



LMP-0601G-SFP-24 Series

**6-Port Industrial PoE+ Gigabit Managed Ethernet Switch, with
4*10/100/1000Tx (30W/Port), 1*10/100/1000Tx, and 1*100/1000
SFP Slot; 12~36VDC Power Input**



User Manual

Version 1.1



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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

CE Mark Warning

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

Industrial Ethernet Switches

Industrial Grade Gigabit PoE Managed Ethernet Switches

User Manual

Version 1.1 (March 2018)

This manual supports the following models:

- LMP-0601G-SFP-24
- LMP-0601G-SFP-24-T

This document is the current official release manual. Please check our website (www.antaira.com) for any updated manual or contact us by e-mail (support@antaira.com).

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1. Introduction

Antaira Technologies' industrial managed switches come with a pre-installed "user friendly" web console interface, which allows users to easily configure and manage the units, whether one is using a serial console and command line interface (CLI) commands like Telnet, SSH, HTTP (Web GUI) or simple network management protocols (SNMP).

1.1 Product Overview

Antaira's LMP-0601G-SFP-24 series is a 6-port industrial PoE+ gigabit managed Ethernet switch that is embedded with 4*10/100/1000Tx Ethernet ports that support IEEE802.3at/af for a maximum of 30 watts per port, 1*10/100/1000Tx Fast Ethernet port, and 1*100/1000 dual rate SFP slot for fiber connection.

LMP-0601G-SFP-24 series is a fully manageable industrial Ethernet switch with a pre-loaded Layer 2 network management web console that supports a low voltage redundant power input range from 12~36VDC with a voltage booster. This product series is IP30 rated, DIN-rail mountable, and has two wide operating temperature models for either a standard temperature range (STD: -10°C to 70°C) or an extended temperature range (EOT: -40°C to 75°C). It also provides high EFT and ESD protection for any industrial networking application within factory automation, ITS, power/utility, water wastewater, and any other outdoor or harsh environment.

1.2 Product Software Features

- Network Redundancy
 - STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switch (ERPS) for network redundancy
- Network Management
 - Web UI based management, SNMP v1/v2, Serial Console
 - Qos, traffic classification QoS, Cos, bandwidth control for Ingress and Egress, broadcast storm control, Diffserv
 - IEEE802.1q VLAN, port-based VLAN support
 - IGMP snooping v1/v2, IGMP filtering / throttling, IGMP query up to 256 group
 - Supports RMON, MIB II, port mirroring, event syslog, DNS, NTP/SNTP, SSH/SSL, TFTP.
- Advanced PoE Ports Management (auto ping check)
 - Auto powered device (PD) detection
 - Auto reset (cycle power to unresponsive PD)
 - PoE ports weekly power scheduling

- Port Configuration
 - Status, statistics, mirroring, rate limiting, event syslog
- Event Handling
 - Event notification by Email: Cold/Warm Start, Power Failure, Authentication, SNMP trap and Fault Alarm Relay Output
- Software Upgrade via TFTP and HTTP
- Configuration Backup – USB Port

1.3 Product Hardware Features

- System Interface and Performance
 - All RJ-45 ports support Auto MDI/MDI-X Function
 - Embedded 4*10/100/1000Tx (PSE 30W/Port) RJ45 ports, 1*10/100/1000Tx Fast Ethernet RJ45 port, and 1*100/1000 SFP Slot for fiber.
 - Store-and-forward switching architecture
 - 8K MAC address table
 - Power line EFT protection: 2,000VDC; Ethernet ESD protection: 6,000VDC
- Power Input
 - DC 12~36V redundant with built-in voltage booster, and a 6-pin removal terminal block
 - One user programmable alarm relay contact
- Operating Temperature
 - Standard operating temperature models: -10°C to 70°C
 - Extended operating temperature models: -40°C to 75°C
- Case/Installation
 - IP-30 protection metal housing
 - Installation in pollution degree to environment
 - DIN-Rail and wall mount design

1.4 Package Contents

- 1– LMP-0601G-SFP-24 series: 6-port industrial PoE+ gigabit managed Ethernet switch, with 4*10/100/1000Tx (30W/Port), 1*10/100/1000Tx, and 1*100/1000 SFP slot; 12~36VDC
- 1-Product CD
- 2-Wall mounting brackets and screws
- 1-RJ45 to DB9 Serial Console cable
- 1-DC cable –18 AWG & DC jack 5.5x2.1mm

1.5 Safety Precaution

Attention: If the DC voltage is supplied by an external circuit, please use a protection device on the power supply input. The industrial Ethernet switch's hardware specs, ports, cabling information, and wiring installation will be described within this user manual.

2. Hardware Description

2.1 Physical Dimensions

Figure 2.1, below, shows the physical dimensions of Antaira's LMP-0601G-SFP-24 series: 6-port industrial PoE+ gigabit managed Ethernet switch with 4*10/100/1000Tx (30W/Port), 1*10/100/1000Tx, and 1*100/1000 SFP Slot; 12~36VDC power input.

(W x D x H) is 46mm x 99mm x 142mm

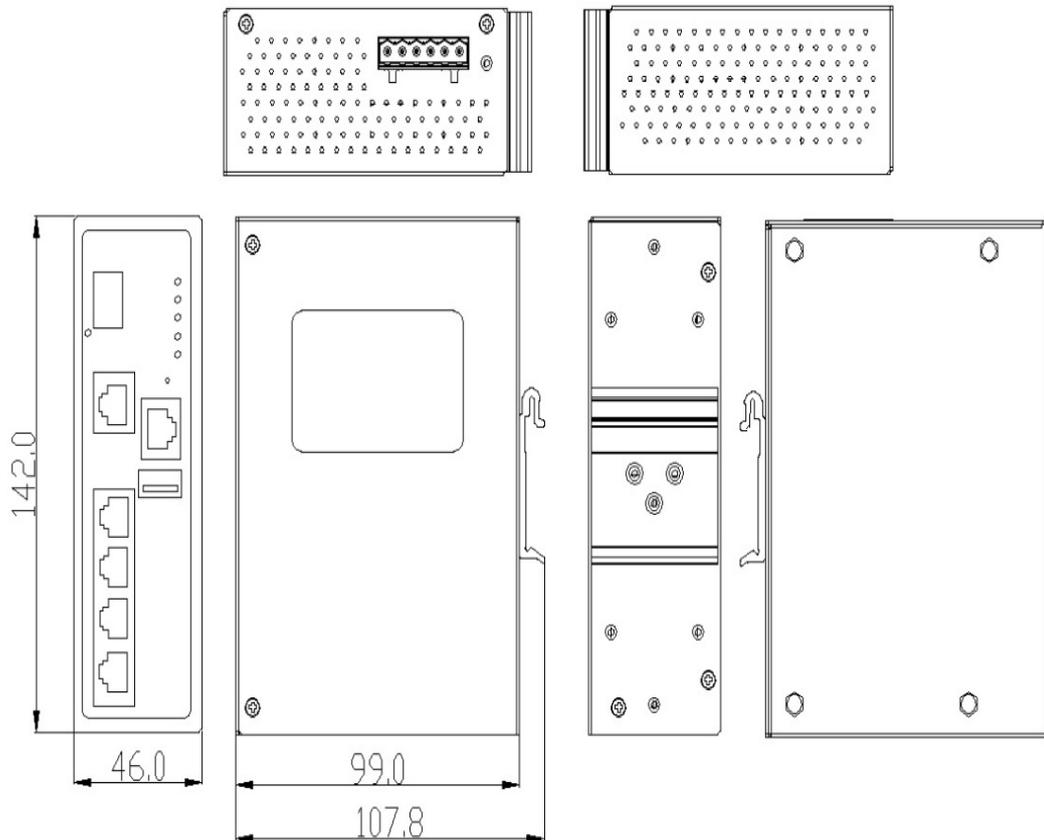


Figure 2.1
LMP-0601G-SFP-24 Series Physical Dimensions

2.2 Front Panel

The front panel of the LMP-0601G-SFP-24 series industrial PoE+ gigabit managed Ethernet switches is shown below in *Figure 2.2*.

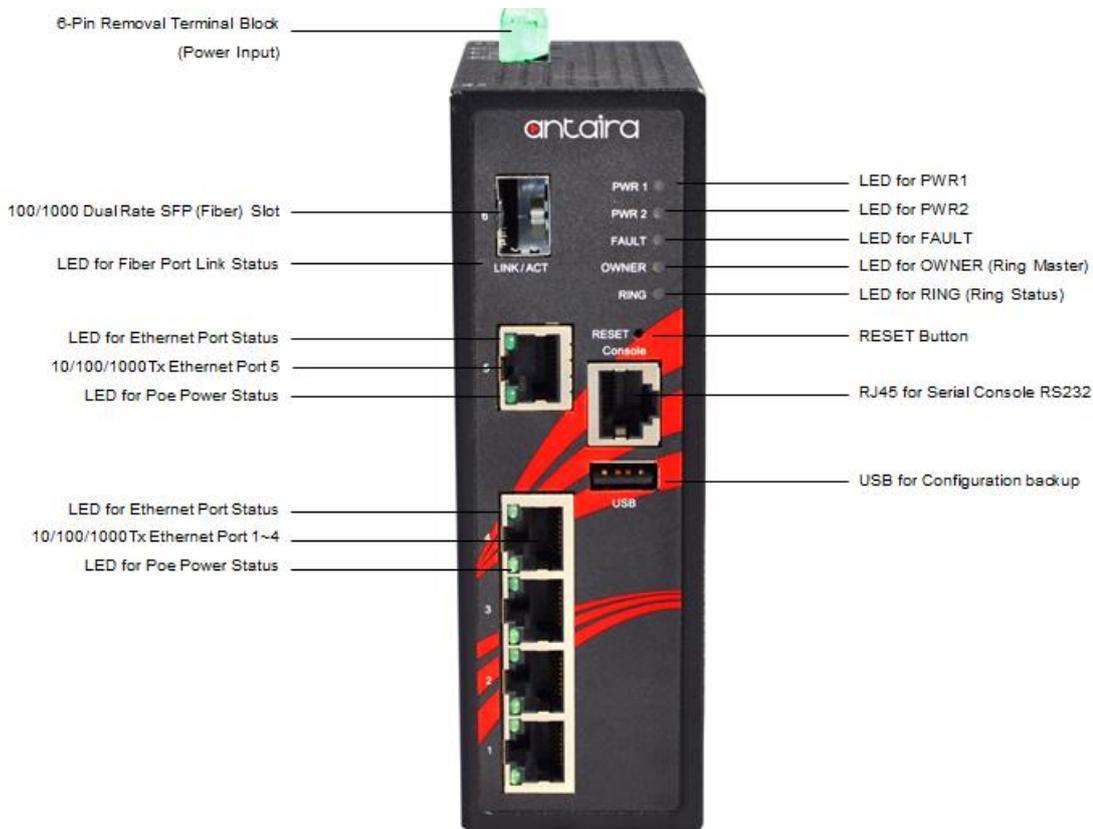


Figure 2.2
 The Front Panel of LMP-0601G-SFP-24 Series

2.3 Top View

Figure 2.3 below, shows the top panel of the LMP-0601G-SFP-24 series switch is equipped with one 6-pin removal terminal block connector for dual DC power inputs (12~36VDC).

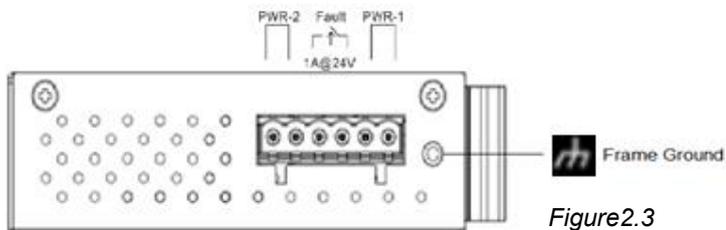


Figure 2.3
 Top Panel View of LMP-0601G-SFP-24 Series

2.4 LED Indicators

There are LED light indicators located on the front panel of the industrial Ethernet switch that display the power status and network status. Each LED indicator has a different color and has its own specific meaning, see below in *Table 2.1*.

LED	Color	Description	
P1	Green	On	Powerinput1is active
		Off	Powerinput1isinactive
P2	Green	On	Powerinput2is active
		Off	Powerinput2isinactive
Fault	Green	On	System is ready
		Off	System is booting
	Red	On	Fault Alarm
		Off	System is in normal state
Owner	Green	On	ERPS Owner Mode (Ring Master) is ready
		Off	ERPS Owner Mode is not active
Ring	Green	On	Ring Network is active
		Off	Ring Network is not active
LAN Port 1~ 4 (Left LED)	Green 	On	Connected to network
		Flashing	Networking is active
		Off	Not connected to network
LAN Port 1~ 4 (Right LED) PoE Indicators	Green 	On	The port is supplying power to the powered-device
		Off	No powered-device attached or power supplying fails
LAN Port 5 (Left LED)	Green 	On	Connected to network, 1000Mbps
		Flashing	Networking is active
		Off	Not connected to network
LAN Port 5 (Right LED)	Green 	On	Connected to network, 10/100Mbps
		Flashing	Networking is active
		Off	Not connected to network
Fiber Port 6 LNK/ACT	Green	On	Connected to network
		Flashing	Networking is active
		Off	Not connected to network

Table 2.1
LED Indicators for LMP-0601G-SFP-24 Series

2.5 Ethernet Ports

■ RJ-45 Ports

RJ-45 Ports (Auto MDI/MDIX): The RJ-45 ports are auto-sensing for 10Base-T, 100Base-TX, or 1000Base-TX connections. Auto MDI/MDIX means that the switch can connect to another switch or workstation without changing the straight-through or crossover cabling. See the figures as below for straight-through and crossover cabling schematics.

■ RJ-45 Pin Assignments (Table 2.2)

Pin Number	Assignment
1	Rx+
2	Rx-
3	Tx+
6	Tx-

Table 2.2
RJ45 Pin Assignments

Note “+” and “-” signs represent the polarity of the wires that make up each wire pair.

All ports on this industrial Ethernet switch support automatic MDI/MDI-X operation. Users can use straight-through cables (see figure below) for all network connections to PCs, servers, other switches or hubs. With straight-through cable pins 1, 2, 3, and 6, at one end of the cable are connected straight through to pins 1, 2, 3 and 6 at the other end of the cable. The table below (Table 2.3) shows the 10BASE-T/100BASE-TX/1000BASE-TX MDI and MDI-X port pin outs.

Pin MDI-X	Signal Name	MDI Signal Name
1	Receive Data plus (RD+)	Transmit Data plus (TD+)
2	Receive Data minus (RD-)	Transmit Data minus (TD-)
3	Transmit Data plus (TD+)	Receive Data plus (RD+)
6	Transmit Data minus (TD-)	Receive Data minus (RD-)

Table 2.3
Ethernet Signal Pin Outs

The following figures show the cabling schematics for straight-through and crossover.

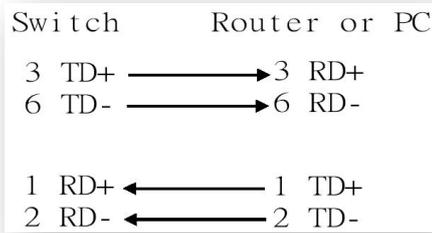


Figure 2.4
 Straight-Through Cable Schematic

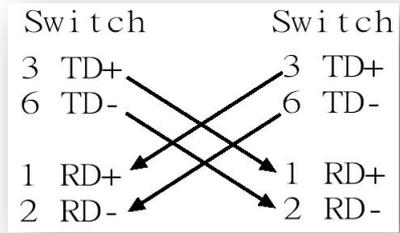


Figure 2.5
 Crossover Cable Schematic

The following figures show the 10,100, and 1000 Ethernet RJ-45 pin outs.

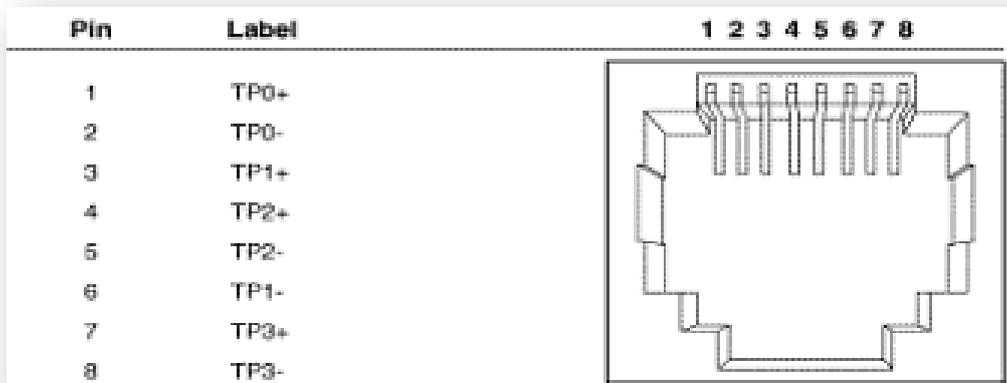


Figure 2.6

RJ45 Ethernet Port Pin Outs

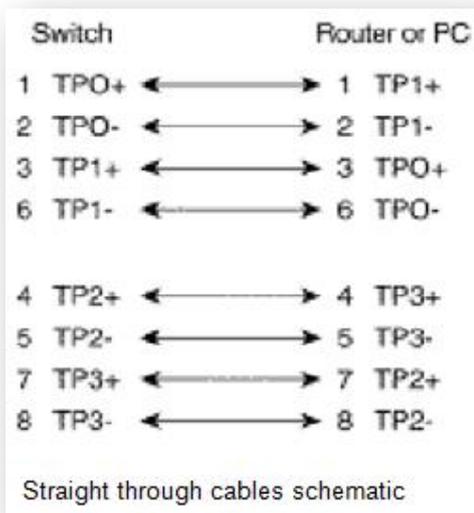


Figure 2.7
 Straight-Through Cable Schematic

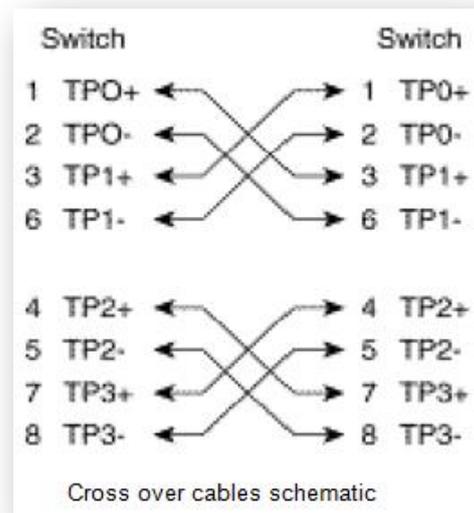


Figure 2.8
 Crossover Cable Schematic

2.6 Cabling

- Twisted-pair segments can be connected with an unshielded twisted pair (UTP) or shielded twisted pair (STP) cable. The cable must comply with the IEEE 802.3u 100Base TX standard (e.g. Category 5, 5e, or 6). The cable between the equipment and the link partner (switch, hub, workstation, etc.) must be less than 100 meters (328 ft.) long.
- Fiber segment – port 6: dual rate (100/1000) SFP slot. The small form-factor pluggable (SFP) is a compact optical transceiver used in optical communications for both telecommunication and data communication applications.
 - ◆ To connect the transceiver and LC cable, please follow below steps:
 - ◆ First, insert the SFP transceiver module into the SFP slot as shown below in *Figure 2.9*. Notice that the triangle mark is at the bottom of the SFP slot. *Figure 2.10* shows SFP transceiver module was inserted.

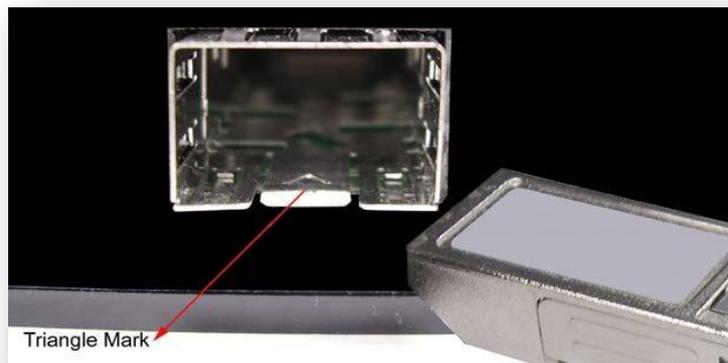


Figure 2.9 - Transceiver to the SFP Module



Figure 2.10 - Transceiver Inserted

- ◆ Second, insert the fiber cable of the LC connector into the transceiver as shown below in *Figure 2.11*.

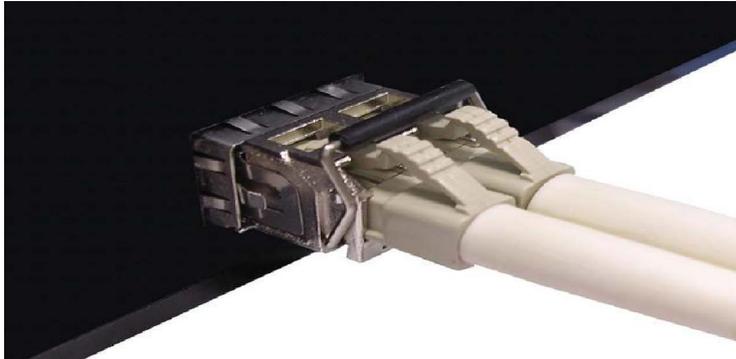


Figure 2.11 - LC Connector to the Transceiver

- To remove the LC connector from the transceiver, please follow the steps shown below:
 - Press the upper side of the LC connector from the transceiver and pull it out to release as shown below in *Figure 2.12*.

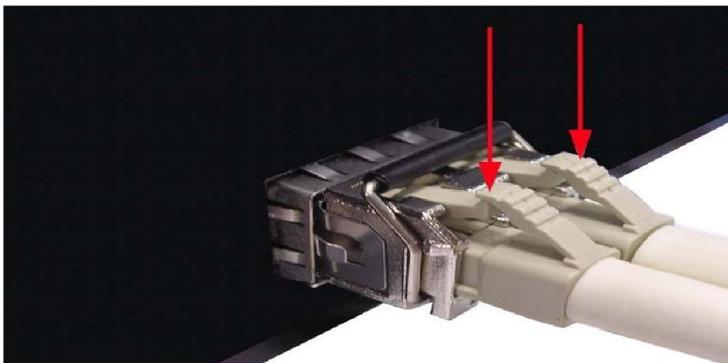


Figure 2.12 - Remove LC Connector

- Push down the metal clasp and pull the transceiver out by the plastic part as shown below in *Figure 2.13*.

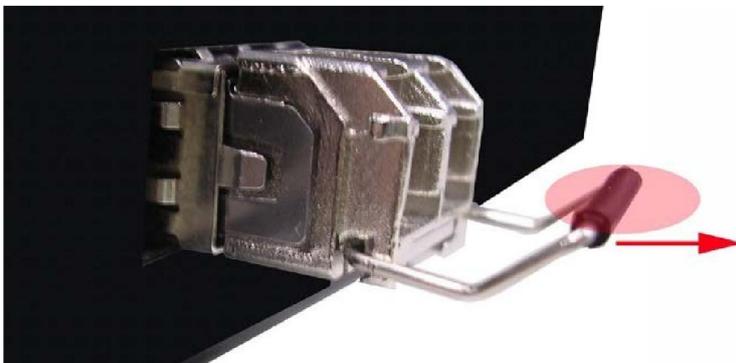


Figure 2.13 - Pull Out from the SFP Module

2.7 Wiring the Power Inputs

Please follow below steps to insert the power wire.

1. Insert the positive and negative wires into the PWR1 (V1+, V1-) and PWR2 (V2+, V2-) contacts on the terminal block connector as shown below in *Figure 2.14*.

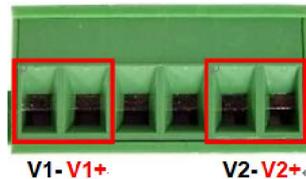


Figure 2.14 - Power Terminal Block

2. Tighten the wire-clamp screws to prevent the wires from loosening, as shown below in *Figure 2.15*.



Figure 2.15 - Power Terminal Block

-
- Note**
- Only use copper conductors, 60/75°C, tighten to 5lbs.
 - The wire gauge for the terminal block should range between 18~20 AWG.
-

2.8 Wiring the Fault Alarm Contact

The fault alarm contact is in the middle of the terminal block connector as the picture shows below in *Figure 2.16*. By inserting the wires, it will detect the fault status including power failure or port link failure (managed industrial switch only) and form a normally open circuit. An application example for the fault alarm contact is shown below in *Figure 2.16*.

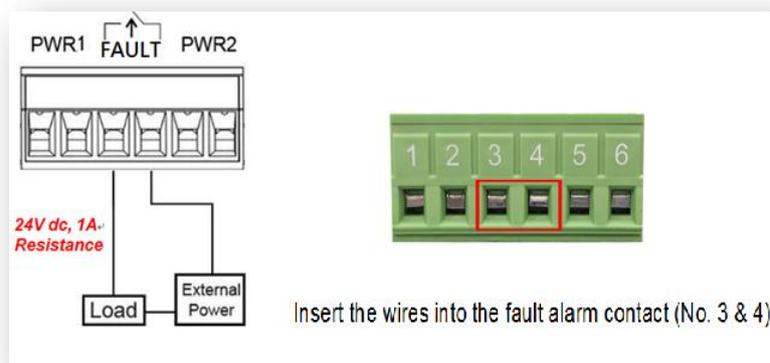


Figure 2.16 - Wiring the Fault Alarm Contact

-
- Note**
- The wire gauge for the terminal block should range between 12 ~ 24AWG
-

3. Mounting Installation

3.1 DIN-Rail Mounting

The DIN-Rail is pre-installed on the industrial Ethernet switch from the factory. If the DIN-Rail is not on the industrial Ethernet switch, please see Figure 3.1 to learn how to install the DIN-Rail on the switch.

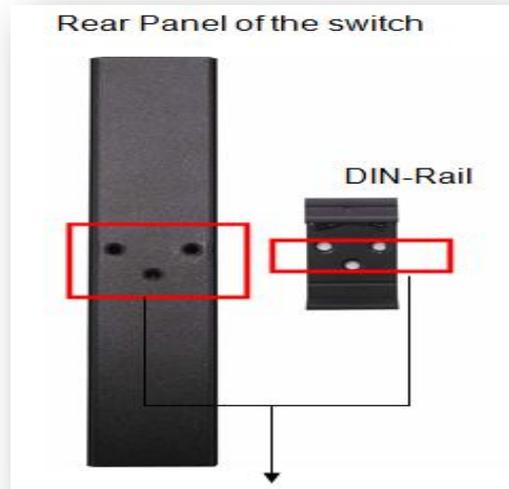


Figure 3.1

The Rear Side of the Switch and DIN-Rail Bracket

Follow the steps below to learn how to hang the industrial Ethernet switch.

1. Use the screws to install the DIN-Rail bracket on the rear side of the industrial Ethernet switch.
2. To remove the DIN-Rail bracket, do the opposite from step 1.
3. After the DIN-Rail bracket is installed on the rear side of the switch, insert the top of the DIN-Rail on to the track as shown below in *Figure 3.2*.
4. Lightly pull down the bracket on to the rail as shown below in *Figure 3.3*.
5. Check if the bracket is mounted tightly on the rail.
6. To remove the industrial Ethernet switch from the rail, do the opposite from the above steps.

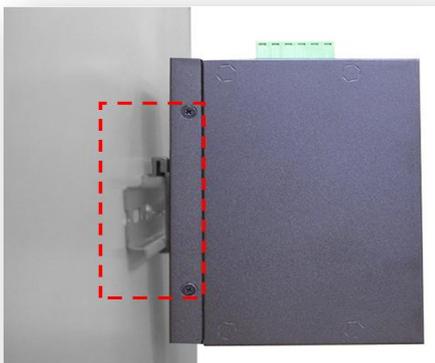


Figure 3.2

Insert the Switch on the DIN-Rail



Figure 3.3

Stable the Switch on DIN-Rail

3.2 Wall Mounting

Follow the steps below to mount the industrial Ethernet switch using the wall mounting bracket as shown below in *Figure 3.4*.

1. Remove the DIN-Rail bracket from the industrial Ethernet switch by loosening the screws.
2. Place the wall mounting brackets on the top and bottom of the industrial Ethernet switch.
3. Use the screws to screw the wall mounting bracket on the industrial Ethernet switch.
4. Use the hook holes at the corners of the wall mounting bracket to hang the industrial Ethernet switch on the wall.
5. To remove the wall mount bracket, do the opposite from the steps above.

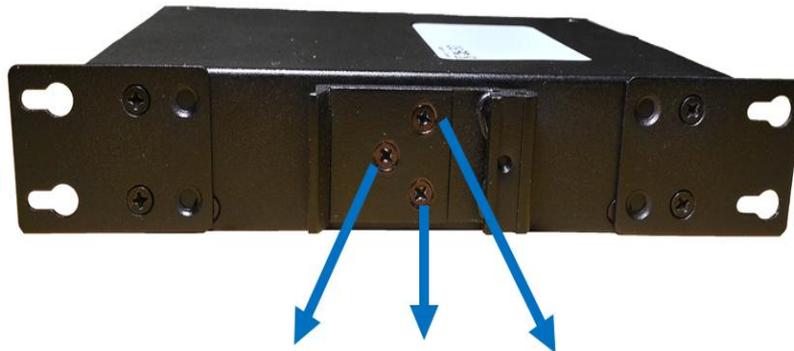


Figure 3.4

Remove DIN-Rail Bracket from the Switch

Below, in *Figure 3.5* are the dimensions of the wall mounting bracket.

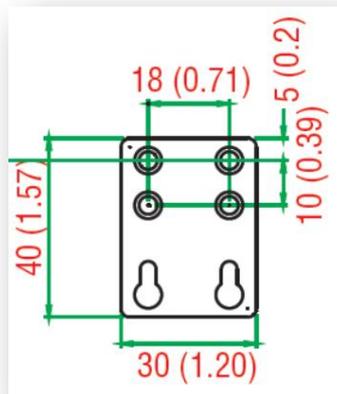


Figure 3.5

Wall Mounting Bracket Dimensions

4. Hardware Installation

4.1 Installation Steps

This section will explain how to install Antaira's LMP-0601G-SFP-24 series: 6-port industrial PoE+ gigabit managed Ethernet switch with 4*10/100/1000Tx (30W/Port), 1*10/100/1000Tx RJ45 ports and 1*100/1000 SFP slot; 12~36VDC power input.

Installation Steps

1. Unpack the industrial Ethernet switch from the original packing box.
2. Check if the DIN-Rail bracket is screwed on the industrial Ethernet switch.
 - If the DIN-Rail is not screwed on the industrial Ethernet switch, please refer to the **DIN-Rail Mounting** section for DIN-Rail installation.
 - If you want to wall mount the industrial Ethernet switch, please refer to the **Wall Mounting** section for wall mounting installation.
3. To hang the industrial Ethernet switch on a DIN-Rail or wall, please refer to the **Mounting Installation** section.
4. Power on the industrial Ethernet switch and then the power LED light will turn on.
 - If you need help on how to wire power, please refer to the **Wiring the Power Inputs** section.
 - Please refer to the **LED Indicators** section for LED light indication.
5. Prepare the twisted-pair, straight-through category 5 cable for Ethernet connection.
6. Insert one side of the RJ-45 cable into switch's Ethernet port and on the other side into the networking device's Ethernet port, e.g. switch PC or server. The Ethernet port's (RJ-45) LED on the industrial Ethernet switch will turn on when the cable is connected to the networking device.
 - Please refer to the **LED Indicators** section for LED light indication.
7. When all connections are set and the LED lights all show normal, the installation is complete.

5. Web Management

5.1 Web Console Configuration

This section introduces the configuration by web browser.

5.1.1 About Web-Based Management

All of Antaira's industrial managed switches are embedded with HTML web console interfaces that have a flash memory on the CPU board. It is a "user friendly" design with advanced management features that allow users to manage the switch from anywhere on the network through any Internet browser, such as Internet Explorer (version 9.0 or above is recommended), Firefox, Chrome and many others.

Preparing for Web Console Configuration

Antaira's industrial managed switches come with a factory default value as below:

- Default IP Address: **192.168.1.254**
- Default User Name: **admin**
- Default Password: **admin**

System Login

1. Launch any Internet browser
2. Type in the factory default IP address: `http://192.168.1.254` of the switch. Press "**Enter**".

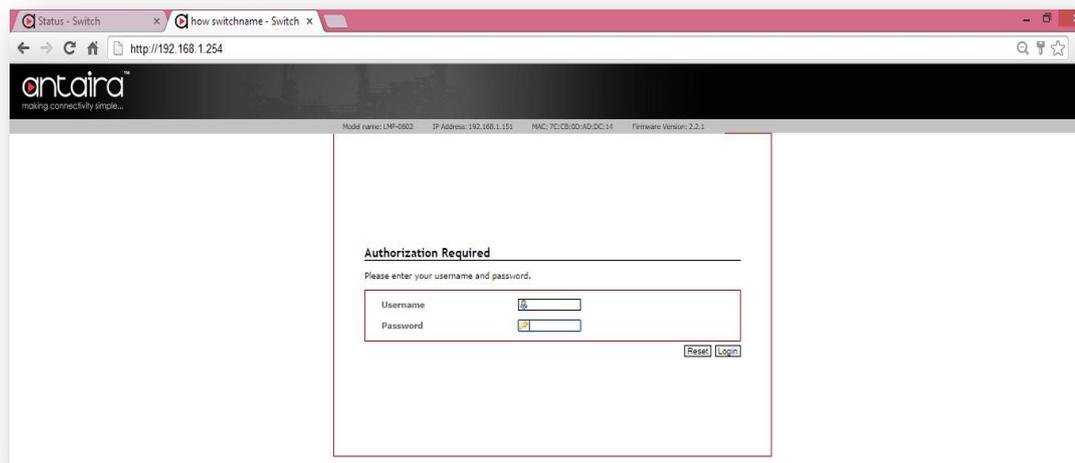


Figure 5.1 - Web Console "Login"

3. The login screen appears.
4. Key in the default username: **admin** and password **admin**.
5. Click the “Login” button, then the main (status) page of the Web Console will appear (Figure 5.2). The online image of the switch will display the real-time ports connection status.

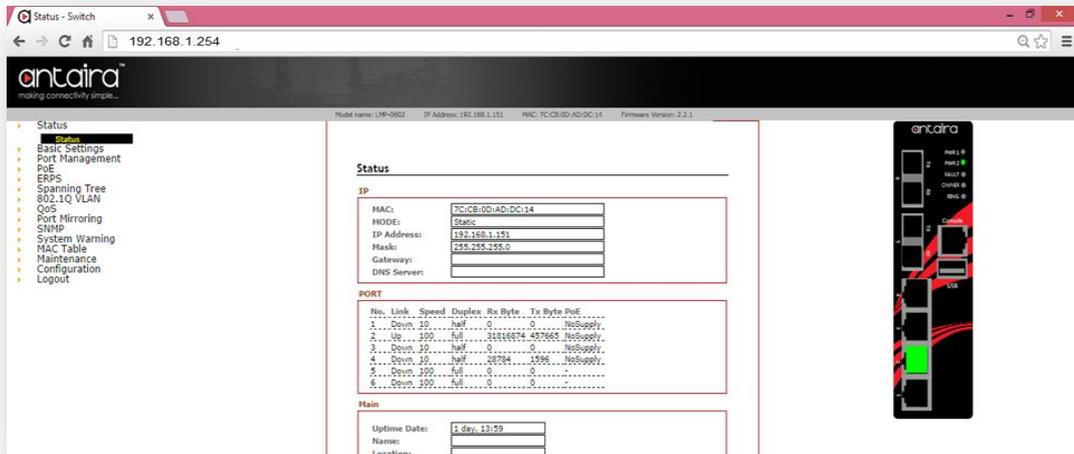


Figure 5.2 - Web Console Main (Status) Page

5.2 Basic Setting

5.2.1 System Information

Below, Figure 5.3, shows the switch system setting information.

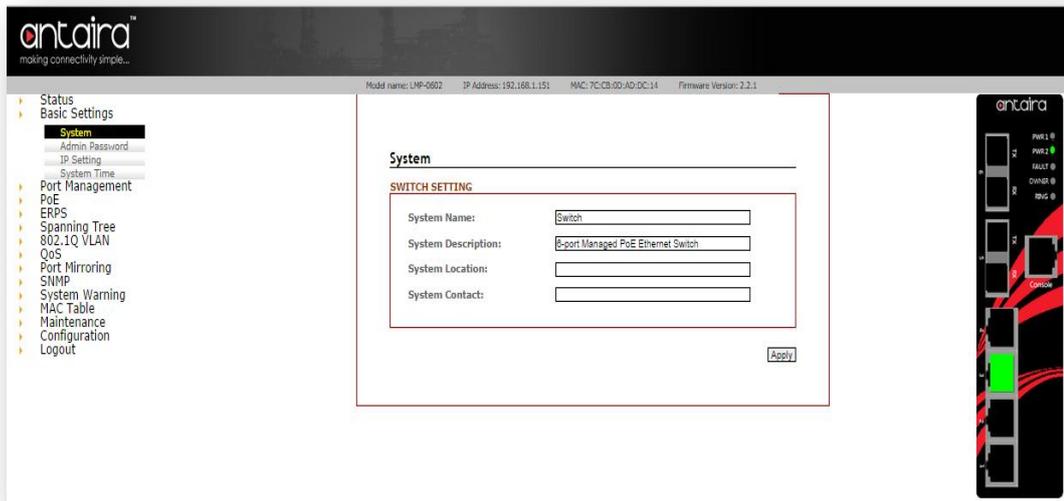


Figure 5.3 – Switch Settings (Status) Page

Terms	Value Description
System Name	Factory Default: Switch *Users can assign any name label to identify this managed node. By convention, a domain name is a text string drawn from the alphabet (A-Z, a-z), digits (0-9), minus sign (-). No space characters are permitted as part of a name. The first character must be an alpha character. And the first or last character must not be a minus sign. The allowed string length is 0 to 255.
System Description	Factory Default: 5-Port Managed PoE Ethernet Switch * Users can assign any new name label to describe this PoE managed switch.
System Location	Factory Default: Blank *Users can use this field to insert the physical location of this switch (e.g., telephone closet, 3rd floor). The maximum allowed string length is 0 to 255, and the allowed content is the ASCII characters from 32 to 126.
System Contact	Factory Default: Blank *Users can insert this field with the administrator of this switch together with information on how to contact this person. The maximum allowed string length is 0 to 255, and the allowed content is the ASCII characters from 32 to 126.
<input type="button" value="Apply"/>	Click the “Apply” button to save changes.

Figure 5.4 – Switch Settings Description

5.2.2 Admin & Password

Below, describes how to configure the system user name and password for the web console login.

Figure 5.5 – Administrative Account

Terms	Value Description
New Password	Users can assign a new password, and the maximum string length allowed is 0 to 31 characters.
Confirmation	Re-type the new password.
<input type="button" value="Apply"/>	Click "Apply" to save changes.

Figure 5.6 – Admin & Password Description

5.2.3 IP Setting

Configure the managed switch's IP setting information.

Figure 5.7 – IP Setting Information

Terms	Value Description
DHCP Client	Enable the DHCP client by checking this box. If DHCP fails and the configured IP address is zero, DHCP will retry. If DHCP fails and the configured IP address is non-zero, DHCP will stop and the configured IP settings will be used. The DHCP client will announce the configured System Name as hostname to provide DNS lookup.
IP Address	The unit default IP is 192.168.1.254. Assign the IP address that the network is using. If the DHCP client function is enabled, the user is not required to assign the IP address. The network DHCP server will assign the IP address for the switch and it will be display in this column.

Subnet Mask	Assign the subnet mask of the IP address. If the DHCP client function is enabled, the user is not required to assign the subnet mask.
Gateway	Assign the network gateway for the switch. If the DHCP client function is enabled, the user is not required to assign the Gateway.
DNS	Assign the DNS IP address.
	Click the “Apply” button to save changes.

Figure 5.8 – IP Setting Information Description

5.2.4 System Time

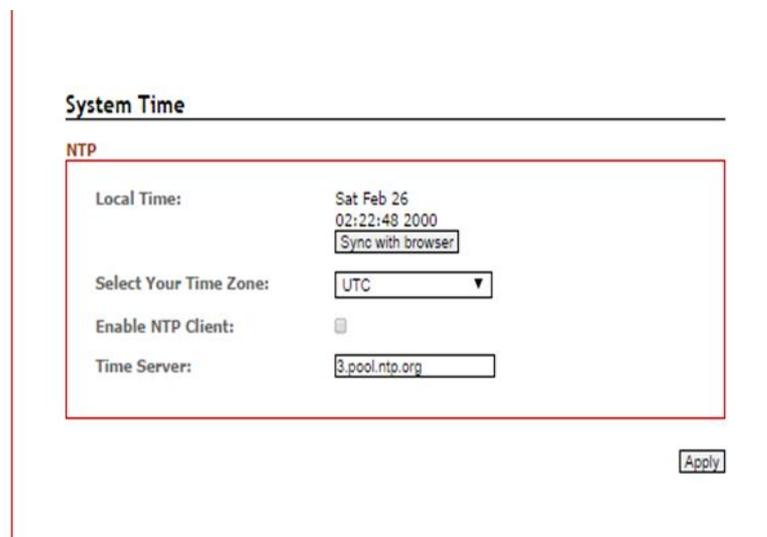


Figure 5.9 – System Time Settings

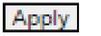
Terms	Value Description
Local Time	Users can define the switch’s local time, or click the “Sync with browser” button to have local time setup automatically.
Select Your Time Zone	Users can use the dropdown box to setup the switch’s location time zone.
Enable NTP Client	Enable or disable the NTP function to get the time from the SNTP server.
Time Server	Users can define the time server info.
	Click the “Apply” button to save changes.

Figure 5.10 – System Time Settings Description

5.3 Port Management

5.3.1 Port Status

The following information provides the current port status.

Status

PORT

No.	Link	Speed	Duplex	Rx Byte	Tx Byte	PoE
1	Down	10	half	0	0	NoSupply
2	Up	100	full	31913127	640601	NoSupply
3	Down	10	half	0	0	NoSupply
4	Down	10	half	28784	1596	NoSupply
5	Down	100	full	0	0	-
6	Down	100	full	0	0	-

Figure 5.11 – Port Status Interface

5.3.2 Port Configuration

Users can assign or insert a “value/label” for each port under each “Port Name” box; enable or disable each port function; state the speed/duplex of each port; and enable or disable the flow control of the port.

Port Configuration

PORT

No.	Link	Port name:	Status	Speed/Duplex	Flow control
1	Down	<input type="text"/>	Enable ▼	Auto ▼	<input type="checkbox"/>
2	Up	<input type="text"/>	Enable ▼	Auto ▼	<input type="checkbox"/>
3	Down	<input type="text"/>	Enable ▼	Auto ▼	<input type="checkbox"/>
4	Down	<input type="text"/>	Enable ▼	Auto ▼	<input type="checkbox"/>
5	Down	<input type="text"/>	Enable ▼		<input type="checkbox"/>
6	Down	<input type="text"/>	Enable ▼		<input type="checkbox"/>

Figure 5.12 – Port Configuration Interface

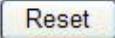
Terms	Value Description
Port No.	It shows each port status: Up for link active, and Down for link inactive.
Port Name	Users can create or insert a value or label for each port's identification.
Status	Enable or disable a port
Speed/Duplex	Users can set the bandwidth of each port as Auto-negotiation, 100 full, 100 half, 10 full, 10 half mode.
Flow Control	Support symmetric and asymmetric mode to avoid packet loss when congestion occurred.
	Click the "Apply" button to save changes.
	Click to undo any changes made locally and revert to previously saved values.

Figure 5.13 – Port Configuration Description

5.4 PoE (Power-over-Ethernet)

LMP-0601G-SFP-24 series is one of Antaira's industrial PoE+ managed switches that has four built-in IEEE802.3at complaint ports, and each PoE port would support PoE output power up to a maximum of 30W per port. It is also backward compatible with IEEE 802.af to support any standard PoE powered devices (PD).

5.4.1 PoE Configuration

POE Configuration

PoE PORT

No.	Status	Mode	Consumption
1	No PD Detected	Enable ▼	0.00W
2	No PD Detected	Enable ▼	0.00W
3	No PD Detected	Enable ▼	0.00W
4	No PD Detected	Enable ▼	0.00W



Figure 5.14 – PoE Port Configuration Interface

Terms	Value Description
Port No.	PoE Port Number
Status	Any PoE port will automatically detect any powered device (PD) that is connected and it will display the situation.
Mode	Users can use the dropdown box to enable or disable any PoE port function.
Consumption	Set the PoE power output limit value. The maximum value must be less than 30.0W.
	Click the "Apply" button to save changes.

Figure 5.15 – PoE Port Configuration Description

5.4.2 Ping Alarm

The PoE ping alarm function is using the ping command to turn on or off any PoE power output port. Users can insert any particular powered device's IP address and set the interval time for a power recycle, timing the particular PoE port.

Power over Ethernet

PoE KEEPALIVE

PD	IP Address	Cycle Time(s)
1	<input style="width: 90%;" type="text"/>	<input style="width: 90%;" type="text"/>
2	<input style="width: 90%;" type="text"/>	<input style="width: 90%;" type="text"/>
3	<input style="width: 90%;" type="text"/>	<input style="width: 90%;" type="text"/>
4	<input style="width: 90%;" type="text"/>	<input style="width: 90%;" type="text"/>



Figure 5.16 – PoE Ping Alarm Interface

5.4.3 PoE Schedule

For energy saving or power recycle powered devices, the PoE managed switch's PoE schedule interface allows users to appoint any date and time to enable or disable PoE functions for each PoE port.

The screenshot displays the 'Power over Ethernet' configuration page, specifically the 'PoE SCHEDULE' section. At the top, there are four tabs labeled 'Port1', 'Port2', 'Port3', and 'Port4'. Below the tabs, the interface is organized by day of the week. For each day (Monday, Tuesday, Wednesday, and Thursday), there is an 'Enable' checkbox and two dropdown menus for 'Start time(hour)' and 'End time(hour)'. All 'Enable' checkboxes are currently unchecked, and all time dropdown menus are set to '0'.

Day	Enable	Start time(hour)	End time(hour)
Monday	<input type="checkbox"/>	0	0
Tuesday	<input type="checkbox"/>	0	0
Wednesday	<input type="checkbox"/>	0	0
Thursday	<input type="checkbox"/>	0	

Figure 5.17 – PoE Schedule Interface

5.5 ERPS

In any industrial automation application, designing the redundant ring network paths can protect networks from unexpected failovers is extremely important in mission-critical networks that need to provide uninterrupted services. In practice, several loop protection methods are implemented to ensure that network functions normally without loops and recovers as soon as possible when a point of failure occurs. The most popular ones are RSTP (802.1w) and MSTP (802.1s). For industrial applications, the ERPS (G.8032) are highly recommended since they can achieve faster recovery time than any STP protocol.

Due to different manufacturers who provide their own proprietary redundant ring protocol, and users facing inconvenient situations with compatible issues when they are planning to design or upgrade their ring network for future proof, Antaira is proud to introduce and implement Ethernet Ring Protection Switching (ERPS) protocol as a standard ring solution for network redundancy with all new industrial managed Ethernet switches. In order to provide users with the flexibility and compatibility when there are any existing switches that contains the standard ERPS protocol.

Ethernet Ring Protection Switching (ERPS), defined in ITU-T G8032, implements a protection switching mechanism for Ethernet traffic in a ring topology. By performing the ERPS function, potential loops in a network can be avoided by blocking traffic to flow to the ring protection link (RPL) to protect the entire Ethernet ring.

In a network with ring topology that runs ERPS, only one switch is assigned as an “owner” that is responsible for blocking traffic in RPL so as to avoid loops. The switch adjacent to the RPL owner is called the RPL “neighbor” node that is responsible for blocking its end of the RPL under normal condition. Other participating switches adjacent to the RPL owner or neighbor in a ring are members or RPL next-neighbor nodes to this topology and normally forward receive traffic. ERPS, like STP, provides a loop-free network by using polling packets to detect faults. When a fault occurs, ERPS heals itself by sending traffic over a protected reverse path less than 50ms and recover quickly to forward traffic. Because of this fault detection mechanism, the network broadcast storm problem could be avoided as well.

5.5.1 ERPS Status

Below, *Figure 5.18*, shows the network redundancy ring status with the Ethernet Ring Protection Switch (ERPS) protocol.

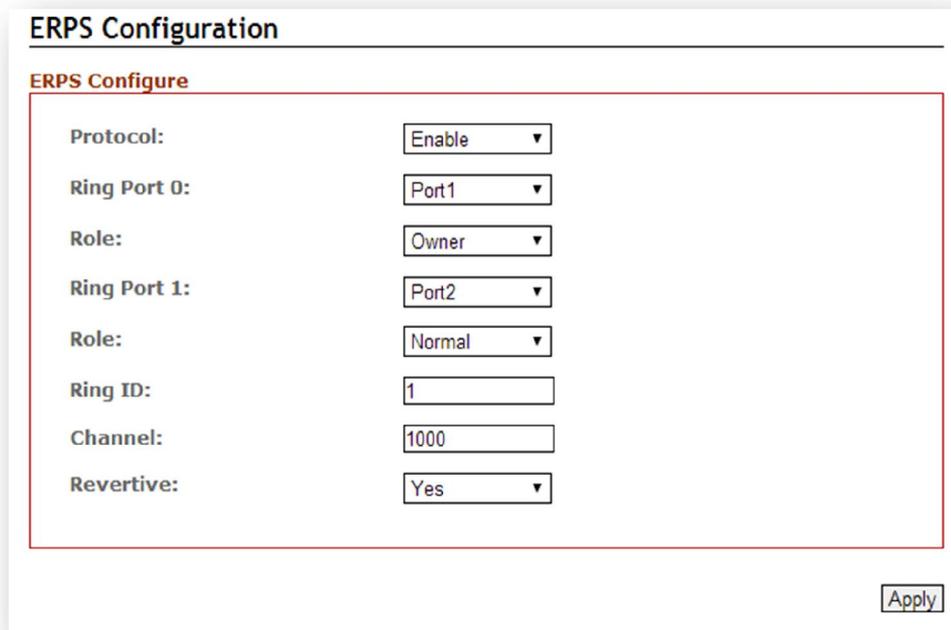


ERPS Status	
Protocol:	Disable
Ring ID:	1
Ring State:	Normal
Node State:	INITIAL STATE
Channel:	1000
Revertive:	Enable

Figure 5.18 – Redundant Ring Network – ERPS Status

5.5.2 ERPS Configuration

Below, *Figure 5.19*, shows the ERPS configuration interface.



ERPS Configuration	
ERPS Configure	
Protocol:	Enable ▼
Ring Port 0:	Port1 ▼
Role:	Owner ▼
Ring Port 1:	Port2 ▼
Role:	Normal ▼
Ring ID:	1
Channel:	1000
Revertive:	Yes ▼

Figure 5.19 – ERPS Configuration Interface

Terms	Value Description
Protocol	“Enable” or “Disable” ERPS protocol
Ring Port 0	ERPS ring port 0, can be mapped to port 1 – port 6. Do not set the same as Ring port 1.
Ring Port 1	ERPS ring port 0, can be mapped to port 1 – port 6. Do not set the same as Ring port 0.
Role	Set the ERPS role as Owner, Neighbor or Normal. [Owner] In charge of blocking one side of RPL link. It will prevent the packet flow from its blocked port. [Neighbor] In charge of blocking one side of RPL link. It will prevent the packet flow from its blocked port. [Normal] Besides Owner and Neighbor node, the rest of nodes are defined as Normal node. All node roles have the ability to block the port if the link attach to the port is failed and disconnected.
Ring ID	ERPS ring ID, ranges from 1 to 239. Ring ID distinguishes different Ring topology.
Channel	ERPS Channel ID, ranges from 1 to 4094. It's a channel to send PDUs of ERPS.
Revertive	Set to Revertive (yes) or Non-revertive (no). The revertive mode works only under scenario A at the RPL Owner node. [Revertive] While the revertive mode is set, the RPL link will be blocked in 5 minutes after recovery form link failure situation. Otherwise, it will remain unchanged of the blocking state. That is, the failed link port will block permanently until the next event happen. [Non-Revertive] The failed ring link the port attached to it will remain blocked even the situation is eliminated.
	Click the “Apply” button to save changes.

Figure 5.20 – ERPS Configuration Terms & Description

5.5.3 Before Configuring ERPS

Before configuring ERPS, the rapid spanning tree protocol (RSTP), or multiple spanning tree protocol is required to disabled, because only one protocol can be exclusively running within a switch. Below are the steps to disable RSTP or MSTP.

- Step 1:** Login to the switch with a web browser.
- Step 2:** Open the “RSTP Configuration” page under the “Spanning Tree” manual as below *Figure 5.21*.

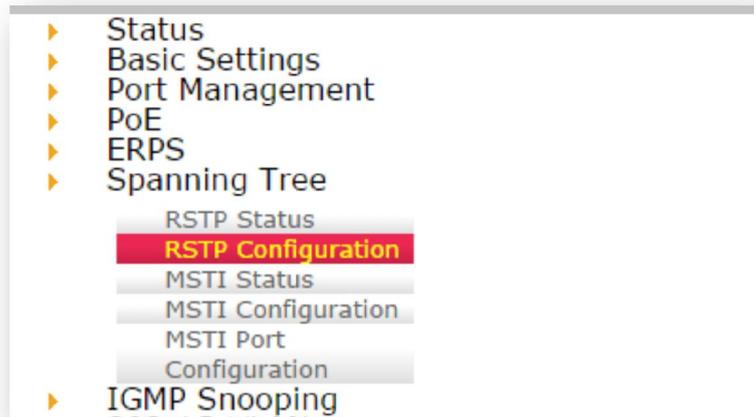


Figure 5.21 – Spanning Tree Manual

- Step 3:** When the RSTP/CIST Configuration page shows up, set “Mode” to “Disable” as shown in *Figure 5.22*.

RSTP/CIST Configuration

RSTP/CIST

Mode:	<input type="text" value="RSTP"/>
Root Priority:	<input type="text" value="RSTP"/>
Root Hello Time:	<input type="text" value="2"/>
Root Forward Delay:	<input type="text" value="15"/>
Root Maximum Age:	<input type="text" value="20"/>

Figure 5.22 – RSTP/CIST Configuration Interface

Step 4: Press the “Apply” button in the lower right corner (Figure 5.23).

RSTP/CIST Configuration

RSTP/CIST

Mode:

Root Priority:

Root Hello Time:

Root Forward Delay:

Root Maximum Age:

RSTP/CIST PORT

No.	Path Cost(0:Auto,1-200000000)	Priority	Admin P2P	Auto Edge	Admin Non STP
1	0	128	True	Auto	False
2	0	128	True	Auto	False
3	0	128	True	Auto	False
4	0	128	True	Auto	False
5	0	128	True	Auto	False
6	0	128	True	Auto	False

Figure 5.23 – RSTP/CIST Configuration Interface

Ethernet Ring Protection Switch (ERPS) is an Ethernet ring protection protocol which is used to prevent forming the loop in LAN, thus, the Broadcast Storm problem could be avoided. The loop avoidance mechanism ensures the traffic flows on all but the RPL ring link. In order to achieve the loop-avoidance mechanism, ITU-T G.8032 defines three roles in ERPS, which are “RPL Owner Node”, “RPL Neighbor Node”, and “Normal Node”.

Below are two scenarios describing how to configure the ERPS in Antaira industrial managed Ethernet switches. Users can reference it to configure the managed switch as RPL-configured architecture as Figure 5.24 or Non-configure architecture as Figure 5.25.

5.5.3.1 Scenario A – RPL Configured Architecture

Under scenario A, there are three major roles that are required to be configured within the ERPS configuration.

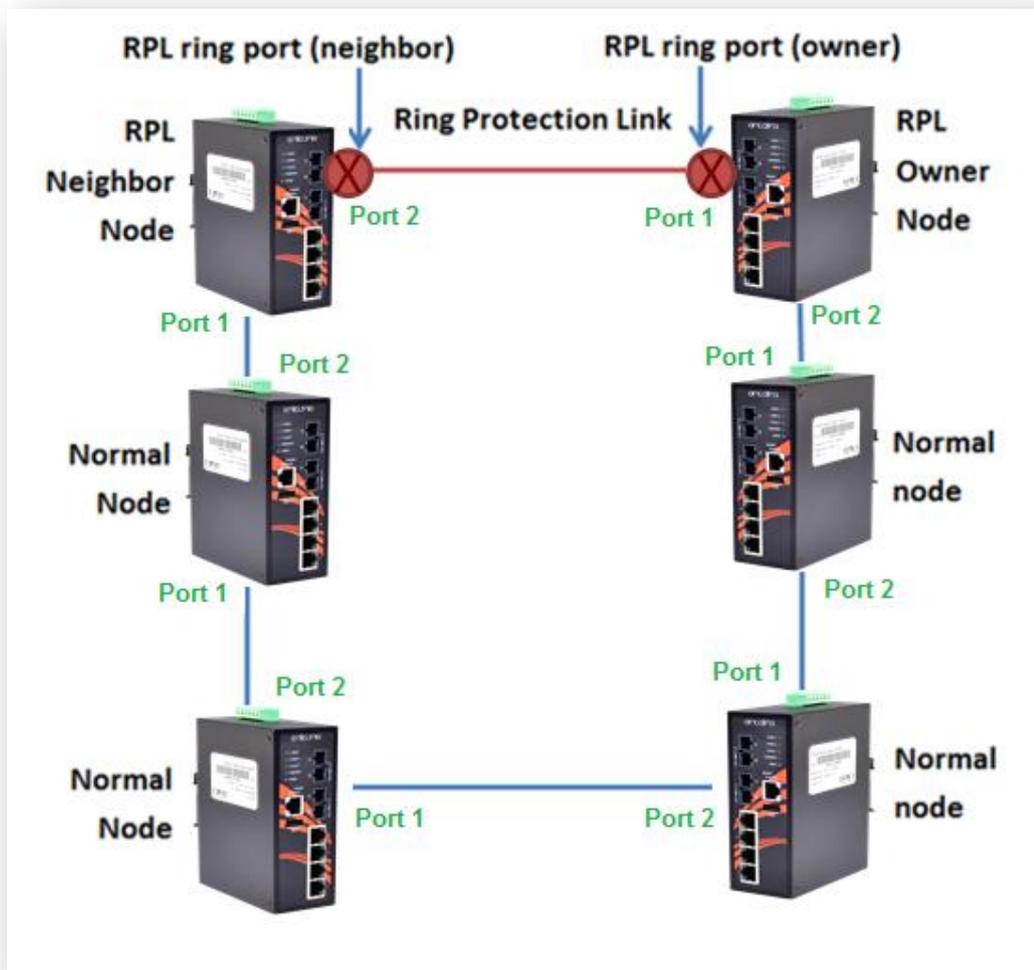


Figure 5.24 – RPL-Configured Architecture

Caution: Before enabling any ERPS protocols on any of the Ring Nodes, please DO NOT connect all switches to form a loop (ring) network just yet. There should be at least one ring port left unplugged until all nodes in the topology are ready.

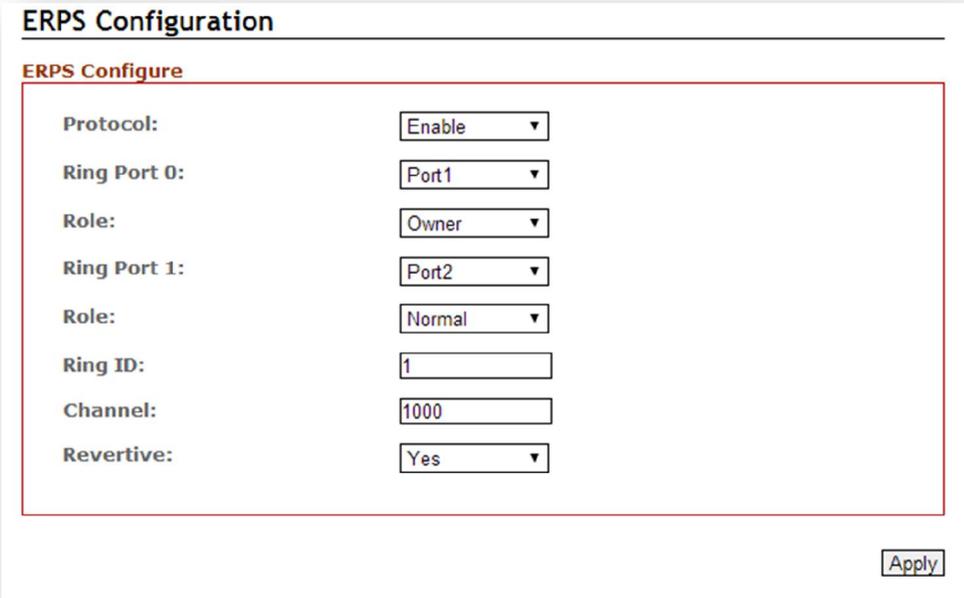
[RPL Owner Node]

There is only one RPL Owner Node that can be set in a ring network. In order to set up the RPL Owner Node, choose a switch and enable the “Protocol” under the ERPS Configuration interface, and follow the steps below (Figure 5.25).

- Step 1: Choose a specific port from the dropdown box next to “ring port 0”, and set it as “Owner” node by clicking the dropdown box next to “Role” below “ring port 0”. At this point, “**Port 1**” was chosen as example.
- Step 2: Choose a specific port from the dropdown box next to “ring port 1”, then set it as “**Normal**” from the dropdown box next to “Role” (which locates below “ring port 1”). At this point, “**Port 2**” was chosen as example.

Note: The port number of “Ring Port 0” and “Ring Port 1” cannot be duplicated.

After the configurations, press the “Apply” button on the right bottom corner to save the setting.



The screenshot displays the 'ERPS Configuration' window. It features a title bar 'ERPS Configuration' and a sub-section 'ERPS Configure'. The configuration fields are as follows:

Protocol:	Enable
Ring Port 0:	Port1
Role:	Owner
Ring Port 1:	Port2
Role:	Normal
Ring ID:	1
Channel:	1000
Revertive:	Yes

An 'Apply' button is located at the bottom right of the configuration area.

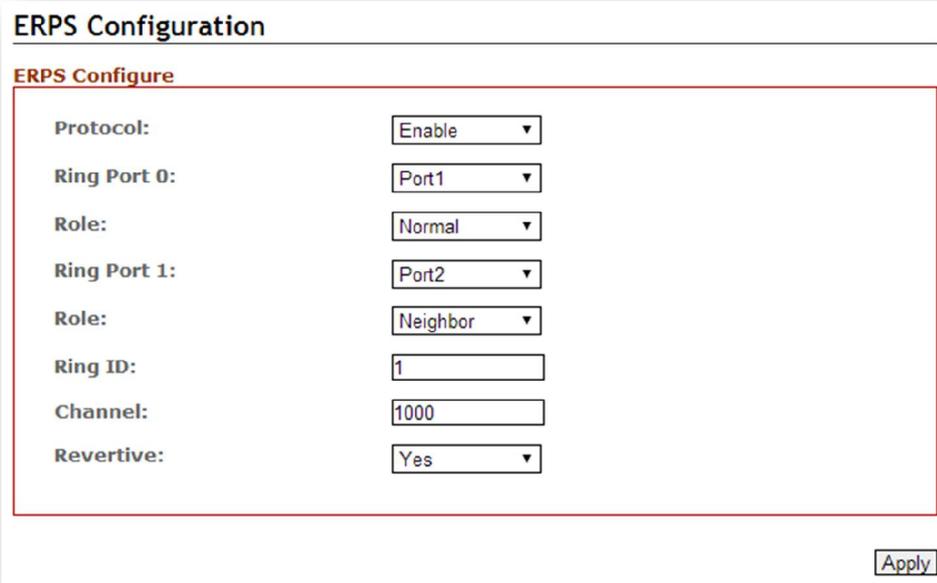
Figure 5.25 – RPL Owner Node Setup Example

Please note, when the revertive mode is set to “Yes”, the ring will recover the same information as shown in Figure 5.24, after, the ring state will go from ABNORMAL to NORMAL within 5 minutes. Otherwise, the blocked port will remain blocked permanently unless users reconfigure it.

[RPL Neighbor Node]

Users should choose a second managed switch that is adjacent to the first managed switch and set it up as the RPL neighbor node. For configuration, users should login to the second managed switch's ERPS configuration interface and choose a specific port number under "Ring Port 0" and set it as the "Normal" node by clicking the dropdown box of "Role"; then, set another specific port number under "Ring Port 1" as the "Neighbor" node as shown below in *Figure 5.26*. So the link between neighbor port and owner port forms the ring protection link (RPL). After the configurations, press the "Apply" button on the bottom right corner to save the settings.

Note: The port number of "Ring Port 0" and "Ring Port 1" cannot be duplicated.



The screenshot displays the "ERPS Configuration" window, specifically the "ERPS Configure" section. The settings are as follows:

Field	Value
Protocol:	Enable
Ring Port 0:	Port1
Role:	Normal
Ring Port 1:	Port2
Role:	Neighbor
Ring ID:	1
Channel:	1000
Revertive:	Yes

An "Apply" button is located in the bottom right corner of the configuration area.

Figure 5.26 – RPL Neighbor Node Setup Example

[Normal Node]

Then user should setup the rest of the managed switches' "Role" of both "Ring Port 0 and 1" as "Normal Node" as shown above in *Figure 5.27*. Please be sure no duplicate port number has been chosen within a managed switch's ERPS ring setting, the incorrect configurations may lead to unexpected errors.

The screenshot displays the 'ERPS Configuration' window. The 'ERPS Configure' section is highlighted with a red border and contains the following fields:

Protocol:	Enable
Ring Port 0:	Port1
Role:	Normal
Ring Port 1:	Port2
Role:	Normal
Ring ID:	1
Channel:	1000
Revertive:	Yes

An 'Apply' button is located at the bottom right of the configuration area.

Figure 5.27 – RPL Normal Node Setup Example

5.5.3.2 Scenario B – Non-Configured Architecture

In some situations, users can choose not to configure the RPL owner and neighbor node; the ERPS could still work well under the mechanism by blocking one of the ring ports in the ERPS ring topology.

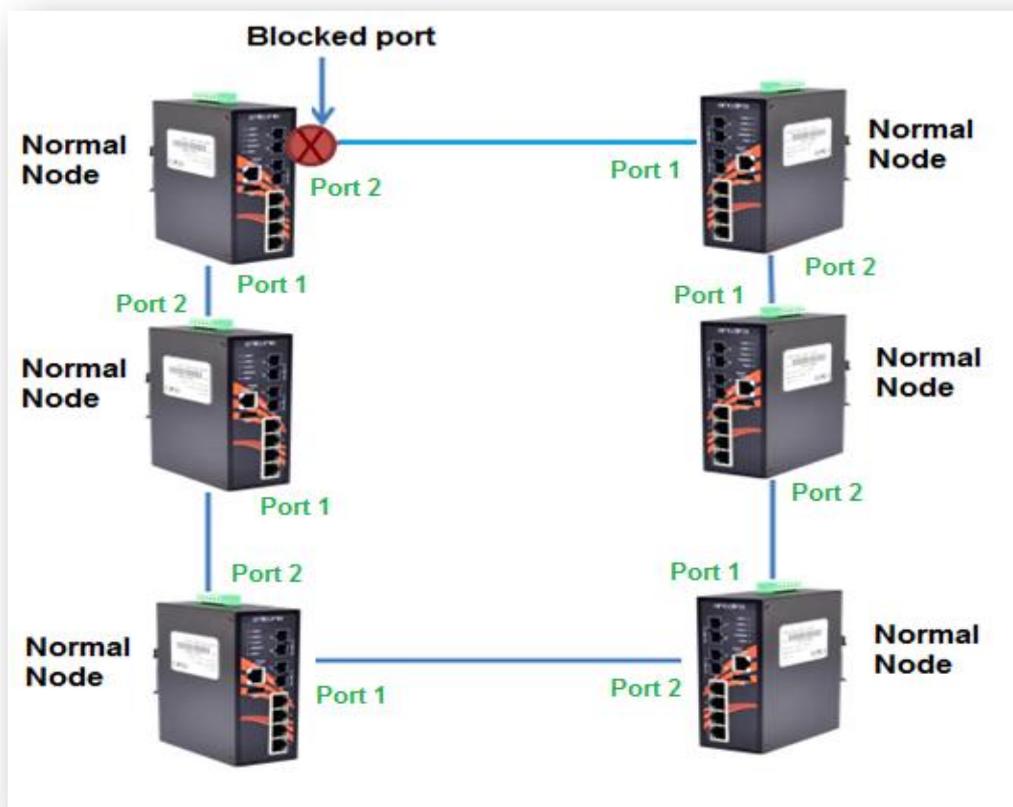


Figure 5.28 – Non-Configured Architecture

Caution: Before enabling any ERPS protocols on any of the Ring Nodes, please DO NOT connect all switches to form a loop (ring) network just yet. There should be at least one ring port left unplugged until all nodes in the topology are ready.

As shown in Figure 5.28, the ERPS is blocked at one of the ring node ports. The blocked port is chosen by an election mechanism that is decided by the MAC address. Due to the MAC address is unique; the ERPS will just choose the biggest MAC as the blocking node.

However, the user is still required to enable the RRPS protocol, and assign a dedicated port number for each uplink port under “Ring Port 0 and 1” but there is no requirement to setting the role. Figure 5.29, below, shows the configurations as a reference.

After the configurations, press the “Apply” button on the bottom right corner to save the settings.

Note: The port number of “Ring Port 0” and “Ring Port 1” cannot be duplicated.

ERPS Configuration	
ERPS Configure	
Protocol:	Enable
Ring Port 0:	Port1
Role:	Normal
Ring Port 1:	Port2
Role:	Normal
Ring ID:	1
Channel:	1000
Revertive:	Yes
<input type="button" value="Apply"/>	

Figure 5.29 – Non-Configured Architecture Setup

5.6 Spanning Tree

The Spanning Tree Protocol (STP), defined in the IEEE Standard 802.1d, can be created within a mesh network of connected layer-2 switches.

The Rapid Spanning Tree Protocol (RSTP), defined in the IEEE 802.1w. RSTP is an enhanced solution of STP. It shares most of its basic operation characteristics, and essentially creates a cascading effect away from the root bridge where each designated bridge proposes to its neighbors to determine if it can make a rapid transition.

Another extension of RSTP is the Multiple Spanning Tree protocol (MSTP), defined in the IEEE802.1s. It allows different VLANs to travel along separate instances of spanning tree. Unlike STP and RSTP, MSTP eliminates the needs for having different STP for each VLAN. Therefore, in a large networking environment that employs many VLANs, MSTP can be more useful than legacy STP.

5.6.1 RSTP Status

Figure 5.30 shows the RSTP algorithm results.

RSTP/CIST Status

Root Status

Bridge ID:	8.000.7C:CB:0D:AD:DC:14
Root Priority:	32768
Root Port:	lan2 (#2)
Root Path Cost:	0
Hello Time:	2
Forward Delay:	15
Max Age:	20

RSTP/CIST Port Status

No.	Role	Path State	Port Cost	Port Priority	Oper P2P	Oper Edge
1	Disabled	Discarding	200000000	128	Shared	Non-Edge
2	Root	Forwarding	200000	128	Shared	Non-Edge
3	Disabled	Discarding	200000000	128	Shared	Non-Edge
4	Disabled	Discarding	200000	128	Shared	Non-Edge
5	Disabled	Discarding	200000000	128	Shared	Non-Edge
6	Disabled	Discarding	200000000	128	Shared	Non-Edge

Figure 5.30 – RSTP Information Interface

5.6.2 RSTP Configuration

Users can enable/disable the RSTP function, and set the parameters for each port.

RSTP/CIST Configuration

RSTP/CIST

Mode:	<input type="text" value="RSTP"/>
Root Priority:	<input type="text" value="32768"/>
Root Hello Time:	<input type="text" value="2"/>
Root Forward Delay:	<input type="text" value="15"/>
Root Maximum Age:	<input type="text" value="20"/>

RSTP/CIST PORT

No.	Path Cost{0:Auto,1-200000000}	Priority	Admin P2P	Auto Edge	Admin Non STP
1	0	128	True	Auto	False
2	0	128	True	Auto	False
3	0	128	True	Auto	False
4	0	128	True	Auto	False
5	0	128	True	Auto	False
6	0	128	True	Auto	False

Figure 5.31 – RSTP Configuration Interface

Terms	Value Description
Mode	Users can select the RSTP or MSTP function to be enabled or disabled before configuring the related parameters.
Root Priority (0~61440)	A value used to identify the root bridge. The bridge with the lowest value has the highest priority and is selected as the root. If any change of the value, the switch is required to be reboot. The value must be a multiple of 4096 according to the protocol standard rule.
Root Hello Time (1~10)	Enter a value between 1 through 10 for the time to control the switch to send out the BPDU packet for RSTP current status checking.
Root Forward Delay (4~30)	Enter a value between 4 through 30 as the number of seconds for a port to wait before changing from its RSTP learning and listening states to the forwarding state.
Root Maximum Age (6~40)	Enter a value between 6 through 40 as the number of seconds a bridge waits without receiving STP configuration messages before attempting a reconfiguration.
Path Cost (0~200000000)	Enter a value from 1 through 200000000 to define the path cost for the other switch from this transmitting switch at the specified port. When path cost insert in 0, the switches will be setup as automatic data transmitting.
Priority (0~240)	Enter a number 0 through 240 to decide which port should be blocked by priority in LAN. The value of priority must be a multiple of 16
Admin P2P	Some of the rapid state transactions that are possible within RSTP are dependent upon whether the port concerned can only be connected to exactly one other switch (i.e. It is served by a point-to-point LAN segment), or it can be connected to two or more switches (i.e. It is served by a shared medium LAN segment). This function allows the P2P status of the link to be manipulated administratively. True means P2P enabling. False means P2P disabling.
Auto Edge	The port is directly connected to end stations, and it cannot create bridging loop in the network.To configure

	the port as an edge port, set the port to “True” .
Admin Non STP	The port includes the STP mathematic calculation. True is not including STP mathematic calculation. False is including the STP mathematic calculation.
Apply	Click the “Apply” button to save changes.

Figure 5.32 – RSTP Configuration Terms & Value Description

MSTP (Multiple Spanning Tree Protocol)

It is defined in IEEE 802.1s, it can map a group of VLAN’s into a single Multiple Spanning Tree instance (MSTI). In fact, the Spanning Tree Protocol is applied separately for a set of VLAN’s instead of the whole network. Different root switches and different STP parameters can be individually configured for each MSTI. So, one link can be active for one MSTI and the other link active for the second MSTI. This enables some degree of load-balancing and generally two MSTI’s are used in the network for easier implementation.

5.6.3 MSTI Status

Users can display the MSTI root status and port status by selecting the instance ID number from 1 to 15 by clicking on the dropdown box from the “MSTI Status” interface.

The screenshot shows the 'MSTI Status' configuration page. At the top, there is a title 'MSTI Status' followed by a horizontal line. Below this is a dropdown menu for 'Instance ID' with the value '1' selected. Underneath is the 'Root Status' section, which contains four fields: 'Root Address:', 'Root Priority:', 'Root Port:', and 'Root Path Cost:'. Each field is followed by a series of dots representing a text input area. Below the 'Root Status' section is the 'MSTI Port Status' section, which features a table with five columns: 'No.', 'Role', 'Path State', 'Port Cost', and 'Port Priority'. The table has several rows of dotted lines for data entry.

Figure 5.33 – MSTI Status Interface

5.6.4 MSTI Configuration

Users can display the MSTI root status and port status by selecting the “Instance ID” number from 1 to 15 by clicking on the dropdown box from the “MSTI Status” interface.

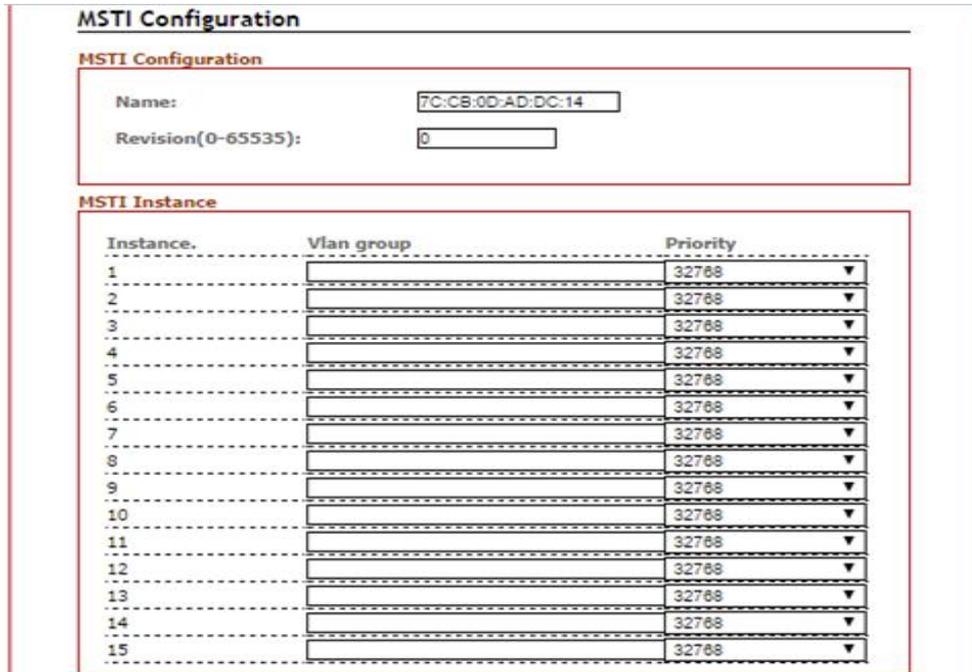


Figure 5.34 – MSTI Configuration Interface

Terms	Value Description
MSTI Configuration	
Name	Users can insert the unique MAC address of the bridge switch.
Revision	Users can insert the value from 0~65535.
MSTI Instance	
Instance No. & VLAN Group	There are 1~15 instance numbers, users can insert which VLAN Group info into the belonging Instance number.
Priority (0~61440)	<p>A value used to identify the root bridge.</p> <p>The bridge with the lowest value has the highest priority and is selected as the root.</p> <p>The switch is required to reboot when there's any value change.</p> <p>The value must be multiple of 4096 according to the protocol standard rule.</p>

	Click the “Apply” button to save changes.
---	---

Figure 5.35 – MSTI Configuration –Terms & Value Description

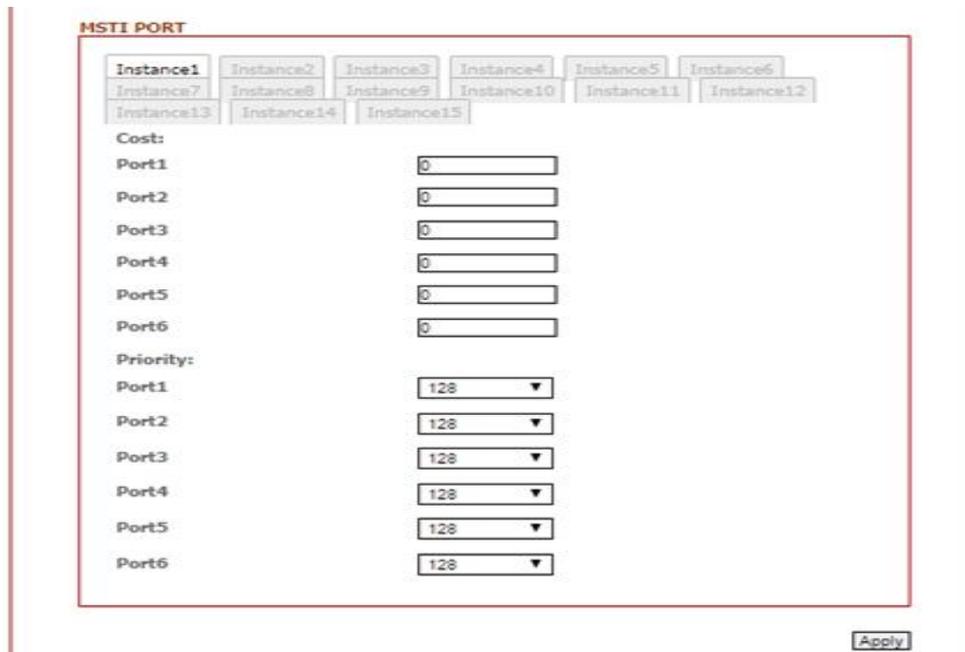


Figure 5.36 – MSTI Port Configuration Interface

Terms	Value Description
Instance Tabs	Users can select Instance Tab #1~#15 to configure each MSTI port “Cost” & “Priority” value.
Cost	Users can define the path cost value from 1 through 200000000 to the other bridge from this transmitting bridge at the specified port.
Priority	Users can decide which port should be blocked by priority in LAN by selecting the value from 0 to 240 within the dropdown box.
	Click the “Apply” button to save changes.

Figure 5.37 – MSTI Port Configuration Terms & Value Description

5.7. 802.1Q VLAN

A Virtual LAN (VLAN) is a logical network grouping that limits the broadcast domain, which allows users to isolate network traffic. Only the members of the VLAN will receive traffic from the same members of VLAN. Basically, creating a VLAN from a switch is logically equivalent of reconnecting a group of network devices to another Layer 2 switch. However, all the network devices are still physically plugged into the same switch. The switch supports port-based and 802.1Q (tagged-based) VLAN. The default configuration of VLAN operation mode is at “802.1Q”.

5.7.1 802.1Q VLAN settings

Tagged-based VLAN is an IEEE 802.1Q specification standard, and it is possible to create a VLAN across devices from different switch vendors. IEEE 802.1Q VLAN uses a technique to insert a “tag” into the Ethernet frames. Tag contains a VLAN Identifier (VID) that indicates the VLAN numbers.

Ports in a port-based VLAN are referred to as untagged ports and the frames received on the ports as untagged frames. The names derive from the fact that the frames received on a port do not contain any information that indicates VLAN membership, and that VLAN membership is determined solely by a port’s PVID.

All of Antaira’s industrial managed switches’ have a default VLAN setting set to “none” for each port, so the users can login to the VLAN setting interface to create a VLAN Group name and choose “Tag” or “Untag” for each port.



Figure 5.38 – 802.1Q VLAN Settings Interface

5.7.2 802.1Q VLAN Settings

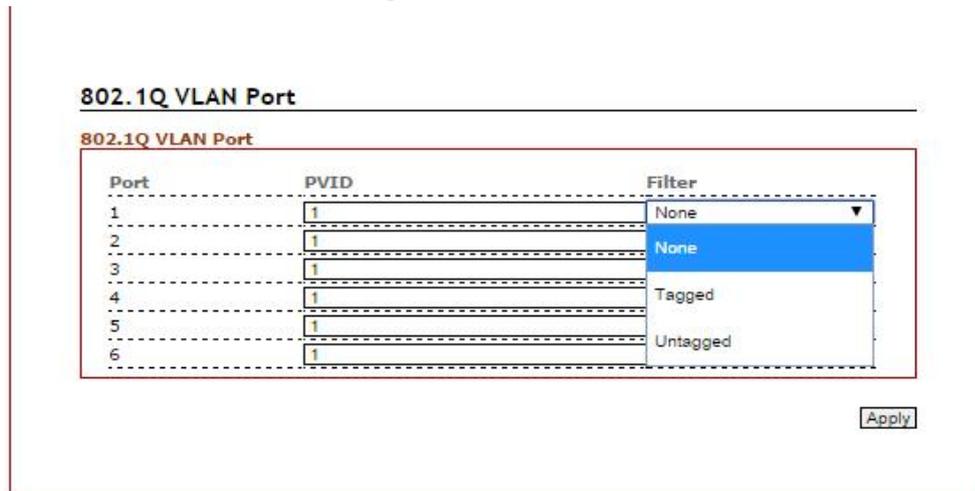


Figure 5.39 – 802.1Q VLAN Settings Interface

Terms	Value Description
PVID	Users can assign a Port VLAN ID for each port
Filter	<p>User can choose any port be “Tagged” or “Untagged”.</p> <p>Tagged VLAN: Set the tagged PVIDs to carry different VLAN frames to other switch.</p> <p>Untagged VLAN: Set the port PVID for untagged devices that connect to the port. The range of PVID is 1 to 4094.</p>
Apply	Click the “Apply” button to save changes.

Figure 5.40 – 802.1Q VLAN settings Terms & Value Description

5.8. IGMP Snooping

The Internet Group Management Protocol (IGMP) is a communications protocol used to manage the membership of Internet Protocol multicast groups. IGMP is used by IP hosts and adjacent multicast routers to establish multicast group memberships.

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

IGMP snooping can reduce multicast traffic from streaming and other bandwidth intensive IP applications more effectively. A switch using IGMP snooping will only forward multicast traffic to the hosts in that traffic. This reduction of multicast traffic reduces the packet processing at the switch (at the cost of needing additional memory to handle the multicast tables) and also

decreases the workload at the end hosts since their network cards (or operating system) will not receive and filter all the multicast traffic generated in the network.

IGMP has 3 versions, IGMP v1, v2, and v3, and support query group up to 256 groups.

5.8.1 IGMP Settings

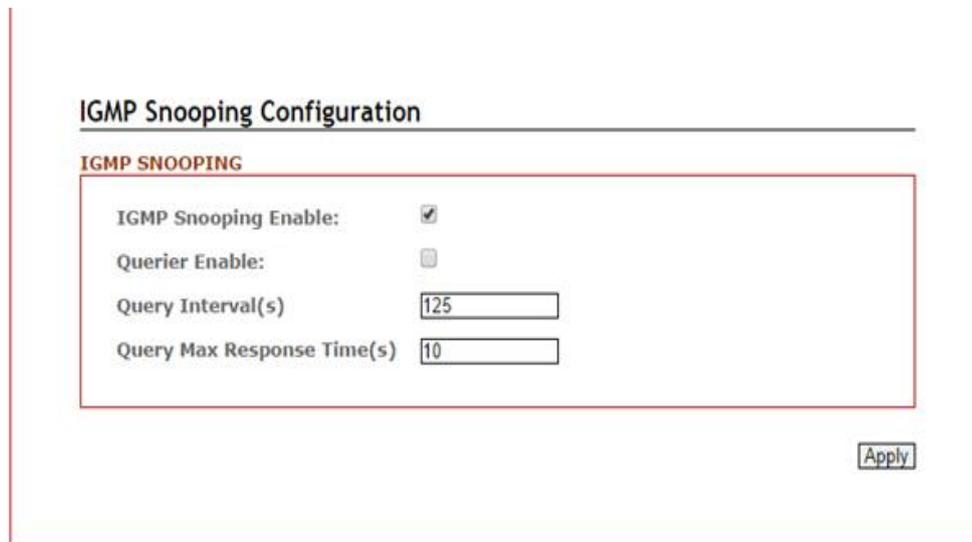


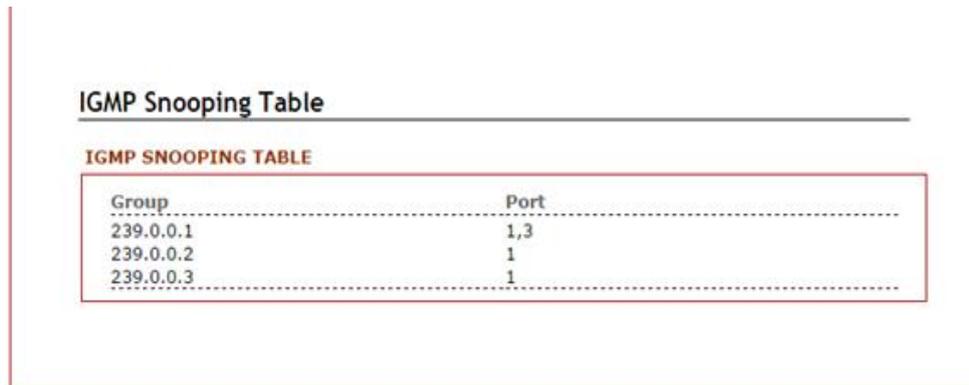
Figure 5.41 – IGMP Snooping Settings Interface

Terms	Value Description
IGMP Protocol	Check the box to enable or disable IGMP Snooping.
Querier	Switch will be IGMP querier or not. There should only be one IGMP querier in an IGMP application – with up to 256 groups.
Query Interval	The frequency at which the querier sends query messages.
Query Max Response Time	The maximum response time advertised.
Apply	Click the “Apply” button to save changes.

Figure 5.42 – IGMP Snooping Settings Terms & Value Description

5.8.2 IGMP Snooping Status Table

Multicast filtering is the system by which the end stations only receive multicast traffic if they have registered to join specific multicast groups. With multicast filtering, network devices only forward multicast traffic to the ports that are connected to registered end stations.



The image shows a screenshot of a network device's configuration page. At the top, the title "IGMP Snooping Table" is displayed. Below it, a table titled "IGMP SNOOPING TABLE" is shown. The table has two columns: "Group" and "Port". The data rows are as follows:

Group	Port
239.0.0.1	1,3
239.0.0.2	1
239.0.0.3	1

Figure 5.43 – IGMP Snooping Status Table

5.9 QoS (Traffic Prioritization)

Network traffic is always unpredictable and the only basic assurance that can be offered is the best effort traffic delivery. To overcome this challenge, Quality of Service (QoS) is applied throughout the network. This ensures that network traffic is prioritized according to specified criteria and receives preferential treatments.

Traffic Prioritization includes three modes: port base, 802.1p/COS, and TOS/DSCP. By traffic prioritization function, users can classify the traffic into four classes for differential network application. All of Antaira's industrial managed switches support four priority queues.

5.9.1 QoS Classification

Figure 5.44 – QoS Classification Interface

Terms	Value Description
Queue Scheduling	<p>Users can set it as “Weighted” or “Strict”.</p> <p>Weighted Mode: An 8, 4, 2, 1 weighting is applied to each round robin priority queue.</p> <p>Strict Mode: It gives egress queues with higher priority to be transmitted first before lower priority queues are serviced. ”</p>
Trust Mode	<p>Users can select the trust mode with either DSCP or Cos.</p> <p>When DSCP is selected, only trusted DSCP (Differentiated Services Code Point) values are mapped to a specific QoS class and drop precedence level (DPL). Frames with untrusted DSCP values are treated as non-IP frames.</p> <p>CoS: (Class Of Service) is well known as 802.1p. It describes that the output priority of a packet is determined by user priority field in 802.1Q VLAN tag. The priority value is supported 0to7COS value map to 4 priority queues: Highest, SecHigh, SecLow, and Lowest.</p>

Default Cost	Users can set each port's priority queue from 0 to 7 by clicking from dropdown box; of which 0 is the Highest, and 7 is the lowest.
<input type="button" value="Apply"/>	Click the "Apply" button to save changes.

Figure 5.45 – QoS Classification Terms & Value Description

5.9.2 CoS Mapping

The screenshot shows the 'CoS Mapping' configuration page. It features a table with two columns: 'Cos' and 'Priority'. The 'Cos' column lists values from 0 to 7. The 'Priority' column shows dropdown menus for each value, with the following selections: 0 (Normal), 1 (Low), 2 (Low), 3 (Normal), 4 (Medium), 5 (Medium), 6 (High), and 7 (High). An 'Apply' button is located at the bottom right of the configuration area.

Cos	Priority
0	Normal
1	Low
2	Low
3	Normal
4	Medium
5	Medium
6	High
7	High

Figure 5.46 – CoS Mapping Interface

Terms	Value Description
Cos Value (0~7)	Users can assign each port a CoS value from 0 to 7. According to the IEEE 802.1p, users can define each CoS value in 4 priority queues: from Low to Normal, Medium, and High.
<input type="button" value="Apply"/>	Click the "Apply" button to save changes.

Figure 5.47 – QoS Mapping Terms & Value Description

5.9.3 ToS Mapping

ToS is an acronym for Type of Service. It is implemented as the IPv4 ToS priority control. It is fully decoded to determine the priority from the 6-bit ToS field in the IP header. The most significant 6 bits of the ToS field are fully decoded into 64 possibilities, and the singular code that results is compared against the corresponding bit in the IPv4 ToS priority control bit (0~63).

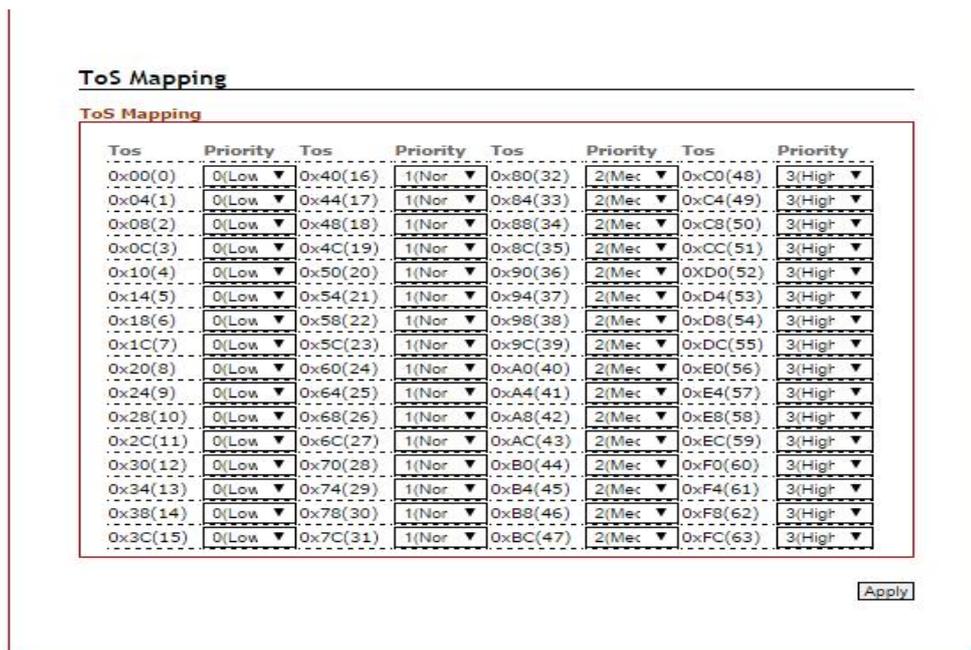


Figure 5.48 – ToS Mapping Interface

Terms	Value Description
ToS	Users can assign each ToS value with 4 priority queues form 0 (Low) to 1 (Normal), 2 (Medium), and 3 (High).
Apply	Click the "Apply" button to save changes.

Figure 5.49 – ToS Mapping Terms & Value Description

5.10 Port Mirroring

Enable or disable the mirroring feature. When enabled, a copy of matched frames will be mirrored to the destination port specified in the port mirroring interface.

Figure 5.50 – Port Mirroring Configuration Interface

Terms	Value Description
Port Mirror Mode	Enable Port Mirroring function by checking the box.
Go To Interface	Users can use the dropdown box to choose the destination port as the “Port to mirror on” feature.
Monitor Direction	Users can select the monitor direction from the dropdown box by “Tx”, “Rx”, or “Tx/Rx”.
Source Port	Users can decide on one particular port as the source port(s) will require port mirroring.
Apply	Click the “Apply” button to save changes.

Figure 5.51 – Port Mirroring Terms & Value Description

5.11 SNMP

Simple Network Management Protocol (SNMP) is the protocol developed to manage nodes (servers, workstations, routers, switches and hubs etc.) on an IP network. SNMP enables network administrators to manage network performance, find and solve network problems, and plan for network growth. Network management systems learn of problems by receiving traps or change notices from network devices implementing SNMP.

5.11.1 SNMP Agent

Figure 5.52 – SNMP Agent Setup Interface

Terms	Value Description
Enable SNMP	Enable the SNMP function by checking the box.
Read-Only Community	Users can release the SNMP to public for “read-only”.
Apply	Click the “Apply” button to save changes.

Figure 5.53 – SNMP Agent Interface Terms & Value Description

5.11.2 SNMP Trap Setting

Trap Setting

SNMP

Enable SNMP Trap:

Trap Destination IP:

Community:

Apply

Figure 5.54 – SNMP Trap Setting

Terms	Value Description
Enable SNMP Trap	Enable the SNMP Trap function by checking the box.
Trap Destination IP	Users can insert the Server IP address as the Trap Destination IP info.
Community	Users can release the SNMP to the public for “read-only”.
Apply	Click the “Apply” button to save changes.

Figure 5.55 – SNMP Trap Settings Terms & Value Description

5.12 System Warning

System warning function is very important for managing a switch. Users can manage the switch by “Syslog”, “System Event Log”, and “Email Server” setup for Advanced Notice in any event type, “Event Type Selection”, and “Fault Alarm” setting. By setting up all these system warning features, users will receive the in advanced warning message through email, whenever any event occurs. It definitely increases the flexibility and capability for the users to monitor the remote site network and device statuses.

5.12.1 Syslog Setting

The SYSLOG is a protocol to transmit event notification messages across networks.

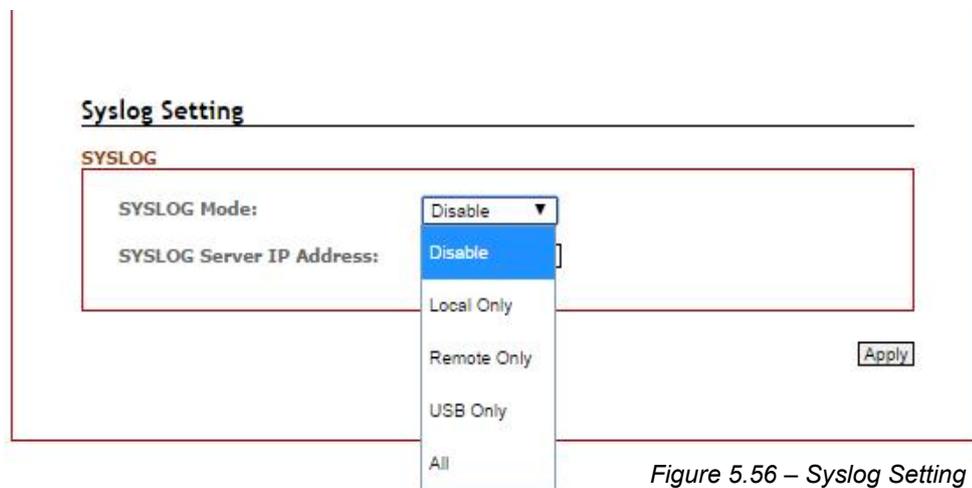


Figure 5.56 – Syslog Setting

Terms	Value Description
SYSLOG Mode	<p>Disable: Disable SYSLOG.</p> <p>Local Only: Log to local system.</p> <p>Remote Only: Log to a remote SYSLOG server.</p> <p>USB Only: Log and store SYSLOG data and warning file to USB storage device through built-in USB Port; and the file name is “message”.</p> <p>All: Log to all local server / USB port, and remote SYSLOG server at the same time.</p> <p>Notice that there is one log in local server or USB port. If USB presented, it will log to USB storage. Otherwise it logs to local server.</p>
SYSLOG Server IP Address	Insert remote SYSLOG server IP address.



Figure 5.57 – SYSLOG Setting Terms & Value Description

5.12.2 System Event Log

Users can view and display the system event log by clicking the “Apply” button on the right bottom corner of the interface. Then, the system event logs will display within the SYSLOG LIST window. The SYSLOG LIST will contain up to 5 pages of system event log information. Users also can click the “Refresh” button to have the most updated system event logs information to display.

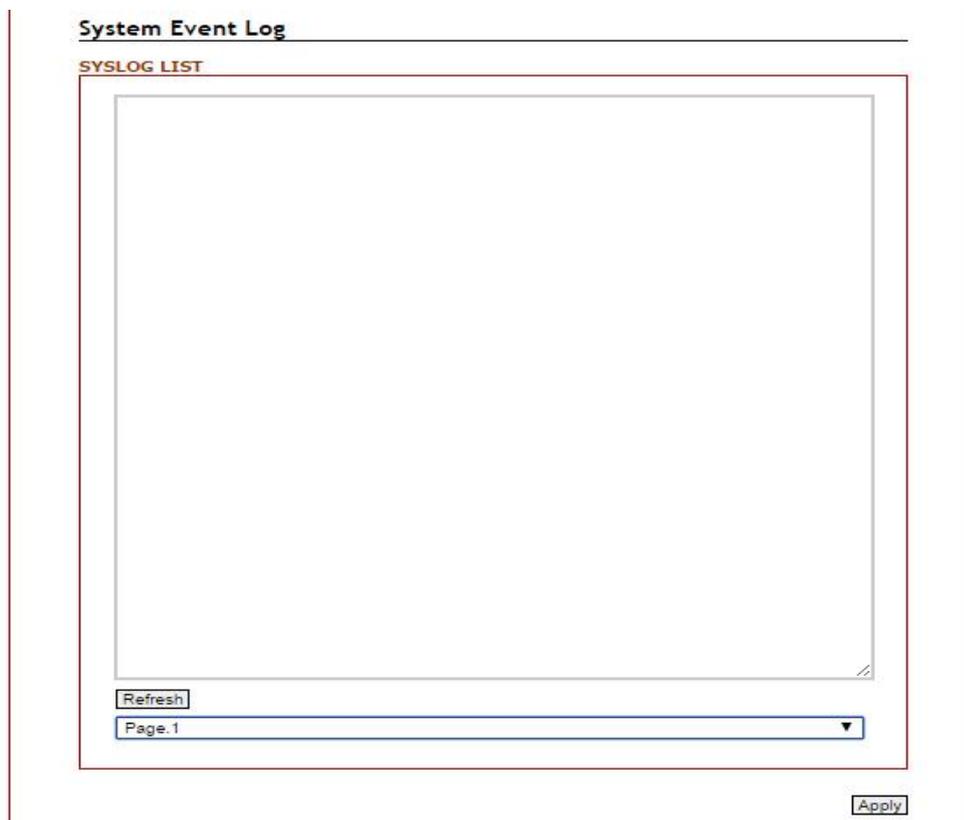


Figure 5.58 – System Event Logs Interface

5.12.3 SMTP Setting

The Simple Mail Transfer Protocol (SMTP) is for e-mail transmission across the Internet.

The screenshot shows a web-based configuration page for SMTP settings. The page has a title bar 'SMTP Setting' and a sub-section 'SMTP'. The settings are as follows:

- E-mail Alert:** A dropdown menu currently set to 'Disable'.
- SMTP Server Address:** A text input field.
- Sender E-mail Address:** A text input field.
- Mail Subject:** A text input field.
- Authentication:** A checkbox that is currently unchecked.
- Username:** A text input field.
- Password:** A text input field.
- Recipient E-mail Address 1:** A text input field.
- Recipient E-mail Address 2:** A text input field.
- Recipient E-mail Address 3:** A text input field.
- Recipient E-mail Address 4:** A text input field.

An 'Apply' button is located at the bottom right of the form area.

Figure 5.59 – SMTP Setting Interface

Terms	Value Description
E-mail Alert	Enable/Disable transmission system warning events by e-mail.
SMTP Server Address	Setting up the mail server IP address.
Sender E-mail Address	Set up the email account to send the alert.
Mail Subject	The subject of the mail.
Authentication	Check the box to enable the Authentication function Username: the authentication username. Password: the authentication password.
Recipient E-mail Address(es)	User can setup up to 4 recipient E-mail addresses to receive any system warning message.
Apply	Click the “Apply” button to save changes.

Figure 5.60 – SMTP Setting Terms & Value Description

5.12.4 Event Selection

Users can select any event type through the “Event Selection” interface, such as “System Cold Start”, any ports’ “Link Up”, “Link Down”, “Link Up & Link Down” and send the system warning message to either SYSLOG or SMTP, or both at the same time. After the event selection, users can click the “Apply” button to save changes.

EVENT SELECTION		
Event	SYSLOG	SMTP
System Cold Start:	<input type="checkbox"/>	<input type="checkbox"/>

EVENT SELECTION PORT		
Port No.	SYSLOG	SMTP
1	Disable	Disable
2	Disable	Disable
3	Disable	Disable
4	Disable	Disable
5	Disable	Disable
6	Disable	Disable

Figure 5.61 – Event Selection Setting Interface

5.12.5 Fault Alarm

When any selected fault event has occurred, the fault LED of the switch’s front panel will light up and the electric relay will signal at the same time. Users can check the checkbox of any “Fault Alarm” type, such as power failure, port link down or broken through the “Fault Alarm” setting interface to trigger this function.

FAULT ALARM	
Power1 Failure:	<input type="checkbox"/>
Power2 Failure:	<input type="checkbox"/>
Port1 Link Down/Broken:	<input type="checkbox"/>
Port2 Link Down/Broken:	<input type="checkbox"/>
Port3 Link Down/Broken:	<input type="checkbox"/>
Port4 Link Down/Broken:	<input type="checkbox"/>
Port5 Link Down/Broken:	<input type="checkbox"/>
Port6 Link Down/Broken:	<input type="checkbox"/>

Figure 5.62 – Event Selection Setting Interface

5.13 MAC Table

The MAC address table is the filtering database that supports queries by the forwarding process, as to whether a frame received by a given port with a given destination MAC address is to be forwarded through a given potential transmission port.

5.13.1 MAC Address Table

MAC Address Table

VID	Mac	Type	Port
1	00:00:21:ff:ff:ff	learning	2
1	00:20:4a:ea:70:d3	learning	2
1	00:30:ab:26:cb:04	learning	2
1	00:50:7f:47:22:8a	learning	2
1	01:00:5e:00:01:3c	static	2
1	01:00:5e:7f:ff:fa	static	2
1	10:bf:48:5a:b4:0d	learning	2
1	1c:af:f7:7c:5b:f6	learning	2
1	30:85:a9:a7:9d:63	learning	2
1	30:85:a9:a8:05:bb	learning	2
1	44:6d:57:47:27:04	learning	2
1	48:5b:39:d1:1f:06	learning	2
1	54:53:ed:af:5c:bd	learning	2
1	7c:cb:0d:08:01:5e	learning	2
1	e0:3f:49:e7:44:c2	learning	2
1	ec:43:f6:6f:90:fd	learning	2
1	f4:ce:46:c8:01:9f	learning	2

Figure 5.63 – MAC Address Table Interface

5.13.2 MAC Table Configuration

Users can check the checked box of each port and insert the port's VID and MAC address of the device that is connected to that port, then click the "Add" button to continue adding other ports' information. Click the "Apply" button to save all the settings.

MAC Table Configuration

MAC Table Configuration

VID	Mac	1	2	3	4	5	6
<input type="text"/>	<input type="text"/>	<input type="checkbox"/>					

Figure 5.64 – MAC Table Setting Interface

5.14 Maintenance

Under the maintenance section, users can execute updated firmware upgrades, system reboots, and reset the system to factory defaults.

5.14.1 Upgrade

Antaira is continuously developing new functions and features for specific application requirements for the industrial managed switches. Users can download the latest firmware from Antaira's website and store it within their local PC, server, or USB drive.

The screenshot shows a web interface titled "Upgrade". It contains two main sections:

- FIRMWARE UPGRADE:** This section has a label "Image:" followed by a "Choose File" button, the text "No file chosen", and an "Upgrade" button.
- USB FIRMWARE UPGRADE:** This section has a label "Image:" followed by a text input field and an "Upgrade" button.

Figure 5.66 – Firmware Upgrade Interface

Terms	Value Description
FIRMWARE UPGRADE	Users can click the “Choose File” button to select the latest firmware from the local PC, or Server; then click the “Upgrade” button to have the switch be updated.
USB FIRMWARE UPGRADE	Fill in the folder and filename and click the button of Upgrade. If the folder or filename does not exist, the system will return error. If it succeeds, the system will reboot. Ex: file1, / folder /file2.

Figure 5.66 – Firmware Upgrade Setting Terms & Value Description

5.14.2 Reboot

Users can click the “Apply” button under the “Reboot” interface to reboot the switch.

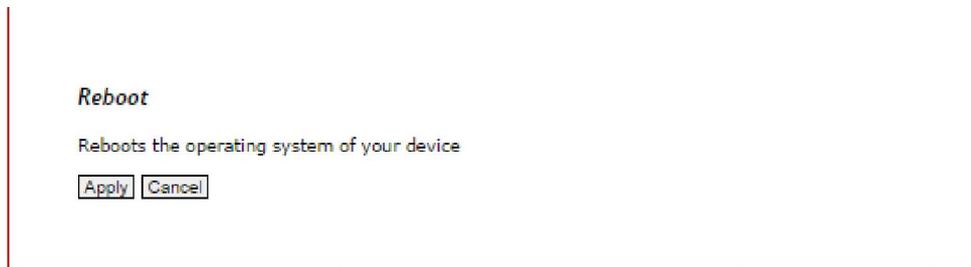


Figure 5.67 – Switch Reboot Interface

5.14.3 Default

Users can reset the switch to “Factory Default” by clicking the “Apply” button under the default interface.

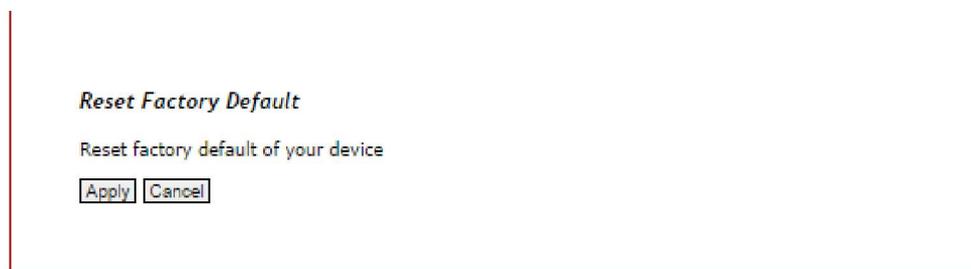


Figure 5.68 – Reset Factory Default Interface

5.15 Configuration

Under the “Configuration” section, users can save all the settings that have been configured, backed up and stored to a local PC, Server, or a USB storage device through the built-in USB port.

Users can use the USB port feature to execute the “Auto Load” function to boot the switch’s configuration that has been saved within the USB storage device, or users can utilize this function to “Auto Load” the configuration to other switches, and those switches would require the same configuration settings.

Users can keep the USB storage device plugged in with the switch to enable the USB “Auto Backup” function to allow the switch’s configuration settings to backup to the USB storage device whenever users makes and save configuration settings.

5.15.1 Save

Users can click the “Save” button under the “SAVE CONFIGURATION” interface, once all the settings have been configured.

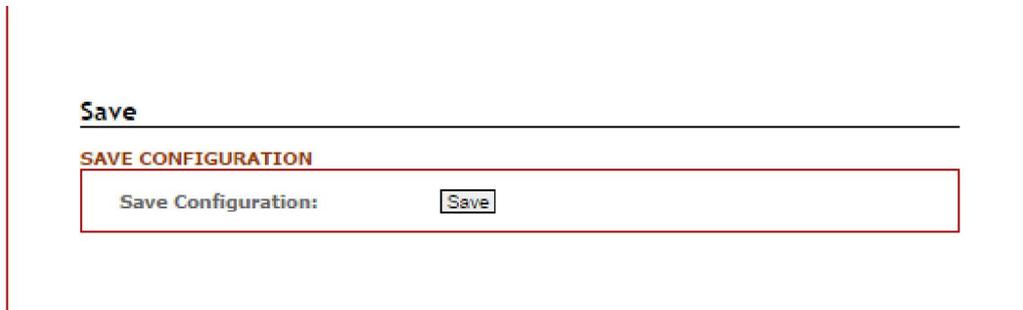


Figure 5.69 – Save Setting Interface

5.15.2 Backup & Store

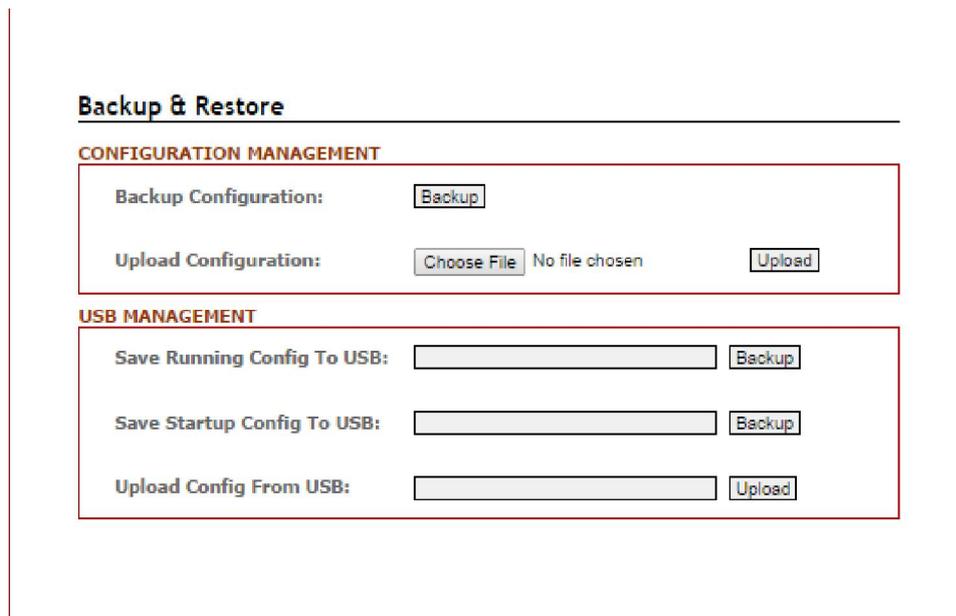


Figure 5.70 – Backup & Restore Setting Interface

Terms	Value Description
CONFIGURATION MANAGEMENT	
Backup Configuration	By clicking the “Backup” button, it allows users to backup the switch configuration setting to their local PC, or server.
Upload Configuration	Users can click the “Choose File” button to select the saved configuration file from their local PC, or server,

	then finish by clicking the “Upload” button.
USB Management	
Save Running Config to USB	Fill in the folder and filename and click the “Backup” button. If the folder or filename does not exist, the system will generate it automatically. Ex: file1, / folder /file2.
Save Startup Config to USB	Fill in the folder and filename and click the button of Backup. The startup file doesn’t exist in the default setting, so it will show an error if attempted to save. If the folder or filename does not exist, the system will generate it automatically. Ex: file1, / folder /file2.
Upload Config from USB	Fill in the folder and filename and click the “Upload” button. If the folder or filename does not exist, the system will return an error. If it succeeds, the system will reboot. Ex: file1, / folder /file2.

Figure 5.71 – Backup & Restore Setting Terms & Value Description

5.15.3 Auto Load & Backup



Figure 5.72 – USB Auto Load and Backup Setting Interface

Terms	Value Description
USB Auto Load	Select the USB Auto Load, it will auto load the startup file from the USB to the Switch. And the file name is “switch-[MAC ADDRESS].cfg”, if the file doesn’t exist, it will find “switch-config.cfg”. If all of them don’t exist, it will not work.
USB Auto Backup	Select the USB Auto Backup, it will start the auto Backup running-config file from the Switch to the USB. And the file name is “startup-config”.

Figure 5.73 – USB Auto Load and Backup Setting Terms & Value Description

5.16 Logout

Users can logout of the web console interface by clicking 'logout' from the menu.

6. Command Line Interface Management

6.1 About CLI Management

Besides WEB-based management, LMP-0601G-SFP-24 series also supports CLI management. Users can use console or telnet to manage their switch by CLI.

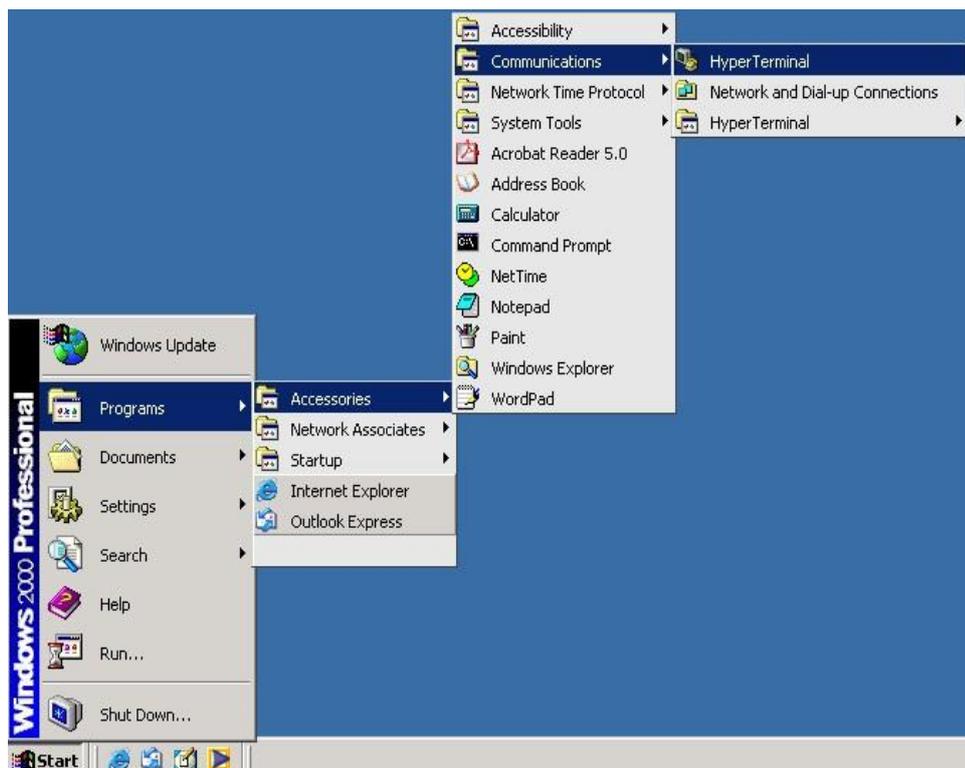
CLI Management Using RS-232 Serial Console (115200, 8, none, 1, none)

Before configuring using an RS-232 serial console, use an RJ45 to DB9-F cable to connect the switches' RS-232 Console port to the PC's COM port.

Follow the steps below to access the console via **RS-232 serial cable**.

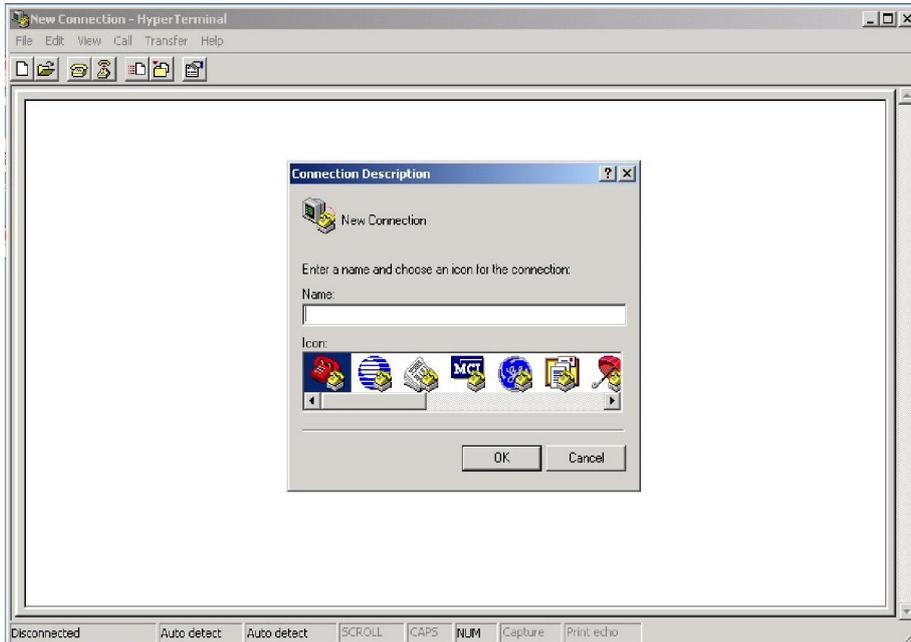
Step 1:

From the Windows desktop, click on Start -> Programs -> Accessories -> Communications -> Hyper Terminal.



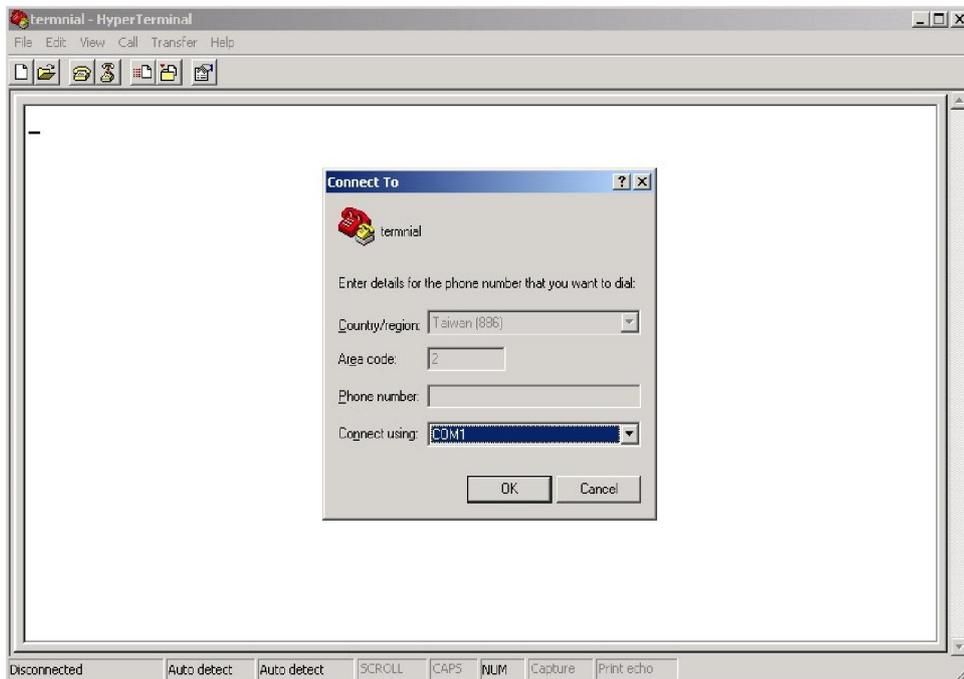
Step 2:

Input a name for the new connection.



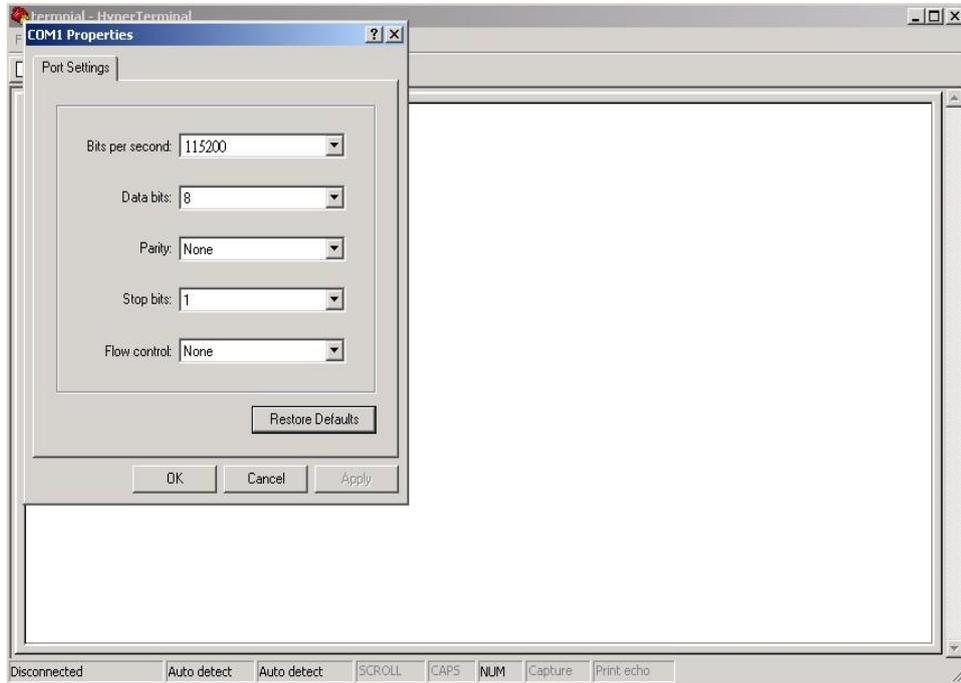
Step 3:

Select a certain COM port number.



Step 4:

The COM port property settings are as follows: 115200 for “Bits per second”, 8 for “Data bits”, None for Parity, 1 for “Stop bits” and none for “Flow control”.



Step 5:

The Console login screen will appear. Use the keyboard to enter the Username and Password, then press “**Enter**”.

```
User Access Verification
Username: admin
Password:
SWES> en
SWES# configure terminal
```

CLI Management by Telnet

Users can use “TELNET” to configure the switches.

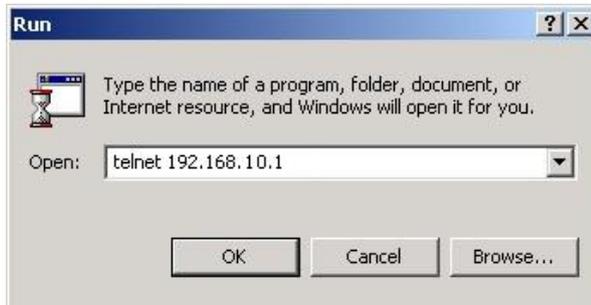
The default value is below:

- IP Address: **192.168.1.254**
- Subnet Mask: **255.255.255.0**
- Default Gateway: none
- User Name: **admin**
- Password: **admin**

Follow the steps below to access the console via **Telnet**.

Step 1:

Enter the Telnet IP address of the switch from the Windows “**Run**” command as below.



Step 2:

The Login screen will appear. Use the keyboard to enter the Username and Password, and then press “**Enter**”.

```
User Access Verification
Username: admin
Password:
SWES> en
SWES# configure terminal
```

Commander Groups

Group	Command	Mode
System	hostname [Switch]	configure
	system location [none]	configure
	system contact [none]	configure
	no system location	configure
	no system contact	configure
	show system uptime	configure
	show system mac	configure
	show system version firmware	configure
	show system version loader	configure
	show environment power 1	configure
	show environment power 2	configure
	show environment temperature	configure
	admin username admin	configure
	admin password admin	configure
IP	boot host dhcp	configure
	ip address [ip_addr] [ip_mask]	configure
	ip default-gateway [ip_router]	configure
	ip name-server [ip_addr_string]	configure
	no boot host dhcp	configure
	no ip default-gateway	configure
	no ip name-server	configure
	show boot host dhcp	configure
	show ip address	configure
	show ip default-gateway	configure
	show ip name-server	configure
	show ip mode	configure
Time	ntp time update	configure
	ntp client enable	
	ntp client timeserver [ip_addr_string]	configure
	clock set [hh:mm:ss] [day] [month] [year]	configure
	clock timezone [area] [city]	configure
	ntp sync schedule enable	configure
	ntp sync minute [time]	configure

	ntp sync hour [time]	configure
	ntp sync day [time]	configure
	ntp sync month [time]	configure
	ntp sync weekly [time]	configure
	no ntp client enable	Configure
	no ntp client timeserver	configure
	no clock timezone	configure
	no ntp sync schedule enable	configure
	no ntp sync minute	configure
	no ntp sync hour	configure
	no ntp sync day	configure
	no ntp sync month	configure
	no ntp sync weekly	configure
	show ntp client enable	configure
	show ntp client timeserver	configure
	show clock timezone	configure
	show ntp sync schedule enable	configure
	show ntp sync minute	configure
	show ntp sync hour	configure
	show ntp sync day	configure
	show ntp sync month	configure
	show ntp sync weekly	configure
Port	speed [auto 10 100 1000]	interface
	duplex [auto full half]	interface
	flowcontrol <receive> [on off desired]	interface
	name [string]	interface
	shutdown	interface
	no speed	interface
	no duplex	interface
	no flowcontrol	interface
	no name	interface
	no shutdown	interface
	show speed	interface
	show duplex	interface
	show flowcontrol	interface

	show administrate	interface
	show name	interface
	show link status	interface
	show link state	interface
	show link speed	interface
	show duplex	interface
	show link rx	interface
	show link tx	interface
	show link summary	interface
	show interface transceiver	interface
VLAN	name [vlan_name]	vlan
	member [member_portlist] [<untag_portlist>]	vlan
	vlan-mode [port tag qinq]	configure
	vlan-group [group_num] [group_portlist]	configure
	switchport pvid [vlan_id]	interface
	switchport filter [tagged untagged]	interface
	switchport provider	interface
	switchport ethertype [ether_type]	interface
	no name	vlan
	no member	vlan
	no vlan-mode	configure
	no vlan-group	configure
	no switchport pvid	interface
	no switchport filter	interface
	no switchport provider	interface
	no switchport ethertype	interface
	show name	vlan
	show member	vlan
	show vlan-mode	configure
	show vlan-group	configure
	show switchport pvid	interface
	show switchport filter	interface
show switchport provider	interface	
show switchport ethertype	interface	
	enable	g8032

ERPS	disable	g8032
	rpl [port0 port1] [owner neighbor]	g8032
	aps-channel [channel ID]	g8032
	revertive	g8032
	clear	g8032
	port0 interface [interface name]	g8032
	port1 interface [interface name]	g8032
	fs	g8032
	ms	g8032
	ring-id [erps ring ID]	g8032
	timer hold-off [time]	g8032
	timer guard [time]	g8032
	timer wtr [time]	g8032
	no rpl [port0 port1]	g8032
	no aps-channel	g8032
	no revertive	g8032
	no port0	g8032
	no port1	g8032
	no ring-id	g8032
	no timer hold-off	g8032
	no timer guard	g8032
	no timer wtr	g8032
show ethernet ring g8032 status	g8032	
show ethernet ring g8032 brief	g8032	
show ethernet ring g8032 port status	g8032	
power inline auto	interface	
power inline never	interface	
power inline delay	interface	
power inline apply	interface	
power inline priority [priority_value]	interface	
power inline max [watts]	interface	
power inline status	interface	
power inline power-supply [watts]	configure	
power inline threshold [theshold_value]	configure	
no power inline	interface	

PoE	no power inline priority	interface
	no power inline max	interface
	show power inline	interface
	show power inline priority	interface
	show power inline max	interface
	show power inline status	interface
	show power inline power-supply	configure
	show power inline total-consumption	configure
	show power inline threshold	configure
STP	spanning-tree enable	configure
	spanning-tree mode [rstp mst]	configure
	spanning-tree priority [priority_value]	configure
	spanning-tree forward-time [forward time]	configure
	spanning-tree hello-time [hello_time]	configure
	spanning-tree max-age [max_age]	configure
	spanning-tree cost [link_cost_value]	interface
	spanning-tree port-priority [port_priority]	interface
	spanning-tree link-type [point-to-point point-to-multiple]	interface
	spanning-tree auto-edge off	interface
	spanning-tree admin-edge on	interface
	spanning-tree stp disable	interface
	no spanning-tree enable	configure
	no spanning-tree mode	configure
	no spanning-tree priority	configure
STP	no spanning-tree forward-time	configure
	no spanning-tree hello-time	configure
	no spanning-tree max-age	configure
	no spanning-tree mst [instance_ID] priority	configure
	no spanning-tree cost	interface
	no spanning-tree port-priority	interface
	no spanning-tree link-type	interface
	no spanning-tree auto-edge	interface
	no spanning-tree admin-edge	interface
	no spanning-tree admin-edge	interface
no spanning-tree stp	interface	

STP	show spanning-tree mode	configure
	show spanning-tree priority	configure
	show spanning-tree forward-time	configure
	show spanning-tree hello-time	configure
	show spanning-tree max-age	configure
	show spanning-tree cost	interface
	show spanning-tree port-priority	interface
	show spanning-tree link-type	interface
	show spanning-tree auto-edge	interface
	show spanning-tree admin-edge	interface
	show spanning-tree stp	interface
	spanning-tree mst [instance_ID] priority [priority]	configure
	spanning-tree mst name [NAME]	configure
	spanning-tree mst revision [REVISION]	configure
	spanning-tree mst instance [instance_ID] vlan [vlan_grp]	configure
	spanning-tree mst [instance_ID] priority [priority_number]	configure
	spanning-tree mst [instance_ID] cost [cost_value]	interface
	spanning-tree mst [instance_ID] port-priority [priority]	interface
	no spanning-tree mst name	configure
	no spanning-tree mst revision	configure
	no spanning-tree mst instance [instance_ID] vlan	configure
	no spanning-tree mst [instance_ID] cost	interface
	no spanning-tree mst [instance_ID] port-priority	interface
	show spanning-tree mst name	configure
	show spanning-tree mst revision	configure
	show spanning-tree mst instance [instance_ID] vlan	configure
	show spanning-tree mst [instance_ID] priority	configure
	show spanning-tree mst [instance_ID] cost	interface
	show spanning-tree mst [instance_ID] port-priority	interface
	event smtp power1 enable	configure
	event smtp power2 enable	configure
	event smtp cold-start enable	configure
	event smtp warm-start enable	configure
	event smtp authentication-failure enable	configure
	event smtp erps-change enable	configure

Event	event smtp interface [INTERFACE_NAME] [up down]	configure
	no event smtp power1	configure
	no event smtp power2	configure
	no event smtp cold-start	configure
	no event smtp warm-start	configure
	no event smtp authentication-failure	configure
	no event smtp erps-change	configure
	no event smtp interface [INTERFACE_NAME] [up down]	configure
	show event smtp power1	configure
	show event smtp power2	configure
	show event smtp cold-start	configure
	show event smtp warm-start	configure
	show event smtp authentication-failure	configure
	show event smtp erps-change	configure
	show event smtp interface [INTERFACE_NAME] [up down]	configure
	event syslog power1 enable	configure
	event syslog power2 enable	configure
	event syslog cold-start enable	configure
	event syslog warm-start enable	configure
	event syslog authentication-failure enable	configure
event syslog erps-change enable	configure	
event syslog interface [INTERFACE_NAME] [up down]	configure	
no event syslog power1	configure	
no event syslog power2	configure	
no event syslog cold-start	configure	
no event syslog warm-start	configure	
no event syslog authentication-failure	configure	
no event syslog erps-change	configure	
no event syslog interface [INTERFACE_NAME] [up down]	configure	
show event syslog power1	configure	
show event syslog power2	configure	
show event syslog cold-start	configure	
show event syslog warm-start	configure	
show event syslog authentication-failure	configure	
show event syslog erps-change	configure	
Event		

	show event syslog interface [INTERFACE_NAME] [up down]	configure
	event alarm power1 enable	configure
	event alarm power2 enable	configure
	event alarm interface [INTERFACE_NAME] [up down]	configure
	no event alarm power1	configure
	no event alarm power2	configure
	no event alarm interface [INTERFACE_NAME] [up down]	configure
	show event alarm power1	configure
	show event alarm power2	configure
	show event alarm interface [INTERFACE_NAME] [up down]	configure
	event apply	configure
SYSLOG	syslog server [IP_address]	configure
	syslog mode [both remote local]	configure
	no syslog server	configure
	no syslog mode	configure
	show syslog server	configure
	show syslog mode	configure
	show syslog log	configure
SMTP	smtp enable	configure
	smtp sender [E-MAIL_ADDR]	configure
	smtp subject [subject_text]	configure
	smtp server address [GMAIL_SMPT_SERVER]	configure
	smtp server port [GMAIL_SMPT_SERVER]	configure
	smtp authentication enable	configure
	smtp authentication username [GMAIL_ACCOUNT]	configure
	smtp authentication password [GMAIL_PASS]	configure
	smtp receive [1 2 3 4] [e-mail_address]	configure
	no smtp enable	configure
	no smtp sender	configure
	no smtp subject	configure
	no smtp server address	configure
	no smtp server port	configure
	no smtp authentication enable	configure
no smtp authentication username	configure	
no smtp authentication password	configure	

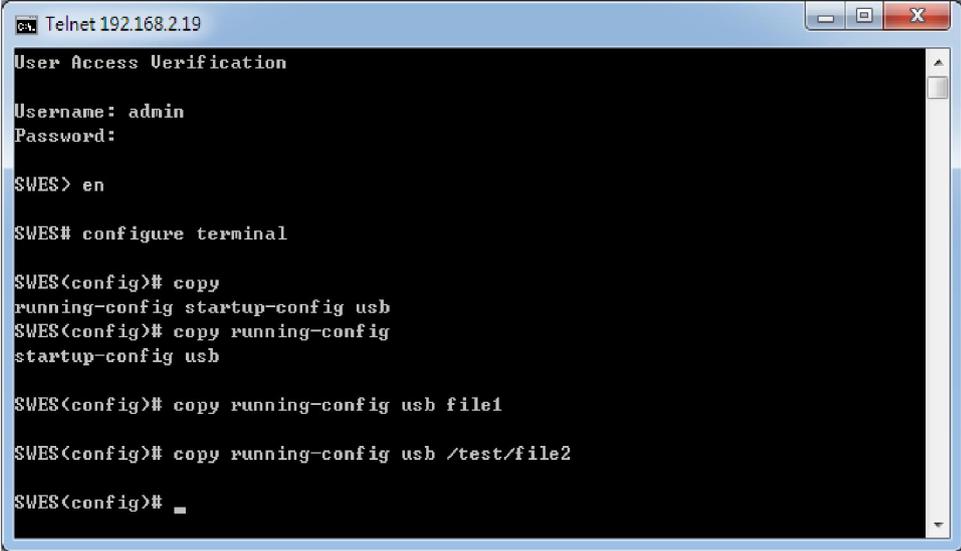
	no smtp receive [1 2 3 4]	configure
	show smtp state	configure
	show smtp sender	configure
	show smtp subject	configure
	show smtp server address	configure
	show smtp server port	configure
	show smtp authentication enable	configure
	show smtp authentication username	configure
	show smtp receive [1 2 3 4]	configure
SNMP	snmp server enable [<v1-v2c-only v3-only>]	configure
	snmp server community [ro rw] [community_name]	configure
	snmp server v3 level [admin user] [auth noauth priv]	configure
	snmp server v3 auth [admin user] [md5 sha] [PWD]	configure
	snmp server v3 encryption [admin user] [des aes] [PWD]	configure
	no snmp server enable	configure
	no snmp server community [ro rw]	configure
	no snmp server v3 level [admin user]	configure
	no snmp server v3 auth [admin user]	configure
	no snmp server v3 encryption [admin user]	configure
	show snmp server enable	configure
	show snmp server community [ro rw]	configure
	show snmp server v3 level [admin user]	configure
	show snmp server v3 auth [admin user]	configure
	show snmp server v3 encryption [admin user]	configure
	snmp trap enable	configure
	snmp trap host [DESTINATION_IP]	configure
	snmp trap version [1 2c 3] [traps inform]	configure
snmp trap community [trap_community_name]	configure	
snmp trap inform retry [retry_time]	configure	
snmp trap inform timeout [retry_interval]	configure	
snmp trap v3 user [user_ID]	configure	
snmp trap v3 level [auth noauth priv]	configure	
snmp trap v3 engine-ID [engineID]	configure	
SNMP snmp trap v3 auth [md5 sha] [PASSWORD]	configure	
snmp trap v3 encryption [des aes] [PASSWORD]	configure	

SNMP	no snmp trap enable	configure
	no snmp trap host	configure
	no snmp trap version	configure
	no snmp trap community	configure
	no snmp trap inform retry	configure
	no snmp trap inform timeout	configure
	no snmp trap v3 user	configure
	no snmp trap v3 level	configure
	no snmp trap v3 engine-ID	configure
	no snmp trap v3 auth	configure
	no snmp trap v3 encryption	configure
	show snmp trap enable	configure
	show snmp trap host	configure
	show snmp trap version	configure
	show snmp trap community	configure
	show snmp trap inform retry	configure
	show snmp trap inform timeout	configure
	show snmp trap v3 user	configure
	show snmp trap v3 level	configure
	show snmp trap v3 engine-ID	configure
show snmp trap v3 auth	configure	
show snmp trap v3 encryption	configure	
FILE	copy running-config startup-config	configure
	copy startup-config running-config	configure
PORT MIRROR	monitor enable	configure
	monitor source [rx tx both] [port_list]	configure
	monitor destination [dest_port_number]	configure
	no monitor enable	configure
	no monitor source	configure
	no monitor destination	configure
	show monitor enable	configure
	show monitor source	configure
show monitor destination	configure	
	qos queue-schedule [strict wrr]	configure
	qos map cos [priority_type] to tx-queue [queue]	configure

QoS	qos map dscp [[priority_type] to tx-queue [[queue]	configure
	qos trust [cos dscp]	interface
	qos default cos [cos_default_value]	interface
	no qos queue-schedule	configure
	no qos map cos [priority_type]	configure
	no qos map dscp [priority_type]	configure
	no qos trust	interface
	no qos default cos	interface
	show qos queue-schedule	configure
	show qos map cos [priority_type]	configure
	show qos map dscp [priority_type]	configure
	show qos trust	interface
	show qos default cos	interface
IGMP	igmp snooping enable	configure
	igmp snooping query max-respond-time [second]	configure
	igmp snooping query interval [second]	configure
	igmp snooping last-member count [time]	configure
	igmp snooping last-member interval [second]	configure
	igmp snooping querier enable	configure
	igmp snooping fast-leave enable	interface
	no igmp snooping enable	configure
IGMP	no igmp snooping query max-respond-time	configure
	no igmp snooping query interval	configure
	no igmp snooping last-member count	configure
	no igmp snooping last-member interval	configure
	no igmp snooping querier	configure
	no igmp snooping fast-leave	interface
	show igmp snooping mdb	configure
	show igmp snooping all	configure
show igmp snooping fast-leave	interface	

Save and Load Configuration File to/from USB

1. CLI: enable -> configure terminal -> copy running-config usb (path)

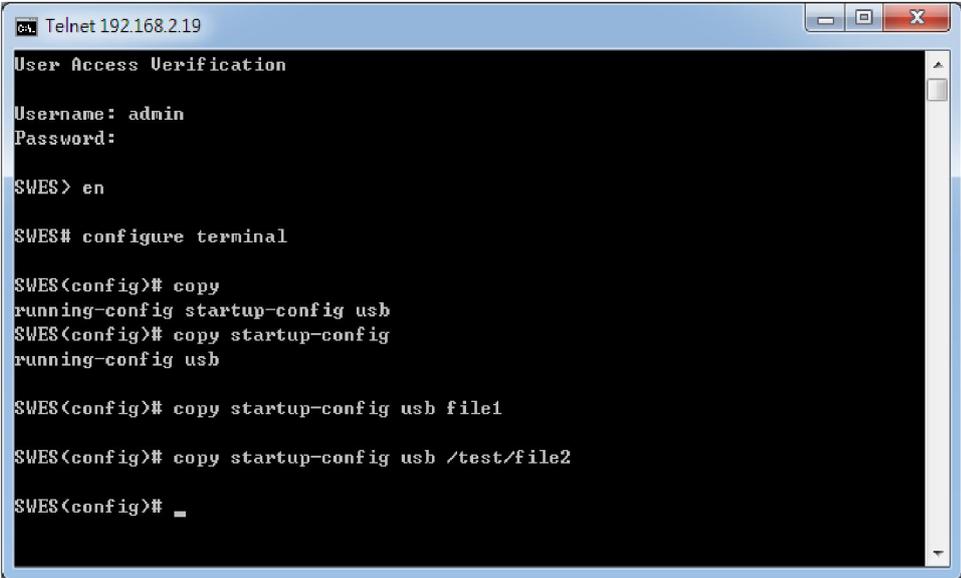


```
Telnet 192.168.2.19
User Access Verification
Username: admin
Password:
SWES> en
SWES# configure terminal
SWES(config)# copy
running-config startup-config usb
SWES(config)# copy running-config
startup-config usb
SWES(config)# copy running-config usb file1
SWES(config)# copy running-config usb /test/file2
SWES(config)#
```

Fill in the folder and filename behind the “copy running-config usb” command.

Ex: file1, / folder /file2.

2. CLI : enable -> configure terminal -> copy startup-config usb (path)

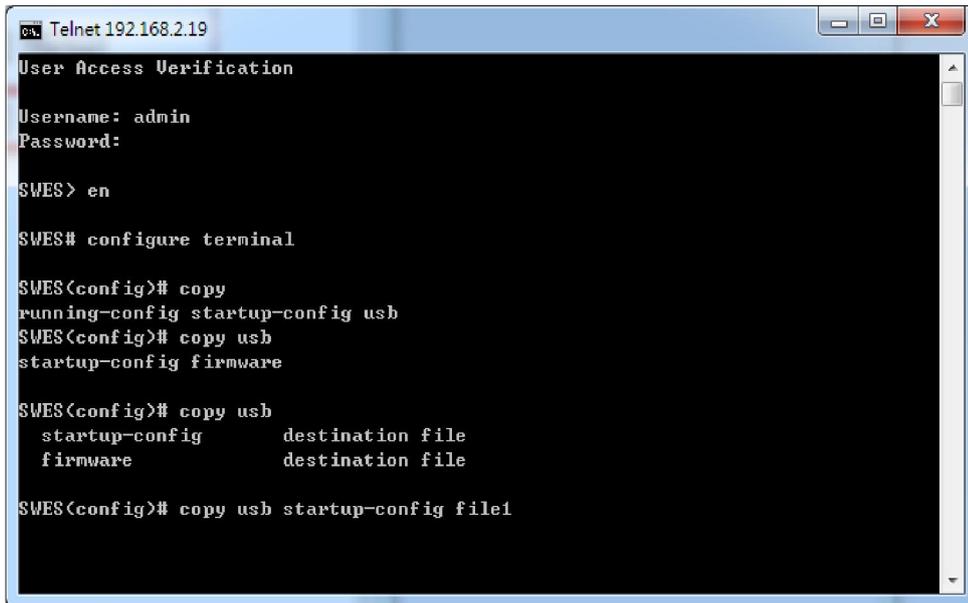


```
Telnet 192.168.2.19
User Access Verification
Username: admin
Password:
SWES> en
SWES# configure terminal
SWES(config)# copy
running-config startup-config usb
SWES(config)# copy startup-config
running-config usb
SWES(config)# copy startup-config usb file1
SWES(config)# copy startup-config usb /test/file2
SWES(config)#
```

Fill in the folder and filename behind the “copy startup-config usb” command.

Ex: file1, / folder /file2.

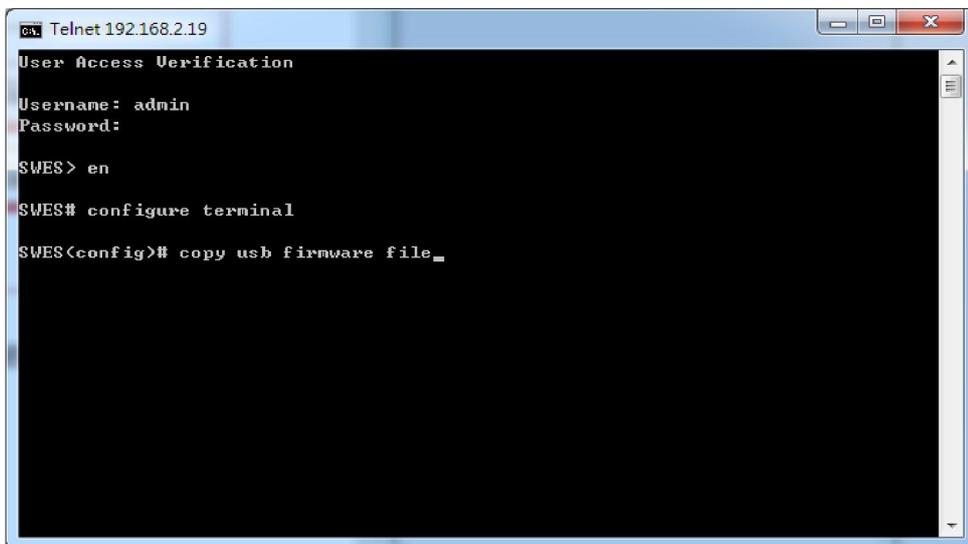
3. CLI :enable -> configure terminal ->copy usb startup-config (path)



```
Telnet 192.168.2.19
User Access Verification
Username: admin
Password:
SWES> en
SWES# configure terminal
SWES(config)# copy
running-config startup-config usb
SWES(config)# copy usb
startup-config firmware
SWES(config)# copy usb
startup-config destination file
firmware destination file
SWES(config)# copy usb startup-config file1
```

Fill in the folder and filename behind the “copy usb startup-config” command.
Ex: file1, / folder /file2.

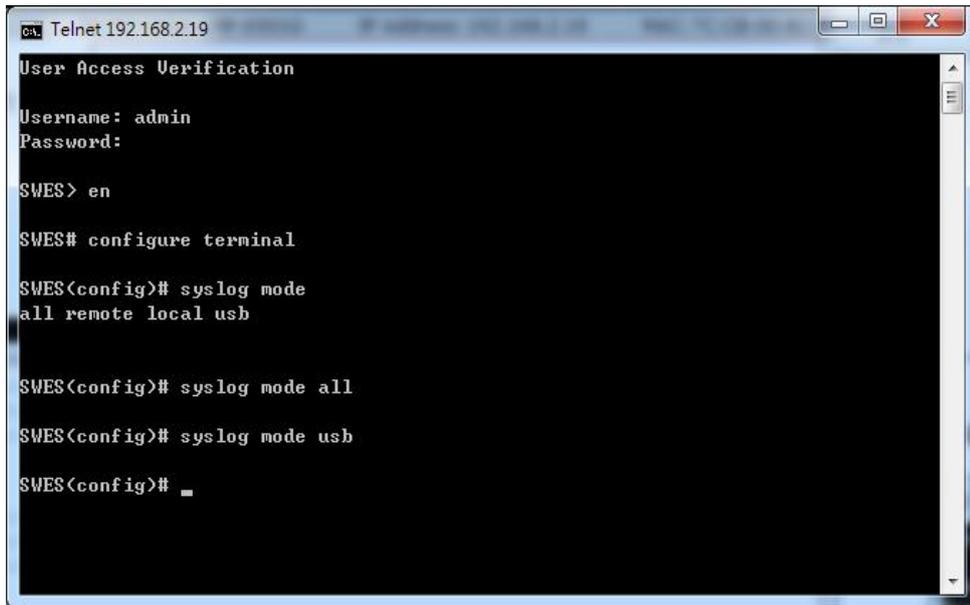
4. CLI : enable -> configure terminal ->copy usb firmware (path)



```
Telnet 192.168.2.19
User Access Verification
Username: admin
Password:
SWES> en
SWES# configure terminal
SWES(config)# copy usb firmware file_
```

Fill in the folder and filename behind the “copy usb startup-config” command.
Ex: file1, / folder /file2.

5. CLI : enable -> configure terminal -> Syslog mode (usb or all)



```
Telnet 192.168.2.19
User Access Verification
Username: admin
Password:

SWES> en

SWES# configure terminal

SWES(config)# syslog mode
all remote local usb

SWES(config)# syslog mode all

SWES(config)# syslog mode usb

SWES(config)# _
```

Select USB or ALL, it can auto save the warning file to the USB. And the file name is "message".

6. CLI : enable -> configure terminal ->usb auto load enable
7. CLI : enable -> configure terminal ->usb auto load enable

7. Technical Specifications

Table 7.1 has the technical specifications for Antaira's LMP-0601G-SFP-24 series: 6-port industrial PoE+ gigabit managed Ethernet switch with 4*10/100/1000Tx (30W/Port), 1*10/100/1000Tx Ethernet port, and 1*100/1000 SFP Slot; 12~36VDC power input.

Standards	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-Tx, 100Base-Fx, Fast Ethernet
	IEEE 802.3ab	1000BaseT Gigabit Ethernet
	IEEE 802.3z	Gigabit Fiber
	IEEE 802.3x	Flow Control for Full Duplex
	IEEE 8023.af	Power-over-Ethernet
	IEEE 802.3at	Power-over-Ethernet Plus (Enhanced)
	IEEE 802.1d	STP (Spanning Tree Protocol)
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol)
	IEEE 802.1s	MTP (Multiple Spanning Tree Protocol)
	ITU-TG.8032 / Y.1344	ERPS (Ethernet Ring Protection Switch)
	IEEE 802.1q	Virtual LANs (VLAN)
	IEEE 802.1x	Port based Network Control, Authentication
	IEEE 802.1ad	Stacked VLAN, Q-in-Q
	IEEE 802.1p	QoS/CoS Protocol for Traffic Prioritization
Switch	Protocol	CSMA/CD,IGMPv1/v2,SNMPv1/v2,TFTP,SNTP,SMTP,RARP, Syslog
	Data Process	Store and Forward
	Transfer Rate	14,880 pps for 10Base-T Ethernet port 148,800 pps for 100Base-TX Fast Ethernet port 1,488,000 pps for 1000Base-TX Gigabit Ethernet port
	Packet Buffer	1Mbits
	MAC Table	8K
	Jumbo Frame	9.6K
	Flow Control	IEEE 802.3x for full duplex mode, back pressure for half duplex mode
	VLAN Groups	0 ~ 4094
IGMP Groups	Up to 256	
Port Interface	Ethernet (RJ45) Port	4*10/100/1000BaseTx (PSE: 30W/Port), and 1*10/100/1000Tx; auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
	PoE Pin Assignment	V+, V+, V-, V-, for pin 1, 2, 3, 6 (Endspan, MDI Alternative A)
	Fiber Port	1*Dual Rate (100/1000) SFP Slot
	Wavelength	Refer to SFP Modules
	RS232 Serial Console	1*RS232 in RJ45 connector with console cable, 115.2Kbps, 8,N,1
Configuration Backup	1*USB 2.0	

Protection	Overload Current	Present
	Power Reverse Polarity	Present
	CPU Watch Dog	Present
	Network Cable	10BaseT: 2-pair UTP/STP Cat. 3,4,5 cable - EIA/TIA-568 100-ohm (100m); 100BaseTX: 2-pair UTP/STP Cat. 5 cable - EIA/TIA-568 100-ohm (100m); 1000BaseTX: UTP/STP Cat. 5/5E cable - EIA/TIA-568 100-ohm (100m)
Mechanical Characteristics	LED Indicator	Per Unit: Power 1 (Green), Power 2 (Green), Fault (Red); Per Port: Link/Activity (Green); PoE: Feeding Power (Green)
	Housing	Metal IP30 protection
	Dimension	46 x 142 x 99 mm (1.81 x 5.59 x 3.90 in.)
	Weight	Unit Weight: 1.5 lbs. Shipping Weight: 2.3 lbs
	Mounting	DIN-Rail Mounting, wall-mounting (optional)
Power Requirement	Input Voltage	12~36VDC (Voltage Booster) Redundant Input
	Power Connection	1 removable 6-contact terminal block
	PoE Power Output	30W per port (Max)
	Power Consumption	10 Watts (no PD included); 145 Watts (Fully loaded)
Environmental Limits	Operating Temperature	STD: -10° to 70°C (14° to 158° F); EOT: -40° to 75° C (-40° to 167°F)
	Storage Temperature	-40°C ~ 85°C (-40°F ~ 185°F)
	Ambient Relative Humidity	5 to 95%, (non-condensing)
Regulatory Approvals	EMI	FCC Class A
	EMS	CE EN6100-4-2/3/4/5/6/8; CE EN6100-6-2; EN6100-6-4
	Stability Testing	IEC60068-2-32 (Free fall) IEC60068-2-27 (Shock) IEC60068-2-6 (Vibration)
	Safety	UL 61010-1, UL 61010-2-201

Table 7.1 - LMP-0601G-SFP-24 Series Technical Specifications

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