



User Manual

GSS-16T2SFP 16 Port Gigabit Web Managed Switch

16x 10/100/1000Mbps ports + 2 paired SFP Ports

GSS-24T2SFPV2 24 Port Gigabit Web Managed Switch

24x 10/100/1000Mbps ports + 2 paired SFP Ports

June 24th, 2005

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Caution

Electronic Circuit devices are sensitive to static electricity. Dry weather conditions or walking across a carpeted floor may cause you to acquire a static electrical charge.

To protect your switch, always:

- Touch the metal chassis of your computer to ground the static electrical charge before you handle the switch.
- Pick up the switch by holding it on the left and right edges only.

Electronic Emission Notices

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

European Community (CE) Electromagnetic Compatibility Directive

This equipment has been tested and found to comply with the protection requirements of European Emission Standard EN55022/EN60555-2 and the Generic European Immunity Standard EN50082-1.

EMC:	EN55022(1988)/CISPR-22(1985)	class A
	EN60555-2(1995)	class A
	EN60555-3	
	IEC1000-4-2(1995)	4K V CD, 8KV, AD
	IEC1000-4-3(1995)	3V/m
	IEC1000-4-4(1995)	1KV – (power line), 0.5KV – (signal line)

Australian C-Tick Compliance.

This equipment is compliant with the required Australian C-Tick standards

About this User Manual

This User Manual will guide you on procedures to install, configure and monitor Alloy 16 port Gigabit (GSS-16T2SFP) and 24 port (GSS-16T2SFP) Gigabit web Managed Switch models utilizing the built-in web management interface.

The two models GSS-16T2SFP and GSS-24T2SFPV2 differ in terms of port density – the former model offering 16x 10/100/100Mbps Gigabit Ethernet ports, and the latter 24x ports of the same specification. In all other respects (web management interface, for example) the two models share identical characteristics.

For the purposes of this User Manual the illustrations included are of the GSS-16T2SFP model. If the model you have purchased is the GSS-24T2SFPV2, please bear in mind that your switch has 24x 10/100/1000Mbps ports.

Overview of the User Manual

- Chapter 1 “Introduction” describes the features of GSS-16T2SFP and GSS-24T2SFPV2 Gigabit Web Managed switches
- Chapter 2 “Installation”
- Chapter 3 “Operation of the Web-based Management”
- Chapter 4 “Maintenance”

Terms Used

16/24 Port Gigabit Switches: This term is used when discussing information that relates to both GSS-16T2SFP 16 port and GSS-24T2SFPV2 24 port Gigabit Web Managed Switch models

16 Port Gigabit Switch: This term is used when discussing information that relates solely to the GSS-16T2SFP 16 port Gigabit Web Managed Switch model

24 Port Gigabit Switch: This term is used when discussing information that relates solely to the GSS-24T2SFPV2 24 port Gigabit Web Managed Switch model

1. Introduction

1.1. Overview of 16/24 Port Gigabit Web Managed Switches

Alloy 16/24 Port Gigabit Switches meet all IEEE 802.3/u/x/z standards Gigabit and Fast Ethernet specifications. The 16 Port Gigabit Switch model features 16x 10/100/1000Mbps copper RJ-45 ports and 2x Gigabit Ethernet SFP Ports. The SFP ports can be used to install a range of optional mini-GBIC Gigabit Ethernet Port Modules (which provide the ability to connect multimode and/or singlemode fibre optic cable links – see below); the SFP ports are each paired with one of the 10/100/1000Mbps copper RJ-45 ports. The 24 Port Gigabit Switch is identical other than featuring 24x 10/100/1000Mbps copper RJ-45 ports. Both switches are managed through any of their Ethernet RJ-45 ports, using a web-based browser such as Internet Explorer.

The SFP ports can support the following optional mini-GBIC modules for fibre optic cable connections (either singlemode or multimode terminated in LC type connectors):

- 1000Mbps multimode 1000Base-SX, 850nm, max. range 500m
- 1000Mbps singlemode 1000Base-LX, 1310nm, max. range 10Km
- 1000Mbps singlemode 1000Base-LHX, 1310nm, max. range 40Km
- 1000Mbps singlemode 1000Base-LHX, 1550nm, max. range 40Km
- 1000Mbps singlemode 1000Base-ZX, 1550nm, max. range 70Km
- 1000Mbps singlemode 1000Base-EZX, 1550nm, max. range 100Km
- 1000Mbps WDM singlemode/singlecore 1310nm, max. range 20Km
- 1000Mbps WDM singlemode/singlecore 1550nm, max. range 20Km

*Notes: * The two WDM (Wave Division Multiplexer) mini-GBIC modules are designed to facilitate a link over a single core of singlemode fibre cable. The two units must be used in a paired manner, one at either end of the link.*

** Mini-GBIC modules that are designed to the relevant standards should be compatible with any make of switch with SFP ports. If you have concerns regarding compatibility, please contact the supplier of your mini-GBIC product.*

The 10/100/1000Mbps copper ports meet all IEEE 802.3/u/x/z Gigabit and Fast Ethernet specifications.

The 1000Mbps SFP Fibre ports via optional mini-GBIC modules are compliant with all IEEE 802.3z and 1000Base-SX/LX/LHX/ZX/EZX standards.

1000Mbps single fibre WDM transceivers are designed with an optic Wavelength Division Multiplexing (WDM) technology that transports bi-directional full duplex signals over a single fibre core.

• Key Features 16/24 Port Gigabit Web Managed Switches

- QoS:** These switches offer powerful Quality of Service (QoS) functions. This feature adds support of TOS fields within the IP packet header (equal DSCP low 3 bits) on Layer 3 of the network framework and 6 types of network transmission events on Layer 4. QoS support is important for real-time applications based on information taken from Layer 2 to Layer 4, such as VoIP.
- VLAN:** Both switch models support Port-based VLAN and IEEE802.1Q Tagged VLAN, with support for 16 active VLANs having VLAN ID's from 1 to 4094. The VLAN feature in the switch offers the benefits of both security and performance. VLAN is used to isolate traffic between different users and thus provides better security. Limiting the broadcast traffic to within the same VLAN broadcast domain also enhances performance.
- Port Trunking:** Allows one or more links to be aggregated together to form a Link Aggregation Group. Up to 12 Gigabit ports can be set up per trunk, and a switch can support up to 8 trunking groups. Port trunks are useful for switch-to-switch cascading, providing very high full-duplex connection speeds.
- Port Mirroring:** Port mirroring copies traffic from a specific port to a target port. This mechanism helps track network errors or abnormal packet transmission without interrupting the flow of data.
- Event Trapping:** An SNMP Trap mechanism is used to inform network supervisors of abnormal status on a switch. This event exception management capability is available on networks that are managed via in-band SNMP management software.
- Bandwidth Control:** Both models support bandwidth allocation rating on a per port basis. Ingress and egress throughput can be limited to a pre-set level appropriate to the traffic generally handled on a specific port.

*Note: * See Appendix A "Technical Specifications" for further details*

1.2. Checklist

Before you start installing your switch, verify that the package contains the following:

- A GSS-16T2SFP or GSS-24T2SFPV2 Gigabit Web Managed Switch
- Mounting Accessories (for 19" Rack Shelf mounting)
- This Users Manual CD-ROM
- AC Power Cord

Please notify your supplier immediately if any of the aforementioned items are missing or damaged.

1.3. Features

Alloy 16/24 Port Gigabit Switches provide a comprehensive range of features:

• Hardware

- 16x 10/100/1000Mbps Nway Gigabit Ethernet copper RJ-45 ports (GSS-16T2SFP) *or*
- 24x 10/100/1000Mbps Nway Gigabit Ethernet copper RJ-45 ports (GSS-24T2SFPV2)
- 2x SFP ports for optional Mini-GBIC fibre optic modules (paired with an RJ-45 port)
- 400KB on-chip frame buffer
- Jumbo frame support
- Programmable classifier for QoS (Layer 4/Multimedia)
- 8K MAC address and 4K VLAN support (IEEE802.1Q)
- Per-port shaping, policing, and Broadcast Storm Control
- IEEE802.1Q-in-Q nested VLAN support
- Full-duplex flow control (IEEE802.3x) and half-duplex backpressure
- Extensive front-panel diagnostic LED suite

• Management

- Easy port configuration
- Port traffic monitoring and counters
- Simple system Information
- Port mirroring
- Static trunk function
- 802.1Q VLAN
- Maximum packet length up to 9216 bytes for jumbo frame applications
- Broadcast Storm Suppression to avoid network problems
- Trap event sending
- Firmware Defaults and Customised Firmware saving and restoring
- Supports hot plug/unplug SFP modules
- Quality of Service (QoS) for real time applications based on information from Layer 2 to Layer 4.
- Built-in web-based management

1.4. Overview of 16/24 Port Gigabit Switches



Fig. 1.1: Front View of the GSS-16T2SFP Switch

1.4.1. User Interfaces on the Front Panel (Button, LEDs and Plugs)

There are 16x (GSS-16T2SFP model) or 24x (GSS-24T2SFPV2 model) copper RJ-45 Gigabit Ethernet ports and 2x SFP fibre ports for optional mini-GBIC modules (both models) on the front panel of the switch. The LED display area, located on the left side of the panel, contains a Power LED (which indicates the power status of the switch) and 16/24 LEDs that indicate the status of each of the RJ-45 ports on the switch.

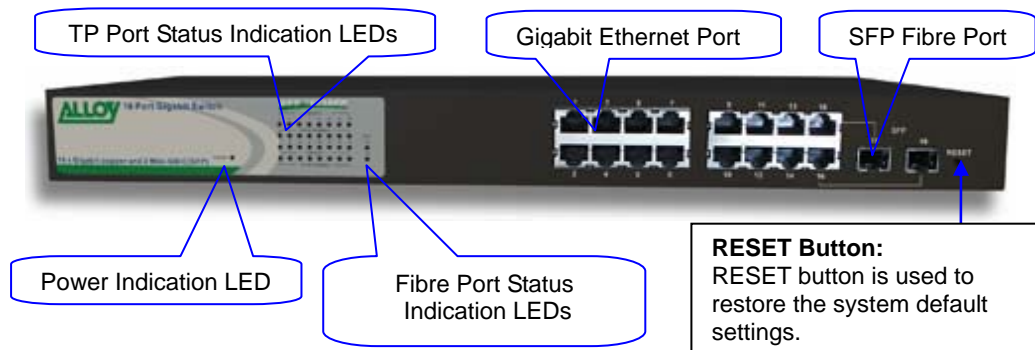


Fig. 1.2 : Front View of the GSS-16T2SFP Switch

- LED Indicators

LED	Color	Function
System LED		
POWER	Green	Lit when +5V DC power is on and good
LEDS for: 10/100/1000Ethernet coppers port 1 to 16 (GSS-16T2SFP)* or 10/100/1000Ethernet coppers port 1 to 24 (GSS-16T2SFP)*		
LINK/ACT	Green	On when connection with remote device is good Blinks when any traffic is present Off when cable connection is not good
10/100/1000Mbps	Green/ Amber	Green when 1000Mbps speed is active Amber when 100Mbps speed is active Off when 10Mbps speed is active
LEDS for: SFP Gigabit Fibre Ports 15 & 16 (GSS-16T2SFP)* or SFP Gigabit Fibre Ports 23 & 24 (GSS-24TSFP)*		
SFP(LINK/ACT)	Green	On when connection with the remote device is good Blinks when any traffic is present Off when module connection is not good

Note: All SFP ports are paired with one of the 10/100/1000Mbps copper RJ-45 ports. Only one of the paired ports can be used.

1.4.2. User Interfaces on the Rear Panel



Fig. 1.3: Rear View of the GSS-16T2SFP Switch

1.5. Overview of the Optional SFP Modules

With the GSS-16T2SFP switch, the SFP ports are paired with RJ-45 copper ports 15 and 16. In the case of the GSS-24T2SFPV2, the SFP ports are paired with RJ-45 copper ports 23 and 24. Only one of any given paired port can be used. In this manner, these paired ports can be seen as 'Dual Media' ports that support 10/100/1000Mbps or 1000Mbps fibre via the SFP interfaces.

Optional 1000Mbps mini-GBIC fibre transceiver modules can be used for high-speed uplink connections to fibre backbones or servers, when installed in the SFP ports. A range of optional Alloy mini-GBIC modules are available:

Alloy Part No.	Description
MGBIC-MLC	1000Mbps multimode 1000Base-SX, 850nm, max. range 500m
MGBIC-SLC10	1000Mbps singlemode 1000Base-LX, 1310nm, max. range 10Km
MGBIC-SLC4013	1000Mbps singlemode 1000Base-LHX, 1310nm, max. range 40Km
MGBIC-SLC4015	1000Mbps singlemode 1000Base-LHX, 1550nm, max. range 40Km
MGBIC-SLC70	1000Mbps singlemode 1000Base-ZX, 1550nm, max. range 70Km
MGBIC-SLC100	1000Mbps singlemode 1000Base-EZX, 1550nm, max. range 100Km
MGBIC-WDMS3.20	1000Mbps WDM singlemode/singlecore 1310nm, max. range 20Km
MGBIC-WDMS3.20	1000Mbps WDM singlemode/singlecore 1550nm, max. range 20Km

- Notes:
- * *The two WDM (Wave Division Multiplexer) mini-GBIC modules are designed to facilitate a link over a single core of singlemode fibre cable. The two units must be used in a paired manner, one at either end of the link.*
 - * *Mini-GBIC modules that are designed to the relevant standards should be compatible with any make of switch with SFP ports. If you have concerns regarding compatibility, please contact the supplier of your mini-GBIC product.*
 - * *The information given in the table above is current at time of publication; availability of individual Alloy mini-GBIC modules may vary over time.*



Fig. 1.4: Front View of 1000Base-SX/LX LC, SFP Fibre Transceiver



Fig. 1.5: Front View of 1000Base-LX WDM LC SFP Fibre Transceiver

2. Installation

2.1. Starting the 16/24 Port Gigabit Web Managed Switches

This section provides a quick start guide for:

- Hardware and Cable Installation
- Management Station Installation
- Software booting and configuration

2.1.1. Hardware and Cable Installation

Please Note:

⇒ Wear a grounding strap to avoid damaging the switch with electrostatic discharge

⇒ Be sure that the power switch is in the 'OFF' position before you insert the power cord

• Installing Optional SFP Mini-GBIC Modules

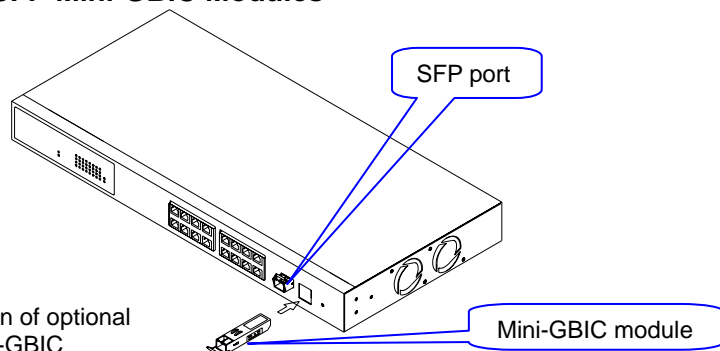


Fig. 2.1: Installation of optional SFP mini-GBIC

• Connecting the SFP Mini-GBIC Module to the Chassis:

The optional SFP Mini-GBIC modules are hot-swappable, so you can plug or unplug them while the power is applied to the switch.

1. Verify that the mini-GBIC module is compatible with the SFP port on the switch (for example, some switch manufacturer's design their mini-GBIC modules to be operable only in their branded devices).
2. Verify that the type of mini-GBIC you have selected for use will be compatible with the type of fibre optic cable that is to be used.
3. Verify that the type of mini-GBIC you have selected for use will be compatible with the fibre optic transceiver at the other end of the link (e.g. – compatible wavelength and standard)
4. Slide the module along the slot and ensure that the module is properly seated against the SFP slot socket/connector.
5. Install the media cable for network connection
6. Repeat the above steps, as needed, for each module to be installed into the switch

• Copper Ports - Cable Installation

Please Note:

- ⇒ *The RJ-45 ports on Alloy 16/24 Port Gigabit Switches support MDI/MDI-X auto-crossover functionality. This enables use of either straight-through or crossover UTP cable types; the RJ-45 ports will automatically be configured to suit the characteristics of the device at the remote end of the link.*
 - ⇒ *The RJ-45 ports on Alloy 16/24 Port Gigabit Switches support Nway auto-negotiation; the ports will automatically be configured to be compatible with the speed and duplex settings of the device at the remote end of the link.*
 - ⇒ *The minimum grade of cable for use with the switch is Cat. 5 grade UTP or STP. Higher grades of UTP/STP cable may also be used to connect to the copper RJ-45 ports.*
1. Depress the clip on the RJ-45 connector and push into the RJ-45 port. Release connector and ensure that the cable connector is securely locked into the RJ-45 port
 2. Repeat the above steps, as needed, for each RJ-45 port to be connected.

• Power On

Please Note:

- ⇒ *Alloy 16/24 Port Gigabit Switches use a 100-240 VAC, 50-60 Hz power supply. The power supply will automatically convert your local AC power source to DC power for use by the switch.*
1. Ensure that the power switch is turned off before connecting mains power
 2. Connect the power cord supplied with the switch to your nearest mains outlet
 3. Connect the other end of the power cord into the IEC power port on the switch
 4. Lock the power cable into place using the power cable clamp mounted on the IEC power port
 5. Turn the switch on
 6. When initial power is applied, all the LED indicators will light up for a brief period while the system performs its startup tests. Once the initial tests ('POST test') have completed all except the power LED should return to an off state.

• Firmware Loading

After power on, the boot-loader will load the switch firmware into the main operational memory. This process will take about 30 seconds. Once completed, the switch will flash all the LED's once and then switch to a ready state.

2.1.2. Cabling Requirements

To help ensure a successful installation and keep network performance at optimum levels, take care to use Cat.5E grade or higher cabling. Ensure that stranded core UTP cable, if used, runs for no more than 10 metres, and that solid core runs for a maximum of 100metres. Poor cabling is the most common cause for network dropouts or poor performance.

2.1.2.1. Cabling Requirements for UTP Ports

- For Ethernet copper network connections, the UTP cable used must be Cat. 3 grade as a minimum, with a maximum length of 100 metres
- For Fast Ethernet copper network connections, the UTP cable used must be Cat. 5 grade as a minimum, with a maximum length of 100 metres
- For Gigabit Ethernet copper network connection, UTP cable used must be Cat.5 grade or higher, with a maximum length of 100 metres. Cat.5e grade UTP cable is recommended.

2.1.2.2. Cabling Requirements for 1000SX/LX/ZX SFP Modules

There are two categories of fibre optic cable - multimode (MM) and singlemode (SM). The later is categorized into several classes by the distance it supports. These are SX, LX, LHX, ZX and EZX. The majority of mini-GBIC modules available use a LC type connector. The connector types used currently on Alloy mini-GBIC modules are LC and WDM SC, for the following module types:

- Gigabit Fibre with multimode LC SFP mini-GBIC modules
- Gigabit Fibre with singlemode LC mini-GBIC modules
- Gigabit Fibre with singlemode/single core WDM SC 1310nm SFP mini-GBIC modules
- Gigabit Fibre with singlemode/single core WDM SC 1550nm SFP mini-GBIC modules

The following table lists the types of fibre optic cable that are supported by SFP mini-GBIC modules installed in Alloy 16/24 Port Gigabit Switches. Other cable types not listed here may be supported; please contact the supplier of your switch for details.

IEEE 802.3z Gigabit Ethernet 1000SX 850nm	Multimode Fibre Cable and Modal Bandwidth			
	Multimode 62.5/125µm		Multimode 50/125µm	
	Modal Bandwidth	Range	Modal Bandwidth	Range
	160MHz-Km	220m	400MHz-Km	500m
	200MHz-Km	275m	500MHz-Km	550m
1000Base- LX/LHX/XD/ZX	Singlemode Fibre 9/125µm			
	Singlemode transceiver 1310nm 10Km, 40Km			
	Singlemode transceiver 1550nm 40Km, 70Km, 100Km			
1000Base-LX Single Fibre (WDM SC)	Singlemode *20Km	TX(Transmit)	1310nm	
		RX(Receive)	1550nm	
	Singlemode *20Km	TX(Transmit)	1550nm	
		RX(Receive)	1310nm	

Cont.

Please Note:

- ⇒ *Further information can be found in section 1.5 on page 7*
- ⇒ *All figures denoting the range a given cable type can achieve must be treated as maximum values. A number of variables can limit the actual range that can be achieved – grade of cable used, quality of cable, and presence of joins in cable runs, for example*

3. Operation of Web-based Management

This chapter instructs you how to configure and manage Alloy 16/24 Port Gigabit Web Managed Switches through the web user interface.

The default values of the GSS-16T2SFP and GSS-24T2SFPV2 Gigabit Web Managed Switches are as follows:

IP Address	192.168.1.1
Subnet Mask	255.255.255.0
Default Gateway	192.168.1.254
Default Password	admin

Browse the switch via its IP address <http://192.168.1.1>. The following screen will be displayed and ask you for a system password to authenticate your login.



Fig. 3-1

The default password is “admin”.

Please Note:

- ⇒ *The management interface can only be used by one administrator at any one time*
- ⇒ *For best display results, we recommend you use Microsoft IE and have the resolution at 1024x768.*

3.1. Web Management Home Page Overview

After you have successfully logged into the management interface screen, the system status information is displayed as in Fig. 3.2.

This page informs you about the basic information of the system, including “Switch Status”, “TP Port Status”, “Fibre Port Status”, “Aggregation”, “VLAN”, “Mirror”, “Trap Event”, and “Maximum Packet Length”.

From this information, you can ascertain the software version used, MAC address, port status and so on. For more details, please refer to Section 3.

Configuration

- [System](#)
- [Ports](#)
- [VLAN Mode](#)
- [VLAN Group](#)
- [PVID](#)
- [Aggregation](#)
- [Mirror](#)
- [Quality of Service](#)
- [Bandwidth Management](#)
- [Trap Event](#)
- [Max. Packet Length](#)

Monitoring

- [Statistics Overview](#)
- [Detailed Statistics](#)

Maintenance

- [Status](#)
- [Warm Restart](#)
- [Factory Default](#)
- [Logout](#)

Switch Status

Product Name	16 port 10/100/1000 Mbps Gigabit Switch
Firmware Version	v1.03
Hardware Version	v1.01
Serial Number	030901000031
IP Address	192.168.1.1
Subnet Mask	255.255.255.0
Default Gateway	192.168.1.254
MAC Address	00-00-8c-02-00-31
System Name	GSS-16T2SFP
Auto Logout Timer (mins)	0

TP Port Status

Port	Link Status	Speed	Flow Control	Port	Link Status	Speed	Flow Control
1	Down	Auto	Enabled	2	Down	Auto	Enabled
3	Down	Auto	Enabled	4	Down	Auto	Enabled
5	Down	Auto	Enabled	6	100FDX	Auto	Enabled
7	Down	Auto	Enabled	8	Down	Auto	Enabled
9	Down	Auto	Enabled	10	Down	Auto	Enabled
11	Down	Auto	Enabled	12	Down	Auto	Enabled
13	Down	Auto	Enabled	14	Down	Auto	Enabled
15	Down	Auto	Enabled	16	Down	Auto	Enabled

Fiber Port Status

15	Down	Auto	Enabled	16	Down	Auto	Enabled
----	------	------	---------	----	------	------	---------

Fig. 3.2

- **The Basic Page Layout.**

- The graphical representation of the switch at the top section of the window displays the current status of both Copper TP and Fibre SFP ports.
- The menu on the left side of the main window provides hyperlinks to access sub- menu options. These submenus are grouped into three parts:
 - Configuration
 - Monitoring
 - Maintenance

Cont.

The functions of each group are described in the corresponded sections through the remainder of this manual. The organization of the submenus shown in diagrammatical format is shown in Fig. 3.3

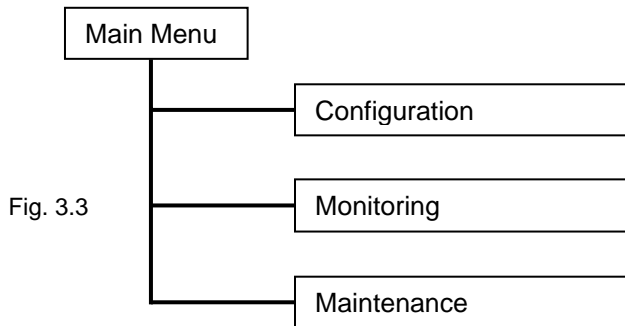


Fig. 3.3

3.2. “System” – The System Configuration Submenu

11 functions are included in the System Configuration group. Each of them will be described in detail in the following sections. In diagrammatical format, the functions are (Fig. 3.4):

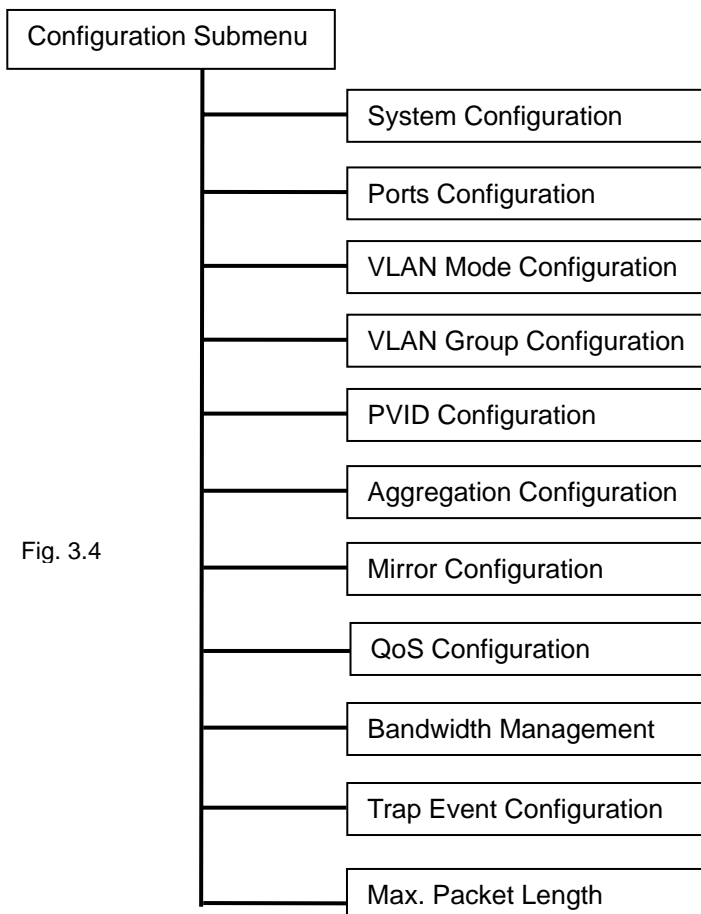


Fig. 3.4

3.2.1. System Configuration

System configuration is one of the most important options in the management of the switch. Without proper configuration, the switch cannot be accessed or managed. The switch supports manual IP address settings. When the IP address is changed you must reboot the switch to have the settings take effect. Changing the IP address will require you to change you management IP in your web browser.

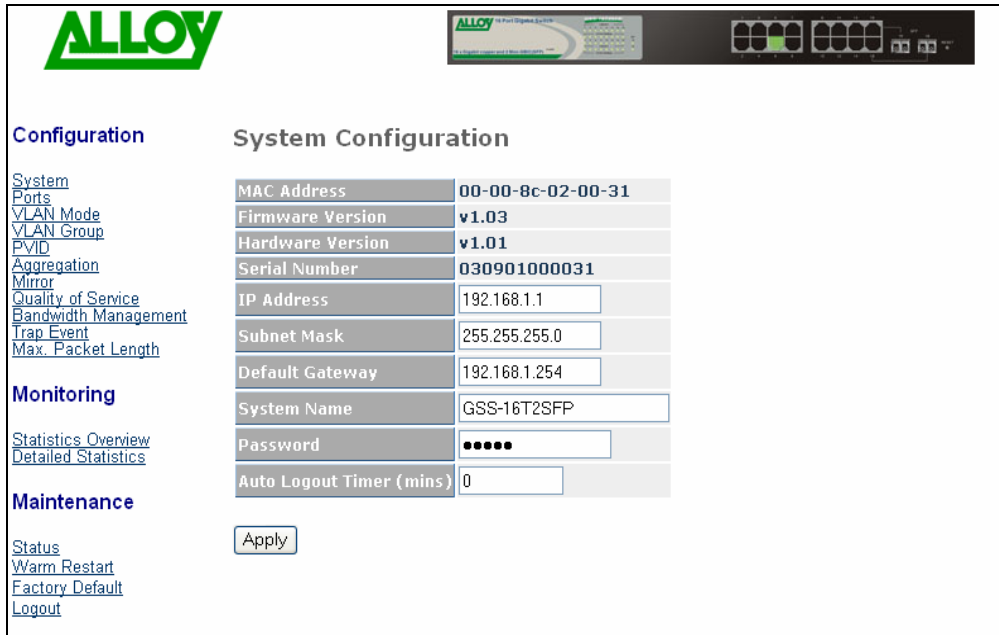


Fig. 3.5

The configuration settings are made in the appropriate areas in the central grey box:

- **Function Name:** System Configuration
- **Function Description:** Set IP address, subnet mask, default gateway, system name, password and auto logout timer for the switch.
- **Parameter Description:**
 - MAC Address** (read only - RO):
 - * The Ethernet MAC address of the management agent in this switch.
 - Firmware Version** (RO):
 - * The firmware version of this switch.
 - Hardware Version** (RO):
 - * The hardware version of this switch.
 - Serial Number** (RO):
 - * The device serial number is assigned by the manufacturer.
 - IP Address** (read/write - RW):
 - * Configure the IP settings, then click the **<apply>** button to update. The default IP is: 192.168.1.1

Cont.

Subnet Mask (RW):

- * Use to configure the Subnet Mask setting, then click **<apply>** button to update. Default value: 255.255.255.0

Default Gateway (RW):

- * The Default Gateway is used in routed networks to determine the net hop for all non local destinations. Click the **<apply>** button to update the field. The default value is: 192.168.1.254

System Name (RW):

- * Used to set a logical name for the switch. Up to 16 alphanumeric characters and nulls are allowed in this parameter. Click the **<apply>** button to update the field. The default value is: GSS-16T2SFP

Password (RW):

- * Used to set a password to access the switch's management interface. Up to 16 alphanumeric characters and nulls are allowed in this parameter. Click the **<apply>** button to update the field. The default value is: admin

Auto Logout Timer (RW):

- * Used to set the auto-logout timer, which will close down the management interface after a set period of inactivity. Valid values are 0 - 60 minutes. Setting the field to 0 means the auto-logout timer is disabled. Click the **<apply>** button to update the field. The default value is: 0

3.2.2. Port Configuration Submenu

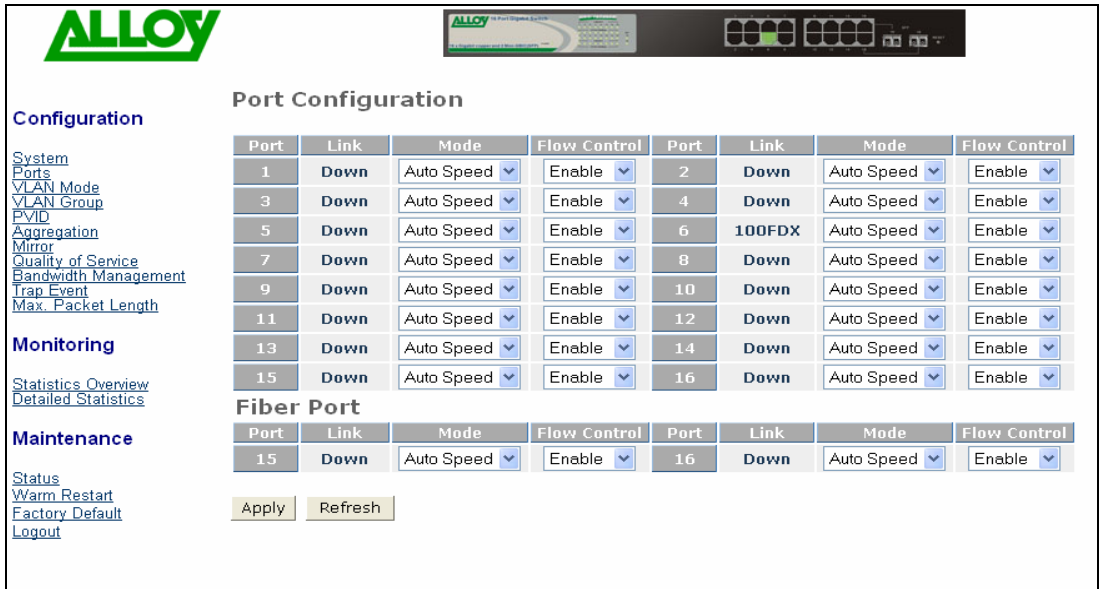


Fig. 3.6

- **Function Name:** Port Configuration
- **Function** Port Configuration allows the various port settings to be changed
- **Description:**
- **Parameter Description:**

Mode:

- * Used to set the speed and duplex parameters of a port.
- * If the media is 1Gbps fibre, then there are three modes to choose from: 'Auto Speed', '1000 Full' and 'Disable'.
- * If the media is UTP (copper), then there are additional Speed/Duplex settings. Speed modes are: '10', '100' or '1000Mbps'. Duplex modes are: 'Full duplex' or 'Half duplex'. The following table summarizes the functions that each media type supports.

Media type	Nway	Speed	Duplex
1000M UTP	ON/OFF	10/100/1000M	Full for all, Half for 10/100
1000M Fibre	ON/OFF	1000M	Full

- * In Auto Speed mode, there are no default values
- * In Forced mode, default values depend on your settings

Flow Control:

- * Select from either 'Enable' or 'Disable' for Flow Control.
- * If flow control is set to 'Enable', then both parties can send PAUSE frames to the transmitting device(s), if the receiving port is too busy to handle the data rate being sent to it.
- * If flow control is set to 'Disable' there will be no flow control on the port. In congested situations the switch will drop packets. Default State: Enable

3.2.3. VLAN Mode Configuration

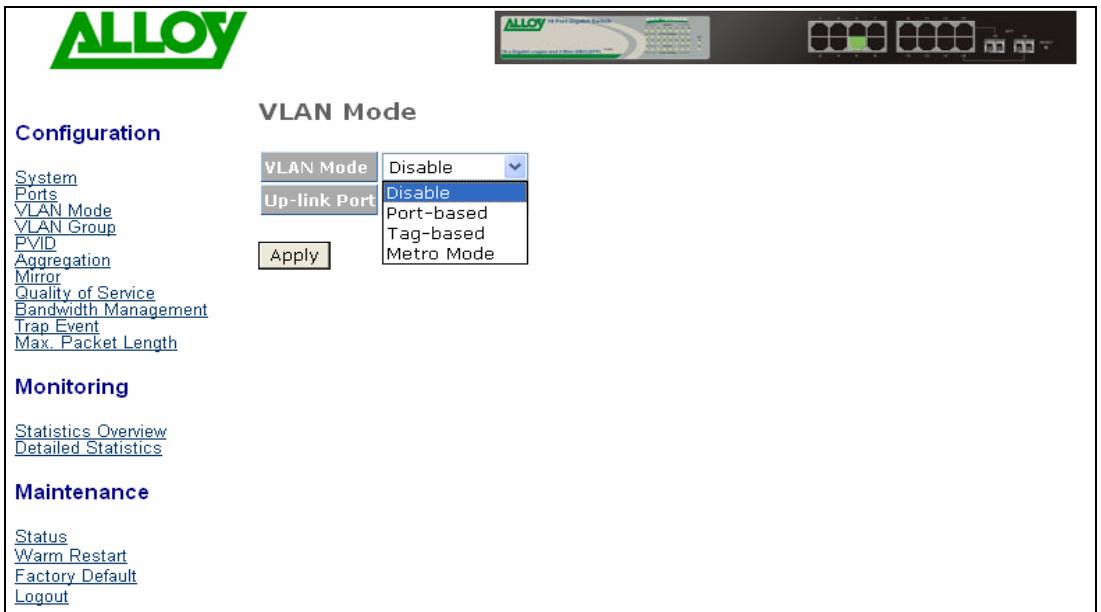


Fig. 3.7

The switch supports Port-based VLAN and Tag-based VLAN (802.1q). 16 active VLANs are supported, with VLAN ID's from 1-4094. VLAN configuration is used to partition your LAN into small broadcast domains (groups). Properly configuring VLANs can improve your network security and increase network performance by limiting broadcast propagation.

- **Function Name:** VLAN Mode Setting
- **Function Description:** There are 4 VLAN Modes: 'Port-based', 'Tag-based', 'Metro mode' or 'Disabled'. These are selected from the drop down list. Selecting one will take affect immediately.
- **Parameter Description:**
 - VLAN Mode:**
 - * **Disable:** Disable all VLAN functions. This is the default setting.
 - * **Port-based:** Port-based VLAN simply groups ports together. Ports within the same group can talk to each other. Ports that are not in the same group are blocked from communicating. Any port can be a member of more than one VLAN to enable shared server, internet or uplink ports. This switch can support up to a maximum of 16 port-based VLAN groups.
 - * **Tag-based:** Tag-based VLAN identifies its members by a VID that is included in the headers of packets sent and received. This is quite different from port-based VLAN, in that tagged VLANs can exist as groups across multiple switches in your enterprise whereas port VLANs are local only to the switch that they are defined on. Port ingress (incoming) and egress (outgoing) rules allow for filtering of packets that don't conform to your

Cont.

specific policies on accepting or denying non-tagged packets. Each tag-based VLAN that is configured must be assigned a VLAN name and a VLAN ID. Valid VLAN ID's are from 1 to 4094. Administrators can create a total of up to 16 Tag VLAN groups.

- * **Metro Mode:** Metro Mode is a quick configuration VLAN option designed for Metro WAN deployment. It uses Port-based VLAN and creates 14 or 15 VLAN groups.
- * **Up-link Port:** This feature enables a VLAN group to be bound to one or both of the paired dual media uplink ports. This feature is only enabled when the 'Metro mode' is selected.
- * **Option 15:** All ports are assigned to a unique VLAN bound to Port 15. Port 15 ends up a member of 15 VLAN groups, one VLAN for each port. This secures intra port traffic, but allows all ports access to a single uplink port (15). Each VLAN has 2 members. 15 VLANs in total
- * **Option 16:** All ports are assigned to a unique VLAN bound to Port 16. Port 16 ends up a member of 15 VLAN groups, one VLAN for each port. This secures intra-port traffic, but allows all ports access to a single uplink port (16). Each VLAN has 2 members. 15 VLANs in total.
- * **Option 15&16:** All ports are assigned to a unique VLAN bound to Ports 15 and 16. Both ports 15 and 16 end up members of 14 VLAN groups, one VLAN for each port. This secures intra port traffic, but allows all ports access to both uplink ports (15 and 16). Each VLAN has 2 members. 14 VLANs in total

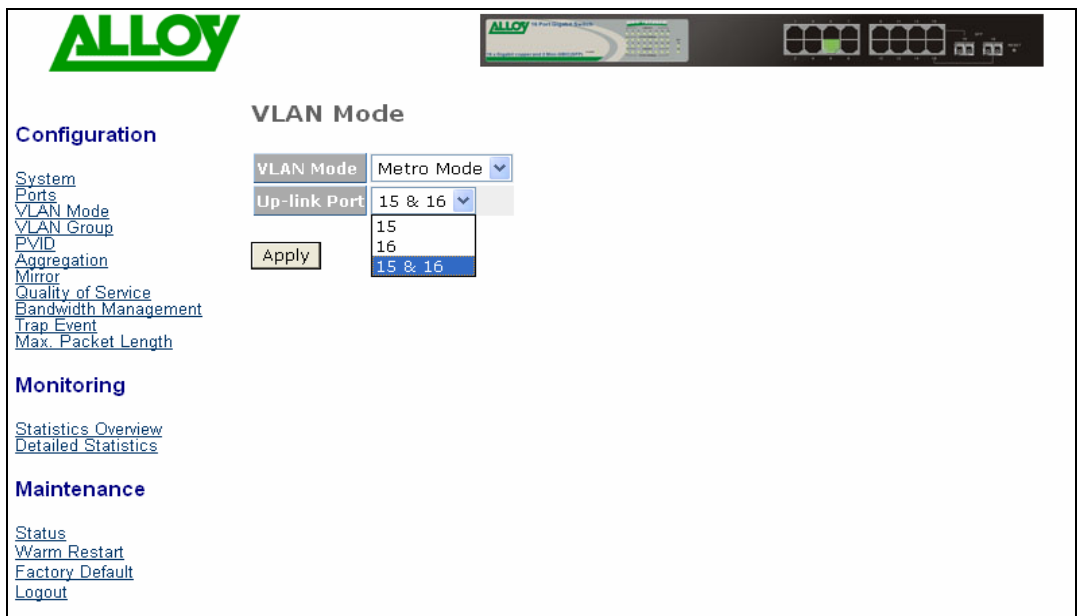


Fig.3.7a

3.2.4. VLAN Group Configuration

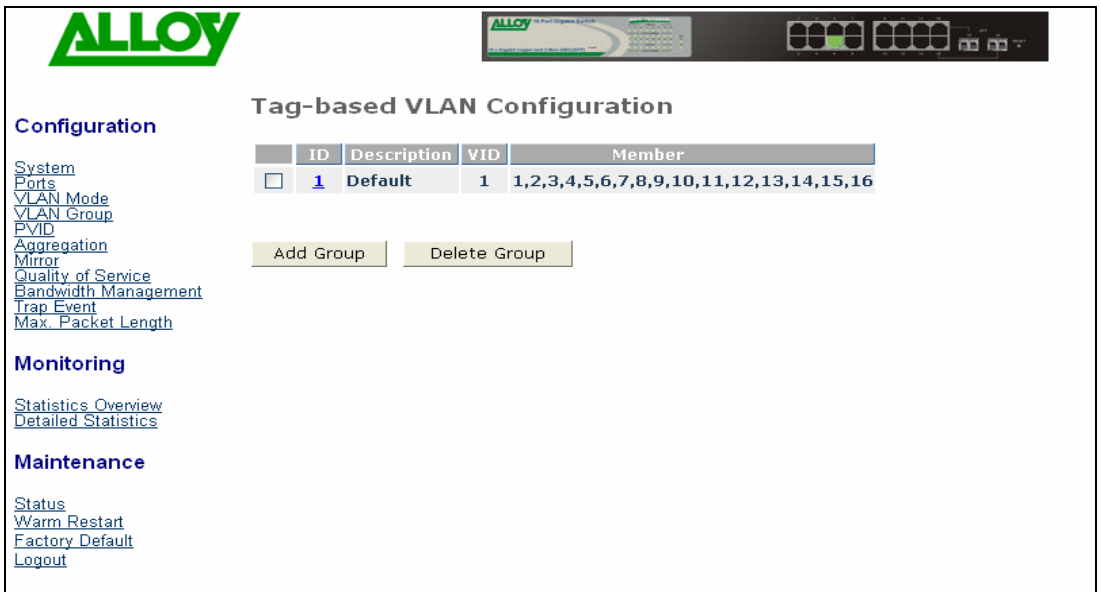


Fig. 3.8

- **Function Name:** Tag-based VLAN Group Configuration
- **Function Description:** In port-based VLAN mode, this will display the “ID - Description” - and members of existing port-based VLAN groups. If in tag-based VLAN mode, this will display the “ID - Description – VID” and Members of the existing tag-based VLAN group. The switch can only be configured to support either port-based VLAN or tag-based VLAN. When selecting one of the VLAN modes, the switch will display the appropriate configuration data as required. You can easily create and delete VLAN groups by using the **<Add Group>** and **<Delete Group>** function buttons, or click the Group ID directly to edit it
- **Parameter Description:**
 - ID (Group ID):**
 - * When you want to edit a VLAN group, you must select the Group ID field
 - * Then enter your Tag Based VLAN Group Settings or Port Based VLAN Group Settings depending on your VLAN mode selection
 - Description:**
 - * The description defined by the administrator is associated with a VLAN group
 - VID:**
 - * VLAN identifier. Each tag-based VLAN group has a unique VID. It appears only in tag-based mode
 - Member:**
 - * This is used to add or delete ports as members of this VLAN. Use the check box () beside the port x to enable it
 - Add Group:**
 - * Create a new port-based VLAN or tag-based VLAN, depending on the VLAN mode selected (see fig 3.9 next page)

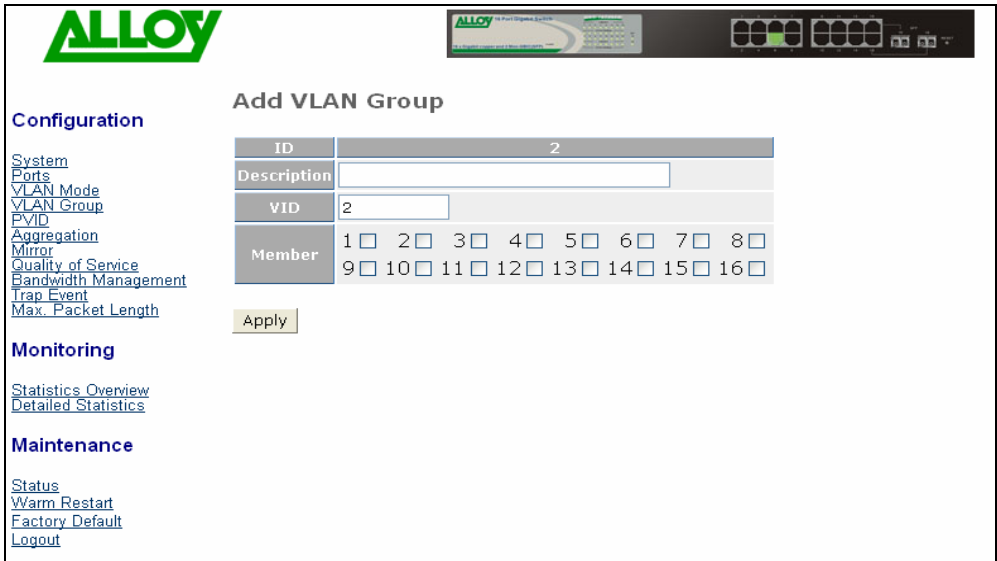


Fig. 3.9

Delete Group:

- * Select the check box () beside the ID, to delete a group. Then press the **<Delete Group>** button to delete the group.

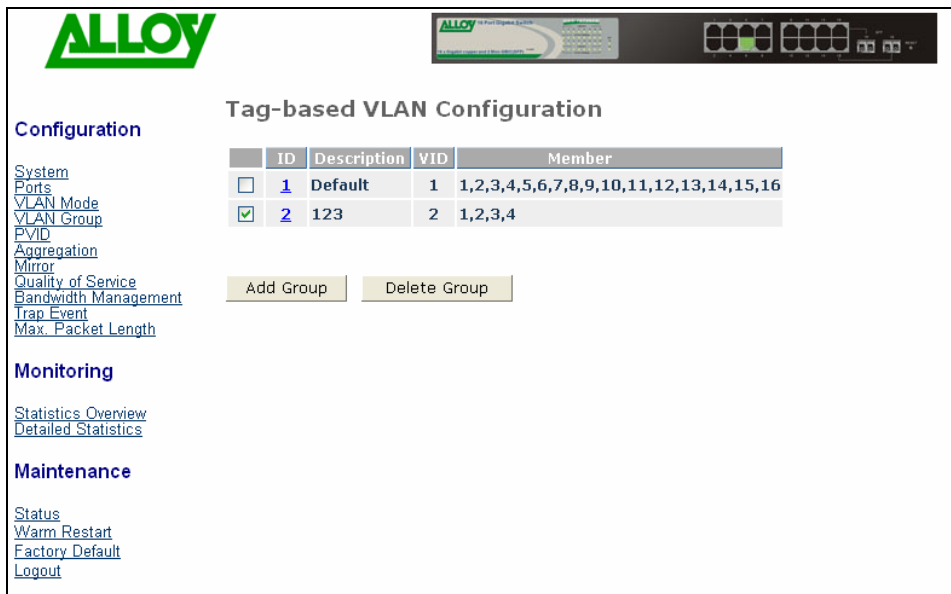


Fig. 3.10

3.2.5. PVID Configuration

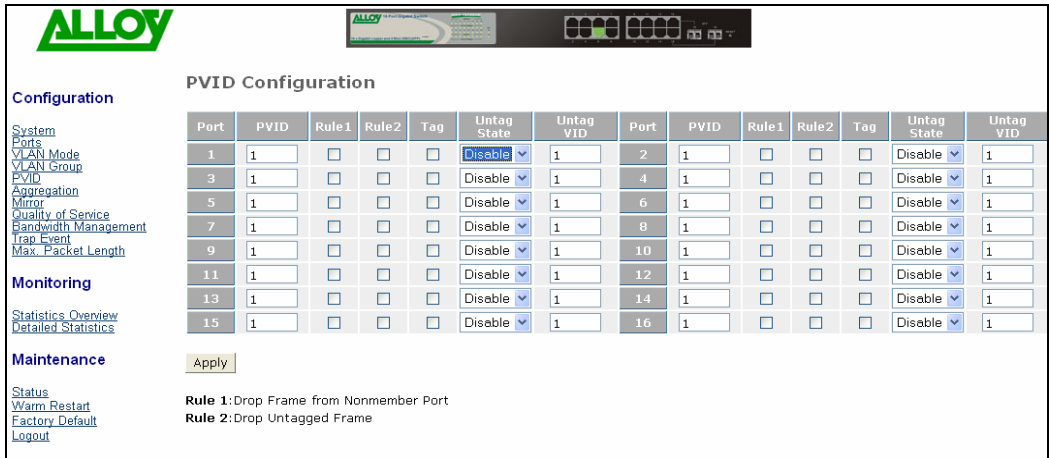


Fig. 3.11

- Function Name:** PVID Configuration
- Function Description:** From within this menu users can assign a VID number for each port. The range of VID numbers is from 1 to 4094. You can also choose ingress filtering rules to each port. There are two ingress filtering rules which can be applied to the switch. Ingress Filtering Rule 1 is “forward only packets with VID matching this port’s configured VID”. Ingress Filtering Rule 2 is “drop untagged frame”
- Parameter Description:**
 - Port 1-16:**
 - * Port number
 - PVID:**
 - * The PVID range will be from 1-4094. Before you set a PVID number, ensure that you have created a Tag-based VLAN with a VID of the same number. For example, if port 1 receives an untagged packet, the switch will apply the PVID (assume VID 5) to tag this packet, the packet then will be forwarded as a packet tagged with VID 5.
 - Rule 1:**
 - * Forward only packets with VID matching this port’s configured VID. You can apply Rule 1 as a way for a given port to filter unwanted traffic. In Rule 1, a given port checks if the received packet is a member of the VLAN which the received port has been assigned via its PVID. For example, if port 1 receives a tagged packet with VID=100 (VLAN name=VLAN100), and if Rule 1 is enabled, the switch will check if port 1 is a member of VLAN100. If it is, then the received packet is forwarded; otherwise, the received packet is dropped.

Cont.

Rule 2:

* Drop untagged frame. You can configure a given port to accept all frames (Tagged and Untagged) or just receive tagged only frames. If the former is the case, then packets either tagged or untagged will be processed. If the later is the case, only packets carrying a VLAN tag will be processed, all other packets will be discarded.

Please note:

⇒ If Rule 1 is enabled and port 1, for example, receives an untagged packet, the switch will apply the PVID of port 1 to tag this packet, and the packet will then be forwarded

Tag:

* This is an egress rule applied on data transmitted out of the port. Select 'untag' or 'tag'. Tag means that the outgoing packets will be tagged with the configured VID, select the check box (☑). Untag means that the outgoing packets carry no VLAN tag headers.

Untag State:

* If this is enabled and the Untag VID matches the VID of the packet, then the tag would be removed. If enabled without a match, no operation will occur. If disabled, no operation will occur.

Untag VID:

* The valid range is 0~4094.

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- Factory Default
- Logout

PVID Configuration

Port	PVID	Rule1	Rule2	Tag	Untag State	Untag VID	Port	PVID	Rule1	Rule2	Tag	Untag State	Untag VID
1	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Disable	1	2	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Disable	1
3	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Disable	1	4	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Disable	1
5	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Disable	1	6	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Disable	1
7	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Disable	1	8	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Disable	1
9	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Disable	1	10	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Disable	1
11	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Disable	1	12	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Disable	1
13	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Disable	1	14	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Disable	1
15	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Disable	1	16	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Disable	1

Rule 1: Drop Frame from Nonmember Port
Rule 2: Drop Untagged Frame

Fig. 3.11a

3.2.6. Aggregation Configuration

Aggregation (Port Trunking) Configuration is used to configure Link Aggregation. You can bundle more than one port with the same speed and duplex settings to form a single logical port. The logical port aggregates the bandwidth of the individual member ports. This allows you to create a higher speed uplink or backbone connection via bandwidth aggregation. For example, if there are three Gigabit Ethernet ports aggregated in a logical port, then this logical port has bandwidth three times as high as a single Gigabit Ethernet port – 3Gbps (in half duplex mode) or 6Gbps (in full duplex mode).

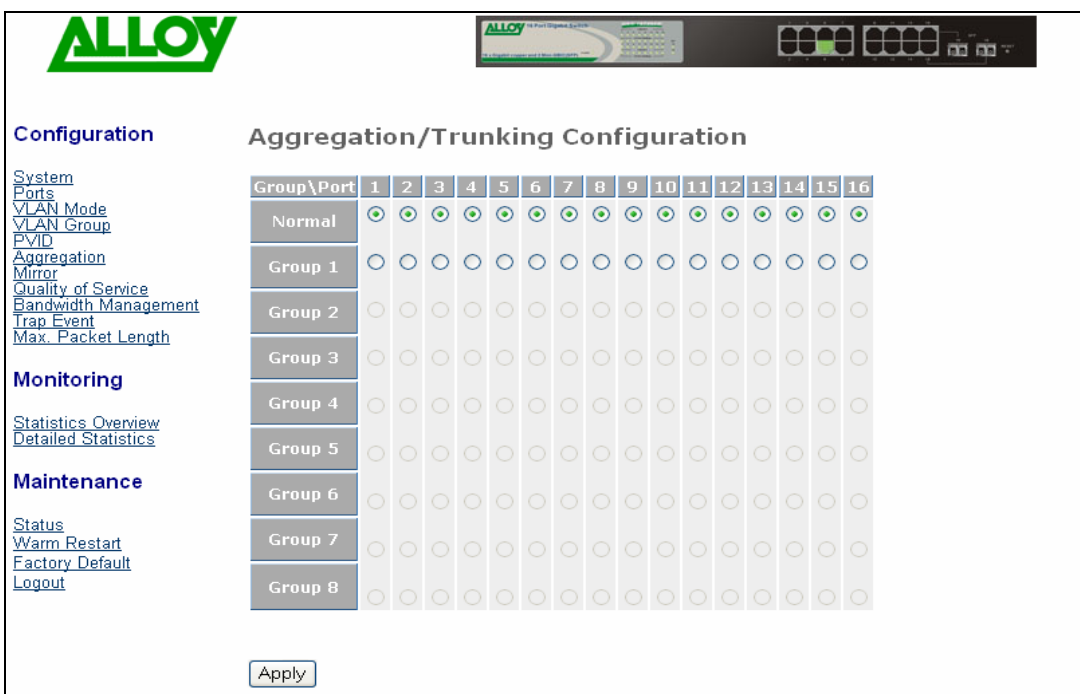


Fig. 3.12

- **Function Name:** Aggregation Configuration
- **Function Description:** Display the current setup of Aggregation/Trunking. With this function you can add a new trunk group or modify the members of an existing trunk group
- **Parameter Description:**
 - Normal:**
 - * Define ports that will not participate in any aggregation/trunking group
 - Group 1-8:**
 - * Group the ports that you need to aggregate/trunk. Up to 8 ports can be selected for each group.

3.2.7 Mirror Configuration

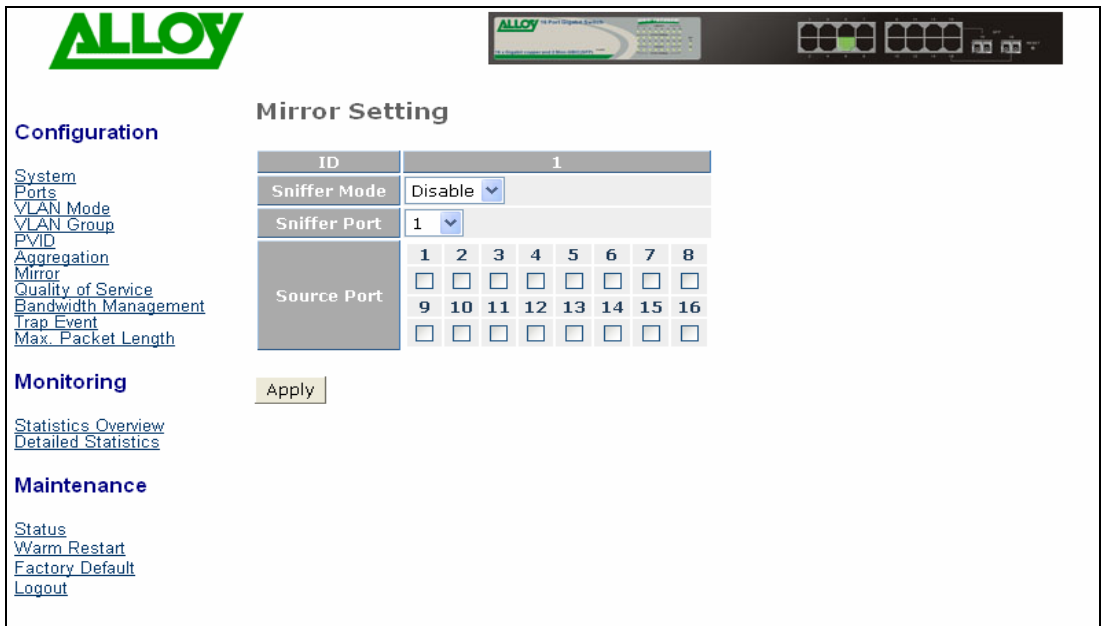


Fig. 3.13

- **Function Name:** Mirror Setting
- **Function Description:** Mirror Configuration is used to monitor the traffic on the network. For example, assume that Port A is a 'sniffer' port and Port B is the Source Port; configuring a mirror setting allows the traffic passed by Port B to be copied to Port A for monitoring purposes
- **Parameter Description:**
 - Sniffer Mode:**
 - * Used for the activation or de-activation of the Port Mirror function. Default is disable
 - Sniffer Port:**
 - * Used to set up the port that will perform the monitoring. Port 1-16 can be used; the default is Port 1
 - Source Port:**
 - * Used to set up the port that will be monitored. Select the check box () under the port label. The valid port range is ports 1-16.

3.2.8. Quality of Service (QoS) Configuration

The switch offers powerful QoS functions including: VLAN tagged priority for 8 levels, TOS field IP header (equal DSCP low 3 bits) on Layer 3 network framework, 6 types of layer 4 network transmission events, and IP DiffServe QoS services.

In the Quality of Service (QoS) Configuration management interface there is an option named "Default Class". Once you have selected one of the four QoS methods, this Default Class is used to group packets that do not match any of the QoS rules defined for the particular QoS method selected. For instance, if you set:

Cont.

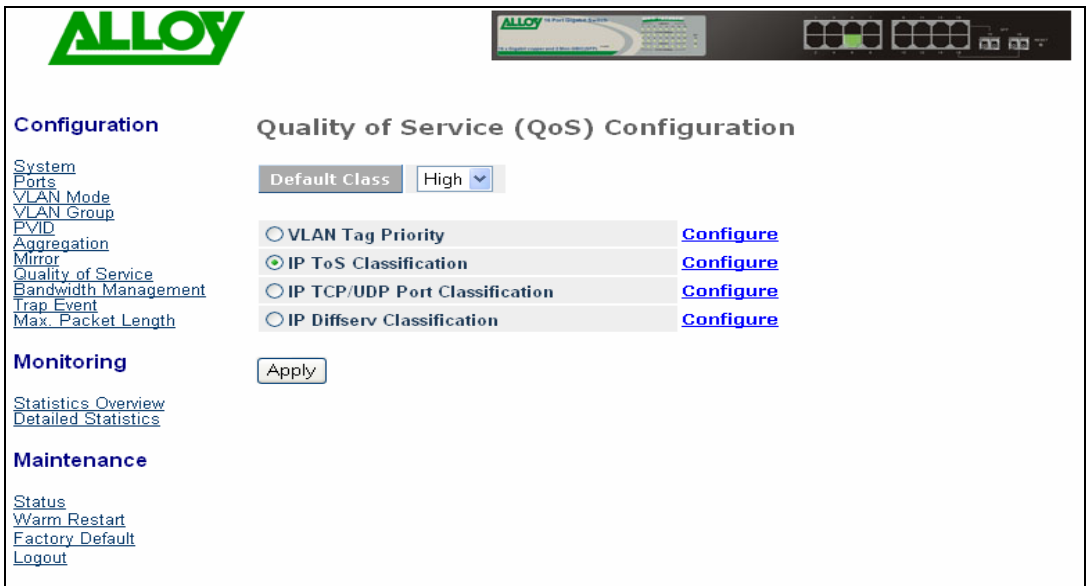


Fig. 3.14

The QoS function as VLAN Tag Priority mode, and then choose Default Class as High, the priority of the packets with no tags will be considered as High priority precedence. The initial value of the Default Class is 'High'.

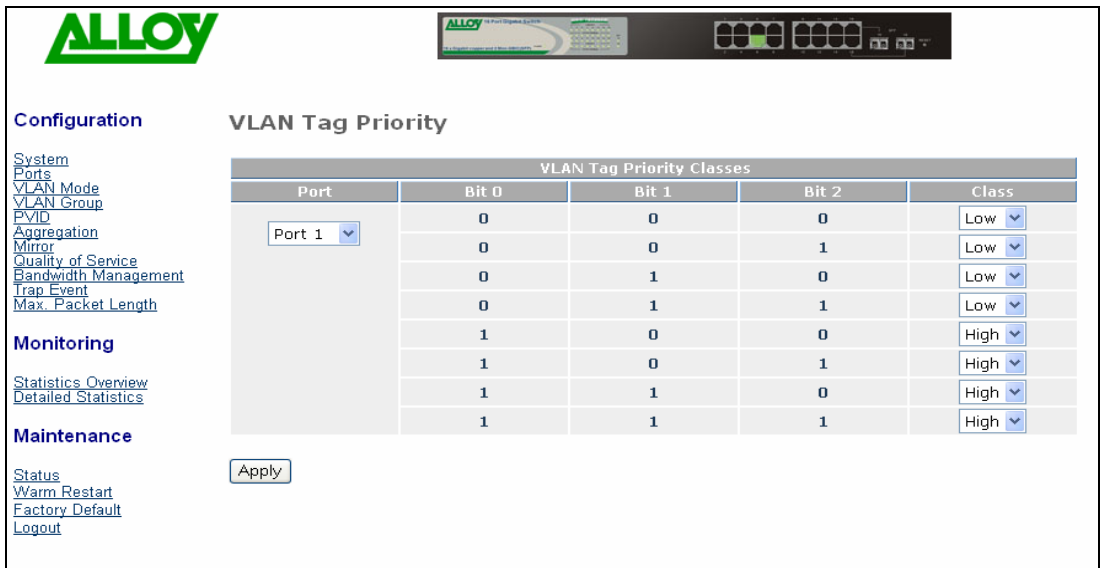


Fig. 3.15

- **Function Name:** VLAN Tag Priority
- **Function Description:** VLAN tags have 3 bits that belong to a priority flag. These 3 bits can define 8 traffic classifications. The classifications can then be mapped to 'High priority' or 'Low' priority queues. Packets tagged as High priority will be forwarded over packets with a low priority when the destination port is in a congested state

Cont.

- Parameter Description:** **Quality of Service (QoS) VLAN Tag Configuration:**
 - * Used for setting up QoS based on VLAN tags.**Port:**
 - * Select the port which your bit mapping will apply. Optionally you can select to control all ports at the same time from the “All” selection.**Bit 0, Bit 1, Bit 2:**
 - * Controls the Tag priority and offers 8 levels of QoS.**Class:**
 - * The 8 levels of QoS are then mapped to High or Low Priorities for each ports output queue respectively.
- Function Name:** Quality of Service (QoS) ToS Configuration:
- Function Description:** Within the Layer 3 network framework is a TOS field for IP headers. Alloy 16/24 Port Gigabit Switches can prioritise packet forwarding based on this TOS header. TOS Headers include 3 bits for 8 levels of TOS. Once again these 8 levels can be mapped to ‘High’ or ‘Low’ priority queues.

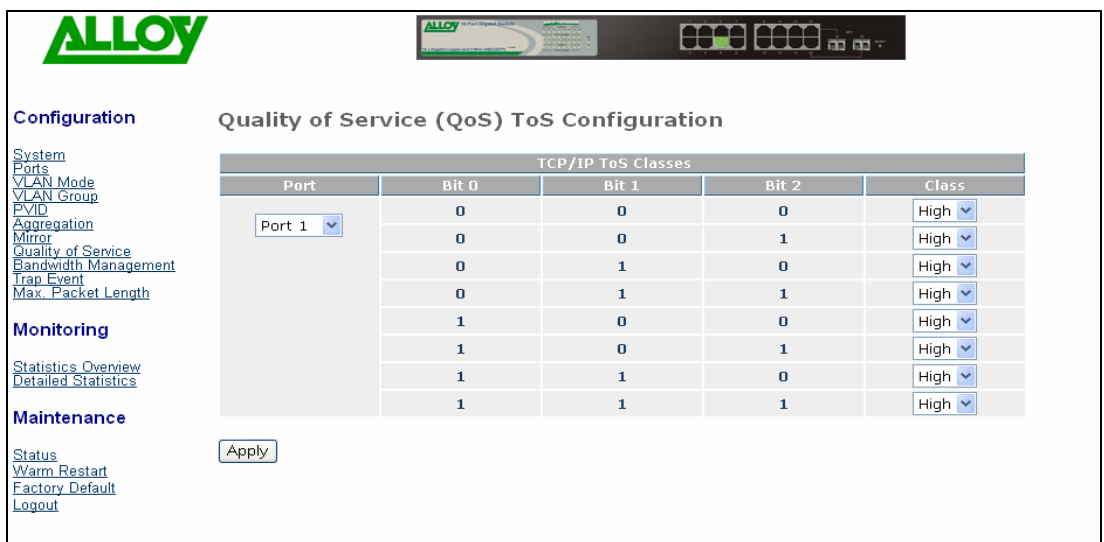


Fig. 3.16

- Parameter Description:** **Quality of Service (QoS) ToS Configuration:**
 - * Used for setting up the TOS QoS based on Layer 3 IP headers.**Port:**
 - * Select the port to which your bit mapping will apply. Optionally you can select to control all ports at the same time from the <All> selection**Bit 0, Bit 1, Bit 2:**
 - * Control the TOS priority and offer 8 levels of QoS**Class:**
 - * The 8 levels of TOS are then mapped to ‘High’ or ‘Low’ Priorities for each ports output queue respectively.
- Function Name:** **Quality of Service (QoS) Layer-4 Configuration:**

(Mode Selection Screen)

- **Function Description:** In Layer 4 QoS Configuration you can prioritise packets based on the application type that they contain; for example, to down prioritise web browsing, e-mail and FTP.

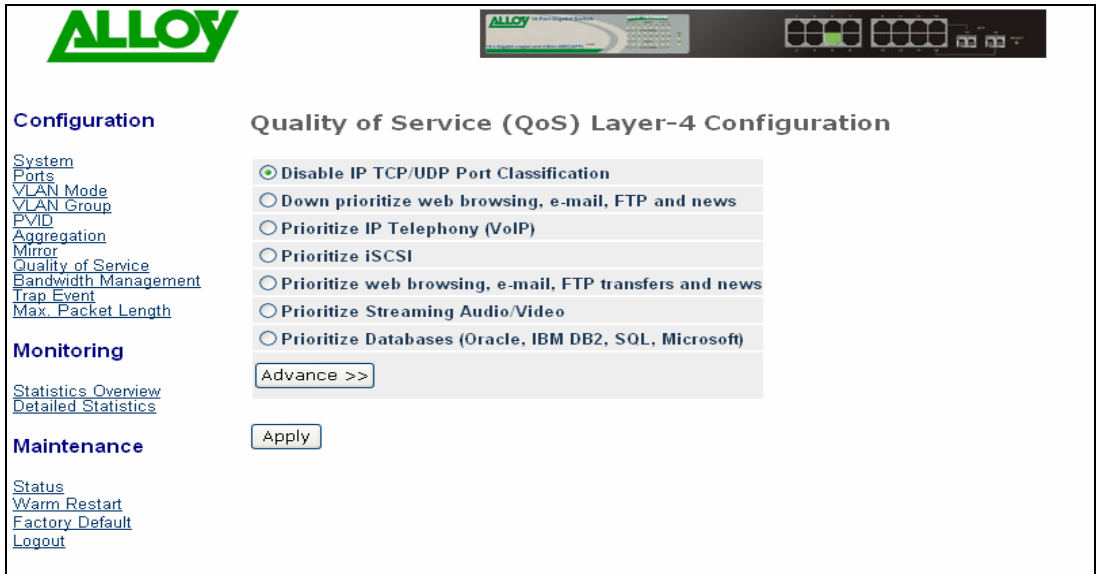


Fig. 3.17

- **Advanced/:** Toggle the **<Simple>** / **<Advanced>** button to switch between configuration modes and to display details on the TCP/UDP ports configured (See Fig 3.18). When Advanced Mode options are toggled, they will appear on the same screen below the items for “Simple Mode” configuration.
- **Simple Mode**
- **Parameter:** **Disable IP TCP/UDP Port Classification:**
 - * Disables all L4 application based QoS
- **Description** **Down Prioritise web browsing, e-mail, FTP and news:**
 - * Enable Low prioritization for standard Internet Applications
- (Simple Mode) **Prioritise IP Telephony (VoIP):**
 - * Enable High prioritization for VoIP applications
- **Prioritise iSCSI:**
 - * Enable High prioritization for iSCSI applications
- **Prioritise web browsing, e-mail, FTP transfers and news:**
 - * Enable High prioritization for standard Internet Applications.
- **Prioritise Streaming Audio/Video:**
 - * Enable High prioritization for standard Video and Audio Streaming Applications
- **Prioritise Databases (Oracle, IBM DB2, SQL, Microsoft):**
 - * Enable High prioritization for Database Applications

Cont.

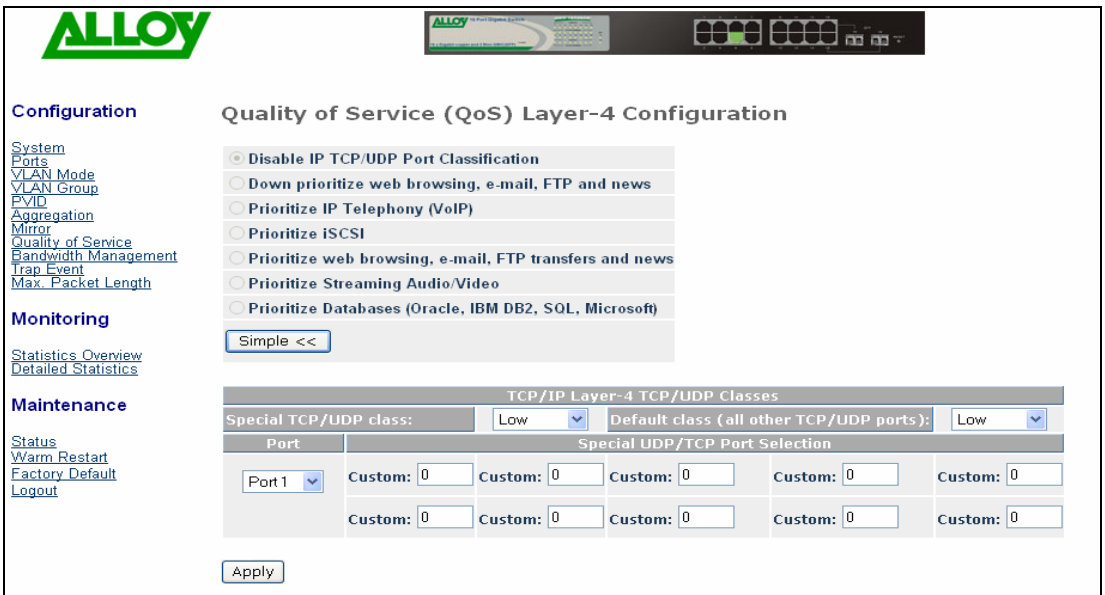


Fig. 3.18

- Advanced: Mode**

The Advanced Configuration Mode interface box allows you to further customise the initial simple configuration defaults with your own TCP/UDP port definitions, or to create your own definition list from scratch. (Refer to Fig 3.18)

- Parameter: Description**

Special TCP/UDP class:

* Select the custom TCP/UDP port definitions as 'High' or 'Low' priority

Default class (all other TCP/UDP ports):

* Select all other TCP/UDP ports as a default priority class of 'High' or 'Low'

Port:

* Select the port which your Special TCP/UDP class will apply. Optionally you can select to control all ports at the same time from the "All" selection.

Special UDP/TCP Port Selection:

The following are port numbers defined by the six specific default TCP/UDP L4 rules:

- * Down Prioritise web browsing, e-mail, FTP and news: port number 80,280,443,25,110,20,21,69,119,2009
- * Prioritise IP Telephony (VoIP):1718, 1719, 1720
- * Prioritise iSCSI: 3225, 3260, 3420
- * Prioritise web browsing, e-mail, FTP transfers and news: 80,280,443,25,110,20,21,69,119,2009
- * Prioritise Streaming Audio/Video: 2979, 1755, 7070, 7071, 554, 8000
- * Prioritise Databases (Oracle, IBM DB2, SQL, Microsoft): 66, 1571, 1575, 523,118, 156, 3306,1232,1433,1434

- **Function Name:** IP DiffServe Classification
- **Function Description:** IP DiffServe Classification supports up to 64 (0-63) Traffic Classifications based on a 6-bit field in the DSCP header of IP packets. The GSS-16T2SFP switch allows mapping of these 64 classifications to High or Low priority queues
- **Parameter Description:**

IP Differentiated Services (DiffServe) Configuration:

 - * Used for setting up the IP Differentiated Services Configuration QoS

DiffServe:

 - * Display 64 (0-63) DiffServe Priority items.

Class:

 - * The 64 traffic types can be mapped to High Priority or Low Priority queues.

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IP Differentiated Services (DiffServ) Configuration

DiffServ	Class	DiffServ	Class	DiffServ	Class	DiffServ	Class
0	High	1	High	2	High	3	High
4	High	5	High	6	High	7	High
8	High	9	High	10	High	11	High
12	High	13	High	14	High	15	High
16	High	17	High	18	High	19	High
20	High	21	High	22	High	23	High
24	High	25	High	26	High	27	High
28	High	29	High	30	High	31	High
32	High	33	High	34	High	35	High
36	High	37	High	38	High	39	High
40	High	41	High	42	High	43	High
44	High	45	High	46	High	47	High
48	High	49	High	50	High	51	High
52	High	53	High	54	High	55	High
56	High	57	High	58	High	59	High
60	High	61	High	62	High	63	High

Apply

Fig. 3.19

3.2.9. Bandwidth Management

- **Function Name:** Bandwidth Management Configuration
- **Function Description:** The Bandwidth Management function is used to set Ingress and Egress bandwidth limits for each port

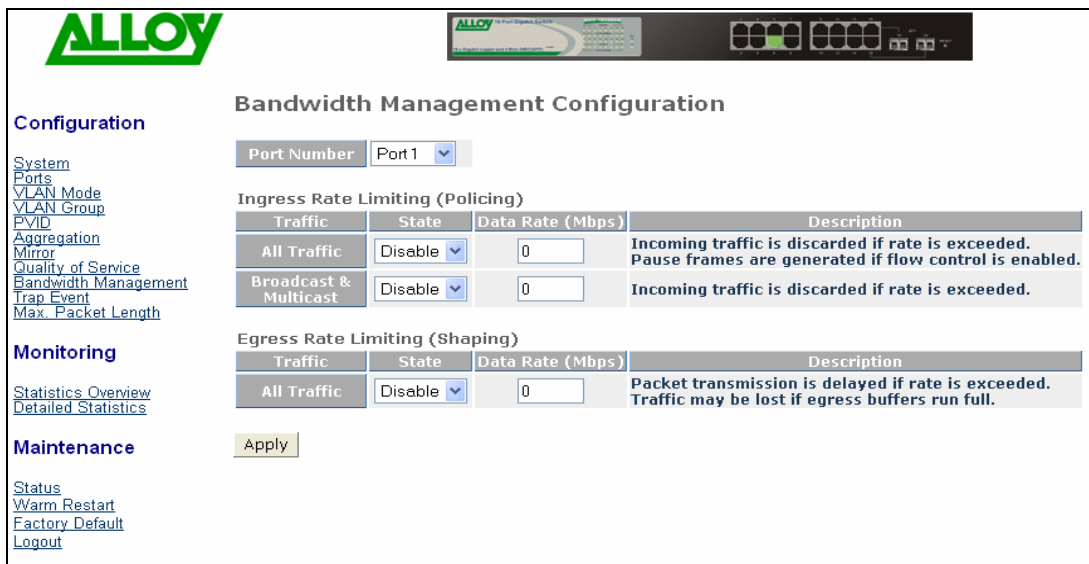


Fig. 3.20

- **Parameter Description:**
 - Port Number:**
 - * Select the port to which you want to add a Rate Control Policy. Optionally, you can select to control all ports at the same time from the “All” selection
 - All Traffic for Ingress Rate Limiting:**
 - * Define the rate for incoming traffic on the selected port. Incoming traffic will be discarded if the rate exceeds the value you set up in Data Rate field. Pause frames are also generated if Flow Control is enabled (see section 3.2.2). The limited format of the packet includes unicast, broadcast and multicast. The valid range is 0-1000.
 - Broadcast & Multicast for Ingress Rate Limiting:**
 - * Define the rate for incoming Broadcast and Multicast traffic on the selected port. Incoming traffic will be discarded if the rate exceeds the value you set up in the Data Rate field. The limited format of the packet only includes broadcast and multicast. The valid range is 0-1000
 - All Traffic for Egress Rate Limiting:**
 - * Define the rate for outgoing traffic on the selected port. Packet transmission will be delayed if the rate exceeds the value you set up in Data Rate field. Traffic may be lost if egress buffers are congested. The limited format of the packet includes unicast, broadcast and multicast. The valid range is 0-1000.

3.2.10. Trap Event Configuration

- **Function Name:** Trap Event Configuration
- **Function Description:** The Trap Event Configuration interface screen enables Alloy 16/24 Port Gigabit Switches to send out trap information when pre-defined events occur on the network. The switch offers 7 different trap events and 2 configurable destination Trap Hosts. Trap messages are enabled by selecting the tick () box beside each event description. Most events support a counter function to help identify the number of times that an event has occurred. (including Warm Boot and Cold Boot events)

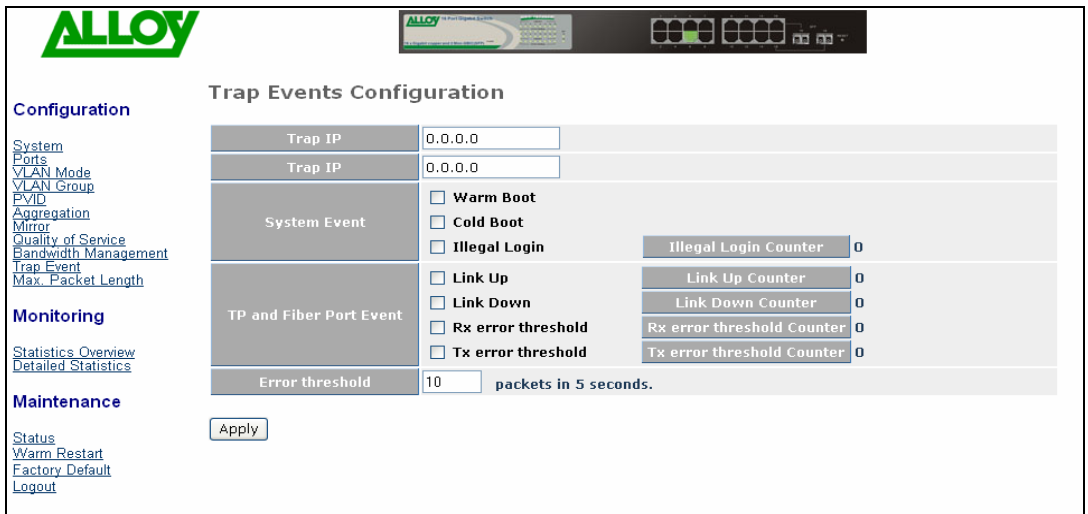


Fig. 3.21

Trap Events supported are as follows:

- **Parameter Description:**
 - Boot:**
 - * Warm Boot
 - * Cold Boot
 - Login:**
 - * Illegal login
 - Link:**
 - * Link up
 - * Link down
 - Transmit/Receive Error:**
 - * Rx error threshold
 - * Tx error threshold

3.2.11. Maximum Packet Length

- **Function Name:** Maximum Packet Length
- **Function Description:** The switch is capable of dealing with 9k Jumbo Frames. Jumbo frames are effective in point to point environments for large payload data transfers. They maximise the data-to-header payload ratio, so that more data is sent with less header information (note that both transmitting and receiving nodes need to support Jumbo Frames)

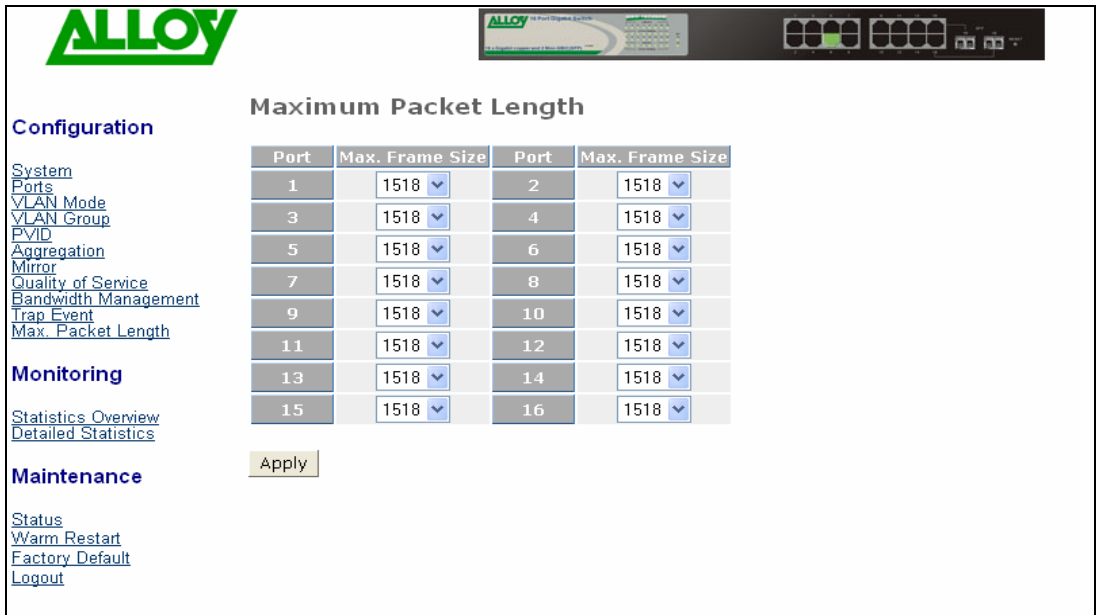
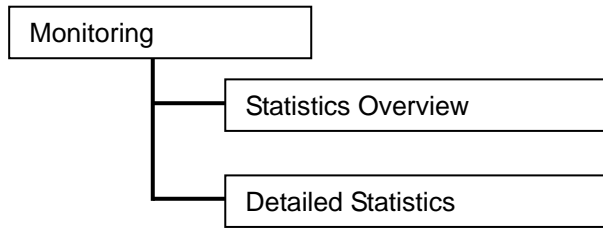


Fig. 3.22

- **Parameter Description:** **Max. Frame Size:** * Used to define the maximum packet length of Jumbo Frames that each port can accept. Maximum length is in bytes, from the available choices of 1518 bytes, 1532 bytes or 9216 bytes. The default is 1518 bytes

3.3. Monitoring

There are two functions contained in the monitoring section of the management.



3.3.1. Statistics Overview

The Statistics Overview function collects summary information from port-based traffic counters. The type of data that can be collected includes information about Frames, Bytes, and Errors.

In Fig. 3.23, all ports are displayed in a summary format. If any counter overflows its maximum level, then it will reset and resume from 0 (zero).

- **Function Name:** Statistics Overview for All Ports
- **Function Description:** Display a summary of each port's traffic, including Transmit Bytes, Transmit Frames, Receive Bytes, Receive Frames, Transmit Errors and Receive Errors

Port	Tx Bytes	Tx Frames	Rx Bytes	Rx Frames	Tx Errors	Rx Errors
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	2827935	11760	235485767	2392008	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	0	0	0	0	0	0
16	0	0	0	0	0	0

Fig. 3.23

- **Parameter Description:**
 - Transmit (Tx) Bytes:** * Total transmitted bytes
 - Tx Frames:** * The number of packets transmitted

Cont.

Rx Bytes:

* Total received bytes

Rx Frames:

* The number of packets received

Tx Errors:

* The number of bad packets transmitted

Rx Errors:

* The number of bad packets received

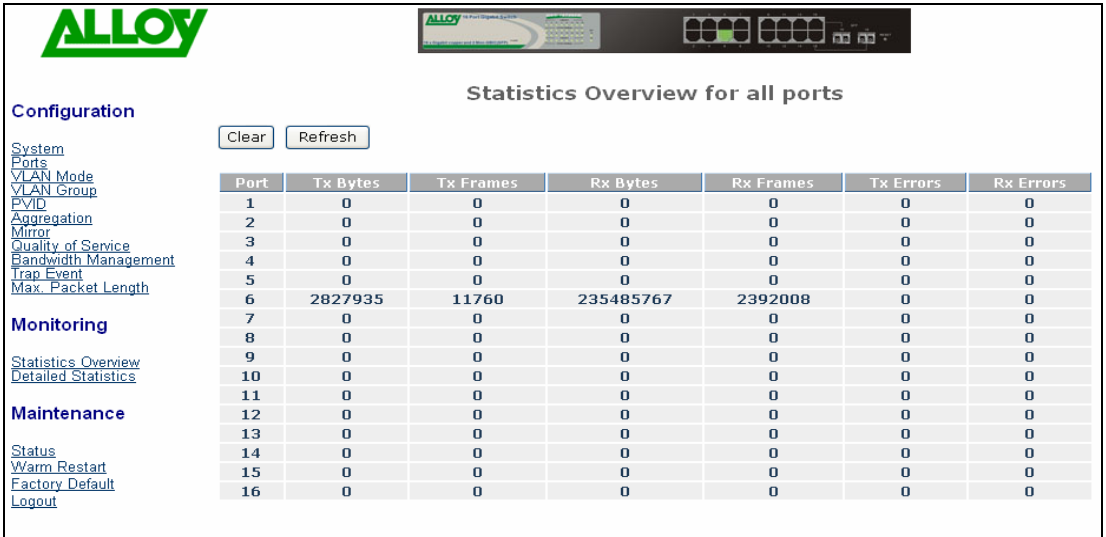


Fig. 3.23a

3.3.2. Detailed Statistics

- **Function Name:** Detailed Statistics
- **Function** Displays detailed counter information for a specific port
- **Description:** (See Fig. 3.24 below, which uses port 1 as an example)

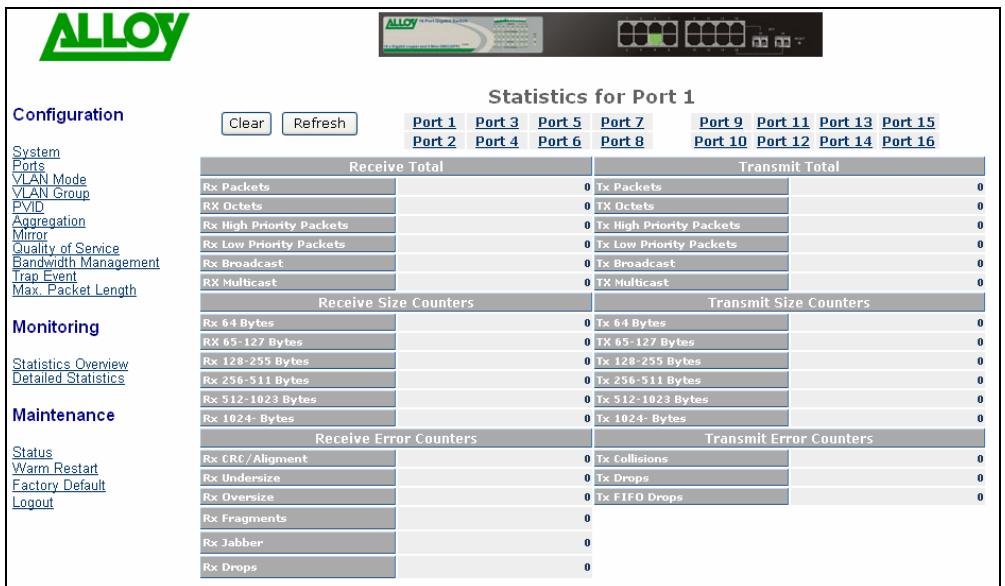


Fig. 3.24

Cont.

- Parameter Description:

Received (Rx) Packets:

* The number of the packets received

RX Octets:

* Total received data in bytes

Rx High Priority Packets:

* Number of Rx packets classified as high priority

Rx Low Priority Packets:

* Number of Rx packets classified as low priority

Rx Broadcast:

* Number of broadcast packets received

Rx Multicast:

* Number of multicast packets received

Transmitted (Tx) Packets:

* Number of packets transmitted

TX Octets:

* Total data transmitted in bytes

Tx High Priority Packets:

* Number of Tx packets classified as high priority

Tx Low Priority Packets:

* Number of Tx packets classified as low priority

Tx Broadcast:

* Number of broadcast packets transmitted

Tx Multicast:

* Number of multicast packets transmitted

Rx 64 Bytes:

* Number of 64-byte frames (includes non valid packets) received

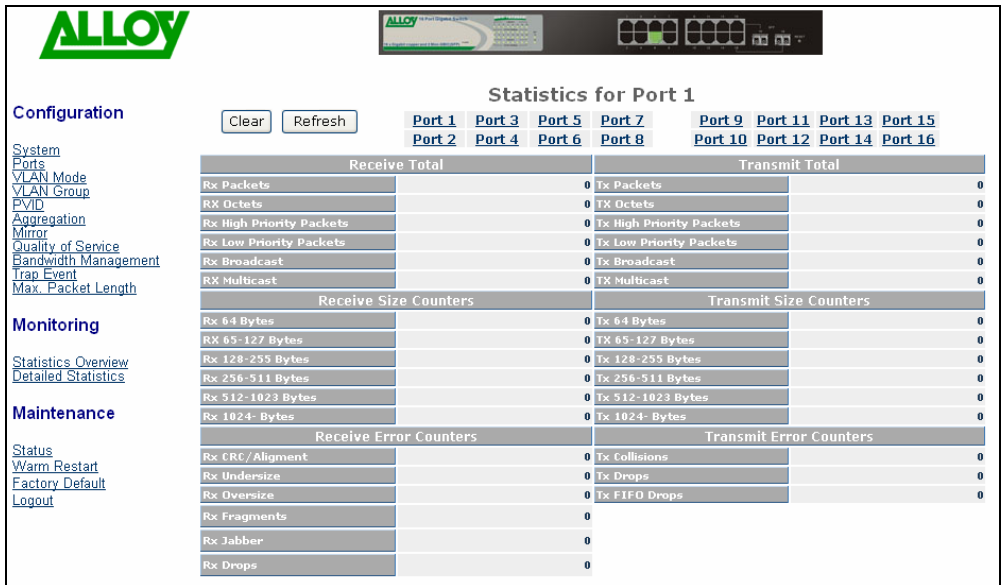


Fig. 3.24a

Rx 65-127 Bytes:

* Number of 65 to 127-byte frames (includes non valid packets) received

Rx 128-255 Bytes:

* Number of 128 to 255-byte frames (includes non valid packets) received

Rx 256-511 Bytes:

* Number of 256 to 511-byte frames (includes non valid packets) received

Rx 512-1023 Bytes:

* Number of 512 to 1023-byte frames (includes non valid packets) received

Rx 1024-Bytes:

* Number of 1024 maximum length byte frames (includes non valid packets) received

Tx 64 Bytes:

* Number of 64-byte frames (includes non valid packets) transmitted

Tx 65-127 Bytes:

* Number of 65 to 126-byte frames (includes non valid packets) transmitted

Tx 128-255 Bytes:

* Number of 128 to 255-byte frames (includes non valid packets) transmitted

Tx 256-511 Bytes:

* Number of 256 to 511-byte frames (includes non valid packets) transmitted

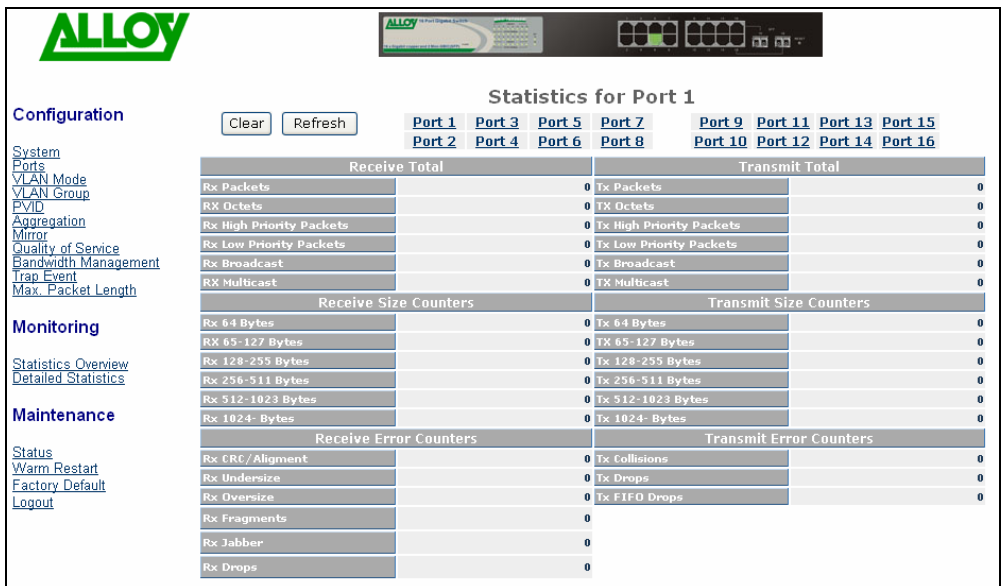


Fig. 3.24b

Cont.

Tx 512-1023 Bytes:

* Number of 512 to 1023-byte frames (includes non valid packets) transmitted

Tx 1024-Bytes:

* Number of 1024-maximum length byte frames (includes non valid packets) transmitted

Rx CRC/Alignment:

* Number of alignment errors/CRC error packets received

Rx Undersize:

* Number of short frames (64 Bytes or under) with valid CRC

Rx Oversize:

* Number of long frames (according to maximum length register) with a valid CRC

Rx Fragments:

* Number of short frames (64 Bytes or under) with an invalid CRC

Rx Jabber:

* Number of long frames (according to maximum length register) with an invalid CRC.

Rx Drops:

* Frames dropped due to the Receive Buffer being full

Tx Collisions:

* Number of collisions experienced during transmission

Tx Drops:

* The number of frames dropped due to excessive collision (for example, due to heavy network traffic loads), late collision (for example, collisions caused by cable lengths in excess of prescribed standards), or frame aging.

Tx FIFO Drops:

* Total frames dropped due to the Transmit Buffer being full

Statistics for Port 1

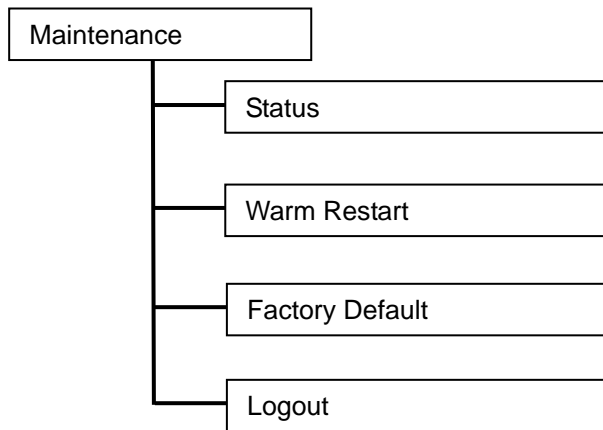
Clear Refresh

	Port 1	Port 3	Port 5	Port 7	Port 9	Port 11	Port 13	Port 15
	Port 2	Port 4	Port 6	Port 8	Port 10	Port 12	Port 14	Port 16
Receive Total					Transmit Total			
Rx Packets	0				Tx Packets	0		
Rx Octets	0				Tx Octets	0		
Rx High Priority Packets	0				Tx High Priority Packets	0		
Rx Low Priority Packets	0				Tx Low Priority Packets	0		
Rx Broadcast	0				Tx Broadcast	0		
Rx Multicast	0				Tx Multicast	0		
Receive Size Counters					Transmit Size Counters			
Rx 64 Bytes	0				Tx 64 Bytes	0		
Rx 65-127 Bytes	0				Tx 65-127 Bytes	0		
Rx 128-255 Bytes	0				Tx 128-255 Bytes	0		
Rx 256-511 Bytes	0				Tx 256-511 Bytes	0		
Rx 512-1023 Bytes	0				Tx 512-1023 Bytes	0		
Rx 1024-Bytes	0				Tx 1024-Bytes	0		
Receive Error Counters					Transmit Error Counters			
Rx CRC/Alignment	0				Tx Collisions	0		
Rx Undersize	0				Tx Drops	0		
Rx Oversize	0				Tx FIFO Drops	0		
Rx Fragments	0							
Rx Jabber	0							
Rx Drops	0							

Fig. 3.24c

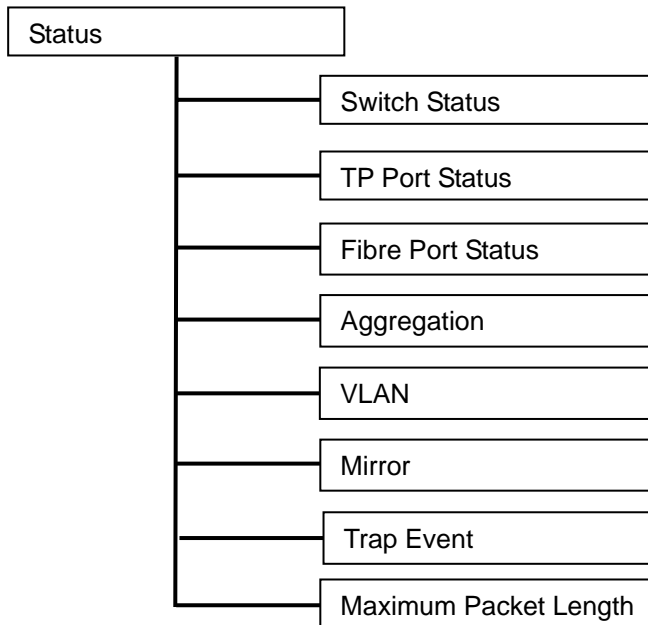
3.4. Maintenance

There are four functions contained in the maintenance section.



3.4.1. Status

8 sections are reported on in the switch status screen. These comprise: Switch status, TP Port Status, Fibre Port Status, Aggregation, VLAN, Mirror, Trap Event and Maximum Packet Length



3.4.1.1. Switch Status

- **Function Name:** Switch Status
- **Function Description:** Display the status information of the switch

Switch Status	
Product Name	16 port 10/100/1000 Mbps Gigabit Switch
Firmware Version	v1.03
Hardware Version	v1.01
Serial Number	030901000031
IP Address	192.168.1.1
Subnet Mask	255.255.255.0
Default Gateway	192.168.1.254
MAC Address	00-00-8c-02-00-31
System Name	GSS-16T2SFP
Auto Logout Timer (mins)	0

Fig. 3.25

- **Parameter Description:**
 - Product Name:**
 - * Provides a description of the specific switch model (i.e. either an Alloy 16 or 24 port Gigabit Switch)
 - Firmware Version:**
 - * Displays the firmware version currently installed on the switch
 - Hardware Version:**
 - * Displays the hardware version of the switch
 - Serial Number:**
 - * Displays the serial number assigned by the manufacturer to the switch
 - IP Address:**
 - * Displays the IP address of the switch
 - Subnet Mask:**
 - * Displays the subnet mask of the switch
 - Default Gateway:**
 - * Displays the default gateway of the switch
 - MAC Address:**
 - * Displays the Ethernet MAC address of the switch
 - System Name:**
 - * Displays the Alloy part number for the model of the switch (i.e. GSS-16T2SFP for a 16 port Gigabit switch and GSS-24T2SFPV2 for a 24 port Gigabit switch)
 - Auto Logout Timer:**
 - * Displays the current setting of the auto-logout timer for the switches web management interface

3.4.1.2. UTP & Fibre Port Status

- **Function Name:** TP/Fibre Port Status
- **Function Description:** Displays a summary of the port status for both TP and Fibre ports

TP Port Status							
Port	Link Status	Speed	Flow Control	Port	Link Status	Speed	Flow Control
1	Down	Auto	Enabled	2	Down	Auto	Enabled
3	Down	Auto	Enabled	4	Down	Auto	Enabled
5	Down	Auto	Enabled	6	100FDX	Auto	Enabled
7	Down	Auto	Enabled	8	Down	Auto	Enabled
9	Down	Auto	Enabled	10	Down	Auto	Enabled
11	Down	Auto	Enabled	12	Down	Auto	Enabled
13	Down	Auto	Enabled	14	Down	Auto	Enabled
15	Down	Auto	Enabled	16	Down	Auto	Enabled

Fiber Port Status							
15	Down	Auto	Enabled	16	Down	Auto	Enabled

Fig. 3.26

- **Parameter Description:**
 - Port:**
 - * Ports 1 to 16. Both ports 15 and 16 are optional SFP modules
 - Link Status:**
 - * Displays the status of the link for the port: Options are:
 - <10FULL>:
10Mbps Full duplex
 - <10HALF>:
10Mbps Half duplex
 - <100FULL>:
100Mbps Full duplex
 - <100HALF>:
100Mbps Half duplex
 - <1000FULL>:
1000Mbps Full duplex
 - <Down>:
Denotes that there is no link at present
 - Speed:**
 - * Displays the speed and duplex state of individual ports. The options are:
 - <Auto>:
Port is set to Auto-negotiation
 - <10FULL>:
Port is forced to 10Mbps Full duplex
 - <10HALF>:
Port is forced to 10Mbps Half duplex

Cont.

- <100FULL>:
Port is forced to 100Mbps Full duplex
- <100HALF>:
Port is forced to 100Mbps Half duplex
- <1000FULL>:
Port is forced to 1000Mbps Full duplex

Flow Control:

- * Displays flow control status active for individual ports.
Two options are available to choose from: **<Enable>** and **<Disable>**. The default mode is **<Enabled>**. There are two types of Flow Control supported by Ethernet (Both supported by Alloy Gigabit Switches):
 - Pause flow control:
As stipulated by IEEE standard 802.3x, for full-duplex operation
 - Backpressure:
For half-duplex operation

3.4.1.3. Aggregation

- **Function Name:** Aggregation
- **Function** Display the current setup of Aggregation/Trunking **Description:**

Aggregation	
Normal	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16
Group 1	
Group 2	
Group 3	
Group 4	
Group 5	
Group 6	
Group 7	
Group 8	

Fig. 3.27

- **Parameter** **Normal:**
Description: * Displays a list of ports that are not participating in any aggregation/trunking groups
- **Group 1-8:**
* If an aggregation/trunking group(s) has been configured, displayed by port number. Up to 8 aggregation/trunking groups can be defined

3.4.1.4. VLAN

- **Function Name:** VLAN Status
- **Function Description:** Display which VLAN mode the switch is operating with, and details of VLAN group settings.
- **Parameter Description:**
 - VLAN Mode:**
 - * Displays the 3 supported VLAN modes, with status displayed for each mode. The 3 modes are:
 - Tag Based VLAN
 - Port Based VLAN
 - Metro Mode VLAN
 - ID:**
 - * Display the Group ID
 - Description:**
 - * Displays the description associated with the VLAN group as defined by the network administrator
 - VID (Tag Based VLAN only):**
 - * Display the VLAN identifier value. Each tag-based VLAN group has a unique VID
 - Member:**
 - * Displays the ports belonging to each VLAN Group.

Fig. 3.28
Tag Based
VLAN

VLAN			
VLAN Mode	Tag Based VLAN		
ID	Description	VID	Member
1	Default	1	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16

Fig. 3.29
Port Based
VLAN

VLAN		
VLAN Mode	Port Based VLAN	
ID	Description	Member
1	Default	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16

Fig. 3.30
Metro Mode
VLAN

VLAN		
VLAN Mode	Metro Mode	
ID	Description	Member
1	Default1	1,15,16
2	Default2	2,15,16
3	Default3	3,15,16
4	Default4	4,15,16
5	Default5	5,15,16
6	Default6	6,15,16
7	Default7	7,15,16
8	Default8	8,15,16
9	Default9	9,15,16
10	Default10	10,15,16
11	Default11	11,15,16
12	Default12	12,15,16
13	Default13	13,15,16
14	Default14	14,15,16

3.4.1.5. Mirror

- **Function Name:** Mirror Status
- **Function Description:** Mirror Status displays the current mirror configuration

Mirror	
Sniffer Mode	Disable
Sniffer Port	1
Source Port	

Fig. 3.31

- **Parameter Description:**
 - Sniffer Mode:** * Displays the mirror status. The default is “disabled”
 - Sniffer Port:** * Displays the number of the port that is receiving the monitored data
 - Source Port:** * Displays the number of the port that is being monitored

3.4.1.6. Trap Event

- **Function Name:** Trap Event Status
- **Function Description:** Display the switch's trap information and trap events.

Trap Event			
Trap IP		0.0.0.0	
Trap IP		0.0.0.0	
System Event			
Warm Boot	<input type="checkbox"/>		
Cold Boot	<input type="checkbox"/>		
Illegal Login	<input type="checkbox"/>	Illegal Login Counter	0
TP and Fiber Port Event			
Link Up	<input type="checkbox"/>	Link Up Counter	0
Link Down	<input type="checkbox"/>	Link Down Counter	0
Rx error threshold	<input type="checkbox"/>	Rx error threshold Counter	0
Tx error threshold	<input type="checkbox"/>	Tx error threshold Counter	0
Error threshold			10

Fig. 3.32

Cont.

- **Parameter Description:**

Trap IP (1 and 2):

* The IP address of 1 or 2 two P.C.'s which can access trap event data and receive trap event warnings can be entered here. Current IP addresses are displayed as status information

Boot:

* Two parameters are available for Boot Traps. The associated tick boxes are endorsed to activate trap data/warnings. The parameters are:

- Warm Boot
- Cold Boot

Login:

* One parameter is available for Login Traps – “Illegal Login”. An associated tick box can be endorsed to activate trap data/warnings

Link:

* Two parameters are available for Link Traps. The associated tick boxes are endorsed to activate trap data/warnings. The parameters are:

- Link Up
- Link Down

“Link Up” and “Link Down” counters are displayed to show the total status of these events.

Transmit (Rx) and Receive (Tx):

* Three parameters are available for Rx/Tx Traps. The associated tick boxes are endorsed to activate trap data/warnings. The parameters are:

- Rx Error Threshold
- Tx Error Threshold
- Error Threshold – enter a number, which will determine how many events trigger a trap exception warning

“Link Up” and “Link Down” counters are displayed to show the total status of the Rx and Tx Error Threshold events

Trap Event			
Trap IP		0.0.0.0	
Trap IP		0.0.0.0	
System Event			
Warm Boot	<input type="checkbox"/>		
Cold Boot	<input type="checkbox"/>		
Illegal Login	<input type="checkbox"/>	Illegal Login Counter	0
TP and Fiber Port Event			
Link Up	<input type="checkbox"/>	Link Up Counter	0
Link Down	<input type="checkbox"/>	Link Down Counter	0
Rx error threshold	<input type="checkbox"/>	Rx error threshold Counter	0
Tx error threshold	<input type="checkbox"/>	Tx error threshold Counter	0
Error threshold			10

Fig. 3.32a

3.4.1.7. Maximum Packet Length

- **Function Name:** Maximum Packet Length
- **Function Description:** Display the maximum packet length setting on a per port basis
- **Parameter Description:** **Max. Frame Size:** * Displays the current setting of the maximum packet length on a per port basis. Values displayed are from a range of 1518 bytes, 1532 bytes or 9216 bytes

Maximum Packet Length			
Port	Max. Frame Size	Port	Max. Frame Size
1	1518	2	1518
3	1518	4	1518
5	1518	6	1518
7	1518	8	1518
9	1518	10	1518
11	1518	12	1518
13	1518	14	1518
15	1518	16	1518

Fig. 3.33

3.4.2. Warm Restart

The management interface for Alloy 16/24 Port Gigabit Switches offers a Warm Restart option. This simply reboots the switch with the current switch settings intact. (Optionally you could also press the RESET button on the front panel to reset the switch).

- **Function Name:** Warm Restart
- **Function Description:** Reboots the switch. This will take around thirty (30) seconds to complete the system boot. To activate, click the **<Yes>** button

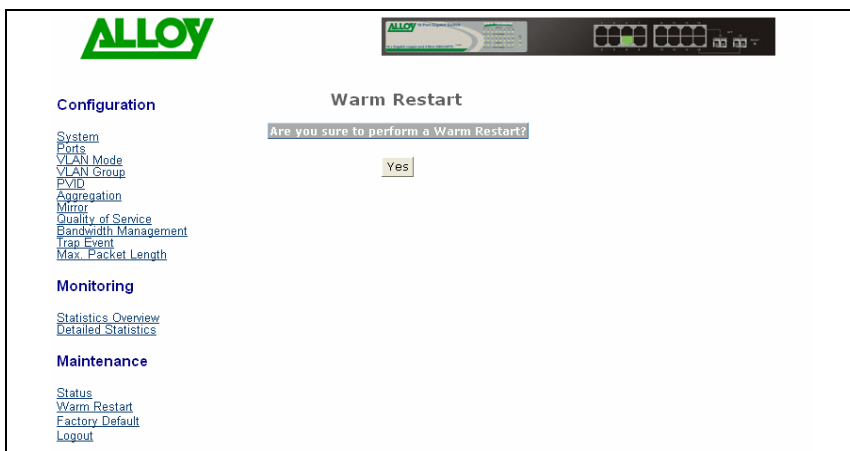


Fig. 3.34

3.4.3. Restore Default Configuration

- **Function Name:** Restore Default Configuration
- **Function Description:** The Factory Default function will reset the current configuration settings of the switch, and replace them with the original Factory Default settings.

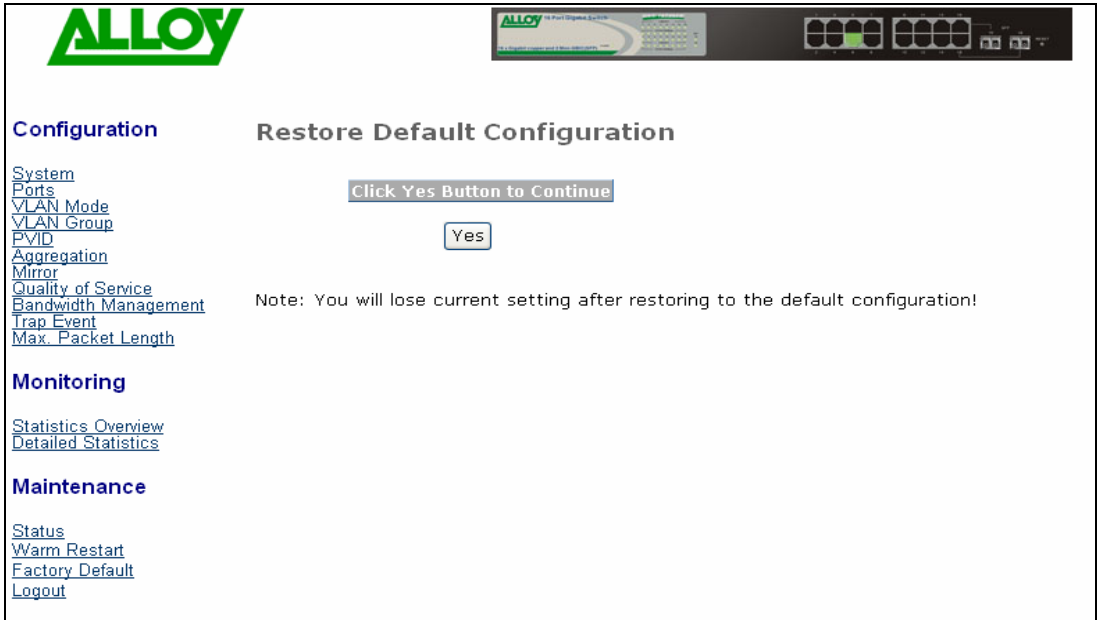


Fig. 3.35

3.4.4. Logout

Alloy 16/24 Gigabit Switches supports a web management auto-logout (see section 3.2.1) from the web interface, but there is also a manual logout function. If you need to release control of the web management so that another user can access it immediately, then you can manually perform a Logout with this function. Management of the switch is then immediately available to other users.

- **Function Name:** Logout
- **Function Description:** Logout from the web interface

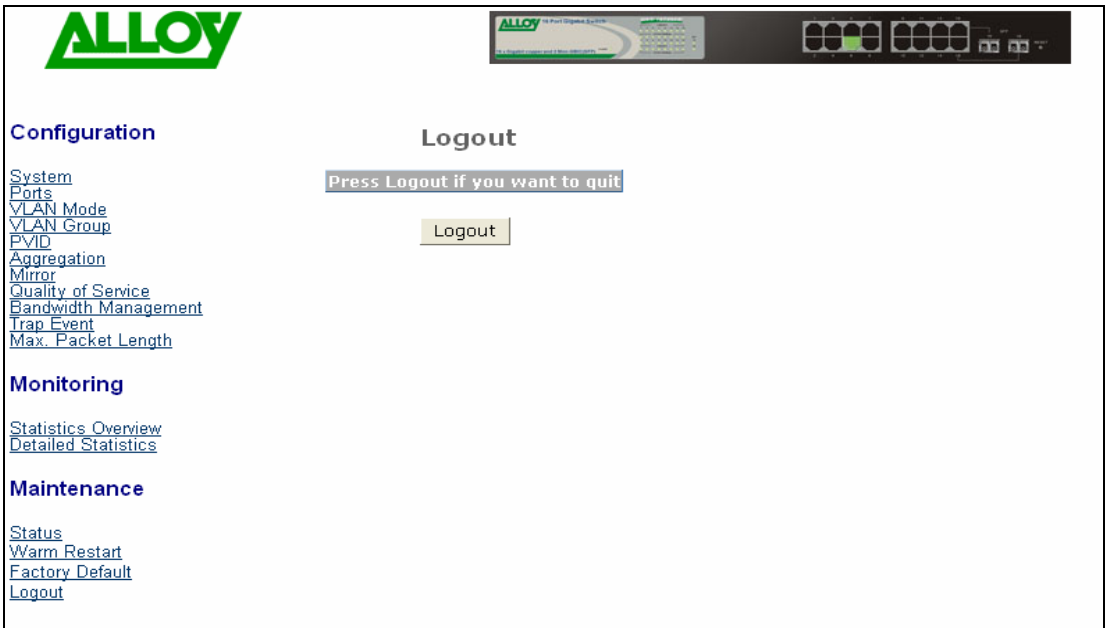


Fig. 3.36

4. Maintenance and Basic Troubleshooting

New generation switches are in most respects a 'black box' solution in terms of the basic installation and connection of network nodes (workstations, servers, subsidiary switches etc). Many discrete components that were present in earlier generation switches have now been 'folded' into the ASIC chipset of modern switches. Factors such as these have greatly enhanced the ease of use, reliability and maintenance of these devices.

This section is not intended to be a comprehensive overview of all maintenance and troubleshooting issues (especially the latter area); here we concentrate on some basic yet important issues that should be kept in mind when installing and using your Alloy switch.

4.1. Maintenance - Environment

Standard switches such as the Alloy 16/24 port Gigabit models are designed for use in an office environment. Specialised switches are available that are designed for use in adverse environments, such as manufacturing facilities, where dust, heat, vibration and other factors are an issue. If a standard type switch must be used in such an environment, it should be installed in an environmentally secure enclosure. For use in office environments, the following maintenance issues should be kept in mind:

- **Airflow:** as with all electronic devices, a switch produces heat. Inadequate or obstructed airflow around the switch can lead to heat buildup and damage to components. Ensure that adequate clearance is maintained around any ventilation points on the switch case
- **Dust/airborne particles:** As mentioned above, standard switches should not be used in a dusty environment, or if used, precaution should be taken to eliminate the ingress of particles into the switch through the ventilation points (environmentally secured cabinets etc). Dust will still be present in a normal office environment, so consideration should be given to using dustcaps to cover RJ-45 and Fibre ports that are not in use – particularly if a port is not used over an extended time frame. This is particularly important for fibre optic ports, and devices such as mini-GBIC modules which are usually supplied with dustcaps.

4.2 Maintenance – Switch Components/Attachments

As mentioned above, modern switches have far fewer components than earlier generation switches. There are no internal parts in an Alloy switch that require user maintenance/intervention (it should be remembered that Alloy's warranty terms exclude customer intervention inside the switch case, which should not be opened by anyone other than Alloy or an appointed alloy agent. Alloy's Warranty Terms can be viewed on the company web site at this address: <http://www.alloy.com.au/warranty.asp>. The following items should be kept in mind:

- **Fans:** Alloy 16/24 Port Gigabit Switches use a fan to ensure good levels of airflow in the switch case. The fan does not need maintenance. As the only moving part in the switch, this is the only possible source of mechanical noise inside the switch. Contact your Alloy reseller or the Alloy Service Department direct if any unexplained mechanical noise is heard from within the switch.
- **Network Cables:** If cables are regularly disconnected from ports and then re-connected, periodically inspect the cable connectors to ensure that wear or misuse has not impaired the ability of the connector to be firmly seated in/on the port and locked in place (for example, the plastic locking clip on RJ-45 connectors)
- **AC Mains Power Cord:** Periodically inspect the power inlet point on the switch to ensure

that the power cord is firmly seated. Alloy 16/24 gigabit Switches have a power cord clamp fitted – use of this device will ensure that the power cord cannot be easily displaced.

4.3 Basic Troubleshooting

As mentioned above, it is not possible to cover all aspects of troubleshooting a switch that is apparently exhibiting operational problems in this manual. However, the following items should be checked in the advent of certain types of difficulties with the basic operation of the switch:

- **The Switch Fails To Power up:**

- ⇒ Ensure the AC power cord is connected to the mains outlet and the switch AC power inlet correctly, and both the mains socket and the switch is turned on *otherwise*
- ⇒ Check and ensure that the mains circuit from which the switch is drawing power is functioning

- **One or More Ports Fail to Link:**

- ⇒ Ensure the switch is powered on (see above)
- ⇒ If you have just powered on the switch, check that it has finished it's POST check and has assumed an operational state
- ⇒ Check that the cable(s) connected to the ports that do not give link are of the correct type. Example 1: Cat 3 UTP cable cannot be used on a Gigabit Ethernet network. Example 2: a singlemode type fibre optic cable will not operate correctly connected to a mini-GBIC fibre optic module whose transceiver is of multimode type, even though the cable can be physically connected
- ⇒ Check that the length of the cable connected to the port is within the range prescribed by the relevant standard (for example, Cat 5e UTP for Gigabit Ethernet – maximum range of 100 metres)
- ⇒ Check that the cable you are using is functioning correctly (the simplest way to do this is to transfer the cable to a port that currently has a valid link with it's associated node device, install the suspect cable, and observe if a valid link is achieved)
- ⇒ If all the above items have been checked, it is possible that a fault has developed on the individual port in question. Contact your Alloy agent
- ⇒ If the network node device at the remote end of the link (Network Adapter Card, Switch, Hub etc) is an older legacy device, it may not support Nway auto-negotiation, as in the case of modern switches. In such cases, it is possible that your Alloy 16/24 Gigabit switch has not been able to synch speed and/or duplex characteristics correctly with the legacy device. For example, the Alloy 16/24 Gigabit switch may have set the port to full duplex mode whilst the remote device is set to half duplex. Check the management interface of your Alloy 16/24 Gigabit switch to determine the speed/duplex mode, and if your remote legacy device has a management utility/interface, check the settings at that end of the link. Correct any mismatch at the remote end.

Cont.

- **Abnormally Heavy Traffic/Packet Collision Count:**

- ⇒ Problems of this type can have many causes. However, if the LED indicators on your Alloy 16/24 Gigabit switch show such problems, check that network cards used in your system are functioning correctly. Faulty Network Adapters can propagate high levels of 'runt' (corrupted) packets onto the network

Appendix A

Technical Specifications

Key Features

- **GSS-16T2SFP:** 16x (10/100/1000Mbps) Gigabit Ethernet (TP) switching ports compliant with IEEE802.3, 802.3u, 802.3z and 802.3ab
- **GSS-24T2SFPV2:** 24x (10/100/1000Mbps) Gigabit Ethernet (TP) switching ports compliant with IEEE802.3, 802.3u, 802.3z and 802.3ab.
- 2 Gigabit Copper/SFP paired ports for support of Fibre or Copper Mini-GBIC media. SFP ports are paired with TP ports 15 and 16 (GSS-16T2SFP) and ports 23 and 24 (GSS-24T2SFPV2). Only one of the two paired ports can be used at any one time
- Non-blocking store-and-forward switching fabric
- Shared buffer memory integrated into ASIC
- Supports auto-negotiation for configuring speed and duplex mode
- Supports 802.3x Flow Control for full-duplex ports
- Supports collision-based and carrier-based backpressure for half-duplex ports
- All ports can be configured for disabled mode, forced mode or auto-negotiation
- Supports Head of Line (HOL) blocking prevention
- Supports broadcast storm filtering
- Web-based management provides the ability to completely manage the switch from any web browser
- Supports Port-based VLAN and Protocol-based (IEEE802.1Q) VLAN.
- MAC address table auto-aging with programmable inter-age time
- Supports 802.1p Class of Service (CoS) with 2-level priority queuing
- Supports Port Trunking with flexible load distribution and failover
- Supports port sniffer mirroring function
- Supports Gigabit Ethernet Jumbo Frames and programmable maximum Ethernet frame length from 1518 to 9216 bytes.
- Efficient self-learning and MAC address recognition mechanism enables forwarding rate at wire speed

Cont.

Hardware Specifications

- **Standards Compliance:** IEEE802.3/802.3ab / 802.3z / 802.3u / 802.3x

- **Network Interface:**

Configuration	Mode	Connector	Port
10/100/1000Mbps Gigabit copper	Nway	TP (RJ-45) ¹	1–16 (GSS-16T2SFP) 1–24 (GSS-16T2SFP)
1000Base-SX Gigabit Fibre	1000 FDX	SFP ²	15,16 (GSS-16T2SFP) 23, 24 (GSS-16T2SFP)
1000Base-LX Gigabit Fibre	1000 FDX	SFP ²	15,16 (GSS-16T2SFP) 23, 24 (GSS-16T2SFP)
1000Base-LX Single Fibre WDM	1000 FDX	SFP ²	15,16 (GSS-16T2SFP) 23, 24 (GSS-16T2SFP)

- Notes: 1: Ports 15 & 16 (GSS-16T2SFP) and 23 & 24 (GSS-16T2SFP) are paired copper TP RJ-45/SFP fibre module slot dual media ports. Only one port from each pair can be used at any given point. The paired ports have an auto- detect feature
- 2: SFP module slots are used to install optional mini-GBIC modules, primarily for fibre Gigabit Ethernet connectivity. Optional SFP mini-GBIC modules support LC or WDM SC transceivers in multimode or singlemode varieties. See section 1.5 for details of Alloy mini-GBIC module products

- **Transmission Mode:**
 - * 10/100Mbps supports full or half duplex
 - * 1000Mbps supports full duplex only
- **Transmission Speed:**
 - * 10/100/1000Mbps for Copper
 - * 1000Mbps for Fibre (SFP)
- **Full Forwarding/Filtering * PPS (packets per second)**
Packet Rate:

Forwarding Rate	Speed
1,488,000PPS	1000Mbps
148,800PPS	100Mbps
14,880PPS	10Mbps

- **MAC Address and Self-learning:**
 - * 8K MAC address
 - * 4K VLAN table entries,
- **Buffer Memory:**
 - * Embedded 400 KB frame buffer
- **Flow Control:**
 - * IEEE802.3x compliant for full duplex
 - * Backpressure flow control for half duplex

Cont.

▪ **Maximum Cable Length:**

TP	Cat. 5 UTP cable or higher, max. range to 100m
1000Base-SX	Up to 220/275/500/550 metres, Depending on Multimode Fibre type and quality
1000Base-LX	Singlemode Fibre, various distances 10/30/50Km etc...
1000Base-LX WDM	Singlemode Single Fibre, up to 20Km

▪ **Diagnostic LED:**

System LED :	Power
Per Port LED: 10/100/1000M TP Port 1 to 16 1000M SFP Fibre Port 15,16	: LINK/ACT, 10/100/1000Mbps : SFP(LINK/ACT)

▪ **Power Requirement:** AC Mains Power

Voltage	100-240 V
Frequency	50-60 Hz
Consumption	30W

▪ **Environmental:**

▪ Ambient Temperature	0° to 50° C
▪ Humidity	5% to 90%
▪ Dimensions	44(H) × 442(W) × 209(D) mm (both models)
▪ Complies with FCC Part 15 Class A & CE Mark Approval, C-Tick	