

## Chapter 3 Web-Based Management

Web-Based Management allows Switch configuration changes to be made using an Internet Web browser. This interface also allows for system monitoring of the Switch.

### 3.1 Configuration

The management function of this interface runs as an unsigned Java applet. As a result, your browser's security setting should be set as following:

- For Netscape 4 or later:
  1. Click on Edit
  2. Pick up Preferences item
  3. Select the Advanced category
  4. Make sure Enable Java is checked
  5. Make sure Enable JavaScript is checked
  6. Press OK
- For Internet Explorer 4:
  1. Click on View
  2. Pick up Internet Options
  3. Select the Security tab
  4. Set Zone to Local Intranet
  5. Click Add Sites, click Advanced and add the IP address of the switch to the zone
  6. Set the security level to Custom
  7. Press the Setting... button
  8. Scroll down and set Java permissions to Custom
  9. Press the Java Custom Settings button
  10. Select the Edit Permissions tab
  11. Set Run Unsigned Content to Enable
  12. Press OK for all open dialog windows
- For Internet Explorer 5:
  1. Click on Tools
  2. Pick Internet Options
  3. Select the Security tab
  4. Select Local Intranet (click on the icon)
  5. Click on Sites, click Advanced and add the IP address of the switch to the zone
  6. Click on Custom Level
  7. Scroll down and set Java Permissions to Custom
  8. Press the Java Custom Settings button
  9. Select the Edit Permissions tab

10. Set Run Unsigned Content to Enable

11. Press OK for all open dialog windows

### 3.1.1 Features

There are features and characteristics of the web interface whose functionality and meanings are consistent throughout and worth mentioning.

- Easy to change folders for intuitive navigation
- Informational messages will print out at the bottom of the screens
- Error messages will be printed in red

#### **Buttons featured are:**

<b>Refresh</b>	Pulls that screen's data from current values on the system
<b>Submit</b>	Submits change request to system and refreshes screen data
<b>Add</b>	Adds new entries to table information and refreshes screen data
<b>Remove</b>	Removes selected entries from table and refreshes screen data

### 3.1.2 Web Pages

The arrangement of the Switch homepage consists of traditional web site hyperlinks for associated information and Java windows for system management.

Upon connecting to the switch via a web browser (i.e. Netscape Navigator 4.0), Key in the IP address of the switch or the alias name. The login screen will appear prompting for an administrator user name and password. Enter the password to access the switch's management mode. (or simply hit Enter if password protection is disabled). If a password box does not appear in the window, it means that the web browser's security setting is not correct for the JAVA applet. Section 3.1 outlines the correct browser settings.



*Figure 3-1 : Password Screen*

The default user name and password is "root" and "switch", After the password is entered you will see the main menu screen.

*Note: If password protection is enabled (using the console) without setting your own password, the default password is “switch”.*

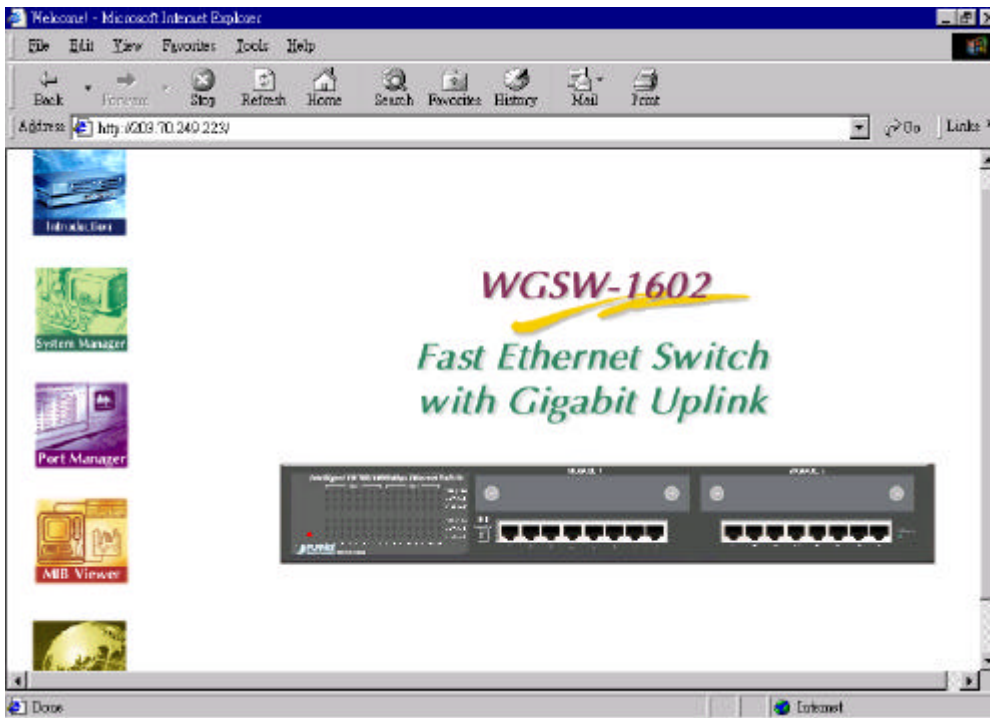


Figure 3-2 : Main Menu

There are four system icons that are available:

- Introduction
- System Manager
- Port Manager
- MIB Viewer
- Home Page

### 3.2 Real time LED Monitor

The LED Monitor (shows on the right part of the screen), in near real-time, the activity and status of the unit and all ports. The display includes all the possible module configurations for the switch. Modules that are installed are shown in solid color. Modules that are not installed are displayed in faded gray. Click on the related port will bring up the “Port Configuration” of that clicked port.



Figure 3-3: LED Monitor screen with gigabit module in slot 1 and 8-port module in slot 2

### 3.3 System Manager

The system manager contains all system operations and general information. It is organized with several sub-folders:

*System Manager*

General	IP	SNMP	Bridge	VLAN
• General	• IP	• SNMP	• Bridge	• VLAN
General system information and administration	IP parameters	Community table and host table management	Spanning tree and transparent bridging operations	VLAN configuration
Port Mirroring configuration	View Ethernet statistics, logs, and messages			

#### 3.3.1 General

Under the General folder, there are several sub-folders:

- System Information
- Software Download
- Password Administration
- System Administration

##### 3.3.1.1 System Information

The System Information screen gives you helpful information about your system. The Media Access Control (MAC) address and the System Description are not configurable.

There are three fields that are site specific and can be modified by the system administrator:

- The local system name
- System administrator's name and contact information
- Physical location of the system

Notice that there are two buttons, Submit and Refresh, in the lower part of the window. The Refresh button

is used for reloading values while the Submit button is for saving values to the Switch.

The screenshot shows a web browser window titled "System Manager". The main heading is "System Manager" in a green, stylized font. Below the heading is a navigation bar with tabs: "General", "IP", "SNMP", "Bridge", and "VLAN". The "General" tab is selected. Under the "General" tab, there are four sub-tabs: "System Information", "Software Download", "Password Administration", and "System Administration". The "System Information" sub-tab is selected. The main content area displays the following information:

- System Description:** PLANET WGSW-1602
- System Name:** Not Defined
- System Contact:** Not Defined
- System Location:** Not Defined
- MAC Address:** 00:40:33:AC:59:53

At the bottom of the form, there are two buttons: "Refresh" on the left and "Submit" on the right.

Figure 3-4: General: System Information

### 3.3.1.2 Software Download

In the Software Download screen, the system can be configured to download and boot from a new image off the network. (Please refer to Chapter 5 when updating software)

- Click the arrow in the box at "Boot from" and click the Net option.

There are three options for Boot from:

- Last Saved: Remain the same, boot from the last time firmware updated.
  - Net: Boot from net and keep the current firmware.
  - Net & Save: Boot from net and save to the firmware. This option will update the firmware, then set the option back to "Last Saved" after device re-start.
- Supply the IP address of the TFTP server and the full path and the filename of the image to be loaded from that server.
  - Click the Submit button.
  - Reset the switch by clicking on the System Administrator tab and clicking on Reset Switch. The image will load-up automatically after the switch reset.

The screenshot shows the 'System Manager' window with the 'General' tab selected. Under the 'Software Download' sub-tab, the following information is displayed:

- Hardware Version: 00010
- Boot ROM Version: Ver 2.1
- Software Version: Release 2.1.0
- Boot From: Last Saved (dropdown menu)
- TFTP Server IP Address: 172.16.50.70 (text field)
- TFTP Path/Filename: Romload03ch3.gz (text field)

Buttons for 'Refresh' and 'Submit' are located at the bottom of the form.

Figure 3-5: General: Software Download

### 3.3.1.3 Password Administration

The password entered is encrypted on the screen and will display as a sequence of asterisks (\*).

- Type the new administrator password in the New password field
- Type the same password in the Verify field
- Click Submit to activate the new password

*Note: Password protection is optional and can only be enabled through the console interface. If the password protection is enabled without setting your own password, the default password is “switch”.*

The screenshot shows the 'System Manager' window with the 'General' tab selected. Under the 'Password Administration' sub-tab, the following fields are visible:

- New Password: (text field)
- Verify: (text field)

A 'Submit' button is located at the bottom right of the form.

Figure 3-6: General: Password Administration

### 3.3.1.4 System Administration

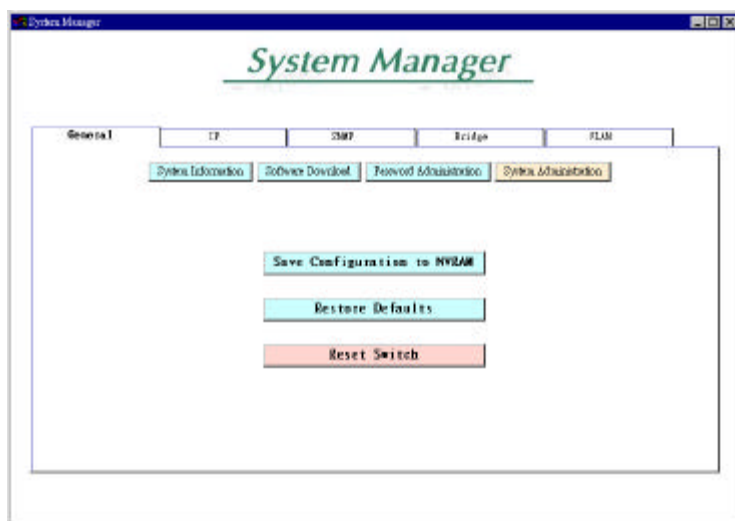


Figure 3-7: General: System Administration

After making any changes to the screens within the Web Interface, users must save the changed settings to NVRAM. This is done in the system administration screen in order for the new settings to remain after a system reboot.

#### Save Configuration to NVRAM

- Click on Save Configuration to NVRAM at this screen and a second screen will ask for verification of this action, to accept choose OK, otherwise click cancel.

#### Restore Defaults

- Click on Restore Defaults to reset switch parameters to their original default settings. In order for changes to occur, you must Reset the switch. Note: network IP settings (i.e. IP address, Gateway Address, Network Mask) will not be affected by this command.

#### Reset Switch

- Click on the Reset Switch button and a second screen will ask for verification of this action, to accept choose OK, otherwise click cancel.

### 3.3.2 IP

There are three tunable parameters to be set by the system administrator.

- Enter site-specific IP address, Gateway address and Net mask
- Click Submit to accept
- Save Configuration to NVRAM and reset the system to implement the changes (refer to General folder's System Administration)

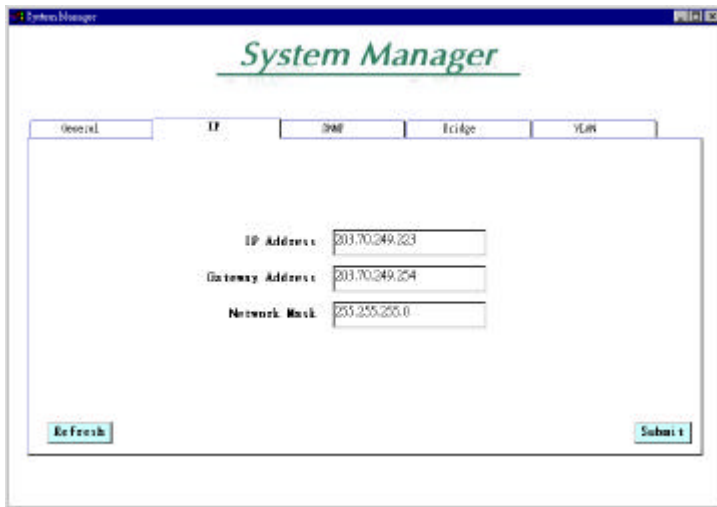


Figure 3-8: IP screen

### 3.3.3 SNMP

The SNMP folder contains the following sub-folders:

- SNMP Trap Configurations
- SNMP Host Table
- SNMP Community Table

#### 3.3.3.1 SNMP Trap Configuration

The SNMP Trap Configuration allows for the setup of authentication traps.

##### Authentication traps

- **Enable** The system will generate a SNMP trap upon a host authorization failure
- **Disable** The authentication traps will not be generated

All hosts in community strings with TRAP privileges will be notified when a trap condition occurs.



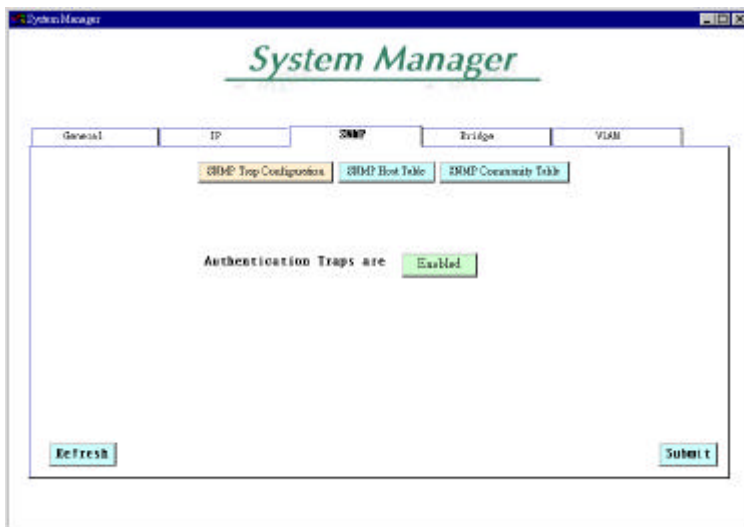


Figure 3-9: SNMP: SNMP Trap Configuration

### 3.3.3.2 SNMP Host Table

The SNMP Host Table screen allows you to add and remove hosts from access rights that have been granted to community groups. The permissions GET, SET and TRAP are assigned to a community string (see next section SNMP Community Tables) and then these permissions are assigned to individual machines by adding those machines and their IP address to the appropriate community string. Host Authorization can be Enabled or Disabled.

#### Host Authorization

- Enable
- Disable

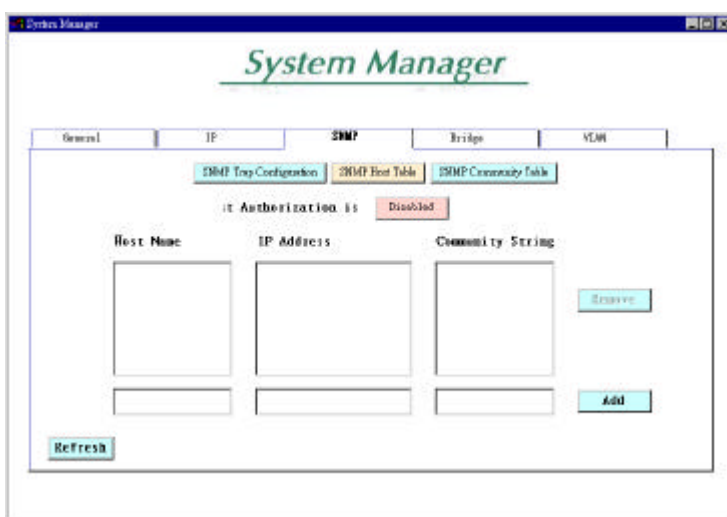


Figure 3-10: SNMP: SNMP Host Table

*Note: When the scroll bars start to appear due to a large number of entries, it may become necessary to click*

on an entry when viewing to ensure proper alignment of sub windows.

### 3.3.3.3 SNMP Community Table

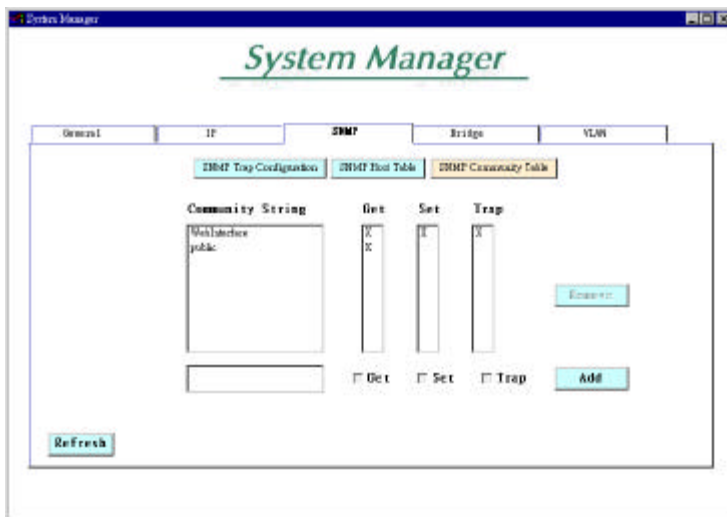


Figure 3-11: SNMP: SNMP Community Table

In the Community Table the administrator can create different community strings with customized access, by choosing combinations of GET, SET and TRAP rights. These community strings need to be set prior to setting host access, as the host table depends on the existence of the community strings.

*Note: When the scroll bars start to appear due to a large number of entries, it may become necessary to click on an entry when viewing to ensure proper alignment of sub windows.*

### 3.3.4 Bridge

The Bridge folder of the System Manager has three sub-folders:

- Spanning Tree Configuration
- Static Bridge Table
- Bridge Aging

#### 3.3.4.1 Spanning Tree Configuration

Spanning Tree can be enabled or disabled in this folder.

**Enable:** There are four other tunable parameters to be addressed.

- **Hello Time** Interval between configuration messages sent by the spanning tree algorithm
- **Max Age** Amount of time before a configuration message is discarded by the system
- **Forward Delay** Amount of time system spends in “learning” and “listening” states
- **Bridge Priority** Priority setting among other switches in the spanning tree

**Disable:** Disable spanning tree algorithm on the system.

System Manager

**System Manager**

Device IP SNMP Bridge VLAN

Spanning Tree Configuration Static Bridge Table Bridge Aging

Spanning Tree is **Enabled**

Hello Time:  (1 - 10 seconds)

Max Age:  (6 - 40 seconds)

Forward Delay:  (4 - 30 seconds)

Bridge Priority:  (0 - 65535)

Figure 3-12: Bridge: Spanning Tree Configuration

- After entering the appropriate values you need and press Submit to set them on the system
- A notification screen will show up, click on OK to enable the new changes

### 3.3.4.2 Static Bridge Table

Any system, whose MAC address and the port number are listed in this screen, will not be purged from the system's forwarding table by the aging process.

#### Add a new entry

- Enter the MAC address and port in the appropriate boxes
- Click Add

#### Remove an exist entry

- Highlight that entry in the table, by clicking on the MAC address
- Choose Remove

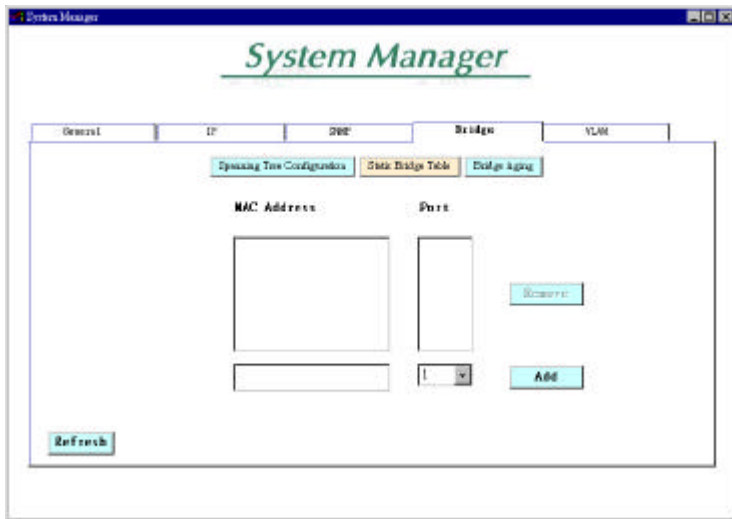


Figure 3-13: Bridge: Static Bridge Table

*Note: When the scroll bars start to appear due to a large number of entries, it may become necessary to click on an entry when viewing to ensure proper alignment of sub windows.*

### 3.3.4.3 Bridge Aging

Aging Time is a variable that must be configured. Its purpose is to determine the amount of time an entry is held in the forwarding tables.

The default value is set to 300 seconds, (or 5 minutes).

- The administrator may change this value to any value between 10 and 824 seconds.
- After changing the value, click Submit

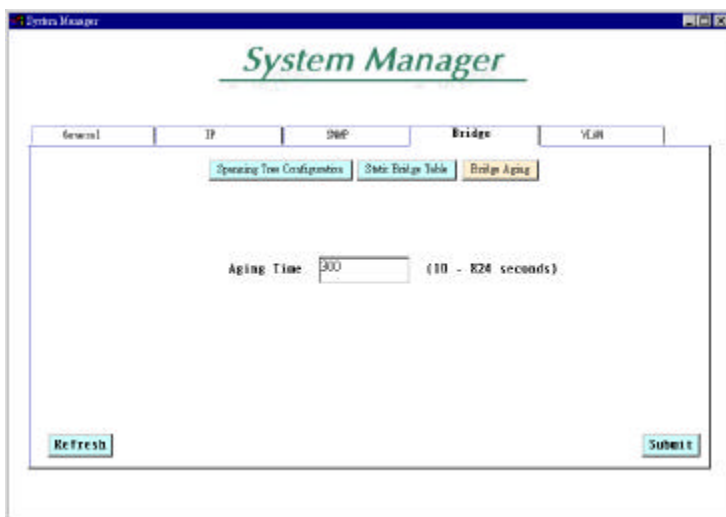


Figure 3-14: Bridge: Bridge Aging

### 3.3.5 802.1Q VLAN

The VLAN option within the System Manager allows users to define VLAN groups. The VLAN Administration button will allow you to create a new VLAN. The VLAN tagging option is a standard set by the IEEE to

facilitate the spanning of VLANs across multiple switches (Reference: Appendix A and IEEE Std 802.1Q-1998 Virtual Bridged Local Area Networks).

### 3.3.5.1 VLAN Administration

#### Add VLAN Group

- Enter the VLAN Id and name in the appropriate boxes
- Click Add

#### Remove VLAN Group

- Highlight the group you want to remove
- Click on the Remove button

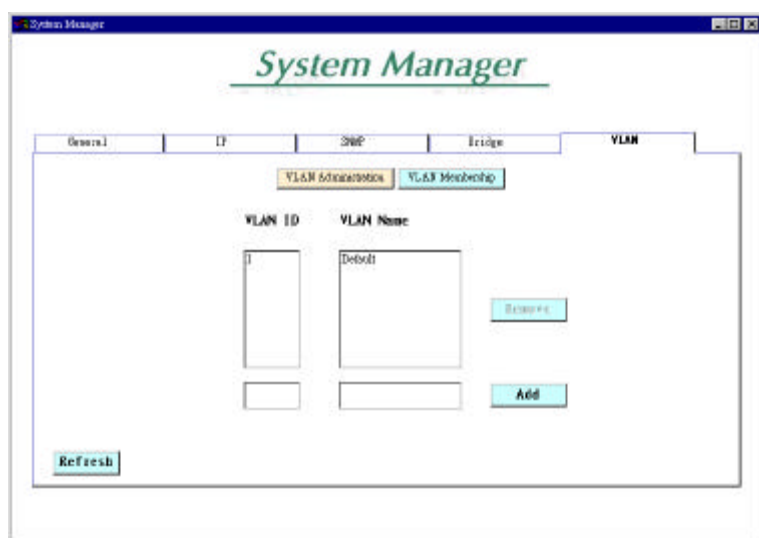


Figure 3-15: VLAN

*Note: When the scroll bars start to appear due to a large number of entries, it may become necessary to click on an entry when viewing to ensure proper alignment of sub windows.*

### 3.3.5.2 VLAN Membership

Choose the VLAN Membership Option, and a window displaying all VLANs and ports will be called.

#### Add VLAN Membership

- Click the box below the port number on the line of the VLAN so that a "T" (tagged) or "U" (untagged) appears.

## Remove VLAN Membership

- Click the box again until a blank box appears. This will remove VLAN membership from the port.

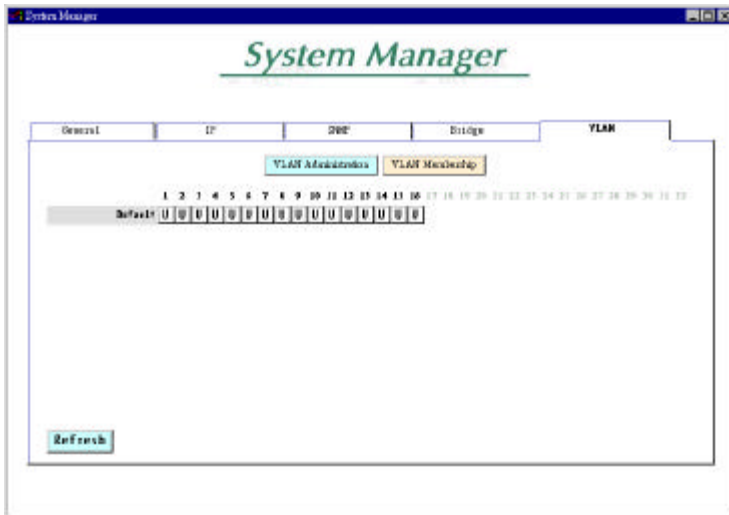


Figure 3-16: VLAN: VLAN Membership

*Note: Ports can belong to different VLAN, however, there is only one un-tagged VLAN for each port, you may need to determine the default un-tagged VLAN for the port.*

## 3.3.6 Mirroring

Port mirroring is a feature to help in the debugging of a network. This web interface page allows enabling or disabling of port mirroring and the setting of source and monitor ports (when enabled). The Monitor port will show a copy of every packet that arrives or leaves the source port.

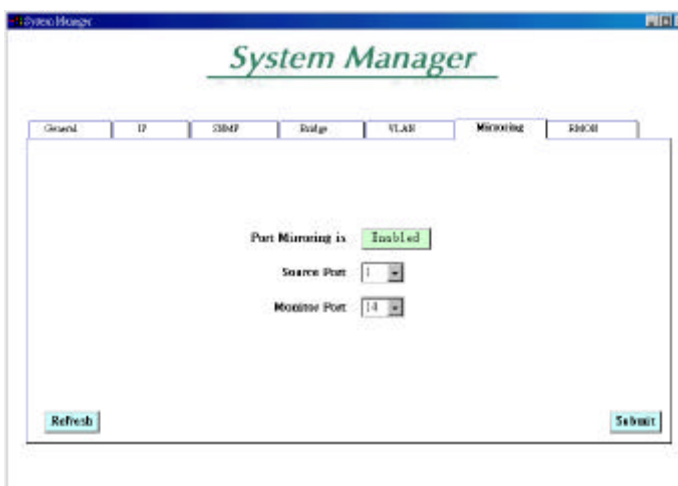


Figure 3-17: Mirroring

## 3.3.7 RMON

The remote monitoring (RMON) section of the System Manager is for configuring the monitoring parameters:

- Ethernet Statistics
- Ethernet History
- Alarm
- Event
- Log

### 3.3.7.1 Ethernet Statistics

Due to the fact that the RMON section of the System Manager is for configuration purposes only. This feature by default is always enabled.

### 3.3.7.2 Ethernet History

The Ethernet History tab sets the number of intervals between samples taken for a port. By default, there are no entries in the table. To add a new setting, choose a port, enter in the appropriate settings. Then, click Add to submit the request to the system. If the system could not handle the number of requested samples, then it will allow as many as possible and list the active number of samples in the Granted column. Any setup requests from this particular page will show the owner as 'WebInterface'.

Source	Samples Requested	Samples Granted	Sample Interval	Owner
Port 1	20	20	20	WebInterface
Port 2	20	20	20	WebInterface

Port 1

Figure 3-18: RMON: Ethernet History

*Note: When the scroll bars start to appear due to a large number of entries, it may become necessary to click on an entry when viewing to ensure proper alignment of sub windows.*

### 3.3.7.3 Alarm

The Alarm folder under RMON is where conditions are set for an alarm that will trigger a pre-determined event (see next section on setting an event).

- Enter the interval (in seconds)
- Choose the type of statistic to check and port to monitor
- Choose a sample type and startup alarm
- Enter the threshold and event if needed

- Click Add

There are two sample types from which to choose: Delta and Absolute.

#### A Delta sample type

- Denotes a change in the statistic. The numeric value given for either the rising or falling threshold represents the difference between successive samples that trigger the event.

The Absolute type

- Defines the statistic actual value, so when a sample equals the rising or falling threshold, it will trigger an event.

In the example page below, the alarm can be explained as follows:

- Sample the Inbound Unicast Packets on Port 1 every 2 seconds
- If the value of the sample is greater than zero then trigger event ID 2

If the startup alarm type, Rising or Falling is chosen, then both thresholds and rising and falling event IDs need to be entered. Where if Rising or Falling are chosen independently then only the corresponding threshold and event id need to be entered. At anytime, an alarm may be removed, simply highlight that alarm by clicking any one of the fields. Then click Remove.

Interval	Statistic	Port	Sample Type	Startup Alarm	Rising Threshold	Falling Threshold	Rising Event ID	Falling Event ID	Owner
30	Inbound Octets	1	Absolute	Rising	0	0	2	0	ethernet0

Interval: 1 Statistic: Inbound Octets Port: 1 Sample Type: Absolute Startup Alarm: Rising Rising Threshold: 0 Falling Threshold: 0 Rising Event ID: 2 Falling Event ID: 0 Owner: ethernet0

Buttons: Refresh, Add, Remove

Figure 3-19: RMON: Alarm

*Note: When the scroll bars start to appear due to a large number of entries, it may become necessary to click on an entry when viewing to ensure proper alignment of sub windows.*

#### 3.3.7.4 Event

The event tells the system what to do when the conditions of the alarm are met. The event screen is quite clear.



### Add an Event

- Enter a description of the event to be defined.
- Choose the type of action to be performed.
- A community string is also required, whether or not a Trap condition is set. If an invalid community string is entered, a message will appear at the bottom of the screen informing the user. (Refer to the SNMP Community Table section )
- After entering all appropriate data, click Add.

### Remove an Event

- Click any field entry of that event and choose Remove.

There are four event actions that may be set; None, Log, SNMP Trap, and Log and Trap.

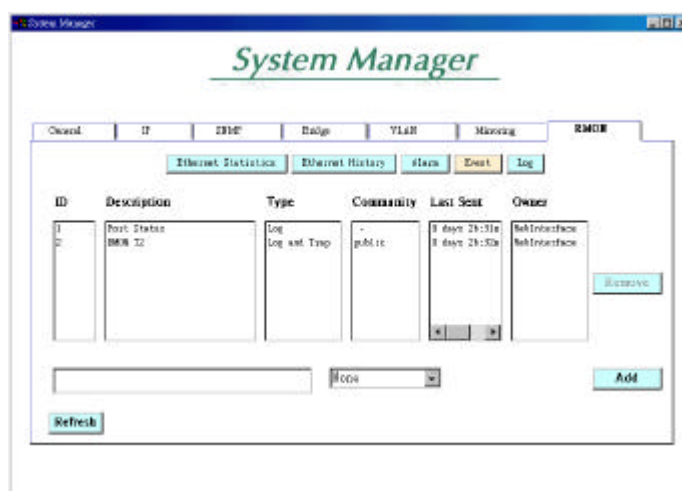


Figure 3-20: RMON: Event

*Note: When the scroll bars start to appear due to a large number of entries, it may become necessary to click on an entry when viewing to ensure proper alignment of sub windows.*

### **3.3.7.5 Log**

If an event type defines logging as an action for an alarm, then the event will be entered in the table here. When an event is removed from the event table, all log entries corresponding to that event will be removed from this log table. This will only be evident with a Refresh of the logging output.

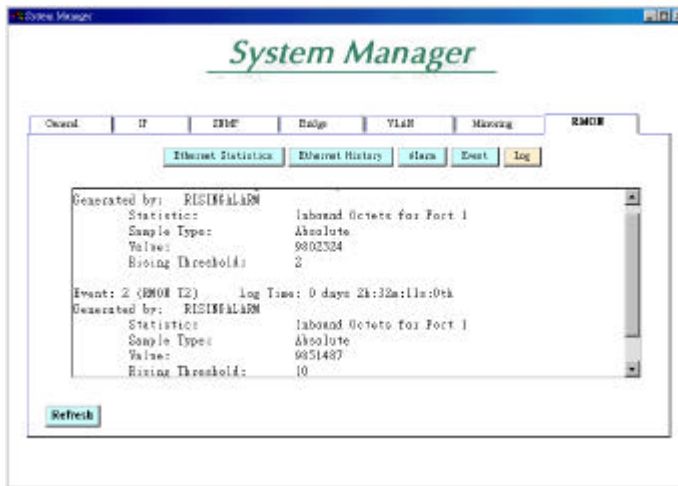


Figure 3-21: RMON: Log

### 3.4 Port Manager

Users can use the Port Manager folder to change the port related parameters and settings. In addition to the per port configuration, users can also program more than one port as a group to have the same configuration using the Group sub-folder. Under each sub-folder, these options are provided:

## Port Manager

All Ports	Group Configuration	Ports 1 - 16	Module 1	Module 2
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- All Ports
- Group Setup
- Port Configuration
- Spanning Tree Configuration
- VLAN Membership

#### 3.4.1 All Ports

An overview of the port settings - The Administrator has the ability to change Admin Status, Data Rate, Duplex, Source Security, and Flow Control through this menu. It also describes the port state, current Data Rate and current Duplex.

#### 3.4.2 Group Setup

The benefit of Group Setup is the ability to setup link configurations, spanning tree configurations, and VLAN memberships for a group of ports at the same time. There are buttons for All Ports and No Ports, simply click to add all ports to the group or to clear up the ports that are associated with the group.

### Add individual ports to the group

- Click the arrow of the port box and choose a port by highlighting it
- Click Add to add that port to the group

### Remove a port from group

- Highlight the port from the group listing and choose Remove

These options exist in the Group sub-folder of the Port Manager.

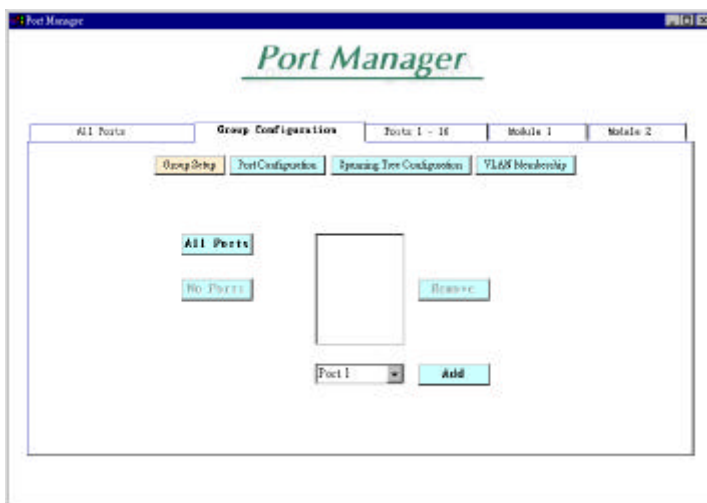


Figure 3-22: Group: Group Setup

### 3.4.3 Port Configuration

The Port Configuration screen is available in both the Group Setup and individual port pages. These pages allow for the manipulation of port link settings. There are three buttons that toggle between enabled and disabled states when chosen. These buttons are for:

- **Admin status:** Sets the port at Enable or Disable
- **Source security:** Turns security to the port on or off
- **Flow Control:** Used to stop the sender from sending data until the receiver can accept it

### The link parameter settings

- **Duplex:** Sets the duplex rate as Full, Half, or Auto. Default setting is Auto
- **Data Rate:** Sets the data rate for each port by choosing Auto, 10, or 100 Megabit per second

When finished setting up the ports, choose Submit to activate the changes.

Note:

- 1) The one notable difference in the Group Port Configuration screen and the Group Port Configuration

screen is the operational status.

2) On the ports 1-16 configuration screen it will state whether or not that port is Up or Down. The Up will be displayed in green while the Down is displayed in red. This informs the administrator whether or not the port is attached and active.

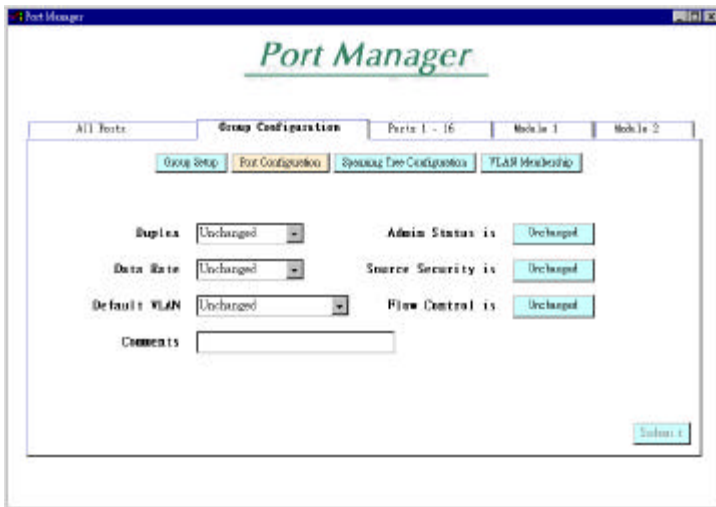


Figure 3-23: Group: Port Configuration

### 3.4.4 Spanning Tree Configuration

The spanning tree priority is a numeric value assigned to a port or group that determines the level of importance that this particular port or group holds in the bridge group. The lower the number the higher the importance. Similarly, the spanning tree cost is a variable that helps the system to determine which port to use in a group.

Note: The port or group with the lower cost will be chosen first by the system.

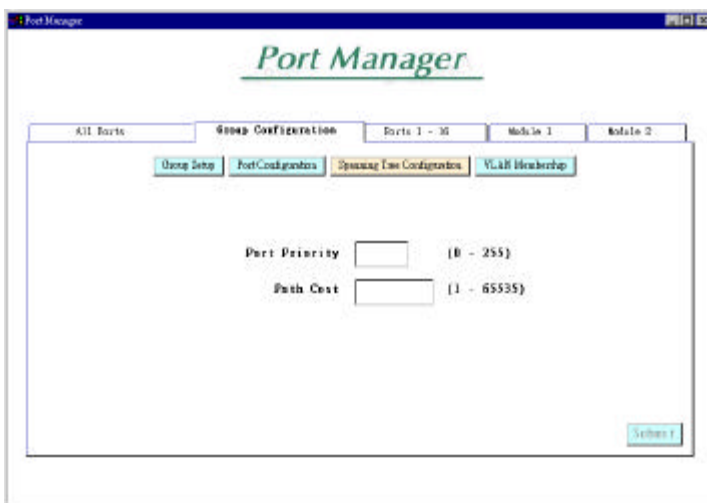


Figure 3-24: Group: Spanning Tree Configuration

### 3.4.5 VLAN Membership

Any VLAN that has been created from the System Manager will be displayed on the screen. Up to 16 VLANs with unique ID numbers and names can be added. VLAN ID numbers must be in the range of 1-4094.

#### Add a port or group to the VLAN

- Click on the box to configure VLAN membership. Settings can be changed from Untagged or Tagged.

#### Remove a port or group from the VLAN

- Click the box until it is blank and the VLAN membership for that port will be removed. To reflect the current system settings, click the Refresh button in the lower left.



Figure 3-25 : Group VLAN Membership

### 3.5 MIB Viewer

The Management Information Base (or MIB) Viewer section of the Web Interface, allows the administrator to chart system data in different manners. There are three folders to this section:

## MIB Viewer



- Comparison Chart
- Group Chart
- History Graph

### 3.5.1 Comparison Chart

For the Comparison Chart section, there are three parameters to set: Statistic, Refresh Rate, and Color. All charts have a maximum ceiling of  $2^{31}-1$ . You can see the value of each bar or line in the chart by clicking on the bar.

- **Statistic** The type of system data to be monitored
- **Refresh Rate** The time interval between automatic refreshes
- **Color** The color setting for the chart

When all of the variables are set, click Chart.

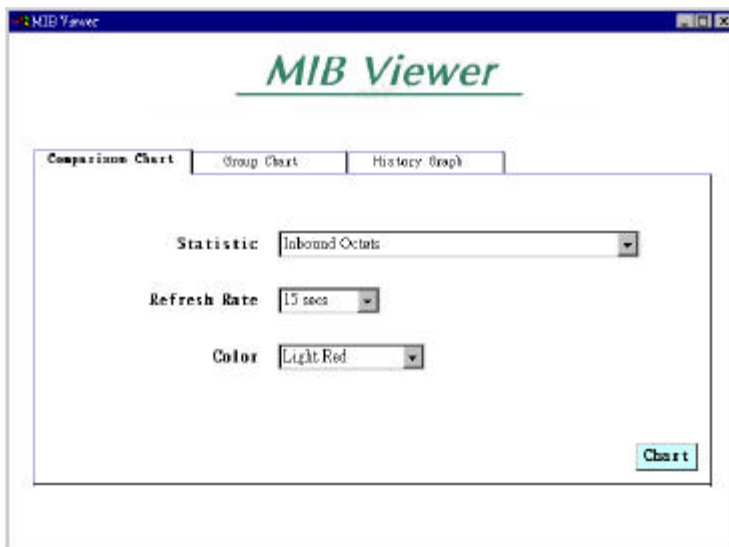


Figure 3-26: Comparison Chart

The chart screen has a couple of options as well.

#### Reset

- To locally reset the data and start collecting new data.

Three options of the scale:

- **Auto scale** Automatically choose an appropriate scale for data
- **Manual scale** Requires user to enter the lower and upper values
- **Full scale** Puts the maximum and minimum boundary value as the scale

### 3.5.2 Group Chart

View error statistics of a specific port:

- Click the arrow in the Group box and select a port to chart

- Select a Refresh Rate and a Color
- Click Chart to move to the graphical screen

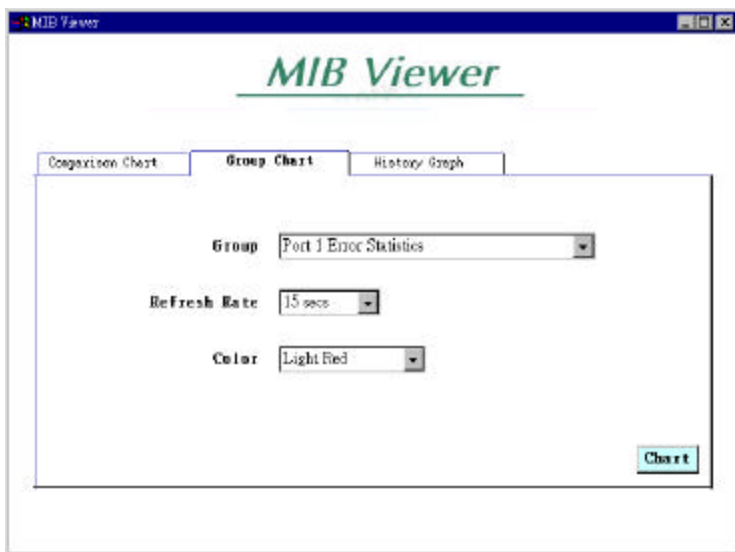


Figure 3-27: Group Chart

There are twelve data transmit error types on this screen to choose from.

#### Scale setting

- As in the Comparison Chart, the scale can be set to Manual, Full, or Auto.

#### Get the exact value of the statistic

- Click the mouse button on any of the bars in the chart and a box with the exact value will appear.

#### Reset

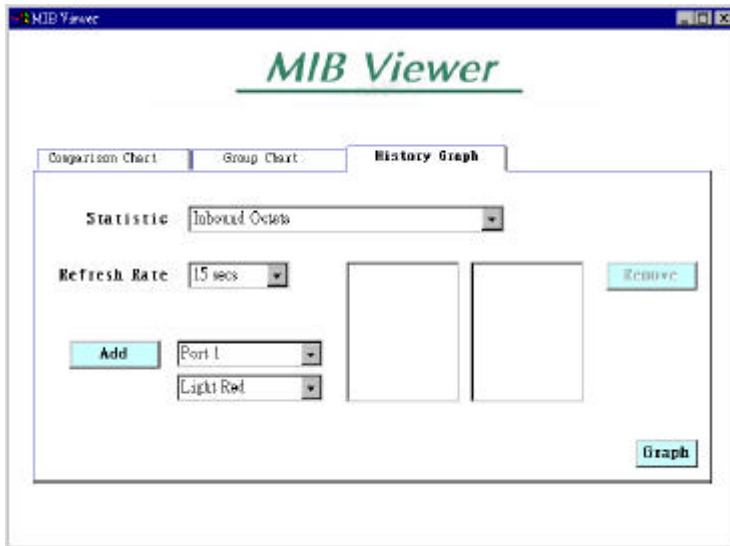
- Click Reset to clear the chart and start plotting from new data, which is computed relative to when the reset button was pressed. This does not reset the statistics' values on the switch, just the local values.

### 3.5.3 History Graph

The history graph allows up to twelve colors to be chosen in order to plot any statistic for up to 10 ports.

#### Set up the information to graph

- Choose a statistic in the statistics box and highlighting an option
- Decide on a refresh rate from the times provided
- Select the ports to be viewed by choosing a port and color to represent
- Click Add
- Click the Graph button to proceed



*Figure 3-28: History Graph*

The graph page has all of the same options as the other chart screens. The scale can be set to Auto, Manual, or Full. The refresh button will remove old data from the screen and start a new graph. Clicking on the black data points will show the exact value of that point.