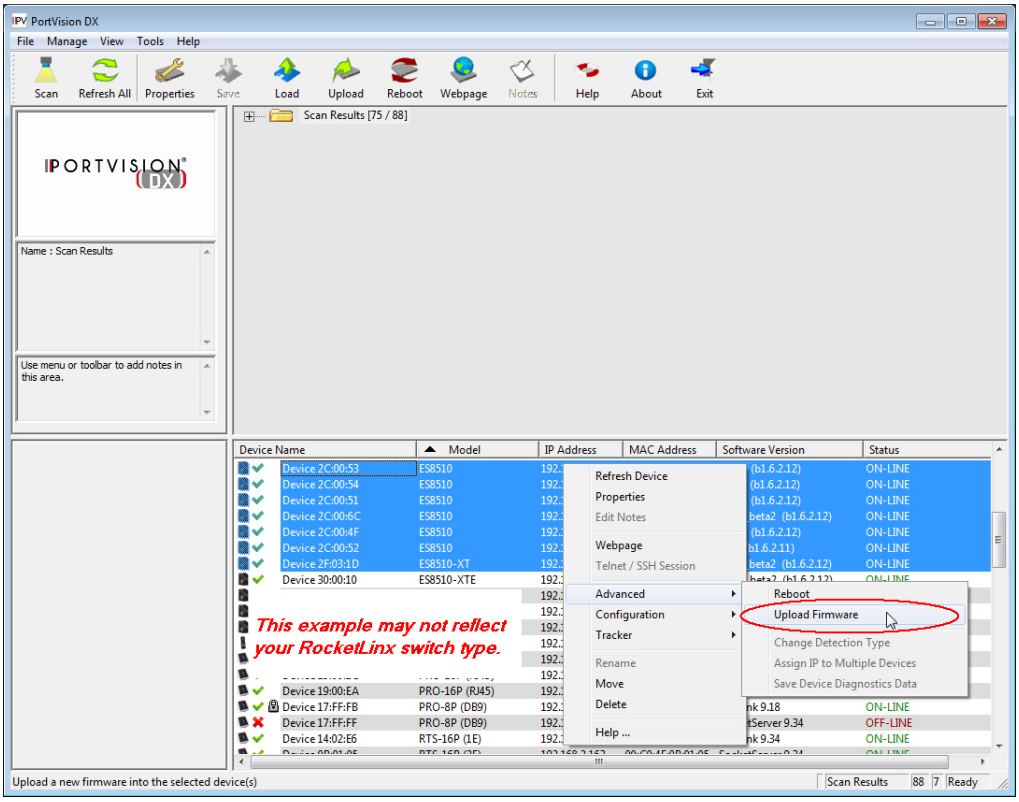


Uploading Firmware to Multiple ES8510-XTE Switches

You can use this procedure if your ES8510-XTE is connected to the host PC, laptop, or if the ES8510-XTE resides on the local network segment.

Note: *Technical support does not advise uploading bootloader to multiple ES8510-XTE switches. Remember that uploading firmware reboots the ES8510-XTE, which depending on your network connections may cause firmware uploading to fail on another ES8510-XTE.*

1. If the ES8510-XTE is not displayed in PortVision DX, click the **Scan** button.
2. Select the Comtrol Ethernet attached product type and click the **Scan** button.
3. Shift-click the multiple ES8510-XTE switches on the **Main** screen that you want to update and right-click and then click **Advanced > Upload Firmware**.



4. Browse, click the firmware (**.bin**) file, **Open** (*Please locate the new firmware*), and then click **Yes** (*Upload Firmware*).

   It may take a few minutes for the firmware to upload onto all of the ES8510-XTE switches. The ES8510-XTE reboots itself during the upload process.

5. Click **Ok** to the advisory message about waiting to use the device until the status reads **ON-LINE**.

In the next polling cycle, PortVision DX updates the *Device List* pane and displays the new firmware version.

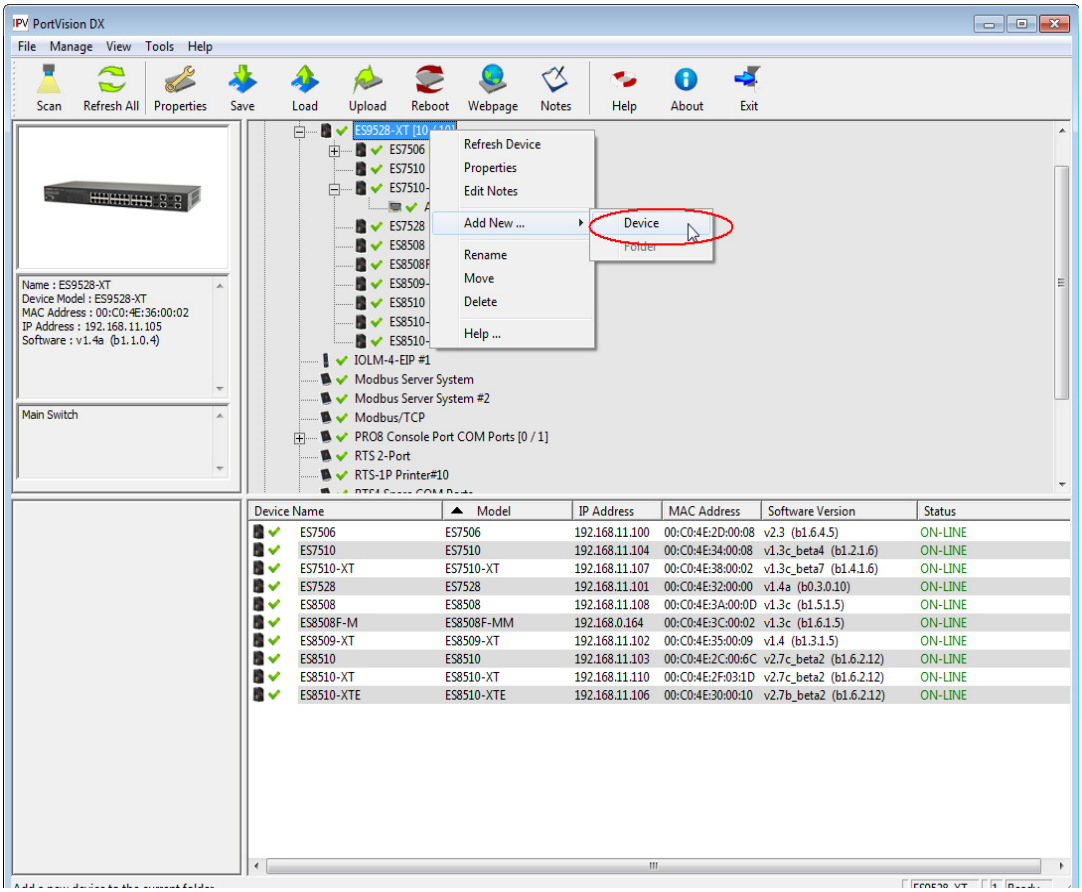
Adding a New Device in PortVision DX

You can add a new ES8510-XTE manually, if you do not want to scan the network to locate it or you want to pre-configure an ES8510-XTE before connecting it to the network. Optionally, you can also add unmanaged devices or RocketLinx switches to maintain information about devices on the network.

See the PortVision DX help system for additional information about adding unmanaged RocketLinx switches or third party devices or switches.

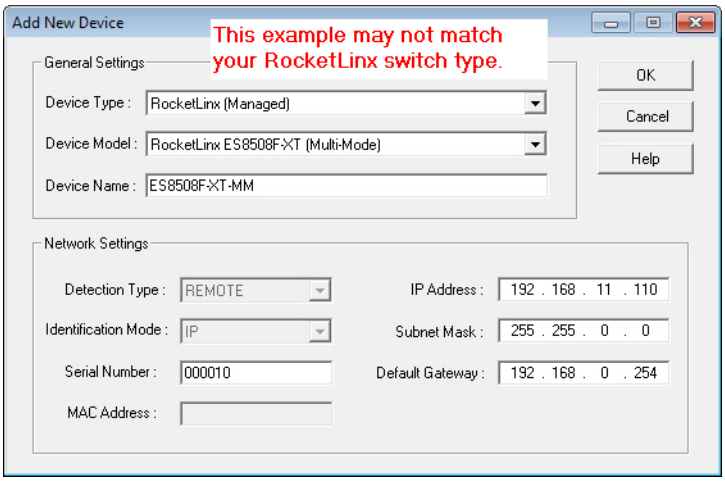
Use the following procedure to add a remote ES8510-XTE to PortVision DX.

1. Access the *New Device* window using one of these methods:
   - Click **Add New > Device** in the *Manage* menu.
   - Right-click a folder or a RocketLinx switch in the *Device Tree* pane and click **Add New > Device**.



2. Select the appropriate RocketLinx in the **Device Type** drop list.
3. Select the appropriate model in the **Device Model** drop list.
4. Enter a friendly device name in the **Device Name** list box.
5. Optionally, enter the serial number in the **Serial Number** list box.

6. Enter the IP Address for the ES8510-XTE. It is not necessary to enter the Subnet Mask and Default Gateway
7. Click **Ok** to close the *Add New Device* window. It may take a few moments to save the ES8510-XTE.
8. If necessary, click **Refresh** for the new RocketLinx to display in the *Device Tree* or *Device List* panes. The RocketLinx shows OFF-LINE if it is not connected to the local network or if an incorrect IP address was entered.



Using Configuration Files

If you are deploying multiple ES8510-XTE switches that share common firmware values, you can save the configuration file (**.dc**) from the *Main* screen in PortVision DX and load that configuration onto other ES8510-XTE switches.

Saving a Configuration File

Use this procedure to save a configuration file.

1. Highlight the ES8510-XTE in the *Device List* pane and use one of the following methods:
   - Click the **Save** button.
   - Right-click and then click **Configuration > Save**.
2. Browse to the location you want to save the file, enter a file name, and click **Save**.
3. Click **Ok** to close the *Save Configuration Completed* message.

Loading a Configuration File

Use the following procedure to load a previously saved a ES8510-XTE configuration file. Load a configuration file and apply it to a selected ES8510-XTE switch or switches from the *Device List* pane.

Use this procedure to load a configuration file using the *Device List* pane to one or more ES8510-XTE switches.

1. Highlight the device or devices in the *Device List* pane and use one of the following methods:
   - Click the **Load** button
   - Right-click and then click **Configuration > Load**
2. Click **Yes** to the warning that it will take 25 seconds per device and it may also reboot the devices.
3. Browse to the location of the configuration file, click the file name (**.dc**) and then **Open**.
4. Close the *Load Configuration* popup message.

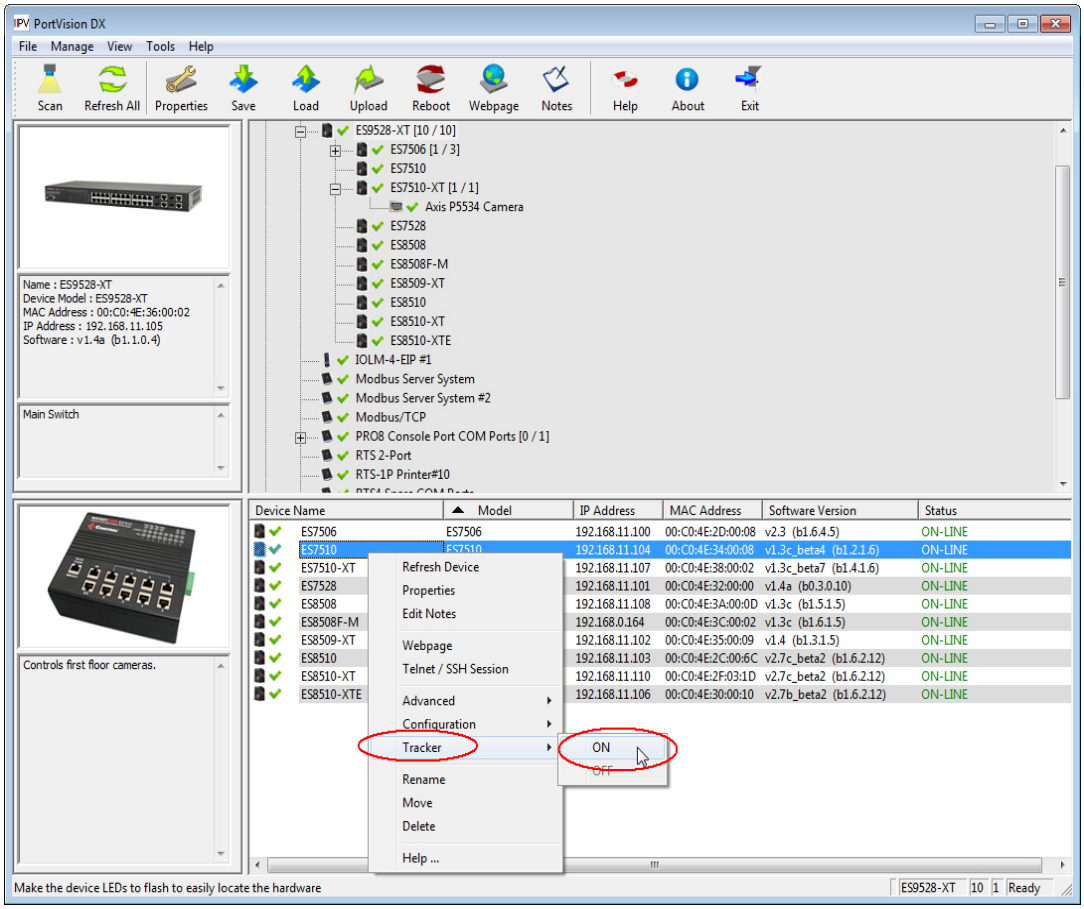
Using the LED Tracker

RocketLinx managed switches support the LED Tracker feature, which allows you to toggle on/off the LEDs on a specific device so that you can locate the physical unit.

Use this procedure to toggle the **LED Tracker** feature on RocketLinx switches.

1. Right-click the ES8510-XTE in the *Device List* pane, click **Tracker**, and then click **ON**.

   The ES8510-XTE **SYS** LED will flash for five seconds.

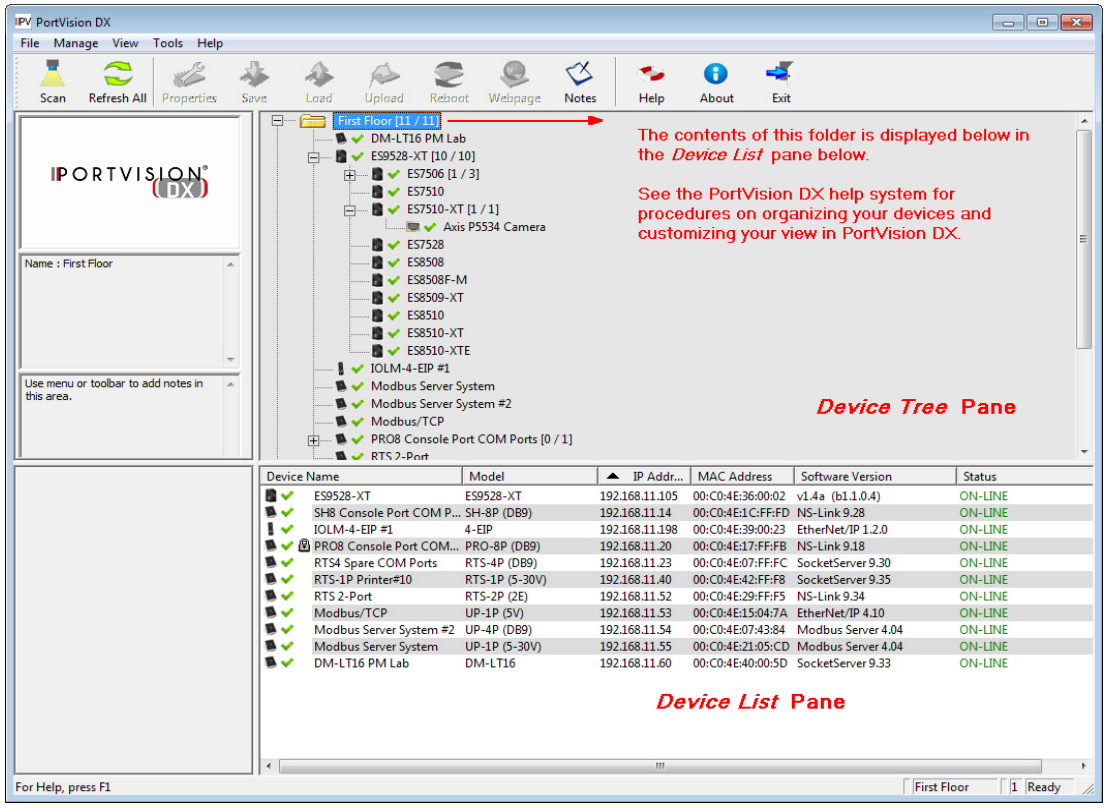


2. If necessary, you may need to click **Tracker** and **ON** several times to catch the flashing **SYS LED**.

Customizing PortVision DX

You can customize how PortVision DX displays the devices. You can even create sessions tailored for specific audiences. You can also add shortcuts to other applications using **Tools > Applications > Customize** feature.

The following illustrates how you can customize your view.



See the PortVision DX Help system for detailed information about modifying the view. For example, the above screen shot illustrates devices layered in folders.

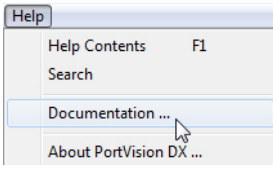
Accessing RocketLinx Documentation from PortVision DX

You can use this procedure in PortVision DX to download and open the previously downloaded documents for the RocketLinx.

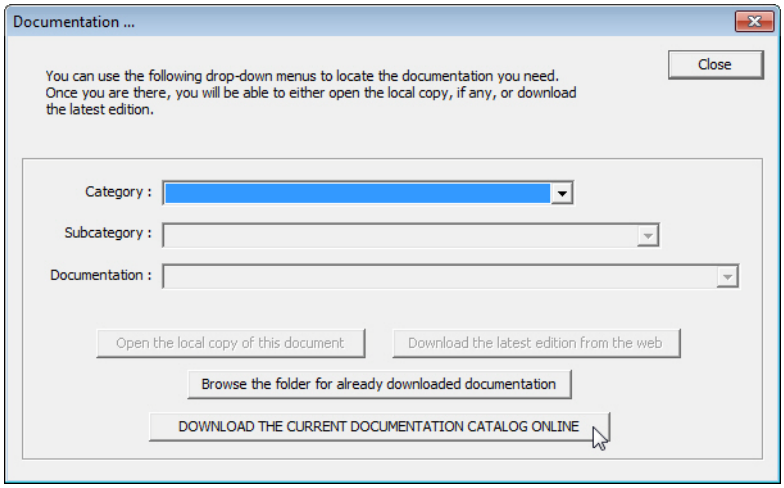
How to Download Documentation

Use this procedure to initially download a document or documents.

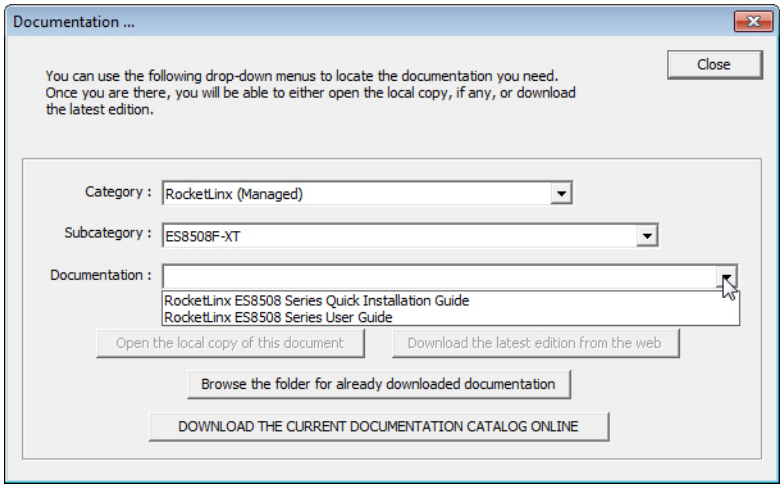
1. If necessary, open PortVision DX.
2. Click **Help > Documentation**.



3. Optionally, click the **DOWNLOAD THE CURRENT DOCUMENTATION CATALOG ONLINE** button to make sure that the latest documentation is available to PortVision DX.



4. Select the product **Category** from the drop list.
5. Select the document you want to download from the **Documentation** drop list.



Note: *This image may not reflect your RocketLinx.*

6. Click the **Download the latest edition from the web** button.

   Note: *It may take a few minutes to download, depending on your connection speed. The document opens automatically after it has downloaded.*

7. Click **Close** if you have downloaded all of the documents that you wanted.

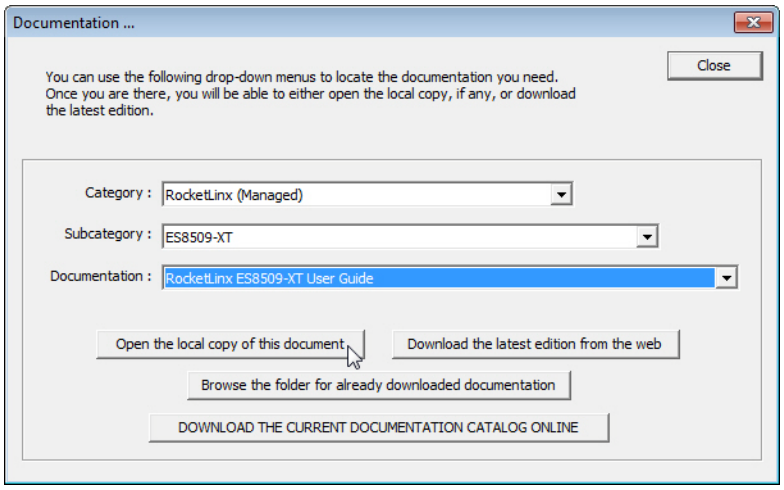
How to Open Previously Downloaded Documents

Use the following procedure to access previously downloaded documents in PortVision DX.

Note: *Optionally, you can browse to the* **Program Files (x86) > Comtrol > PortVision DX > Docs** *subdirectory and open the document.*

1. If necessary, open **PortVision DX > Start/Programs > Comtrol > PortVision DX > PortVision DX** or use the desktop shortcut.
2. Click **Help > Documentation**.
3. Click the **Open the local copy of the document** button to view the document.

   Note: *This image may not reflect your RocketLinx.*



   Note: *If the document fails to open, it may be that your browser has been disabled. You can still access the document by clicking the* **Browse the folder for already downloaded documentation** *button and opening the document with your custom browser.*

4. Click **Close** in the *Documentation...* popup, unless you want to open or download other documents.

Configuration Using the Web User Interface

The ES8510-XTE provides in-band and out-band configuration methods:

- Out-band management means that you configure the ES8510-XTE using the RS-232 console cable and the Command Line Interface (CLI) to access the ES8510-XTE without attaching an admin PC to the network. You can use out-band management if you lose the network connection to the ES8510-XTE. The CLI and Telnet are discussed in *Configuration Using the Command Line Interface (CLI)* on Page 126.
- In-band management means that you connect remotely using the ES8510-XTE IP address through the network. You can remotely connect with the ES8510-XTE web user interface or a Telnet console and the CLI. The ES8510-XTE provides HTTP web user interface (Page 32) and secure HTTPS web user interface (Page 33) for web management.

Configuration Overview

This subsection discusses a minimum level of configuration required to operate the ES8510-XTE.

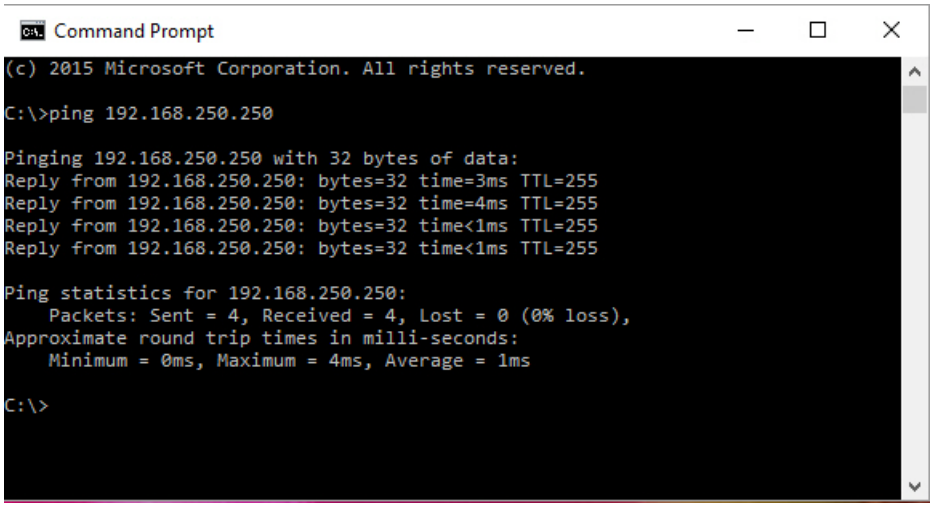
1. If you have not done so, install the hardware, see *Hardware Installation* on Page 9.
2. If you are planning on using in-band management, you need to program the ES8510-XTE IP address to meet your network requirements. The easiest way to configure the IP address is using a Windows system and PortVision DX, see *Configuring the Network Settings* on Page 18.
3. Configure other features as desired. You can refer to the *Feature Overview* on Page 35 to locate configuration information or use these links:
   - *Basic Settings* on Page 44
   - *Port Configuration* on Page 64
   - *Network Redundancy* on Page 71
   - *VLAN* on Page 85 and *Private VLAN* on Page 91
   - *Traffic Prioritization* on Page 95
   - *Multicast Filtering* on Page 99
   - *SNMP* on Page 102
   - *Security* on Page 105
   - *Warning* on Page 112
   - *Monitor and Diag* on Page 116
   - *Device Front Panel* on Page 123
   - *Save to Flash* on Page 124
   - *Logout* on Page 124

Web User Interface

You can use any standard web browser to configure and communicate with the ES8510-XTE from anywhere on the network.

The default IP address for the ES8510-XTE is ***192.168.250.250***.

1. Open a command prompt window and ping the IP address for the ES8510-XTE to verify a normal response time.



Note: *If you did not program the IP address for your network using PortVision DX (Configuring the Network Settings on Page 18), you need to change your computer IP address to* **192.168.250.x** *(Network Mask: 255.255.0.0).*

2. Launch the web browser on the PC using one of these methods:
   - Right-click the ES8510-XTE in PortVision DX and click **Webpage**.
   - Open your browser, enter the IP address of the switch, and then press **Enter**. For example: **http://10.0.0.114**.
3. Enter the user name, the password, and click **OK**. The default user name and password are both **admin**.

   The *Welcome* page of the web interface then appears.

4. If you have not done so, you can change the ES8510-XTE IP address to meet your network environment.
   a. Double-click **Basic Setting**.
   b. Click **IP Configuration**.
      - To use static addressing, enter a valid IP address, subnet mask and default gateway.
      - To use DHCP, click **Enable** in the **DHCP Client** drop list.
   c. Click **Apply**.

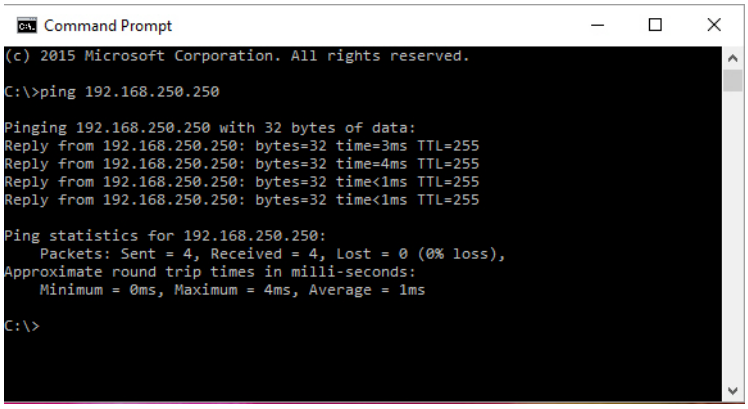
You can use the *Feature Overview* on Page 35 to locate other features that you may want to configure.

Secure Web User Interface

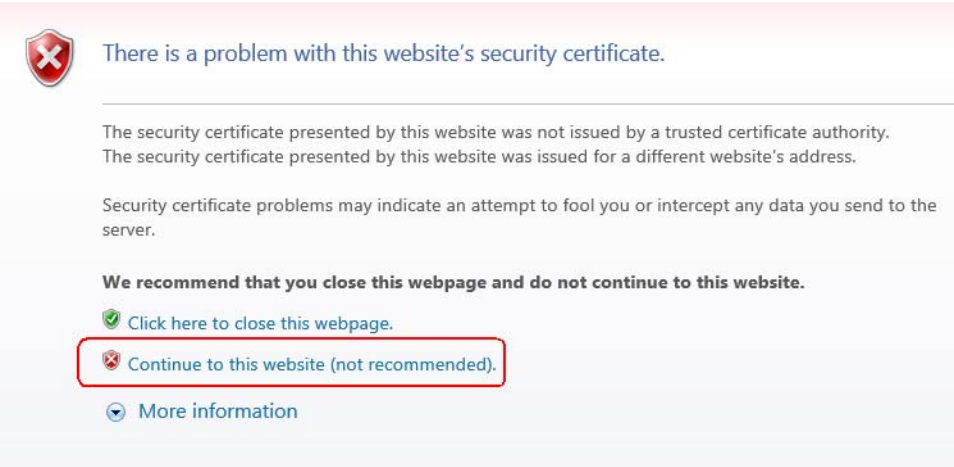
The ES8510-XTE web user interface also provides secured management through an HTTPS login so that all of the configuration commands are secure.

If you did not program the IP address for your network using PortVision DX (*Configuring the Network Settings* on Page 18), you need to change your computer IP address to **192.168.250.x** (Network Mask: 255.255.0.0). The default IP address for the ES8510-XTE is *192.168.250.250*.

1. Open a command prompt window and ping the IP address for the ES8510-XTE to verify a normal response time.

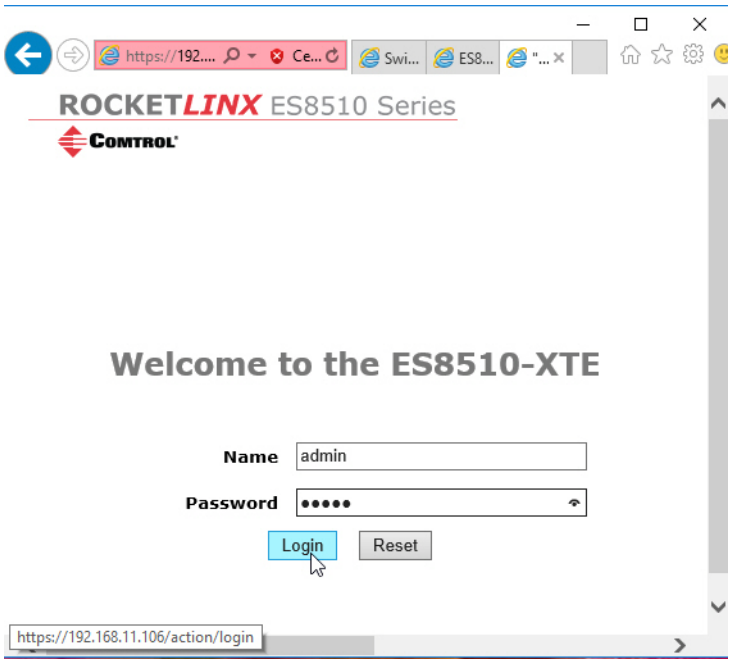


2. Launch the web browser and type **https://192.168.250.250** (or the IP address of the ES8510-XTE).and then press **Enter**.
3. Click **Continue to the web site (not recommended)**.



4. Enter the user name and the password and click **OK**. The default user name and password are both **admin**.

   The *Welcome* page of the web management interface then appears.



5. If you have not done so, you can change the ES8510-XTE IP address to meet your network environment.
   a. Double-click **Basic Setting**.
   b. Click **IP Configuration**.
      - To use static addressing, enter a valid IP address, subnet mask and default gateway.
      - To use DHCP, click **Enable** in the **DHCP Client** drop list.
   c. Click **Apply**.

Feature Overview

The following table provides detailed information about ES8510-XTE features and provides the location of the configuration information in the web user interface.

Type	Category	Details
802.1x Port-Based Network Access Control Configuration	*802.1x Configuration* on Page 110	• System Authentication Control - Enable/Disable • Authentication Method - RADIUS or Local • RADIUS Server - IP Address, Shared Key, Server Port, and Accounting Port • Local RADIUS User - User Name, Password, and VID • Secondary RADIUS Server - IP Address, Shared Key, Server Port, and Accounting Port • Local RADIUS User List
802.1x Port-Based Network Access Control Port Configuration	*802.1x Port Configuration* on Page 111	Port Configuration • Port Control - Auto, Forced Authorized, or Force Unauthorized • Re-authentication - Enable/Disable • Maximum Request • Guest VLAN • Host Mode - Single/Multi • Admin Control Direction - Both or In Timeout Configuration • Port by Port • Re-Authentication Periods • Quiet Period • Tx Period • Supplicant Timeouts • Server Timeouts
802.1x Port-Based Network Access Control Port Status	*802.1x Port Status* on Page 113	• Port by Port • Port Control • Authorize Status • Authorized Supplicant • Oper Control Direction
Admin Password	*Admin Password* on Page 50	• Admin • RADIUS Server (RADIUS Server IP, Shared Key, and Server Port) • Secondary RADIUS Server (RADIUS Server IP, Shared Key, and Server Port)
Backup and Restore	*Backup and Restore* on Page 60	Local or TFTP

Type	Category	Details
CoS-Queuing Mapping	*CoS-Queue Mapping* on Page 100	• CoS 0 through 7 • Queue 0 through 3 • Queue 3 highest priority
DHCP Server Configuration	*DHCP Server Configuration* on Page 56 *DHCP Leased Entries* on Page 58 *DHCP Relay Agent* on Page 59	• DHCP Server Configuration - Excluded Addresses and Manual Binding - Port and IP Address - Option 82 • DHCP Leased Entries • DHCP Relay Agent - Helper Address 1-4 - DHCP Option82 Relay Agent (Circuit ID/Remote ID)
DSCP-Queuing Mapping	*DSCP-Queue Mapping* on Page 101	• DSCP 0 through 7 • Queue 0 through 3 • Queue 3 highest priority
Event Selection	*Event Selection* on Page 116	• Device Cold Start • Device Warm Start • Authentication Failure • Time Synchronization Failure • Power 1 Failure • Power 2 Failure • Fault Relay • DI1 Change • DI2 Change • Ring Event • Loop Protection • Ring Event • SFP Failure • Port by Port Event Selection
Fault Relay	*Fault Relay* on Page 114	Relay 1- Multi-event • DI - State (DI number and High or Low) • Dry Output - On Period (Sec) and Off Period (Sec) • Power Failure - Power 1 or Power 2 • Link Failure (Port or Ports) • Ping Failure, IP Address, Reset Time (Sec), and Hold Time (Sec) • Super Ring Failure

Type	Category	Details
GVRP Configuration	*GVRP Configuration* on Page 93	• 2K Entries • Enable/Disable GVRP Protocol • State - Enable/Disable • Join Timer • Leave Timer • Leave All Timer
IGMP Query	*IGMP Query* on Page 104	• Version - Version 1, Version 2, or Disable • Query Intervals • Query Maximum Response Time
IGMP Snooping	*IGMP Snooping* on Page 103	• Enable/Disable • VID • Port by Port IGMP Snooping Table - IP Address - VID
IP Configuration	*Basic Settings* on Page 49	• IPv4 and IPv6 support • DHCP • DNS1 and DNS2
IP Security	*IP Security* on Page 109	• Enable/Disable • Security IP • Security IP List - Index and Security IP
Loop Protection	*Loop Protection* on Page 87	• Transmit Interval • Enable/Disable port by port • Status
MAC Address Table (8K)	*MAC Address Table* on Page 120	• Aging Time (Sec) • Static Unicast MAC Address - MAC Address, VID, and Port • Port by Port MAC Address Table View - Static Unicast - Dynamic Unicast - Static Multicast - Dynamic Multicast
MSTP Configuration	*MSTP Configuration* on Page 78	• MSTP Region Configuration - Name and Revision • New MST Instance - Instance ID, VLAN Group, and Instance Priority • Current MST Instance Configuration - Instance ID, VLAN Group, and Instance Priority

Type	Category	Details
MSTP Information	*MSTP Information* on Page 82	• Instance ID • Root Information - Root Address - Root Priority - Root Port - Root Path Cost - Maximum Age - Hello Time - Forward Delay • Port Information - Role - Port State - Path Cost - Port Priority - Link Type - Edge Port
MSTP Port Configuration	*MSTP Port Configuration* on Page 81	Instance ID • Port • Path Cost • Priority • Link Type • Edge Port
Ping Utility	*Ping Utility* on Page 126	Target IP Address
Port Control	*Port Control* on Page 68	• Enable/Disable Port State • Speed/Duplex - Auto-Negotiation, 10 Full/Half, and 100 Full/Half • Flow control - Disable/Symmetric • User-Defined Description
Port Mirror Mode	*Port Mirroring* on Page 123	• Port Mirror Mode - Enable/Disable • Port by Port - Source Port - Rx and Tx - Destination Port - Rx and Tx
Port Security	*Port Security* on Page 108	• Port Security State - Port by Port • Add Port Security Entry - Port, VID, and MAC Address • Port Security Entry List - Port VID, and MAC Address

Type	Category	Details
Port Statistics	*Port Statistics* on Page 122	Port by Port • Type • Link • State • Rx and Tx Good • Rx and Tx Bad • Rx Abort • Collision
Port Status	*Port Status* on Page 70	• Port Type • Link - Up/Down • State - Enable/Disable • Speed/Duplex • Flow Control • SFP Vendor, Wavelength, and Distance • SFP DDM - Temperature, Tx Power, and Rx Power
Port Trunk	*Aggregation Setting* on Page 72 *Aggregation Status* on Page 73	Aggregation Settings • Group ID - Trunk 1-5 Trunk Type - Static or 802.3ad LACPAggregation Status by Trunk • Type • Aggregated Ports • Individual Ports • Link down Ports
PVLAN Configuration	*PVLAN Configuration* on Page 95	• VLAN ID • PVLAN Type - None, Primary, Isolated, and Community
PVLAN Information	*PVLAN Information* on Page 97	• Primary VLAN • Secondary VLAN • Secondary VLAN Type • Ports
PVLAN Port Configuration	*PVLAN Port Configuration* on Page 96	Port Configuration • PVLAN Port Type - Normal, Host, or Promiscuous • VLAN ID PVLAN Association • Secondary VLAN • Primary VLAN

Type	Category	Details
QoS Setting	*QoS Setting* on Page 98	Queue scheduling • Use 8.4.2.1 Weighted Fair Queuing Scheme • Use A Strict Priority Scheme Port Setting • CoS - 0 through 7 • Trust Mode - COS Only, DSCP Only, COS First, or DSCP First
Rate Control	*Rate Control* on Page 71	• Ingress Packet Types - Broadcast Only, Broadcast/Multicast, Broadcast/Multicast/Unknown Unicast, and All • Ingress Rate (1 Mbps to 100Mbps) • Egress Packet Type • Egress Rate (1 Mbps to 100Mbps)
Redundant Ring	*Redundant Ring* on Page 84	• Ring ID and Name • Ring Configuration - ID - Name - Version (Super Ring and Rapid Super Ring) - Device Priority - Ring Port - Path Cost - Ring Port2 - Path Cost - Rapid Dual Homing - Ring Status
Redundant Ring Information	*Redundant Ring Information* on Page 86	• 32 Ring ID Maximum (0-31) • Supports up to four 100M rings • Version • Role • Status • RM MAC • Blocking Port • Role Transition Count • Ring State Transition Count
Reset/Reboot	*Load Default* on Page 66 *System Reboot* on Page 67	• System Reset Button • Reset to Factory Default Values • Reboot from Interface
SNMP Configuration	*SNMP Configuration* on Page 105	• V1/V2c Community • Public - Read Only or Read and Write • Private - Read Only or Read and Write

Type	Category	Details
SNMP Traps	*SNMP Traps* on Page 107	• Enable/Disable • Trap Server - Server IP Address, Community, and Version (V1 or V2c) • Trap Server Profile - Displays Server IP, Community, and Version
SNMP V3 Profile	*SNMP V3 Profile* on Page 106	SNMP V3 • User Name • Security Level • Authentication Level • Authentication Password • DES Password SNMP V3 Users - Displays Profile Information
STP Configuration	*STP Configuration* on Page 75	• STP, RSTP, MSTP, or Disable • Bridge Address • Bridge Priority • Maximum Age • Hello Time • Forward Delay
STP Information	*STP Information* on Page 77	• Root Information - Root Address - Root Priority - Root Port - Root Path Cost - Maximum Age - Hello Time - Forward Delay • Port Information - Role - Port State - Path Cost - Port Priority - Link Type - Edge Port - Aggregated (D/Type)
STP Port Configuration	*STP Port Configuration* on Page 76	Port by Port • STP State • Path Cost • Priority • Link Type • Edge Port

Type	Category	Details
SYSLOG Mode	*SysLog Configuration* on Page 118	• Disable, Local, Remote, or Both • Remote IP Address
System Event Logs	*Event Log* on Page 124	• Index • Date • Time • Event Log
Time Setting	*Time Setting* on Page 53	• Manual or NTP Client • Time Zone Setting • Daylight Savings Time
Topology Discovery	*Topology Discovery (LLDP)* on Page 125	• LLDP - Enable/Disable • LLDP Configuration - Timer and Hold Time • LLDP Port State - Local Port, Neighbor ID, Neighbor IP, and Neighbor VID
Unknown Multicast	*Unknown Multicast* on Page 104	• Send to Query Ports • Send to All Ports • Discard
Upgrade Firmware	*that contains the configuration file Firmware Upgrade* on Page 64	Local or TFTP
VLAN Configuration	*VLAN Configuration* on Page 90	• Tunneling support for 256 • Management VLAN ID • Static VLAN - ID and Name • Static VLAN Configuration - VLAN ID, Name, and Ports (Options: No VLAN, Trunk Link, or Access Link)
VLAN Port Configuration	*VLAN Port Configuration* on Page 89	• PVID • Tunnel Mode • Accept Frame Type • Ingress Filtering
VLAN Table	*VLAN Table* on Page 94	• VLAN ID • Name • Status • Port by Port

Type	Category	Details
Warning - SMTP Configuration	*SMTP Configuration* on Page 119	• Email Alert - Enable/Disable • SMTP Server IP • Mail Account • Authentication • User Name • Password • Recipient Email Address 1-4

Basic Settings

The *Basic Setting* group allows you the ability to configure switch information, IP address, User name/ Password of the system. It also allows you to do firmware upgrade, backup and restore configuration, reload factory default, and reboot the system.

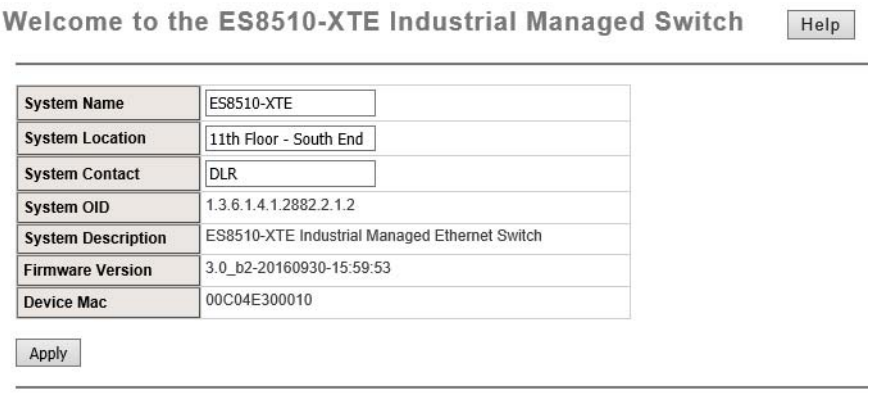
The following web pages are included in this group:

- *Switch Setting* on Page 44
- *Admin Password* on Page 46
- *IP Configuration* on Page 47
- *Time Setting* on Page 49
- *DHCP Server Configuration* on Page 52
  - *DHCP Leased Entries* on Page 54
  - *DHCP Option82 Relay Information* on Page 55
- *Backup and Restore* on Page 57
- *Firmware Upgrade* on Page 61
- *Load Default* on Page 62
- *System Reboot* on Page 63

Optionally, you can use the CLI for configuration, see *Basic Settings (CLI)* on Page 140.

Switch Setting

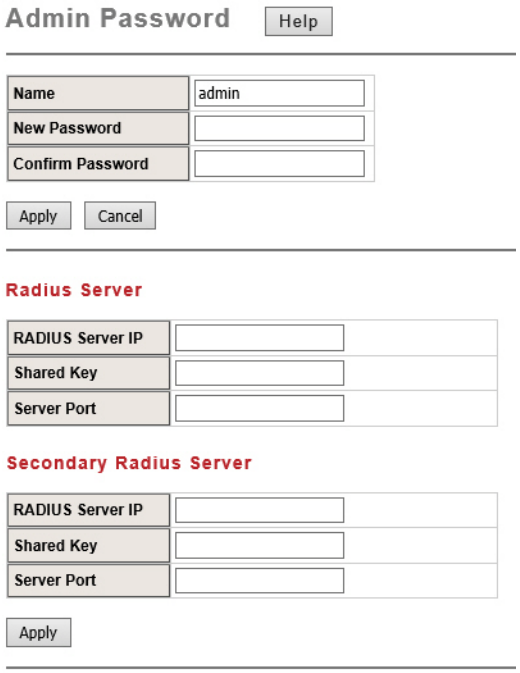
You can assign the **System Name**, **Location**, **Contact** and view ES8510-XTE information.



Switch Setting Page	
System Name	You can assign a name to the ES8510-XTE with up to 64 characters. After you configure the name, the CLI system selects the first 12 characters as the name in CLI system.
System Location	You can specify the ES8510-XTE physical location with up to 64 characters.
System Contact	You can specify contact people with up to 64 characters by typing the Administer's name, mail address or other information.
System OID	The SNMP Object ID of the ES8510-XTE. You can follow the path to find its private MIB in an MIB browser. ***Note:*** *When you attempt to view private MIB, you should first compile private MIB files into your MIB browser.*
Firmware Version	Displays the firmware version installed in this ES8510-XTE.
Device MAC	Displays a unique hardware address (MAC address) assigned at the factory.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

Admin Password

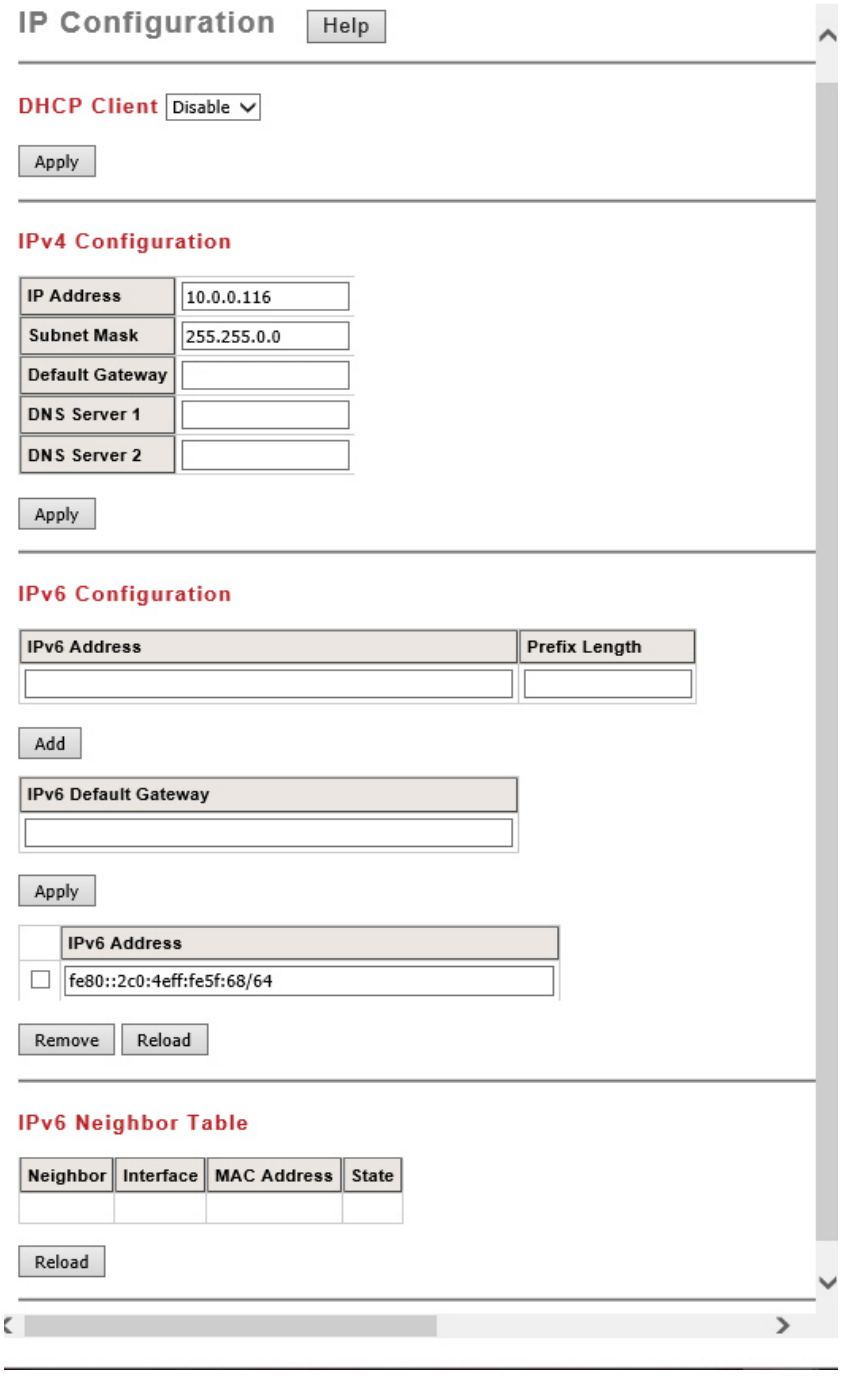
You can change the user name and the password here to enhance security.



Admin Password Page	
Administrator	
Name	You can enter a new user name here. The default name is **admin**.
Password	You can enter a new password here. The default password is **admin**.
Confirm Password	You need to type the new password again to confirm it.
RADIUS Server	
RADIUS Server IP	The IP address of the RADIUS server.
Shared Key	The password for communication between switch and RADIUS Server.
Server Port	The UDP port of the RADIUS server.
Secondary RADIUS Server	
RADIUS Server IP	The IP address of the RADIUS server.
Shared Key	The password for communication between switch and RADIUS Server.
Server Port	The UDP port of the RADIUS server.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

IP Configuration

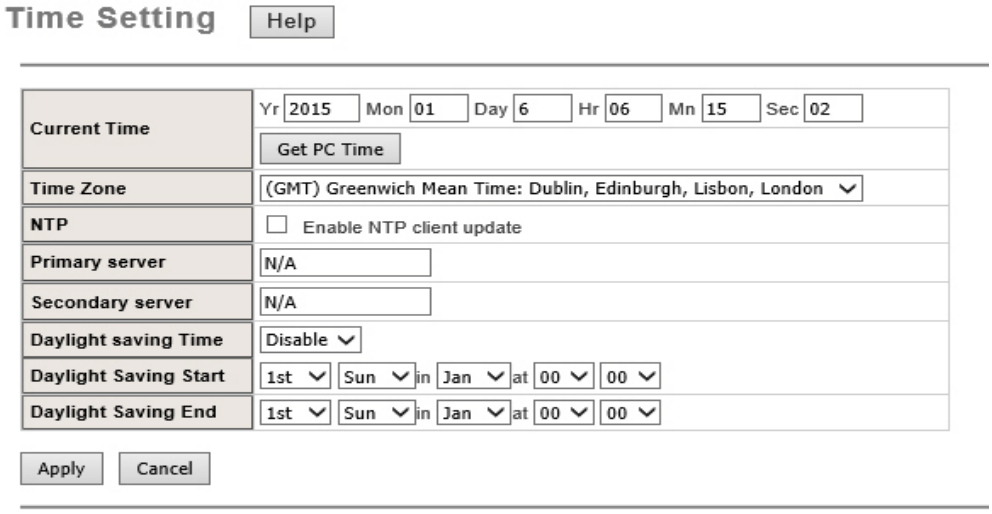
This web page allows you to configure the ES8510-XTE's IP address settings.



IP Configuration Page	
DHCP Client	You can select to **Enable** or **Disable** the DHCP Client function. When the DHCP Client function is enabled, an IP address is assigned to the switch from the network's DHCP server. In this mode, the default IP address is replaced by the one assigned by DHCP server. If DHCP Client is disabled, then the IP address that you specified is used.
IP Address Default: 192.168.250.250	You can assign the IP address reserved by your network for the ES8510-XTE. If the DHCP Client function is enabled, you do not need to assign an IP address to the ES8510-XTE, because it is overwritten by the DHCP server and displays here.
Subnet Mask Default: 255.255.255.0	You can assign the subnet mask for the IP address here. If the DHCP Client function is enabled, you do not need to assign the subnet mask. . ***Note:*** *In the CLI, the enabled bit of the subnet mask is used to represent the number displayed in the web management interface. For example, 8 represents: 255.0.0.0,16 represents: 255.255.0.0, 24 represents: 255.255.255.0.*
Default Gateway Default: 192.168.250.1	You can assign the gateway for the switch here. ***Note:*** *In the CLI, use 0.0.0.0/0 to represent the default gateway.*
DNS Server 1/2	The Domain Name System (DNS) is a hierarchical naming system built on a distributed database for computers, services, or any resource connected to the Internet or a private network. It associates various information with domain names assigned to each of the participating entities. Most importantly, it translates domain names meaningful into the numerical identifiers associated with networking equipment for the purpose of locating and addressing these devices worldwide.
IPv6 Address	You can enter an IPv6 address for the ES8510-XTE. An IPv6 address is represented as eight groups of four hexadecimal digits, each group representing 16 bits (two octets). The groups are separated by colons (:), and the length of IPv6 address is 128bits. The 64-bit interface identifier is automatically generated from the MAC address for the ES8510-XTE using the modified EUI-64 format.
Prefix Length	This IPv6 prefix specifies the size of a network or subnet. The default is 64.
IPv6 Default Gateway	The IPv6 default gateway IP address identifies the gateway (for example, a router) that receives and forwards those packets whose addresses are unknown to the local network. The agent uses the default gateway address when sending alert packets to the management workstation on a network other than the local network.
IPv6 Address	This table shows the IPv6 addresses that have been added to the management VLAN. To remove an entry, click the check box next to it and then click the **Remove** button. To reload the list, click the **Reload** button.
IPv6 Neighbor Table	
Neighbor	The *IPv6 Neighbor Table* lists neighbors of the ES8510-XTE.
Interface	The interface connected to the neighbor.
MAC address	This is the MAC address of the neighbor.
State	This displays the Neighbor Unreachability Detection (NUD) state of the neighbor entry.
Remove	Click the **Remove** button to remove an IPv6 configuration or IPv6 Neighbor Table entry.
Reload	Click the **Reload** button to reload IPv6 configuration.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

Time Setting

Time Setting allows you to set the time manually or through a Network Time Protocol (NTP) server. NTP is used to synchronize computer clocks on the Internet. You can configure NTP settings here to synchronize the clocks of several switches on the network. The ES8510-XTE also provides Daylight Saving functionality.



Time Setting Page	
Current Time	**Manual Setting**: Click the **Get PC Time** button to get PC's time setting for the ES8510-XTE or enter the appropriate information in the fields provided. **NTP client**: Click **Time Setting Source** if you want the NTP client to permit the ES8510-XTE to enable the NTP client service. NTP client is automatically enabled if you change the Time Setting Source to NTP Client. The system sends a request packet to acquire current time from the NTP server you assign.
Time Zone	Select the time zone where the ES8510-XTE is located. The following table lists the time zones for different locations for your reference. The default time zone is (GMT) Greenwich Mean Time.
NTP	Click this check box to enable NTP (Network Time Protocol).
Primary/Secondary Server	The Primary Server is the primary NTP server for which you want to synchronize time. The Secondary Server is the back up NTP server to use if the Primary Server becomes unavailable.
Daylight Saving Time	You can enable **Daylight Saving Time** and then set the **Daylight Saving Time Start** and **End** times. During Daylight Saving Time, the ES8510-XTE time is one hour earlier than the actual time.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

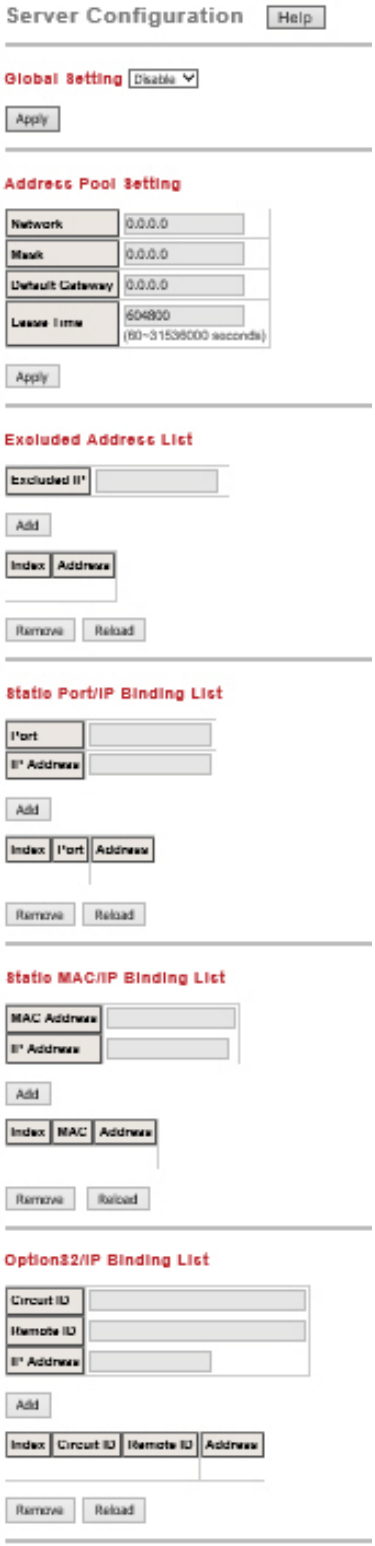
```
Switch(config)# clock timezone
  01  (GMT-12:00) Eniwetok, Kwajalein
  02  (GMT-11:00) Midway Island, Samoa
  03  (GMT-10:00) Hawaii
```

```
04  (GMT-09:00) Alaska
05  (GMT-08:00) Pacific Time (US & Canada), Tijuana
06  (GMT-07:00) Arizona
07  (GMT-07:00) Mountain Time (US & Canada)
08  (GMT-06:00) Central America
09  (GMT-06:00) Central Time (US & Canada)
10  (GMT-06:00) Mexico City
11  (GMT-06:00) Saskatchewan
12  (GMT-05:00) Bogota, Lima, Quito
13  (GMT-05:00) Eastern Time (US & Canada)
14  (GMT-05:00) Indiana (East)
15  (GMT-04:00) Atlantic Time (Canada)
16  (GMT-04:00) Caracas, La Paz
17  (GMT-04:00) Santiago
18  (GMT-03:00) NewFoundland
19  (GMT-03:00) Brasilia
20  (GMT-03:00) Buenos Aires, Georgetown
21  (GMT-03:00) Greenland
22  (GMT-02:00) Mid-Atlantic
23  (GMT-01:00) Azores
24  (GMT-01:00) Cape Verde Is.
25  (GMT) Casablanca, Monrovia
26  (GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London
27  (GMT+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna
28  (GMT+01:00) Belgrade, Bratislava, Budapest, Ljubljana, Prague
29  (GMT+01:00) Brussels, Copenhagen, Madrid, Paris
30  (GMT+01:00) Sarajevo, Skopje, Sofija, Vilnius, Warsaw, Zagreb
31  (GMT+01:00) West Central Africa
32  (GMT+02:00) Athens, Istanbul, Minsk
33  (GMT+02:00) Bucharest
34  (GMT+02:00) Cairo
35  (GMT+02:00) Harare, Pretoria
36  (GMT+02:00) Helsinki, Riga, Tallinn
37  (GMT+02:00) Jerusalem
38  (GMT+03:00) Baghdad
39  (GMT+03:00) Kuwait, Riyadh
40  (GMT+03:00) Moscow, St. Petersburg, Volgograd
41  (GMT+03:00) Nairobi
42  (GMT+03:30) Tehran
43  (GMT+04:00) Abu Dhabi, Muscat
44  (GMT+04:00) Baku, Tbilisi, Yerevan
45  (GMT+04:30) Kabul
46  (GMT+05:00) Ekaterinburg
47  (GMT+05:00) Islamabad, Karachi, Tashkent
48  (GMT+05:30) Calcutta, Chennai, Mumbai, New Delhi
49  (GMT+05:45) Kathmandu
50  (GMT+06:00) Almaty, Novosibirsk
51  (GMT+06:00) Astana, Dhaka
52  (GMT+06:00) Sri Jayawardenepura
```

```
53  (GMT+06:30) Rangoon
54  (GMT+07:00) Bangkok, Hanoi, Jakarta
55  (GMT+07:00) Krasnoyarsk
56  (GMT+08:00) Beijing, Chongqing, Hong Kong, Urumqi
57  (GMT+08:00) Irkutsk, Ulaan Bataar
58  (GMT+08:00) Kuala Lumpur, Singapore
59  (GMT+08:00) Perth
60  (GMT+08:00) Taipei
61  (GMT+09:00) Osaka, Sapporo, Tokyo
62  (GMT+09:00) Seoul
63  (GMT+09:00) Yakutsk
64  (GMT+09:30) Adelaide
65  (GMT+09:30) Darwin
66  (GMT+10:00) Brisbane
67  (GMT+10:00) Canberra, Melbourne, Sydney
68  (GMT+10:00) Guam, Port Moresby
69  (GMT+10:00) Hobart
70  (GMT+10:00) Vladivostok
71  (GMT+11:00) Magadan, Solomon Is., New Caledonia
72  (GMT+12:00) Auckland, Wellington
73  (GMT+12:00) Fiji, Kamchatka, Marshall Is.
74  (GMT+13:00) Nuku'alofa
```

DHCP Server Configuration

Use this page to configure DHCP server services.



DHCP Server Configuration Page	
Global Setting	You can select to **Enable** or **Disable** the DHCP Server function. The ES8510-XTE assigns a new IP address to link partners.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*
Address Pool Setting	
Network	Enter the IPv4 address for the DHCP server.
Subnet Mask	Enter the subnet mask for the DHCP server.
Default Gateway	Enter the IP gateway address for the DHCP server.
Lease Time	Enter the Lease Time in seconds for the client.
Excluded Address List	
Excluded IP	You can type a specific address into the **Excluded IP** field for the DHCP server reserved IP address. The IP addresses listed in the **Excluded Address List Table** are not assigned to the network devices. Add or remove an IP address from the **Excluded Address List** by clicking **Add** or **Remove**. ***Note:*** *By default, only the table heading are displayed until an IP address is entered in the **Excluded IP** field and added using the **Add** button.*
Static Port/IP Binding List	
Port	Enter the client port number for the DHCP server.
IP Address	Enter the client IP address for the DHCP server. After entering the port number and IP address, click **Add**. To remove a port and associated IP address, click **Remove**. Click **Reload** to reload selected port and IP address entries. ***Note:*** *By default, only the table heading are displayed until information is entered in the **Port** and **IP Address** fields and added using the **Add** button.*
Static MAC/IP Binding List	
IP Address	The ES8510-XTE provides an IP address binding and removing function. Enter the specified IP address, and then click **Add** to add a new IP address binding rule for a specified link partner, like a PLC, or any device without **DHCP client** function. To remove an IP address from the Manual Binding List, highlight the rule and click **Remove**.
MAC Address	The ES8510-XTE provides a MAC address binding and removing function. Enter the specified MAC address, and then click **Add** to add a new MAC address binding rule for a specified link partner, like a PLC, or any device without **DHCP client** function. The MAC address format is **xxxx.xxxx.xxxx**; for example, 00C0.4E30.0001. To remove a MAC address from the Static MAC/IP Binding List, highlight the rule and click **Remove**. ***Note:*** *By default, only the table heading are displayed until information is entered in the **IP Address** and **MAC Address** fields and added using the **Add** button.*

DHCP Server Configuration Page (Continued)	
Option82/IP Binding List	
Circuit ID	The Circuit ID of the Option82 IP address configuration.
Remote ID	The Remote ID of the Option82 IP address configuration. After entering the IP Address, Circuit ID, and Remote ID, click **Add**. Click the **Remove** button to remove selected Option82 IP Address table entries. Click the **Reload** button to reload selected Option82 IP Address table entries.
IP Address	Option 82 IP Address Configuration: fully supports DHCP relay function. The IP address of the Option82 IP address configuration. ***Note:*** *By default, only the table heading are displayed until information is entered in the **Circuit ID, Remote ID**, and **IP Address** fields and added using the **Add** button.*

DHCP Leased Entries

The ES8510-XTE provides a table that displays assigned IP addresses.

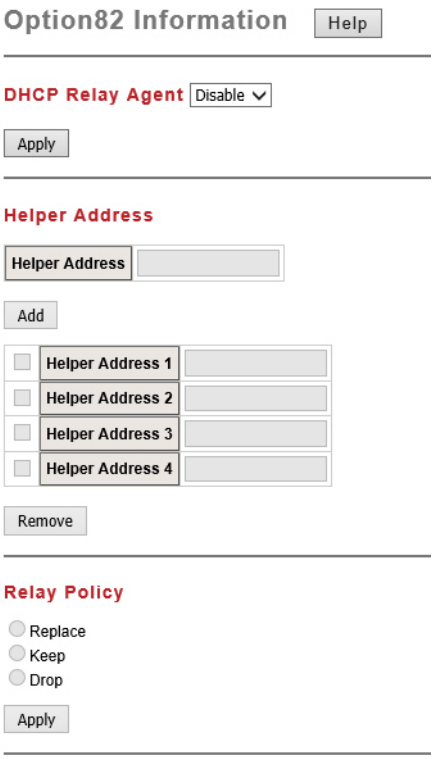
DHCP Leased Entries Page	
Index	Index of DHCP leased entries.
Binding	Manual or auto binding IP addresses and MAC addresses.
IP Address	The IP address of the leased entry.
MAC Address	The MAC Address of the leased entry.
Lease Time(s)	The lease time of the leased entry (in seconds).
Reload	Click to reload DHCP leased entries.

Note: *By default, only the table heading are displayed until there is data to display.*

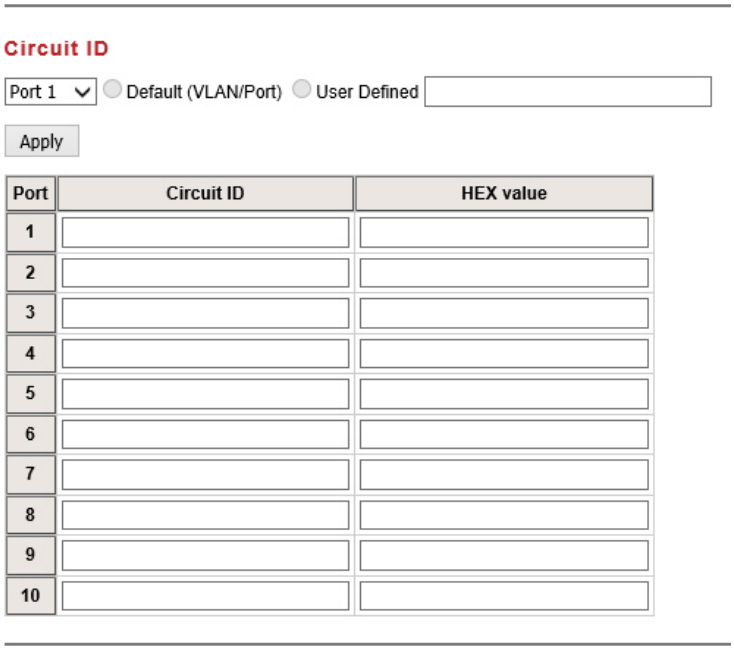
DHCP Option82 Relay Information

This subsection discusses the *DHCP Option82 Relay Information* page.

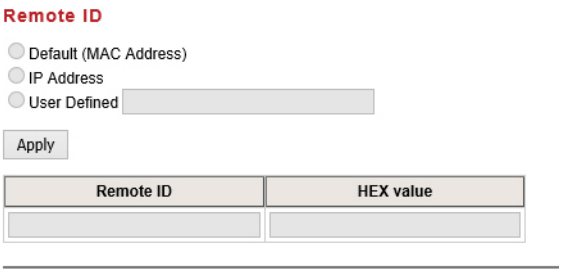
Note: *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*



DHCP Option82 Relay Information Page	
Relay Agent	You can select to **Enable** or **Disable** the DHCP Option82 Relay function, which assigns a new IP address to link partners.
Helper Address	
Helper Address	Enter the DHCP Server address for the Relay Agent and click **Add**. The Helper Addresses appear in the table below.
Helper Address 1-4	DHCP Server addresses for the Relay Agent.
Relay Policy	
Relay policy replace	Replaces the existing option 82 field and adds new option 82 field. This is the default when the DHCP Relay Agent is enabled.
Relay policy keep	Keeps the original option 82 field and forwards to server.
Relay policy drop	Drops the option 82 field and do not add any option 82 field.



DHCP Option82 Relay Information Page	
Circuit ID	
Circuit ID	**Default**: Default value of the Circuit-ID. **Port**: Port of the switch. **Circuit ID**: The Circuit ID includes information specific to which circuit the request came in on. It is an identifier that is specific to the relay agent, so the type of circuit varies depending on the relay agent.
Remote ID	
Remote-ID	**Default**: Default value of the Remote-ID. **IP Address**: IP Address of the switch. **Remote ID**: The Remote-ID carries information relating to the remote host end of the circuit, which is the MAC address of the relay.

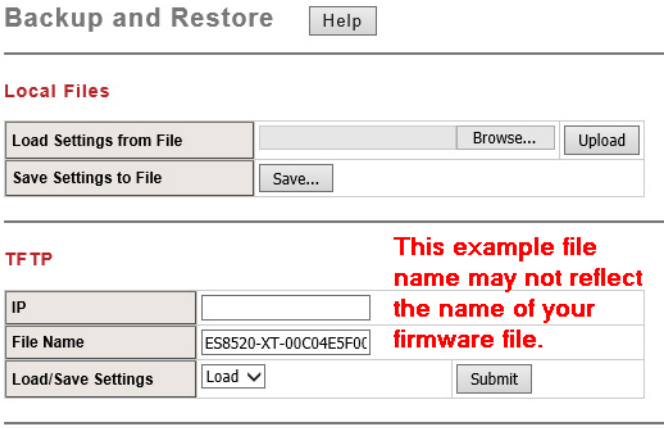


Backup and Restore

You can use the **Backup** option to save the current configuration saved in the ES8510-XTE flash to a PC or laptop or your TFTP server.

This allows you to use the **Restore** option to restore a configuration file back to the ES8510-XTE or load the same settings to another ES8510-XTE. Before you can restore a configuration file, you must first save the backup configuration file to a local system or your TFTP server.

The ES8510-XTE configuration file is a standard text file. You can open the file with WordPad or Notepad. You can also modify the file, add/remove the configuration settings, and then restore the file back to the ES8510-XTE.



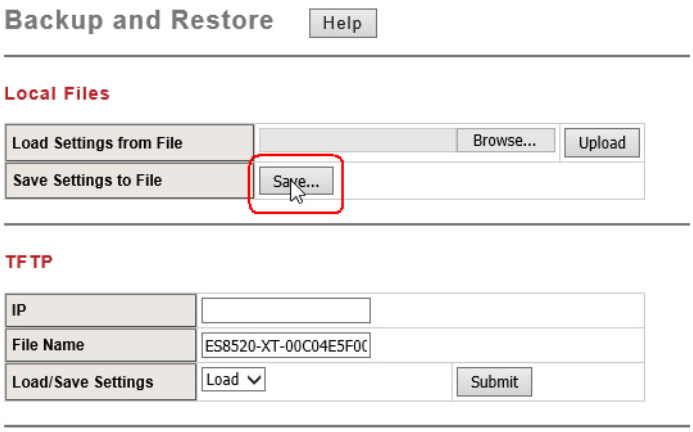
Note: *Optionally, you can use PortVision DX to back up and restore configuration files.*

Backup & Restore Page	
Backup Configuration	• **Local File**: The ES8510-XTE acts as a file server and you can save the file to a local location, see *Backup the Configuration - Local File Method* on Page 58. • **TFTP Server**: The ES8510-XTE acts as a TFTP client, see *Backup the Configuration - TFTP Server Method* on Page 59. ***Note:*** *Pointing to the wrong file causes the entire configuration to be skipped.*
• The ES8510-XTE provides a default configuration file in the ES8510-XTE. To load the default configuration file, you can use the **Reset** on the *Load Default* page on Page 62 or the **Reload** command in the CLI (Page 147). • You can use the CLI to view the latest settings running in the ES8510-XTE. The information are the settings you have configured but have not yet saved to the flash. The settings must be saved to the flash in order to work after a power recycle. Use the **running-config** command to view the configuration file, see *Show Running Configuration* on Page 147. • After you save the **running-config** to flash, the new settings are kept and work after the power is cycled. Use the **show startup-config** to view it in the CLI. The **Backup** command can only backup the configuration file to your PC or TFTP server.	

Backup the Configuration - Local File Method

Use the following procedure to use the Local File method to save a configuration file.

1. Open the ES8510-XTE web user interface and open the **Backup and Restore** page under *Basic Settings*.
2. Click the **Save** button next to the **Save Settings to a file** option. (The next step is slightly different depending on your browser.)



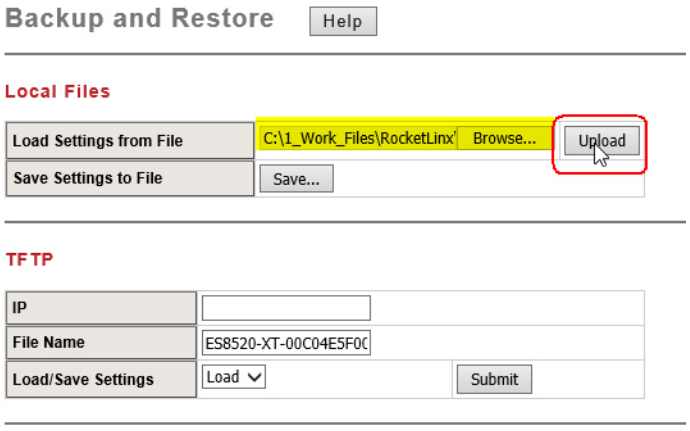
3. Browse to the location that you want to store the backup configuration file, optionally enter a file name, and click **Save**. The default configuration file name is the RocketLinx ES8510-XTE with a dash, followed by the MAC address of the ES8510-XTE.

   Note: *You cannot use spaces in the path to the target file.*

Restore the Configuration - Local Method

Use the following steps to upload a configuration that is stored locally.

1. Open the web user interface for the ES8510-XTE and open the **Backup and Restore** page under *Basic Settings*.
2. Click the **Browse** button next to the **Load Settings from File** option. (The next step is dependent on the browser.)
3. Navigate to the configuration file location, select the file, and click the **Open** button.
4. Click the **Upload** button.



5. Click **Yes** to the *Are you sure that you want to upload the configuration file* message.
6. Click **Ok** to the *Please reboot the system* message.
7. Open the *Reboot* page and click **Yes**.

You are returned to the log in page.

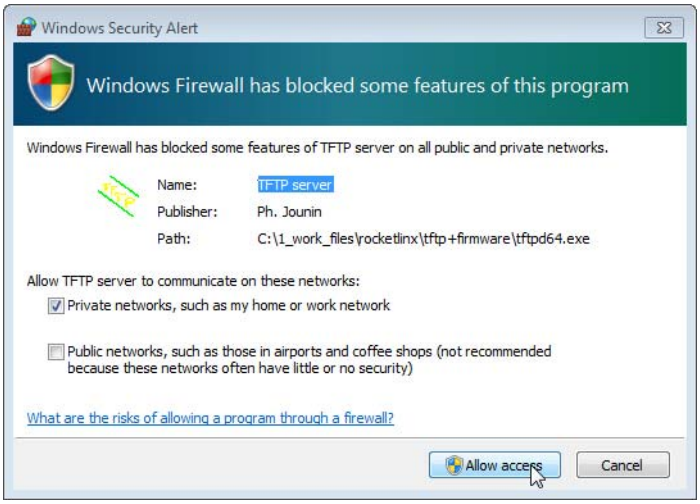
Backup the Configuration - TFTP Server Method

If you do not have a TFTP server, you can download one from Comtrol using the *Start the TFTP Server* subsection.

Start the TFTP Server

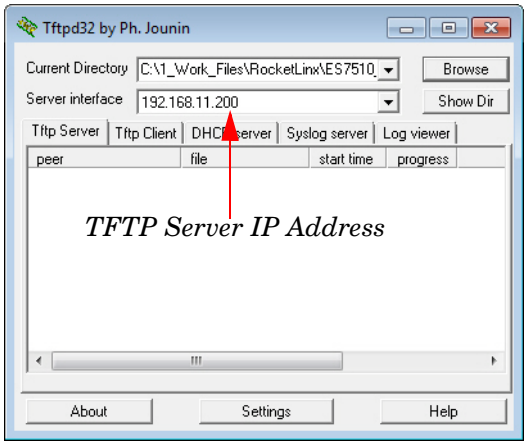
Use this procedure to download either the 32-bit or the 64-bit version from Comtrol.

1. If necessary, download the appropriate **.zip** file for your operating system from: http://downloads.comtrol.com/contribs/utilities/3rd_party_utils_free/tftp_server to your system and unzip the file.
2. Execute the TFTP server application, click **Allow access**, and the TFTP server opens.



3. Leave the TFTP server open and go to *Create a Backup File* on Page 59.

Note: *You will need the TFTP Server IP address in the next procedure.*

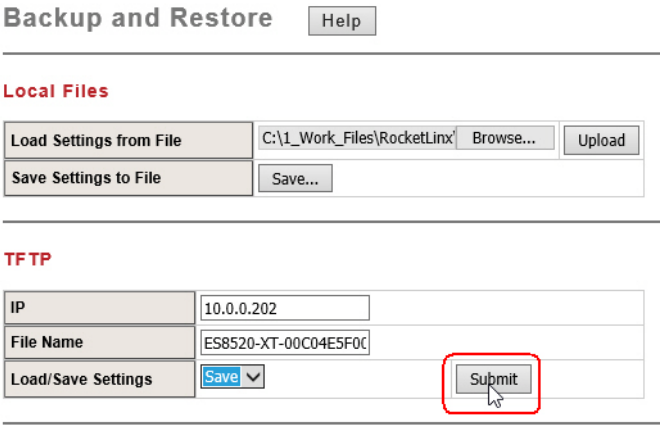


Create a Backup File

You must have a TFTP server open.

1. Open the ES8510-XTE web user interface and open the **Backup and Restore** page under *Basic Settings*.
2. Enter the TFTP IP address in the **IP** field.
3. Optionally, change the file name. The default configuration file name is ES8510-XTE with a dash, followed by the MAC address of the ES8510-XTE.
4. Select **Save** from the **Load/Save Settings** drop list.

5. Click the **Submit** button.



Note: *You cannot use spaces in the path to the target file.*

6. Click **OK** to close the popup message.

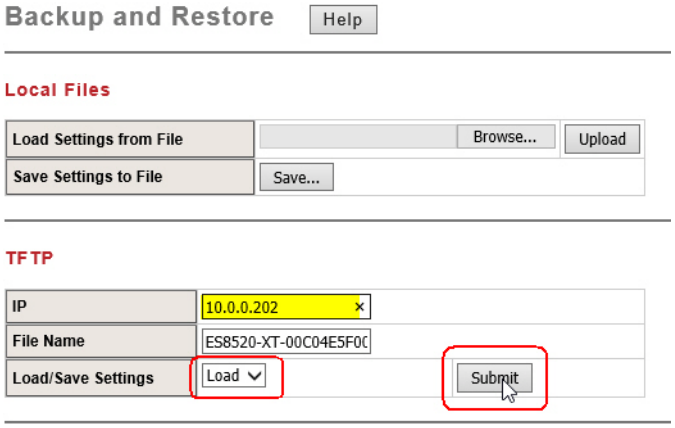
The backup file is located in the same directory that the TFTP server resides.

Restore the Configuration - TFTP Server Method

To restore a configuration file, you must open a TFTP server. If necessary, use *Start the TFTP Server* on Page 59.

The backup file must be located in the same directory that the TFTP server resides for this procedure to work.

1. Open the ES8510-XTE web user interface, open the **Backup and Restore** page under *Basic Settings*.
2. Enter the TFTP IP address in the **IP** field.
3. If necessary, enter the configuration file name.
4. Select **Load** from the **Load/Save Settings** drop list.
5. Click the **Submit** button.



6. Click **Ok** to *The settings were successfully changed* message.
7. Open the **Reboot** page.

Firmware Upgrade

Use this section to update the ES8510-XTE with the latest firmware. Comtrol provides the latest firmware on the Comtrol download site. Updated firmware may include new features, bug fixes, or other software changes. Comtrol Technical Support suggests you use the latest firmware before installing the ES8510-XTE at a customer site.

Note: *Optionally, you can use PortVision DX to upload the latest firmware. If you need to upload a new version of the Bootloader, you must use PortVision DX or the CLI. You cannot use the web user interface to upload the Bootloader.*

Firmware Upgrade Page	
Select File	Use the browse button to locate the firmware file that you want to load.
Upgrade	Click the **Upgrade** button to load the firmware.

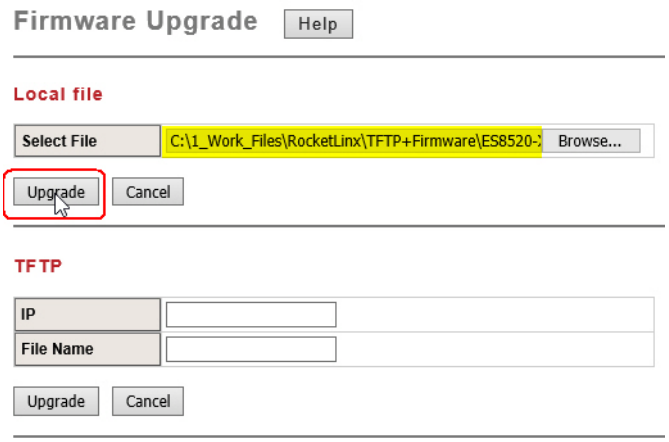
Upgrading Firmware (Local File)

You can use this procedure to upgrade the web interface firmware (not Bootloader).

Note: *You can also use PortVision DX to upload the web interface firmware. You must use PortVision DX or the CLI to upload the Bootloader firmware.*

You can use this procedure to upgrade the web interface firmware (not Bootloader).

1. Open the ES8510-XTE web user interface, open the **Firmware Upgrade** page under *Basic Settings*.
2. Click the **browse** button, locate the firmware, highlight the **.bin** file, and click **Open**.
3. Click the **Upgrade** button.



After a few moments, a system message appears notifying you not to disconnect power, which is followed up with a *rebooting* message

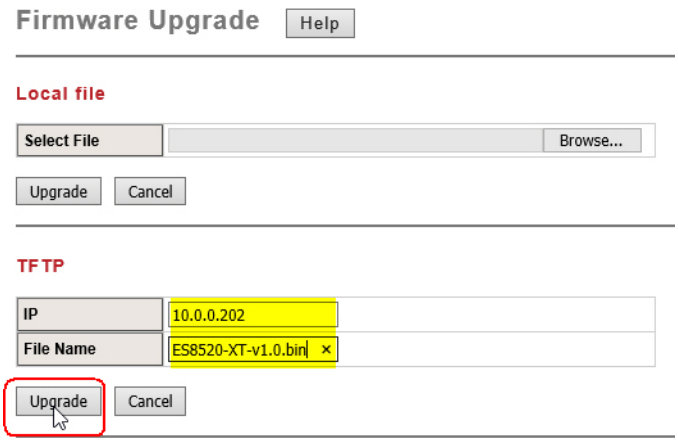
Note: *The system is automatically rebooted after you finish upgrading firmware. You should alert the attached users before updating the firmware that network interruption may occur.*

Upgrading Firmware (TFTP Server)

You can use this procedure to upgrade the firmware (not Bootloader).

Note: *You can also use PortVision DX to upload firmware. You must use PortVision DX or the CLI to upload Bootloader.*

1. Open a TFTP server, if necessary, see *Start the TFTP Server* on Page 59.
2. Place the ES8510-XTE **.bin** file in the same directory where the TFTP server resides.
3. If necessary, open the web user interface, open the **Firmware Upgrade** page in the *Basic Settings* group.
4. Enter the TFTP IP address in the **IP** field.
5. Enter firmware file name, and click the **Upgrade** button.



After a few moments, a system message appears notifying you not to disconnect power, which is followed up with a *rebooting* message

Note: *The system is automatically rebooted after you finish upgrading firmware. You should alert the attached users before updating the firmware that network interruption may occur.*

Load Default

You can reset the ES8510-XTE configuration values to default settings, excluding the network information. Optionally, you can use the *Reset Button* on Page 14, which also resets the IP address with the default configuration values.

Note: *You can also use PortVision DX to reset the switch to the default configuration values (excluding the network settings.).*

1. Click the **Reset** button, if you want the ES8510-XTE to reset all configurations to factory default settings.

The system displays a popup message window after finishing. The default settings work after rebooting the ES8510-XTE.

2. Click **OK** in the popup message to reset the configuration to the defaults.

3. Click **OK** to the *Please reboot the switch to reload default settings except IP address* message.
4. Go to the **Reboot** page, click the **Yes** button.

System Reboot

System Reboot allows you to reboot the device. Most feature changes require a switch reboot to take affect.

Note: *Before rebooting, remember to click **Save** to save your settings. Otherwise, the settings you are lost when the ES8510-XTE is powered off.*

Click the **Yes** button to reboot your ES8510-XTE.

Port Configuration

The *Port Configuration* group allows you to enable/disable port state, or configure port auto-negotiation, speed, duplex, flow control, port aggregation settings (port trunking), and rate limit control. It also allows you to view port status and aggregation information. The following pages are included in this group:

- *Port Control*
- *Port Status* on Page 66
- *Rate Control* on Page 68
- *Port Trunking* on Page 69

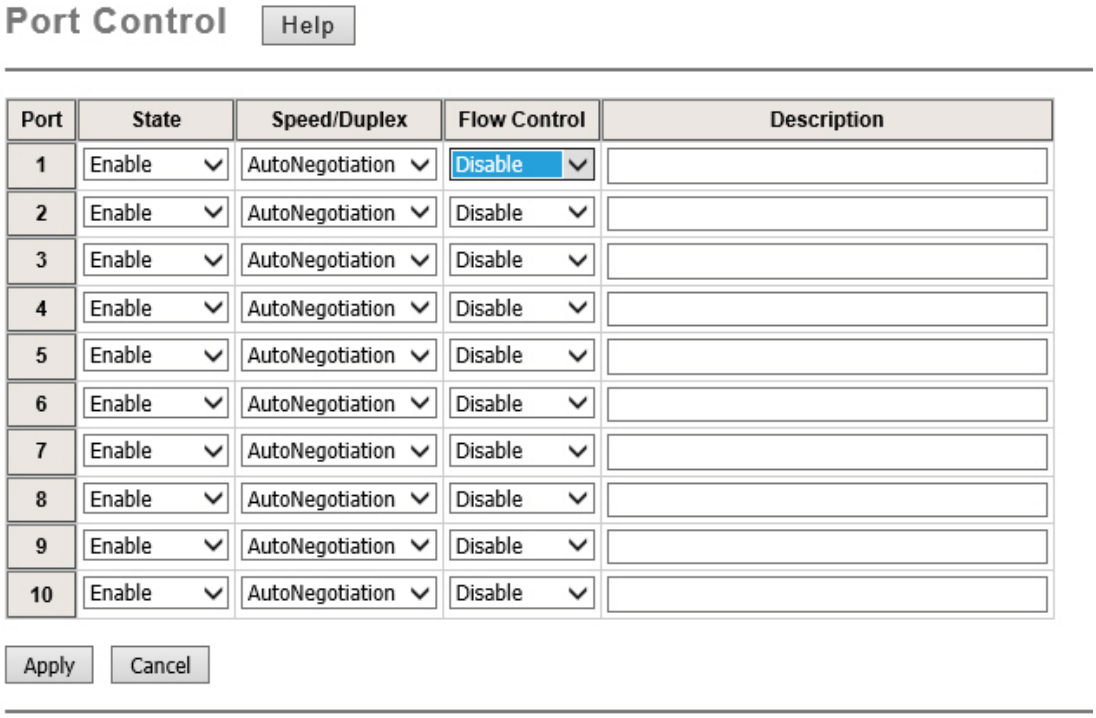
Optionally, you can use the CLI for configuration, see *Port Configuration (CLI)* on Page 146.

Port Control

The *Port Control* page allows you to enable/disable port state, or configure the port auto-negotiation, speed, duplex, and flow control.

Select the port you want to configure and make changes to the port. The following table provides information about the different port control options.

Note: *If both ends are not at the same speed, they cannot link with each other. If both ends are not in the same duplex mode, they are connected by half-duplex mode.*

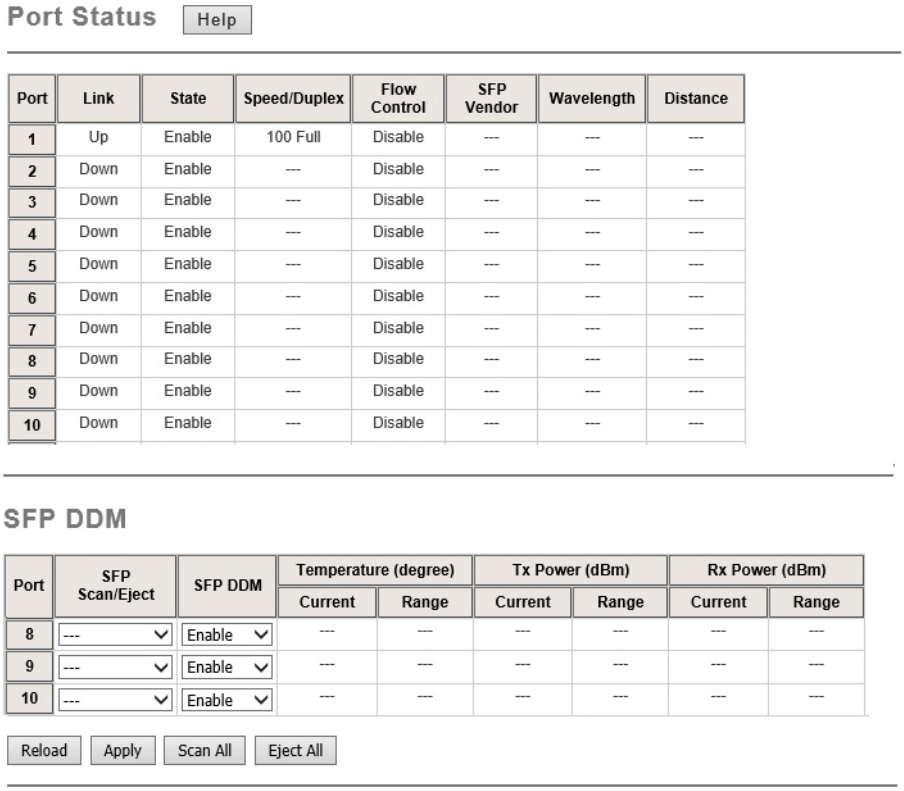


Port Configuration Page	
State	You can enable or disable the state of this port. Once you click **Disable**, the port stops to link to the other end and stops to forward any traffic. The default setting is **Enable** which means all the ports are workable when you receive the ES8510-XTE.
Speed/Duplex	You can configure port speed and duplex mode of each port. Below are the selections you can choose: • Fast Ethernet Ports 1~ 10 (fa1~fa10) - Auto Negotiation (default) - 10M full-duplex (10 Full) - 10M half-duplex (10 Half) - 100M full-duplex (100 Full) 100M half-duplex (100 Half)
Flow Control	**Enable** means that you need to activate the flow control function of the remote network device in order to let the flow control of that corresponding port on the switch to work. **Disable** (default) means that you do not need to activate the flow control function of the remote network device, as the flow control of that corresponding port on the switch works.
Description	Click this field if you want to enter a port description.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

Port Status

The *Port Status* page displays the current port status, including Small Form Factory (SFP) fiber transceivers .

Port Status Page	
Type	100BASE-TX displays for Fast Ethernet ports
Link	Shows link status; **Up** means the link is up and **Down** means that the link is down.
State	Shows the port state. If the state is enabled it displays **Enable**. If the port is disabled or shutdown, it displays **Disable**.
Speed/Duplex	Current working status of the port.
Flow Control	The state of the flow control.
SFP Vendor	Vendor name of the SFP transceiver that is plugged into the SFP port or ports.
Wavelength	The wave length of the SFP transceiver that is plugged into the SFP port or ports.
Distance	The distance of the SFP transceiver that is plugged into the SFP port or ports.
SFP Scan/ Eject	You can choose from these options: • **Scan**: Scan the SFP transceiver and display the information. • **Eject**: Eject the SFP transceiver that you have selected. You can eject one port or eject all by click the **Eject All** button.
SFP DDM	When you select, enable, this scans a SFP DDM transceiver and displays the information.
Temperature	Displays the current temperature detected and acceptable temperature range for the DDM SFP transceiver.
Tx Power (dBm)	Displays the current transmit power detected and acceptable Tx power range for the DDM SFP transceiver.
Rx Power (dBm)	Displays the current received power and acceptable Rx power range for the DDM SFP transceiver.
Scan All	Click the **Scan All** button to scan for all SFPs.
Eject All	You can eject one or all of the DDM SFP transceivers. To eject all of the SFPs, click **Eject All**.



Port Status Help

Port	Link	State	Speed/Duplex	Flow Control	SFP Vendor	Wavelength	Distance
1	Up	Enable	100 Full	Disable	---	---	---
2	Down	Enable	---	Disable	---	---	---
3	Down	Enable	---	Disable	---	---	---
4	Down	Enable	---	Disable	---	---	---
5	Down	Enable	---	Disable	---	---	---
6	Down	Enable	---	Disable	---	---	---
7	Down	Enable	---	Disable	---	---	---
8	Down	Enable	---	Disable	---	---	---
9	Down	Enable	---	Disable	---	---	---
10	Down	Enable	---	Disable	---	---	---

SFP DDM

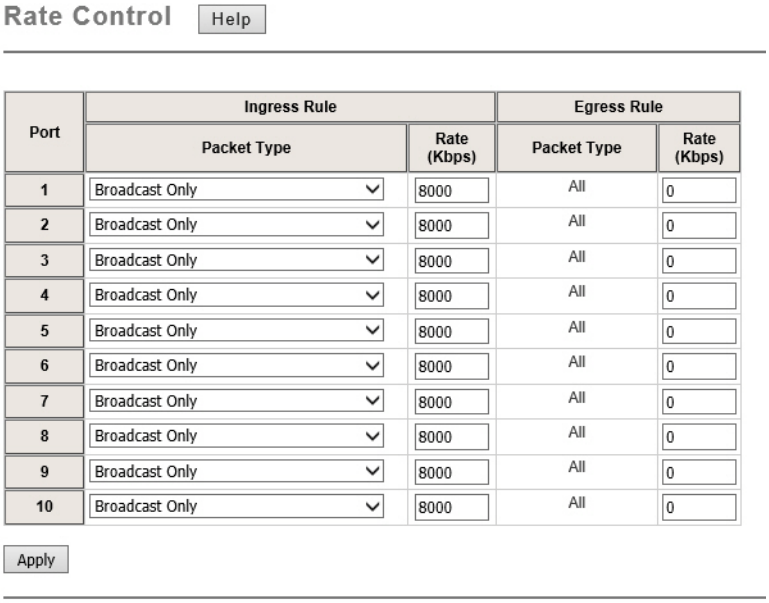
Port	SFP Scan/Eject	SFP DDM	Temperature (degree)		Tx Power (dBm)		Rx Power (dBm)	
			Current	Range	Current	Range	Current	Range
8	---	Enable	---	---	---	---	---	---
9	---	Enable	---	---	---	---	---	---
10	---	Enable	---	---	---	---	---	---

Reload Apply Scan All Eject All

Note: *Most of the SFP transceivers provide vendor information that allows the ES8510-XTE to read it. The web interface can display vendor name, wave length, and distance of all Comtrol SFP transceiver models. If you see Unknown info, it may mean that the vendor does not provide their information or that the information of their transceiver cannot be read. If the plugged DDM SFP transceiver is not certified by Comtrol, the DDM function is not supported, but the communication is not disabled.*

Rate Control

Rate limiting is used to control the rate of traffic that is sent or received on a network interface. For ingress rate limiting, traffic that is less than or equal to the specified rate is received, whereas traffic that exceeds the rate is dropped. For egress rate limiting, traffic that is less than or equal to the specified rate is sent, whereas traffic that exceeds the rate is dropped.



Rate Control Page	
Ingress Packet Type	You can select the packet type that you want to filter. The Ingress packet types supported are: • Broadcast/Multicast/Unknown Unicast • Broadcast/Multicast • Broadcast • All The Egress rate supports all types of packets.
Bandwidth	All ports support port Ingress and Egress rate control. For example, assume Port 1 is 10Mbps, you can set it's effective Egress rate at 2Mbps, Ingress rate at 1Mbps. The ES8510-XTE performs the Ingress rate by packet counter to meet the specified rate. • Ingress Ingress rate in Mbps, the rate range is from 1 Mbps to 100 Mbps and zero means no limit. The default value is 8Mbps • Egress The default value is **no-limit**. Egress rate limiting has an effect on all types of packets, including Unicast, Multicast and Broadcast packets.
Ingress Rule (Kbps)	Ingress rate in Kbps, the rate range is from Kbps to 256000 Kbps and zero means no limit. The default value is 8000Kpbs.
Egress Rule (Kbps)	Egress rate in Kbps, the rate range is from Kbps to 256000 Kbps and zero means no limit. The default value is 8000Kpbs. Egress rate limiting has an effect on all types of packet types, including Unknown Unicast, Multicast, and Broadcast.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

Port Trunking

Port Trunking allows you to group multiple Ethernet ports in parallel to increase link bandwidth. The aggregated ports can be viewed as a physical port that has a bandwidth equal to the combined bandwidth of each trunked port.The member ports of the same trunk group can balance the loading and backup for each other. The Port Trunking feature is usually used when you need higher bandwidth for the network backbone. This is an inexpensive way for you to transfer more data.

The aggregated ports can interconnect to the another switch that also supports Port Trunking. Comtrol supports two types of port trunking:

- Static Trunk
- IEEE 802.3ad

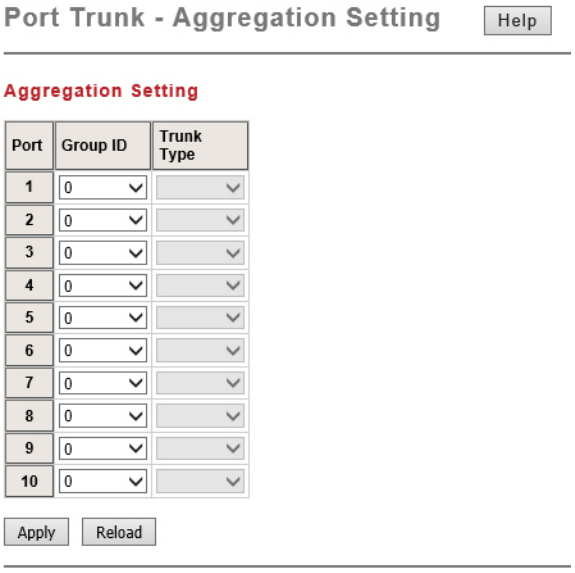
There are some different descriptions for the port trunking. Different manufacturers may use different descriptions for their products, like Link Aggregation Group (LAG), Link Aggregation Control Protocol, Ethernet Trunk, or Ether Channel.

When the other end uses IEEE 802.3ad LACP, you should assign IEEE 802.3ad LACP to the trunk. When the other end uses non-802.3ad, you can then use Static Trunk.

There are two pages for port trunking, *Aggregation Setting* on Page 69 and *Aggregation Information* on Page 70.

Aggregation Setting

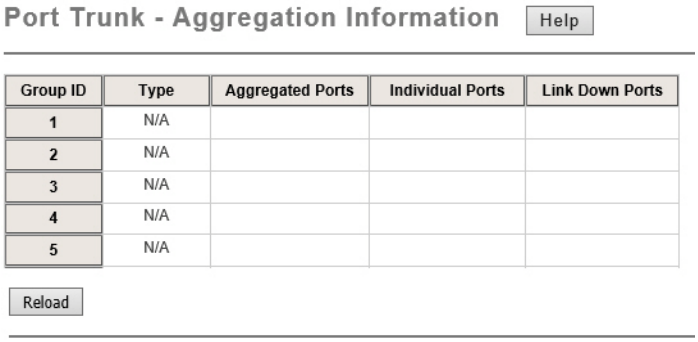
Use the *Port Trunk - Aggregation Setting* page to set up port trunking.



Aggregation Setting Page	
Group ID	**Group ID** is the ID for the port trunking group. Ports with same group ID are in the same group.
Trunk Type	**Static** or **802.3ad LACP**. Each trunk group can only support **Static** or **802.3ad LACP**. Non-active ports cannot be setup here.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

Aggregation Information

The *Port Trunk - Aggregation Information* page shows the status of port aggregation. Once the aggregation ports are negotiated, you see the following status.



Aggregation Status Page	
Group ID	Displays Trunk 1 to Trunk 5 set up.
Type	The Type is **Static** or **LACP**. Static means that LACP is disabled and configured statically by the Administrator.
Aggregated Ports	When LACP links, you can see the member ports in the **Aggregated** column.
Individual Ports	When **LACP** is enabled, member ports of LACP group that are not connected to the correct LACP member ports are displayed in the **Individual** column.
Link Down Ports	When **LACP** is enabled, member ports of LACP group that are not linked up are displayed in the **Link Down** column.
Reload	Click **Reload** to reload aggregation settings.

Network Redundancy

It is critical for industrial applications that the network remains running at all times. The ES8510-XTE supports:

- *Standard Rapid Spanning Tree Protocol* (STP) and *Rapid Spanning Tree Protocol* (RSTP)

  The ES8510-XTE supports RSTP versions IEEE 802.1D-2004, IEEE 802.1D-1998 STP, and IEEE 802.1w RSTP.

- *Multiple Spanning Tree Protocol* (MSTP)

  MSTP implements IEEE 802.1s, which uses RSTP for rapid convergence, enables VLANs to be grouped into a spanning-tree instance, with each instance having a spanning-tree topology independent of other spanning-tree instances. This architecture provides multiple forwarding paths for data traffic, enables load balancing, and reduces the number of spanning-tree instances required to support a large number of VLANs. MSTP was originally defined in the IEEE 802.1s and later merged into the IEEE 802.1Q-2003 specification.

- *Redundant Ring*

  The Redundant Ring features 0 ms for restore and less than 5 ms for fail over for copper.

- *Rapid Dual Homing (RDH)*

  Advanced RDH technology allows the ES8510-XTE to connect with a core managed switch easily. With RDH technology, you can also couple several Rapid Super Rings or RSTP groups together, which is also known as Auto Ring Coupling.

The following pages are included in this group:

- *STP Configuration* on Page 72
- *STP Port Configuration* on Page 73
- *STP Information* on Page 74
- *MSTP Configuration* on Page 76
- *MSTP Port Configuration* on Page 78
- *MSTP Information* on Page 79
- *Redundant Ring* on Page 81
- *Redundant Ring Information* on Page 83
- *Loop Protection* on Page 84

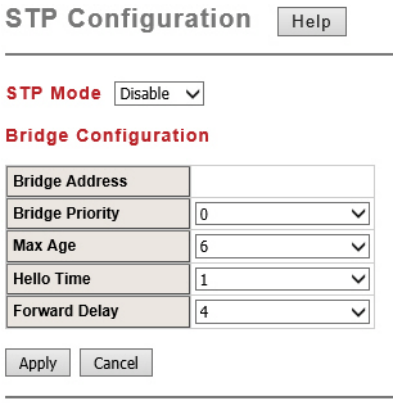
Optionally, you can use the CLI to configure these features, see *Network Redundancy (CLI)* on Page 151.

STP Configuration

This page allows you to select the STP mode and configure the global STP/RSTP bridge configuration. Spanning Tree Protocol (STP; IEEE 802.1D) provides a loop-free topology for any LAN or bridged network.

Rapid Spanning Tree Protocol (RSTP; IEEE 802.1w) is an evolution of the Spanning Tree Protocol (STP), and was introduced with the IEEE 802.1w standard, and provides faster spanning tree convergence after a topology change. In most cases, IEEE 802.1w can also revert back to IEEE 802.1D in order to interoperate with legacy bridges on a per-port basis. The new edition of the IEEE 802.1D standard, IEEE 802.1D-2004, incorporates the IEEE 802.1t-2001 and IEEE 802.1w standards.

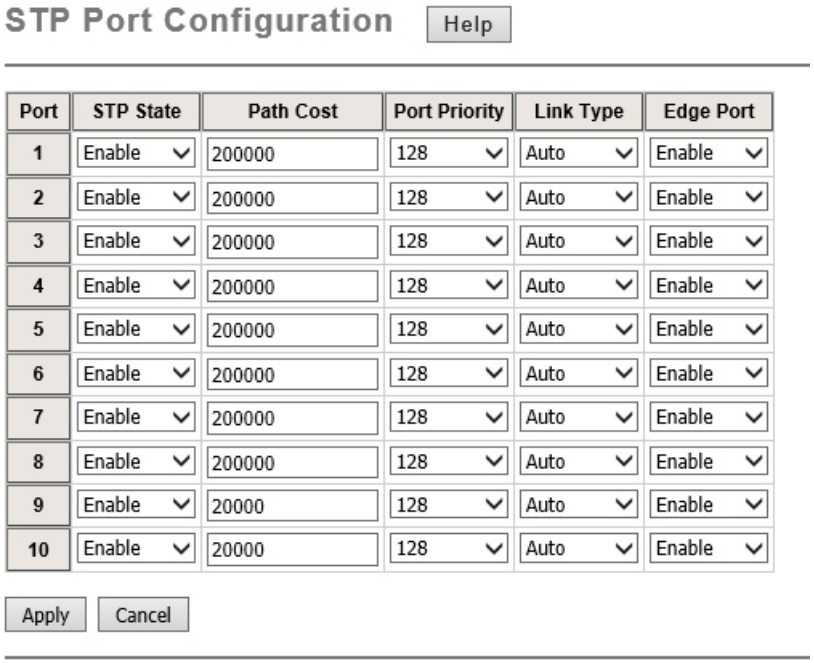
Multiple Spanning Tree Protocol (MSTP; IEEE 802.1s) which uses RSTP for rapid convergence, enables VLANs to be grouped into a spanning-tree instance, with each instance having a spanning-tree topology independent of other spanning-tree instances. This architecture provides a loop-free topology with load balancing while reducing the number of spanning-tree instances required to support a large number of VLANs. MSTP was originally defined in the IEEE 802.1s and later merged into the IEEE 802.1Q-2003 specification.



STP Configuration Page	
STP Mode	Select the spanning tree protocol: STP, RSTP or MSTP or disable STP.
Bridge Configuration	
Bridge Address	A value used to identify the bridge. This item cannot be modified.
Bridge Priority	A value used to identify the bridge. The bridge with the lowest value has the highest priority and is selected as the root. Enter a number 0 through 61440 in increments of 4096.
Max Age (See Note)	The number of seconds a bridge waits without receiving Spanning-Tree Protocol configuration messages before attempting to reconfigure. Enter a number of 6 - 40.
Hello Time (See Note)	The number of seconds between the transmissions of Spanning-Tree Protocol configuration messages. Enter a number of 1 through 10.
Forward Delay (See Note)	The number of seconds a port waits before changing from its Spanning-Tree Protocol learning and listening states to the forwarding state. Enter a number 4 - 30.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*
Note: *2*(Forward Delay Time-1) should be greater than or equal to the Max Age. The Max Age should be greater than or equal to 2*(Hello Time + 1).*	

STP Port Configuration

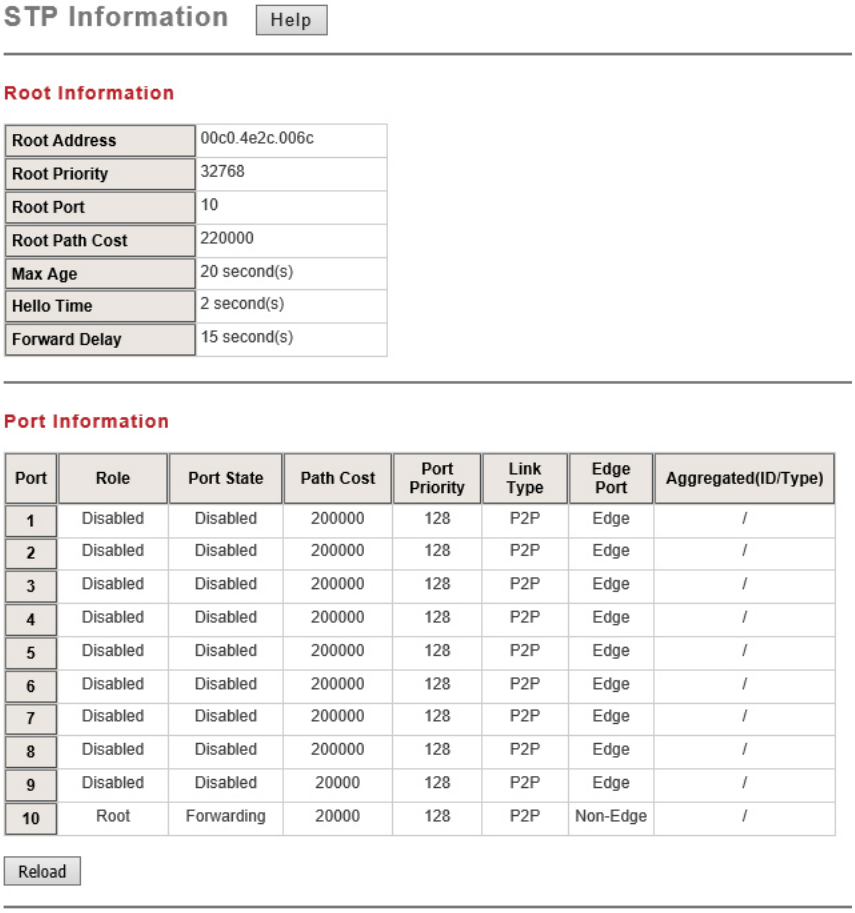
This page allows you to configure the port parameter after you have enabled STP, RSTP, or MSTP.



STP Port Configuration Page	
STP State	You can enable/disable STP/RSTP/MSTP on a port by port basis. You can disable the STP state when connecting a device in order to avoid STP waiting periods.
Path Cost	The cost of the path to the other bridge from this transmitting bridge at the specified port. Enter a number from 1 through 200000000.
Port Priority	Decide which port should be blocked by priority on your LAN. Enter a number from 0 - 240 in increments of 16.
Link Type	Some of the rapid state transactions that are possible within RSTP are dependent upon whether the port in question is connected to exactly one other bridge (that is, it is served by a point-to-point LAN segment), or if it is connected to two or more bridges (that is., it is served by a shared medium LAN segment). This configuration allows the p2p status of the link to be controlled by an administrator.
Edge Port	Present in implementations that support the identification of edge ports. All ports directly connected to end stations cannot create bridging loops in the network and can thus directly transition to forwarding, and skipping the listening and learning stages. When a non-bridge device connects an edge port, this port is in a blocking state and turn to forwarding state in 2*Hello Time seconds. When the bridge device connects an edge port, this port is a non-edge port automatic.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

STP Information

The *STP Information* page allows you to see the ES8510-XTE root information and port status.



STP Information Page	
Root Information	
Root Address	Root bridge address, which is the bridge with the smallest (lowest) bridge ID.
Root Priority	Root bridge priority, the bridge with the lowest value has the highest priority and is selected as the root.
Root Port	Root port of this bridge.
Root Path Cost	Root path cost.
Max Age	The number of seconds a bridge waits without receiving Spanning-Tree Protocol configuration messages before attempting to reconfigure.
Hello Time	The number of seconds between the transmissions of Spanning-Tree Protocol configuration messages.
Forward Delay	The number of seconds a port waits before changing from its Spanning-Tree Protocol learning and listening states to the forwarding state.

STP Information Page (Continued)	
Port Information	
Role	Descriptive information about the STP/RSTP switch port role. Role: Root, Designated, Alternate, Backup, Disabled, Unknown.
Port State	Descriptive information about the STP/RSTP switch port state. State: Blocking, Listening, Learning, Forwarding, Disabled, Unknown.
Path Cost	The cost of the path to the other bridge from this transmitting bridge at the specified port. Path cost range is 1 through 200000000.
Port Priority	Decide which port should be blocked by priority in your LAN. Range is 0 through 240 in increments of 16.
Link Type	Operational link type. Some of the rapid state transactions that are possible within RSTP are dependent upon whether the port in question can be concerned to exactly one other bridge (that is, it is served by a point-to-point LAN segment), or can be connected to two or more bridges (that is, it is served by a shared medium LAN segment).
Edge Port	Operational edge port state. Present in implementations that support the identification of edge ports. All ports directly connected to end stations cannot create bridging loops in the network and can thus directly transition to forwarding, skipping the listening and learning stages. When the non-bridge device connects an edge port, this port is in blocking state and turn to forwarding state in 2*Hello Time seconds. When the bridge device connects an edge port, this port is a non-edge port automatic.
Aggregated (ID/ Type)	This is the aggregated port information. The ID is the aggregation ID (Trunk ID) and the Type is either Static or LACP.
Reload	Click the **Reload** button to reload STP information.

MSTP Configuration

Multiple Spanning Tree Protocol (MSTP) is a direct extension of RSTP. It can provide an independent spanning tree for different VLANs. It simplifies network management, creates a faster convergence than RSTP by limiting the size of each region, and prevents VLAN members from being segmented from the rest of the group (as sometimes occurs with IEEE 802.1D STP).

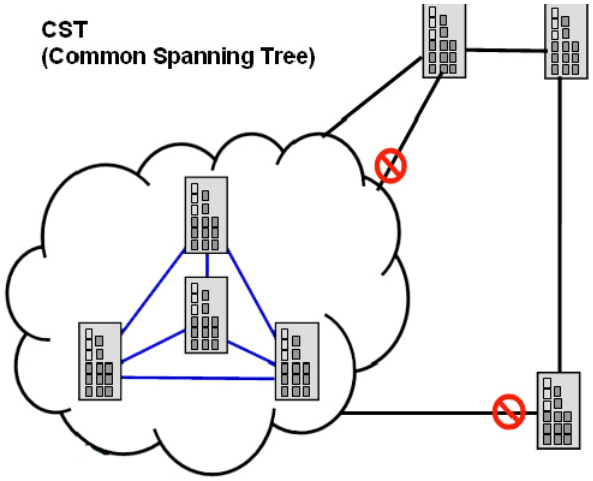
While using MSTP, there are some new concepts of network architecture. A switch may belong to different groups, act as root or designate switch, or generate BPDU packets for the network to maintain the forwarding table of the spanning tree. MSTP can also provide load balancing between switches.

One VLAN can be mapped to a Multiple Spanning Tree Instance (MSTI). The maximum number of instances that the ES8510-XTE supports is 16, with a range from 0-15. The MSTP builds a separate Multiple Spanning Tree (MST) for each instance to maintain connectivity among each of the assigned VLAN groups. An Internal Spanning Tree (IST) is used to connect all the MSTP switches within an MST region. An MST Region may contain multiple MSTP instances.

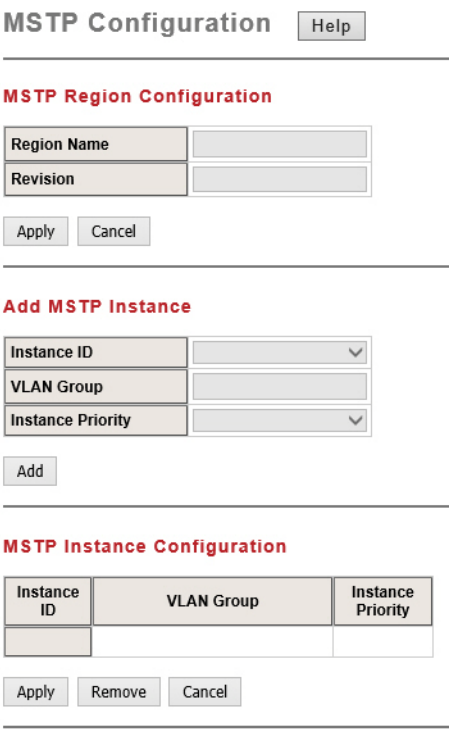
The following figure shows a MSTP instance with two VLANs. Each instance has a root node and forwarding paths.

A Common Spanning Tree (CST) interconnects all adjacent MST regions and acts as a virtual bridge node for communications with STP or RSTP nodes in the global network. MSTP connects all bridges and LAN segments with a single Common Internal Spanning Tree (CIST). The CIST is formed as a result of the running spanning tree algorithm between switches that support the STP, RSTP, or MSTP protocols.

The following diagram shows a CST attached to a larger network. In this network, a Region may have different instances and its own forwarding path and table, however, the CST acts as a single bridge.



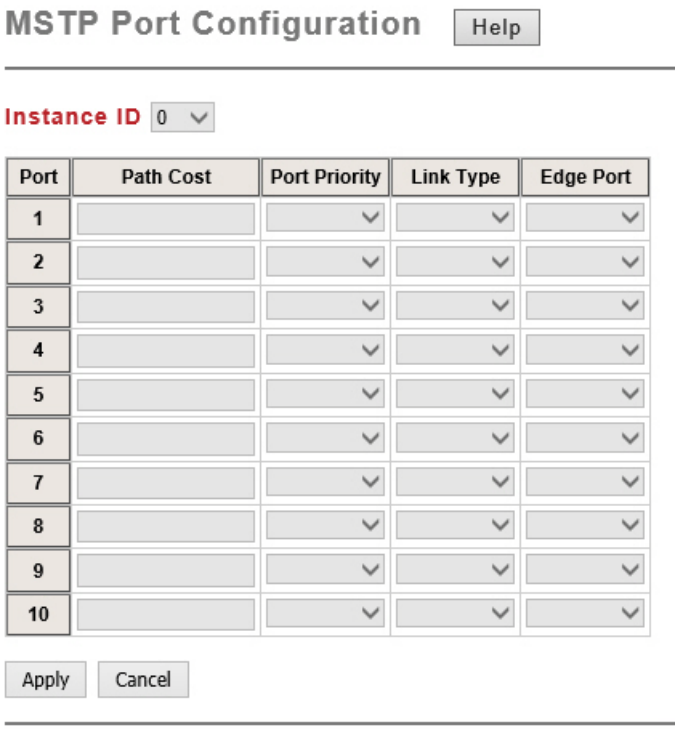
This is the *MSTP Configuration* page.



MSTP Configuration Page	
MST Region Configuration	
Region Name	A name used to identify the MST Region. Maximum length: 32 characters.
Revision	A value used to identify the MST Region. Range: 0-65535; Default: 0).
Apply	Click the **Apply** button to apply the **MST Region Configuration**.
New MST Instance	
Instance ID	A value used to identify the MST instance, valid value are 1 through 15. Instance 0 (CIST, Common Internal Spanning Tree) is a special instance of spanning-tree known as IST or Internal Spanning Tree (=MSTI00).
VLAN Group	Give a VLAN group to map this MST instance. Use a VLAN number (for example, 10), range (for example:1-10) or mixing format (for example: 2,4,6,4-7,10).
Instance Priority	A value used to identify the MST instance. The MST instance with the lowest value has the highest priority and is selected as the root. Enter a number 0 through 61440 in increments of 4096.
Add	Click the **Add** button to add the **New MST Instance**.
Current MST Instance Configuration	
Instance ID	A value used to identify the MST instance. Instance 0 (CIST, Common Internal Spanning Tree) is a special instance of spanning-tree known as IST or Internal Spanning Tree (=MSTI00).
VLAN Group	Provide a VLAN group to map this MST instance. Use the VLAN number, for example: 10. You can set a range, for example: 1-10) or set specific VLANs, for example: 2,4,6,4-7.
Instance Priority	A value used to identify the MST instance. The MST instance with the lowest value has the highest priority and is selected as the root. Enter a number 0 through 61440 in increments of 4096.
Apply	Click the **Apply** button to apply the current **MST instance configuration**. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

MSTP Port Configuration

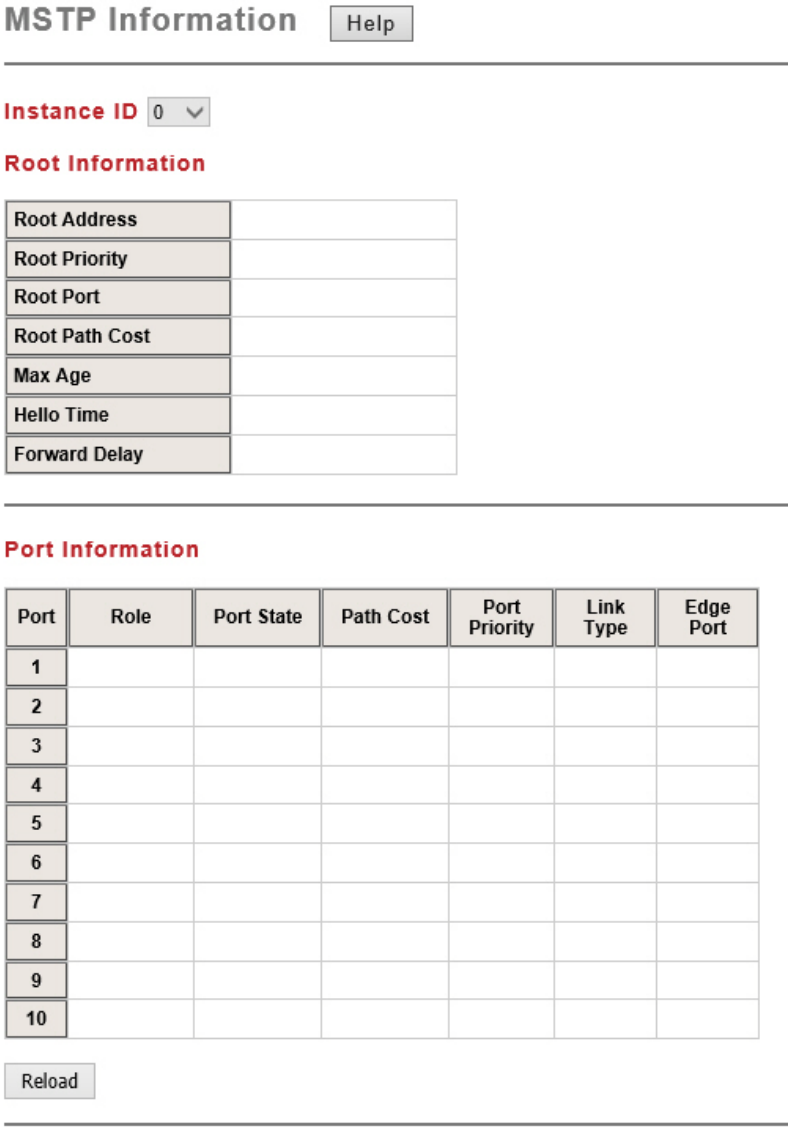
This page allows you to configure the port settings. Choose the Instance ID that you want to configure.



MSTP Port Configuration Page	
Instance ID	Select an Instance ID to display and modify MSTP instance setting.
Port Configuration	
Path Cost	The cost of the path to the other bridge from this transmitting bridge at the specified port. Enter a number from 1 through 200000000.
Port Priority	Decide which port should be blocked by priority on your LAN. Enter a number from 0 through 240 in increments of 16.
Link Type	Some of the rapid state transactions that are possible within RSTP are dependent upon whether the port in question is connected to exactly one other bridge (that is, it is served by a point-to-point LAN segment), or if it's connected to two or more bridges (that is, it is served by a shared medium LAN segment). This configuration allows the p2p status of the link to be controlled by an administrator.
Edge Port	Present in implementations that support the identification of edge ports. All ports directly connected to end stations cannot create bridging loops in the network and can thus directly transition to forwarding, and skipping the listening and learning stages. When the non-bridge device connects an edge port, this port is in a blocking state and turn to forwarding state in 2*Hello Time seconds. When the bridge device connects an edge port, this port is a non-edge port automatic.
Apply	Click the **Apply** button to apply the configuration. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

MSTP Information

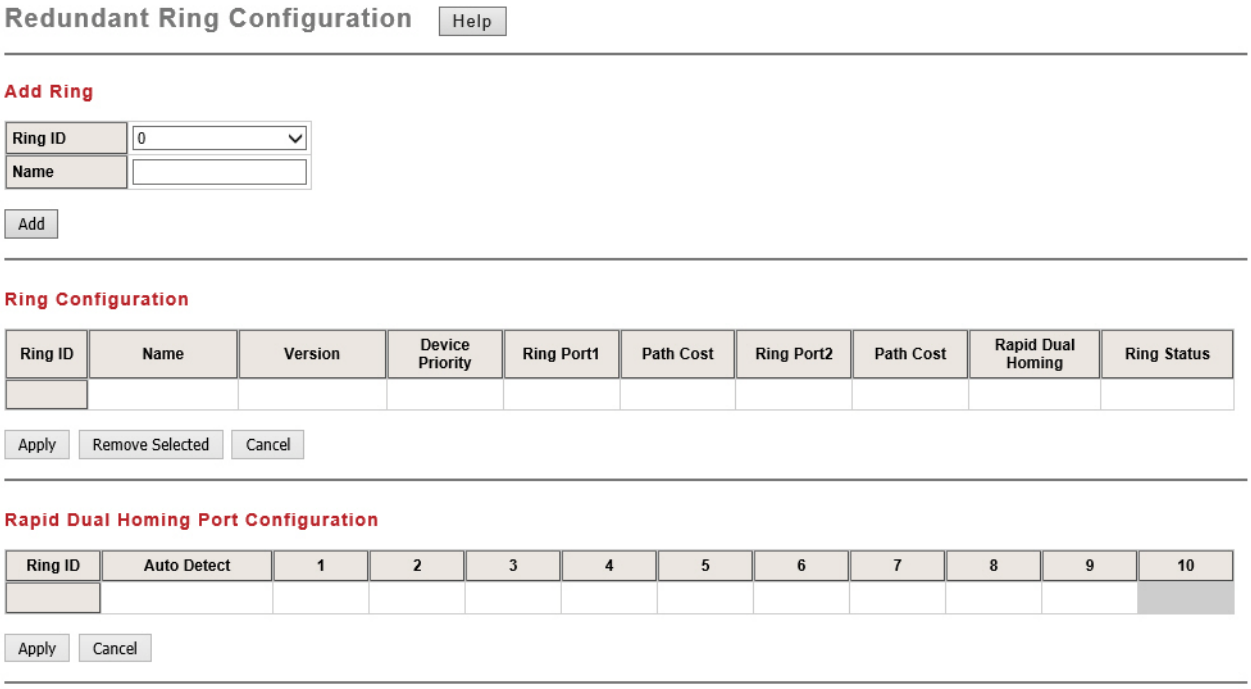
This page allows you to see the current MSTP information. Choose the Instance ID first. If the instance is not added, the information remains blank.



MSTP Information Page	
Instance ID	Select an instance ID to display MSTP instance information. Instance 0 (CIST, Common Internal Spanning Tree) is a special instance of spanning-tree known as IST or Internal Spanning Tree (=MSTI00).
Root Information	
Root Address	Root bridge address, which is the bridge with the smallest (lowest) bridge ID.
Root Priority	Root bridge priority, the bridge with the lowest value has the highest priority and is selected as the root.
Root Port	Root port of this bridge.
Root Path Cost	Root path cost.
Max Age	The number of seconds a bridge waits without receiving Spanning-Tree Protocol configuration messages before attempting to reconfigure.
Hello Time	The number of seconds between the transmissions of Spanning-Tree Protocol configuration messages.
Forward Delay	The number of seconds a port waits before changing from its Spanning-Tree Protocol learning and listening states to the forwarding state.
Port Information	
Port Role	Descriptive information about the MSTP switch port role. Role: Master, Root, Designated, Alternate, Backup, Boundary, Disabled, Unknown.
Port State	Descriptive information about the MSTP switch port state. State: Blocking, Listening, Learning, Forwarding, Disabled, Unknown.
Path Cost	The cost of the path to the other bridge from this transmitting bridge at the specified port. Path cost range is 1 through 200000000.
Port Priority	Decide which port should be blocked by priority in your LAN. The range is 0 through 240 in increments of 16.
Link Type	Operational link type. Some of the rapid state transactions that are possible within MSTP are dependent upon whether the port in question can be concerned to exactly one other bridge (that is, it is served by a point-to-point LAN segment), or can be connected to two or more bridges (that is, it is served by a shared medium LAN segment).
Edge Port	Operational edge port state. Present in implementations that support the identification of edge ports. All ports directly connected to end stations cannot create bridging loops in the network and can thus directly transition to forwarding, skipping the listening and learning stages. When the non-bridge device connects an edge port, this port is in blocking state and turn to forwarding state in 2*Hello Time seconds. When the bridge device connects an edge port, this port is a non-edge port automatic.
Reload	Click the **Reload** button to reload MSTP instance information.

Redundant Ring

The most common industrial network redundancy is to form a ring or loop. Typically, managed switches are connected in series and the last switch is connected back to the first one. In such connection, you can implement Redundant Ring technology.

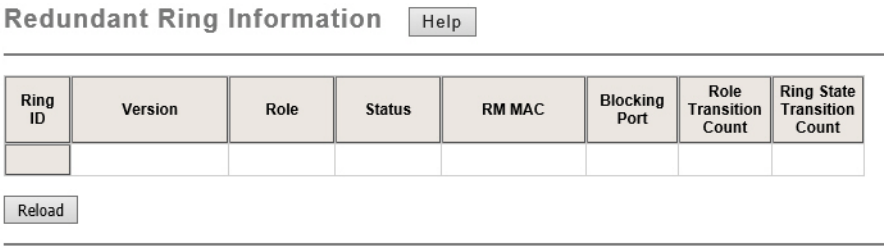


Redundant Ring Page	
Ring ID/Name	To create a Redundant Ring select the Ring ID, which has range from 0 to 31. If the name field is left blank, the name of this ring is automatically named with the Ring ID. The maximum number of rings is 32. ***Note:*** *Once a ring is created, you cannot change it.*
Ring Configuration	
Ring ID	Once a Ring is created, the Ring ID appears, and cannot be changed. In multiple ring environments, the traffic can only be forwarded under the same Ring ID. Remember to check the Ring ID when there are more than one ring in existence.
Name	This field shows the name of the Ring. If it is not entered when creating, it is automatically named by the rule *RingID*.
Version	The version of Ring can be changed here, the choices are **Rapid Super Ring** or **Super Ring**.
Device Priority	The switch with highest priority (highest value) is automatically selected as the **Ring Master** (RM). When one of the ring ports on this switch becomes a forwarding port and the other one becomes a blocking port. If all of the switches have the same priority, the switch with the highest MAC address is selected as the Ring Master.
Ring Port1	In a **Rapid Super Ring** environment, you should have two Ring ports. Whether this switch is a Ring Master or not. When configuring **Rapid Super Rings**, two ports should be selected to be Ring ports. For a Ring Master, one of the Ring Ports becomes the forwarding port and the other one becomes the blocking port.
Path Cost	Change the **Path Cost** of Ring Port1, if this switch is the Ring Master of a Ring, then it determines the blocking port. The port with higher **Path Cost** in the two Ring Ports becomes the blocking port, If the **Path Cost** is the same, the port with larger port number becomes the blocking port.

Redundant Ring Page (Continued)	
Ring Port2	Assign another port for ring connection.
Path Cost	Change the Path Cost of Ring Port2.
Rapid Dual Homing	Rapid Dual Homing is an important feature of Rapid Super Ring redundancy technology. When you want to connect multiple RSR or form redundant topology with other vendors, RDH allows you to have a maximum of seven multiple links for redundancy without any problem. In RDH, you do not need to configure a specific port to connect to other protocol. The RDH selects the fastest link for the primary link and blocks all the other links to avoid a loop. If the primary link failed, RDH automatically forwards the secondary link for a network redundant. If there are more connections, they are standby links and are recovered if both primary and secondary links are broken.
Ring status	To **Enable/Disable** the Ring, remember to enable the Ring after you add it.
Rapid Dual Homing Port Configuration	
Ring ID	The Ring Identifier referring to this Ring.
Auto Detect	Enable Rapid Dual Homing (RDH) auto detect RDH port mode.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

Redundant Ring Information

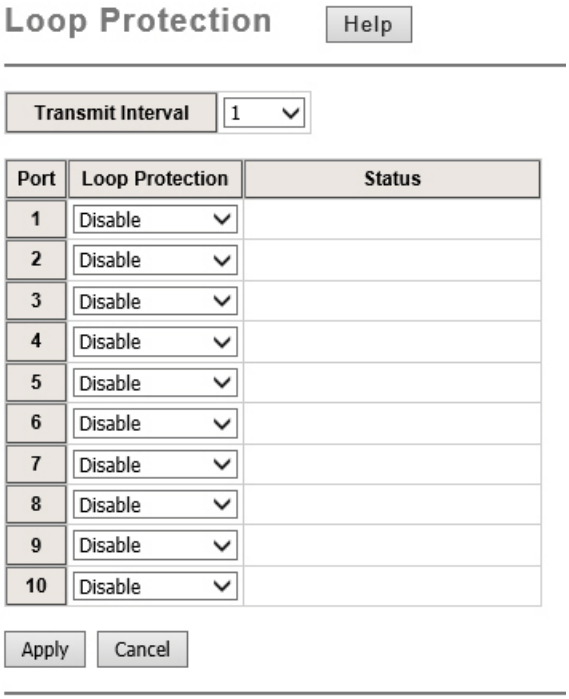
This page shows Redundant Ring information.



Redundant Ring Information Page	
Ring ID	The Ring ID.
Version	Displays the ring version, this field could be Super Ring or Rapid Super Ring.
Role	This ES8510-XTE is the RM (Ring Master) or nonRM (non-ring master).
Status	If this field is **Normal** it means the redundancy is approved. If any one of the link in this Ring is broken, then the status is **Abnormal**.
RM MAC	The MAC address of Ring Master of this Ring, which helps to find the redundant path.
Blocking Port	Shows which is blocked port of RM.
Role Transition Count	Shows how many times this ES8510-XTE has changed its Role from nonRM to RM or from RM to nonRM.
Ring State Transition Count	Shows how many times the Ring status has been transformed between **Normal** and **Abnormal** state.
Reload	Click to reload redundant ring information.

Loop Protection

Loop protection prevents broadcast loops in Layer 2 switching configurations.



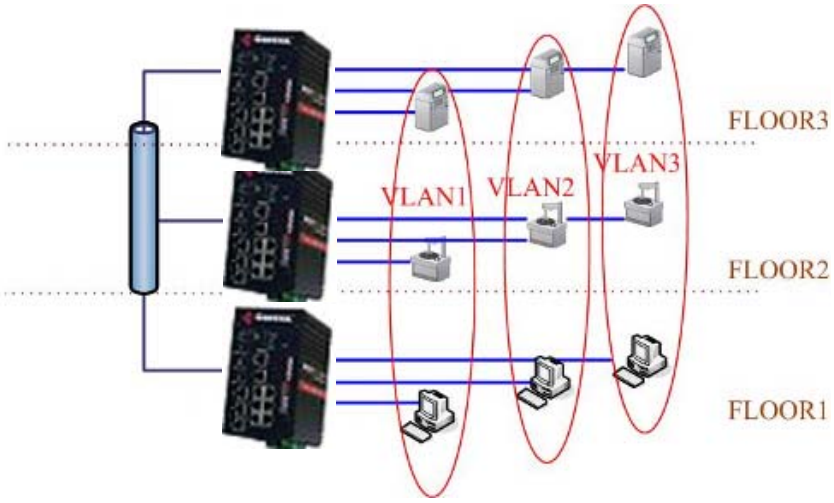
Loop Protection Page	
Transmit Interval	Loop protection mechanism detection packet transmitting interval 1 ~ 10 seconds (default is 1).
Port	The port ID.
Loop Protection	Enable/Disable loop protection mechanism on port.
Status	The status of loop protection.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*
Enable/Disable All	Click the **Enable/Disable All** button to enable or disable all ports and then click **Apply** button to apply.
Reload	Click the **Reload** button to reload loop protection information.

VLAN

A Virtual LAN (VLAN) is a logical grouping of nodes for the purpose of limiting a broadcast domain to specific members of a group without physically grouping the members. The VLAN allows you to isolate network traffic so that only members of the VLAN could receive traffic from the same VLAN members. Basically, creating a VLAN from a switch is the logical equivalent of physically reconnecting a group of network devices to another Layer 2 switch, without actually disconnecting these devices from their original switches.

The ES8510-XTE supports IEEE 802.1Q VLAN, which is also known as Tag-Based VLAN. This Tag-Based VLAN allows a VLAN to be created across different switches. IEEE 802.1Q tag-based VLAN makes use of VLAN control information stored in a VLAN header attached to IEEE 802.3 packet frames. This tag contains a VLAN Identifier (VID) that indicates which VLAN a frame belongs to. Since each switch only has to check a frame's tag, without the need to dissect the contents of the frame, this saves a lot of computing resources within the ES8510-XTE.

The following figure displays an IEEE 802.1Q VLAN.



The ES8510-XTE supports VLAN tunneling (QinQ), which expands the number of VLANs by adding a tag to the 802.1Q packets. The original VLAN is usually identified as Customer VLAN (C-VLAN) and the new VLAN is Service VLAN(S-VLAN). By adding the additional tag, QinQ increases the possible number of VLANs. After QinQ is enabled, the ES8510-XTE can reach up to 256x256 VLANs. With different standard tags, it also improves network security.

VLAN Configuration pages allow you to add and remove a VLAN, configure port Ingress/Egress parameters, and view the VLAN table. The following pages are included in this group:

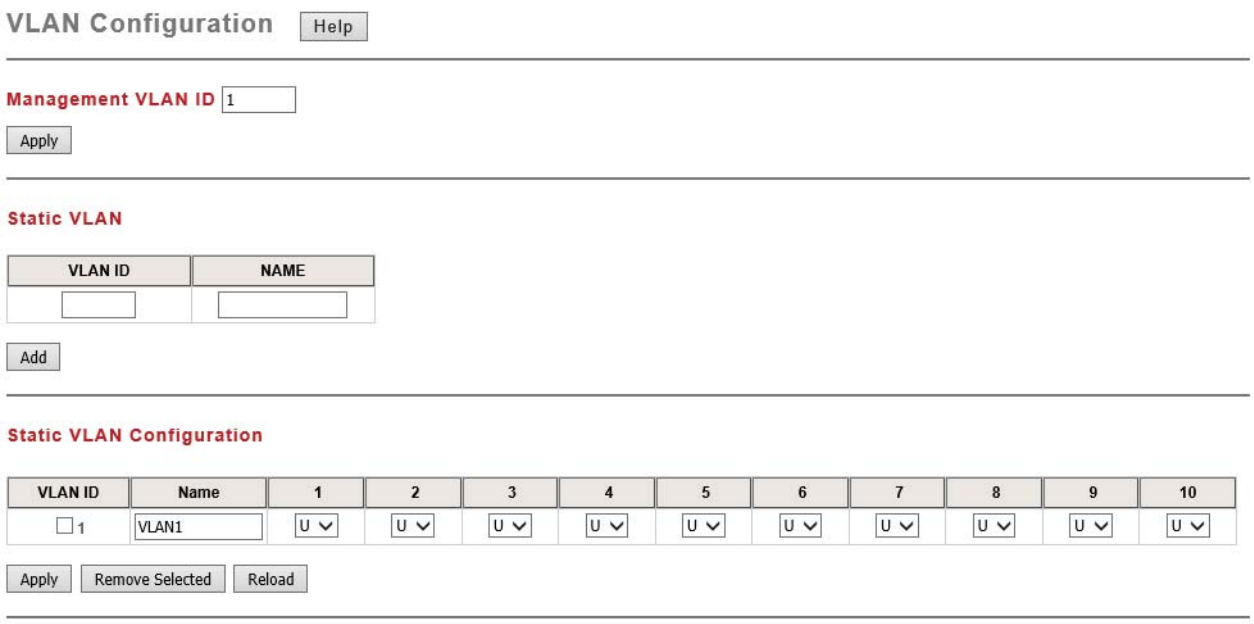
- *VLAN Configuration* on Page 86
- *VLAN Configuration* on Page 86
- *VLAN Information* on Page 90
- *Private VLAN* on Page 91
- *PVLAN Configuration* on Page 91

- *PVLAN Port Configuration* on Page 92
- *PVLAN Information* on Page 93
- *GVRP Configuration* on Page 94

Optionally, you can use the CLI for configuration, see *VLAN (CLI)* on Page 159.

VLAN Configuration

Use this page to assign the Management VLAN, create the static VLAN, and assign the Egress rule for the member ports of the VLAN.

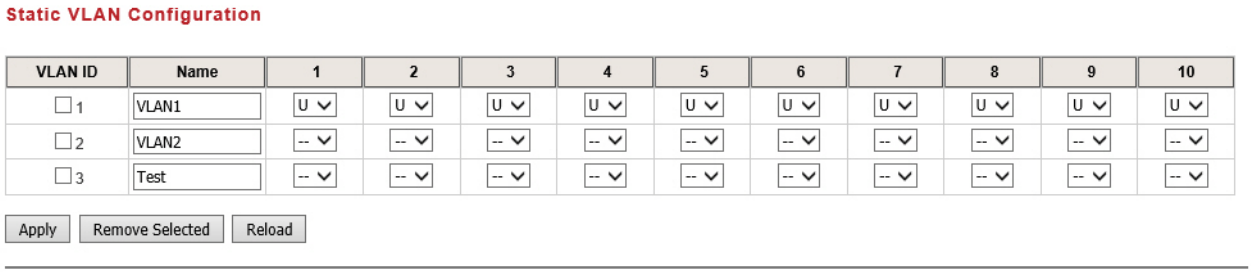


VLAN Configuration Page	
Management VLAN ID	The management VLAN ID is the VLAN ID of the CPU interface so that only member ports of the management VLAN can ping and access the switch. The default management VLAN ID is **1**. Click **Apply** after you enter the VLAN ID.
Static VLAN	You can assign a VLAN ID and VLAN Name for the new static VLAN. • **VLAN ID**: This is used by the switch to identify different VLANs. A valid VLAN ID is between 1 and 4,094, 1 is the default VLAN. • **VLAN Name**: This is a reference for the network administrator to identify different VLANs. The VLAN name may up to 12 characters in length. If you do not provide a VLAN name, the system automatically assigns a VLAN name. The rule is VLAN (VLAN ID). Click **Add** to create a new VLAN. The new VLAN displays in the *Static VLAN Configuration* table. After creating the VLAN, the status of the VLAN remains Unused, until you add ports to the VLAN. ***Note:*** *Before changing the management VLAN ID by web or Telnet, remember that the port attached by the administrator should be the member port of the management VLAN; otherwise the administrator cannot access the switch through the network. The ES8510-XTE supports a maximum of 256 VLANs.*

VLAN Configuration Page (Continued)	

Static VLAN Configuration	• **VLAN ID**: The VLAN identifier for this VLAN.
	• **Name**: The name of the VLAN.
	• 1 - 10: The corresponding port number on the VLAN.
	  • **--** Not available
	  • **U** Untag, indicates that egress/outgoing frames are not VLAN tagged.
	  • **T** Tag, indicates that egress/outgoing frames are LAN tagged.
	• Click **Apply** to apply the settings.
	Note: *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*
	• Click **Remove Selected** to remove the selected static VLAN.
	• Click **Reload** to reload static VLAN configuration.

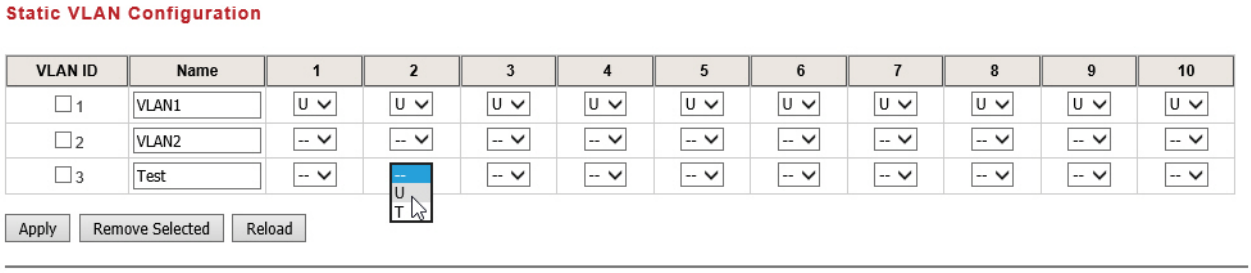
The following figure shows a static VLAN configuration table. Two new VLANs were created (VLAN2 and Test). Egress rules of the ports are not configured.



This figure displays how to configure the Egress rule of the ports.

Use the following steps to configure Egress rules:

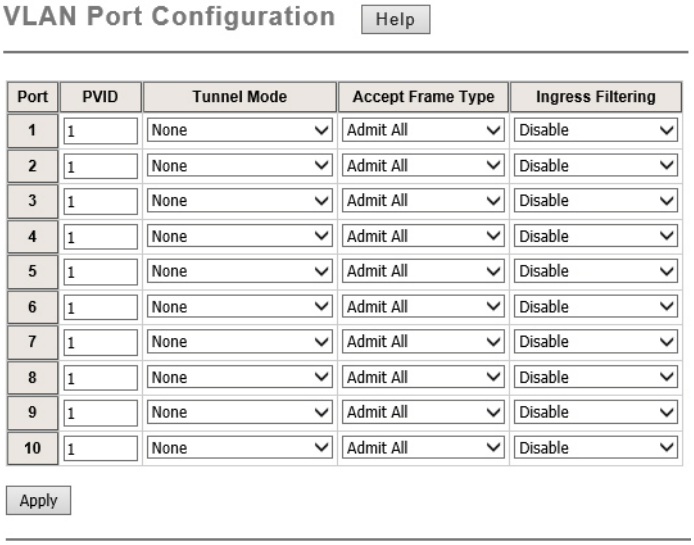
1. Assign Egress rule of the ports to **U** or **T**.
2. Press **Apply** to apply the setting.



If you want to remove one VLAN, select the VLAN entry and then click the **Remove** button.

VLAN Port Configuration

The *VLAN Port Configuration* page allows you to configure VLAN port parameters on a specific port. These parameters include the port VLAN ID (PVID), Tunnel Mode, Accept Frame Type and Ingress Filtering.

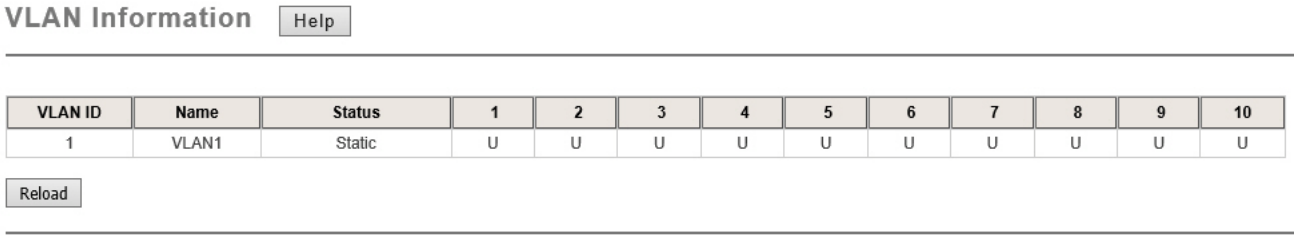


VLAN Port Configuration Page	
PVID	Enter the port VLAN ID (PVID). The PVID allows the switches to identify which port belongs to which VLAN. To keep things simple, it is recommended that PVID is equivalent to VLAN IDs. The values of PVIDs are from 0 to 4,095 (0 and 4,095 are reserved), 1 is the default value; 2 to 4,094 are valid and available in this column.
Tunnel Mode	**None** - IEEE 802.1Q tunnel mode is disabled. **802.1Q Tunnel**: QinQ is applied to the ports which connect to the C-VLAN. The port receives a tagged frame from the C-VLAN. You need to add a new tag (Port VID) as an S-VLAN VID. When the packets are forwarded to the C-VLAN, the S-VLAN tag is removed. After **802.1Q Tunnel** mode is assigned to a port, the egress setting of the port should be *Untag*, it indicates that the egress packet is always untagged. This is configured in the **Static VLAN Configuration** table (Page 86). **802.1Q Tunnel Uplink**: QinQ is applied to the ports which connect to the S-VLAN. The port receives a tagged frame from the S-VLAN. When the packets are forwarded to the S-VLAN, the S-VLAN tag is kept. After **802.1Q Tunnel Uplink** mode is assigned to a port, the egress setting of the port should be *Tag*, it indicates that the egress packet is always tagged. This is configured in the Static VLAN Configuration table (Page 86). For example, if the VID of S-VLAN/Tunnel Uplink is 10, the VID of C-VLAN/Tunnel is 5. The 802.1Q Tunnel port receives Tag 5 from C-VLAN and adds Tag 10 to the packet. When the packets are forwarded to S-VLAN, Tag 10 is kept.
Accept Frame Type	This defines the accepted frame type of the port. There are two modes you can select: • **Admit All** mode means that the port can accept both tagged and untagged packets. When you select **Admit All**, untagged frames or Priority-Tagged only frames received on this port are accepted and assigned to the PVID for this frame. This control does not affect VLAN independent BPDU frames, such as Super Ring, STP, GVRP and LACP. It does affect VLAN dependent BPDU frames, such as GMRP. • **Tag Only** mode means that the port can only accept tagged packets.When you select **Tag Only** the ES8510-XTE discards untagged frames or Priority-Tagged only frames received on this port.

VLAN Port Configuration Page (Continued)	
Ingress Filtering	Ingress filtering instructs the VLAN engine to filter out undesired traffic on a port. • When you **Enable Ingress Filtering**, the port checks whether the incoming frames belong to the VLAN they claimed or not. The port then determines if the frames can be processed or not. For example, if a tagged frame from *TEST VLAN* is received, and Ingress Filtering is enabled, the ES8510-XTE determines if the port is on the *TEST VLAN*'s Egress list. If it is, the frame can be processed. If it is not, the frame is dropped. • When you select **Disable**, the port accepts all incoming frames regardless of its VLAN classification. This control does not affect VLAN independent BPDU frames, such as Super Ring, STP, GVRP and LACP. It does affect VLAN dependent BPDU frames, such as GMRP.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

VLAN Information

The *VLAN Information* page displays the current settings of your VLAN table, including VLAN ID, Name, Status, and Egress rule of the ports.



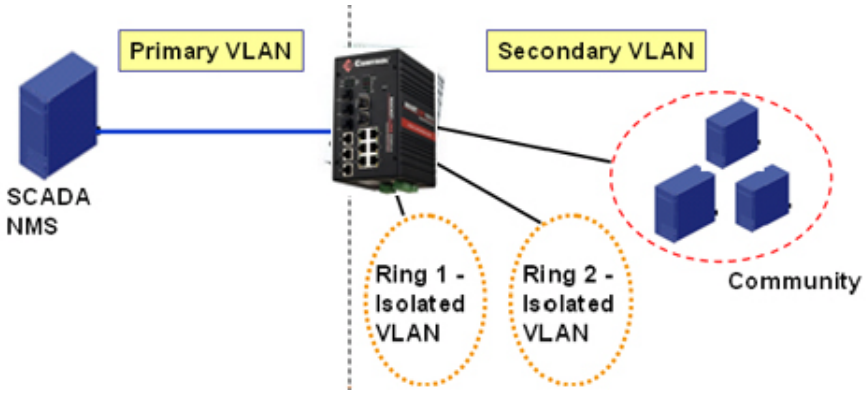
VLAN Information Page	
VLAN ID	The ID of the VLAN.
Name	The name of the VLAN.
Status	**Static** means that this is a manually configured static VLAN. **Unused** means this VLAN is created by web user interface/CLI and has no member ports and the VLAN is not workable yet. **Dynamic** means this VLAN was learnt by GVRP. • **--** No VLAN setting. • **T** A Trunk Link is a LAN segment used for multiplexing VLANs between VLAN bridges. All the devices that connect to a Trunk Link must be IEEE 802.1Q VLAN-aware, which sends and receives frames with IEEE 802.1Q tags. • **U** An Access Link is a LAN segment used to multiplex one or more IEEE 802.1Q VLAN-unaware devices into a Port of a VLAN Bridge. Devices that are connected to an Access Link sends and receives frames without IEEE 802.1Q tagging, which is the identification of the VLAN it belongs to.

Private VLAN

A private VLAN helps to resolve the primary VLAN ID shortage, client ports' isolation and network security issues. The private VLAN features provides primary and secondary VLANs within a single switch.

Primary VLAN: The uplink port is usually a member of the primary VLAN. A primary VLAN contains promiscuous ports that can communicate with Secondary VLANs.

Secondary VLAN: The client ports are usually defined within secondary VLAN. The secondary VLAN includes Isolated and Community VLANs. The client ports can be isolated VLANs or can be grouped in the same Community VLAN. The ports within the same community VLAN can communicate with each other, however, the isolated VLAN ports cannot.



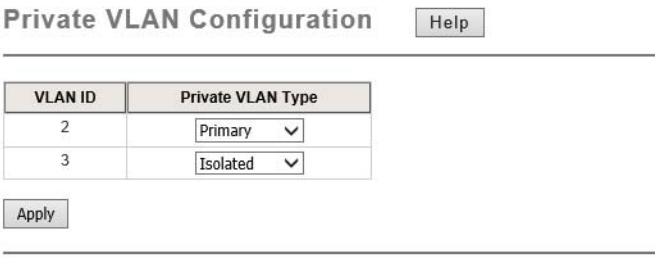
This figure shows a typical private VLAN network. A SCADA/Public Server or NMS workstation is usually located in a primary VLAN. Client PCs and rings are usually located within the secondary VLAN.

Optionally, you can use the CLI for configuration, see *Private VLAN (CLI)* on Page 162.

PVLAN Configuration

PVLAN Configuration allows you to assign a private VLAN type. Choose the private VLAN types for each VLAN you want configure.

Note: *You must have previously configured a VLAN in the VLAN Configuration screen. Refer to VLAN Configuration on Page 86 for information.*

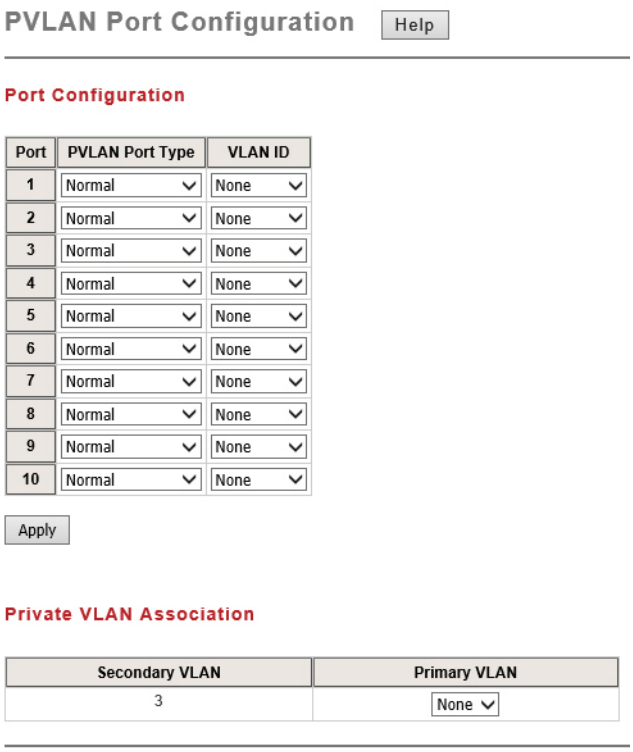


Private VLAN Configuration Page	
VLAN ID	• *Primary VLAN* - The uplink port is usually the primary VLAN. Ports within a primary VLAN can communicate with ports in a secondary VLAN • *Secondary VLAN* - The client ports are usually defined within secondary VLAN. The secondary VLAN includes Isolated VLAN and Community VLANs. The client ports can be isolated VLANs or can be grouped in the same Community VLAN. The ports within the same community VLAN can communicate with each other. However, the isolated VLAN ports cannot.

Private VLAN Configuration Page (Continued)	
Private VLAN Type	• **None**: The VLAN is not included in private VLAN. • Primary: A primary VLAN contains promiscuous ports that can communicate with the secondary VLANs. • **Isolated**: The member ports of the VLAN are isolated. • **Community**: The member ports of the VLAN can communicate with each other.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

PVLAN Port Configuration

The *PVLAN Port Configuration* page allows you to configure the port configuration and private VLAN associations.

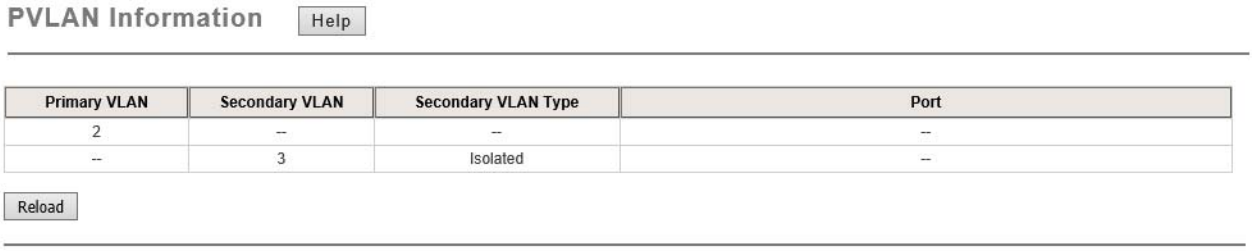


Private VLAN Port Configuration Page	
PVLAN Port Type	The following options are available: **Normal**: Normal ports remain in their original VLAN configuration. **Host**: Host ports can be mapped to the secondary VLAN. **Promiscuous**: Promiscuous ports can be associated to the primary VLAN.
VLAN ID	After assigning the port type, this displays the available VLAN ID for which the port can associate.

Private VLAN Port Configuration Page (Continued)	
Private VLAN Association	
Secondary VLAN	After the isolated and community VLANs are configured in the *Private VLAN Configuration* page, the VLANs belonging to the second VLAN are displayed.
Primary VLAN	After the Primary VLAN Type is assigned in *Private VLAN Configuration* page, the secondary VLAN can associate to the primary VLAN ID. ***Note:*** *Before configuring PVLAN port type, the private VLAN Association should be done first.*

PVLAN Information

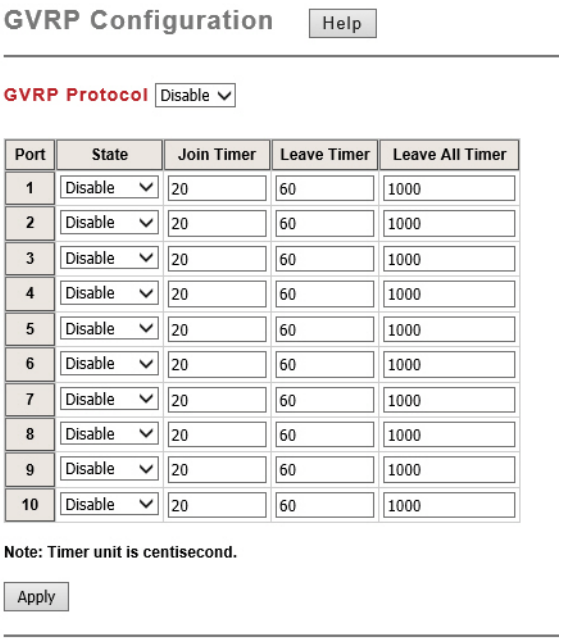
The *PVLAN Information* page allows you to see the private VLAN information. Click **Reload** to refresh the page contents.



GVRP Configuration

GARP VLAN Registration Protocol (GVRP) allows you to set-up VLANs automatically rather than manual configuration on every port on every switch in the network. GVRP conforms to the IEEE 802.1Q specification. This defines a method of tagging frames with VLAN configuration data that allows network devices to dynamically exchange VLAN configuration information with other devices.

GARP (Generic Attribute Registration Protocol), a protocol that defines procedures by which end stations and switches in a local area network (LAN) can register and de-register attributes, such as identifiers or addresses, with each other. Every end station and switch thus has a current record of all the other end stations and switches that can be reached. GVRP, like GARP, eliminates unnecessary network traffic by preventing attempts to transmit information to unregistered users. In addition, it is necessary to manually configure only one switch and all the other switches are configured accordingly.



GVRP Configuration Page	
GVRP Protocol	Allows you to **Enable/Disable** GVRP globally.
State	After enabling GVRP globally, you can still **Enable/Disable** GVRP by port.
Join Timer	Controls the interval of sending the GVRP Join BPDU (Bridge Protocol Data Unit). An instance of this timer is required on a per-port, per-GARP participant basis.
Leave Timer	Controls the time to release the GVRP reservation after having received the GVRP Leave BPDU. An instance of the timer is required for each state machine that is in the LV state.
Leave All Timer	Controls the period to initiate the garbage collection of registered VLAN. The timer is required on a per-port, per-GARP participant basis.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

Traffic Prioritization

Quality of Service (QoS) provides a traffic prioritization mechanism which allows you to deliver better service to certain flows. QoS can also help to alleviate congestion problems and ensure high-priority traffic is delivered first. This section allows you to configure *Traffic Prioritization* settings for each port with regard to setting priorities.

The ES8510-XTE QoS supports eight physical queues, weighted fair queuing (WRR) and Strict Priority scheme, that follows the IEEE 802.1p CoS tag and IPv4 TOS/DiffServ information to prioritize the traffic of your industrial network.

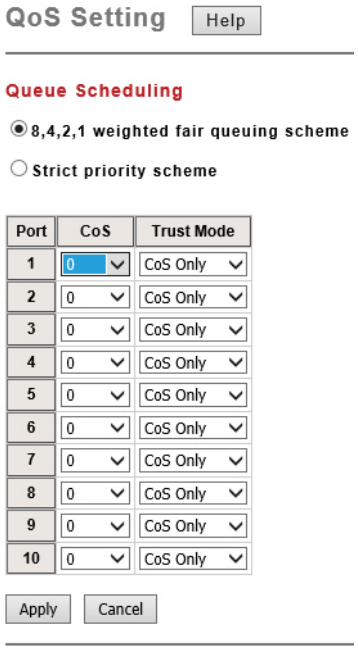
The following web pages are included in this group:

- *QoS Setting*
- *CoS-Queue Mapping* on Page 97
- *DSCP-Queue Mapping* on Page 98

Optionally, you can use the CLI for configuration, see *Traffic Prioritization (CLI)* on Page 166.

QoS Setting

Use this subsection to set up QoS settings for the ES8510-XTE.



QoS Setting Page	
Queue Scheduling	
Use an 8,4,2,1 weighted fair queuing scheme	This is also known as **WRR** (Weight Round Robin). The ES8510-XTE follows the 8:4:2:1 rate to process the packets in a queue from the highest priority to the lowest. For example, the system processes 8 packets with the highest priority in the queue, 4 with middle priority, 2 with low priority, and 1 with the lowest priority at the same time.
Use a strict priority scheme	Packets with higher priority in the queue are always processed first, except that there is no packet with higher priority.
Port Setting	
CoS	The CoS column indicates that the default port priority value for untagged or priority-tagged frames. When the ES8510-XTE receives the frames, the ES8510-XTE attaches the value to the CoS field of the incoming VLAN-tagged packets. You can enable 0,1,2,3,4,5,6 or 7 to the port.
Trust Mode	**Trust Mode** indicates the Queue Mapping types that you can select. • **COS Only** (default): The port priority follows the CoS-Queue Mapping you have assigned. The ES8510-XTE provides the default CoS-Queue table for which you can refer to for the next command. • **DSCP Only**: Port priority only follows the DSCP-Queue Mapping you have assigned. • **COS first**: Port priority follows the CoS-Queue Mapping first, and then the DSCP-Queue Mapping rule. • **DSCP first**: Port priority follows the DSCP-Queue Mapping first, and then the CoS-Queue Mapping rule.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

CoS-Queue Mapping

Use this page to change the CoS values into a Physical Queue mapping table. Since the switch fabric of the ES8510-XTE supports eight queues, Lowest, Low, Middle and High. You should therefore assign how to map CoS value to the level of the physical queue.

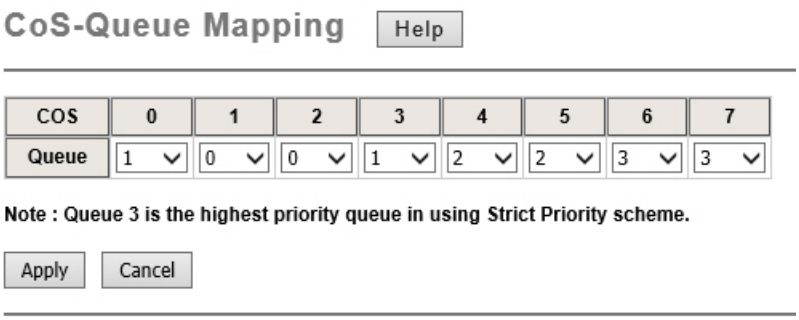
Use this page to change the CoS values into the Physical Queue mapping table. Since the switch fabric of ES8510-XTE supports four queues, Lowest, Low, Middle, and High users should therefore assign how to map the CoS value to the level of the physical queue.

You can assign the mapping table or follow the suggestion of the IEEE 802.1p standard. The ES8510-XTE uses IEEE 802.1p suggestion as default values. CoS Values 1 and 2 are mapped to physical Queue 0, the lowest queue. CoS Values 0 and 3 are mapped to physical Queue 1, the low/normal physical queue. CoS Values 4 and 5 are mapped to physical Queue 2, the middle physical queue. CoS Values 6 and 7 are mapped to physical Queue 3, the high physical queue.

Class of service (CoS) is a 3 bit field within a layer two Ethernet frame header defined by IEEE 802.1p when using IEEE 802.1Q tagging. The field specifies a priority value of between 0 and 7 inclusive that can be used by Quality of Service (QoS) disciplines to differentiate traffic.

While CoS operates only on Ethernet at the data link layer, other QoS mechanisms (such as DiffServ) operate at the network layer and higher. Others operate on other physical layers. Although IEEE 802.1Q tagging must be enabled to communicate priority information from switch to switch, some switches use CoS to internally classify traffic for QoS purposes.

Differentiated Services (DiffServ) is a model where traffic is treated by intermediate systems with relative priorities based on the type of services (ToS) field. Defined in RFC2474 and RFC2475, the DiffServ standard supersedes the original specification for defining packet priority described in RFC791. DiffServ increases the number of definable priority levels by reallocating bits of an IP packet for priority marking. The DiffServ architecture defines the DiffServ field, which supersedes the ToS field in IPv4 to make per-hop behavior (PHB) decisions about packet classification and traffic conditioning functions, such as; metering, marking, shaping, and policing.

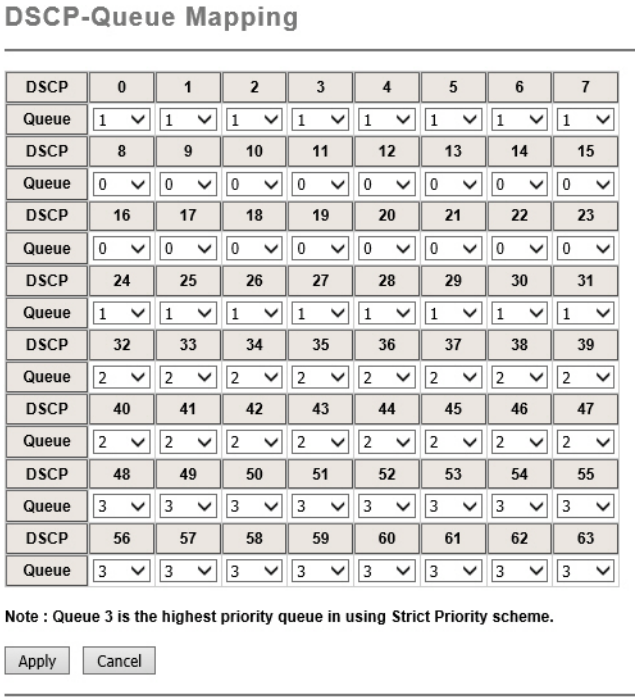


After configuration, press **Apply** to enable the settings.

Note: *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

DSCP-Queue Mapping

Use this page to change DSCP values to Physical Queue mapping table. Since the switch fabric of the ES8510-XTE only supports four queues. Lowest, Low, Middle and High users should therefore assign how to map DSCP values to the level of the physical queue. You should therefore assign how to map DSCP value to the level of the queue. You can change the mapping table to follow the upper layer 3 switch or routers' DSCP setting.



After configuration, press **Apply** to enable the settings.

Note: *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

Multicast Filtering

For multicast filtering, the ES8510-XTE uses IGMP (Internet Group Management Protocol) Snooping technology. IGMP is an internet protocol that provides a way for internet device to report its multicast group membership to adjacent routers. Multicasting allows one computer on the internet to send data to a multitude of other computers that have identified themselves as being interested in receiving the originating computer's data.

Multicasting is useful for such applications as updating the address books of mobile computer users in the field, sending out newsletters to a distribution list, and broadcasting streaming media to an audience that has tuned into the event by setting up multicast group membership.

In effect, IGMP Snooping manages multicast traffic by making use of switches, routers, and hosts that support IGMP. Enabling IGMP Snooping allows the ports to detect IGMP queries, report packets, and manage multicast traffic through the switch. IGMP has three fundamental types of messages, as shown in the following table.

Messages	
Query	A message sent from the querier (an IGMP router or a switch) that asks for a response from each host that belongs to the multicast group.
Report	A message sent by a host to the querier to indicate that the host wants to be or is a member of a given group indicated in the report message.
Leave Group	A message sent by a host to the querier to indicate that the host has quit as a member of a specific multicast group.

You can enable **IGMP Snooping** and **IGMP Query** functions. This section illustrates the information of the IGMP Snooping function, including different multicast groups' VID and member ports, and IP multicast addresses that range from 224.0.0.0 to 239.255.255.255.

The following web pages are included in this group:

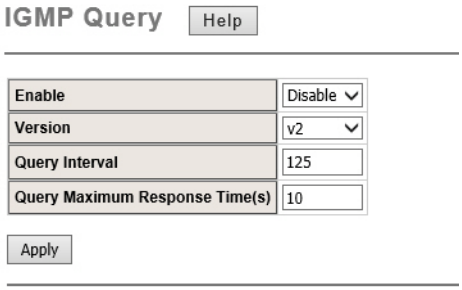
- *IGMP Query* on Page 100
- *IGMP Snooping* on Page 101

Optionally, you can use the CLI for configuration, see *Multicast Filtering (CLI)* on Page 169.

IGMP Query

Use this page to configure the *IGMP Query* feature. Since the ES8510-XTE can only be configured by member ports of the management VLAN, the IGMP Query can only be enabled on the management VLAN. If you want to run IGMP Snooping feature in several VLANs, first check to see whether each VLAN has its own IGMP Querier.

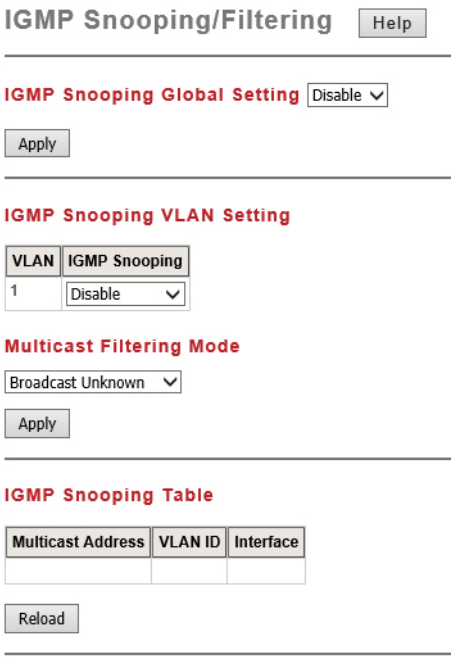
The IGMP querier periodically sends query packets to all end-stations on the LANs or VLANs that are connected to it. For networks with more than one IGMP querier, a switch with the lowest IP address becomes the IGMP querier.



IGMP Query Page	
Version	Select **Version 1**, **Version 2** or **Disable**. • **Version 1** means IGMP V1 General Query • **Version 2** means IGMP V2 General Query. The query is forwarded to all multicast groups in the VLAN. • **Disable** allows you to disable IGMP Query.
Query Interval(s)	The period of query (seconds) sent by querier. Enter a number between 1 and 65,535.
Query Maximum Response Time	This option is available when you select **Version 2**. The span querier detect (seconds) to confirm there are no more directly connected group members on a LAN. Enter a number between 1 and 25.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

IGMP Snooping

Use this page to enable the IGMP Snooping feature, assign IGMP Snooping for specific VLANs, and view the *IGMP Snooping Table* from a dynamic learnt or static that you provide..



IGMP Snooping Page	
IGMP Snooping Global Setting	You can select to **Enable** or **Disable** IGMP Snooping. After enabling IGMP Snooping, you can then enable IGMP Snooping for specific VLAN using the *IGMP Snooping VLAN Setting* table.
IGMP Snooping VLAN Setting	
VLAN	Refers to the VLAN number that was configured using the *VLAN Configuration* page.
IGMP Snooping	Select **Enable** to start IGMP snooping on the selected VLAN.
Filtering Mode	The available filtering modes are: • **Broadcast-Unknown**- The unknown multicast is broadcast to all ports even if they are not member ports of the groups. • **Discard-Unknown** - The unknown multicast is discarded. Non-member ports do not receive the unknown multicast streams. • **Source-only-learning** - This is forwarding unknown multicast traffic to all ports that are already members of a multicast group.
IGMP Snooping Table	This table displays the multicast group IP address, VLAN ID it belongs to, and member ports of the multicast group. The ES8510-XTE supports 256 multicast groups. Click **Reload** to refresh the table.

Note: *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

SNMP

Simple Network Management Protocol (SNMP) is a protocol to exchange management information between network devices. SNMP is a member of the TCP/IP protocol suite. The ES8510-XTE supports SNMP v1 and v2c and v3.

An SNMP managed network consists of two main components: agents and a manager. An agent is a management software module that resides in a managed switch. An agent translates the local management information from the managed device into a SNMP compatible format. The manager is the console through the network.

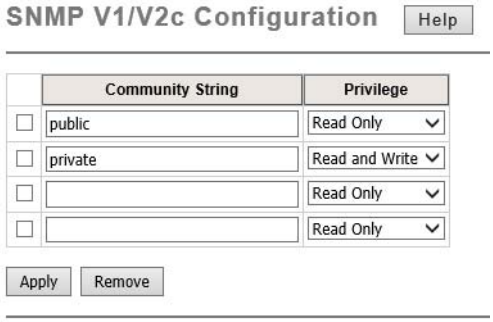
The following web pages are included in this group:

- *SNMP Configuration*
- *SNMP V3 Profile* on Page 103
- *SNMP Traps* on Page 104

Optionally, you can use the CLI for configuration, see *SNMP (CLI)* on Page 172.

SNMP Configuration

Use this page to configure the SNMP v1/v2c Community. The community string can be viewed as the password because SNMP v1/v2c does not request you to enter a password before you try to access the SNMP agent.



The community includes two privileges:

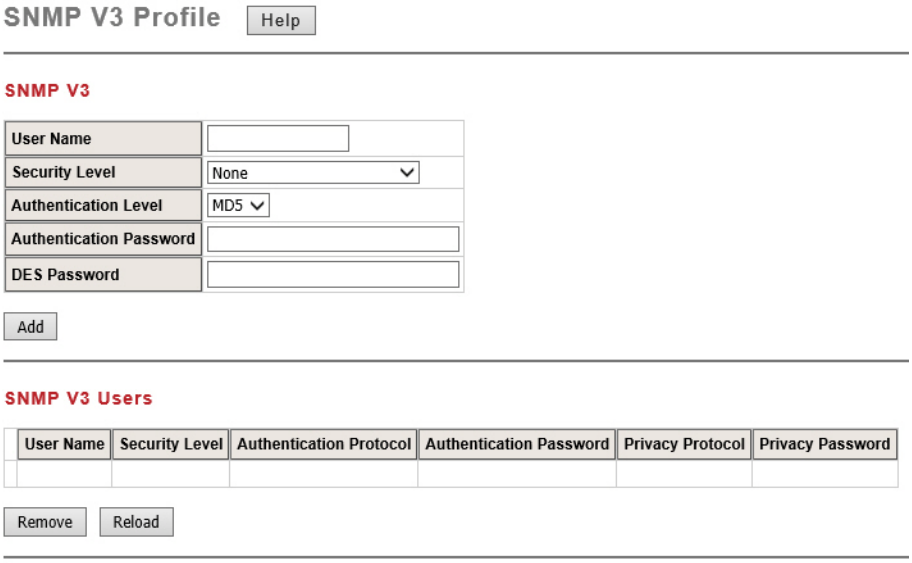
- **Read Only** privilege, you only have the ability to read the values of MIB tables. The default community string is **public**.
- **Read and Write** privilege, you have the ability to read and set the values of MIB tables. The default community string is **private**.

The ES8510-XTE allows you to assign four community strings. Type the community string, select the privilege, and then click **Apply**.

Note: *When you first install the device in your network, we recommend that you change the community string. Most SNMP management applications use public and private as the default community name, this could be a network security leak.*

SNMP V3 Profile

SNMP v3 can provide more security functions when you perform remote management through SNMP protocol. It delivers SNMP information to the administrator with user authentication; all of data between the ES8510-XTE and the administrator are encrypted to ensure secure communication.



SNMP V3 Profile Page	
User Name	SNMP v3 user name.
Security Level	Select the following levels of security: **None**, **Authentication**, and **Authentication and Privacy**.
Authentication Level	Select either **MD5** (Message-Digest algorithm 5) or **SHA** (Secure Hash Algorithm). • **MD5** is a widely used cryptographic hash function with a 128-bit hash value. • **SHA** functions refer to five Federal Information Processing Standard-approved algorithms for computing a condensed digital representation. The ES8510-XTE provides two user authentication protocols in MD5 and SHA. You need to configure SNMP v3 parameters for your SNMP tool with the same authentication method.
Authentication Password	Enter the SNMP v3 user authentication password.
DES Password	Enter the password for SNMP v3 user DES Encryption.
Add	Click to add an SNMP v3 user.
SNMP V3 Users	This table provides SNMP v3 user information. Click **Remove** to remove a selected SNMP v3 user. Click **Reload** to reload SNMP v3 user information.

Note: *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

SNMP Traps

SNMP Trap is the notification feature defined by SNMP protocol. All the SNMP management applications can understand such trap information. So you do not need to install new applications to read the notification information.

SNMP Trap Page	
SNMP Trap	Click **Enable** or **Disable** SNMP trap functionality.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*
SNMP Trap Server	
Server IP	The SNMP trap server IP address.
Community	The SNMP trap server community string.
Version	The SNMP trap version, V1 or V2c.
Add	Click the **Add** button to add a SNMP server.
Trap Server Profile	
Server IP	The SNMP trap server IP address
Community	The SNMP trap server community string.
Version	The SNMP trap version, V1 or V2c.
Remove	Click **Remove** to remove selected SNMP server.
Reload	Click the **Reload** button to reload SNMP server information.

You can see the change of the SNMP predefined standard traps and Comtrol pre-defined traps. The pre-defined traps can be found on the Comtrol ftp site.

Note: *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

Security

The ES8510-XTE provides several security features for you to secure your connection. The following pages are included in this group:

- *Port Security* on Page 105
- *IP Security* on Page 106
- *802.1X Configuration* on Page 107
- *802.1X Port Configuration* on Page 109
- *802.1X Port Information* on Page 111

Optionally, you can use the CLI for configuration, see *Security (CLI)* on Page 173.

Port Security

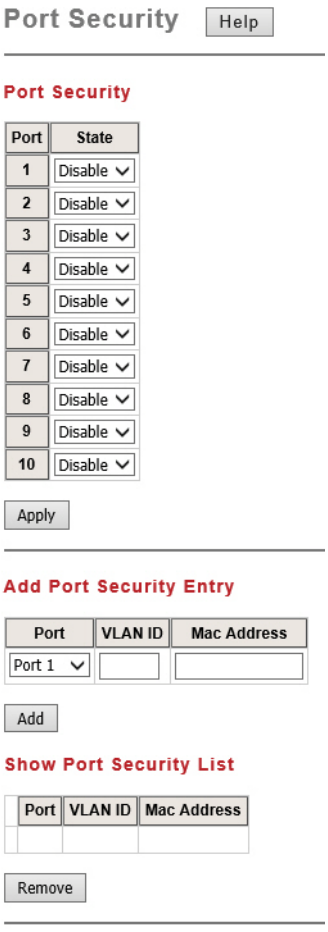
The *Port Security* page allows you to stop the MAC address learning for specific port. After stopping MAC learning, only the MAC address listed in Port Security List can access the switch and transmit/receive traffic.

You can restrict what devices can access the ES8510-XTE management features. MAC addresses added to the static MAC address table can be authorized to access specified ports on the switch.

When **Port Security** is enabled on any port, only authorized MAC addresses are able to access the management features of the ES8510-XTE on enabled ports. Ports with security disabled block all attempts to access the ES8510-XTE's management features. To globally disable port security you must disable the feature on each individual port.

The *Port Security* page allows you to enable port security and configure a port security entry list.

Port Security Page	
Port Security State	Select **Enable** to change the state of the Port Security State for this port.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*
Add Port Security Entry	Select the port, and enter the VID and MAC address. The format of the MAC address is xxxx.xxxx.xxxx, for example: 00c0.4e30.0101. The maximum volume of one port is 10. The system can accept a total of 100 Port Security MAC addresses.
Add	Adds a port security entry.
Show Port Security List	This table shows you enabled port security entries.
Remove	Removes the selected port security entry.



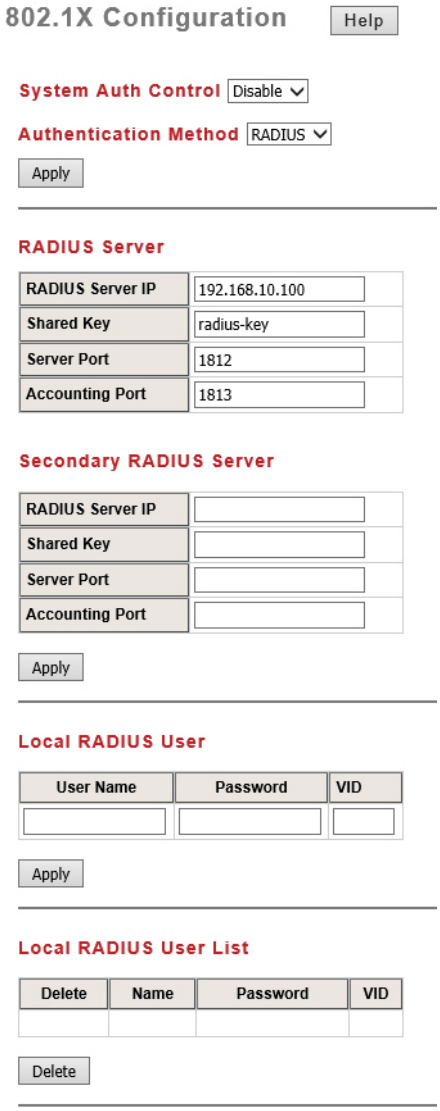
IP Security

Use the *Security IP* page to set up specific IP addresses to grant authorization for management access to this ES8510-XTE through a web browser or Telnet.

IP Security Page	
IP Security	Select **Enable** and **Apply** to enable the IP security function.
Add Security IP	You can assign specific IP addresses and then click **Add**. Only these IP addresses can access and manage ES8510-XTE through a web browser or Telnet. The maximum security IP is 10.
Security IP List	This table shows you added the security IP addresses.
Remove	Click **Remove** to delete a highlighted entry.
Reload	To reload the table.

802.1X Configuration

IEEE 802.1X is the protocol that performs authentication to obtain access to IEEE 802 LANs. It is port-base network access control. With the function, the ES8510-XTE could control which connection is available or not.

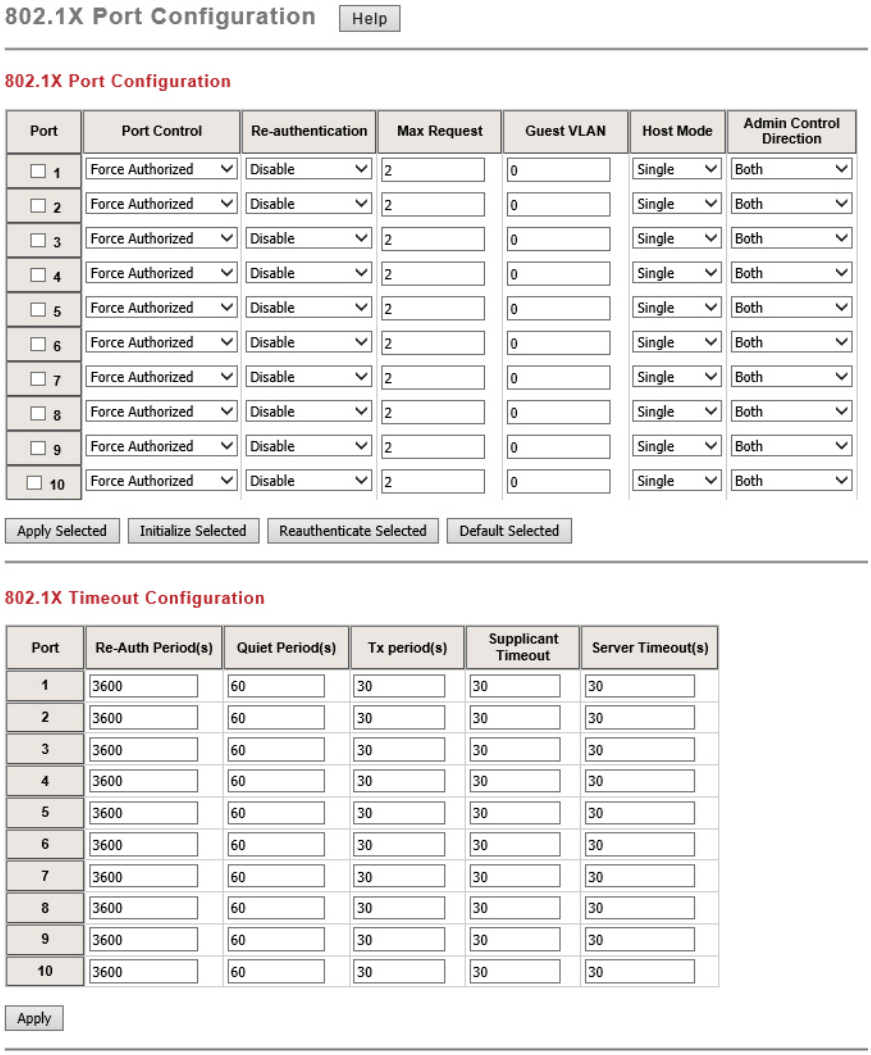


IEEE 802.1x Page	
System Auth Control	**Enable** or **Disable** the IEEE 802.1x authentication.
Authentication Method	**RADIUS** is an authentication server that provides a key for authentication. When you use this method, you must connect the switch to the server. If you select **Local** for the authentication method, the switch uses the local user database that can be created in this page for authentication.
RADIUS Server	
RADIUS Server IP	The IP address of the RADIUS server.
Shared Key	The password used to communicate between the ES8510-XTE and the RADIUS Server.
Server Port	The UDP port of the RADIUS server.

IEEE 802.1x Page (Continued)	
Accounting Port	The port for packets that contains the account login or logout information.
Secondary RADIUS Server	
RADIUS Server IP	You can set a Secondary RADIUS Server, if the primary RADIUS server goes down.
Shared Key	The password used to communicate between the ES8510-XTE and the secondary RADIUS Server.
Server Port	The UDP port of the secondary RADIUS server.
Accounting Port	The port for packets that contains the account login or logout information for the secondary server.
Local RADIUS User	You can add an Account/Password for local authentication. • User name: The user name of the local RADIUS user. • Password: The password of the local RADIUS user. • VID: The VLAN ID (VID) of the local RADIUS user. Click the **Add** button to add a local RADIUS user.
Local RADIUS User List	Shows the account information, select **Remove** to remove a selected account. • User name: The user name of the local RADIUS user. • Password: The password of the local RADIUS user. • VID: The VLAN ID (VID) of the local RADIUS user.

802.1X Port Configuration

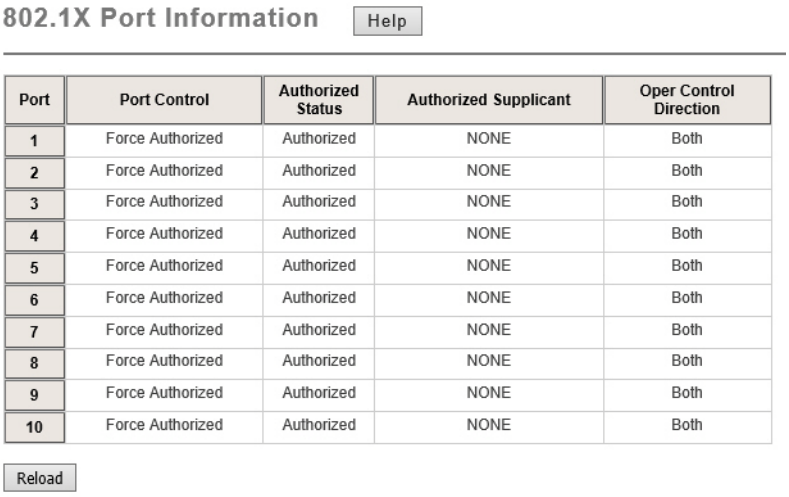
After configuring the **RADIUS Server** or **Local RADIUS User List**, you also need to configure the authentication mode, authentication behavior, applied VLAN for each port, and permitted communications.



802.1x Port Configuration Page	
Port control	**Force Authorized** means that this port is authorized; the data is free to move in/out. **Force unauthorized** is just the opposite, the port is blocked. To control this port with a RADIUS server, select **Auto** for port control.
Reauthentication	If this field is enabled, the ES8510-XTE requests the client to re-authenticate. The default time interval is 3600 seconds.
Max Request	This is the maximum times that the ES8510-XTE allows a client request.
Guest VLAN	The permitted range for this field is 0 to 4094. If this field is set to 0, that means the port is blocked after an authentication failure. Otherwise, the port is set to Guest VLAN.
Host Mode	If there is more than one device connected to this port, set the Host Mode to **Single**, which means only the first PC to authenticate successfully can access this port. If this port is set to **Multi**, all of the devices can access this port once any one of them passes the authentication.
Admin Control Direction	Use this to determine which devices can only send data or both send and receive data.
Apply	Click **Apply** to apply the settings.
Initialize Selected	Click to set the authorization state of the selected port to initialize status.
Reauthenticate Selected	Click to send an EAP Request to the requestor to request reauthentication.
Default Selected	Click to reset the configurable IEEE 802.1x parameters of selected port to the default values.
802.1x Timeout Configuration	
Re-Auth Period(s)	Controls the re-authentication time interval (seconds), you can enter a range of 1 - 65535.
Quiet Period(s)	When authentication fails, the ES8510-XTE waits for a period and then tries to communicate with the RADIUS server again.
Tx Period(s)	The time interval of the authentication request.
Supplicant Timeout(s)	The timeout for the client authentication.
Sever Timeout(s)	The timeout for the server response for authentication.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

802.1X Port Information

Use the *802.1X Port Information* page to observe the port status for **Port Control Status**, **Authorize Status**, Authorized **Supplicant**, and **Oper Control Direction** for each port.



Warning

The ES8510-XTE provides several types of warning features for you to remotely monitor the status of the attached devices or changes in your network. The features include Fault Relay, System Log, and SMTP Email Alert.

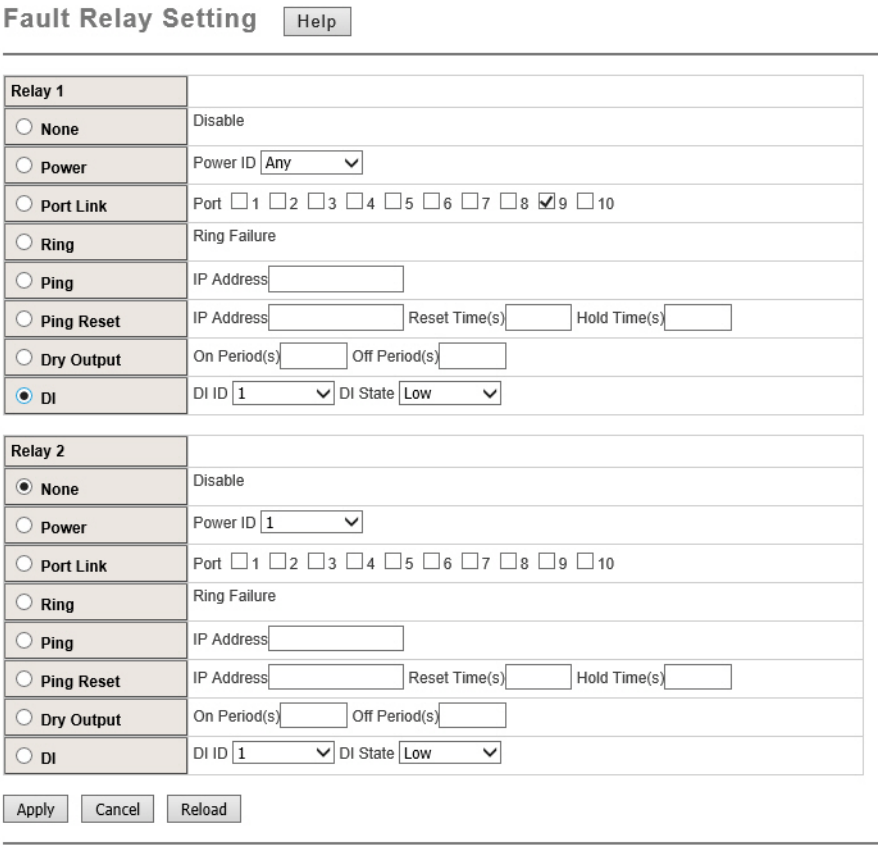
The following web pages are included in this group:

- *Fault Relay*
- *Event Selection* on Page 113
- *SysLog Configuration* on Page 114
- *SMTP Configuration* on Page 115

Optionally, you can use the CLI for configuration, see *Warnings (CLI)* on Page 175.

Fault Relay

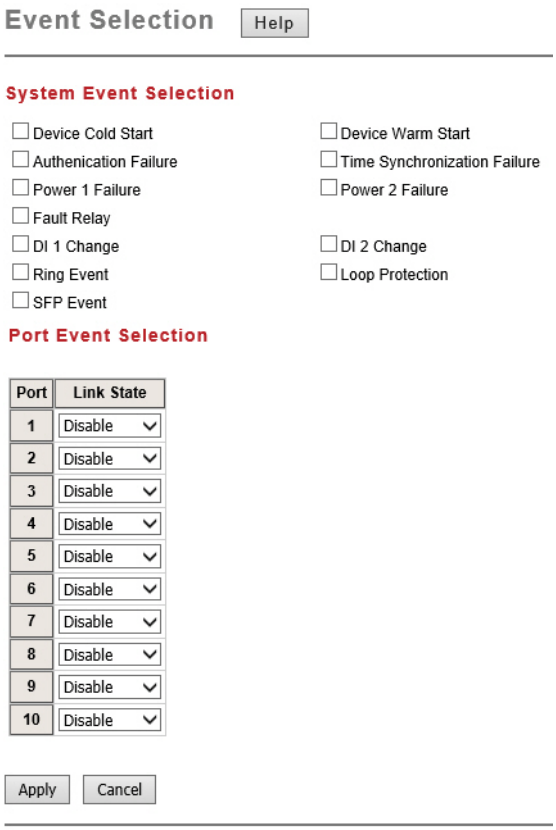
The ES8510-XTE provides two digital outputs (also called relay outputs). The relay contacts are energized (open) for normal operation and closes under fault conditions. Fault conditions include **Digital Input (DI) State**, **Dry Output**, **Power Failure**, **Link Failure**, **Ping Failure**, and **Super Ring Failure**. You can configure these settings in this **Fault Relay Setting**. Each Relay can be assigned one fault condition.



Once you finish configuring the settings click the **Apply** button to apply your configuration.

Event Selection

Event Types can be divided into two basic groups: System Events and Port Events. System Events are related to the overall function of the switch, whereas Port Events are related to the activity of specific ports.

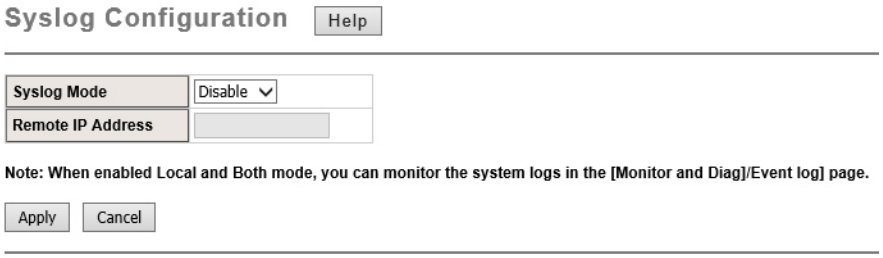


System Event	Warning is sent when....
Device Cold Start	Power is cut off and then reconnected.
Device Warm Start	Reboot the device by CLI or web user interface.
Power 1 Failure	Select this if you want the ES8510-XTE to send notification of a PW1 failure.
Power 2 Failure	Select this if you want the ES8510-XTE to send notification of a PW2 failure.
Authentication failure	An incorrect password or SNMP Community String is entered.
Time Synchronize Failure	Accessing the NTP Server is failing.
Fault Relay	Fault Relay has occurred.
DI1 Change	The Digital Input#1 status has changed.
DI2 Change	The Digital Input#2 status has changed.
Ring Event	A ring event has occurred.
Loop Protection	A loop protection event has occurred.
SFP Event	The information read from the DDM SFP transceiver is over temperature or out the range of TX/RX power.

Port Event	Warning is sent when.....
Link-Up	The port is connected to another device.
Link-Down	The port is disconnected. For example, the cable is pulled out or the opposing devices is down.
Both	The link status changed.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

SysLog Configuration

The *System Log* page provides the system administrator ES8510-XTE events history. There are two System Log modes provided by the ES8510-XTE, **Local** mode and **Remote** mode.



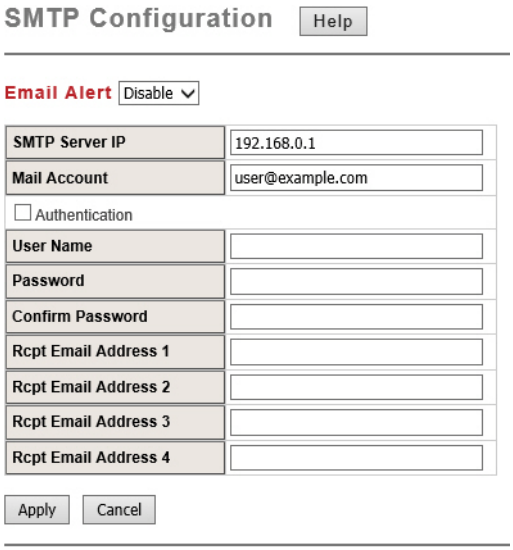
Warning - SysLog Configuration Page	
Syslog Mode	There are two system logs available: • **Local Mode**: The ES8510-XTE prints the events that have been selected in the Event Selection page to the System Log table of the ES8510-XTE. You can monitor the system logs in the *Monitor and Diag /Event Log* page. • **Remote Mode**: Assign the IP address of the System Log server. The ES8510-XTE sends the events that occurred in the selected in *Event Selection* page to System Log server that you assign. • **Both**: This enables both **Local** and **Remote** modes.
Remote IP Address	The IP address of the System log server.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

When enabling **Local** or **Both** modes, you can monitor the system logs in the *Monitor and Diag /Event Log* page.

SMTP Configuration

The ES8510-XTE supports an email alert feature. The ES8510-XTE sends the events that have occurred to a remote email server. The email warning conforms to the SMTP standard.

The *E-mail Alert* page allows you to assign the SMTP Server IP, Sender E-mail, and Receiver E-mail. If the SMTP server requests authentication, you can set up the user name and password.



SMTP Configuration Page	
SMTP Server IP Address	Enter the IP address of the email server.
Mail Account	The mail account for the SMTP server.
Authentication	Click the check box to enable password.
User Name	Enter an email account name (maximum 40 characters).
Password	Enter the password of the email account.
Confirm Password	Re-type the password of the email account.
You can set up to 4 email addresses to receive email alarm from the ES8510-XTE.	
Rcpt E-mail Address 1	The first email address to receive an email alert from the ES8510-XTE (maximum 40 characters).
Rcpt E-mail Address 2	The second email address to receive an email alert from the ES8510-XTE (maximum 40 characters).
Rcpt E-mail Address 3	The third email address to receive an email alert from the ES8510-XTE (maximum 40 characters).
Rcpt E-mail Address 4	The fourth email address to receive an email alert from the ES8510-XTE (maximum 40 characters)
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

Monitor and Diag

The ES8510-XTE provides several web user interface pages for you to monitor the status of the switch or diagnostics when encountering problems related to the ES8510-XTE. The features include MAC Address Table, Port Statistics, Port Mirror, Event Log, and Ping.

The following web pages are included in this group:

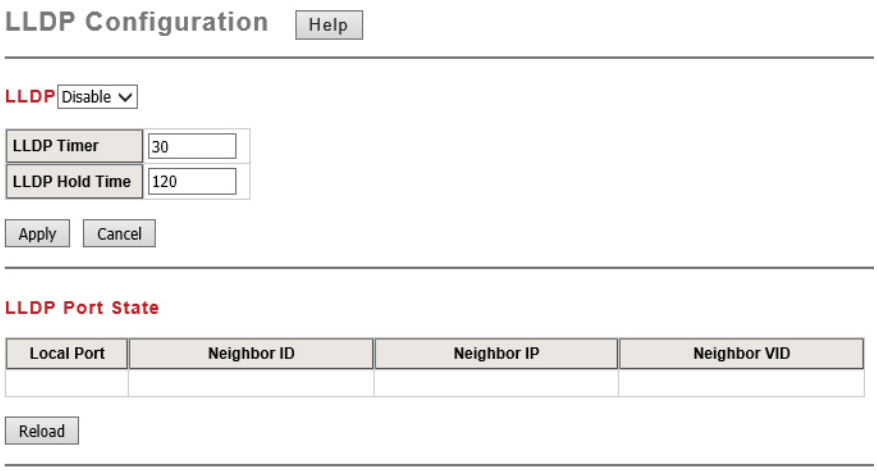
- *LLDP Configuration* on Page 116
- *MAC Address Table*
- *Port Statistics* on Page 120
- *Port Mirroring* on Page 121
- *Event Logs* on Page 122
- *Ping Utility* on Page 122

Optionally, you can use the CLI for configuration, see *Monitor and Diag (CLI)* on Page 179.

LLDP Configuration

The ES8510-XTE supports topology discovery or LLDP (IEEE 802.1AB Link Layer Discovery Protocol) functionality that can help to discovery multi-vendor's network devices on the same segment by a network monitoring system (NMS) that supports LLDP functionality.

With LLDP functionality, NMS can easily maintain the topology map, display port ID, port description, system description, and VLAN ID. Once a link failure occurs, the topology changes the events that can be updated to the NMS as well. The **LLDP Port State** can display the neighbor ID and IP learnt from the connected devices.

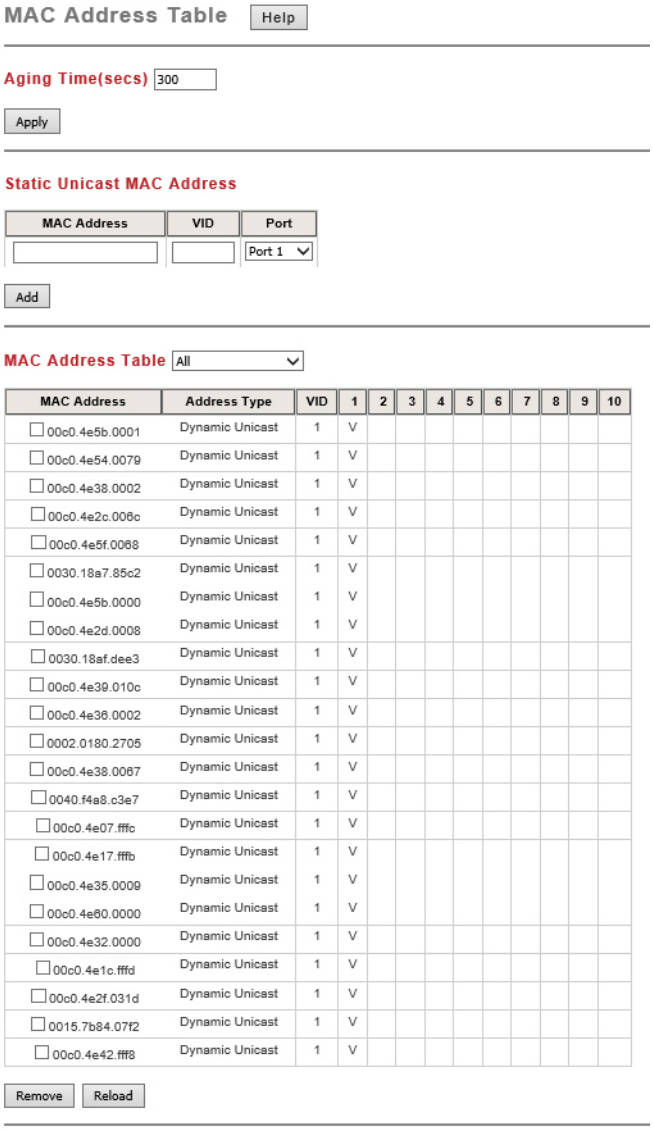


LLDP Configuration Page	
LLDP	Select **Enable/Disable** to enable/disable LLDP function.
LLDP Configuration	
LLDP timer	This is the interval time of each LLDP in seconds; valid values are from 5 to 254. The default is 30 seconds when LLDP is enabled.
LLDP hold time	The Time to Live (TTL) timer. The LLDP state expires when the LLDP is not received by the hold time. The default is 120 seconds when LLDP is enabled. and the range is from 10 to 255.

LLDP Configuration Page (Continued)	
LLDP Port State	
Local Port	The current port number that linked with network device.
Neighbor ID	The MAC address of the peer device on the same network segment.
Neighbor IP	The IP address of the peer device on the same network segment.
Neighbor VID	The VLAN ID of the peer device on the same network segment.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

MAC Address Table

The ES8510-XTE provides 8K entries in the *MAC Address Table*. You can change the Aging time, add Static Unicast MAC Address, monitor the MAC address or sort them by different packet types and ports.



MAC Address Table Page	
Aging Time (Sec)	Each switch fabric has a size limit to write the learnt MAC address. To save more entries for a new MAC address, the switch fabric ages out a non-used MAC address entry per the Aging Time timeout. This value determines the interval that an automatically learnt MAC address entry remains valid in the forwarding database, since its last access as a source address, before being purged. The value should be increments of 15 in seconds. The minimum age time is 15 seconds. The maximum age time is 3825 seconds or almost 64 minutes. The default **Aging Time** is 300 seconds. If the value is set to 0, the aging function is disabled and all learned addresses remain in the database forever.

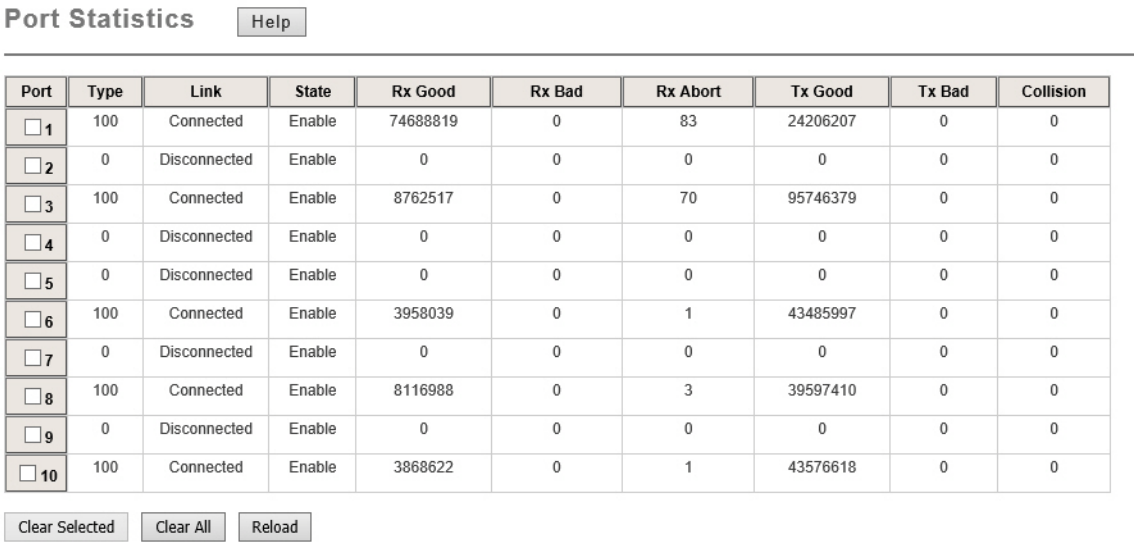
MAC Address Table Page (Continued)	
Static Unicast MAC Address	Some applications may require that you type in the static Unicast MAC address to its MAC address table. Type the MAC address (format: xxxx.xxxx.xxxx), select its VID, and Port ID, and then click **Add** to add it to MAC Address Table.
MAC Address Table	This displays all the MAC addresses learnt by the switch fabric. The packet types include Management Unicast, Static Unicast, Dynamic Unicast, Static Multicast, and Dynamic Multicast. The table allows you to sort the address by the packet types and port.
Address Types	• **Management Unicast** means the MAC address of the switch. It belongs only to the CPU port. • **Static Unicast** MAC addresses can be added and deleted. • **Dynamic Unicast MAC** is a MAC address learnt by the switch Fabric. • **Static Multicast** can be added by the CLI and can be deleted using the web user interface and CLI. • **Dynamic Multicast** appears after you enabled IGMP and the switch learnt IGMP report. • **Management Multicast** - multicast address that is configured for management purposes, such as GVRP and so on. Management entries are read-only. Dynamic and static entries can be removed.
Remove	Click to remove the static Unicast/Multicast MAC address.
Reload	Click to reload to refresh the table. The new learnt Unicast/Multicast MAC address are updated in the *MAC Address Table*.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

Port Statistics

Use this page to view operation statistics for each port. The statistics that can be viewed include **Link Type**, **Link State**, **Rx Good**, **Rx Bad**, **Rx Abort**, **Tx Good**, **Tx Bad** and **Collisions**.

Note: *If you see an increase of Bad, Abort or Collision counts, that may mean the network cable is not properly connected or the network performance of the port is poor. Check your network cable, the network interface card of the connected device, the network application, or reallocate the network traffic.*

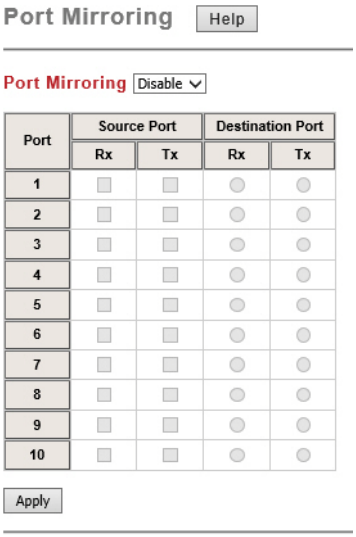
The following information provides a view of the current port statistic information.



Port Statistics Page	
Type	Indicates the port type.
Link	Indicates the link status; **Up** or **Down**.
State	Indicates the link state; **Enable** or **Disable**.
Rx Good	The count of good frames received, which is the total number of received unicast, broadcast, multicast, and pause frames.
Rx Bad	The count of bad frames received, which is the total number of undersized, fragments, oversized, jabber, receive errors (**RxErr**), and frame check sequence errors (**FCSErr**) frames.
Rx Abort	The count of abort frames received, which is the total number of discarded and filtered frames.
Tx Good	The count of good frames transmitted, which is the total number of transmitted unicast, broadcast, multicast and pause frames.
Tx Bad	The count of **FCSErr** frames transmitted.
Collision	The count of collision frames, including single, multiple, excessive, and late collisions frames.
Clear Selected	Click to clear selected port counts.
Clear All	Click to clear all counts.
Reload	Click to reload all counts.

Port Mirroring

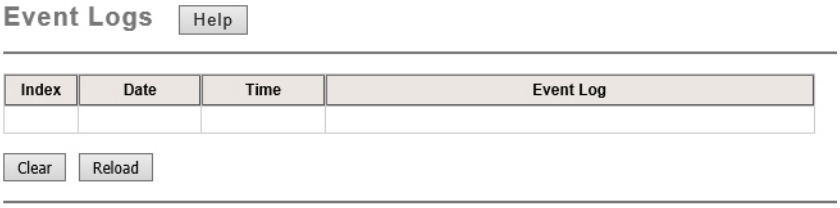
Port mirroring (also called *port spanning*) is a tool that allows you to mirror the traffic from one or more ports onto another port, without disrupting the flow of traffic on the original port. Any traffic that goes into or out of the **Source Ports** is duplicated at the **Destination Ports**. This traffic can then be analyzed at the Destination Port using a monitoring device or application. The network administrator typically utilizes this tool for diagnostics, debugging, or fending off attacks.



Port Mirroring Mode Page	
Port Mirror Mode	Select **Enable** or **Disable** to enable/disable port mirroring.
Source Port	This is also known as *Monitor Port*. These are the ports that you want to monitor. The traffic of all source/monitor ports is copied to destination/analysis ports. You can choose a single port, or any combination of ports, but you can only monitor them in Rx or TX only. Click the check box of the **Port ID**, **Rx, Tx** or both to select the source ports.
Destination Port	This is also known as *Analysis Port*. You can analyze the traffic of all the monitored ports at this port without affecting the flow of traffic on the port or ports being monitored. Only one RX/TX of the destination port can be selected. The network administrator typically connects a LAN analyzer or Netxray device to this port.
Apply	Click **Apply** to apply the settings. ***Note:*** *You must **Save** the settings (Page 124), if you want to maintain these settings if the ES8510-XTE is powered off.*

Event Logs

The System Log feature was introduced in *SysLog Configuration* on Page 114. When **System Log Local** mode is selected, the ES8510-XTE records events that occurred in the local log table. This page shows the log table. The entry includes the index, occurred data and time, and content of the events.

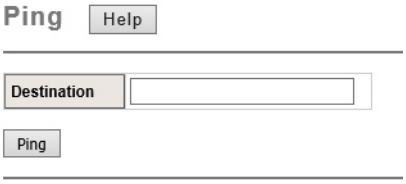


Click **Clear** to clear the entries. Click **Reload** to refresh the table.

Ping Utility

This page provides a **Ping Utility** to ping a remote device and check whether the device is alive or not.

Type the **Target IP** address of the target device and click **Start** to start the ping.

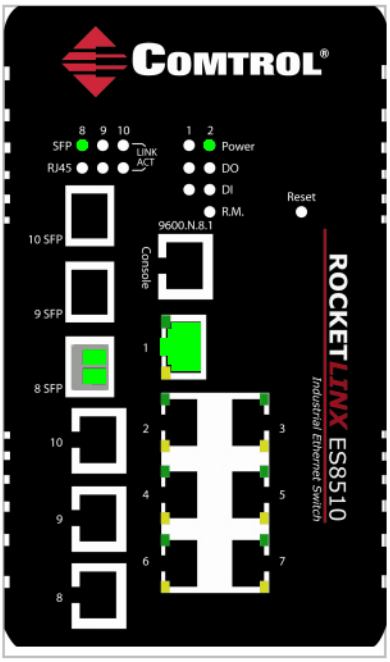


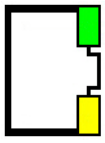
After few seconds, you can see the result in the **Result** field.

Device Front Panel

The **Device Front Panel** allows you to see the LED status of the ES8510-XTE.

Device Front Panel



LED Name	LED On/Link Up	LED Off/Link Down
Power 1 Power 2	Green	Black: No power
DO1 (Digital Output) DO2 (Digital Output)	Green: DO activated	Black: DO not activated
DI1 (Digital Input) DI2 (Digital Input)	Green: DI activated	Black: DI not activated
R.M. (ring master)	Green: Ring Master	Black: Ring function disabled
1 - 7  Link/ Speed	Green: Linked to another device	Black: Not connected
8 - 10 SFP RJ45	Green: Connected Gray: Plugged in but not linked up	Black: Not connected

Note: *There is not a CLI command for this feature. If you can view the physical LEDs, you can use the* *LED Descriptions on Page 13**, which provide detailed LED information. If you need to locate yourES8510-XTE in a rack, you can use the LED Tracker feature in PortVision DX.*

Save to Flash

The **Save Configuration** page saves any changes to the configuration to the flash.

If the switch loses power before clicking **Save Configuration** causes loss of the new settings. Applying changes on web user interface pages do not save the changes to the flash.

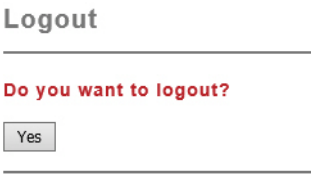
After selecting **Save Configuration**, click **Save to Flash** to save your new configuration.

Optionally, you can use the CLI, see *Saving to Flash (CLI)* on Page 182.

Logout

Click the **Logout** option in the web user interface to manually logout the web connection.

If you have saved your changes, click **Yes** to logout, **No** to remain the web user interface.



Configuration Using the Command Line Interface (CLI)

Overview

The ES8510-XTE provides in-band and out-band configuration methods:

- Out-band management means that you configure the ES8510-XTE using the RS-232 console cable and the Command Line Interface (CLI) to access the ES8510-XTE without attaching an admin PC to the network. You can use out-band management if you lose the network connection to the ES8510-XTE.
- In-band management means that you connect remotely using the ES8510-XTE IP address through the network. You can remotely connect with the ES8510-XTE embedded web user interface or a Telnet console and the CLI.

If you are planning on using in-band management, you need to program the ES8510-XTE IP address to meet your network requirements. The easiest way to configure the IP address is using a Windows system and PortVision DX, which is discussed in *Configuring the Network Settings* on Page 18.

If you want to use the web user interface for configuration, see *Configuration Using the Web User Interface* on Page 31.

Use the following procedures to access the ES8510-XTE using the CLI:

- *Using the Serial Console*
- *Using a Telnet/SSH Console*

This section contains information about the following groups of commands:

- *Basic Settings (CLI)* on Page 140
- *Port Configuration (CLI)* on Page 146
- *Network Redundancy (CLI)* on Page 151
- *VLAN (CLI)* on Page 159 and *Private VLAN (CLI)* on Page 162
- *Traffic Prioritization (CLI)* on Page 166
- *Multicast Filtering (CLI)* on Page 169
- *SNMP (CLI)* on Page 172
- *Security (CLI)* on Page 173
- *Warnings (CLI)* on Page 175
- *Monitor and Diag (CLI)* on Page 179
- *Saving to Flash (CLI)* on Page 182
- *Logging Out (CLI)* on Page 182
- *Service (CLI)* on Page 182

Using the Serial Console

Comtrol provides one RS-232 RJ45 console cable with the ES8510-XTE.

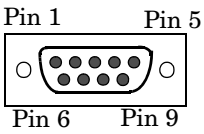
Note: *A system COM port is required to use a serial console connection. If you do not have an available COM port, use the* *Using a Telnet/SSH Console* procedure on *Page 130*.

1. Attach the RS-232 connector (DB9 female) to your PC COM port and connect the other end to the **Console** port of the ES8510-XTE. If you misplace the cable, you can use this console cable pin assignment or purchase a null-modem cable. If building a replacement cable, at a minimum, you need to connect Tx, Rx, and ground signals.

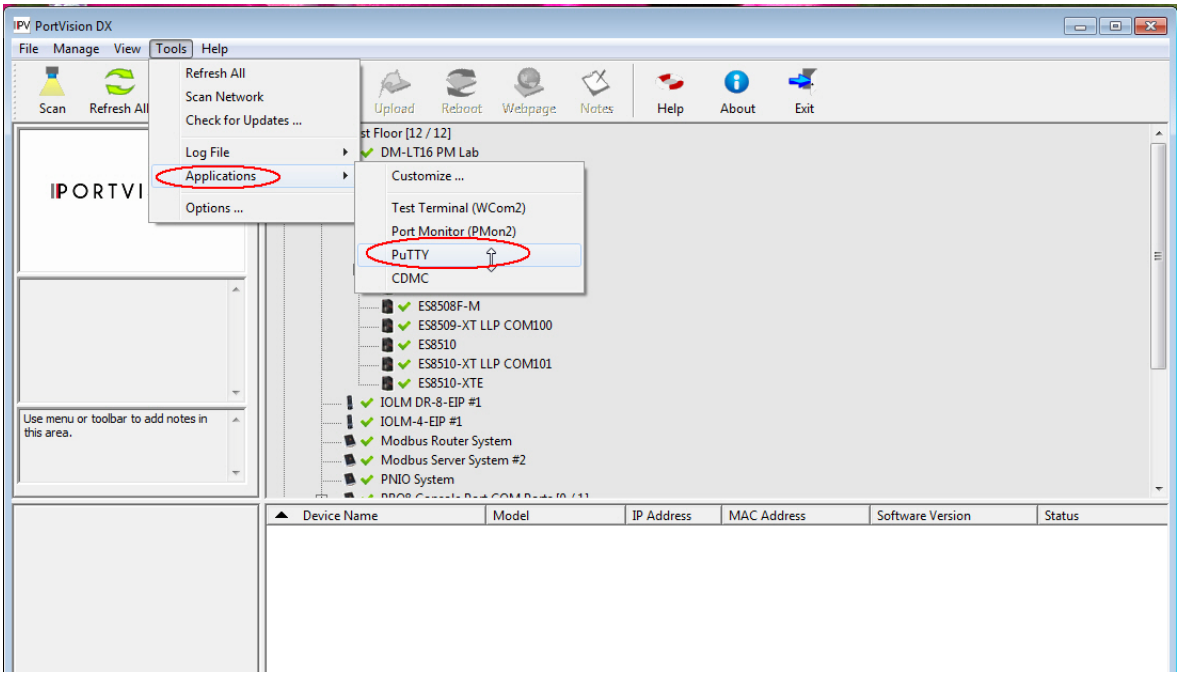
RJ45 Pin	RJ45 Signal
5	DTR
7	Tx
6	Rx
3	DSR
4	Gnd
1	CTS
8	RTS
2	CD

DB9F Pin	DB9 Signal
1	CD
2	Rx
3	Tx
4	DTR
5	Gnd
6	Not Used
7	RTS
8	CTS
9	RI

Serial End

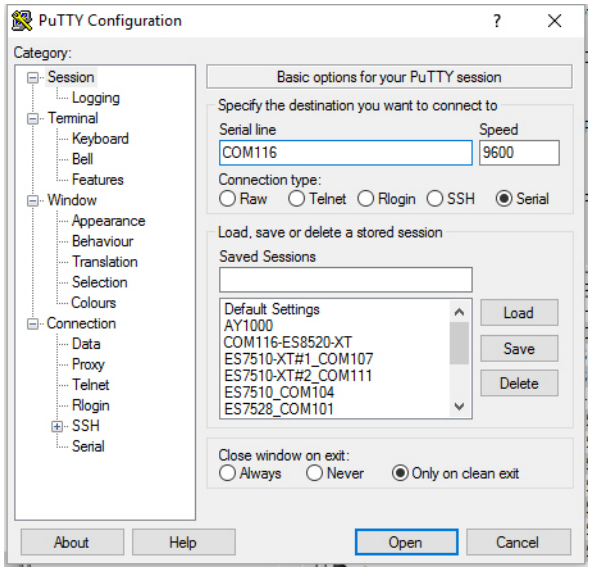


2. Start a terminal program such as HyperTerminal or use PuTTY, which is included with PortVision DX. The following example illustrates using PuTTY.
3. Open PortVision DX, click **Tools | Applications | PuTTY**.



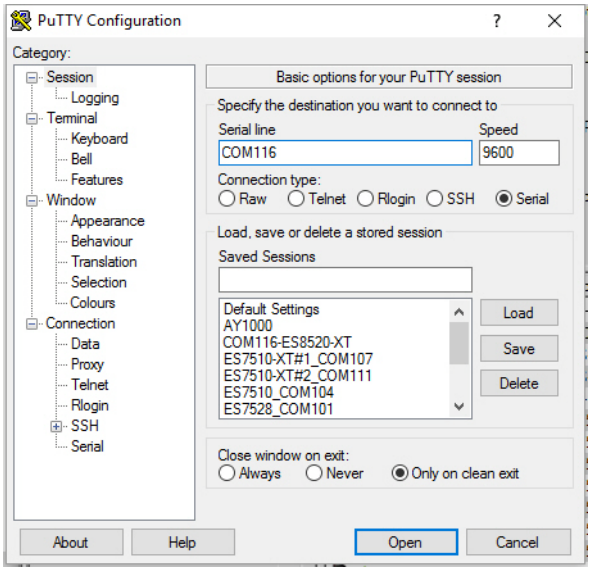
4. Click **Serial** for the **Connection type**.

5. Type a **Host Name** to represent the COM port.

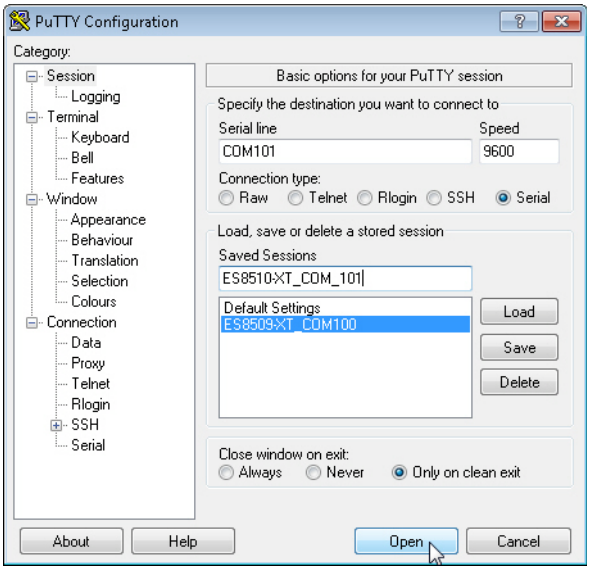


6. Click **Serial** on the left side under **Category**.
7. Configure the serial line with the following characteristics.

Serial Settings	Value
Baud Rate	9600
Data bits	8
Parity	None
Stop Bit	1
Flow Control	None



8. Click **Session** under **Category** in the menu.
9. Type an appropriate **Saved Session** name and click **Save**.



10. Click **Open**.

11. Press **Enter**.
12. Log in to the switch. The default user name is **admin**, password, **admin**.
    a. Type the login and press the **Enter** key.
    b. Type the password and press the **Enter** key.

```
Switch login: admin
Password:

Switch (version 3.0_b2-20160930-15:59:53).

Switch>
```

13. If necessary, configure the IP address for your network. The following example shows how to program an IP address of 192.168.11.252 with a Class B subnet mask (255.255.0.0).

```
Switch> enable
Switch# configure terminal
Switch(config)# int vlan1
Switch(config-if)# ip address 192.168.11.252/16
```

For more information about using the CLI, see *Command Line Interface Introduction* on Page 131.

Using a Telnet/SSH Console

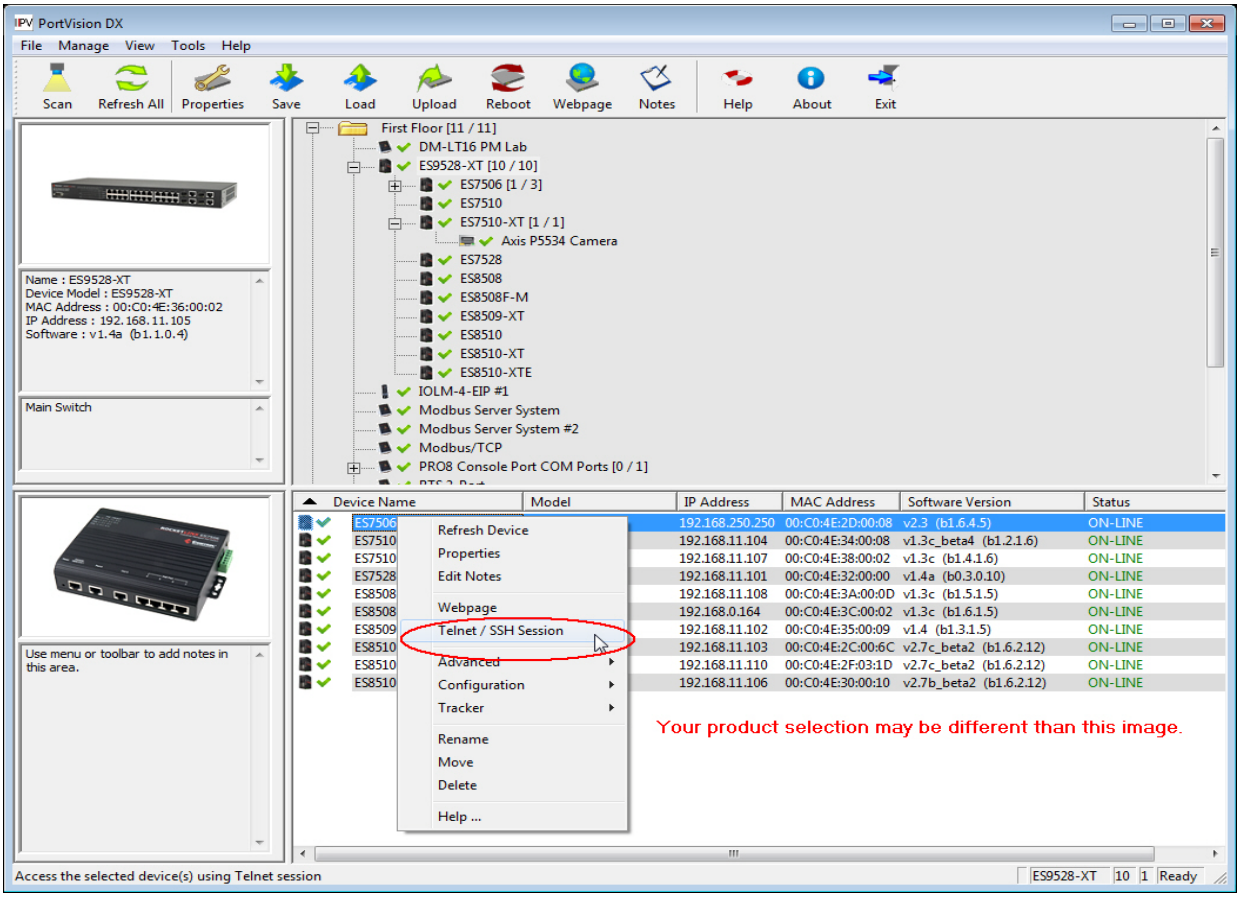
The ES8510-XTE supports a Telnet console or SSH console with the Command Line Interface (CLI), which is the same as what you see using the RS-232 console port. The SSH connection can secure all the configuration commands you send to the ES8510-XTE.

SSH is a client/server architecture while the ES8510-XTE is the SSH server. When you want to make SSH connection with the ES8510-XTE, you can use PortVision DX or download an SSH client tool.

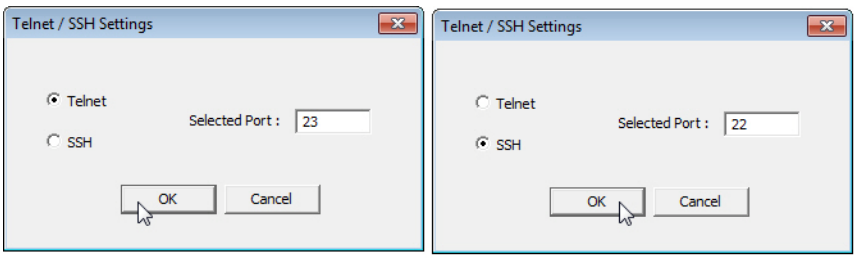
The next discussion provides procedures to use PortVision DX with a Telnet or SSH connection.

You can use PortVision DX to access the CLI using the following procedure.

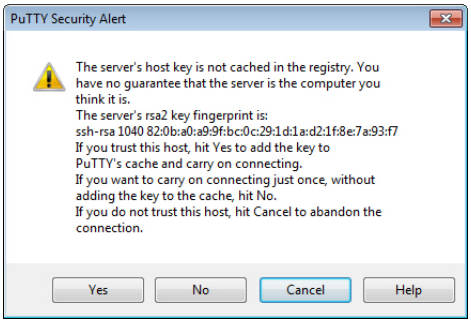
1. If you have not done so, install PortVision DX (*Installing PortVision DX* on Page 16).
2. Start PortVision DX.
3. Right-click the ES8510-XTE in the *Device List* pane (lower) and click **Telnet/SSH**.



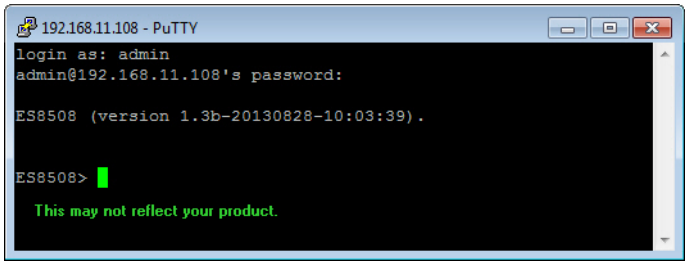
4. Select either Telnet or SSH and leave the default port number.



If you selected **SSH**, click **Yes**.

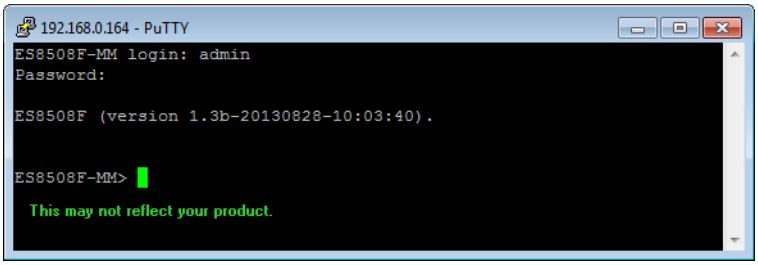


- Enter the user name (default = **admin**).
- Enter the password (default = **admin**).



If you selected **Telnet**:

- Enter the user name (default = **admin**).
- Enter the password (default = **admin**).



All the commands you see in SSH are the same as the CLI commands you see through the RS-232 console.

For more information about using the CLI, see *Command Line Interface Introduction* on Page 131.

Command Line Interface Introduction

The Command Line Interface (CLI) is the user interface to the ES8510-XTE embedded software. You can view the system information, show the status, configure the switch, and receive a response back from the system by keying in a command.

There are several different command modes. Each command mode has its own access ability, available command lines and uses different command lines to enter and exit. These modes are:

- *User EXEC Mode* on Page 132, which includes commands to ping or telnet to a remote device, and show some basic information and to access *Privileged EXEC* mode
- *Privileged EXEC Mode* on Page 134, which provides a view current configuration, reset default, reload switch, show system information, save configuration, and access *Global Configuration* mode
- *Global Configuration Mode* on Page 135, which you can use configure all ES8510-XTE features and access to one of the *Interface Configuration* modes
- *(Port) Interface Configuration* on Page 136, which can be used to configure port settings
- *(VLAN) Interface Configuration* on Page 137, which can be used to configure the settings for a specific VLAN

Refer to *Configuration Using the Command Line Interface (CLI)* on Page 126 to access the CLI.

User EXEC Mode

When you login to the ES8510-XTE with the CLI, you are in *User EXEC* mode.

In *User EXEC* mode, you can ping, telnet to a remote device, and show some basic information.

Type the command and press **Enter**:

```
Switch>
  enable       Turn on privileged mode command
  exit         Exit current mode and down to previous mode
  list         Print command list
  ping         Send echo messages
  quit         Exit current mode and down to previous mode
  show         Show running system information
  telnet       Open a telnet connection
  traceroute   Trace route to destination
```

- **enable** to access *Privileged EXEC* mode (*Privileged EXEC Mode* on Page 134).
- **exit** to logout.
- **?** to see the command list.
- **list** to review the *User EXEC* mode commands and corresponding options.

For the complete list of commands with options, refer to *User EXEC Mode* on Page 183.

Accessing the Options for a Command

The following example illustrates how to view the description and options for a command. This example illustrates the **show** command and the firmware version displayed may not reflect your firmware version.

Note: *The **?** does not appear on the screen.*

1. If you type **show?** (without a space between **show** and the **?**; do not press the **Enter** key) the ES8510-XTE provides a basic description of that command.

```
Switch login: admin
Password:

Switch  (version 2.7 -20130314 - 15:23:41)
switch> show
  show  Show running system information
```

Note: *The firmware version may not reflect your RocketLinx.*

2. If you type **show ?** (with a space between **show** and the **?**; do not press the **Enter** key) the ES8510-XTE provides information about the options for that command.

```
Switch> show
  arp             ARP table
  gvrp            GARP VLAN Registration Protocol
  ip              IP information
  version         Displays ISS version
```

3. Type **show ip ?** (with a space between **show** and the **?**, do not press the **Enter** key) to review the options for **ip**.

```
Switch> show ip
  forwarding  IP forwarding status
  route       IP routing table
```

4. Type **show ip route** and press the **Enter** key to view the IP routing tables for the ES8510-XTE.

```
Switch> show ip route
Codes: K - kernel route, C - connected, S - static, R - RIP, O - OSPF,
       B - BGP, > - selected route, * - FIB route

S>* 0.0.0.0/0 [1/0] via 192.168.0.253, vlan1
C>* 127.0.0.0/8 is directly connected, lo
C>* 192.0.0.0/8 is directly connected, vlan1
```

5. If you type **list** and press **Enter**, the ES8510-XTE provides you information about all of the commands and options for a mode. The following example shows the available commands and their options for *User EXEC* mode.

```
ES8510-XTE> list
  enable
  exit
  list
  ping A.B.C.D
  ping X:X::X:X
  quit
  show arp
  show gvrp statistics [IFNAME]
  show ip forwarding
  show ip route
  show ip route A.B.C.D
  show ip route A.B.C.D/M
  show ip route supernets-only
  show version
  telnet WORD
  telnet WORD PORT
  traceroute WORD
```

Privileged EXEC Mode

If you type **enable** in *User EXEC* mode, you can access *Privileged EXEC* mode. In this mode, the ES8510-XTE allows you to view current configuration, reset default, reload switch, show system information, save configuration, and enter *Global Configuration* mode.

Type the following commands and press the **Enter** key:

- **configure terminal** to access *Global Configuration* mode (*Global Configuration Mode* on Page 135).
- **exit** to close the CLI.
- **?** to see the command list.
- **list** to review the *Privileged EXEC* mode commands and corresponding options.

For the complete list of commands and options, refer to *Privileged EXEC Mode* on Page 184.

```
Switch>enable
Switch#
  archive       manage archive files
  clear         Reset functions
  clock         Configure time-of-day clock
  configure     Configuration from vty interface
  copy          Copy from one file to another
  debug         Debugging functions
  disable       Turn off privileged mode command
  dot1x         IEEE 802.1x standard access security control
  end           End current mode and change to enable mode
  exit          Exit current mode and down to previous mode
  list          Print command list
  no            Negate a command or set its defaults
  pager         Terminal pager
  ping          Send echo messages
  quit          Exit current mode and down to previous mode
  reboot        Reboot system
  reload        copy a default-config file to replace the current one
  show          Show running system information
  telnet        Open a telnet connection
  terminal      Set terminal line parameters
  traceroute    Trace route to destination
  write         Write running configuration to memory, network, or terminal
```

Global Configuration Mode

If you type **configure terminal** in *Privileged EXEC* mode, you can then access *Global Configuration* mode. In *Global Configuration* mode, you can configure all ES8510-XTE features. Type the following commands and press the **Enter** key:

- **interface *IFNAME/VLAN***, to access the corresponding *Interface Configuration* mode.
- **exit** to return to *Privileged EXEC* mode.
- **?** to see the command list.
- **list** to review the *Global Configuration* mode commands and corresponding options.

The following is a list of available command lists of *Global Configuration* mode. For the complete list of commands and options, refer to *Global Configuration Mode* on Page 189..

Optionally, type **config term**

```
Switch# configure terminal
Switch(config)#
  administrator      Administrator account setting
  arp                Set a static ARP entry
  auth               Authentication
  clock              Configure time-of-day clock
  default            Set a command to its defaults
  dot1x              IEEE 802.1x standard access security control
  end                End current mode and change to enable mode
  ethertype          Ethertype
  exit               Exit current mode and down to previous mode
  gvrp               GARP VLAN Registration Protocol
  hostname           Set system's network name
  interface          Select an interface to configure
  ip                 IP information
  ipv6               IP information
  lacp               Link Aggregation Control Protocol
  list               Print command list
  lldp               Link Layer Discovery Protocol
  log                Logging control
  loop-protect       Ethernet loop protection
  mac-address-table  Mac address table
  mirror             Port mirroring
  modbus             Modbus TCP slave
  nameserver         DNS Server
  netvision          NetVision protocol
  no                 Negate a command or set its defaults
  ntp                Configure NTP
  qos                Quality of Service (QoS)
  redundant-ring     Configure redundant ring
  relay              relay output type information
  router             Enable a routing process
  service            System service
  sfp                Small form-factor pluggable
  smtp-server        SMTP server configuration
  snmp-server        SNMP server
  spanning-tree      spanning tree algorithm
  trunk              Trunk group configuration
  vlan               Virtual LAN
  warning-event      Warning event selection
  write-config       Specify config files to write to
```

(Port) Interface Configuration

When you type **interface *IFNAME*** in *Global Configuration* mode, you can access *Interface Configuration* mode. In this mode you can configure port settings.

The port interface names for the Fast Ethernet ports are fa1 through fa10

Type the interface name, for example fa1, when you want to enter a certain interface configuration mode. Type the following commands and press the **Enter** key:

- **exit** to return to *Privileged EXEC* mode.
- **?** to see the command list.
- **list** to review the *Interface Configuration* mode commands and corresponding options. The following list is the available commands for the *Port Interface Configuration* mode.

For the complete list of commands and options, refer to *Port Interface Configuration Mode* on Page 194.

```
Switch(config)# interface fa1
Switch(config-if)#
  acceptable         Configure 802.1Q acceptable frame types of a port
  auto-negotiation   Enable auto-negotiation state of a given port
  description        Interface specific description
  dot1x              IEEE 802.1x standard access security control
  duplex             Specify duplex mode of operation for a port
  end                End current mode and change to enable mode
  exit               Exit current mode and down to previous mode
  flowcontrol        Set flow-control value for an interface
  garp               General Attribute Registration Protocol
  ingress            IEEE 802.1Q ingress filtering features
  lacp               Link Aggregation Control Protocol
  list               Print command list
  loopback           Specify loopback mode of operation for a port
  mdix               Enable mdix state of a given port
  no                 Negate a command or set its defaults
  qos                Quality of Service (QoS)
  quit               Exit current mode and down to previous mode
  rate-limit         Rate limit configuration
  sfp                Small form-factor pluggable
  shutdown           Shutdown the selected interface
  spanning-tree      spanning-tree protocol
  speed              Specify the speed of a Fast Ethernet port
  switchport         Set switching mode characteristics
```

(VLAN) Interface Configuration

If you type **interface VLAN *VLAN-ID*** in *Global Configuration* mode, you can access *VLAN Interface Configuration* mode. In this mode, you can configure the settings for the specific VLAN.

The VLAN interface name of VLAN 1, VLAN 2 is VLAN 2.

Type **exit** to return to the previous mode. Type **?** to see the available command list.

For the complete list of commands and options, refer to *VLAN Interface Configuration Mode* on Page 196.

```
Switch(config)# interface vlan 1
Switch(config-if)#
  description  Interface specific description
  end          End current mode and change to enable mode
  exit         Exit current mode and down to previous mode
  ip           Interface Internet Protocol config commands
  ipv6         Interface Internet Protocol config commands
  list         Print command list
  no           Negate a command or set its defaults
  quit         Exit current mode and down to previous mode
  shutdown     Shutdown the selected interface
```

Command Mode Summary

This table is a summary of the five command modes.

Mode: Main Function	Access and Exit Mode	Prompt
User EXEC: This is the first level of access. You can ping, telnet a remote device, and show some basic information.	• Access *User EXEC* mode: Login successfully. • Exit: **exit** to logout. • Next mode: Type **enable** to enter *Privileged EXEC* mode.	`Switch>`
Privileged EXEC: Allows you to view current configuration, reset the default values, reload the switch, show system information, save configuration and enter *Global Configuration* mode.	• Access *Privileged EXEC* mode: Type **enable** in *User EXEC* mode. • Exec: Type **disable** to exit to *User EXEC* mode. • Type **exit** to logout. • Next mode: Type **configure terminal** to enter *Global Configuration* mode.	`Switch#`
Global Configuration: Configure all of the features that the ES8510-XTE provides.	• Access *Global Configuration* mode: Type **configure terminal** in *Privileged EXEC* mode. • Exit: Type **exit** or **end** or press **Ctrl-Z** to exit. • Next mode: Type **interface IFNAME/ VLAN *VID*** to enter *Interface Configuration* mode.	`Switch(config)#`
Port Interface Configuration: Configure port related settings.	• Access *Port Interface Configuration* mode: Type **interface *IFNAME*** in global configuration mode. • Exit: Type **exit** or **Ctrl+Z** to *Global Configuration* mode. • Type **end** to return to *Privileged EXEC* mode.	`Switch(config-if)#`

Mode: Main Function	Access and Exit Mode	Prompt
VLAN Interface Configuration: Configure settings for a specific VLAN.	• Access *VLAN Interface Configuration* mode: Type **interface VLAN *VID*** in *Global Configuration* mode. • Exit: Type **exit** or **Ctrl+Z** to return to *Global Configuration* mode. • Type **end** to return to *Privileged EXEC* mode.	`Switch(config-vlan)#`

The following are useful commands to save you typing time and to avoid typing errors.

Press **?** to see all of the available commands in a mode. It helps you to see the next command you can type.

```
Switch(config)# interface (?)
  IFNAME    Interface's name
  vlan      Select a vlan to configure
```

Type a *Character***?** (shown below) to see all of the available commands starting with this character.

```
Switch(config)# a?
  arp             Set a static ARP entry
  auth            Authentication
```

Press the **Tab** key, which helps you to input the command quicker. If there is only one available command in the next, click the **Tab** key to help finish the typing.

```
Switch# co (tab) (tab)
Switch# configure terminal

Switch(config)# ad (tab)
Switch(config)# administrator
```

Key Combination	Function
Ctrl+C	To stop executing the unfinished command.
Ctrl+S	To lock the screen of the terminal - you cannot input any command.
Ctrl+Q	To unlock the screen which is locked by **Ctrl+S**.
Ctrl+Z	To exit *Configuration* mode.

Basic Settings (CLI)

The *Basic Setting* group provides you with the ability to configure switch information, IP address, User name/ Password of the system. It also allows you to do firmware upgrade, backup and restore configuration, reload factory default, and reboot the system.

Optionally, you can use the web user interface for configuration, see *Basic Settings* on Page 44.

This table provides detailed information about the CLI commands for basic settings.

Switch Setting	

System Name	`Switch(config)# hostname`
	`  DWORD  Network name of this system`
	`Switch(config)# hostname ES8510-XTE`
	`Switch(config)#`

System Location	`Switch(config)# snmp-server location Minnesota`
System Contact	`Switch(config)# snmp-server contact support@comtrol.com`

Display	`Switch# show snmp-server name`
	`ES8510-XTE`
	`Switch# show snmp-server location`
	`Minnesota`
	`Switch# show snmp-server contact`
	`support@comtrol.com`
	`Switch> show version`
	`Hardware Information :`
	`Loader version : 1.6.2.12`
	`Firmware version : 3.0_b2-20160930-15:59:53`
	`Hardware version : 1.0`
	`CPLD Version : 1.0`
	`Switch# show hardware mac`
	`MAC Address: 00C04E300002`

Admin Password	

User Name and Password	`Switch(config)# administrator`
	`  NAME  Administrator account name`
	`Switch(config)# administrator admin`
	`  PASSWORD  Administrator account password`
	`Switch(config)# administrator admin admin`
	`Change administrator account admin and password admin success.`

Display	`Switch# show administrator`
	`Administrator account information`
	`name: admin`
	`password: admin`

IP Configuration	
IP Address/Mask (192.168.250.250, 255.255.255.0) The enabled bit of the subnet mask is used to represent the number displayed in the web user interface. For example, 8 represents: 255.0.0.0, 16 represents: 255.255.0.0, 24 represents:255.255.255.0.	Switch(config)# int vlan 1 Switch(config-if)# ip address dhcp Switch(config-if)# ip address 192.168.250.8/24 Switch(config-if)# ip dhcp client Switch(config-if)# ip dhcp client renew Switch(config-if)# ipv6 address ; IPv6 configuration X:X::X:X/M IPv6 address (e.g. 3ffe:506::1/48) Switch(config-if)# ipv6 address 3ffe:506::1/48
Gateway	Switch(config)# ip route 0.0.0.0/0 192.168.250.254/24
Remove Gateway	Switch(config)# no ip route 0.0.0.0/0 192.168.250.254/24
Display	Switch# show running-config …… ! interface vlan1 ip address 192.168.250.8/24 no shutdown ! ip route 0.0.0.0/0 192.168.250.254/24 !
Time Setting	
NTP Server	Switch(config)# ntp peer enable disable primary secondary Switch(config)# ntp peer primary IPADDR Switch(config)# ntp peer primary 192.168.250.250
Time Zone	Switch(config)# clock timezone 26 Sun Jan 1 04:13:24 2006 (GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London ***Note:*** *By typing clock timezone?, you can see the timezone list. Then choose the number of the timezone you want to select.*

Time Setting (Continued)	

Display	Switch # sh ntp associations
	Network time protocol
	  Status: Disabled
	  Primary peer: N/A
	  Secondary peer: N/A
	Switch # show clock
	Sun Jan 1 04:14:19 2006 (GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London
	
	Switch # show clock timezone
	clock timezone (26) (GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London

DHCP Server	
DHCP Server configuration	Enable DHCP Server on ES8510-XTE Switch Switch# Switch# configure terminal Switch(config)# router dhcp Switch(config-dhcp)# service dhcp Configure DHCP network address pool Switch(config-dhcp)#network 50.50.50.0/4 -(network/mask) Switch(config-dhcp)#default-router 50.50.50.1
Lease time configure	Switch(config-dhcp)#lease 300 (300 sec)

DHCP Relay Agent	Enable DHCP Relay Agent
	Switch#
	Switch# configure terminal
	Switch(config)# router dhcp
	Switch(config-dhcp)# service dhcp
	Switch(config-dhcp)# ip dhcp relay information option
	
	Enable DHCP Relay policy
	Switch(config-dhcp)# ip dhcp relay information policy replace
	drop Relay Policy
	keep Drop/Keep/Replace option 82 field replace
	Switch(config-dhcp)# ip dhcp relay information option
	  <cr>
	  circuit-id Configure Circuit-ID
	  remote-id Configure Remote-ID
	Switch(config-dhcp)# ip dhcp relay information option
	  option Option82
	Switch(config-dhcp)# ip dhcp relay information option

DHCP Server (continued)	
Show DHCP server information	Switch# show ip dhcp server statistics DHCP Server ON Address Pool 1 network:192.168.17.0/24 default-router:192.168.17.254 lease time:300 Excluded Address List IP Address ---------- (list excluded address) Manual Binding List IP Address MAC Address ---------- ---------- (list IP & MAC binding entry) Leased Address List IP Address MAC Address Leased Time Remains ---------- ---------- ---------- (list leased Time remain information for each entry)
DHCP Commands	Switch(config)# router dhcp Switch(config-dhcp)# default-router DHCP Default Router end Exit current mode and down to previous enable mode exit Exit current mode and down to previous mode ip IP protocol lease DHCP Lease Time list Print command list network dhcp network no Remove quit Exit current mode and down to previous mode service Enable service
DHCP Server Enable	Switch(config-dhcp)# service dhcp
DHCP Server IP Pool (Network/Mask)	Switch(config-dhcp)# network A.B.C.D/M network/mask ex. 10.10.1.0/24 Switch(config-dhcp)# network 192.168.10.0/24
DHCP Server – Default Gateway	Switch(config-dhcp)# default-router A.B.C.D address Switch(config-dhcp)# default-router 192.168.10.254
DHCP Server – lease time	Switch(config-dhcp)# lease TIME second Switch(config-dhcp)# lease 1000 (1000 second)
DHCP Server – Excluded Address	Switch(config-dhcp)# ip dhcp excluded-address A.B.C.D IP address Switch(config-dhcp)# ip dhcp excluded-address 192.168.10.123 <cr>

DHCP Server (continued)	

DHCP Server – Static IP and MAC binding	`Switch(config-dhcp)# ip dhcp static`
	`  MACADDR  MAC address`
	`Switch(config-dhcp)# ip dhcp static 00C0.4E30.0001`
	`  A.B.C.D  leased IP address`
	`Switch(config-dhcp)# ip dhcp static 00C0.4E30.0001`
	`192.168.10.99`

DHCP Relay – Enable DHCP Relay	`Switch(config-dhcp)# ip dhcp relay information`
	`  option  Option82`
	`  policy  Option82`
	`Switch(config-dhcp)# ip dhcp relay information option`

DHCP Relay – DHCP policy	`Switch(config-dhcp)# ip dhcp relay information policy`
	`  drop  Relay Policy`
	`  keep  Drop/Keep/Replace option82 field`
	`  replace`
	`Switch(config-dhcp)# ip dhcp relay information policy drop`
	`Switch(config-dhcp)# ip dhcp relay information policy keep`
	`Switch(config-dhcp)# ip dhcp relay information policy replace`

DHCP Relay – IP Helper Address	`Switch(config-dhcp)# ip dhcp helper-address`
	`  A.B.C.D`
	`Switch(config-dhcp)# ip dhcp helper-address 192.168.10.200`

Reset DHCP Settings	`Switch(config-dhcp)# ip dhcp reset`
Backup and Restore	

Backup Startup Configuration File	`Switch# copy startup-config tftp: 192.168.250.33/`
	`default.conf`
	`Writing Configuration [OK]`
	Note: *To backup the latest startup configuration file, you should save current settings to flash first. You can refer to Save to Flash on Page 124 to see how to save settings to the flash.*
	In the example above, 192.168.250.33 is the TFTP server's IP and default.conf is name of the configuration file. Your environment may use different IP addresses or different file name. Type target TFTP server IP or file name in this command.

Restore Configuration	`Switch# copy tftp: 192.168.250.33/default.conf startup-config`
Show Startup Config	`Switch# show startup-config`
Show Running Config	`Switch# show running-config`

Firmware Upgrade	
Firmware Upgrade	Switch# archive download-sw /overwrite tftp 192.168.11.33 ES8510-XTE.bin Firmware upgrading, don't turn off the switch! Tftping file ES8510-XTE.bin Firmware upgrading .... Firmware upgrade success!! Rebooting.....
Load Default	
Load Default	Switch# reload default-config file Reload OK! Switch# reboot
System Reboot	
Reboot	Switch# reboot

Port Configuration (CLI)

The Port Configuration group allows you to enable/disable port state, or configure port auto-negotiation, speed, duplex, flow control, rate limit control, and port aggregation settings. It also allows you to view port status and aggregation information.

Optionally, you can use the web user interface for configuration, see *Port Configuration* on Page 66.

This table provides detailed information about the CLI commands for port configuration.

Port Control	
Port Control – State	Switch(config-if)# shutdown -> Disable port state Port1 Link Change to DOWN interface fastethernet1 is shutdown now. Switch(config-if)# no shutdown -> Enable port state Port1 Link Change to DOWN Port1 Link Change to UP interface fastethernet1 is up now. Switch(config-if)# Port1 Link Change to UPSwitch(config)# sfp ddm Digital diagnostic and monitoring Switch(config)# sfp ddm Eject Reject DDM SFP Switch(config)# sfp ddm eject → eject SFP DDM transceiver all All DDM interface Example: Switch(config)# sfp ddm eject all DDM SFP on Port 9 normally ejected. DDM SFP on Port 9 normally ejected. All DDM SFP normally ejected. Switch(config)# interface fa9 → eject port 9 SFP DDM transceiver. Switch(config-if)# sfp ddm eject DDM SFP on Port 9 normally ejected
Port Control – Auto Negotiation	Switch(config)# interface fa1 Switch(config-if)# auto-negotiation Auto-negotiation of port 1 is enabled!
Port Control – Force Speed/ Duplex	Switch(config-if)# speed 100 Port1 Link Change to DOWN set the speed mode ok! Switch(config-if)# Port1 Link Change to UP Switch(config-if)# duplex full set the duplex mode ok!
Port Control – Flow Control	Switch(config-if)# flowcontrol on Flowcontrol on for port 1 set ok! Switch(config-if)# flowcontrol off Flowcontrol off for port 1 set ok!

Port Status	

Port Status	Switch# show interface fa1
	Interface fastethernet1
	  Administrative Status : Enable
	  Operating Status : Connected
	  Duplex : Full
	  Speed : 100
	  Flow Control :off
	  Default Port VLAN ID: 1
	  Ingress Filtering : Disabled
	  Acceptable Frame Type : All
	  Port Security : Disabled
	  Auto Negotiation : Disable
	  Loopback Mode : None
	  STP Status: forwarding
	  Default CoS Value for untagged packets is 0.
	  Mdix mode is Disable.
	  Medium mode is Copper.Switch# show sfp ddm →show SFP DDM information
	Port 8
	  Temperature:N/A
	  Tx power:N/A
	  Rx power:N/A
	Port 9
	  Temperature:64.00 C <range :0.0-80.00>
	  Tx power:-6.0 dBm <range : -9.0 - -4.0>
	  Rx power:-30.0 dBm <range: -30.0 - -4.0>
	Port 10
	  Temperature:67.00 C <range :0.0-80.00>
	  Tx power:-6.0 dBm <range : -9.0 - -4.0>
	  Rx power:-2.0 dBm <range: -30.0 - -4.0>
	Note: *Administrative Status -> Port state of the port. Operating status -> Current status of the port. Duplex -> Duplex mode of the port. Speed -> Speed mode of the port. Flow control -> Flow Control status of the port.*

Rate Control	

Rate Control – Ingress or Egress	`Switch(config-if)# rate-limit`
	`  egress   Outgoing packets`
	`  ingress  Incoming packets`
	Note: *To enable rate control, you should select the Ingress or Egress rule first; then assign the packet type and bandwidth.*

Rate Control – Filter Packet Type	`Switch(config-if)# rate-limit ingress mode`
	`  all              Limit all frames`
	`  broadcast        Limit Broadcast frames`
	`  flooded-unicast  Limit Broadcast, Multicast and flooded unicast frames`
	`  multicast        Limit Broadcast and Multicast frames`
	`Switch(config-if)# rate-limit ingress mode broadcast`
	`Set the ingress limit mode broadcast ok.`

Rate Control – Bandwidth	`Switch(config-if)# rate-limit ingress bandwidth`
	`  <0-100>  Limit in megabits per second (0 is no limit)`
	`Switch(config-if)# rate-limit ingress bandwidth 8`
	`Set the ingress rate limit 8Mbps for Port 1.`

Port Trunking	

LACP	`Switch(config)# lacp group 1 fa1`
	`Group 1 based on LACP(IEEE 802.3ad) is enabled!`
	Note: *The interface list is fa8-10. Ports with a different speeds cannot be aggregated together.*

Static Trunk	`Switch(config)# trunk group 2 fa6-7` `Trunk group 2 enable ok!`

Display – LACP	`Switch# show lacp internal`
	`LACP group 1 internal information:`
	`      LACP Port   Admin    Oper     Port`
	`Port  Priority    Key      Key      State`
	`----- ----------- -------- -------- -------`
	`   8           1        8        8    0x45`
	`   9           1        9        9    0x45`
	`  10           1       10       10    0x45`
	
	`LACP group 2 is inactive`
	`LACP group 3 is inactive`
	`LACP group 4 is inactive`

Display – LACP	`Switch# show lacp internal`
	`LACP group 1 is inactive`
	`LACP group 2 is inactive`
	`LACP group 3 is inactive`
	`LACP group 4 is inactive`
	`LACP group 5 is inactive`

Port Trunking	
Display – Trunk	Switch# show trunk group 1 FLAGS: I -> Individual P -> In channel D -> Port Down Trunk Group GroupID Protocol Ports --------+---------+----------------------------------- 1 LACP 8(D) 9(D) 10(D) Switch# show trunk group 2 FLAGS: I -> Individual P -> In channel D -> Port Down Trunk Group GroupID Protocol Ports --------+---------+----------------------------------- 2 Static 6(D) 7(P) Switch#

Network Redundancy (CLI)

It is critical for industrial applications that the network remains running at all times. The ES8510-XTE supports:

- Standard Rapid Spanning Tree Protocol (STP) and Rapid Spanning Tree Protocol (RSTP)

  The ES8510-XTE supports RSTP versions IEEE 802.1D-2004, IEEE 802.1D-1998 STP, and IEEE 802.1w RSTP.

- Multiple Spanning Tree Protocol (MSTP)

  MSTP implements IEEE 802.1s, which uses RSTP for rapid convergence, enables VLANs to be grouped into a spanning-tree instance, with each instance having a spanning-tree topology independent of other spanning-tree instances. This architecture provides multiple forwarding paths for data traffic, enables load balancing, and reduces the number of spanning-tree instances required to support a large number of VLANs. MSTP was originally defined in the IEEE 802.1s and later merged into the IEEE 802.1Q-2003 specification.

- Redundant Ring

  The Redundant Ring features 0 ms for restore and about 5 ms for fail over for copper.

- Rapid Dual Homing (RDH)

  Advanced RDH technology allows the ES8510-XTE to connect with a core managed switch easily and conveniently. With RDH technology, you can also couple several Rapid Super Rings or RSTP groups together, which is also known as Auto Ring Coupling.

Optionally, you can use the web user interface for configuration, see *Network Redundancy* on Page 71.

This table provides detailed information about the CLI command lines for network redundancy.

Global (STP, RSTP, and MSTP)	
Enable	`Switch(config)# spanning-tree enable`
Disable	`Switch(config)# spanning-tree disable`

Mode	`Switch(config)# spanning-tree mode`
	`  rst  the rapid spanning-tree protocol (802.1w)`
	`  stp  the spanning-tree prtotcol (802.1d)`
	`  mst  the multiple spanning-tree protocol (802.1s)`
	`Switch(config)# spanning-tree mode`
	`Switch(config)# spanning-tree mode mst`
	`  Spanning-Tree Mode change to be MSTP (802.1s)`
	`Switch(config)# spanning-tree mode stp`
	`Spanning-Tree Mode change to be STP(802.1d) .`
	`Switch(config)# spanning-tree mode rst`
	`Spanning-Tree Mode change to be RSTP(802.1w) .`
	`Switch(config)# spanning-tree mode mst`
	`Spanning-Tree Mode change to be MSTP(802.1s).`

Bridge Priority	`Switch(config)# spanning-tree priority`
	`  <0-61440>  the value of bridge priority in multiple of 4096`
	`Switch(config)# spanning-tree priority 4096`

Bridge Times	`Switch(config)# spanning-tree bridge-times (forward Delay) (max-age) (Hello Time)`
	`Switch(config)# spanning-tree bridge-times 15 20 2`
	
	`This command allows you configure all the timing in one time.`

Global (STP, RSTP, and MSTP) (Cont.)	
Forward Delay	Switch(config)# spanning-tree forward-time <4-30> the value of forward delay time in seconds Switch(config)# spanning-tree forward-time 15
Max Age	Switch(config)# spanning-tree max-age <6-40> the value of message maximum age time in seconds Switch(config)# spanning-tree max-age 20
Hello Time	Switch(config)# spanning-tree hello-time <1-10> the value of hello time in seconds Switch(config)# spanning-tree hello-time 2
MSTP	

Enter the MSTP Configuration Tree	Switch(config)# spanning-tree mst
	  MSTMAP the mst instance number or range
	  configuration enter mst configuration mode
	  forward-time the forward delay time
	  hello-time the hello time
	  max-age the message maximum age time
	  max-hops the maximum hops
	  sync sync port state of exist vlan entry
	Switch(config)# spanning-tree mst configuration
	Switch(config)# spanning-tree mst configuration
	Switch(config-mst)#
	  abort exit current mode and discard all changes
	  end exit current mode, change to enable mode and apply all changes
	  exit exit current mode and apply all changes
	  instance the mst instance
	  list Print command list
	  name the name of mst region
	  no Negate a command or set its defaults
	  quit exit current mode and apply all changes
	  revision the revision of mst region
	  show show mst configuration

Region Configuration	Region Name: Switch(config-mst)# name NAME the name string Switch(config-mst)# name comtrol Region Revision: Switch(config-mst)# revision <0-65535> the value of revision Switch(config-mst)# revision 65535
Mapping Instance to VLAN (Ex: Mapping VLAN 2 to Instance 1)	Switch(config-mst)# instance <1-15> target instance number Switch(config-mst)# instance 1 vlan VLANMAP target vlan number(ex.10) or range(ex.1-10) Switch(config-mst)# instance 1 vlan 2

MSTP (cont.)	
Display Current MST Configuration	Switch(config-mst)# show current Current MST configuration Name [comtrol] Revision 65535 Instance Vlans Mapped -------- --------------------------------------- 0 1,4-4094 1 2 2 3 --- Config HMAC-MD5 Digest: 0xB41829F9030A054FB74EF7A8587FF58D ---
Remove Region Name	Switch(config-mst)# no name name configure revision revision configure instance the mst instance Switch(config-mst)# no name
Remove Instance example	Switch(config-mst)# no instance <1-15> target instance number Switch(config-mst)# no instance 2
Show Pending MST Configuration	Switch(config-mst)# show pending Pending MST configuration Name [] (->The name is removed by no name) Revision 65535 Instance Vlans Mapped -------- --------------------------------------- 0 1,3-4094 1 2 (->Instance 2 is removed by no instance 2) --- Config HMAC-MD5 Digest: 0x3AB68794D602FDF43B21C0B37AC3BCA8 ---
Apply the setting and go to the configuration mode	Switch(config-mst)# quit apply all mst configuration changes Switch(config)#
Apply the setting and go to the global mode	Switch(config-mst)# end apply all mst configuration changes Switch#

MSTP (Continued)	
Abort the Setting and go to the configuration mode. Show Pending to see the new settings are not applied.	Switch(config-mst)# abort discard all mst configuration changes Switch(config)# spanning-tree mst configuration Switch(config-mst)# show pending Pending MST configuration Name [comtrol] (->The name is not applied after Abort settings.) Revision 65535 Instance Vlans Mapped -------- ------------------------------------ 0 1,4-4094 1 2 2 3 (-> The instance is not applied after Abort settings.) --- Config HMAC-MD5 Digest: 0xAC36177F50283CD4B83821D8AB26DE62 ---
RSTP	
System RSTP Setting	The mode should be rstp, timings can be configured in the global settings listed in the previous examples.
Port Configuration Mode	
Port Configuration	Switch(config)# interface fa1 Switch(config-if)# spanning-tree bpdufilter a secure BPDU process on edge-port interface bpduguard a secure response to invalid configurations (received BPDU sent by self) cost change an interface's spanning-tree port path cost edge-port interface attached to a LAN segment that is at the end of a bridged LAN or to an end node link-type the link type for the Rapid Spanning Tree mst the multiple spanning-tree port-priority the spanning tree port priority stp-state the bridge port STP state
Port Path Cost	Switch(config-if)# spanning-tree cost <1-200000000> 16-bit based value range from 1-65535, 32-bit based value range from 1-200,000,000 Switch(config-if)# spanning-tree cost 200000
Port Priority	Switch(config-if)# spanning-tree port-priority <0-240> Number from 0 to 240, in multiple of 16 Switch(config-if)# spanning-tree port-priority 128
Link Type - Auto	Switch(config-if)# spanning-tree link-type auto
Link Type - P2P	Switch(config-if)# spanning-tree link-type point-to-point

Port Configuration Mode (Continued)	
Link Type – Share	`Switch(config-if)# spanning-tree link-type shared`
Edge Port	`Switch(config-if)# spanning-tree edge-port enable` `Switch(config-if)# spanning-tree edge-port disable`

MSTP Port Configuration	`Switch(config-if)# spanning-tree mst MSTMAP cost`
	`  <1-200000000>  the value of mst instance port cost`
	`Switch(config-if)# spanning-tree mst MSTMAP port-priority`
	`  <0-240>  the value of mst instance port priority in multiple of 16`

Global Information	

Active Information	`Switch# show spanning-tree active`
	` Spanning-Tree :  Enabled  Protocol :  MSTP`
	` Root Address :  00C0.4E30.0001  Priority :  32768`
	` Root Path Cost : 0  Root Port : N/A`
	` Root Times :  max-age 20, hello-time  2, forward-delay 15`
	` Bridge Address : 00C0.4E30.0001  Priority :  32768`
	` Bridge Times : max-age 20, hello-time  2, forward-delay 15`
	` BPDU transmission-limit : 3`
	
	`  Port  Role  State  Cost  Prio.Nbr  Type  Aggregated`
	`  fa1  Designated Forwarding  200000  128.1  P2P(RSTP)  N/A`
	`  fa2  Designated Forwarding  200000  128.2  P2P(RSTP)  N/A`

RSTP Summary	`Switch# show spanning-tree summary`
	` Spanning-Tree :  Enabled  Protocol :  MSTP`
	` Root Address :  00c0.4e30.004f  Priority :  32768`
	` Root Path Cost : 400000  Root Port : 10`
	` Root Times :  max-age 20, hello-time  2, forward-delay 15`
	` Bridge Address  00c0.4e30.0001  Priority :  32768`
	` Bridge Times : max-age 20, hello-time  2, forward-delay 15`
	` BPDU transmission-limit : 3`
	` BPDU Skewing Detection : Disabled`
	` Backbonefast : Disabled`
	` Topology Change Flag :  False  Topology Change Detected Flag : False`
	` Topology Change Count : 571  Last Topology Change from : 0000.0000.0000`
	` Timers: hello 0, topology change 0`
	
	` Summary of connected spanning tree ports :`
	`  Port-State Summary`
	`  Blocking  Listening  Learning  Forwarding  Disabled`
	`  1  0  0  1  8`
	`  Port Link-Type Summary`
	`  AutoDetected  PointToPoint  SharedLink  EdgePort`
	`  10  0  0  8`

Global Information (Continued)	
Port Info	Switch# show spanning-tree interface fa1 Interface fastethernet1 of Bridge is Alternate Blocking Edge Port : Edge (Non-Edge) BPDU Filter : Disabled Link Type : Auto (Point-to-point) BPDU Guard : Disabled Timers : message-age 4, forward-delay 0 BPDUs : sent 26, received 34037 TCNs : sent 0, received 0 Message Expired Count : 0 Forward Transition Count : 8 Aggregation Group: N/A Type: N/A Aggregated with : N/A Port information port id 128.6 priority 128 cost 200000 Designated root address 00c0.4e30.004f priority 32768 cost 200000 Designated bridge address 00c0.4e30.0007 priority 32768 port id 128.5
MSTP Information	
MSTP Configuration	Switch# show spanning-tree mst configuration Current MST configuration (MSTP is Running) Name [comtrol] Revision 65535 Instance Vlans Mapped -------- --------------------------------------- 0 1,4-4094 1 2 2 3 --- Config HMAC-MD5 Digest: 0xAC36177F50283CD4B83821D8AB26DE62 ---
Display all MST Information	Switch# show spanning-tree mst ###### MST00 vlans mapped: 1,4-4094 Bridge address 00C0.4E30.0001 priority 32768 (sysid 0) Root this switch for CST and IST Configured max-age 2, hello-time 15, forward-delay 20, max-hops 20 Port Role State Cost Prio.Nbr Type ------ ---------- ---------- -------- ---------- ------------------ fa1 Designated Forwarding 200000 128.1 P2P Internal(MSTP) fa2 Designated Forwarding 200000 128.2 P2P Internal(MSTP) ###### MST01 vlans mapped: 2 Bridge address 00C0.4E30.0001 priority 32768 (sysid 1) Root this switch for MST01 Port Role State Cost Prio.Nbr Type ------ ---------- ---------- -------- ---------- ------------------ fa1 Designated Forwarding 200000 128.1 P2P Internal(MSTP) fa2 Designated Forwarding 200000 128.2 P2P Internal(MSTP)

MSTP Information (Continued)

Display all MST Information

```
Switch# show spanning-tree mst
 ###### MST00   vlans mapped: 1-4094
 Bridge         address 00c0.4e30.0001  priority  32768 (sysid 0)
 Root           address 00c0.4e2c.004f  priority  32768 (sysid 0)
                port    10              path cost 400000
 Regional root  this switch
 Operational    max-age  2, hello-time 15, forward-delay 20
 Configured     max-age  2, hello-time 15, forward-delay 20, max-hops 20

  Port     Role      State      Cost    Prio.Nbr         Type
 ------ ---------- ---------- -------- ---------- ------------------
  fa2   Alternate  Blocking    200000   128.6    P2P Bound(RSTP)
  fa1   Root       Forwarding  200000   128.10   P2P Bound(RSTP)
```

MSTP Root Information

```
Switch# show spanning-tree mst root
   MST    Root         Root    Root  Root   Max  Hello  Fwd
 Instance   Address     Priority  Cost  Port   age         dly
 -------- -------------- -------- ----------- ------ ----- ----- -----
   MST00  00C0.4E30.0001   32768   0   N/A   20   2   15
   MST01  00C0.4E30.0001   32768   0   N/A   20   2   15
   MST02  00C0.4E30.0001   32768   0   N/A   20   2   15
```

MSTP Instance Information

```
Switch# show spanning-tree mst 1
 ###### MST01   vlans mapped: 2
 Bridge         address 00C0.4E30.0001  priority  32768 (sysid 1)
 Root           this switch for MST01

  Port     Role      State      Cost    Prio.Nbr         Type
 ------ ---------- ---------- -------- ---------- ------------------
   fa1  Designated Forwarding   200000   128.1    P2P Internal(MSTP)
   fa2  Designated Forwarding   200000   128.2    P2P Internal(MSTP)
```

MSTP Port Information

```
Switch# show spanning-tree mst interface fa1
 Interface fastethernet1 of MST00 is Designated Forwarding
 Edge Port : Edge (Edge)            BPDU Filter : Disabled
 Link Type : Auto (Point-to-point)  BPDU Guard :  Disabled
 Boundary :  Internal(MSTP)
 BPDUs :  sent 6352, received 0

 Instance    Role      State      Cost    Prio.Nbr      Vlans mapped
 -------- ---------- ---------- -------- ---------- --------------------
     0    Designated Forwarding   200000   128.1    1,4-4094
     1    Designated Forwarding   200000   128.1    2
     2    Designated Forwarding   200000   128.1    3
```

Redundant Ring	
Create or configure a Ring	Switch(config)# redundant-ring 1 Ring 1 created Switch(config-redundant-ring)# ***Note:*** *1 is the target Ring ID which is going to be created or configured.*
Super Ring Version	Switch(config-redundant-ring)# version default set default to Redundant ring rapid-super-ring rapid super ring super-ring super ring Switch(config-redundant-ring)# version rapid-super-ring
Priority	Switch(config-redundant-ring)# priority <0-255> valid range is 0 to 255 default set default Switch(config-redundant-ring)# super-ring priority 100
Ring Port	Switch(config-redundant-ring)# port IFLIST Interface list, ex: fa1,fa3-5,fa8-10 cost path cost Switch(config-redundant-ring)# port fa1,fa2
Ring Info	
Ring Info	Switch# show redundant-ring [Ring ID] [Ring1] Ring1 Current Status : Disabled Role : Disabled Ring Status : Abnormal Ring Manager : 0000.0000.0000 Blocking Port : N/A Giga Copper : N/A Configuration : Version : Super Ring Priority : 128 Ring Port : fa1, fa2 Path Cost : 100, 200 Dual-Homing II : Disabled Statistics : Watchdog sent 0, received 0, missed 0 Link Up sent 0, received 0 Link Down sent 0, received 0 Role Transition count 0 Ring State Transition count 1 *Ring ID* is optional. If the ring ID is typed, this command only displays the information of the target Ring.

VLAN (CLI)

A Virtual LAN (VLAN) is a logical grouping of nodes for the purpose of limiting a broadcast domain to specific members of a group without physically grouping the members. The VLAN allows you to isolate network traffic so that only members of the VLAN could receive traffic from the same VLAN members. Basically, creating a VLAN from a switch is the logical equivalent of physically reconnecting a group of network devices to another Layer 2 switch, without actually disconnecting these devices from their original switches.

The ES8510-XTE supports IEEE 802.1Q VLAN, which is also known as Tag-Based VLAN. This Tag-Based VLAN allows a VLAN to be created across different switches. IEEE 802.1Q tag-based VLAN makes use of VLAN control information stored in a VLAN header attached to IEEE 802.3 packet frames. This tag contains a VLAN Identifier (VID) that indicates which VLAN a frame belongs to. Since each switch only has to check a frame's tag, without the need to dissect the contents of the frame, this also saves a lot of computing resources within the switch.

Optionally, you can use the web user interface for configuration, see *VLAN* on Page 85.

The following table provides detailed information about command lines for the VLAN.

VLAN Port Configuration	
VLAN Port PVID	`Switch(config-if)# switchport trunk native vlan 2` `Set port default vlan id to 2 success`

Port Accept Frame Type	`Switch(config)# inter fa1`
	`Switch(config-if)# acceptable frame type all`
	`any kind of frame type is accepted!`
	`Switch(config-if)# acceptable frame type vlantaggedonly`
	`only vlan-tag frame is accepted!`

Ingress Filtering (for Fast Ethernet Port 1)	`Switch(config)# interface fa1`
	`Switch(config-if)# ingress filtering enable`
	`ingress filtering enable`
	`Switch(config-if)# ingress filtering disable`
	`ingress filtering disable`

Egress rule – Untagged (for VLAN 2)	`Switch(config-if)# switchport access vlan 2` `switchport access vlan - success`
Egress rule – Tagged (for VLAN 2)	`Switch(config-if)# switchport trunk allowed vlan add 2`

Display – Port Ingress Rule (PVID, Ingress Filtering, Acceptable Frame Type)	`Switch# show interface fa1`
	`Interface fastethernet1`
	`  Administrative Status : Enable`
	`  Operating Status : Not Connected`
	`  Duplex : Auto`
	`  Speed : Auto`
	`  Flow Control :off`
	`  Default Port VLAN ID: 2`
	`  Ingress Filtering : Disabled`
	`  Acceptable Frame Type : All`
	`  Port Security : Disabled`
	`  Auto Negotiation : Enable`
	`  Loopback Mode : None`
	`  STP Status: disabled`
	`  Default CoS Value for untagged packets is 0.`
	`  Mdix mode is Auto.`
	`  Medium mode is Copper.`

VLAN Port Configuration (continued)	

Display – Port Egress Rule (Egress rule, IP address, status)	`Switch# show running-config`
	`……`
	`!`
	`interface fastethernet1`
	`switchport access vlan 1`
	`switchport access vlan 3`
	`switchport trunk native vlan 2`
	`…….`
	`interface vlan1`
	`ip address 192.168.250.8/24`
	`no shutdown`

VLAN Configuration	

Create VLAN (2)	`Switch(config)# vlan 2`
	`vlan 2 success`
	
	`Switch(config)# interface vlan 2`
	`Switch(config-if)#`
	Note: *In the CLI configuration, you should first create a VLAN interface. Then you can start to add/remove ports. The default status of the created VLAN is unused until you add member ports to it.*

Remove VLAN	`Switch(config)# no vlan 2`
	`no vlan success`
	Note: *You can only remove the VLAN when the VLAN is in unused mode.*

VLAN Name	`Switch(config)# vlan 2`
	`vlan 2 has exists`
	`Switch(config-vlan)# name v2`
	
	`Switch(config-vlan)# no name`
	Note: *Use no name to change the name to default name, VLAN VID.*

VLAN description	`Switch(config)# interface vlan 2`
	`Switch(config-if)#`
	`Switch(config-if)# description this is the VLAN 2`
	
	`Switch(config-if)# no description  ->Delete the description.`

IP address of the VLAN	`Switch(config)# interface vlan 2`
	`Switch(config-if)#`
	`Switch(config-if)# ip address 192.168.250.18/24`
	`Switch(config-if)# no ip address 192.168.250.8/24  ->Delete the IP address`

Create multiple VLANs (VLAN 5-8)	`Switch(config)# interface vlan 5-8`

Shutdown VLAN	`Switch(config)# interface vlan 2`
	`Switch(config-if)# shutdown`
	`Switch(config-if)# no shutdown  ->Turn on the VLAN`

VLAN Configuration (continued)	
Display – VLAN table	Switch# sh vlan VLAN Name Status Trunk Ports Access Ports ---- ---- ------ ------------ ------------------------- 1 VLAN1 Static - fa1-102 VLAN2 Unused - - 3 test Static fa410 fa1-3,fa7,fa8-10
Display – VLAN interface information	Switch# show interface vlan1 interface vlan1 is up, line protocol detection is disabled index 14 metric 1 mtu 1500 <UP,BROADCAST,RUNNING,MULTICAST> HWaddr: 00:c0:4e:ff:01:b0 inet 192.168.250.100/24 broadcast 192.168.250.255 input packets 639, bytes 38248, dropped 0, multicast packets 0 input errors 0, length 0, overrun 0, CRC 0, frame 0, fifo 0, missed 0 output packets 959, bytes 829280, dropped 0 output errors 0, aborted 0, carrier 0, fifo 0, heartbeat 0, window 0 collisions 0
GVRP Configuration	
GVRP enable/ disable	Switch(config)# gvrp mode disable Disable GVRP feature globally on the switch enable Enable GVRP feature globally on the switch Switch(config)# gvrp mode enable Gvrp is enabled on the switch!
Configure GVRP timer Join timer /Leave timer/ LeaveAll timer	Switch(config)# inter fa1 Switch(config-if)# garp timer <10-10000> Switch(config-if)# garp timer 20 60 1000 ***Note:*** *The unit of this timer is centiseconds.*
Management VLAN	
Management VLAN	Switch(config)# int vlan 1 (Go to management VLAN) Switch(config-if)# no shutdown
Display	Switch# show running-config …. ! interface vlan1 ip address 192.168.250.17/24 ip igmp no shutdown ! ….

Private VLAN (CLI)

A private VLAN helps to resolve the primary VLAN ID shortage, client ports' isolation and network security issues. The Private VLAN features provides primary and secondary VLANs within a single switch.

Primary VLAN: The uplink port is usually a member of the primary VLAN. A primary VLAN contains promiscuous ports that can communicate with Secondary VLANs.

Secondary VLAN: The client ports are usually defined within secondary VLAN. The secondary VLAN includes Isolated and Community VLANs. The client ports can be isolated VLANs or can be grouped in the same Community VLAN. The ports within the same community VLAN can communicate with each other, however, the isolated VLAN ports cannot.

Optionally, you can use the web user interface for configuration, see *Private VLAN* on Page 98.

The following table provides detailed information about command lines for private VLAN port configuration, VLAN configuration, and VLAN table display.

Private VLAN Configuration	

Create VLAN	`Switch(config)# vlan 2`
	`vlan 2 success`
	`Switch(config-vlan)#`
	`  end  End current mode and change to enable mode`
	`  exit  Exit current mode and down to previous mode`
	`  list  Print command list`
	`  name  Assign a name to vlan`
	`  no  no`
	`  private-vlan  Configure a private VLAN`

Private VLAN Type
 	
Choose the Types
 	
Primary Type
 	
Isolated Type
 	
Community Type
	Go to the VLAN you want configure first.
	`Switch(config)# vlan (VID)`
	
	`Switch(config-vlan)# private-vlan`
	`  community  Configure the VLAN as an community private VLAN`
	`  isolated  Configure the VLAN as an isolated private VLAN`
	`  primary  Configure the VLAN as a primary private VLAN`
	
	`Switch(config-vlan)# private-vlan primary`
	`  <cr>`
	
	`Switch(config-vlan)# private-vlan isolated`
	`  <cr>`
	
	`Switch(config-vlan)# private-vlan community`
	`  <cr>`

Private VLAN Port Configuration	

Go to the port configuration	`Switch(config)# interface (port_number, ex: fa1)`
	`Switch(config-if)# switchport private-vlan`
	`  host-association  Set the private VLAN host association`
	`  mapping  map primary VLAN to secondary VLAN`

Private VLAN Port Type
 	
Promiscuous Port Type
 	
Host Port Type
	`Switch(config-if)# switchport mode`
	`  private-vlan  Set private-vlan mode`
	`Switch(config-if)# switchport mode private-vlan`
	`  host  Set the mode to private-vlan host`
	`  promiscuous  Set the mode to private-vlan promiscuous`
	`Switch(config-if)# switchport mode private-vlan promiscuous`
	`  <cr>`
	
	`Switch(config-if)# switchport mode private-vlan host`
	`  <cr>`

Private VLAN Port Configuration
 	
PVLAN Port Type
 	
Host Association primary to secondary
 	
(The command is only available for host port.)
	`Switch(config)# interface fa1`
	
	`Switch(config-if)# switchport mode private-vlan host`
	
	`Switch(config-if)# switchport private-vlan host-association`
	`  <2-4094>  Primary range VLAN ID of the private VLAN port association`
	`Switch(config-if)# switchport private-vlan host-association 2`
	`  <2-4094>  Secondary range VLAN ID of the private VLAN port association`
	`Switch(config-if)# switchport private-vlan host-association 2 3`

Mapping primary to secondary VLANs
 	
(This command is only available for promiscuous port)
	`Switch(config)# interface fa1`
	
	`Switch(config-if)# switchport mode private-vlan promiscuous`
	
	`Switch(config-if)# switchport private-vlan mapping 2 add 3`
	`Switch(config-if)# switchport private-vlan mapping 2 add 4`
	`Switch(config-if)# switchport private-vlan mapping 2 add 5`

Private VLAN Information	

Private VLAN Information	`Switch# show vlan private-vlan`
	`FLAGS:  I -> Isolated  P -> Promiscuous`
	`  C -> Community`
	`Primary Secondary Type  Ports`
	`------- --------- ----------------- ----------------------`
	`2  3  Isolated  fa1(P),fa2(I)`
	`2  4  Community  fa2(P),fa3(C)`
	`2  5  Community  fa2(P),fa1(C),fa3(I)`
	`10  -  -  -`

Private VLAN Information (Continued)	

Running Config Information
 	
Private VLAN Type
 	
Private VLAN Port Information
	Switch# show run
	Building configuration...
	
	Current configuration:
	hostname Switch
	vlan learning independent
	!
	vlan 1
	!
	vlan 2
	 private-vlan primary
	!
	vlan 3
	 private-vlan isolated
	!
	vlan 4
	 private-vlan community
	!
	vlan 5
	 private-vlan community
	!
	……..
	……..
	interface fastethernet7
	  switchport access vlan add 2,5
	  switchport trunk native vlan 5
	 switchport mode private-vlan host
	 switchport private-vlan host-association 2 5
	!
	interface fastethernet
	  switchport access vlan add 2,4
	  switchport trunk native vlan 4
	 switchport mode private-vlan host
	 switchport private-vlan host-association 2 4
	!
	interface gigabitethernet9
	  switchport access vlan add 2,5
	  switchport trunk native vlan 5
	 switchport mode private-vlan host
	 switchport private-vlan host-association 2 3
	!
	interface gigabitethernet10
	  switchport access vlan add 2,5
	  switchport trunk native vlan 2
	 switchport mode private-vlan promiscuous
	 switchport private-vlan mapping 2 add 3-5
	……
	……..

Private VLAN Information (Continued)	
PVLAN Type	Switch# show vlan private-vlan type Vlan Type Ports ---- ---------- ---------- 2 primary fa3 3 isolated fa2 4 community fa1 5 community fa4,fa5 10 primary -
Host List	Switch# show vlan private-vlan port-list Ports Mode Vlan ----- ---------- ---- 1 normal - 2 normal - 3 normal - 4 normal - 5 normal - 6 normal - 7 host 5 8 host 4 9 host 3 10 promiscuous 2

Traffic Prioritization (CLI)

Quality of Service (QoS) provides a traffic prioritization mechanism which allows you to deliver better service to certain flows. QoS can also help to alleviate congestion problems and ensure high-priority traffic is delivered first. This section allows you to configure Traffic Prioritization settings for each port with regard to setting priorities.

ES8510-XTE QOS supports four physical queues, weighted fair queuing (WRR) and Strict Priority scheme, that follows the IEEE 802.1p COS tag and IPv4 TOS/DiffServ information to prioritize the traffic of your industrial network.

Optionally, you can use the web user interface for configuration, see *Traffic Prioritization* on Page 95. This table provides detailed information about command lines for traffic prioritization configuration

QoS Setting	

Queue Scheduling – Strict Priority	`Switch(config)# qos queue-sched`
	`  sp  Strict Priority`
	`  wrr  Weighted Round Robin (Use an 8,4,2,1 weight)`
	`Switch(config)# qos queue-sched sp`
	`  <cr>`

Queue Scheduling - WRR	`Switch(config)# qos queue-sched wrr`

Port Setting – CoS (Default Port Priority)	`Switch(config)# interface fa1`
	`Switch(config-if)# qos cos`
	`  DEFAULT-COS  Assign an priority (7 highest)`
	`Switch(config-if)# qos cos 7`
	`The default port CoS value is set 7 ok.`
	Note: *When change the port setting, you should select the specific port first.* `fa1` *means Fast Ethernet port 1.*

Port Setting – Trust Mode- CoS Only	`Switch(config)# interface fa1`
	`Switch(config-if)# qos trust cos`
	`The port trust is set CoS only ok.`

Port Setting – Trust Mode- CoS First	`Switch(config)# interface fa1`
	`Switch(config-if)# qos trust cos-first`
	`The port trust is set CoS first ok.`

Port Setting – Trust Mode- DSCP Only	`Switch(config)# interface fa1`
	`Switch(config-if)# qos trust dscp`
	`The port trust is set DSCP only ok.`

Port Setting – Trust Mode- DSCP First	`Switch(config)# interface fa1`
	`Switch(config-if)# qos trust dscp-first`
	`The port trust is set DSCP first ok.`

Display – Queue Scheduling	`Switch# show qos queue-sched` `QoS queue scheduling scheme : Weighted Round Robin (Use an 8,4,2,1 weight)`

QoS Setting (cont.)	
Display – Port Setting - Trust Mode	Switch# show qos trust QoS Port Trust Mode : Port Trust Mode -----+------------ 1 DSCP first 2 COS only 3 COS only 4 COS only 5 COS only 6 COS only 7 COS only 8 COS only 9 COS only 10 COS only
Display – Port Setting – CoS (Port Default Priority)	Switch# show qos port-cos Port Default Cos : Port CoS -----+---- 1 7 2 0 3 0 4 0 5 0 6 0 7 0 8 0 9 0 10 0
CoS-Queue Mapping	
Format	Switch(config)# qos cos-map PRIORITY Assign an priority (7 highest) Switch(config)# qos cos-map 1 QUEUE Assign an queue (0-3) **Format**: *qos cos-map priority_value queue_value.*
Map CoS 0 to Queue 1	Switch(config)# qos cos-map 0 1 The CoS to queue mapping is set ok.
Map CoS 1 to Queue 0	Switch(config)# qos cos-map 1 0 The CoS to queue mapping is set ok.
Map CoS 2 to Queue 0	Switch(config)# qos cos-map 2 0 The CoS to queue mapping is set ok.
Map CoS 3 to Queue 1	Switch(config)# qos cos-map 3 1 The CoS to queue mapping is set ok.
Map CoS 4 to Queue 2	Switch(config)# qos cos-map 4 2 The CoS to queue mapping is set ok.
Map CoS 5 to Queue 2	Switch(config)# qos cos-map 5 2 The CoS to queue mapping is set ok.
Map CoS 6 to Queue 3	Switch(config)# qos cos-map 6 3 The CoS to queue mapping is set ok.
Map CoS 7 to Queue 3	Switch(config)# qos cos-map 7 3 The CoS to queue mapping is set ok.

CoS-Queue Mapping (cont.)	
Display – CoS-Queue mapping	Switch# sh qos cos-map CoS to Queue Mapping : CoS Queue ---- + ------ 0 1 1 0 2 0 3 1 4 2 5 2 6 3 7 3
DSCP-Queue Mapping	
Format	Switch(config)# qos dscp-map PRIORITY Assign an priority (63 highest) Switch(config)# qos dscp-map 0 QUEUE Assign an queue (0-3) **Format**: *qos dscp-map priority_value queue_value.*
Map DSCP 0 to Queue 1	Switch(config)# qos dscp-map 0 1 The TOS/DSCP to queue mapping is set ok.
Display – DSCO-Queue mapping	Switch# show qos dscp-map DSCP to Queue Mapping : (dscp = d1 d2) d2| 0 1 2 3 4 5 6 7 8 9 d1 | -----+---------- 0 | 1 1 1 1 1 1 1 1 0 0 1 | 0 0 0 0 0 0 0 0 0 0 2 | 0 0 0 0 1 1 1 1 1 1 3 | 1 1 2 2 2 2 2 2 2 2 4 | 2 2 2 2 2 2 2 2 3 3 5 | 3 3 3 3 3 3 3 3 3 3 6 | 3 3 3 3

Multicast Filtering (CLI)

For multicast filtering, the ES8510-XTE uses IGMP (Internet Group Management Protocol) Snooping technology. IGMP is an internet protocol that provides a way for internet device to report its multicast group membership to adjacent routers. Multicasting allows one computer on the internet to send data to a multitude of other computers that have identified themselves as being interested in receiving the originating computers data.

Multicasting is useful for such applications as updating the address books of mobile computer users in the field, sending out newsletters to a distribution list, and broadcasting streaming media to an audience that has tuned into the event by setting up multicast group membership.

In effect, IGMP Snooping manages multicast traffic by making use of switches, routers, and hosts that support IGMP. Enabling IGMP Snooping allows the ports to detect IGMP queries, report packets, and manage multicast traffic through the switch. IGMP has three fundamental types of messages, as shown in the following table.

Message	
Query	A message sent from the querier (an IGMP router or a switch) that asks for a response from each host that belongs to the multicast group.
Report	A message sent by a host to the querier to indicate that the host wants to be or is a member of a given group indicated in the report message.
Leave Group	A message sent by a host to the querier to indicate that the host has quit as a member of a specific multicast group.

You can enable **IGMP Snooping** and **IGMP Query** functions. This section illustrates the information of the IGMP Snooping function, including different multicast groups' VID and member ports, and IP multicast addresses that range from 224.0.0.0 to 239.255.255.255.

Optionally, you can use the web user interface for configuration, see *Multicast Filtering* on Page 99.

The following table provides detailed information about command lines for multicast filtering configuration.

IGMP Snooping	
IGMP Snooping - Global	`Switch(config)# ip igmp snooping` `IGMP snooping is enabled globally. Specify on which vlans IGMP snooping enables`

IGMP Snooping - VLAN	`Switch(config)# ip igmp snooping vlan`
	`  VLANLIST  allowed vlan list`
	`  all       all existed vlan`
	`Switch(config)# ip igmp snooping vlan 1-2`
	`IGMP snooping is enabled on VLAN 1-2.`

Disable IGMP Snooping - Global	`Switch(config)# no ip igmp snooping` `IGMP snooping is disabled globally ok.`
Disable IGMP Snooping - VLAN	`Switch(config)# no ip igmp snooping vlan 3` `IGMP snooping is disabled on VLAN 3.`

IGMP Snooping (Continued)	
Display – IGMP Snooping Setting	Switch# sh ip igmp interface vlan1 enabled: Yes version: IGMPv1 query-interval; 125s query-max-response-time: 10s Switch# sh ip igmp snooping IGMP snooping is globally enabled Vlan1 is IGMP snooping enabled Vlan2 is IGMP snooping enabled Vlan3 is IGMP snooping disabled
Display – IGMP Table	Switch# sh ip igmp snooping multicast all VLAN IP Address Type Ports ---- --------------- ------- ------------------------ 1 239.192.8.0 IGMP fa6, 1 239.255.255.250 IGMP fa6,
IGMP Query	
IGMP Query V1	Switch(config)# int vlan 1 Switch(config-if)# ip igmp v1
IGMP Query V2	Switch(config)# int vlan 1 Switch(config-if)# ip igmp
IGMP Query version	Switch(config-if)# ip igmp version 1 Switch(config-if)# ip igmp version 2

IGMP Query Interval	Switch(config)# int vlan 1 (Go to management VLAN)
	Switch(config-if)# ip igmp
	Switch(config-if)# ip igmp query-interval 60 (Change query interval to 60 seconds, default value is 125 seconds)

IGMP Query Max Response Time	Switch(config)# int vlan 1 (Go to management VLAN)
	Switch(config-if)# ip igmp
	Switch(config-if)# ip igmp query-max-response-time 15 (Change query max response time to 15 seconds, default value is 10 seconds)

Disable	Switch(config)# int vlan 1 Switch(config-if)# no ip igmp

IGMP Query (Continued)	
Display	Switch# sh ip igmp interface vlan1 enabled: Yes version: IGMPv2 query-interval: 125s query-max-response-time: 10s Switch# show running-config …. ! interface vlan1 ip address 192.168.250.17/24 ip igmp no shutdown ! …….
Unknown Multicast	
Send Unknown Multicast to Query Ports	Switch(config)# ip igmp snooping source-only-learning IGMP Snooping Source-Only-Learning enabled
Send Unknown Multicast to All Ports	Switch(config)# no ip igmp snooping source-only-learning IGMP Snooping Source-Only-Learning disabled Switch(config)# no mac-address-table multicast filtering Flooding unknown multicast addresses ok!
Discard All Unknown Multicast	Switch(config)# mac-address-table multicast filtering Filtering unknown multicast addresses ok!
Force Filtering	
Enable	Switch(config)# mac-address-table force filtering Filtering unknown multicast addresses ok!
Disable	Switch(config)# no mac-address-table force filtering Flooding unknown multicast addresses ok!

SNMP (CLI)

Simple Network Management Protocol (SNMP) is a protocol used for exchanging management information between network devices. SNMP is a member of the TCP/IP protocol suite. The ES8510-XTE supports SNMP v1 and v2c and V3.

An SNMP managed network consists of two main components: agents and a manager. An agent is a management software module that resides in a managed switch. An agent translates the local management information from the managed device into a SNMP compatible format. The manager is the console through the network.

Optionally, you can use the web user interface for configuration, see *SNMP* on Page 102.

The following table provides detailed information about command lines for SNMP configuration.

SNMP Community	
Read Only Community	`Switch(config)# snmp-server community public ro` `community string add ok`
Read Write Community	`Switch(config)# snmp-server community private rw` `community string add ok`
SNMP Trap	
Enable Trap	`Switch(config)# snmp-server enable trap` `Set SNMP trap enable ok.`
SNMP Trap Server IP without specific community name	`Switch(config)# snmp-server host 192.168.250.33` `SNMP trap host add OK.`

SNMP Trap Server IP with version 1 and community	`Switch(config)# snmp-server host 192.168.250.33 version 1 private`
	`SNMP trap host add OK.`
	Note: *Private is the community name, version 1 is the SNMP version.*

SNMP Trap Server IP with version 2 and community	`Switch(config)# snmp-server host 192.168.250.33 version 2 private` `SNMP trap host add OK.`
Disable SNMP Trap	`Switch(config)# no snmp-server enable trap` `Set SNMP trap disable ok.`

Display	`Switch# sh snmp-server trap`
	`SNMP trap: Enabled`
	`SNMP trap community: public`
	
	`Switch# show running-config`
	`.......`
	`snmp-server community public ro`
	`snmp-server community private rw`
	`snmp-server enable trap`
	`snmp-server host 192.168.250.33 version 2 admin`
	`snmp-server host 192.168.250.33 version 1 admin`
	`.....`

Security (CLI)

The ES8510-XTE provides several security features for you to secure your connection.
Optionally, you can use the web user interface for configuration, see *Security* on Page 105.
This table provides information about the command lines for security configuration.

Port Security	
Add MAC	`Switch(config)# mac-address-table static 00c0.4e30.0101 vlan 1 interface fa1` `mac-address-table unicast static set ok!`

Port Security	`Switch(config)# interface fa1`
	`Switch(config-if)# switchport port-security`
	`Disables new MAC addresses learning and aging activities!`
	Rule: *Add the static MAC, VLAN and Port binding first, then enable the port security to stop new MAC learning.*

Disable Port Security	`Switch(config-if)# no switchport port-security` `Enable new MAC addresses learning and aging activities!`

Display	`Switch# show mac-address-table static`
	`Destination Address  Address Type  Vlan  Destination Port`
	`------------------  --------------  -------  -----------------`
	`00c0.4e30.0101  Static  1  fa1`

IP Security	

IP Security	`Switch(config)# ip security`
	`Set ip security enable ok.`
	`Switch(config)# ip security host 192.168.250.33`
	`Add ip security host 192.168.250.33 ok.`

Display	`Switch# show ip security`
	`ip security is enabled`
	`ip security host:`
	`192.168.250.33`

Securing Interfaces	

Display	`Switch# show service`
	`Telnet : Disabled`
	`Http : Disabled`
	`NetVision : Disabled`

Telnet	`Switch(config)# service telnet enable`
HTTP	`Switch(config)# service http enable`
PortVision DX	`Switch(config)# service netvision enable` ***Note:*** *Disabling PortVision DX means that the switch displays as off-line in PortVision DX.*

802.1x	
enable disable	Switch(config)# dot1x system-auth-control Switch(config)# Switch(config)# no dot1x system-auth-control Switch(config)#

authentic-method	Switch(config)# dot1x authentic-method
	  local Use the local username database for authentication
	  radius Use the Remote Authentication Dial-In User Service (RADIUS) servers for authentication
	Switch(config)# dot1x authentic-method radius
	Switch(config)#

radius server-ip	Switch(config)# dot1x radius Switch(config)# dot1x radius server-ip 192.168.250.120 key 1234 RADIUS Server Port number NOT given. (default=1812) RADIUS Accounting Port number NOT given. (default=1813) RADIUS Server IP : 192.168.250.120 RADIUS Server Key : 1234 RADIUS Server Port : 1812 RADIUS Accounting Port : 1813 Switch(config)#
radius secondary-server-ip	Switch(config)# dot1x radius secondary-server-ip 192.168.250.250 key 5678 Port number NOT given. (default=1812) RADIUS Accounting Port number NOT given. (default=1813) Secondary RADIUS Server IP : 192.168.250.250 Secondary RADIUS Server Key : 5678 Secondary RADIUS Server Port : 1812 Secondary RADIUS Accounting Port : 1813
User name/ password for authentication	Switch(config)# dot1x username chris passwd chris vlan 1

Warnings (CLI)

The ES8510-XTE provides several types of warning features for you to remotely monitor the status of the attached devices or changes in your network. The features include Fault Relay, System Log, and SMTP Email Alert.

Optionally, you can use the web user interface for configuration, see *Warning* on Page 116.

This table provides detailed information about the command lines of the warning configuration.

Fault Relay Output	

Relay Output	`Switch(config)# relay 1`
	`  di  DI State`
	`  dry  dry output`
	`  ping  ping failure`
	`  port  port link failure`
	`  power  power failure`
	`  ring  super ring failure`
	Select Relay 1 or 2 first and then the event types

DI State	`Switch(config)# relay 1 di`
	`  <1-2>  DI number`
	`Switch(config)# relay 1 di 1`
	`  high  high is abnormal`
	`  low  low is abnormal`
	`Switch(config)# relay 1 di 1 high`

Dry Output	`Switch(config)# relay 1 dry`
	`<0-4294967295> turn on period in second`
	`Switch(config)# relay 1 dry 5`
	`<0-4294967295> turn off period in second`
	`Switch(config)# relay 1 dry 5 5`

Ping Failure	`Switch(config)# relay 1 ping 192.168.250.33`
	`  <cr>`
	`  reset  reset a device`
	`Switch(config)# relay 1 ping 192.168.250.33 reset`
	`  <1-65535>  reset time`
	`Switch(config)# relay 1 ping 192.168.250.33 reset 60`
	`  <0-65535>  hold time to retry`
	`Switch(config)# relay 1 ping 192.168.250.33 reset 60 60`

Port Link Failure	`Switch(config)# relay 1 port`
	`  PORTLIST  port list`
	`Switch(config)# relay 1 port fa1-5`

Power Failure	`Switch(config)# relay 1 power`
	`  <1-2>  power id`
	`Switch(config)# relay 1 power 1`
	`Switch(config)# relay 1 power 2`

Power Failure	`Switch(config)# relay 1 power`
	`  <1-2>  power id`
	`  any  Anyone power failure asserts relay`
	`Switch(config)# relay 1 power 1`
	`Switch(config)# relay 1 power 2`

Super Ring Failure	`Switch(config)# relay 1 ring`

Fault Relay Output (cont.)	
Disable Relay	Switch(config)# no relay <1-2> relay id Switch(config)# no relay 1 *(Relay_ID: 1 or 2)* <cr>
Display	Switch# show relay 1 Relay Output Type : Port Link Port : 1, 2, 3, 4 Switch# show relay 2 Relay Output Type : Super Ring
Event Selection	

Event Selection	Switch(config)# warning-event
	  coldstart Switch cold start event
	  warmstart Switch warm start event
	  linkdown Switch link down event
	  linkup Switch link up event
	  authentication Authentication failure event
	  di Switch di event
	  fault-relay Switch fault relay event
	  loop-protect Switch loop protection event
	  power Switch power failure event
	  sfp Switch SFP event
	  ring Switch ring event
	  time-sync Switch time synchronize event

Example: Cold Start event	Switch(config)# warning-event coldstart Set cold start event enable ok.
Example: Link Up event	Switch(config)# warning-event linkup [IFNAME] Interface list, ex: fastethernet1 Switch(config)# warning-event linkup fastethernet1 Set fa5 link up event enable ok.

Display	Switch# show warning-event
	Warning Event:
	  Cold Start: Enabled
	  Warm Start: Disabled
	  Authentication Failure: Disabled
	  Link Down: fa4-5
	  Link Up: fa4-5
	  Power Failure:
	  Ring: Disabled
	  Fault Relay: Disabled
	  Time synchronize Failure: Disabled
	  SFP DDM: Enabled
	  DI: Disabled

Syslog Configuration	
Local Mode	`Switch(config)# log syslog local`
Server Mode	`Switch(config)# log syslog remote 192.168.250.33`
Both	`Switch(config)# log syslog local` `Switch(config)# log syslog remote 192.168.250.33`
Disable	`Switch(config)# no log syslog local`
SMTP Configuration	
SMTP Enable	`Switch(config)# smtp-server enable email-alert` `SMTP Email Alert set enable ok.`

Sender mail	`Switch(config)# smtp-server server 192.168.250.100`
	`  ACCOUNT  SMTP server mail account, ex: admin@comtrol.com`
	`Switch(config)# smtp-server server 192.168.250.100 admin@comtrol.com`
	`SMTP Email Alert set Server: 192.168.250.100, Account: admin@comtrol.com ok.`

Receiver mail	`Switch(config)# smtp-server receipt 1 abc@comtrol.com` `SMTP Email Alert set receipt 1: abc@comtrol.com ok.`

Authentication with user name and password	`Switch(config)# smtp-server authentication username admin password admin`
	`SMTP Email Alert set authentication Username: admin, Password: admin`
	Note: *You can assign string to user name and password.*

Disable SMTP	`Switch(config)# no smtp-server enable email-alert` `SMTP Email Alert set disable ok.`
Disable Authentication	`Switch(config)# no smtp-server authentication` `SMTP Email Alert set Authentication disable ok.`

Display	`Switch# sh smtp-server`
	`SMTP Email Alert is Enabled`
	`  Server: 192.168.250.100, Account: admin@comtrol.com`
	`  Authentication: Enabled`
	`  Username: admin, Password: admin`
	`SMTP Email Alert Receipt:`
	`  Receipt 1: abc@comtrol.com`
	`  Receipt 2:`
	`  Receipt 3:`
	`  Receipt 4:`

Monitor and Diag (CLI)

The ES8510-XTE provides several types of features for you to monitor the status of the switch or diagnostic for you to check the problem when encountering problems related to the switch. The features include MAC Address Table, Port Statistics, Port Mirror, Event Log, and Ping.

Optionally, you can use the web user interface for configuration, see *Monitor and Diag* on Page 116.

This table provides detailed information about command lines of the Monitor and Diag configuration.

MAC Address Table	

Aging Time	`Switch(config)# mac-address-table aging-time 350`
	`mac-address-table aging-time set ok!`
	Note: *The default aging timeout value is 300.*

Add Static Unicast MAC address	`Switch(config)# mac-address-table static 00c0.4e30.0101 vlan 1 interface fastethernet5`
	`mac-address-table ucast static set ok!`
	Rule: mac-address-table static MAC_address VLAN VID interface interface_name

Add Multicast MAC address	`Switch(config)# mac-address-table multicast 00c0.4e30.0101 vlan 1 interface fa3-4`
	`Adds an entry in the multicast table ok!`
	Rule: mac-address-table multicast MAC_address VLAN VID interface_list interface_name/range

Show MAC Address Table – All types	`Switch# show mac-address-table`
	
	`***** UNICAST MAC ADDRESS *****`
	`Destination Address  Address Type  Vlan  Destination Port`
	`00c0.4e30.ca3b  Dynamic  1  fa1`
	`00c0.4e30.0386  Dynamic  1  fa2`
	`00c0.4e30.0101  Static  1  fa3`
	`00c0.4e30.0102  Static  1  fa3`
	`00c0.4e30.0100  Management  1`
	`***** MULTICAST MAC ADDRESS *****`
	`Vlan  Mac Address  COS  Status  Ports`
	`1  00c0.4e30.0800  0  fa6`
	`1  00c0.4e30.fffa  0  fa4,fa6`

Show MAC Address Table – Dynamic Learnt MAC addresses	`Switch# show mac-address-table dynamic`
	`Destination Address  Address Type  Vlan  Destination Port`
	`00c0.4e30.ca3b  Dynamic  1  fa4`
	`00c0.4e30.0386  Dynamic  1  fa6`

Show MAC Address Table – Multicast MAC addresses	`Switch# show mac-address-table multicast`
	`Vlan  Mac Address  COS  Status  Ports`
	`1  00c0.4e30.0800  0  fa5-6`
	`1  00c0.4e30.fffa  0  af3,fa5-6`

MAC Address Table (continued)	
Show MAC Address Table – Static MAC addresses	Switch# show mac-address-table static Destination Address Address Type Vlan Destination Port ---------- ---------- ---- ---------- 00c0.4e30.0101 Static 1 fa4 00c0.4e30.0102 Static 1 fa5
Show Aging timeout time	Switch# show mac-address-table aging-time the mac-address-table aging-time is 300 sec.
Port Statistics	
Port Statistics	Switch# show rmon statistics fa4 (select interface) Interface fastethernet4 is enable connected, which has Inbound: Good Octets: 178792, Bad Octets: 0 Unicast: 598, Broadcast: 1764, Multicast: 160 Pause: 0, Undersize: 0, Fragments: 0 Oversize: 0, Jabbers: 0, Discards: 0 Filtered: 0, RxError: 0, FCSError: 0 Outbound: Good Octets: 330500 Unicast: 602, Broadcast: 1, Multicast: 2261 Pause: 0, Deferred: 0, Collisions: 0 SingleCollision: 0, MultipleCollision: 0 ExcessiveCollision: 0, LateCollision: 0 Filtered: 0, FCSError: 0 Number of frames received and transmitted with a length of: 64: 2388, 65to127: 142, 128to255: 11 256to511: 64, 512to1023: 10, 1024toMaxSize: 42
Port Mirroring	
Enable Port Mirror	Switch(config)# mirror en Mirror set enable ok.
Disable Port Mirror	Switch(config)# mirror disable Mirror set disable ok.
Select Source Port	Switch(config)# mirror source fa1-2 both Received and transmitted traffic rx Received traffic tx Transmitted traffic Switch(config)# mirror source fa1-2 both Mirror source fa1-2 both set ok. ***Note:*** *Select source port list and TX/RX/Both mode.*
Select Destination Port	Switch(config)# mirror destination fa6 Mirror destination fa6 set ok

Port Mirroring (continued)	
Display	Switch# show mirror Mirror Status : Enabled Ingress Monitor Destination Port : fa6 Egress Monitor Destination Port : fa6 Ingress Source Ports :fa1,fa2, Egress Source Ports :fa1,fa2,
Event Log	
Display	Switch# show event-log <1>Jan 1 02:50:47 snmpd[101]: Event: Link 4 Down. <2>Jan 1 02:50:50 snmpd[101]: Event: Link 5 Up. <3>Jan 1 02:50:51 snmpd[101]: Event: Link 5 Down. <4>Jan 1 02:50:53 snmpd[101]: Event: Link 4 Up.
Topology Discovery (LLDP)	
Enable LLDP	Switch(config)# lldp holdtime Specify the holdtime of LLDP in seconds run Enable LLDP timer Set the transmission frequency of LLDP in seconds Switch(config)# lldp run LLDP is enabled!
Change LLDP timer	Switch(config)# lldp holdtime <10-255> Valid range is 10~255 Switch(config)# lldp timer <5-254> Valid range is 5~254
Ping	
Ping IP	Switch# ping 192.168.11.14 PING 192.168.11.14 (192.168.11.14): 56 data bytes 64 bytes from 192.168.11.14: icmp_seq=0 ttl=128 time=0.0 ms 64 bytes from 192.168.11.14: icmp_seq=1 ttl=128 time=0.0 ms 64 bytes from 192.168.11.14: icmp_seq=2 ttl=128 time=0.0 ms 64 bytes from 192.168.11.14: icmp_seq=3 ttl=128 time=0.0 ms 64 bytes from 192.168.11.14: icmp_seq=4 ttl=128 time=0.0 ms --- 192.168.11.14 ping statistics --- packets transmitted, 5 packets received, 0% packet loss round-trip min/avg/max = 1.3/1.3/1.4 ms

Saving to Flash (CLI)

Save Configuration allows you to save any configuration you just made to the flash. Powering off the switch without saving the configuration causes loss of the new settings.

Saving to Flash	
Save to Flash	SWITCH# write Building Configuration… [OK] Switch# copy running-config startup-config Building Configuration... [OK]

Logging Out (CLI)

The CLI connection logs out of configure terminal mode, if you do not input any command after 30 seconds.

Logging Out	
Logout	SWITCH> exit SWITCH# exit

Service (CLI)

The service command provides the ability to disable HTTP and Telnet.

Note: *There is not a web user interface page for the service command.*

Service	
Disable HTTP	Switch(config)# service http disable Switch(config)#
Enable HTTP	Switch(config)# service http enable Switch(config)#
Disable telnet	Switch(config)# service telnet disable Switch(config)#
Enable telnet	Switch(config)# service telnet enable Switch(config)#

Complete CLI List

This section provides the complete listing of RocketLinx ES8510-XTE commands with the supporting options:

- *User EXEC Mode*
- *Privileged EXEC Mode* on Page 184
- *Global Configuration Mode* on Page 189
- *Port Interface Configuration Mode* on Page 194
- *VLAN Interface Configuration Mode* on Page 196

User EXEC Mode

For information about accessing *User EXEC* mode, see *User EXEC Mode* on Page 183.

```
Switch> list
  enable
  exit
  list
  ping A.B.C.D
  ping X:X::X:X
  quit
  show arp
  show gvrp statistics [IFNAME]
  show ip forwarding
  show ip route
  show ip route A.B.C.D
  show ip route A.B.C.D/M
  show ip route supernets-only
  show version
  telnet WORD
  telnet WORD PORT
  traceroute WORD
```

Privileged EXEC Mode

For information about accessing Privileged EXEC mode, see *Privileged EXEC Mode* on Page 184.

```
Switch# list
  archive download-boot /overwrite tftp IPADDRESS IMAGE
  archive download-sw /overwrite tftp IPADDRESS IMAGE
  clear event-log
  clear gvrp statistics [IFNAME]
  clear lacp counters
  clear mac-address-table address MACADDR
  clear mac-address-table dynamic
  clear mac-address-table dynamic address MACADDR
  clear mac-address-table dynamic interface IFNAME
  clear mac-address-table dynamic vlan VLANID
  clear mac-address-table interface IFNAME
  clear mac-address-table multicast MACADDR vlan VLANID
  clear redundant-ring statistics [0-31]
  clear rmon statistics [IFNAME]
  clear spanning-tree counters
  clear spanning-tree counters interafce IFNAME
  clear spanning-tree detected-protocols
  clear spanning-tree detected-protocols interface IFNAME
  clock set TIME MONTH DAY YEAR
  configure terminal
  copy running-config startup-config
  copy startup-config tftp: URL
  copy tftp: URL (ssh-dss|ssh-rsa)
  copy tftp: URL ssl-cert
  copy tftp: URL startup-config
  debug dot1x all
  debug dot1x errors
  debug dot1x events
  debug dot1x packets
  debug dot1x registry
  debug dot1x state-machine
  debug gvrp (all|rcv|tx|gvrp_event|vlan_event)
  debug ip dhcp (all|event)
  debug ip igmp
  debug ip igmp snooping (all|group|management|router|timer)
  debug l2 mac (all|trace|debug)
  debug lacp (all|event|fsm|misc|packet)
  debug mirror
  debug proto pdu
  debug qos
  debug rate-limit
  debug redundant-ring (pdu|trace|debug|rapid-dual-homing|rstp|multi-ring|all) <0-
   31>
  debug snmp
  debug spanning-tree (all|bpdu|config|events|general|root|sync|tc)
  debug trunk
  debug vlan (all|trace|debug)
  disable
  dot1x initialize interface IFNAME
```

Privileged EXEC Mode (continued)

```
dot1x reauthenticate interface IFNAME
end
exit
list
no debug dot1x all
no debug dot1x errors
no debug dot1x events
no debug dot1x packets
no debug dot1x registry
no debug dot1x state-machine
no debug gvrp (all|rcv|tx|gvrp_event|vlan_event)
no debug ip dhcp (all|event)
no debug ip igmp
no debug ip igmp snooping (all|group|management|router|timer)
no debug l2 mac (all|trace|debug)
no debug lacp (all|event|fsm|misc|packet)
no debug mirror
no debug proto
no debug qos
no debug rate-limit
no debug redundant-ring <0-31>
no debug snmp
no debug spanning-tree (all|bpdu|config|events|general|root|sync|tc)
no debug trunk
no debug vlan (all|trace|debug)
no pager
pager
ping A.B.C.D
ping X:X::X:X
quit
reboot
reload default-config file
reload default-ssh file
reload default-ssl file
show acceptable frame type [IFNAME]
show administrator
show arp
show auth radius
show clock
show clock summer-time
show clock timezone
show debugging dot1x
show debugging gvrp
show debugging ip dhcp
show debugging ip igmp
show debugging ip igmp snooping
show debugging lacp
show debugging snmp
show debugging spanning-tree
show deny host mac-address
show dot1q-tunnel
show dot1x
```

Privileged EXEC Mode (continued)

```
show dot1x all
show dot1x authentic-method
show dot1x info
show dot1x interface IFNAME
show dot1x radius
show dot1x statistics interface IFNAME
show dot1x username
show ethernet-ip
show ethertype
show event-log
show garp timer [IFNAME]
show gvrp configuration [IFNAME]
show gvrp portstate IFNAME VID
show gvrp status
show hardware led
show hardware mac
show ingress filtering [IFNAME]
show interface [IFNAME]
show interface vlan [VLANID]
show ip dhcp relay
show ip dhcp server statistics
show ip forwarding
show ip igmp
show ip igmp group
show ip igmp interface IFNAME
show ip igmp query-interval
show ip igmp query-max-response-time
show ip igmp snooping
show ip igmp snooping multicast (dynamic|user|all) [VLANLIST]
show ip igmp snooping multicast count
show ip igmp snooping vlan (VLANLIST|all)
show ip igmp timers
show ip igmp version
show ip route
show ip route A.B.C.D
show ip route A.B.C.D/M
show ip route supernets-only
show ip security
show ipv6 neighbour
show ipv6 route
show l2_interface [IFNAME]
show lacp counters [GROUPID]
show lacp group [GROUPID]
show lacp internal [GROUPID]
show lacp neighbor [GROUPID]
show lacp port-setting [IFNAME]
show lacp system-id
show lacp system-priority
show lldp
show lldp neighbors
show lldp statistics
show loop-protect
```

Privileged EXEC Mode (continued)

```
show mac-address-table
show mac-address-table aging-time
show mac-address-table dynamic
show mac-address-table dynamic address MACADDR
show mac-address-table dynamic interface IFNAME
show mac-address-table dynamic vlan VLANID
show mac-address-table multicast
show mac-address-table multicast MACADDR vlan VLANID
show mac-address-table multicast filtering
show mac-address-table static
show mac-address-table static address MACADDR
show mac-address-table static interface IFNAME
show mac-address-table static vlan VLANID
show mirror
show modbus
show nameserver
show netvision password
show ntp associations
show qos cos-map
show qos dscp-map
show qos port-cos
show qos queue-sched
show qos trust
show rate-limit egress [IFNAME]
show rate-limit ingress [IFNAME]
show redundant-ring [0-31]
show relay <1-2>
show rmon statistics [IFNAME]
show running-config
show service
show sfp
show sfp ddm
show smtp-server
show smtp-server authentication
show smtp-server email-alert
show smtp-server receipt
show smtp-server server
show snmp-server community
show snmp-server contact
show snmp-server host
show snmp-server info
show snmp-server location
show snmp-server name
show snmp-server trap
show snmp-server user
show spanning-tree active
show spanning-tree interface IFNAME
show spanning-tree mst
show spanning-tree mst <0-15>
show spanning-tree mst <0-15> interface IFNAME
show spanning-tree mst configuration
show spanning-tree mst interface IFNAME
```

Privileged EXEC Mode (continued)

```
show spanning-tree mst root
show spanning-tree summary
show startup-config
show trunk group [1-5]
show version
show vlan
show vlan (static|dynamic) [VLANID]
show vlan VLANID
show vlan management
show vlan name VLANAME
show vlan private-vlan
show vlan private-vlan port-list
show vlan private-vlan type
show warning-event
telnet WORD
telnet WORD PORT
terminal length <0-512>
terminal no length
traceroute WORD
write
write file
write memory
write terminal
```

Global Configuration Mode

For information about accessing *Global Configuration* mode, see *Global Configuration Mode* on Page 189.

```
Switch(config)# list
  administrator NAME PASSWORD
  arp A.B.C.D H.H.H
  auth radius server A.B.C.D key RADIUS_KEY [PORT]
  clock set TIME MONTH DAY YEAR
  clock summer-time (enable|disable)
  clock summer-time <1-5> <0-6> <1-12> START_TIME <1-5> <0-6> <1-12> END_TIME
  clock timezone
   (01|02|03|04|05|06|07|08|09|10|11|12|13|14|15|16|17|18|19|20|21|22|23|24|25|26|27
   |28|29|30|31|32|33|34|35|36|37|38|39|40|41|42|43|44|45|46|47|48|49|50|51|52|53|54
   |55|56|57|58|59|60|61|62|63|64|65|66|67|68|69|70|71|72|73|74)
  default dot1x system-auth-control
  default gvrp configuration
  default ip igmp snooping
  dot1x authentic-method (radius|local)
  dot1x radius secondary-server-ip A.B.C.D key RADIUS_KEY [PORT] [PORT]
  dot1x radius server-ip A.B.C.D key RADIUS_KEY [PORT] [PORT]
  dot1x system-auth-control
  dot1x username WORD passwd WORD vlan <1-4094>
  end
  ethernet-ip run
  ethertype [0x0800-0xFFFF]
  exit
  gvrp mode (enable|disable)
  gvrp mode (enable|disable) IFNAME
  hostname .DWORD
  interface IFNAME
  interface vlan VLAN-ID
  ip forwarding
  ip igmp snooping
  ip igmp snooping immediate-leave
  ip igmp snooping immediate-leave vlan (VLANLIST|all)
  ip igmp snooping last-member-query-interval TIMEVALUE
  ip igmp snooping last-member-query-interval TIMEVALUE vlan (VLANLIST|all)
  ip igmp snooping source-only-learning
  ip igmp snooping vlan (VLANLIST|all)
  ip route A.B.C.D A.B.C.D (A.B.C.D|INTERFACE)
  ip route A.B.C.D A.B.C.D (A.B.C.D|INTERFACE) <1-255>
  ip route A.B.C.D/M (A.B.C.D|INTERFACE)
  ip route A.B.C.D/M (A.B.C.D|INTERFACE) <1-255>
  ip security
  ip security host A.B.C.D
  ipv6 route X:X::X:X/M (X:X::X:X|INTERFACE)
  lacp group <1-5> IFLIST
  lacp system-priority <1-65535>
  list
  lldp holdtime <10-255>
  lldp run
  lldp timer <5-254>
  log file FILENAME
```

Global Configuration Mode (continued)

```
log stdout
log syslog local
log syslog remote A.B.C.D
loop-protect (enable|disable) IFLIST
loop-protect (enable|disable) all
loop-protect transmit-interval <1-10>
mac-address-table aging-time TIMEVALUE
mac-address-table multicast MACADDR vlan VLANID interface IFLIST
mac-address-table multicast filtering
mac-address-table multicast filtering (flood|discard)
mac-address-table static MACADDR vlan VLANID interface IFNAME
mirror (enable|disable)
mirror destination IFNAME (rx|tx|both)
mirror source IFLIST (rx|tx|both)
modbus (enable|disable)
modbus idle-timeout <200-10000>
modbus master <1-20>
modbus port <1-65535>
nameserver A.B.C.D
netvision password PASS
no administrator
no arp A.B.C.D
no auth radius server A.B.C.D
no clock set
no clock summer-time
no clock timezone
no dot1x authentic-method
no dot1x radius secondary-server-ip
no dot1x system-auth-control
no dot1x username WORD
no ethernet-ip run
no hostname [HOSTNAME]
no interface IFNAME
no interface vlan VLAN-ID
no ip forwarding
no ip igmp snooping
no ip igmp snooping immediate-leave
no ip igmp snooping immediate-leave vlan (VLANLIST|all)
no ip igmp snooping last-member-query-interval
no ip igmp snooping last-member-query-interval vlan (VLANLIST|all)
no ip igmp snooping source-only-learning
no ip igmp snooping vlan (VLANLIST|all)
no ip route A.B.C.D A.B.C.D (A.B.C.D|INTERFACE)
no ip route A.B.C.D A.B.C.D (A.B.C.D|INTERFACE) <1-255>
no ip route A.B.C.D/M (A.B.C.D|INTERFACE)
no ip route A.B.C.D/M (A.B.C.D|INTERFACE) <1-255>
no ip security
no ip security host A.B.C.D
no ipv6 route X:X::X:X/M (X:X::X:X|INTERFACE)
no lacp group <1-5>
no lacp system-priority
no lldp run
```

Global Configuration Mode (continued)

```
no log file
no log stdout
no log syslog local
no log syslog remote
no loop-protect transmit-interval
no mac-address-table aging-time
no mac-address-table multicast MACADDR vlan VLANID interface IFLIST
no mac-address-table multicast filtering
no mac-address-table static MACADDR vlan VLANID interface IFNAME
no mirror destination (rx|tx|both)
no mirror source IFLIST (rx|tx|both)
no nameserver A.B.C.D
no netvision password
no ntp peer (primary|secondary)
no qos cos-map
no qos dscp-map
no qos queue-sched
no relay <1-2>
no smtp-server authentication
no smtp-server authentication username password
no smtp-server enable email-alert
no smtp-server receipt <1-4>
no smtp-server server
no snmp-server community WORD (ro|rw)
no snmp-server community trap
no snmp-server contact
no snmp-server enable trap
no snmp-server host A.B.C.D [VERSION]
no snmp-server location
no snmp-server name
no snmp-server user WORD v3
no spanning-tree bridge-times
no spanning-tree forward-time
no spanning-tree hello-time
no spanning-tree max-age
no spanning-tree mst MSTMAP priority
no spanning-tree mst configuration
no spanning-tree mst forward-time
no spanning-tree mst hello-time
no spanning-tree mst max-age
no spanning-tree mst max-hops
no spanning-tree priority
no spanning-tree transmission-limit
no trunk group <1-5>
no vlan [VLANID]
no warning-event (coldstart|warmstart)
no warning-event (linkdown|linkup) [IFLIST]
no warning-event authentication
no warning-event di <1-2>
no warning-event fault-relay
no warning-event loop-protect
no warning-event power <1-2>
```

Global Configuration Mode (continued)

```
no warning-event ring
no warning-event sfp
no warning-event time-sync
no write-config (daemon|integrated)
ntp peer (enable|disable)
ntp peer (primary|secondary) IPADDRESS
qos cos-map PRIORITY QUEUE
qos dscp-map PRIORITY QUEUE
qos queue-sched (wrr|sp)
redundant-ring <0-31>
relay <1-2> di <1-2> (high|low)
relay <1-2> dry <0-4294967295> <0-4294967295>
relay <1-2> ping WORD
relay <1-2> ping WORD reset <1-65535> <0-65535>
relay <1-2> port PORTLIST
relay <1-2> power <1-2>
relay <1-2> power any
relay <1-2> ring
router dhcp
service http (enable|disable)
service netvision (enable|disable)
service telnet (enable|disable)
sfp ddm (enable|disable) all
sfp eject all
sfp scan all
smtp-server authentication
smtp-server authentication username WORD password WORD
smtp-server enable email-alert
smtp-server receipt <1-4> EMAIL
smtp-server server A.B.C.D ACCOUNT
snmp-server community WORD (ro|rw)
snmp-server community trap WORD
snmp-server contact .DWORD
snmp-server enable trap
snmp-server host A.B.C.D
snmp-server host A.B.C.D version (1|2) [COMMUNITY]
snmp-server location .DWORD
snmp-server name .DWORD
snmp-server user WORD v3 auth (md5|sha) WORD
snmp-server user WORD v3 noauth
snmp-server user WORD v3 priv (md5|sha) WORD des WORD
spanning-tree (enable|disable)
spanning-tree bridge-times <4-30> <6-40> <1-10>
spanning-tree forward-time <4-30>
spanning-tree hello-time <1-10>
spanning-tree max-age <6-40>
spanning-tree mode (stp|rst)
spanning-tree mode mst
spanning-tree mst MSTMAP priority <0-61440>
spanning-tree mst configuration
spanning-tree mst forward-time <4-30>
spanning-tree mst hello-time <1-10>
```

Global Configuration Mode (continued)

```
spanning-tree mst max-age <6-40>
spanning-tree mst max-hops <1-40>
spanning-tree mst sync vlan <1-4094>
spanning-tree pathcost method (long|short)
spanning-tree priority <0-61440>
spanning-tree transmission-limit <1-10>
trunk group <1-5> IFLIST
vlan <1-4094>
vlan learning (independent|shared)
warning-event (coldstart|warmstart)
warning-event (linkdown|linkup) [IFLIST]
warning-event authentication
warning-event di <1-2>
warning-event fault-relay
warning-event loop-protect
warning-event power <1-2>
warning-event ring
warning-event sfp
warning-event time-sync
write-config (daemon|integrated)
```

Port Interface Configuration Mode

For information about accessing *Port Interface Configuration* mode, see *Port Interface Configuration Mode* on Page 194.

```
Switch(config)# interface fa1
Switch(config-if)# list
  acceptable frame type (all|vlantaggedonly)
  auto-negotiation
  description .LINE
  dot1x admin-control-direction (both|in)
  dot1x default
  dot1x guest-vlan <1-4094>
  dot1x host-mode (single-host|multi-host)
  dot1x max-req <1-10>
  dot1x port-control (auto|force-authorized|force-unauthorized)
  dot1x reauthentication
  dot1x timeout (reauth-period|quiet-period|tx-period|supp-timeout|server-timeout)
   TIMEVALUE
  duplex (half|full)
  end
  exit
  flowcontrol (off|on)
  garp timer <10-10000> <30-30000> <150-150000>
  ingress filtering (enable|disable)
  lacp port-priority <1-65535>
  lacp timeout (long|short)
  list
  loopback
  mdix
  no description
  no dot1x admin-control-direction
  no dot1x guest-vlan
  no dot1x host-mode
  no dot1x max-req
  no dot1x port-control
  no dot1x reauthentication
  no dot1x timeout (reauth-period|quiet-period|tx-period|supp-timeout|server-
   timeout)
  no duplex
  no garp timer
  no lacp port-priority
  no lacp timeout
  no loopback
  no mdix
  no qos cos
  no qos trust
  no rate-limit egress bandwidth
  no rate-limit ingress bandwidth
  no rate-limit ingress mode
  no shutdown
  no spanning-tree bpdufilter
  no spanning-tree bpduguard
  no spanning-tree cost
```

Port Interface Configuration Mode (continued)

```
no spanning-tree edge-port
no spanning-tree link-type
no spanning-tree mst MSTMAP cost
no spanning-tree mst MSTMAP port-priority
no spanning-tree port-priority
no spanning-tree stp-state
no speed
no switchport access vlan VLANID
no switchport block
no switchport dot1q-tunnel mode (access|uplink)
no switchport mode private-vlan host
no switchport mode private-vlan promiscuous
no switchport port-security
no switchport private-vlan host-association
no switchport trunk native vlan
qos cos DEFAULT-COS
qos trust (cos|dscp|cos-first|dscp-first)
quit
rate-limit egress bandwidth <0-100>
rate-limit ingress bandwidth <0-100>
rate-limit ingress mode (all|flooded-unicast|multicast|broadcast)
sfp ddm (enable|disable)
sfp eject
sfp scan
shutdown
spanning-tree bpdufilter
spanning-tree bpduguard
spanning-tree cost <1-200000000>
spanning-tree edge-port
spanning-tree link-type (auto|point-to-point|shared)
spanning-tree mst MSTMAP cost <1-200000000>
spanning-tree mst MSTMAP port-priority <0-240>
spanning-tree port-priority <0-240>
spanning-tree stp-state (enable|disable)
speed (10|100)
switchport access vlan VLANID
switchport access vlan add VLANLIST
switchport access vlan remove VLANLIST
switchport block (multicast|unicast|both)
switchport dot1q-tunnel mode (access|uplink)
switchport dot1q-tunnel mode uplink add-pvid
switchport mode private-vlan host
switchport mode private-vlan promiscuous
switchport port-security
switchport private-vlan host-association <2-4094> <2-4094>
switchport private-vlan mapping <2-4094> add VLANLIST
switchport private-vlan mapping <2-4094> remove VLANLIST
switchport trunk allowed vlan add VLANLIST
switchport trunk allowed vlan remove VLANLIST
switchport trunk native vlan VLANID
```

VLAN Interface Configuration Mode

For information about accessing VLAN Interface Configuration mode, see *VLAN Interface Configuration Mode* on Page 196.

```
Switch(config-if)# interface vlan1
Switch(config-if)# list
  description .LINE
  end
  exit
  ip address A.B.C.D/M
  ip dhcp client
  ip dhcp client renew
  ip igmp
  ip igmp last-member-query-count CNT
  ip igmp last-member-query-interval SECONDS
  ip igmp query-interval SECONDS
  ip igmp query-max-response-time SECONDS
  ip igmp robustness-variable CNT
  ip igmp v1
  ip igmp version (1|2)
  ipv6 address X:X::X:X/M
  list
  no description
  no ip address A.B.C.D/M
  no ip dhcp client
  no ip igmp
  no ipv6 address X:X::X:X/M
  no shutdown
  quit
  shutdown
```

ModBus TCP /IP Support

This section provides the following information:

- *Modbus TCP/IP Function Codes* on Page 198
- *Error Checking* on Page 198
- *Exception Response* on Page 199
- *Modbus TCP Register Table* on Page 199
- *CLI Commands for Modbus TCP/IP* on Page 206

Overview

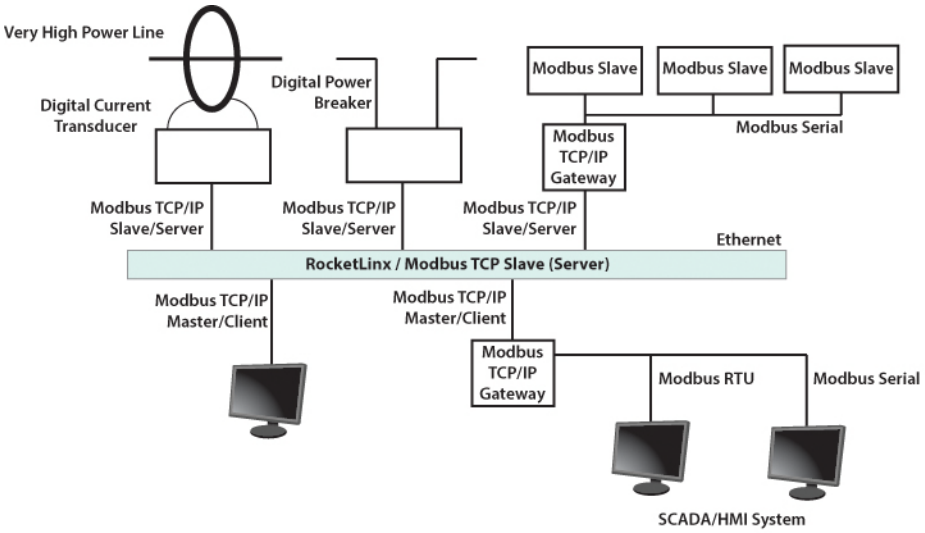
The ES8510-XTE supports Modbus TCP/IP communications through the CLI, which does not support Modbus ASCII or Modbus RTU. This functionality is not available on a web user interface page.

Modbus TCP/IP is commonly used to communicate over TCP/IP networks, connecting over Port 502. Modbus TCP/IP is used in industrial automatic communications systems and has become a standard protocol for industrial communications to transfer data to analog I/O devices or PLC systems.

Modbus TCP/IP defines a simple protocol data unit independent of the underlying data link layer. The Modbus TCP/IP packet includes three parts:

- MBAP header is used in the TCP/IP header to identify the Modbus application data unit. The MBAP header also includes a unit identifier to recognize and communicate between multiple independent Modbus end units.
- Function code
- Data payload

Modbus devices communicate using a master (client) /slave (server) architecture, only one device can initiate a transaction and the others respond to the master/client. The other devices (slave/server) respond by supplying the requested data to the master/client, or by taking the action requested in the query. The slave/server can be any peripheral device that processes information and sends the output data to the master using Modbus TCP/IP protocol.



The ES8510-XTE operates as slave/server device, while a typical master/client device is a host computer running appropriate application software, for example, a SCADA / HMI system. The ES8510-XTE can be polled through Ethernet, thus the Modbus TCP/IP master can read or write to the Modbus registers provided by the Modbus TCP/IP.

The ES8510-XTE firmware provides Modbus TCP/IP registers that map to the ES8510-XTE operating system information which, includes the description, IP address, power status, interface status, interface information and inbound/outbound packet statistics. With the register support, you can read the information through the Modbus TCP/IP based progress/ display/ monitor applications and monitor the status of the switch easily.

Modbus TCP/IP Function Codes

Modbus TCP/IP devices use a subset of the standard Modbus TCP/IP function codes to access device-dependent information. Modbus TCP/IP function codes are defined in the following table.

Function Code	Name	Usage
01	Read Coils	Reads the state of a digital output.
02	Read Input Status	Reads the state of a digital input.
03	Read Holding Register	Reads the holding register in 16-bit register format.
04 (see note)	Read Input Registers	Reads data in 16-bit register format.
05	Write Coil	Writes data to force a digital output ON/OFF.
06	Write Single Register	Writes data in 16-bit register format.
15	Force Multiple Coils	Writes data to force multiple consecutive coils.

Note: *The ES8510-XTE supports Function Code 04, the Read Input Registers. With this support, the remote SCADA or other Modbus TCP/IP applications can poll the information of the device and monitor the major status of the ES8510-XTE.*

Error Checking

The utilization of the error checking helps eliminate errors caused by noise in the communications link. In Modbus TCP/IP mode, messages include an error-checking field that is based on a Cyclical Redundancy Check (CRC) method. The CRC field checks the contents of the entire message. It is applied regardless of any parity check method used for the individual BYTE characters of the message. The CRC value is calculated by the transmitting device, which appends the CRC to the message. The receiving device recalculates a CRC during receipt of the message, and compares the calculated value to the actual value it received in the CRC filed.

Exception Response

If an error occurs, the slave sends an exception response message to master consisting of the slave address, function code, exception response code and error check field. In an exception response, the slave sets the high-order bit (MSB) of the response function code to one.

Code	Name	Descriptions
01	Illegal Function	The message function received is not an allowable action.
02	Illegal Data Address	The address referenced in the data field is not valid.
03	Illegal Data Value	The value referenced at the addressed device location is not within range.
04	Slave Device Failure	An unrecoverable error occurred while the slave was attempting to perform the requested action.
05	Acknowledge	The slave has accepted the request and processing it, but a long duration of time is required to do so.
06	Slave Device Busy	The slave is engaged in processing a long-duration program command.
07	Negative Acknowledge	The slave cannot perform the program function received in the query.
08	Memory Parity Error	The slave attempted to read extended memory, but detected a parity error in the memory.

Modbus TCP Register Table

The latest firmware provides the initial release of the Modbus TCP/IP client service support for factory automation applications. You can implement the modbus command using the command line interface in console and Telnet modes, which allows you to modify some parameters such as, idle time, number of Modbus masters, and the Modbus service port.

Note: *The Modbus TCP client returns 0xFFFF to a Modbus master when pulling a reserved address.*

Word Address	Data Type	Description
System Information		
0x0000	16 words	Vender Name = “Comtrol” Word 0 Hi byte = ‘C’ Word 0 Lo byte = ‘o’ Word 1 Hi byte = ‘m’ Word 1 Lo byte = ‘t’ Word 2 Hi byte = ‘r’ Word 2 Lo byte = ‘o’ Word 3 Hi byte = ‘l’ Word 3 Lo byte = ‘\0’ (other words = 0)

Word Address	Data Type	Description
System Information (cont.)		
0x0010	16 words	Product Name = "ES8510-XTE" Word 0 Hi byte = 'E' Word 0 Lo byte = 'S' Word 1 Hi byte = '8' Word 1 Lo byte = '5' Word 2 Hi byte = '0' Word 2 Lo byte = '0' Word 3 Hi byte = '-' Word 3 Lo byte = 'X' Word 4 Hi byte = 'T' Word 4 Lo byte = 'E' Word 5 Hi byte = '\0' (other words = 0)
0x0020	128 words	SNMP system name (string)
0x00A0	128 words	SNMP system location (string)
0x0120	128 words	SNMP system contact (string)
0x01A0	32 words	SNMP system OID (string)
0x01C0	2 words	System uptime (unsigned long)
0x01C2 to 0x01FF	60 words	Reserved address space
0x0200	2 words	Hardware version
0x0202	2 words	S/N information
0x0204	2 words	CPLD version
0x0206	2 words	Bootloader version
0x0208	2 words	Firmware Version Word 0 Hi byte = major Word 0 Lo byte = minor Word 1 Hi byte = reserved Word 1 Lo byte = reserved
0x020A	2 words	Firmware Release Date Firmware was released on 2010-08-11 at 09 o'clock Word 0 = 0x0B09 Word 1 = 0x0A08

Word Address	Data Type	Description
0x020C	3 words	Ethernet MAC Address For example: MAC = 01-02-03-04-05-06 Word 0 Hi byte = 0x01 Word 0 Lo byte = 0x02 Word 1 Hi byte = 0x03 Word 1 Lo byte = 0x04 Word 2 Hi byte = 0x05 Word 2 Lo byte = 0x06
0x0300	2 words	IP address For example: IP = 192.168.250.250 Word 0 Hi byte = 0xC0 Word 0 Lo byte = 0xA8 Word 1 Hi byte = 0x0A Word 1 Lo byte = 0x01
0x020F to 0x2FF	241 words	Reserved address space
0x0302	2 words	Subnet Mask
0x0304	2 words	Default Gateway
0x0306	2 words	DNS Server
0x0308 to 0x3FF	248 words	Reserved address space (IPv6 or others)
0x0400	1 word	AC1 0x0000:Off 0x0001:On 0xFFFF: unavailable
0x0401	1 word	AC2 0x0000:Off 0x0001:On 0xFFFF: unavailable
0x0402	1 word	DC1 0x0000:Off 0x0001:On 0xFFFF: unavailable
0x0403	1 word	DC2 0x0000:Off 0x0001:On 0xFFFF: unavailable
0x0404 to 0x040F	12 words	Reserved address space

Word Address	Data Type	Description
System Information (cont.)		
0x0410	1 word	DI1 0x0000:Off 0x0001:On 0xFFFF: unavailable
0x0411	1 word	DI2 0x0000:Off 0x0001:On 0xFFFF: unavailable
0x0412	1 word	DO1 0x0000:Off 0x0001:On 0xFFFF: unavailable
0x0413	1 word	DO2 0x0000:Off 0x0001:On 0xFFFF: unavailable
0x0414 to 0x041F	12 words	Reserved address space
0x0420	1 word	RDY 0x0000:Off 0x0001:On
0x0421	1 word	RM 0x0000:Off 0x0001:On
0x0422	1 word	RF 0x0000:Off 0x0001:On
0x0423	1 word	RS

Word Address	Data Type	Description
Port Information (32 Ports)		
0x1000 to 0x11FF	16 words	Port Description
0x1200 to 0x121F	1 word	Administrative Status 0x0000: disable 0x0001: enable
0x1220 to 0x123F	1 word	Operating Status 0x0000: disable 0x0001: enable 0xFFFF: unavailable
0x1240 to 0x125F	1 word	Duplex 0x0000: half 0x0001: full 0x0003: auto (half) 0x0004: auto (full) 0x0005: auto 0xFFFF: unavailable
0x1260 to 0x127F	1 word	Speed 0x0001: 10 0x0002: 100 0x0003: 1000 0x0004: 2500 0x0005: 10000 0x0101: auto 10 0x0102: auto 100 0x0103: auto 1000 0x0104: auto 2500 0x0105: auto 10000 0x0100: auto 0xFFFF: unavailable
0x1280 to 0x129F	1 word	Flow Control 0x0000: off 0x0001: on 0xFFFF: unavailable
0x12A0 to 0x12BF	1 word	Default Port VLAN ID 0x0001-0xFFFF
0x12C0 to 0x12DF	1 word	Ingress Filtering 0x0000: disable 0x0001: enable

Word Address	Data Type	Description
Port Information (32 Ports - cont.)		
0x12E0 to 0x12FF	1 word	Acceptable Frame Type 0x0000: all 0x0001: tagged frame only
0x1300 to 0x131F	1 word	Port Security 0x0000: disable 0x0001: enable
0x1320 to 0x133F	1 word	Auto Negotiation 0x0000: disable 0x0001: enable 0xFFFF: unavailable
0x1340 to 0x135F	1 word	Loopback Mode 0x0000: none 0x0001: MAC 0x0002: PHY 0xFFFF: unavailable
0x1360 to 0x137F	1 word	STP Status 0x0000: disabled 0x0001: blocking 0x0002: listening 0x0003: learning 0x0004: forwarding
0x1380 to 0x139F	1 word	Default CoS Value for untagged packets
0x13A0 to 0x13BF	1 word	MDIX 0x0000: disable 0x0001: enable 0x0002: auto 0xFFFF: unavailable
0x13C0 to 0x13DF	1 word	Medium mode 0x0000: copper 0x0001: fiber 0x0002: none 0xFFFF: unavailable
0x13E0 to 0x14FF	288 words	Reserved address space
SFP Information (32 Ports)		
0x1500 to 0x151F	1 word	SFP Type
0x1520 to 0x153F	1 words	Wave length
0x1540 to 0x157F	2 words	Distance
0x1580 to 0x167F	8 words	Vender

Word Address	Data Type	Description
SFP DDM Information (32 Ports)		
0x1800 to 0x181F	1 words	Temperature
0x1820 to 0x185F	2 words	Alarm Temperature
0x1860 to 0x187F	1 words	Tx power
0x1880 to 0x18BF	2 words	Warning Tx power
0x18C0 to 0x18DF	1 words	Rx power
0x18E0 to 0x191F	2 words	Warning Rx power
0x1920 to 0x1FFF	1760 words	Reserved address space
Inbound Packet Information		
0x2000 to 0x203F	2 words	Good Octets
0x2040 to 0x207F	2 words	Bad Octets
0x2080 to 0x20BF	2 words	Unicast
0x20C0 to 0x20FF	2 words	Broadcast
0x2100 to 0x213F	2 words	Multicast
0x2140 to 0x217F	2 words	Pause
0x2180 to 0x21BF	2 words	Undersize
0x21C0 to 0x21FF	2 words	Fragments
0x2200 to 0x223F	2 words	Oversize
0x2240 to 0x227F	2 words	Jabbers
0x2280 to 0x22BF	2 words	Discards
0x22C0 to 0x22FF	2 words	Filtered frames
0x2300 to 0x233F	2 words	RxError
0x2340 to 0x237F	2 words	FCSError
0x2380 to 0x23BF	2 words	Collisions
0x23C0 to 0x23FF	2 words	Dropped Frames
0x2400 to 0x243F	2 words	Last Activated SysUpTime
0x2440 to 0x24FF	191 words	Reserved address space
Outbound Packet Information		
0x2500 to 0x253F	2 words	Good Octets
0x2540 to 0x257F	2 words	Unicast
0x2580 to 0x25BF	2 words	Broadcast
0x25C0 to 0x25FF	2 words	Multicast
0x2600 to 0x263F	2 words	Pause
0x2640 to 0x267F	2 words	Deferred
0x2680 to 0x26BF	2 words	Collisions
0x26C0 to 0x26FF	2 words	SingleCollision
0x2700 to 0x273F	2 words	MultipleCollision
0x2740 to 0x277F	2 words	ExcessiveCollision
0x2780 to 0x27BF	2 words	LateCollision
0x27C0 to 0x27FF	2 words	Filtered
0x2800 to 0x283F	2 words	FCSError
0x2840 to 0x29FF	447 words	Reserved address space

Word Address	Data Type	Description
Number of Frames Received and Transmitted with a Length (Octets)		
0x2A00 to 0x2A3F	2 words	64
0x2A40 to 0x2A7F	2 words	65 to 127
0x2A80 to 0x2ABF	2 words	128 to 255
0x2AC0 to 0x2AFF	2 words	256 to 511
0x2B00 to 0x2B3F	2 words	512 to 1023
0x2B40 to 0x2B7F	2 words	1024 to maximum size

CLI Commands for Modbus TCP/IP

The CLI commands for Modbus TCP/IP are listed in the following table.

Modbus TCP/IP Commands	
Enable	`Switch(config)# modbus enable`
Disable	`Switch(config)# modbus disable`

Set Modbus Interval Time between Request	`Switch(config)# modbus idle-timeout`
	`<200-10000>  Timeout value: 200-10000ms`
	`Switch(config)# modbus idle-timeout 200`

Set Modbus TCP Master Communicate Session	`Switch(config)# modbus master`
	`<1-20> Max Modbus TCP Master`
	`Switch(config)# modbus master 2`

Set Modbus TCP Listening Port	`Switch(config)# modbus port`
	`<1-65536>  Port Number`
	`Switch(config)# modbus port 502`

Technical Support

Comtrol SFP Modules

Comtrol provides a variety of SFP transceivers. These certified SFP transceivers can be identified by the RocketLinx ES8510-XTE and displayed in the web user interface. We recommend using Comtrol SFP transceivers when configuring your RocketLinx ES8510-XTE.

Note: *Low quality SFP transceivers may result in poor network performance and may not meet claimed distance or temperature ratings.*

Comtrol Private MIB

Comtrol supports many standard MIBs for users to configure or monitor the switch configuration by SNMP. However, since some commands can't be found in standard MIBs, Comtrol provides a Private MIB file. Compile the private MIB file with your SNMP tool. The private MIB can be downloaded it from the Comtrol download Site.

The Private MIB tree is the same as the web tree. This is easier to understand and use. If you are not familiar with a standard MIB, you can directly use the private MIB to manage /monitor the switch, without the need to learn or find where the OIDs of the commands are.

Comtrol Support

You can use one of the following methods to contact Comtrol.

Contact Method	Web Address or Phone Number
Downloads	http://downloads.comtrol.com
Support	http://www.comtrol.com/support
Downloads	ftp://ftp.comtrol.com/html/ES8510_xte_main.htm
Web Site	http://www.comtrol.com
Phone	763.957.6000