

LevelOne

GSW-2490TXM

24-Port + 2 Slide-in Slots SNMP Switch

1. Introduction

Welcome to the World of Switching-Network.

In modern society, communication and information sharing are fundamental to our lifestyle. Computer networks are one of the fastest means of communication.

As your company grows, your network demands will increase. ...

The LevelOne GSW-2490TXM SNMP Switch are designed to provide your network with Ethernet, Fast Ethernet, Gigabit Ethernet connectivity over twisted pair and fiber optic cabling. Two expansion slots on the front panel of the LevelOne GSW-2490TXM SNMP Switches further add to the flexibility of the systems.

Figure 1-1. The 24TP+2Exp-Slot Switch



The LevelOne GSW-2490TXM SNMP is a managed Fast Ethernet switch, that provides a number of exceptional features with extremely flexible configuration expansions without compromising the wire speed performance.

The LevelOne GSW-2490TXM SNMP switch provide wire-speed switching with advanced bridging functions like VLAN, priority, multicast filtering, link aggregation and port mirroring. It can also support two different GBIC type as Mini GBIC LC and standard GBIC SC.

Many comprehensive network management functions are provided, such as Spanning Tree protocol for loop prevention and full recovery, VLAN configuration and IGMP snooping for multicast grouping configuration. VT100 console, remote telnet login, SNMP, and Web Interfaces are all standard management features.

Features

- _ Conforms to IEEE802.3, IEEE802.3u, IEEE802.3z, IEEE802.3x, IEEE802.1p, IEEE802.3ac, IEEE802.1D, IEEE802.1Q
- 24 auto-sensing 10/100Mbps Ethernet RJ-45 ports
- 2 Expansion slots for optional modules: 1-port Duplex SC Gigabit (SX/LX), 100Mbps Fiber (SC/MT-RJ/VF-45), 1 RJ-45 for UTP or STP Gigabit 1000T Module with Automatic MDI/MDIX support, Mini GBIC LC type and Standard GBIC SC type.
- One Console-connecting port for communication parameter configuration
- Auto-negotiation & Full-duplex/half-duplex supported
- Store-and- Forward error free packet forwarding scheme
- 9.6 GB Backplane Bandwidth
- 8K-entry MAC address table
- 6Mbits share memory
- Full wire speed forwarding rate

- LED-indicators for Power, per port Link/Active, FDX/COL 10/100M Gigabit Module LK/ACT, FDX/ COL statuses

Intelligent Management Features

- Console and Telnet Configuration
- Web-based management
- SNMP network management
- IEEE 802.1Q Tagging VLAN and Port Based VLAN supported
- IEEE802.3x Flow Control Mechanism is used in Full-Duplex mode and back-pressure is used in half-duplex
- IEEE 802.1D Blocking, Learning, and Forwarding state are supported for Spanning Tree Protocol
- IEEE 802.3ac Extends the maximum Ethernet Length to 1522 to Add the 4-Byte VLAN Tag
- IEEE802.1p, provides four levels priority per port, packets are prioritized according to the source port or the 802.1p priority tag
- Security Functions Supported
- IGMP Snooping and GMRP protocol supported
- Link Aggregation function supported
- Port Priority - 802.1p & TOS (Type of Service) supported
- TFTP support for firmware on network upgrade
- Port Mirror supported

Package Contents

Unpack the carton of the LevelOne GSW-2490TXM SNMP Switch and verify them against the checklist below.



LevelOne GSW-2490TXM SNMP Switch

Rubber Feet



Figure 1-2. Package Contents

Compare the contents of your LevelOne GSW-2490TXM SNMP Switch package with the standard checklist above. If any item is missing or damaged, please contact your local dealer for service.

Management Methods

The LevelOne GSW-2490TXM SNMP Switch supports following management methods:

- Console and Telnet Management
- Web-based Management
- SNMP Network Management

Console and Telnet Management

Console Management is done through the RS-232 Console Port. Managing the LevelOne GSW-2490TXM SNMP Switch in this method requires a direct connection between PC and the LevelOne GSW-2490TXM SNMP Switch. While Telnet management is done over the network. Once the LevelOne GSW-2490TXM SNMP Switch is on the network, you can use Telnet to Log in and change the configuration.

SNMP Network Management

SNMP (Simple Network Management Protocol) provides a means to monitor and control network device, and to manage configurations, statistic collection, performance, and security. Data is passed from SNMP agents, which are hardware & software

processes reporting activity in each network device to the workstation console used to oversee the network. The agent return information contained in a MIB (Management Information Base), which is a data structure that defines what is obtainable from the device and what can be controlled.

2. Hardware Description

This section mainly describes the hardware of the LevelOne GSW-2490TXM SNMP Switch, and gives a functional overview of the Switch.

The physical dimensions of the LevelOne GSW-2490TXM SNMP Switch are: 440mmx 225mmx 44.5mm (Lx Wx H)

Hardware Description

The LevelOne GSW-2490TXM SNMP Switch is a fixed 24-port auto-sensing Ethernet RJ-45 connectors, and its chassis contains two expansion slots. The optional modules come with the built-in CPU module.

The Front Panel

The Front Panel of the LevelOne GSW-2490TXM SNMP Switch consists of 24x auto-sensing 10/100Mbps Ethernet RJ-45 Ports, two optional expansion slots, and Console port. The LED Indicators are also located on the front panel of the Switch.

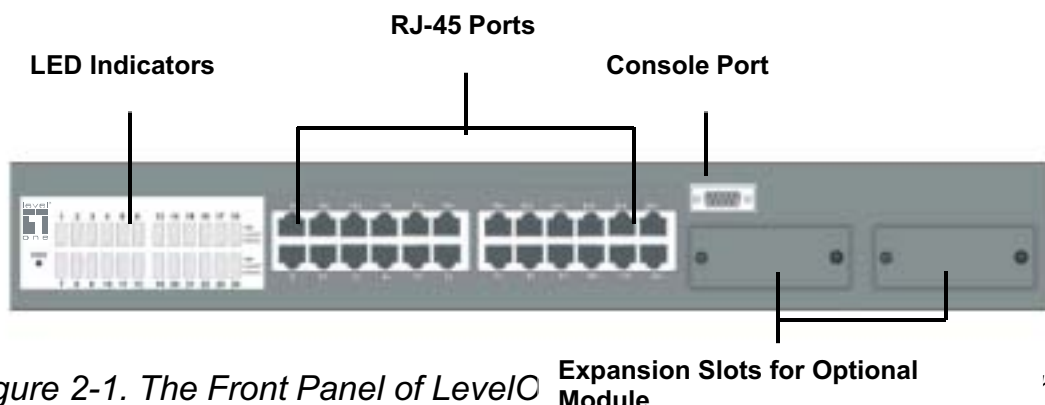


Figure 2-1. The Front Panel of LevelOne

Expansion Slots for Optional Module

7

10/100Base-TX RJ-45 ports (Auto MDI/MDIX):
24x 10/100Mbps auto-sensing port for 10Base-T or 100Base-TX devices connection. Note: [MDI/MDIX means that you can connect

to another Switch or workstation without changing non-crossover or crossover cabling.]

Expansion Slots :

- For two of the following Optional modules :
- 1 Port Gigabit 1000Base-T Intelligent Switch Modules,
- 1 Port Gigabit 1000Base-SX/LX Intelligent Fiber Modules.
- 1 Port 100Base-FX Intelligent Fiber Module

Console Port :

Console Management can be done through the Console Port. It requires a direct connection between the LevelOne GSW-2490TXM SNMP Switch and an end station (PC) via a RS-232 cable.

LED Indicators



Figure 2-2 The LED Indicators

All LED indicators are located on the front panel of the LevelOne GSW-2490TXM SNMP Switch. They provide a real-time indication of system and operational status. The following table gives descriptions of the LED status and their meanings.

LED	Status	Description
PWR	Green	Power On
	Off	Power is Off.
100	Green	The port is operating at the speed of 100Mbps.
	Off	No device attached or in 10Mbps mode

LK/ACT	Green	The port is connecting with the device.
	Blinks	The port is receiving or transmitting data.
	Off	No device attached.
FD/COL	Yellow	The port is operating in Full-duplex mode.
	Blinks	Collision of Packets occurs in the port.
	Off	No device attached or in half-duplex mode .

Table 2-1. The Descriptions of LED Indicators

Rear Panel

The 3-pronged power plug, On/off Switch are located at the Rear Panel of the LevelOne GSW-2490TXM SNMP Switch. (The Ventilation fan is located on the side of the Switch). The Switch will work with AC in the range 100-240V AC, 50-60Hz.



Figure 2-3. The Rear Panel of the LevelOne GSW-2490TXM SNMP Switch

Power On

After all network cables are connected, plug the power cord into the power socket on the back panel and the other end into a power outlet. Turn the power On using the power Switch on the back panel.

Check the front panel Power indicator to see if power is properly supplied. The Switch uses a universal power supply that requires no additional adjustment.

Diagnostic Test

After the installation is completed and AC power is applied to the Switch, the system will automatically perform a diagnostic test. When the Power LED is on within 5 seconds, the Diagnostic status

LEDs will soon flash red.

When the Switch passes the self-test within 15 seconds, the Link /ACT LED turns on.

Note : *If the Switch fails the self-test, the Diag LED will blink.*

3. Connecting to the Network

This section provides the installation procedure and instructions for assigning IP address.

Pre-Installation Requirements

Before you start hardware installation, make sure your installation environment has below items:

- ✦ **PCs with 10/100Mbps Ethernet NICs/ 100Mbps Fiber NICs:** Your PC must have a standard Ethernet interface to connect to the Switch.
- ✦ **UTP cable with RJ45 connectors/ Fiber cable with MT-RJ/ VF-45 connectors:** Check if the cable and connectors work properly.
- ✦ **A power outlet: 100 to 240V AC at 50 to 60 Hz:** Make sure that the Switch power is accessible and cables can be connected easily.

- ✦ **Dedicated power supply:** Use dedicated power circuits or power conditioners to supply reliable electrical power to the network devices.
- ✦ **A dry cool place:** Keep the Switch away from moisture. Avoid direct sunlight, heat source, and high amount of electromagnetic interference around.
- ✦ **Mounting tools:** If you intend to mount the Switch on a rack, make sure you have all the tools, mounting brackets, screws etc.

Caution:

- ‡ Cabling must be away from sources of electrical noise such as radio, computers, transmitters, broadband amplifiers, power lines and keep away from TVs, hair dryers, and microwave.
- ‡ Air flow around the Switch and through its vents on the rear cannot be restricted.

Mounting the Switch

The LevelOne GSW-2490TXM SNMP Switch is suitable for use in an office environment where it can be rack-mounted in standard EIA 19-inch racks or standalone.

Desktop Mounting

1. Set the Switch on a sufficiently large flat space with a power outlet nearby, and about the center of all networked devices.
2. Make sure mounting surface on the bottom of the Switch is grease dust free.
3. Remove adhesive backing from your Rubber Feet.



Figure 3-1. Attaching Rubber Feet to each corner on the bottom of the Switch

4. Apply the Rubber Feet to each corner on the bottom of the Switch. These footpads can prevent the Switch from shock/vibrations.

Caution: Do not place objects on top of the Switch.

Rack-mounted Installation

The LevelOne GSW-2490TXM SNMP Switch come with a rack-mounted kit and can be mounted in an EIA standard size, 19-inch Rack. The Switch can be placed in a wiring closet with other equipment.

Perform the following steps to rack mount the Switch:

- A. Position one bracket to align with the holes on one side of the Switch and secure it with the smaller bracket screws. Then attach the remaining bracket to the other side of the Switch.



Figure 3-2. Attach mounting brackets with screws

- B. After attached both mounting brackets, position the LevelOne GSW-2490TXM SNMP Switch (UTP/MT-RJ/VF-45) Switch in the rack by lining up the holes in the brackets with the appropriate holes on the rack. Secure the Switch to the rack with a screwdriver and the rack-mounting screws.



Figure 3-3. Mount the 24TP+1Fiber Module Switch in an EIA standard 19-inch Rack

Note: For proper ventilation, allow about at least 4 inches (10 cm) of clearance on the front and 3.4 inches (8 cm) on the back of the Switch. This is especially important for enclosed rack installation.

Connecting to the Switch

The Console port is a male DB-9 connector that enables a connection to a PC or terminal for monitoring and configuring the LevelOne GSW-2490TXM SNMP Switch. Use the supplied RS-232 cable with a female DB-9 connector to connect a terminal or PC to the Console port.

The Console configuration (out of band) allow you to set your Switch to enable a user at a remote console terminal to communicate with the LevelOne GSW-2490TXM SNMP Switch as if the console terminal were directly connected to it.

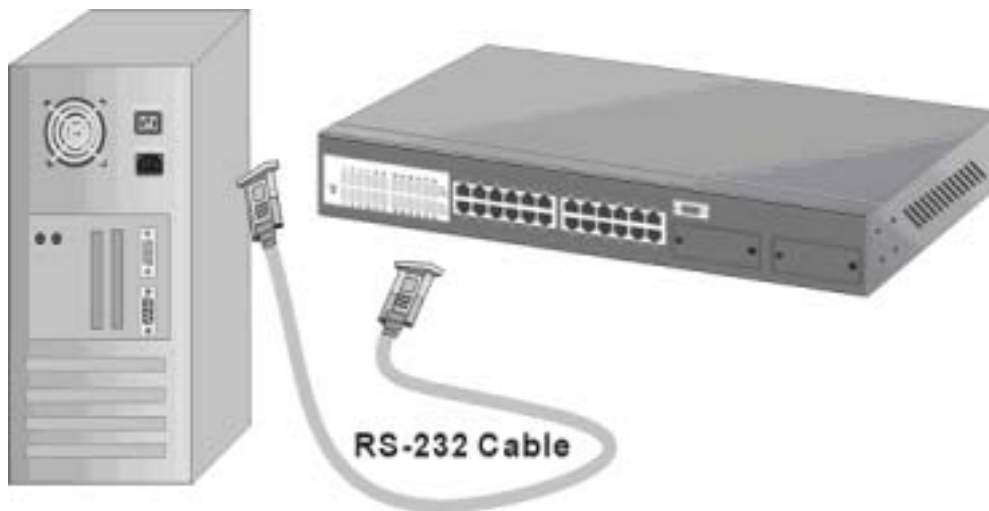


Figure 3-4. Connecting the LevelOne GSW-2490TXM SNMP Switch to a terminal via RS-232 cable

Login in the Console Interface

When the connection between Switch and PC is finished, turn on the PC and run a terminal emulation program or **Hyper Terminal** and configure its **communication parameters** to match the following default characteristics of the console port:

Baud Rate: 9600 bps
Data Bits: 8
Parity: none
Stop Bit: 1
Control flow: None

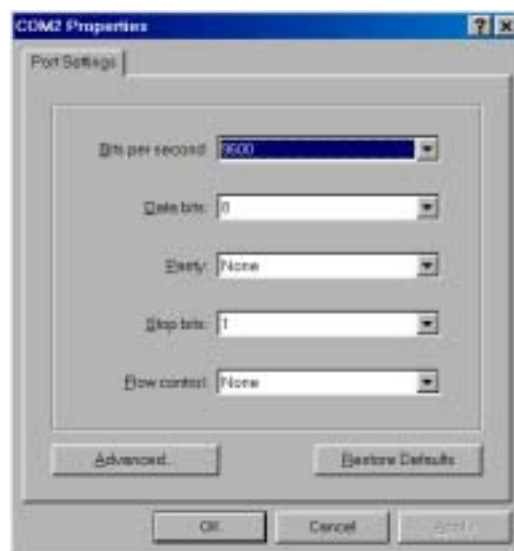
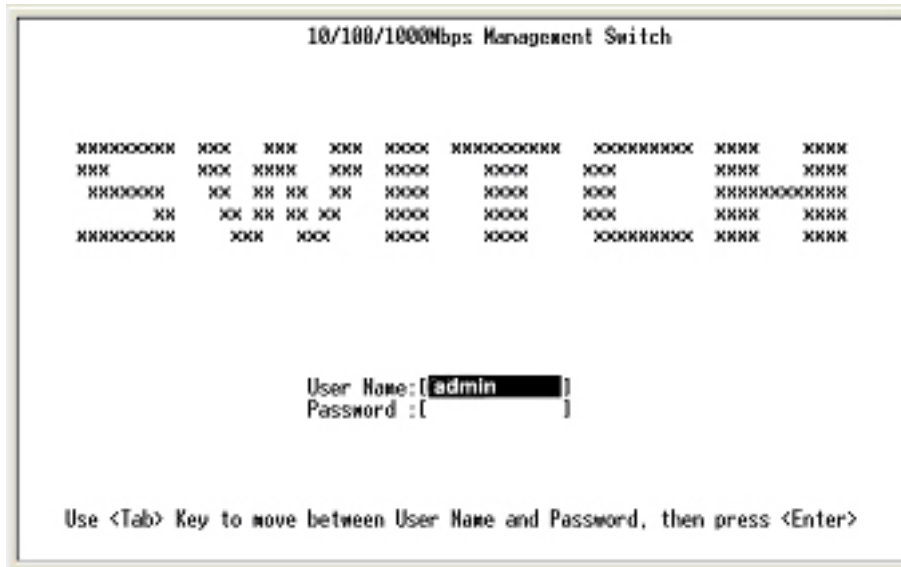


Figure 3-5. The settings of communication parameters



After you have finished parameter settings, click “OK”. When the screen shows above, press “**admin**” Key for the User name, then the Main Menu of console management appears.

Main Menu



Figure 3-6. The screen of Main Menu

After login you will see the main menu screen as illustrated in the picture. The main menu displays all the sub-menu and pages that are available in the console interface.

1. System Information

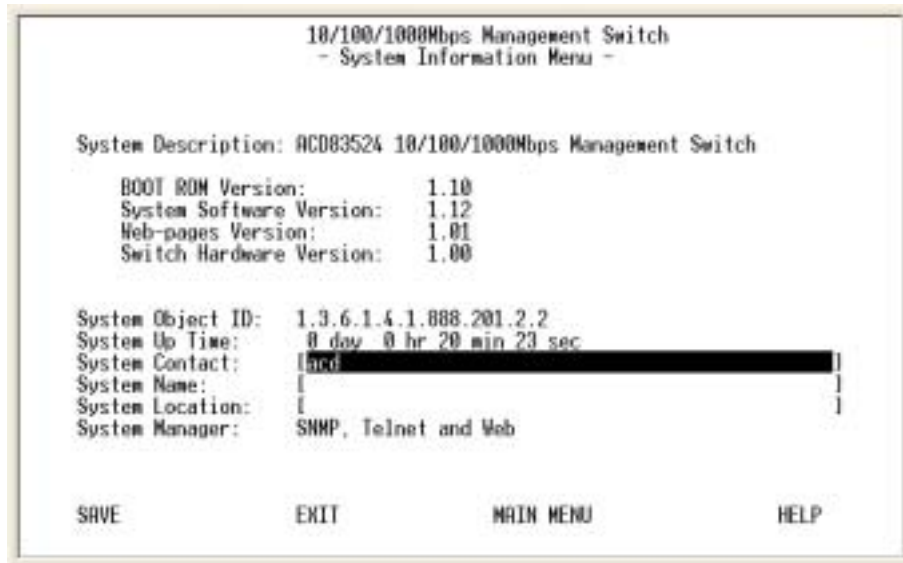


Figure 3-7. The System Information Menu

The system information screen displays information such as hardware, software versions, and system up time. You can also enter specific information about you and your organization here.

2. Management Setup



Figure 3-8. The Management Setup Menu

The management setup menu contains 6 submenus and are discussed in the section in the following pages.

2.1. Network Configuration

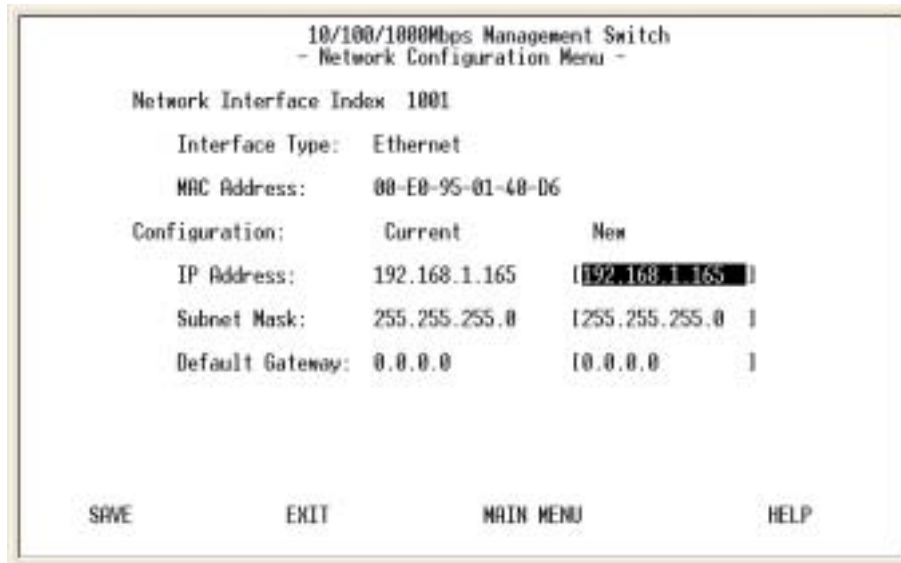


Figure 3-9. The Network Configuration Menu

This screen is provided to change the IP setting of your switch according to your network configuration. After changing the setting you need to save it so that whatever changes you made can take effect. Also note that the value under Current column will not reflect the changes you made until next time you login after resetting the switch.

2.2. Serial Port Configuration

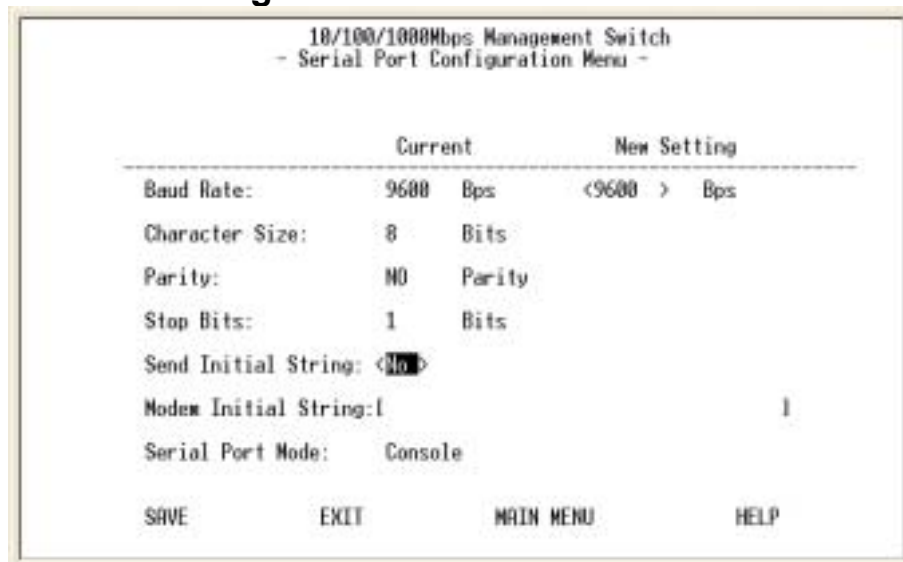


Figure 3-10. The Serial Port Configuration

You can change the serial port setting through this screen to suit your environment, however, we recommend you to keep the default setting.

2.3. SNMP Community Setup

10/100/1000Mbps Management Switch - SNMP Community Menu -			
Index	SNMP Community Name	Access Right	Status
1	[public]	<Read Only >	<Enable >
2	[private]	<Read/Write>	<Enable >
3	[]	<Read Only >	<Disable>
4	[]	<Read Only >	<Disable>
5	[]	<Read Only >	<Disable>
6	[]	<Read Only >	<Disable>

SAVE EXIT MAIN MENU HELP

Figure3-11. The SNMP Community Menu

In the SNMP Community Menu, you can create different communities and customize their access right. Use <TAB> key to move the highlight bar and select desired community to modify or add a new community (use space bar to toggle the access right and status)

2.4. Trap Receiver

10/100/1000Mbps Management Switch - Trap Receiver Menu -				
Index	Community Name	IP Address	Status	
1	[]	[10.0.0.0]	<Disable >	
2	[]	[10.0.0.0]	<Disable >	
3	[]	[10.0.0.0]	<Disable >	
4	[]	[10.0.0.0]	<Disable >	
5	[]	[10.0.0.0]	<Disable >	
6	[]	[10.0.0.0]	<Disable >	

SAVE EXIT MAIN MENU HELP

Figure 3-12. The Trap Receiver Menu

Use trap receiver screen to designate certain community to receive trap(s) generated by the system.

2.5. Management Capability Setup

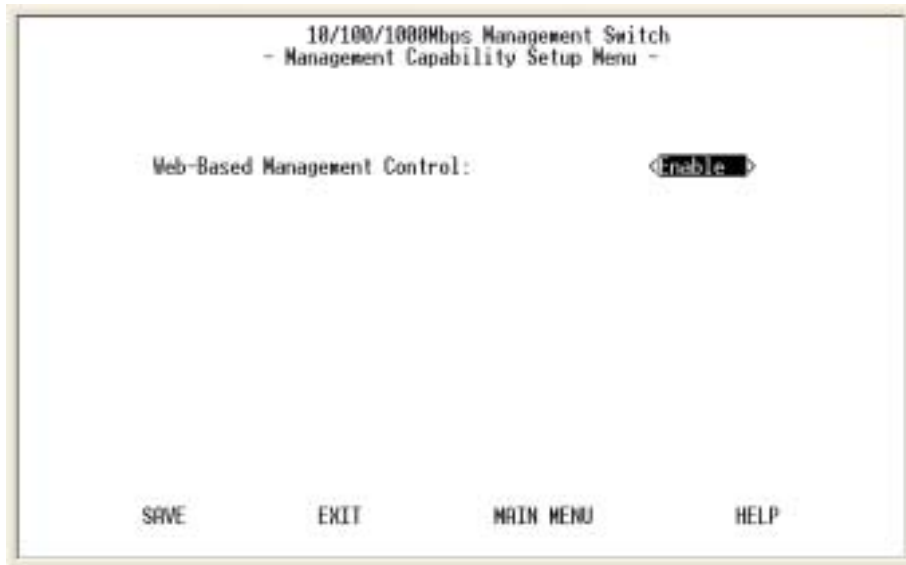


Figure 3-13. The Management Capability setup Menu

This is where you can enable / disable Web-Based management capability which in turn allow or disallow the access to management function through the use of a web browser such as Microsoft IE.

2.6. Trap Filter Setup



Figure 3-14. The Trap Filter Setup menu

The system can generate a set of SNMP traps upon the occurrence of those events. By checking a filter event, you are turning off the filter and enabling the trap associated with that event.

3. Device Control Menu

```
10/100/1000Mbps Management Switch
- Device Control Menu -

Switch Device Configuration
Switch Port Configuration
Permanent Address Configuration
Port Statistics

Spanning Tree Protocol Configuration
Spanning Tree Protocol Port Configuration
Port-Based VLAN Configuration
Static VLAN Configuration
Dynamic VLAN Table
VLAN Untagged Configuration
MTU/MDU Per-Port VLAN Table

GARP Configuration
IGMP Snooping Table

Trunk Group Configuration
Port Mirroring Configuration

EXIT                               MAIN MENU                               HELP
Use <Tab> key to select the item, then press <Enter>
```

Figure 3-15. The Device Control menu

Device control menu contains 15 submenus where you get to maneuver most of the functions and features.

3.1. Switch Device Configuration

```
10/100/1000Mbps Management Switch
- Switch Device Configuration Menu -

Spanning Tree Enable State: <Disable>
Dynamic Entry Aging Time: 13001 Sec.

Broadcast Storm Prevention <Disable>
Ingress Filtering : <Disable>
Per-Port Priority : <Disable>
HOLB Prevention : <Disable>

QoS (Type Of Service) : <Disable>
Priority High (0-63): 10 1
Priority Middle (0-63): 11 1
Priority Low (0-63): 12 1
Priority Lowest (0-63): 13 1
VLAN Mode Configuration: <IEEE 802.1Q VLAN >
MTU/MDU Per-Port VLAN : <One Uplink>
GARP Enable State: <Disable>
IGMP Snooping: <Disable>
IGMP Snoop Tbl Aging Time: 11251 Sec.

SAVE                               EXIT                               MAIN MENU                               HELP
```

Figure 3-16. The Switch Device Configuration menu

Use <Space Bar> key to toggle the Enable / Disable field and type in appropriate value in the Time and Priority field.

- Broadcast Storm Prevention can be set to 6% Or 20% beside Disable. The percentage indicates the allowance against the capacity. When its disable there will be no limitation on the incoming rate of broadcast / multicast traffic, otherwise limitation on those traffics will be set to the percentage accordingly.
- When QoS is enabled you can map the Type of Service of your

choice (according to IEEE 802.1p) to the four priority levels provided.

• There are three different mode of VLAN supported in this system – 802.1Q, Port Base VLAN, MTU/MDU. The choice you made here will ultimately decide the VLAN mode and function for entire system (the configuration of the other two VLAN mode will have no effect to the system behavior).

3.2. Switch Port Configuration

```
10/100/1000Mbps Management Switch
- Switch Port Configuration Menu -

Unit ID:          Group ID: <F>

Port ID  Operational Status  Link Status  Auto Partitioned  Duplex Mode  Speed Status
-----  -
1        No                 No Link
2        No                 No Link
3        No                 No Link
4        No                 No Link
5        No                 No Link
6        No                 No Link
7        No                 No Link
8        No                 No Link
9        No                 No Link
10       No                 No Link
11       No                 No Link
12       No                 No Link

PREV PAGE      NEXT PAGE      EXIT      MAIN MENU      HELP
Use <Tab> or arrow keys to select index; <Enter> to EDIT
```

Figure 3-17. The Switch Port Configuration menu

The Ports (24+2) of the system are divided and displayed in three separated pages. Use PREV PAGE, NEXT PAGE to list desired port range and select the port with navigation key.

In the port configuration screen (display in next page) you can configure the common characteristics such as speed negotiation, flow control, and VLAN ID as well as the following special features provided with the system:

- Per-Port Priority – Four levels of priority (High, Medium, Low and Lowest) can be set to each individual port. However, the priority level set through QoS / Type of Service configuration in the device configuration menu will have higher precedence.
- Local IP Forwarding – A policy instrument that provides a way for local IP traffic to cross the local VLAN boundary set force in a typical (secure) access environment.
- Bandwidth provisioning - 8 levels of speed control facilitate the provisioning control for access provider.

3.3. Permanent Address Configuration



Figure 3-18. The Permanent Address Configuration menu

There are 128 static unicast groups and 32 multicast supported by the system. Two submenus contains in this section.

3.3.1. Static Unicast Address Configuration

You can creat, modify, or delete Static Unicast Address by selecting entries from the following screen.

Enter the MAC address of a system you wish to set as static unicast address the port associated with the system. Use<Space Bar> to toggle the status field between Disable, Forwarding, Filter-In, and Filter-Out.

- Disable – This Unicast Address entry has no effect to the switch system.
- Forwarding – All packets designated to this MAC address will be forward (and only to) the designated port.
- Filter-in – Only packets originated to from this MAC address will be permitted to enter this port, in other words, packets originated from other MAC address will be dropped at this port automatically.
- Filter-out – All packets designated to this MAC address will be blocked (the port is disregard here).

3.3.2. Static Multicast Address Configuration

In the Static Multicast Configuration Menu screen, besides the MAC Address and Status field (Enable/Disable), you add member(s) to the group by checking the port(s) with <Space Bar> key.

3.4. Port Statistics

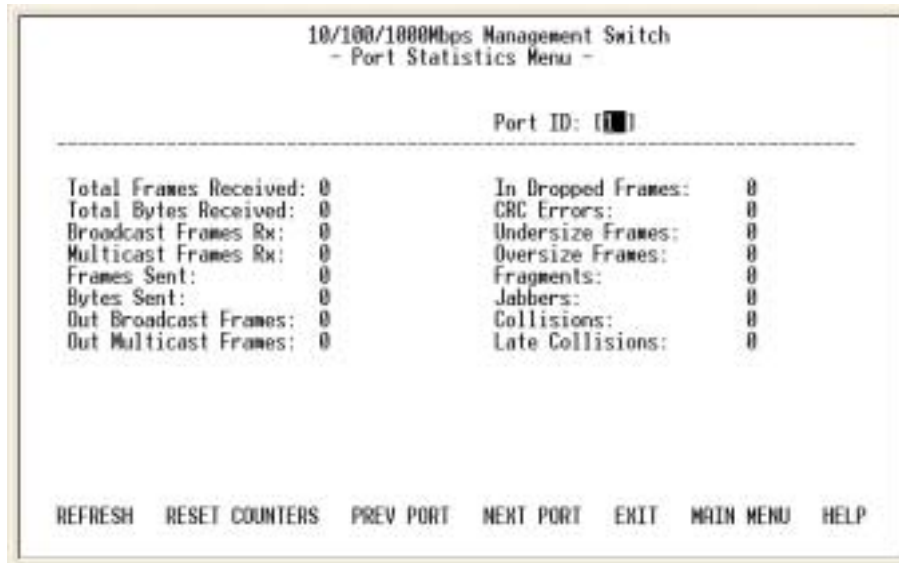


Figure 3-19. The Port Statistics menu

You can view the statistics information display in this screen regarding a certain port by entering the port number in the port id field. You can also refresh or reset the counter as you wish.

3.5. Spanning Tree Protocol Configuration



Figure 3-20. The Spanning Tree Protocol Configuration menu

You can alter the Spanning Tree status with <Space Bar> key. If you enable the spanning tree protocol, you must complete the Priority and Time fields with appropriate value. Also note that you

can choose to leave a menu screen without applying any changes you had made at any time by pressing <Esc> key and then confirm with <Enter> key.

3.6. Spanning Tree Protocol Port Configuration



Figure 3-21. The Spanning Tree Protocol port Configuration menu

In this screen you can assign spanning priority and path cost to any port(s). A port with higher priority, lower path cost is less likely to be blocked if Spanning Tree Protocol is detecting network loop.

3.7. Post-Based VLAN Configuration

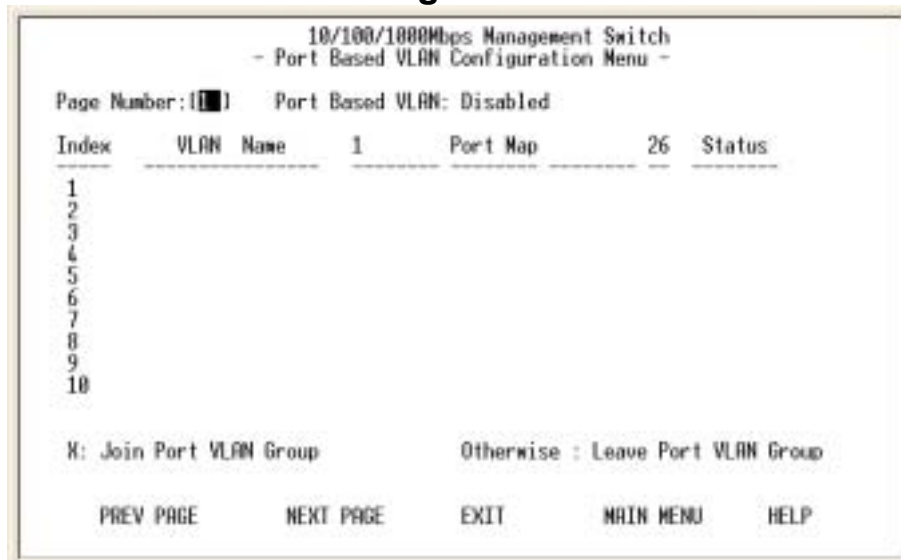


Figure 3-22. The Port Based VLAN Configuration menu

Assigning physical ports within workgroup is simple, and is a common method of defining a virtual workgroup – VLAN. It delivers the benefit of broadcast control and simplifies configuration for the network manager.



Figure 3-23. The Port Based VLAN Configuration menu



- () – Port(s) is not set as static (fixed) member of the VLAN but it can become a member through Dynamic VLAN Registration.
- (F) – Port(s) is set as static (fixed) member of the VLAN and can be registered as a dynamic VLAN member as well.
- (B) – Port(s) is being forbidden to be neither a static member nor a dynamic member of the VLAN.

3.8.2. Dynamic VLAN Table



Figure 3-24. The Dynamic VLAN Table menu

This screen displays the VLAN mapping for port(s) that join the VLAN(s) through Dynamic VLAN Registration.

3.8.3. VLAN Untagged Configuration



Figure 3-25. The Port Untag Configuration menu

All ports are set by default as <Untagged> in this switch system, to change port(s) to <Tagged> just use <Space Bar> to uncheck - () the port(s) from the Port Map.

3.8.4 GARP Configuration

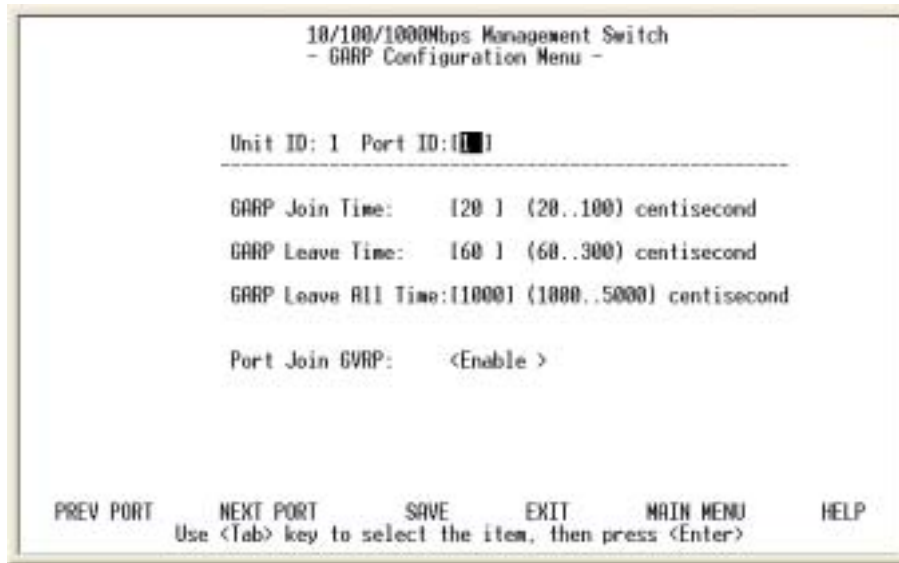


Figure 3-26. The GARP Configuration menu

GARP (Generic Attribute Registration Protocol) defines the architecture, rules of operation, state machines and variables for the registration and de-registration of attribute values. It allows dynamic filter entries for VLAN membership to be distributed among the Forwarding Databases of VLAN-aware switches. By joining GVRP (GARP VLAN Registration Protocol), it helps maintaining VLAN information. The rule of the aging scheme is:

GARP Leave All Time > GARP Leave Time > GARP Join Time

3.9. MTU/MDU Per-Port VLAN Table

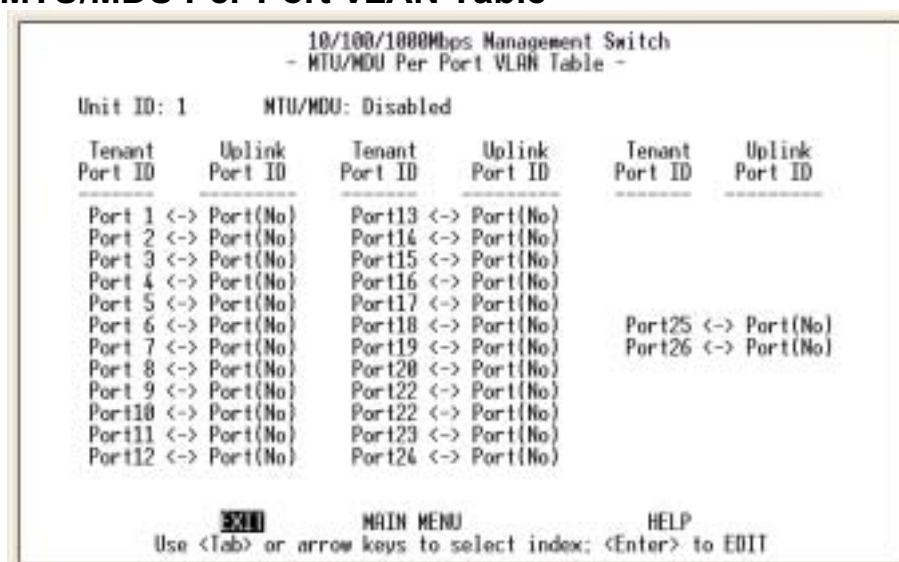


Figure 3-27. The MTU/MDU Per-Port VLAN Table menu

This screen only reflects the setting you made in Switch Device Configuration menu - there is no change can be made here. Should you set the VLAN Mode to <MTU/MDU> mode and <one Uplink>

port then
 port 1 ~ 25 will be mapped to port 26 - the uplink port, otherwise,
 port 1 ~ 12 and port 13 ~ 24 will be mapped to uplink port 25 and
 port 26 accordingly.

3.10. IGMP Snooping Table

Idx	Multicast Group	MAC Address	VID	Port Map
1			1	26
2			1	26
3			1	26
4			1	26
5			1	26
6			1	26
7			1	26
8			1	26
9			1	26
10			1	26

Figure 3-28. The IGMP Snooping Table

By supporting IGMP (Internet Group Management Protocol) Snooping, the switch can forward multicast traffic intelligently. Packets are forwarded to the ports that belong to the multicast group instead of being broadcast to all ports and possibly disrupting network performance. This lookup table reflects the multicast group(s) (up to 32) configuration of your system and provides an overview of the port(s) map to each multicast group.

3.11. Trunk Group Configuration

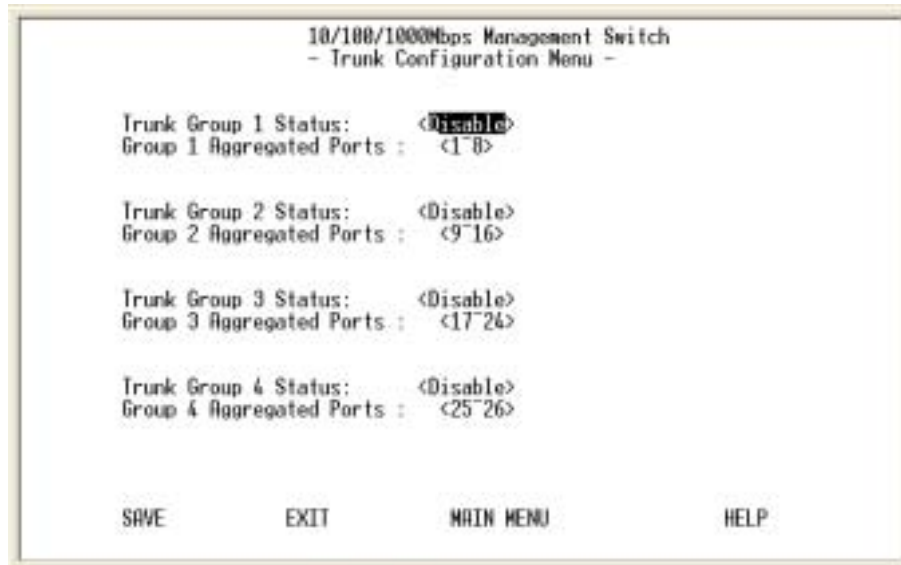


Figure 3-29. The Trunk Configuration Menu

Multiple links between switches can be grouped (trunk) to work as one virtual, aggregate link. You can create 4 trunks at a time; each trunk can hold up to 8 ports - only ports of the same speed can belong to a single trunk.

3.12. Port Mirroring Configuration



Figure 3-30. The Port Mirroring Configuration Menu

By enabling port mirroring, traffic to and from the source port will be forwarded to the target port. You can select any of the 26 port as either the Source port or the Target port by using <Space Bar> to scroll though the desired port number.

4. User Authentication



```
10/100/1000Mbps Management Switch
- User Authentication Menu -

Index  User Name  Password  Privilege
-----  -
1      admin     *****  Read/Write
2      guest     *****  Read Only
3      [blank]   *****  Read Only
4      [blank]   *****  Read Only

EXIT          MAIN MENU          HELP
Use <Tab> key to select the item, then press <Enter>
```

Figure 3-31. The User Authentication Menu

You can change the password setting as in the user authentication menu. You can also create user and assign different privilege to suit your needs.



```
10/100/1000Mbps Management Switch
- User Authentication Menu -

User Name  Password  Confirm  Privilege
-----  -
[guest]    [*****] [*****] <Read Only >

UPDATE    DELETE    EXIT    MAIN MENU    HELP
```

After selecting an entry to add or modify, type in user name and password, toggle the user privilege with <Space Bar> and then update the changes.

5. System Utility

5.1 System Restart



Figure 3-32. The System Restart Menu

As mention earlier, you need to perform either a <Cold Start> or <Warm Star> to have the changes you made written into the NVRAM so that changes are really saved and keep in effect until you make change to them again.

5.2 Factory Reset

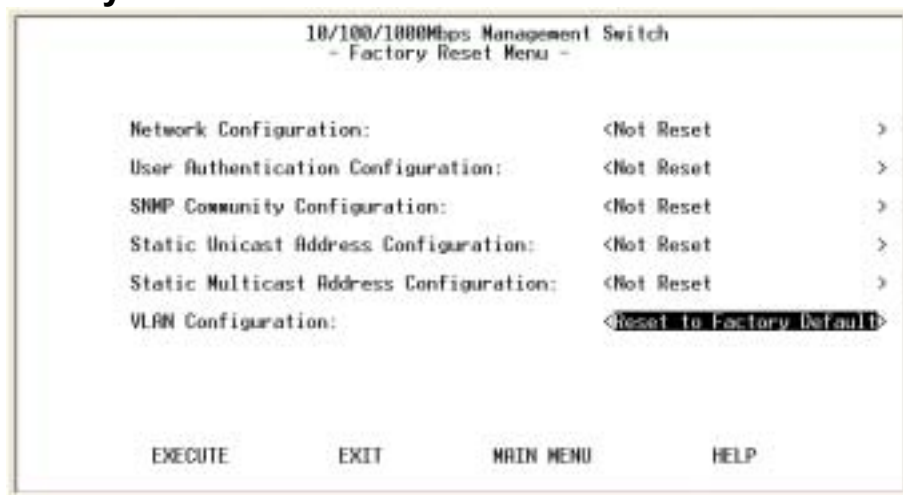


Figure 3-33. The Factory Reset Menu

The system can let you to reset all configurations as you wish anytime.

5.3 Login Timeout Interval

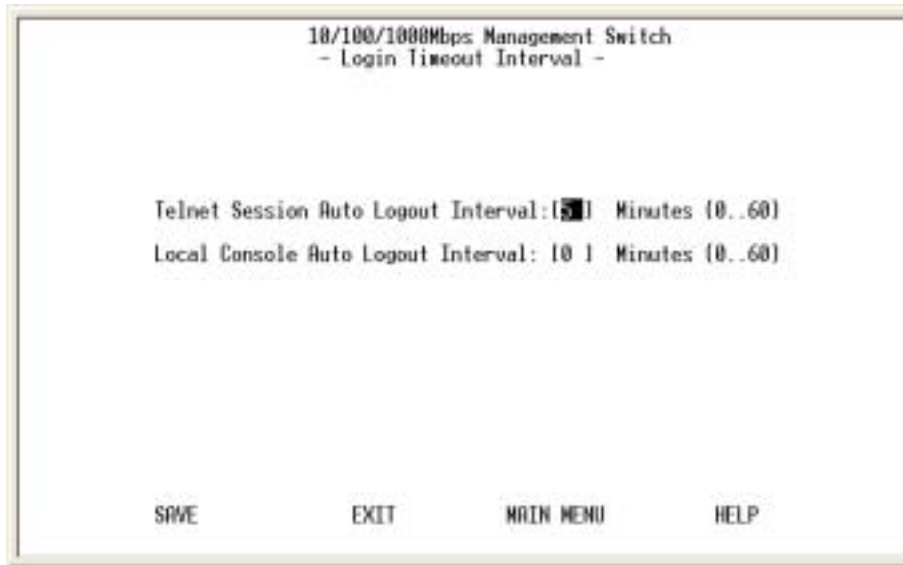


Figure 3-34. The Login Timeout Interval

You can set up the time you need for the automatic log-out in anytime.

5.4 System Download



Figure 3-35. The System Download Menu

Use TFTP download the code you need, and two code as Boot code and System Software code for upgrading.

4. Web-Based Management

This section introduces the configuration and functions of the Web-Based management.

About Web-based Management

Inside the CPU board of the switch exists an embedded HTML web site residing in flash memory. It offers advanced management features and allow users to manage the switch from anywhere on the network through a standard browser such as Microsoft Internet Explorer.

The Web-Based Management supports Internet Explorer 5.0. It is based on Java Applets with an aim to reduce network bandwidth consumption, enhance access speed and present an easy viewing screen.

Note: By default, IE5.0 or later version does not allow Java Applets to open sockets. The user has to explicitly modify the browser setting to enable Java Applets to use network ports. (See Appendix A: for the means to modify the setting).

System Login

1. Start Internet Explorer.
2. Type http:// and the IP address of the Modular Switch (for example, the default is 192.168.16.1) in the Location or Address field. Press Enter.

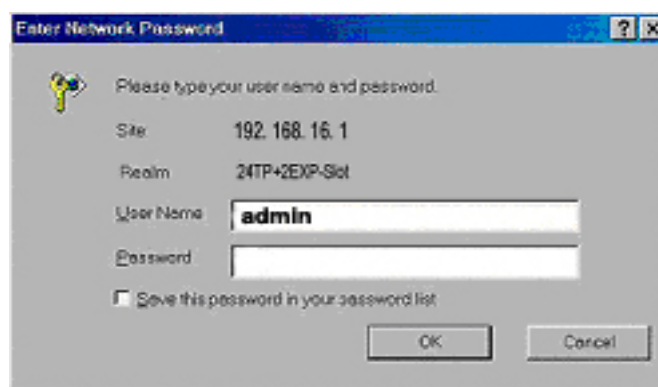


Figure 4-1: The Password Window

3. The Password screen appears.
4. Type user name and password. The default is “ **admin** ” for both.
5. Press “Enter” or Click “OK”, then the Home Screen of the Web-based management appear.

System Information

System Information Menu	
System Name	<input type="text"/>
System Contact	act
System Location	<input type="text"/>
Description	24-Port with 2 Slide-in Slots SNMP Switch
System Object ID	1.3.6.1.4.1.888.201.2.2
Pre-Load Firmware Version	1.02
BOOT ROM Version	1.10
System Software Version	1.15
Web-Pages Version	1.00
System Up Time	0 day 0 hr 30 min 23 sec
System Manager	SNMP, Telnet and Web

Figure 4-2 The System Information Menu

You can manage the Switch using third-party's SNMP (Simple Network Management Protocol) agent. Access rights to the SNMP agent are controlled by community strings.

To set system name, system location and system contact, you can type the desired text string in the corresponding edit box.

Management Setup

Network Configuration

Network Configuration Menu		
Network Interface Index:	1001	
Interface Type:	Ethernet	
MAC Address:	00-00-95-01-40-59	
Configuration:	Current	New
IP Address:	192.168.1.186	192.168.1.186
Subnet Mask:	255.255.255.0	255.255.255.0
Default Gateway:	192.168.1.186	192.168.1.186

Figure 4-3. The Network Configuration Menu

You can change the IP address, subnet mask and default gateway of the managed node. (You can also do that from RS232 console). Enter the IP address, subnet mask and default gateway in the corresponding edit box.

If you want to change the user name or password for the managed node, the following steps is needed:

- ☛ Click the "Change Password" checkbox
- ☛ Enter the user name in "Username" edit box
- ☛ Enter the same password in "Password" and "Confirm Password" edit box
- ☛ Press the "Apply" button

You should reboot system to let your settings take effect if you have changed one of the IP address, subnet mask and default gateway.

Serial Port Configuration

Serial Port Configuration Menu

Unit ID: 1

	Current	New Setting
Baud Rate:	9600 tps	4800 tps
Character Size:	8 bits	
Parity:	No parity	
Stop Bits:	1 bit	
Send Initial String:	No	
Modem Initial String:		
Serial Port Mode:	Console	

Submit Reset

Figure 4-4. The Serial Port Configuration Menu

You can change the serial port setting through this screen to suit your environment, however, using the default setting is recommended.

SNMP Community Setup



Figure 4-5. The SNMP Community Setup Menu

Public Community (Read-only access right) means that member of community can view the information but can not make changes to the configuration.

Private Community (Read/Write access right) allow the member of the community to view and make change to the configuration.

To set the "Public" and "Private" community name, you can type the desired text string in the corresponding edit box.

Trap Receiver



Figure 4-6. The Trap Receiver Menu

Use trap receiver screen to designate certain community to receive trap(s) generated by the system.

Management Capability Setup



Figure 4-7. The Management Capability Setup Menu

This is where you can enable / disable Web-Based management capability which in turn allow or disallow the access to management function through the use of a web browser such as Microsoft IE.

Trap Filter Setup

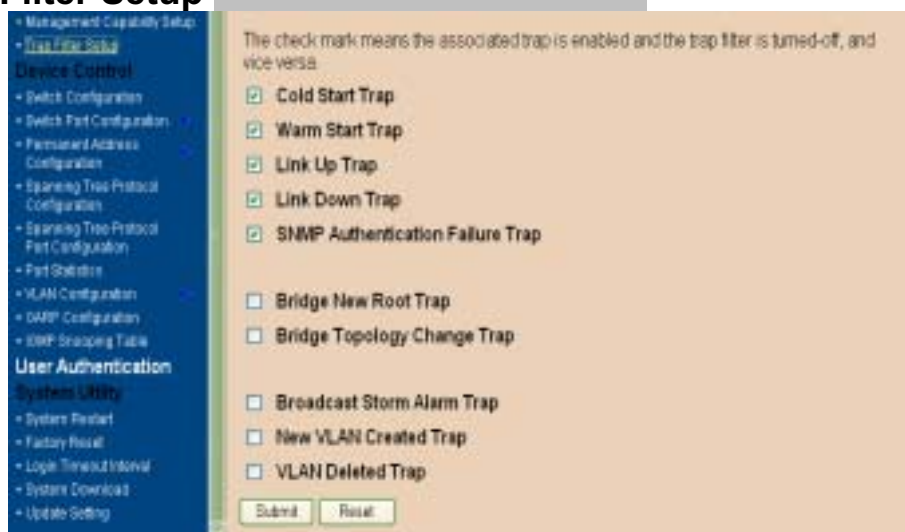


Figure 4-8. The Trap Filter Setup Menu

The system can generate a set of SNMP traps upon the occurrence of those events. By checking a filter event, you are turning off the filter and enabling the trap associated with that event.

Device Control

Switch Configuration



Figure 4-9. The Switch Configuration upper Menu

1. There are three different mode of VLAN supported in this system – 802.1Q, Port Base VLAN, MTU/MDU. The choice you made here will ultimately decide the VLAN mode and function for entire system (the configuration of the other two VLAN mode will have no effect to the system behavior).
2. Broadcast Storm Prevention can be set to 6% Or 20% beside Disable. The percentage indicates the allowance against the capacity. When its disable there will be no limitation on the incoming rate of broadcast / multicast traffic, otherwise limitation on those traffics will be set to the percentage accordingly.
3. When QoS is enabled you can map the Type of Service of your choice (according to IEEE 802.1p) to the four priority levels provided.



Figure 4-10. The Switch Configuration lower Menu

Switch Port Configuration

Port	Operational Status	Link Status	Auto Partitioned	Duplex Mode	Speed Status
1	No	No Link	No		
2	Yes	Link	No	Full	100Mbps
3	No	No Link	No		
4	No	No Link	No		
5	No	No Link	No		
6	No	No Link	No		
7	No	No Link	No		
8	No	No Link	No		
9	No	No Link	No		

Figure 4-11. The Port Administration in Switch Port Configuration Menu

The Ports (24+2) of the system are divided and displayed in three separated pages. In the port Administration menu, select a port that you can configure the common characteristics such as speed negotiation, flow control, and VLAN ID as well as the following special features provided with the system:

- Per-Port Priority – Four levels of priority (High, Medium, Low and Lowest) can be set to each individual port. However, the priority level set through QoS / Type of Service configuration in the device configuration menu will have higher precedence.
- Local IP Forwarding – A policy instrument that provides a way for local IP traffic to cross the local VLAN boundary set force in a typical (secure) access environment.
- Bandwidth provisioning - 8 levels of speed control facilitate the provisioning control for access provider.

Trunk Group Configuration

Check port numbers to make a trunk group.

Unit ID: 1 Trunk ID: 1

Trunk Name:

Trunk Members:

Port ID:	1	2	3	4	5	6	7	8
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Status:

Figure 4-12. The Trunk Group in Switch Port Configuration Menu

Port trunking is the ability to group several ports to increase the bandwidth between this switch and another compatible switch. This is an inexpensive way to increase bandwidth. We define port trunking as the ability to group set of ports (up to 4 groups).



Figure 4-13. The Port Mirror in Switch Port Configuration Menu

Port Mirror is to mirror traffic (all frames) from a specific resource port to a target port. This help tracking down network errors or erroneous packet transfers without interrupting the flow of data across the network.

If you want to monitor all receive and transmit packets of one port. You can do the following:

- ☛ Choose the monitored port in " Source Port "
- ☛ Choose the corresponding target module, port in "Target Port" choice box.
- ☛ Click the corresponding "Enabled" check box.
- ☛ Press "Submit" button

Permanent Address Configuration



Figure 4-14. The Static Unicast Address in Permanent Address Configuration Menu

You can Add, modify, or delete Static Unicast Address by selecting entries from the following screen.

Enter the MAC address of a system you wish to set as static unicast address the port associated with the system. Select the status field between Disable, Forwarding, Filter-In, and Filter-Out.

- Disable – This Unicast Address entry has no effect to the switch system.
- Forwarding – All packets designated to this MAC address will be forward (and only to) the designated port.
- Filter-in – Only packets originated to from this MAC address will be permitted to enter this port, in other words, packets originated from other MAC address will be dropped at this port automatically.
- Filter-out – All packets designated to this MAC address will be blocked (the port is disregard here).



Figure 4-15. The Static Multicast Address Configuration in Permanent Address Configuration Menu

In the Static Multicast Configuration Menu screen, you can add member(s) to the group by checking the port(s).

Spanning Tree Protocol Configuration

Spanning tree is a link management protocol that provides path redundancy while preventing undesirable loops in the network. For Layer 2 Ethernet network to function properly, only one active path must exist between two stations.

The spanning-tree algorithm calculates the best loop-free path throughout a switched network. STP forces redundant data paths into a standby (blocked) state. If a network segment in the spanning tree fails and a redundant path exists, the spanning-tree algorithm recalculates the spanning tree topology and activates the standby path.

Spanning Tree Protocol Configuration Menu	
STP Enable State:	Disabled
STP Specification:	IEEE 802.1D
STP Base MAC Address:	00-80-95-01-40-59
STP Designated Root:	8000-008095014059
STP Root Port:	0
STP Root Cost:	0
STP Max. Age:	2000 (1/100 seconds)
STP Hello Time:	200 (1/100 seconds)
STP Forward Delay:	1500 (1/100 seconds)
STP Hold Time:	100 (1/100 seconds)
STP Topology Change Count:	0
STP Time Since Topology Changed:	0 day 0 hr 0 min 0 sec
Role of STP Bridge:	STP Disabled

Figure 4-16. The Spanning Tree Protocol Configuration upper Menu

If you enable the spanning tree protocol, you must complete the Priority and Time fields with appropriate value.

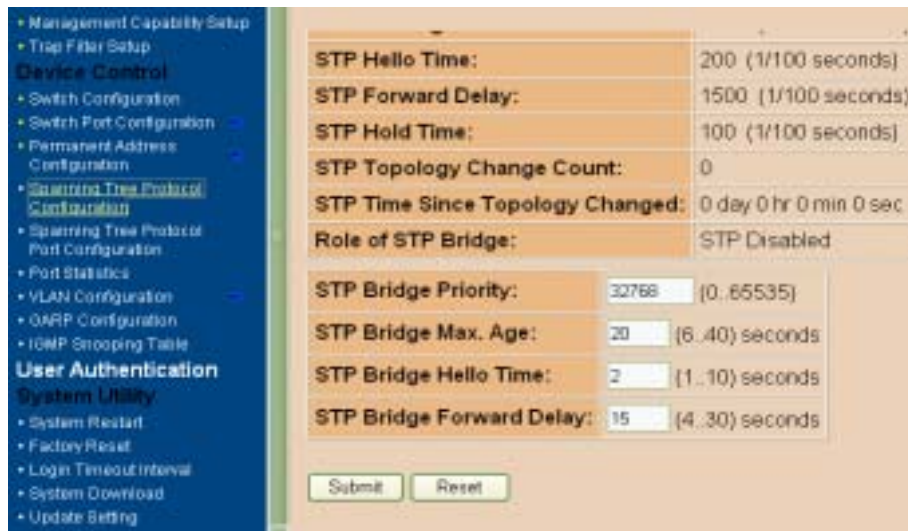


Figure 4-17. The Spanning Tree Protocol Configuration lower Menu

Spanning Tree Protocol Port Configuration



Figure 4-18. The Spanning Tree Protocol Port Configuration upper Menu

In this upper and lower menu, you can assign spanning priority and path cost to any port(s). A port with higher priority, lower path cost is less likely to be blocked if Spanning Tree Protocol is detecting network loop.

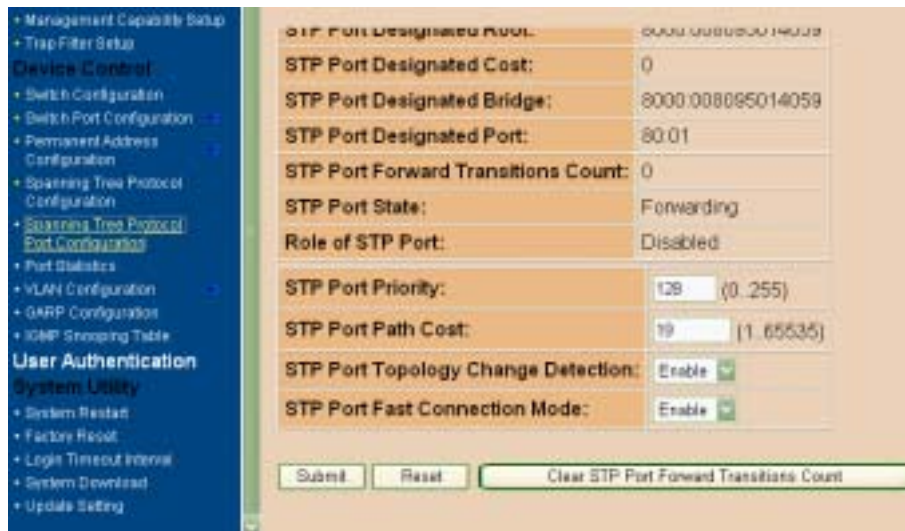


Figure 4-19. The Spanning Tree Protocol Port Configuration lower Menu

Port Statistics



Figure 4-20. The Port Statistics Menu

You can view the statistics information display in this screen regarding a certain port by entering the port number in the port id field. You can also refresh or reset the counter as you wish.

VLAN Configuration



Figure 4-21. The Static VLAN Configuration Menu

- (S) – Port(s) is set as static (fixed) member of the VLAN.
- (D) – Port(s) is set as static (fixed) member of the VLAN and can be registered as a dynamic VLAN member as well.
- (C) – Port(s) is being both a static member and a dynamic member of the VLAN.

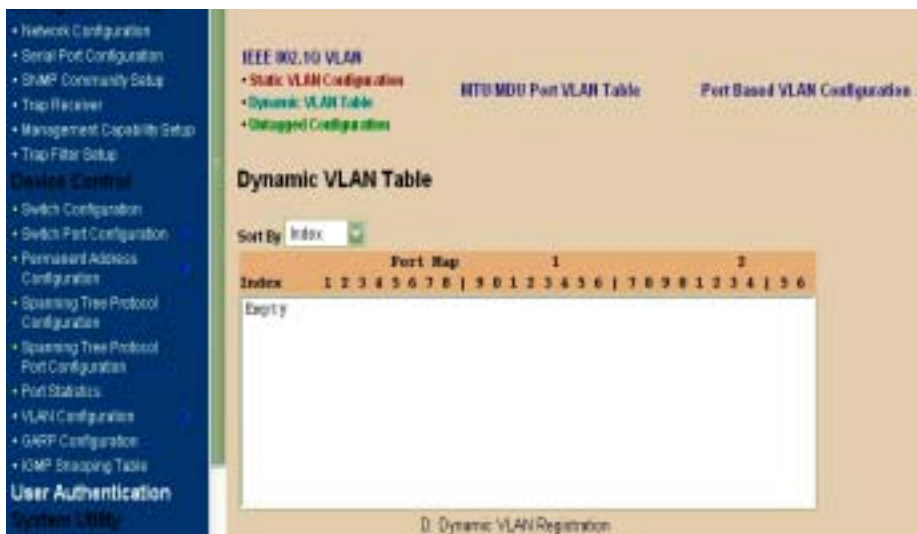


Figure 4-22. The Dynamic VLAN Table Menu

This screen displays the VLAN mapping for port(s) that join the VLAN(s) through Dynamic VLAN Registration.

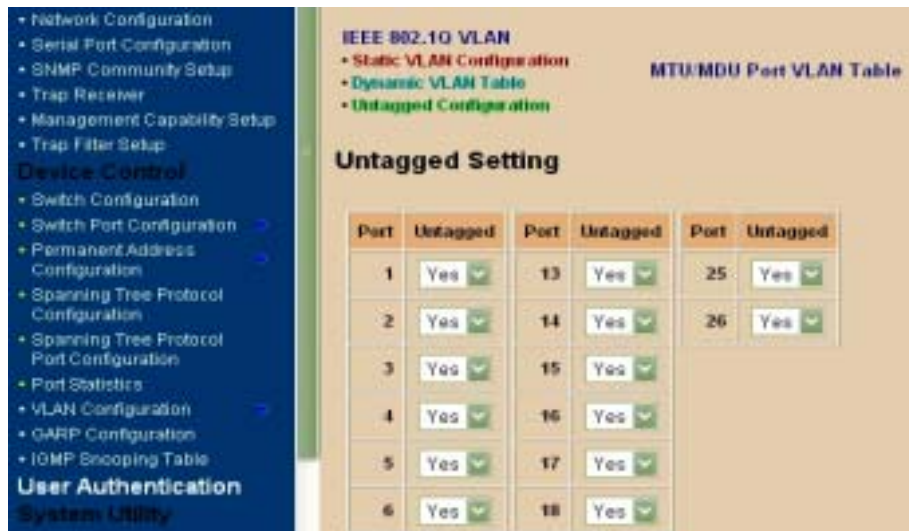


Figure 4-23. The Untagged Configuration Menu

All ports are set by default as Untagged in this switch system, to change port(s) to Tagged just pick the port number you need and select “No” from the Port Map.

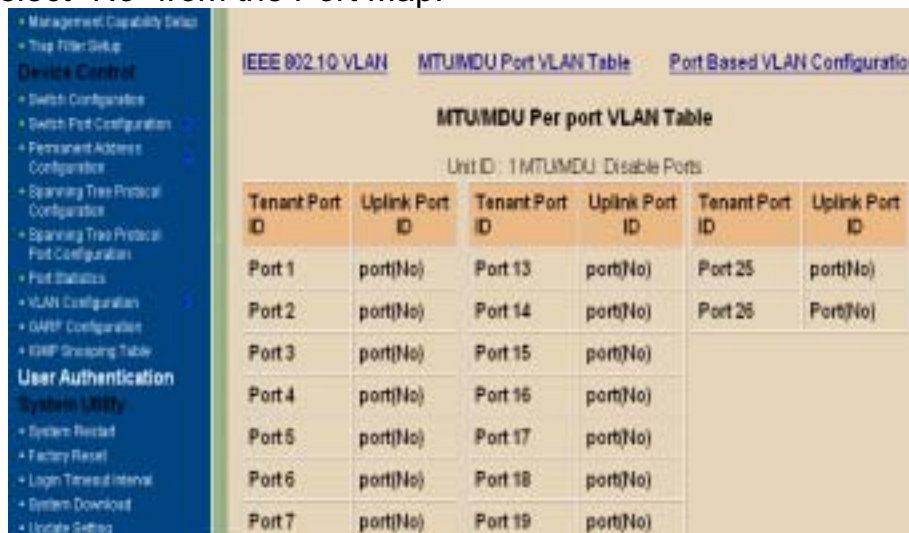


Figure 4-24. The MTU/MDU Per Port VLAN Table in The VLAN Configuration Menu

This screen as above only reflects the setting you made in Switch Device Configuration menu - there is no change can be made here. Should you set the VLAN Mode to <MTU/MDU> mode and <one Uplink> port then port 1 ~ 25 will be mapped to port 26 - the uplink port, otherwise, port 1 ~ 12 and port 13 ~ 24 will be mapped to uplink port 25 and port 26 accordingly.



Figure 4-25. The Port Based VLAN Configuration in The VLAN Configuration Menu

Select the VLAN entry to create, modifies, or deletes the VLAN group. Choose the port(s) to the VLAN group

GARP Configuration



Figure 4-26. The GARP Configuration Menu

GARP (Generic Attribute Registration Protocol) defines the architecture, rules of operation, state machines and variables for the registration and de-registration of attribute values. It allows dynamic filter entries for VLAN membership to be distributed among the Forwarding Databases of VLAN-aware switches. By joining GVRP (GARP VLAN Registration Protocol), it helps maintaining VLAN information. The rule of the aging scheme is:

GARP Leave All Time > GARP Leave Time > GARP Join Time

IGMP Configuration



Figure 4-27. The IGMP Configuration Menu

Multicasting is used to support real-time applications such as video conferencing or streaming audio. IGMP (Internet Group Multicast Protocol) allows you to query for any attached hosts who want to receive a specific multicast service. The switch looks up the IP Multicast Group used for this service and adds any port, which received a similar request to that group. It then propagates the service request on to any neighboring multicast switch to ensure that it will continue to receive the multicast service.

By supporting IGMP (Internet Group Management Protocol) Snooping, the switch can forward multicast traffic intelligently. Packets are forwarded to the ports that belong to the multicast group instead of being broadcast to all ports and possibly disrupting network performance. This lookup table reflects the multicast group(s) (up to 32) configuration of your system and provides an overview of the port(s) map to each multicast group.

User Authentication



Figure 4-28. The User Authentication Menu

You can change the password setting as in the user authentication menu. You can also create user and assign different privilege to suit your needs. After selecting an entry to add or modify, type in user name and password, toggle the user privilege and then update the changes

System Utility

System Restart



Figure 4-29. The System Restart Menu

As mention earlier, you need to perform either a Cold Start or Warm Star to have the changes you made so that changes are really saved and keep in effect until you make change to them again.

Factory Reset

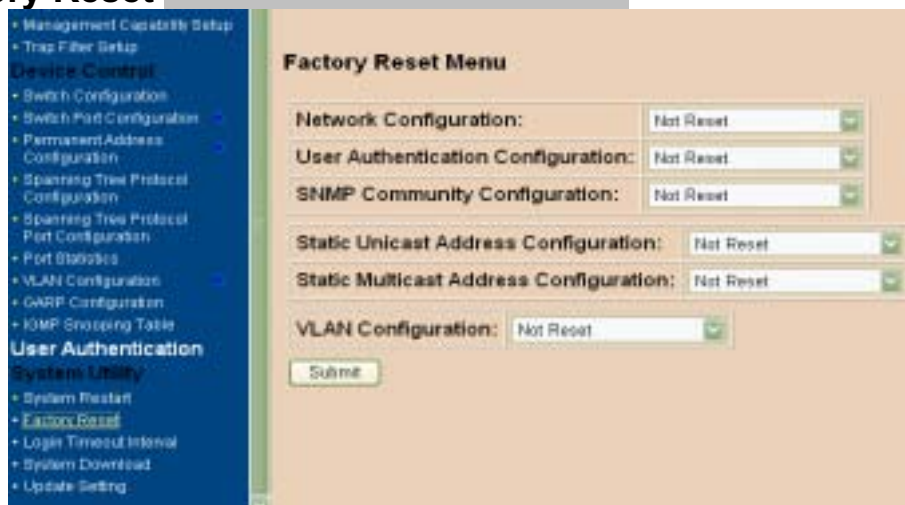


Figure 4-30. The Factory Reset Menu

All selections in this menu are separate to be setup their own default.

Login Timeout Interval

Management Capability Setup
Trap Filter Setup
Device Control
Switch Configuration
Switch Port Configuration
Permanent Address Configuration
Spanning Tree Protocol Configuration
Spanning Tree Protocol Port Configuration
Port Statistics
VLAN Configuration
GARP Configuration
IGMP Snooping Table
User Authentication
System Utility
System Restart
Factory Reset
Login Timeout Interval
System Download
Update Setting

Login Timeout Interval

Telnet Session Auto Logout Interval: 5 Minutes (0..60)
Local Console Auto Logout Interval: 0 Minutes (0..60)

Submit Reset

Figure 4-31. The Login Timeout Interval Menu

You can set up the time you need for the automatic log-out in anytime.

System Download

Management Capability Setup
Trap Filter Setup
Device Control
Switch Configuration
Switch Port Configuration
Permanent Address Configuration
Spanning Tree Protocol Configuration
Spanning Tree Protocol Port Configuration
Port Statistics
VLAN Configuration
GARP Configuration
IGMP Snooping Table
User Authentication
System Utility
System Restart
Factory Reset
Login Timeout Interval
System Download
Update Setting

System Download Menu

File Download Request:

TFTP Server IP Address: 0.0.0.0

Boot ROM Code Download
File Name: _____

System Software and Web Pages Database Download
File Name: _____

Save and Download Save Reset

Figure 4-31. The System Download Menu

Use TFTP download the code you need, and two code as Boot code and System Software code for upgrading.

Update Setting

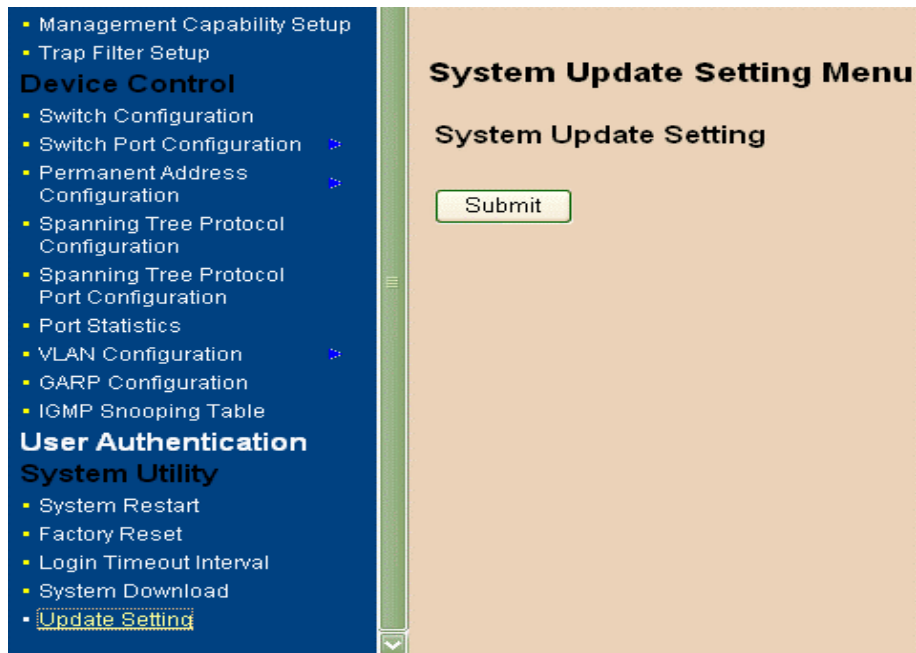


Figure 4-32. The Update Setting Menu

You can save current settings by click the "Submit" checkbox .You should reboot the system so that your current settings will take effect.

5. Network Configuration

This section provides you a few samples of network topology in which LevelOne GSW-2490TXM SNMP Switch (UTP/MT-RJ/VF-45, Intelligent) is used.

The Switch provides versatile configuration options for the network. It is ideally suited as a workgroup or segment Switch in a network; it has the flexibility to provide Switched 10Mbps to the desktop or shared hubs, aggregate traffic from workgroup Switches, or provide dedicated 100Mbps or 1000Mbps (Gigabit) to servers with bandwidth-intensive applications. And because all Fast Ethernet ports auto-negotiate for operation at 100 Mbps the Switch is perfectly suited to an evolving network environment where demand for network speed is increasing.

Collapsed Backbone Application

For small network where rapid growth can be expected in the near future, this Switch is an ideal solution supporting backbone connectivity.

The Switch can be used as a standalone Switch for a group of heavy traffic users. Switching is brought to the desktop either through a single end-station per Switch port or through a multi-port Switch.

A 1000 Mbps server is connected to the Switch, providing end stations high-speed accessibility to its applications. This configuration provides dedicated 100 Mbps connections to the network center, to the server, and up to 40 users (while 2 Optional 8-port module are installed).

When the network needs expansion, you can simply connect the Switch to any IEEE 802.3 (Ethernet), IEEE 802.3u (Fast Ethernet) and 802.3ab (Gigabit Ethernet) compliant Switch utilizing the Auto MDI/MDIX function. This Switch can also cooperate with a wide range of networking devices (e.g., firewall routers and printer servers) added to the network.

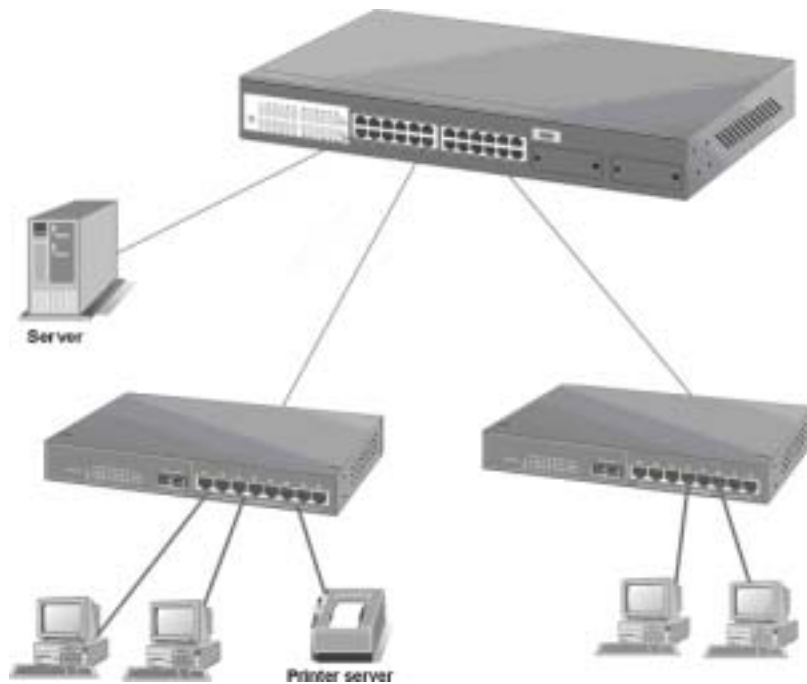


Figure 5-1. Collapsed Backbone Application

Departmental Bridge

For enterprise networks where large data broadcasts are constantly processed, this Switch is an ideal solution for department users to connect to the corporate backbone. The LevelOne GSW-2490TXM SNMP Switch used as segment Switch can alleviate user contention for bandwidth and eliminate server and network bottlenecks. All ports can connect to high-speed department servers that need high bandwidth. This Switch provides parallel communications within its Gigabit port, which can run up to 2000 Mbps at Full-duplex.

The Switch makes key servers available to more users by allowing multiple conversations to occur concurrently, thereby significantly expanding overall network throughput. Moreover, this Switch eases supervision and maintenance by allowing network manager centralize multiple servers in a single location.

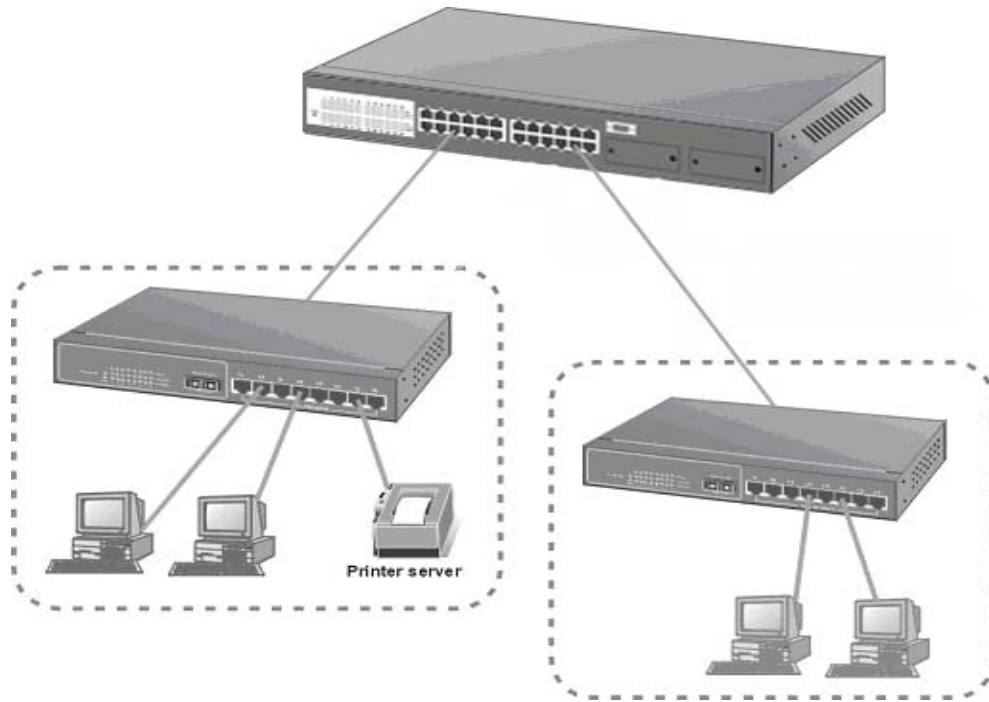


Figure 5-2: Departmental Bridge Application

NOTE: *Full-duplex operation only applies to point-to-point access (for example, when attaching the Switch to a workstation, server, or another Switch). When connecting to hubs, use a standard cascaded connection set for half-duplex operation.*

High Performance Switched Workgroup

This Switch is also a good solution for connecting two workgroups, supporting the throughput, for example, of 800Mbps. This application is useful for power groups that need high bandwidth.

The most common LAN implementations use a combination of standard switches, bridges and routers. The bridges and routers quickly become bottlenecks, reducing overall network throughput. Switching to higher-speed LANs such as FDDI or ATM is not a good choice for most people.

However, such broadband equipment is still extremely expensive and hard to maintain. Besides, you have to replace all existing Ethernet cable and adapter cards, restructure your network, and

implement more expensive administration procedures.

The Switch can provide the same bandwidth of FDDI and ATM at much lower costs. In addition, all current adapters and network devices can still be used. The Switching cross-domain connection is better than bridge and router because users can retain LAN structure in which any node can freely communicate with any other node.

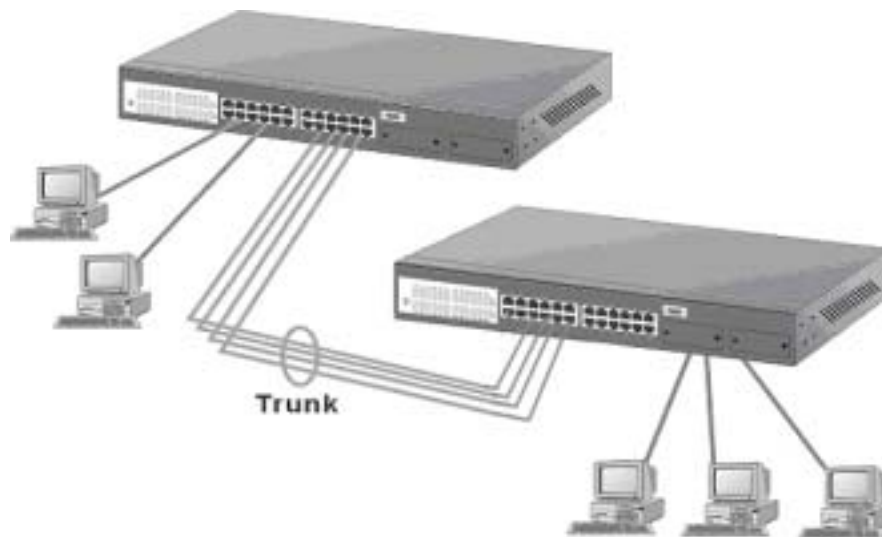


Figure 5-3: High Performance Switched Workgroup Application

IEEE 802.1Q VLAN Application

The Switch supports up to 128 Group, IEEE 802.1Q-compatible virtual LAN (VLANs).

Port-based VLAN Workgroup

You can group the Switch ports into broadcast domains by assigning them to the same VLAN to increase network capacity and performance. With network segmentation, each Switch port connects to a segment that is a single broadcast domain. Packets received in one VLAN can only be forwarded within that VLAN.

VLAN allows the grouping of end stations logically, based not on physical location but on business policies such as job function or department. Members of a group can be dispersed throughout a facility - they do not have to be connected in close physical locations.

Hence, group members can coordinate their data communication requirements regardless of the actual working locations; and the logical network can extend to any point you want it to. Moreover,

VLAN groups can be modified at any time to add, move or change users without any re-cabling.

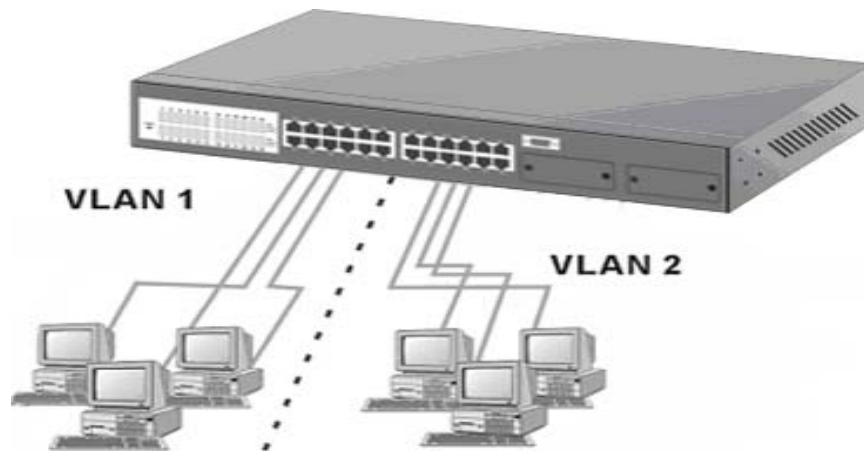


Figure 5-4: VLAN Workgroup Application
Shared Server

The Switch compliant to the IEEE802.1Q tagging VLAN standard allows ports to exist in multiple VLANs for shared resources, such as servers, printers, and Switch-to-Switch connections. It is also possible to have resources exist in multiple VLANs on one Switch as shown in the following figure.

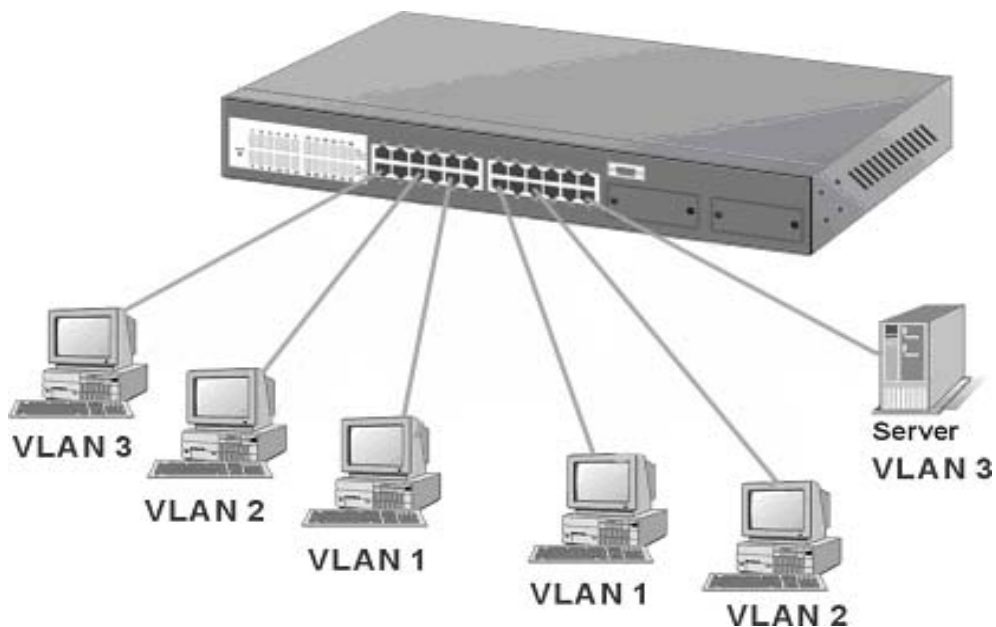


Figure 5-5: Shared Server

In this example, stations on different VLANs share resources. As a result, VLAN 1 and VLAN 2 can access VLAN 3 for printing. The broadcasts from ports configured in VLAN3 can be seen by all

VLAN port members of VLAN3.

6. Product Specifications

This section provides the specifications of LevelOne GSW-2490TXM SNMP Switch, and the following table lists them.

Standards Compliance	IEEE802.3 10BASE-T IEEE802.3u 100BASE-TX and 100BASE-FX IEEE802.3ab 1000BASE-T IEEE802.3z 1000BASE-SX IEEE802.3x Flow Control IEEE802.1p Priority Support IEEE802.3ac Frame Extension for VLAN Tagging IEEE802.1D spanning tree IEEE802.1Q VLAN tagging
Protocol	CSMA/CD
Media connector	100M FX, SC, MTRJ, VF45 Basic unit: 24 RJ-45 for STP or UTP, Auto MDI/MDI-X Support Gigabit SX/LX Module: 1 Duplex SC Gigabit 1000T Module: 1 RJ-45 for UTP or STP, Auto MDI/MDI-X Support GBIC: Mini GBIC LC type, Standard GBIC SC type
Transfer Rate	14880 Packets per second for 10Mbps 148800 packets per second for 100Mbps 1488000 packets per second for 1000Mbps
Backplane Bandwidth	9.6Gb
Switch Technology	Store-and-Forward Error Free Packet Forwarding Scheme Supports Hardware Level Broadcast Storm Prevention without Consuming System CPU Utilization

MAC Address	8K MAC address with auto learning function
Data Buffer	6Mb share memory
LED	System Power, per port Link/active, FDX/Col, 10/100Mbps Gigabit Module Link/active, FDX/Col
Dimension	440mm(W)*225mm(D)*44.5mm(H)
Power	100~240 VAC 50/60HZ
EMI & Safety	FCC Class A, CE, UL

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