

PES-1014

Phoneline-Ethernet Switch

September 2001

User's Guide

ZyXEL

TOTAL INTERNET ACCESS SOLUTION

Copyright

Copyright © 2001 by ZyXEL Communications Corporation.

The contents of this publication may not be reproduced in any part or as a whole, transcribed, stored in a retrieval system, translated into any language, or transmitted in any form or by any means, electronic, mechanical, magnetic, optical, chemical, photocopying, manual, or otherwise, without the prior written permission of ZyXEL Communications Corporation.

Published by ZyXEL Communications Corporation. All rights reserved.

Disclaimer

ZyXEL does not assume any liability arising out of the application or use of any products, or software described herein. Neither does it convey any license under its patent rights nor the patents rights of others. ZyXEL further reserves the right to make changes in any products described herein without notice. This publication is subject to change without notice.

Trademarks

Trademarks mentioned in this publication are used for identification purposes only and may be properties of their respective owners.

ZyXEL Limited Warranty

ZyXEL warrants to the original end user (purchaser) that this product is free from any defects in materials or workmanship for a period of up to two (2) years from the date of purchase. During the warranty period, and upon proof of purchase, should the product have indications of failure due to faulty workmanship and/or materials, ZyXEL will, at its discretion, repair or replace the defective products or components without charge for either parts or labor, and to whatever extent it shall deem necessary to restore the product or components to proper operating condition. Any replacement will consist of a new or re-manufactured functionally equivalent product of equal value, and will be solely at the discretion of ZyXEL. This warranty shall not apply if the product is modified, misused, tampered with, damaged by an act of God, or subjected to abnormal working conditions.

Note

Repair or replacement, as provided under this warranty, is the exclusive remedy of the purchaser. This warranty is in lieu of all other warranties, express or implied, including any implied warranty of merchantability or fitness for a particular use or purpose. ZyXEL shall in no event be held liable for indirect or consequential damages of any kind of character to the purchaser.

To obtain the services of this warranty, contact ZyXEL's Service Center; refer to the separate Warranty Card for your Return Material Authorization number (RMA). Products must be returned Postage Prepaid. It is recommended that the unit be insured when shipped. Any returned products without proof of purchase or those with an out-dated warranty will be repaired or replaced (at the discretion of ZyXEL) and the customer will be billed for parts and labor. All repaired or replaced products will be shipped by ZyXEL to the corresponding return address, Postage Paid (USA and territories only). If the customer desires some other return destination beyond the U.S. borders, the customer shall bear the cost of the return shipment. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Interference Statements and Warnings

FCC

Interference Statement:

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference.
- (2) This device must accept any interference received, including interference that may cause undesired operations.

FCC Warning!

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

CE Mark Warning:

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

Certifications

Refer to the product screen at www.zyxel.com.

Customer Support

If you have questions about your ZyXEL product or desire assistance, contact ZyXEL Communications Corporation offices worldwide, in one of the following ways:

Contacting Customer Support

When you contact your customer support representative, have the following information ready:

- ◆ Product model and serial number.
- ◆ Firmware version information.
- ◆ Warranty information.
- ◆ Date you received your product.
- ◆ Brief description of the problem and the steps you took to solve it.

METHOD	E-MAIL - SUPPORT/ SALES	TELEPHONE/FAX	WEB SITE/ FTP SITE	REGULAR MAIL
LOCATION				
Worldwide	support@zyxel.com.tw support@europe.zyxel.com sales@zyxel.com.tw	+886-3-578-3942 +886-3-578-2439	www.zyxel.com www.europe.zyxel.com ftp.europe.zyxel.com	ZyXEL Communications Corp., 6 Innovation Road II, Science-Based Industrial Park, HsinChu, Taiwan 300, R.O.C.
North America	support@zyxel.com sales@zyxel.com	+1-714-632-0882 800-255-4101 +1-714-632-0858	www.zyxel.com ftp.zyxel.com	ZyXEL Communications Inc., 1650 Miraloma Avenue, Placentia, CA 92870, U.S.A.
Scandinavia	support@zyxel.dk sales@zyxel.dk	+45-3955-0700 +45-3955-0707	www.zyxel.dk ftp.zyxel.dk	ZyXEL Communications A/S, Columbusvej 5, 2860 Soeborg, Denmark.
Austria	support@zyxel.at sales@zyxel.at	+43-1-4948677-0 +43-1-4948678	www.zyxel.at ftp.zyxel.at	ZyXEL Communications Services GmbH, Thaliastrasse 125a/2/2/4 A-1160 Vienna, Austria
Germany	support@zyxel.de sales@zyxel.de	+49-2405-6909-0 +49-2405-6909-99	www.zyxel.de	ZyXEL Deutschland GmbH, Adenauerstr. 20/A4 D-52146 Wuerselen, Germany
Malaysia	support@zyxel.com.my sales@zyxel.com.my	+603-795-44-688 +603-795-34-407	www.zyxel.com.my	Lot B2-06, PJ Industrial Park, Section 13, Jalan Kemajuan, 46200 Petaling Jaya Selangor Darul Ehasn, Malaysia

Table of Contents

Copyright.....	ii
ZyXEL Limited Warranty	iii
Interference Statements and Warnings	iv
Customer Support	v
List of Figures.....	ix
List of Tables	xi
Preface	xii
Chapter 1 Getting to Know the PES-1014	1-1
1.1 PES-1014 Phonenumber Ethernet Switch.....	1-1
1.2 Features.....	1-1
1.2.1 Easy Management	1-1
1.2.2 Interface.....	1-1
1.2.3 High Performance.....	1-1
1.2.4 Scalability.....	1-1
1.2.5 VLAN Group.....	1-2
1.2.6 Security Mode	1-2
1.2.7 Loop Free Network.....	1-2
1.2.8 Flow control	1-2
1.2.9 QoS.....	1-2
1.2.10 Broadcast Storm Control	1-2
1.2.11 Firmware Upgrade.....	1-2
1.2.12 LED Indicators	1-2
1.3 Physical Specifications	1-3
1.3.1 Dimensions and Weight	1-3
1.3.2 Operating Environment and Power	1-3
1.4 MTU Application	1-3
Chapter 2 Hardware Overview	2-1
2.1 Front Panel	2-1
2.1.1 Front Panel Ports	2-1
2.1.2 Front Panel LEDs	2-1
2.2 Console Port.....	2-2
2.3 Ethernet Port Connections	2-2
2.4 Daisy-chain Connections	2-3
2.5 Phonenumber Networking Port Connections.....	2-3
2.6 Rear Panel.....	2-3
Chapter 3 Getting Started.....	3-1

3.1	Web Browser	3-1
3.2	Login.....	3-1
3.3	Welcome Screen	3-2
	Main Screen	3-3
3.4.1	Information Panel.....	3-3
3.4.2	Front Panel	3-4
3.4.3	System Info	3-5
3.4.4	Saving Changes.....	3-6
3.4.5	Reset.....	3-6
Chapter 4	System	4-1
4.1	Introduction.....	4-1
4.2	System Info.....	4-2
4.3	System Configuration	4-3
4.4	Port Monitoring Configuration.....	4-4
4.5	Networking.....	4-5
4.6	SNMP	4-6
4.6.1	SNMP Community.....	4-6
4.6.2	SNMP Host	4-7
4.7	Save Changes	4-8
4.8	Firmware Upgrade.....	4-8
Chapter 5	Port.....	5-1
5.1	Introduction.....	5-1
5.2	All Ports Status	5-2
5.3	Port Configuration.....	5-3
5.4	Port Assigned	5-4
Chapter 6	Trunk.....	6-1
6.1	Introduction.....	6-1
6.2	Load-balancing Methods	6-1
6.2.1	MAC-based Load-balancing	6-1
6.2.2	Port-based Load-balancing.....	6-1
6.3	Trunk Menus.....	6-1
6.3.1	Current Trunk Status	6-2
6.3.2	Load Balancing Method Selection	6-2
6.3.3	MAC-based Mode Trunk Configuration.....	6-3
6.3.4	Port-based Mode Trunk Configuration	6-4
6.3.5	Port-based Mode Port Mapping	6-5
Chapter 7	VLAN.....	7-1
7.1	Introduction.....	7-1

7.1.1	VLAN Status	7-1
7.2	Edit VLAN Group	7-2
Chapter 8	Forwarding DB (Database).....	8-1
8.1	Introduction	8-1
8.2	Current Forwarding DB Status	8-1
8.2.1	Current Static Entries	8-2
8.2.2	Edit Static Entry	8-3
Chapter 9	Statistics.....	9-1
9.1	Introduction	9-1
9.2	TX/RX Counters.....	9-2
9.3	Error Counters	9-3
9.4	Packet Analysis (TX)	9-4
9.5	Packet Analysis (RX).....	9-5
9.6	Packet Attribute	9-6
9.7	Collision Info	9-7
9.7.1	Single Port Statistics.....	9-8
Chapter 10	STP.....	10-1
10.1	Introduction	10-1
10.2	Spanning Tree Configuration (Bridge) – (Switch Parameters)	10-1
10.3	Spanning Tree Configuration (Port).....	10-3
Chapter 11	Reset.....	11-1
11.1	Introduction	11-1
11.2	Reset Counters.....	11-1
11.3	Reset To Factory Default	11-2
11.4	Reboot Device	11-2
Chapter 12	Account	12-1
12.1	Introduction	12-1
12.2	Browse Account List	12-1
12.3	Add/Del Account.....	12-2
12.4	Change Password	12-3
Appendix A	System Parameters	A
Appendix B	Safety Warnings and Instructions.....	E
Index	G

List of Figures

Figure 1-1 MTU Application.....	1-4
Figure 2-1 PES-1014 Front Panel.....	2-1
Figure 2-2	2-2
Figure 2-3 PES-1014 Rear Panel.....	2-3
Figure 3-1 Login.....	3-1
Figure 3-2 Welcome Screen	3-2
Figure 3-3 Main Screen.....	3-3
Figure 3-4	3-3
Figure 3-5	3-3
Figure 3-6.....	3-3
Figure 3-7 Information Panel	3-3
Figure 3-8 Switch Icon	3-4
Figure 3-9 Front Panel.....	3-4
Figure 3-10 System Info.....	3-5
Figure 4-1 System	4-1
Figure 4-2 System Info.....	4-2
Figure 4-3 System Configuration	4-3
Figure 4-4 Port Monitoring Configuration	4-4
Figure 4-5 Networking	4-5
Figure 4-6 SNMP Community	4-6
Figure 4-7 SNMP Host.....	4-7
Figure 4-8 Save Changes.....	4-8
Figure 4-9 Firmware Upgrade	4-8
Figure 5-1 Port bar	5-1
Figure 5-2 All Ports Status	5-2
Figure 5-3 Port Configuration	5-3
Figure 5-4 Port Assigned.....	5-5
Figure 6-1 Trunk.....	6-2
Figure 6-2 Trunk Status Screen.....	6-2
Figure 6-3 Load Balancing Mode Selection Screen.....	6-3
Figure 6-4 MAC-based Mode Trunk Configuration Screen.....	6-3
Figure 6-5 Port-based Mode Trunk Configuration Screen	6-5
Figure 6-6 Port-based Mode Mapping Screen.....	6-5
Figure 7-1 VLAN	7-1
Figure 7-2 VLAN Status	7-2
Figure 7-3 Edit VLAN Group	7-2
Figure 8-1 Forwarding Database Bar	8-1

Figure 8-2 Current Forwarding DB Status	8-2
Figure 8-3 Current Static Entries	8-3
Figure 8-4 Edit Static Entry	8-3
Figure 9-1 Statistics	9-1
Figure 9-2 TX/RX Counters.....	9-2
Figure 9-3 Error Counters	9-3
Figure 9-4 Packet Analysis (TX)	9-4
Figure 9-5 Packet Analysis (RX)	9-5
Figure 9-6 Packet Attribute	9-6
Figure 9-7 Collision Info.....	9-7
Figure 9-8 Single Port Statistics.....	9-8
Figure 10-1 STP.....	10-1
Figure 10-2 Spanning Tree Configuration (Bridge).....	10-2
Figure 10-3 Spanning Tree Configuration (Port).....	10-3
Figure 11-1 Reset	11-1
Figure 11-2 Reset Counters.....	11-1
Figure 11-3 Reset to Factory Default	11-2
Figure 11-4 Reboot Device Screen	11-2
Figure 12-1 Account Bar.....	12-1
Figure 12-2 Account List	12-1
Figure 12-3 Add/Del Account.....	12-2
Figure 12-4 Change Password	12-3

List of Tables

Table 2-1 Front Panel Ports	2-1
Table 2-2 PES-1014 Network Module LED Descriptions.....	2-1
Table 3-1 Information Descriptions.....	3-4
Table 3-2 Manager Front Panel LEDs.....	3-4
Table 4-1 System Info Description.....	4-2
Table 4-2 System Configuration Description	4-3
Table 4-3 Port Monitoring Configuration Description	4-4
Table 4-4 Networking Description	4-5
Table 4-5 SNMP Community Description	4-6
Table 4-6 SNMP Host Description.....	4-7
Table 5-1 All Ports Status Description	5-2
Table 5-2 Speed/Duplex Settings	5-3
Table 5-3 Port Configuration Description	5-3
Table 5-4 Port Assigned Description.....	5-5
Table 6-1 Exclusive Or.....	6-4
Table 6-2 Bit Selection Port Assignment	6-4
Table 6-3 MAC Address Based Mode Bit Selection Example	6-4
Table 6-4 Port-based Mode Mapping	6-5
Table 7-1 VLAN Status Description	7-2
Table 7-2 Edit VLAN Group Description	7-3
Table 8-1 Current Forwarding DB Status Description	8-2
Table 8-2 Current Static Entries Description.....	8-3
Table 8-3 Edit Static Entry Description.....	8-4
Table 9-1 TX/RX Counters Description.....	9-2
Table 9-2 Error Counters Description	9-3
Table 9-3 Packet Analysis (TX) Description.....	9-4
Table 9-4 Packet Analysis (RX) Description.....	9-5
Table 9-5 Packet Attribute Description	9-6
Table 9-6 Collision Info Description.....	9-7
Table 9-7 Single Port Statistics Description	9-8
Table 10-1 Spanning Tree Configuration (Bridge) Description	10-2
Table 10-2 Spanning Tree Configuration (Port) Description.....	10-3
Table 12-1 Account List Description.....	12-2
Table 12-2 Add/Del Account Description	12-2
Table 12-3 Change Password Description.....	12-3

Preface

Congratulations on your purchase of the PES-1014 Phonenumber-Ethernet Switch.

This preface introduces you to the PES-1014 and discusses the organization and conventions of this user's guide

About the PES-1014

The PES-1014 is a Phonenumber to Ethernet switch. It allows you to multiplex traffic from up to 14 phone lines to an Ethernet network before it is forwarded to the Internet.

General Syntax Conventions

“Enter” means for you to type one or more characters and press the carriage return. “Select” or “Choose” means for you to select one from the predefined choices.

“Out-of-band” refers to the RJ-45 Ethernet port labeled **CONSOLE**.

“In-band” refers to all of the other ports (Ethernet ports A and B and the RJ-11 phonenumber ports 1 to 14)

Related Documentation

ZyXEL Web site and FTP server site

You can access release notes as well as firmware upgrades at ZyXEL web and FTP sites. Refer to the Customer Support page for more information.

Chapter 1

Getting to Know the PES-1014

1.1 PES-1014 Phonenumber Ethernet Switch

The PES-1014 is a sixteen port (14 RJ-11 and 2 RJ-45) intelligent phonenumber networking switch for Multi-Tenant Unit and Multi-Dwelling Unit (MTU/MDU) applications. It uses well-known SNMP management platforms such as Hewlett Packards's Open View, and web browsers like Netscape or Internet Explorer (IE) for configuration and supervising network status.

1.2 Features

1.2.1 Easy Management

- Built-in, user-friendly, web-based management
- Supports Netscape 4.0, Internet Explorer 5.0 and later
- RJ-45 console port for local management
- Supports SNMP v1 (RFC-1157)
- Supports MIB II (RFC-1213)
- Supports Bridge MIB (RFC-1493)
- Supports private switch MIB
- Supports RMON groups 1,2,3 and 9.

1.2.2 Interface

- Two 10BaseT/100BaseTX, auto-negotiating RJ-45 ports
- Fourteen RJ-11 ports that support the 1.0Mbps HPNA 1.1 standard

1.2.3 High Performance

- 4Mb total memory buffer
- 17K entry MAC address table
- Supports port aggregation (combining lower speed ports into a higher speed logical link)

1.2.4 Scalability

- Daisy-chain up to seven PES-1014 switches

1.2.5 VLAN Group

- Supports up to 64 port-based VLAN groups
- Provides privacy in MTU applications

1.2.6 Security Mode

- Blocks unauthorized computers from accessing the network

1.2.7 Loop Free Network

- Supports the Spanning Tree Protocol (802.1D) to simplify network configuration and improve fault tolerance

1.2.8 Flow control

- Supports Backpressure flow control in half-duplex mode
- Supports 802.3x flow control in full-duplex mode.

1.2.9 QoS

- Quality of Service prioritizes network traffic

1.2.10 Broadcast Storm Control

- Allows you to define a threshold to limit the amount of broadcast traffic and avoid degrading overall system performance

1.2.11 Firmware Upgrade

- Remote firmware upgrade via web browser

1.2.12 LED Indicators

- Power LED
- Status LEDs for power-on or reset diagnostics
- Out-of-band (console) port LED
- SNMP-enabled LED
- Speed and Activity/Link LEDs for each Ethernet port
- Link and Activity LEDs for each phonenumber networking port

1.3 Physical Specifications

1.3.1 Dimensions and Weight

- Dimensions: 440 x 192 x 44 mm
- Weight: 2.5kg
- Metal case that is 483mm (19 inch) rack mountable

1.3.2 Operating Environment and Power

- Operating Temperature: 5 — 50° Celsius
- Operating Humidity: 10% — 90% (non-condensing)
- Input Voltage Range: 100 — 240 Volts AC
- Line Frequency Range 50 — 60 Hertz

1.4 MTU Application

The PES-1014 delivers 1Mbps data service over existing copper telephone wires. It does not interfere with Plain Old Telephone Service (POTS), digital telephone or ISDN traffic and does not require splitters. The PES-1014 is also compatible with ADSL lines, allowing service providers to deploy the PES-1014 in buildings where broadband service already exists. See the following figure for an example of an MTU installation.

Multiple Tenant Unit (MTU)

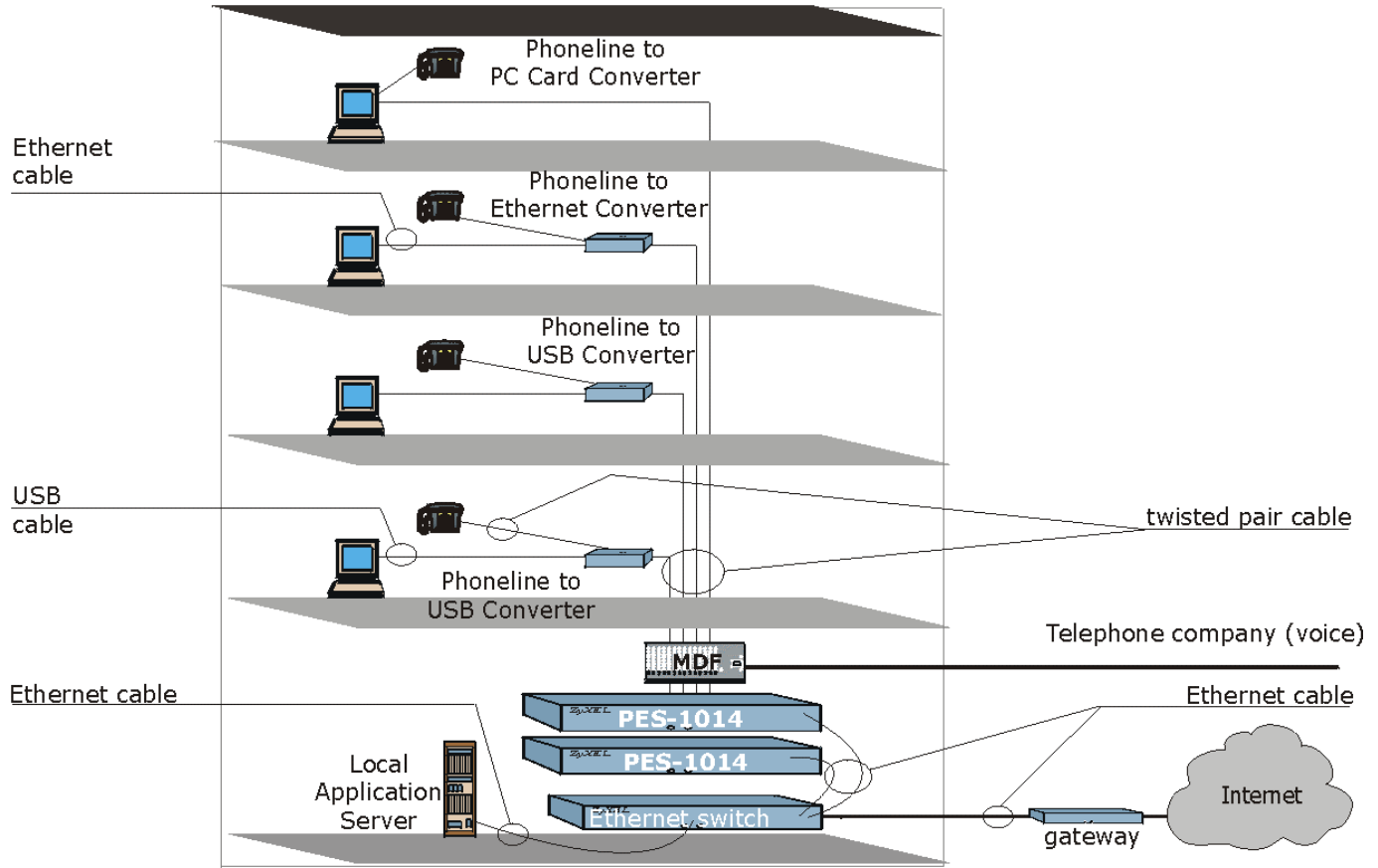


Figure 1-1 MTU Application

Chapter 2

Hardware Overview

2.1 Front Panel

Refer to *Appendix B* Safety Warnings and Instructions before installing the PES-1014.

The following figure shows the front panel of the PES-1014.

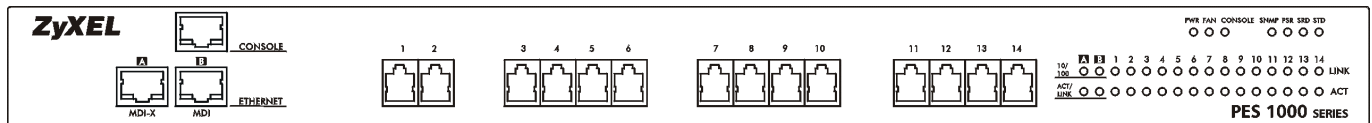


Figure 2-1 PES-1014 Front Panel

2.1.1 Front Panel Ports

The following table describes the ports on the front panel of the PES-1014.

Table 2-1 Front Panel Ports

PORTS	DESCRIPTION
CONSOLE	An RJ-45 10/100 Mbps auto-sensing Ethernet port for configuring the PES-1014.
ETHERNET	
A MDI-X	An RJ-45 10/100 Mbps auto-sensing Ethernet port for WAN connection to a router.
B MDI	An RJ-45 10/100 Mbps auto-sensing Ethernet port for WAN connection to a router.
1-14	RJ-11 ports that connect users to the PES-1014.

2.1.2 Front Panel LEDs

The following table describes the LED indicators on the front panel the PES-1014.

Table 2-2 PES-1014 Network Module LED Descriptions

LED	COLOR	STATUS	DESCRIPTION
PWR	Green	On	The PES-1014 is receiving power.
		Off	The PES-1014 is not receiving power.
FAN	Orange	On	The fan is malfunctioning.
		Off	The fan is operating normally
CONSOLE	Green	On	The CONSOLE port is connected.
		Off	The CONSOLE port is not connected.

LED	COLOR	STATUS	DESCRIPTION
SNMP	Green		These LEDs are used in a diagnostic test when the PES-1014 turns on. They turn on and off one-by-one in the following order: SNMP> PSR> SRD> STD. After this the SNMP will turn on again and remain on.
PSR	Green		
SRD	Green		
STD	Green		
A, B (these are the Ethernet ports)			
10/100	Green	On	The port is connected to a 100Mbps Ethernet.
		Off	The port is connected to a 10Mbps Ethernet.
ACT/LINK	Green	Blinking	The port link is sending/receiving data.
		Off	The port link is down.
1-14 (these are the phonenumber ports)			
LINK	Green	On	The phonenumber networking link is up.
		Off	The phonenumber networking link is down.
ACT	Green	Blinking	The phonenumber networking link is sending/receiving data.
		Off	The phonenumber networking link is not sending/receiving data.

2.2 Console Port

Connect the manager computer to the PES-1014's console port using a straight-through Ethernet cable.

2.3 Ethernet Port Connections

ETHERNET PORT	ETHERNET CABLE TYPE
ETHERNET A MDI-X	Straight-through or cross-over
ETHERNET B MDI	Straight-through

Figure 2-2

Connect **ETHERNET** port **A** to a switch or router. You may use either a straight-through or a cross-over cable since **ETHERNET** port **A MDI-X** automatically detects and adjusts to the type of equipment to which it is connected.

Use a straight-through Ethernet cable to connect **ETHERNET** port **B MDI** to a switch or router.

2.4 Daisy-chain Connections

Daisy-chain up to seven PES-1014 switches using Ethernet cables.

If you daisy-chain PES-1014s, you cannot trunk the Ethernet ports to form a 200Mbps connection; since one Ethernet port must be used to connect to the next PES-1014.

Connect the Ethernet switch or router to **ETHERNET** port **A** on the first PES-1014 using an Ethernet cable. Connect the first PES-1014's **ETHERNET** port **B** to **ETHERNET** port **A** on the second PES-1014 using another Ethernet cable. Connect up to five more PES-1014 switches; always connecting **ETHERNET** port **B** of one PES-1014 to **ETHERNET** port **A** of the next.

2.5 Phonenumber Networking Port Connections

An MDF (Main Distribution Frame) is the point of termination for the telephone company and in-building telephone lines. Use standard telephone wire to connect the RJ-11 ports (numbered 1-14) on the PES-1014 to the MDF.

2.6 Rear Panel

Make sure you are using a 100 — 240 Volt AC, 50 — 60 Hertz power source.

The following figure shows the rear panel of the PES-1014.

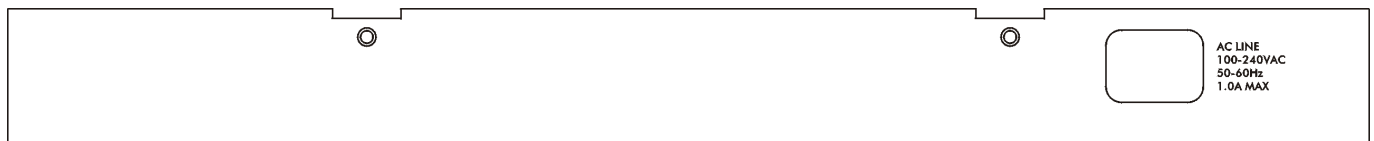


Figure 2-3 PES-1014 Rear Panel

Connect the female end of the power cord to the power receptacle on the rear panel of your PES-1014. Connect the other end of the cord to a power outlet. Make sure that no objects obstruct the airflow of the fan (located on the side of the unit).

Chapter 3

Getting Started

3.1 Web Browser

Use IE 5.0 or later or Netscape 4.0 or later. The default IP addresses are as follows:

192.168.11.1 for the CONSOLE port (out-of-band)

192.168.10.1 for all other ports (in-band)

After the first login, refer to 4.5 for information on configuring the switch's IP address.

You cannot configure the CONSOLE port's (out-of-band) IP address.

3.2 Login

Procedure for a first login (using the out-of-band console port):

- Step 1.** Type in your PES-1014's IP address as the URL in your web browser (192.168.11.1 for the out-of-band console port).
- Step 2.** The **Enter Network Password** screen appears as shown next.

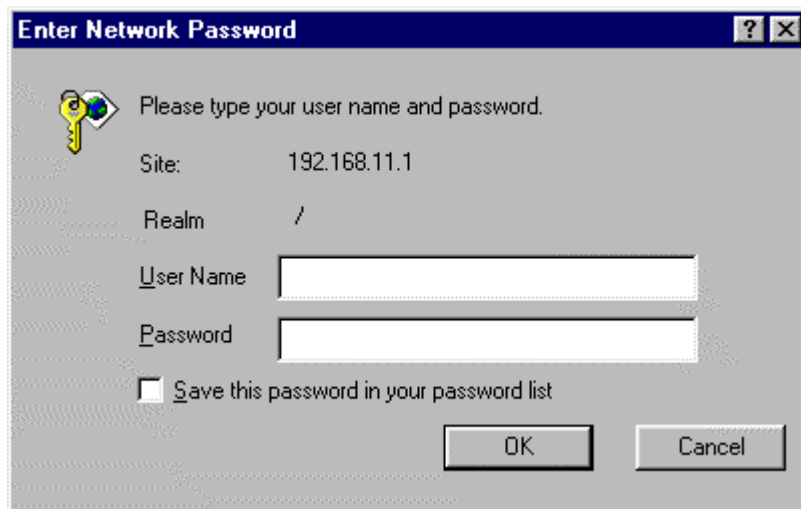


Figure 3-1 Login

Step 3. The **User Name** and **Password** boxes have been set to “null” for the first login; just click **OK**.

Step 4. The web-based management system **Welcome** screen appears.

Refer to section 12.3 for adding accounts after logging in.

After adding accounts, type in the **User Name** and **Password** when logging in.

3.3 Welcome Screen

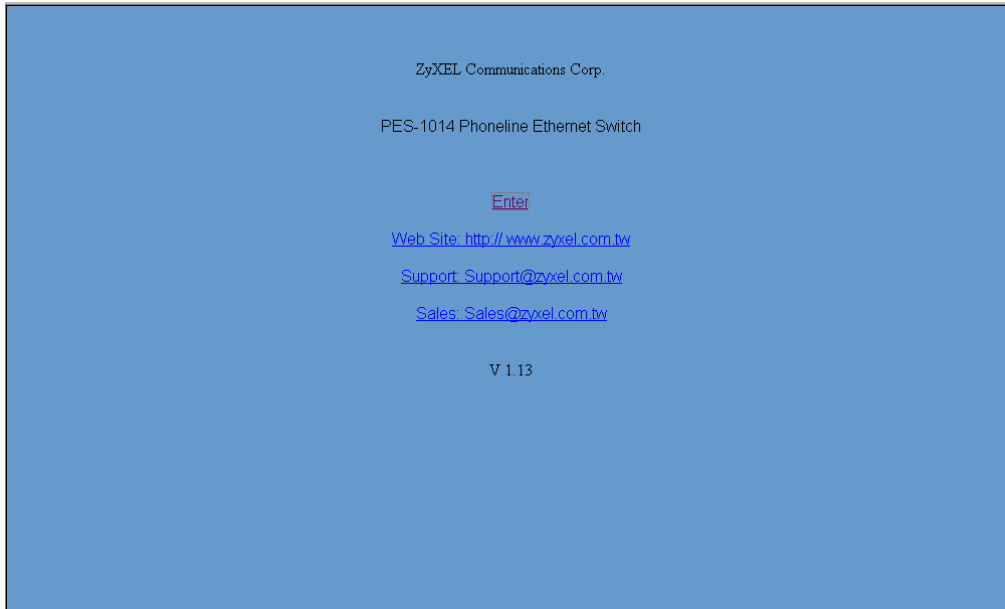


Figure 3-2 Welcome Screen

The **Welcome** screen gives you links to the main ZyXEL web-site and e-mail for support and sales. Click **Enter** to go to the **Main** screen of the device manager.

3.4 Main Screen

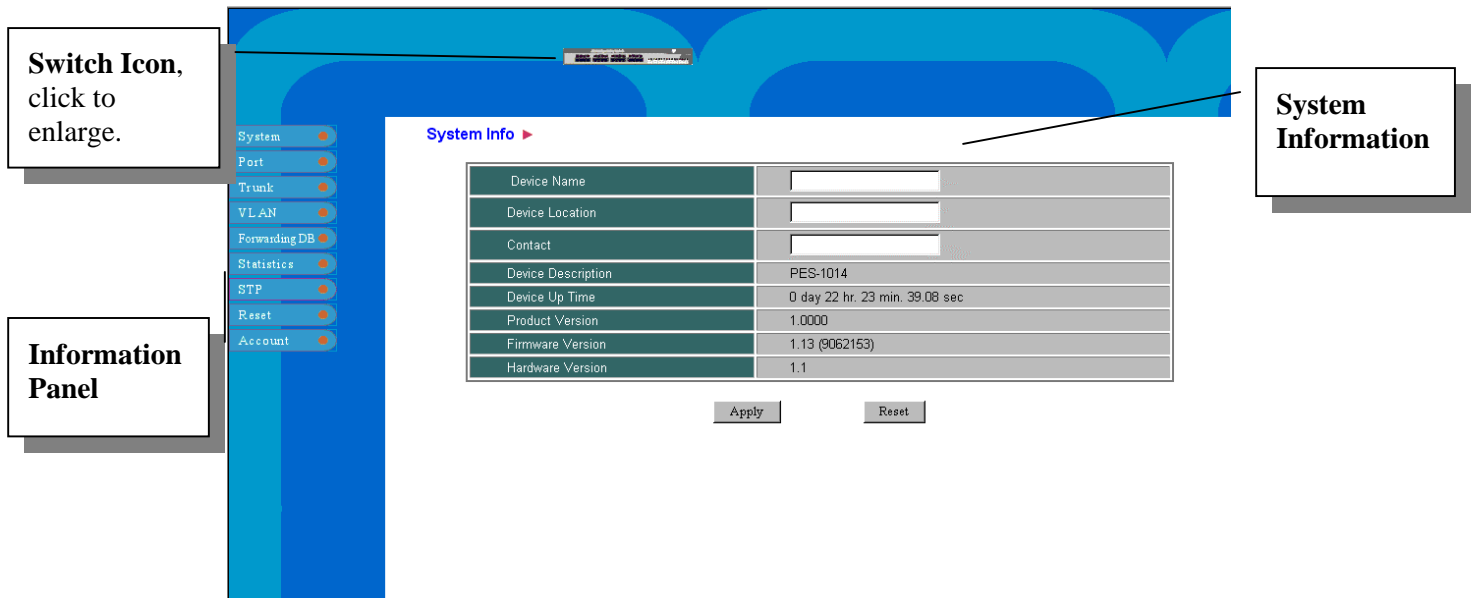


Figure 3-3 Main Screen

3.4.1 Information Panel



Figure 3-7 Information Panel

The left side of the **Main** screen links you to every main subject of this management system. Click a link to bring up corresponding submenus for further information.

Table 3-1 Information Descriptions

LINK	DESCRIPTION
System	Use to view general system information and set related system functions.
Port	Use to view information about the main functions and status of each port and set individual port functions.
Trunk	Use to view trunk status, and set trunk configuration and mapping.
VLAN	Use to display VLAN status and edit VLAN setup
Forwarding DB	Use to display status of the forwarding data base and edit entries
Stastics	Use to view the statistical contents of each port and host
STP	Use to edit switch and port parameters
Reset	Use to reset counters and factory defaults or restart the switch.
Account	Use to view and add/delete accounts or change passwords.

3.4.2 Front Panel



Figure 3-8 Switch Icon



Figure 3-9 Front Panel

On the front of the switch, we see different ports and LEDs.



-  Represents an Ethernet port.
-  Represents an RJ-11 Port

Table 3-2 Manager Front Panel LEDs

LED	COLOR	STATUS	DESCRIPTION
PWR	Green	On	The PES-1014 is receiving power.
		Off	The PES-1014 is not receiving power.
FAN	Orange	On	The fan is malfunctioning.
		Off	The fan is operating normally
CONSOLE	Green	On	The CONSOLE port is connected.
		Off	The CONSOLE port is not connected.
A, B (these are the Ethernet ports)			

LED	COLOR	STATUS	DESCRIPTION
10/100	Green	On	The port is connected to a 100Mbps Ethernet.
		Dim	The port is connected to a 10Mbps Ethernet.
ACT/LINK	Green	Off	The port link is down.
		Blinking	The port link is sending/receiving data.
1-14 (these are the phoneline ports)			
LINK	Green	On	The phoneline networking link is up.
		Off	The phoneline networking link is down.
ACT	Green	Blinking	The phoneline networking link is sending/receiving data.
		Off	The phoneline networking link is not sending/receiving data.

- Click on a port to enter that port's configuration screen.

You may modify the panel refresh time in the System Configuration screen.

Click the top-right icon  of the panel to hide the front panel.

3.4.3 System Info

System Info ▶

Device Name	<input type="text"/>
Device Location	<input type="text"/>
Contact	<input type="text"/>
Device Description	PES-1014
Device Up Time	0 day 22 hr. 29 min. 39.91 sec
Product Version	1.0000
Firmware Version	1.13 (9062153)
Hardware Version	1.1

Figure 3-10 System Info

- This screen refreshes every 3 minutes.
- See 4.2 for detailed field descriptions.

3.4.4 Saving Changes

If you do not save your configuration changes to flash memory, all of your changes will be lost when the switch is restarted. Use the following steps to save changes when you are done configuring a screen.

Step 1. Click **Apply** (this saves the settings to working memory).

Step 2. Move your cursor over **System** in the **Information Panel** and click **Save Changes**.

Step 3. Click **Save** in the **Save Changes** screen (saves the settings to flash memory).

- Settings in the Networking screen will not take effect until the switch is restarted. Do the following to restart:

Step 4. Move your cursor over **Reset** in the **Information Panel** and click **Reboot Device**.

Step 5. Click **Reboot and Saving**.

3.4.5 Reset

Click **Reset** to go to the screen's previous configuration.

Chapter 4 System

4.1 Introduction

Move the cursor over the **System** link to display the submenus shown in the next figure.



Figure 4-1 System

4.2 System Info

Move the cursor over the **System** link and click **System Info** to display the **System Info** screen shown next.

Use this screen to display general system information and record the switch's name, location and contact person.

System Info ▶

Device Name	<input type="text"/>
Device Location	<input type="text"/>
Contact	<input type="text"/>
Device Description	PES-1014
Device Up Time	0 day 22 hr. 29 min. 39.91 sec
Product Version	1.0000
Firmware Version	1.13 (9062153)
Hardware Version	1.1

Figure 4-2 System Info

Table 4-1 System Info Description

FIELD	DESCRIPTION	EXAMPLE
Device Name	Type in up to 255 characters for the name of the switch here. This field is case sensitive.	Switch 1
Device Location	Type in up to 255 characters for the location of the switch here. This field is case sensitive.	Vienna Austria
Contact	Type in up to 255 characters for the name of the contact person for this switch. This field is case sensitive.	Bob Administrator
Device Description	This read-only field displays your device's model name.	PES-1014
Device Up Time	This read-only field displays the length of time that your device has been up and running since it was last initiated.	0 day 22 hr. 29 min. 39.91 sec
Product Version	This read-only field displays the version of your device.	1.0000
Firmware Version	This read-only field displays the current firmware version of your device.	1.13 (9062153)
Hardware Version	This read-only field displays the current hardware version of your device.	1.1

Click **Apply** to save your changes to working memory or click **Reset** to go to the previous configuration. Refer to 3.4.4 for directions on saving your changes to flash memory before you restart the switch.

4.3 System Configuration

Move the cursor over the **System** link and click **System Configure** to display the **System Configuration** screen shown next.

Use the **System Configuration** screen to set up functions of the system. It can also set the counter and panel refreshing time intervals. These settings apply to the whole device.

System Configuration ►

SuperMAC	Disable ▾
Aging Control	Enable ▾
Aging Time (0..30) min	10
BroadCast Storm Control Threshold	48 ▾
Panel Refresh Time Interval (1..60) sec	10
Counter Refresh Time Interval (1..60) sec	10

Figure 4-3 System Configuration

Table 4-2 System Configuration Description

FIELD	DESCRIPTION	EXAMPLE
SuperMac	<p>Enable or Disable the capability of using a more aggressive backing off of incoming packets when collisions happen.</p> <p>When set to Enable, the device will use a more aggressive back off algorithm (back off max. 3 time slots) when collisions occur, instead of using the standard Ethernet back off algorithm.</p> <p>When set to Disable, the device will use the IEEE802.3 standard exponential back off algorithm when collisions occur.</p>	Disable
Aging Control	<p>Enable or Disable the aging of the dynamic address learning table entries. The address table is set by auto address learning (dynamic) or by manual entry (static). Aging Control is only available to dynamic address learning table entries.</p> <p>Select Enable to make the switch age the dynamic address learning entries.</p> <p>When you select Disable, the switch will not age the dynamic address learning entries.</p>	Enable (default)
Aging Time (0.30) min	<p>Configure this field to determine how long a source MAC address can stay in the address look up table (forwarding database).</p> <p>Select an Aging Time range from 0 to 30 minutes.</p>	10 (default)
Broadcast Storm Control Threshold	<p>Use this option to limit the number of consecutive broadcast packets transmitted to the switch. The available selections are 16, 32, 48 or 64 packets.</p>	48 (default)

FIELD	DESCRIPTION	EXAMPLE
Panel Refresh Time Interval (1..60) sec	Select how often you wish to refresh this screen. Options range from 1 to 60 seconds. You must reopen the page after configuring to make the new settings active.	10 (default)
Counter Refresh Time Interval (1..60) sec	Select how often you wish to refresh the statistics counters. Options range from 1 to 60 seconds. You must reopen the page after configuring to make the new settings active.	10 (default)

Click **Apply** to save your changes to working memory or click **Reset** to go to the previous configuration. Refer to 3.4.4 for directions on saving your changes to flash memory before you restart the switch.

4.4 Port Monitoring Configuration

Move the cursor over the **System** link and click **Port Monitoring** to display the **Port Monitoring Configuration** screen shown next.

You can specify snooping ports to do monitoring on the monitored port. Only one monitored port is allowed at one time. Incoming packet flow and outgoing packet flow can be monitored by different snooping ports. Check the **Status** box of the Monitored Port to enable the monitoring of both the incoming and the outgoing packet flows.

Port Monitoring Configuration ►

Current Monitoring Port Status.

Monitored Port ID.	Snooping Port ID for incoming packet flow.	Snooping Port ID for Outcoming packet flow.
1	2	3

Monitored Port ID.

Status	Function	Port
<input checked="" type="checkbox"/>	Snooping Port ID for Incoming packet flow.	<input type="text" value="2"/>
<input checked="" type="checkbox"/>	Snooping Port ID for Outgoing packet flow.	<input type="text" value="3"/>

Apply

Figure 4-4 Port Monitoring Configuration

Table 4-3 Port Monitoring Configuration Description

FIELD	DESCRIPTION	EXAMPLE
Current Monitoring Port Status		
Monitored Port ID	Indicates the number of the monitored port.	1
Snooping Port ID for Incoming packet flow	Indicates the snooping port that monitors the Incoming packet flow of the monitored port. "-" when it is disabled	- (default)
Snooping Port ID for Outgoing packet flow	Indicates the snooping port that monitors the outgoing packet flow of the monitored port.	- (default)
Monitored Port ID.	Select the number of a port to monitor.	1
Status	Select the Status box to enable monitoring of the incoming or outgoing packet flows.	Unchecked (default)

FIELD	DESCRIPTION	EXAMPLE
Port options	Select the number of the port that will monitor the incoming or outgoing packet flows.	2

Click **Apply** to save your changes to working memory. Refer to 3.4.4 for directions on saving your changes to flash memory before you restart the switch.

Performance of a monitored port degrades if incoming and outgoing packet snooping are both being performed on it simultaneously.

4.5 Networking

Move the cursor over the **System** link and click **Networking** to display the **Networking** screen shown next. Select one of the two interfaces currently supported (In-Band and Out-of Band) in this management system.

Out-of-Band is the CONSOLE port and cannot be configured.

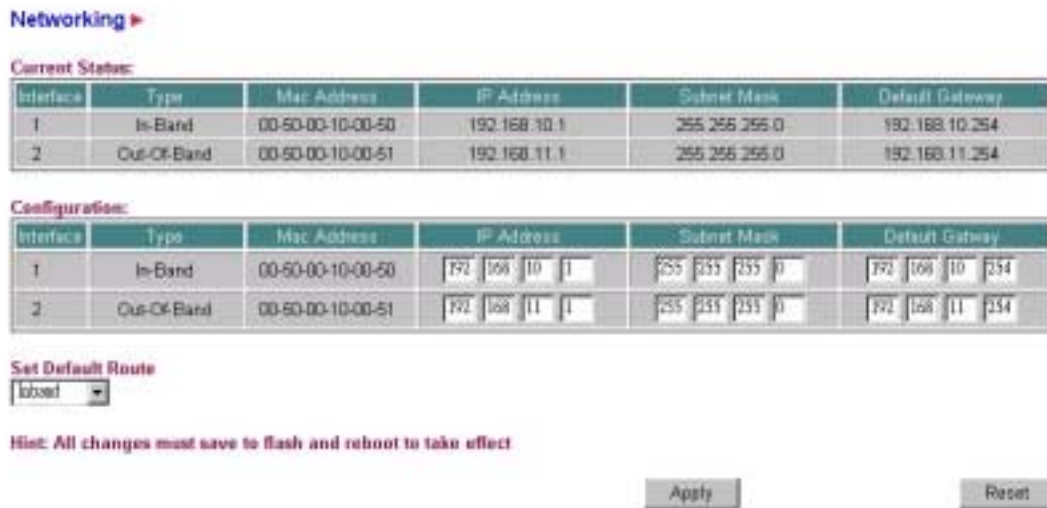


Figure 4-5 Networking

Table 4-4 Networking Description

FIELD	DESCRIPTION	EXAMPLE
Current Status - These read-only fields display the current status of each interface.		
Configuration (You may only configure the in-band interface)		
Interface	This read-only field is the number of the type of interface that connects to the switch.	1
Type	This read-only field is the type of interface that connects to the switch. Out-of-band stands for the console port and in-band stands for the switch's other ports.	Out-of-Band
Mac Address	This read-only field is the Mac address calculated by the switch for either the in-band ports or the out-of-band (console) port.	00-50-00-10-00-50
IP Address	Type your IP address in this field. Each time the IP address is changed, you must restart the switch before the new IP address becomes effective.	192.168.10.1 (In-Band default)
Subnet Mask	Type your subnet mask here (if you are using one).	255.255.255.0

FIELD	DESCRIPTION	EXAMPLE
Default Gateway	The default gateway IP address is used when the switch tries to reach a non-local IP host. Use this field to assign a default gateway.	192.168.10.254 (In-Band default)
Set Default Route	The default route is where the switch sends packets that it receives that are not in its domain. Normally you select Inband to send these packets through the in-band ports. Select Out-of Band if you have the out-of-band port linked to a different subnet and want to send these packets through the out-of-band port.	Inband

Click **Apply** to save your changes to working memory or click **Reset** to go to the previous configuration. Refer to 3.4.4 for directions on saving your changes to flash memory and restarting the switch. You must restart the switch to make changes in this screen effective.

4.6 SNMP

Manage and monitor the switch through the Simple Network Management Protocol (SNMP) Management Information Base (MIB). Configure the following settings:

- Set the names of the community strings
- Set each community's access right to either read-write or read-only.
- Set which community will receive SNMP traps
- Enable or disable certain communities

4.6.1 SNMP Community

Move the cursor over the **System** link and click **SNMP** to display the **SNMP Community** screen shown next.

SNMP Community ▶

Community	Access Right	Trap Receiving	Status
public	Read-Write	Enable	Enable
	Read-Only	Disable	Disable
	Read-Only	Disable	Disable
	Read-Only	Disable	Disable

Figure 4-6 SNMP Community

Table 4-5 SNMP Community Description

FIELD	DESCRIPTION	EXAMPLE
Community	Give a name to each community (a group of nodes in a management host) in this field. Each community must have a name (like a password) in order to identify legitimate sources of SNMP requests, determine what information a community can access and which functions that community is allowed to perform. Up to four communities can be assigned and enabled in one system. The community name is case sensitive and can be up to a maximum of 12	public (default)

FIELD	DESCRIPTION	EXAMPLE
	characters.	
Access Right	Select Read-Only , to allow the management host to perform read functions only. Select Read-Write , to allow the management host to perform both read and write functions.	Read-Write (default)
Trap Receiving	Select Enable to allow the management host to receive SNMP Traps. Select Disable to disallow the management host from receiving SNMP Traps.	Enable (default)
Status	Select Enable or Disable to enable or disable a specific community.	Enable (default)

Click **Apply** to save your changes to working memory or click **Reset** to go to the previous configuration. Refer to 3.4.4 for directions on saving your changes to flash memory before you restart the switch.

You must get a valid Community string before enabling the specified Community.

4.6.2 SNMP Host

This **SNMP Host** screen gives SNMP host information. The maximum number of SNMP hosts is six.

SNMP Host ▶

IP Address	Host Name	Community	Status
192 . 168 . 10 . 2	FactorySnmp	public	Enable ▼
0 . 0 . 0 . 0			Disable ▼
0 . 0 . 0 . 0			Disable ▼
0 . 0 . 0 . 0			Disable ▼
0 . 0 . 0 . 0			Disable ▼
0 . 0 . 0 . 0			Disable ▼

Figure 4-7 SNMP Host

Table 4-6 SNMP Host Description

FIELD	DESCRIPTION	EXAMPLE
IP Address	Input the IP addresses of the management hosts so they can receive SNMP trap messages.	192.168.10.2 (default)
Host Name	This column indicates the name of the management host. It is case sensitive and its maximum length is 12 characters.	Factory SnmpM (default)
Community	Indicates the name of the community that the management host belongs to. See the previous figure or the top half of the screen.	public (default)
Status	Select either Enable or Disable to enable or disable the SNMP management functions of each management host.	Enable (default)

Click **Apply** to save your changes to working memory or click **Reset** to go to the previous configuration. Refer to 3.4.4 for directions on saving your changes to flash memory before you restart the switch.

4.7 Save Changes

Move the cursor over the **System** link and click **Save Changes** to display the **Save Changes** screen shown next. All the settings mentioned above are stored only in working memory and are lost after the power is turned off. After you configure settings, use the following procedure to store them:

Step 1. Click **Apply**.

Step 6. Click **System** in **Information**, and then **Save Changes**.

Step 2. Click **Save** to save the settings into flash memory.

Restart the device (see 3.4.4) to store the settings in long term memory.



Figure 4-8 Save Changes

4.8 Firmware Upgrade

Use Internet Explorer 5.0 or later to upgrade the firmware.
Do not interrupt the upgrade process (interrupting it causes an error).
Restart the switch immediately after the upgrade is completed.

Move the cursor over the **System** link and click **Software Upgrade** to display the **Firmware Upgrade** screen shown next.

- Download the new version software file through Internet by web browser or FTP server.

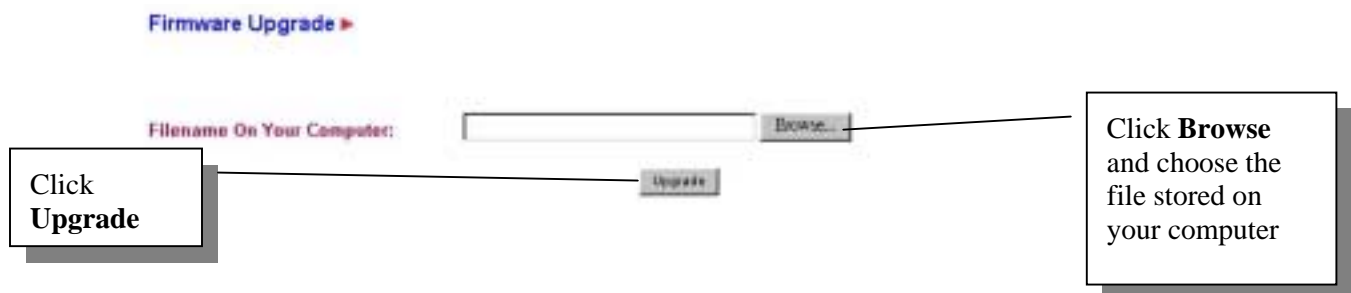


Figure 4-9 Firmware Upgrade

- The system will complete the upgrade process automatically.
- Restart the device to finish the upgrade process.

Chapter 5

Port

5.1 Introduction

Move the cursor over the **Port** link to display the submenus shown in the next figure.



Figure 5-1 Port bar

5.2 All Ports Status

Move the cursor over the **Port** link and then click **All Ports** to display the **All Ports Status** screen shown next. This screen shows the link status, transmission speed and duplex mode of the current ports. Click a port's number to link directly to the selected port.

All Ports Status ►

Port NO.	Port Name	Link	Speed/Duplex	STP Port Status
A		Down	-	-
B		Up	100/FULL	-
1		Down	-	-
2		Down	-	-
3		Down	-	-
4		Down	-	-
5		Down	-	-
6		Down	-	-
7		Down	-	-
8		Down	-	-
9		Down	-	-
10		Down	-	-
11		Down	-	-
12		Down	-	-
13		Down	-	-
14		Down	-	-

Figure 5-2 All Ports Status

Table 5-1 All Ports Status Description

FIELD	DESCRIPTION	EXAMPLE
Port NO.	Click Port NO. to go to a port's configuring screen.	A
Port Name	Give each port a name (up to 255 characters) for identification purposes. This field is case sensitive.	myport
Link	This column indicates the current link status of each port. UP represents connected DOWN represents disconnected.	Up
Speed/Duplex	This column shows each port's current transmission speed of 10 Mbps or 100 Mbps, as well as its duplex. Refer to <i>Table 5-2</i> for more information. Duplex- "Full" indicates simultaneously sending and receiving transmissions at 10Mbps or 100Mbps. "Half" indicates sending or receiving at 10Mbps or 100Mbps in one direction only at a time.	100/FULL
STP Port Status	This column represents the port's status in STP (Spanning Tree Protocol). Possible states are forwarding, listening, learning, blocking and "-" (which means the Spanning Tree Protocol is disabled).	-

Table 5-2 Speed/Duplex Settings

SPEED/DUPLEX	DESCRIPTION
100/FULL	This port is simultaneously sending and receiving transmissions at 100 Mbps (full duplex).
10/FULL	This port is simultaneously sending and receiving transmissions at 10Mbps (full duplex).
100/HALF	This port is sending or receiving at 100Mbps in one direction only at a time (half duplex).
10/HALF	This port is sending or receiving at 10Mbps in one direction only at a time (half duplex).

5.3 Port Configuration

Click on a port's **Port NO.** in the **All Ports Status** screen to bring up the **Port Configuration** screen. Use this screen to configure the specified port.

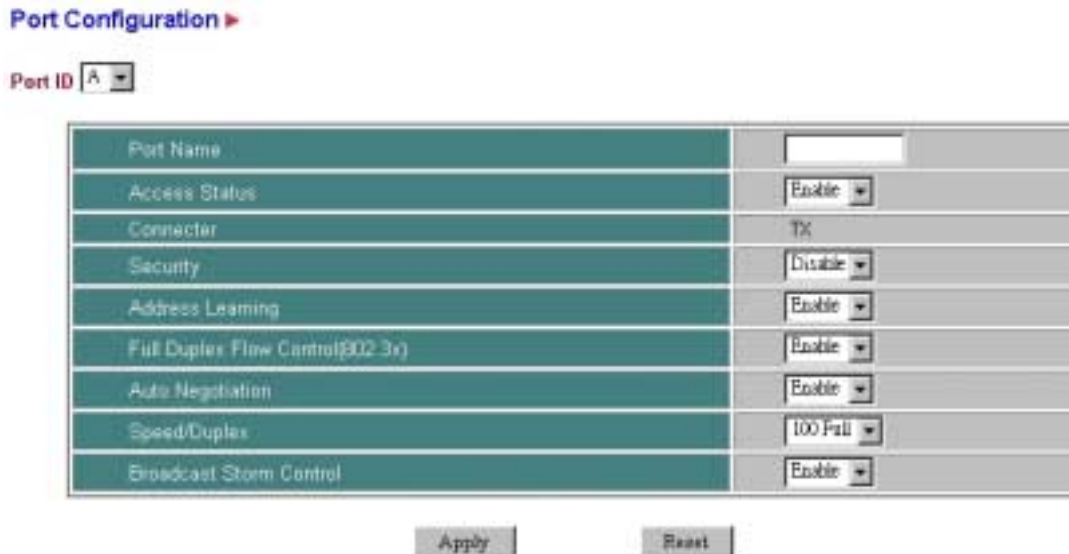


Figure 5-3 Port Configuration

Table 5-3 Port Configuration Description

FIELD	DESCRIPTION	EXAMPLE
Port ID	The letter or number that identifies this port.	A
Port Name	Give each port a name (up to 255 characters) for identification purposes. This field is case sensitive.	myportname
Access Status	Select Enable or Disable to enable or disable port access.	Enable (default)
Connector	This read-only field shows the port's connector type. There are RJ-11 phone connectors for the phoneline networking ports and RJ-45 Ethernet connectors for the Ethernet ports.	TX
Security	Use the Security box to set up security functions for the selected port. Select Enable , to have the switch discard all packets that violate the	Disable (default)

FIELD	DESCRIPTION	EXAMPLE
	security parameters. A security violation is defined as any incoming packet that does not match a SA (Source MAC Address) on the address table. When Disable is selected, the SA of incoming packets is not checked.	
Address Learning	Select Enable to enable or Disable to disable dynamic MAC address learning.	Disable (default)
Full Duplex Flow Control (802.3x)	Select Enable to enable or Disable to disable 802.3x Full Duplex Flow control.	Enable (default)
Auto Negotiation (Ethernet ports only)	When you select Enable the port automatically negotiates the transmission rate and duplex mode. When you select Disable auto negotiation is turned off and you need to specify the transmission rate and duplex mode manually.	Enable (default)
Speed/Duplex (Ethernet ports only)	Select the data transmission rate and duplex mode of the selected port (see <i>Table 5-2</i>). To enable the forcing mode operation, you must disable auto-negotiation.	100 Full (default)
Broadcast Storm Control	Select Enable to turn on Broadcast Storm Control. This discards consecutive incoming broadcast packets that exceed the programmed threshold (set in the system configuration screen). Select Disable to cancel Broadcast Storm Control.	Enable (default)
Click Apply to save your changes to working memory or click Reset to go to the previous configuration. Refer to 3.4.4 for directions on saving your changes to flash memory before you restart the switch.		

5.4 Port Assigned

Move the cursor over the **Port** link and then click **Port Assigned** to display the **Port Assigned** screen shown next.

Use the **Port Assigned** screen to copy a selected port's settings to other ports.

The Auto Negotiation and Speed/Duplex choices apply only to Ethernet ports.



Figure 5-4 Port Assigned

Table 5-4 Port Assigned Description

FIELD	DESCRIPTION
Source Port	Select the port with the settings that you want to duplicate to other ports.
Target Port	Select the port(s) to which you want to copy the settings of the source port. Click Select All Ports to select all ports and Clear All Ports to clear all ports.
Item	Choose up to seven properties to copy from the Source Port to the target port(s).
Click Apply to save your changes to working memory. Refer to 3.4.4 for directions on saving your changes to flash memory before you restart the switch.	

Chapter 6

Trunk

6.1 Introduction

“Trunking” means aggregating multiple low-speed physical links onto a single higher-speed logical link. For example, two Fast Ethernet (100Mbps) links could be aggregated into one single 200Mbps link.

Trunking is an advanced feature of the PES-1014. Exercise extreme caution if you decide to configure these menus.

Configure up to four trunks with two to four ports in each trunk. The last number of the trunk set must be port 2, 6, 10, or 14. Within each trunk set, you may freely gather two to four ports into one trunk. For example, you cannot group ports 2 and 3 to form a trunk, because they are not in the same trunk set; but you can use ports 3, 4 and 6 to form a trunk. Ethernet port A is trunk port A and RJ 11 port 1 is trunk port 1.

6.2 Load-balancing Methods

There are two load-balancing methods for aggregating ports onto a trunk.

6.2.1 MAC-based Load-balancing

You can only use this method if you are aggregating the maximum of four ports into one trunk. It determines which port to forward an incoming packet to by examining two bits (that you designate) of its source MAC address and destination MAC address.

6.2.2 Port-based Load-balancing

Using this method, you have to determine which trunk port to link with a non-trunk port so that the load is balanced among all trunk ports.

6.3 Trunk Menus

Move the cursor over the **Trunk** link to display the submenus shown in the next figure.

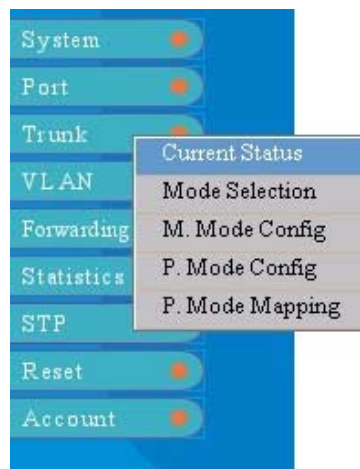


Figure 6-1 Trunk

6.3.1 Current Trunk Status

Move the cursor over the **Trunk** link and click **Current Status** to display the **Trunk Status** screen shown next. This read-only screen displays the current status of each trunk, including which Load-balance method you are using and which ports are assigned to which trunk. Ports A and B are the Ethernet ports. Ports 1 to 14 are the Phonenumber ports.

Trunk Status ▶

Load Balancing Mode: MAC Based				
Trunk and Trunk Port Assignment				
<input type="checkbox"/> Trunk 1	<input type="checkbox"/> Port A	<input type="checkbox"/> Port B	<input type="checkbox"/> Port 1	<input type="checkbox"/> Port 2
<input type="checkbox"/> Trunk 2	<input type="checkbox"/> Port 3	<input type="checkbox"/> Port 4	<input type="checkbox"/> Port 5	<input type="checkbox"/> Port 6
<input type="checkbox"/> Trunk 3	<input type="checkbox"/> Port 7	<input type="checkbox"/> Port 8	<input type="checkbox"/> Port 9	<input type="checkbox"/> Port 10
<input type="checkbox"/> Trunk 4	<input type="checkbox"/> Port 11	<input type="checkbox"/> Port 12	<input type="checkbox"/> Port 13	<input type="checkbox"/> Port 14

Figure 6-2 Trunk Status Screen

6.3.2 Load Balancing Method Selection

Move the cursor over the **Trunk** link and click **Mode Selection** to display the **Load Balancing Method Selection** screen shown next. The default is **MAC Address Based Method**. For each selection there is a corresponding submenu to configure.

Load Balancing Mode Selection ▶

Selection	Mode
<input checked="" type="radio"/>	MAC Address Based Method
<input type="radio"/>	Port Based Method

Apply

Reset

Figure 6-3 Load Balancing Mode Selection Screen

6.3.3 MAC-based Mode Trunk Configuration

Configure this screen when you choose **MAC Address Based Method** in the previous screen. Select which trunk should use **MAC Address Based Method** load balancing and which ports should be included in the selected trunk(s). Each trunk selected must contain four ports. Once a trunk is selected, the corresponding four ports will trunk automatically according to the your **MAC Based Mode Bit Selection**.

MAC Based Mode Trunk Configuration ▶

Trunk Assignment				
<input type="checkbox"/> Trunk 1	<input type="checkbox"/> Port A	<input type="checkbox"/> Port B	<input type="checkbox"/> Port 1	<input type="checkbox"/> Port 2
<input type="checkbox"/> Trunk 2	<input type="checkbox"/> Port 3	<input type="checkbox"/> Port 4	<input type="checkbox"/> Port 5	<input type="checkbox"/> Port 6
<input type="checkbox"/> Trunk 3	<input type="checkbox"/> Port 7	<input type="checkbox"/> Port 8	<input type="checkbox"/> Port 9	<input type="checkbox"/> Port 10
<input type="checkbox"/> Trunk 4	<input type="checkbox"/> Port 11	<input type="checkbox"/> Port 12	<input type="checkbox"/> Port 13	<input type="checkbox"/> Port 14
MAC Based Mode Bit Selection				
MAC	<input checked="" type="radio"/> [0:1]	<input type="radio"/> [2:3]	<input type="radio"/> [4:5]	<input type="radio"/> [6:7]

Apply

Reset

Figure 6-4 MAC-based Mode Trunk Configuration Screen

MAC Address Based Mode Bit Selection

Port trunking is determined by a packet's source MAC address (SA) and destination MAC address (DA). Select which bit-pair ([0:1], [2:3], [4:5], [6:7]) you want the management system to select from the SA and DA of each incoming Ethernet data packet. The management system then maps the packet to a port according to the procedure discussed next.

The designated two bits of the SA and DA are Exclusive Or'd (XOR).

Table 6-1 Exclusive Or

BINARY BIT PAIR	XOR RESULT
[0, 0]	0
[0, 1]	1
[1, 0]	1
[1, 1]	0

These combinations map to trunk ports as shown next. The left value represents SA and the right represents DA.

Table 6-2 Bit Selection Port Assignment

XOR RESULT PAIR	PORT FORWARDED TO
[1, 1]	trunk port 1
[1, 0]	trunk port 2
[0, 1]	trunk port 3
[0, 0]	trunk port 4

MAC Address Based Mode Bit Selection Example

Select **Trunk 2** from **Trunk Assignment** and **[0,1] MAC Address Based Mode Bit Selection** in the **MAC-based Mode Trunk Configuration** screen.

The following two packets are forwarded as follows:

Table 6-3 MAC Address Based Mode Bit Selection Example

PACKET	SA	DA	PORT FORWARDED TO
Packet 1	00:C0:A7:98:FE:81 ¹	00:C0:A7:98:FE:9B ²	Port 4 (trunk port 2).
Packet 2	00:C0:A7:98:FE:80 ³	00:C0:A7:98:FE:9A ⁴	Port 5 (trunk port 3).

6.3.4 Port-based Mode Trunk Configuration

Assign ports that map to a trunk in this screen when you choose **Port Based Method** in the **Load Balancing Mode Selection** screen shown previously. Aggregate between two and four ports to each trunk.

¹ The last two bits are "81" which is "10000001" binary. Exclusive Or these last two (least significant) bits (01) to give "1".

² The last two bits are "9B" which is "10011011" binary. Exclusive Or these last two bits (11) to give "0". [1,0] maps to trunk port 2 according to the table above. As Trunk 2 is selected, trunk port 2 is Port 4.

³ The last two bits are "80" which is "10000000" binary. Exclusive Or these last two bits (00) to give "0".

⁴ The last two bits are "9A" which is "10011010" binary. Exclusive Or these last two bits (10) to give "1". [0,1] maps to trunk port 3 according to the table above. As Trunk 2 is selected, trunk port 3 is Port 5.

Port Based Mode Trunk Configuration ▶

Trunk and Trunk Port Assignment				
<input type="checkbox"/> Trunk 1	<input type="checkbox"/> Port A	<input type="checkbox"/> Port B	<input type="checkbox"/> Port 1	<input type="checkbox"/> Port 2
<input type="checkbox"/> Trunk 2	<input type="checkbox"/> Port 3	<input type="checkbox"/> Port 4	<input type="checkbox"/> Port 5	<input type="checkbox"/> Port 6
<input type="checkbox"/> Trunk 3	<input type="checkbox"/> Port 7	<input type="checkbox"/> Port 8	<input type="checkbox"/> Port 9	<input type="checkbox"/> Port 10
<input type="checkbox"/> Trunk 4	<input type="checkbox"/> Port 11	<input type="checkbox"/> Port 12	<input type="checkbox"/> Port 13	<input type="checkbox"/> Port 14

Figure 6-5 Port-based Mode Trunk Configuration Screen

6.3.5 Port-based Mode Port Mapping

Move the cursor over the **Trunk** link and click **P. Mode Mapping** to display the **Port-based Mode Port Mapping** screen shown next. Use this screen to view and modify port mappings of assigned trunks when using Port-based Load Balancing.

Port Based Mode Port Mapping ▶

Trunk ID

Trunk Port	Assigned	Port to Trunk Port Mapping															
		A	B	1	2	3	4	5	6	7	8	9	10	11	12	13	14
7	Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 6-6 Port-based Mode Mapping Screen

After configuring, click **Apply** to make the changes effective or click **Reset** to go back to the previous configuration. Select one trunk at a time for port mapping.

Table 6-4 Port-based Mode Mapping

FIELD	DESCRIPTION
Trunk ID	This field displays the number of the trunk that is currently displayed. Use the down arrow to select the number of another trunk that has been set to Port Based Mode . If no trunk has been set to Port Based Mode , the screen will show "none".
Trunk Port	These are the trunk ports in the trunk ID that you selected above.
Assigned	This field shows whether or not individual trunk ports have been assigned to this trunk.

FIELD	DESCRIPTION
Port to Trunk Port Mapping	Click radio buttons to select ports to map to trunk ports.
Click Apply to save your changes to working memory or click Reset to go to the previous configuration. Refer to 3.4.4 for directions on saving your changes to flash memory before you restart the switch.	

Chapter 7

VLAN

7.1 Introduction

VLAN (Virtual Local Area Network) is basically a broadcast domain. In an ordinary switched network system, a broadcast packet or an unknown destination MAC address packet is broadcasted to all ports and that will decrease network performance dramatically. By grouping some ports into one VLAN, broadcast packets will be sent only to the ports within that VLAN without affecting the traffic of other ports. Any two or more ports can be grouped as one VLAN in the device, and an overlapping VLAN port is permitted.

Move the cursor over the **VLAN** link to display the submenus shown in the next figure.



Figure 7-1 VLAN

7.1.1 VLAN Status

Move the cursor over the **VLAN** link and click **Current Status** to display the read-only **VLAN Status** screen shown next. This screen shows the current VLAN status in the switch. Click the **Group ID** (number of a VLAN Group) to set the related attributes of that group regarding **Status**, **Name** and **Port Members**.

- VLAN Group 1 is the default VLAN setting, with all ports included. To modify the VLAN for the first time, VLAN Group 1 has to be disabled, so new VLAN groups can be added.
- Enabling STP enables the default VLAN automatically. Disabling the default VLAN disables STP and vice versa.

VLAN Status ▶

Group ID	Status	Name	Port Members
1	Enable	Default VLAN	A,B,1,2,3,4,5,6,7,8,9,10,11,12,13,14
3	Enable		A,3,7,11
6	Enable		3,4,5,6,9

Figure 7-2 VLAN Status

Table 7-1 VLAN Status Description

FIELD	DESCRIPTION
Group ID	There are 64 possible VLAN Groups (VLAN Group 1 is the default and non-editable). Click any of the other Group ID numbers to display the corresponding VLAN editing screen.
VLAN Status	This column indicates the current status of all VLAN groups. "Enable" means that the selected VLAN is active. "Disable" means that the selected VLAN is inactive.
VLAN Name	This is the name of a VLAN group; the maximum length is 32 characters. This field is case sensitive.
Port Members	This column shows the participating ports of a particular VLAN group. Add or delete port members by doing edits in the Edit VLAN screen.

7.2 Edit VLAN Group

Move the cursor over the **VLAN** link and click **Edit VLAN** to display the **Edit VLAN Group** screen shown next. Use this screen to modify a VLAN group's list of port members, activity status, and name.

Edit VLAN Group ▶

Group ID Status Group Name :

Port Members			
<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> 1	<input type="checkbox"/> 2
<input checked="" type="checkbox"/> 3	<input checked="" type="checkbox"/> 4	<input checked="" type="checkbox"/> 5	<input checked="" type="checkbox"/> 6
<input type="checkbox"/> 7	<input type="checkbox"/> 8	<input checked="" type="checkbox"/> 9	<input type="checkbox"/> 10
<input type="checkbox"/> 11	<input type="checkbox"/> 12	<input type="checkbox"/> 13	<input type="checkbox"/> 14

Figure 7-3 Edit VLAN Group

Table 7-2 Edit VLAN Group Description

FIELD	DESCRIPTION	EXAMPLE
Group ID	Each VLAN group has a number as its ID (as the VLAN Status screen showed). Select the ID number of a VLAN group for editing.	6
Status	Select Enable to activate or Disable to de-activate a selected VLAN group. Disabling a VLAN Group only deactivates it.	Enable
Group Name	This is the name of the selected VLAN Group. The name is case sensitive and can be up to 32 characters.	Home
Port Members	To modify port members, select Port Members of a group by clicking the checkbox on the table. At least two ports must be selected to form a VLAN group.	✓
Click Apply to save your changes to working memory or click Reset to go to the previous configuration. Refer to 3.4.4 for directions on saving your changes to flash memory before you restart the switch.		

Chapter 8

Forwarding DB (Database)

8.1 Introduction

The switch will check the address tables (Forwarding Database) before sending data packets to make sure all of the packets are sent correctly. The address table (look up table, forwarding table) can be built by dynamic (automatic) address learning or by static (manual) entry. Using dynamic address learning it is possible to age out certain entries if aging control is enabled and the aging time expires; but it is also keeps updating for new packets received with different SAs.

The switch does not age out or update static entries. The only way to change the static entries is through manual editing in the **Edit Static Entry** screen.

Moving the cursor over the **Forwarding DB** icon brings up the following submenus.

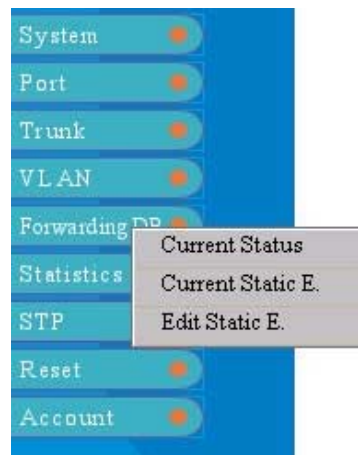


Figure 8-1 Forwarding Database Bar

Enabling the Security setting for a port in the Port Configuration screen (5.3) automatically disables the aging out timer for that port and changes it to a static entry in the Forwarding Database.

8.2 Current Forwarding DB Status

Move the cursor over the **Forwarding DB** link and click **Current Status** to display the **Current Forwarding DB Status** screen shown next. This screen shows the current forwarding database status. A total of 17 K MAC addresses entries can be stored in the device.

Current Forwarding DB Status ▶

ID	Port/Trunk/CPU	MAC	Static/Dynamic
1	Port B	00-45-12-34-56-78	Dynamic
2	Port B	00-00-1C-B5-DE-9E	Dynamic
3	Port B	00-50-00-10-0B-1A	Dynamic
4	Port B	00-C0-26-A3-56-7F	Dynamic
5	Port B	00-50-00-10-0C-86	Dynamic
6	Port B	00-00-1C-B0-9E-C4	Dynamic
7	Port B	00-00-E8-42-C9-EA	Dynamic
8	Port B	00-50-00-20-54-48	Dynamic
9	Port B	00-C0-26-A3-00-3F	Dynamic

Figure 8-2 Current Forwarding DB Status

Table 8-1 Current Forwarding DB Status Description

FIELD	DESCRIPTION	EXAMPLE
Refresh Data	Click Refresh Data to get the current forwarding database of the management system. How many screens can be viewed depends on how many entries are currently in the database.	
Screen	A total of 20 screens are available in the management system for the maximum 1024 addresses.	1
ID	Indicates the number of an entry. Click ID to sort the table in descending or ascending order.	1
Port/Trunk/CPU	Port/Trunk/CPU shows whether the MAC address of a received packet is from a port, trunk or the switch respectively. Click Port/Trunk/CPU to sort the table in descending or ascending order.	Port B
MAC	This column indicates the MAC address of each entry. Click MAC to sort the table in descending or ascending order.	00-45-12-34-56-78
Static/Dynamic	This column indicates the static or dynamic method of entry for each address. Click Static/Dynamic to sort the table in descending or ascending order.	Dynamic

8.2.1 Current Static Entries

A static entry is one that can only be changed manually and is not aged out by dynamic address learning.

Move the cursor over the **Forwarding DB** link and click **Current Static E.** to display the **Current Static Entries** screen shown next. This screen shows the current status of the static address table, which includes port/trunk and the MAC address.

Only activated static entries are shown on this screen.

Current Static Entries ▶

ID	Port/Trunk	MAC
1	Port 9	00-C0-00-00-00-1A
4	Port A	00-C0-00-00-00-1B
10	Port B	00-C0-00-00-00-99

Figure 8-3 Current Static Entries

Table 8-2 Current Static Entries Description

FIELD	DESCRIPTION	EXAMPLE
ID	This management system supports 256 explicit static address entries, click each entry's ID to get the Edit Static Entry screen for editing.	1
Port/Trunk	This column indicates the member port of each static address entry.	Port 9
MAC	This column shows the address of each static address entry. Each entry is a 12 digit, real MAC address. Each entry must have a unique MAC address in the system.	00-C0-00-00-00-1A

8.2.2 Edit Static Entry

Move the cursor over the **Forwarding DB** link and click **Edit Static E.** to display the **Edit Static Entry** screen shown next. Choose a static entry to edit its status, as well as port or trunk.

Edit Static Entry ▶

Entry ID Status

Port				Trunk
<input type="radio"/> Port A	<input type="radio"/> Port B	<input type="radio"/> Port 1	<input type="radio"/> Port 2	<input type="radio"/> Trunk 1
<input type="radio"/> Port 3	<input type="radio"/> Port 4	<input type="radio"/> Port 5	<input type="radio"/> Port 6	<input type="radio"/> Trunk 2
<input type="radio"/> Port 7	<input type="radio"/> Port 8	<input checked="" type="radio"/> Port 9	<input type="radio"/> Port 10	<input type="radio"/> Trunk 3
<input type="radio"/> Port 11	<input type="radio"/> Port 12	<input type="radio"/> Port 13	<input type="radio"/> Port 14	<input type="radio"/> Trunk 4

MAC Address

Figure 8-4 Edit Static Entry

Table 8-3 Edit Static Entry Description

FIELD	DESCRIPTION	EXAMPLE
Entry ID	There are 256 static entries available in the system, and each static entry must have a unique ID number (from 1 to 256). Select an Entry ID to link to its corresponding static entry for editing.	1
Status	Select Enable to activate or Disable to deactivate the selected static entry. Disabled static entries will not be shown on the Current Static Entries screen.	Enable
Port/Trunk Member	Click one radio button in either the Port column or the Trunk column.	
MAC	Enter the MAC address of the computer's Network Interface Card (NIC) that you are connecting to. You must assign a unique and legal MAC address for each static entry for security identification and port selection purposes while transmitting. Different entries can be assigned with the same port/trunk, but the MAC addresses have to be different.	00.00.00.0 0.00.1A
Click Apply to save your changes to working memory or click Reset to go to the previous configuration. Refer to 3.4.4 for directions on saving your changes to flash memory before you restart the switch.		

Chapter 9

Statistics

9.1 Introduction

Statistics leads to the statistical contents of each port and host, all figures reflect the latest facts since the last time the port has been turned on.

Move the cursor over **Statistics** to bring up the following submenus.

All counters are updated every 10 seconds by default.

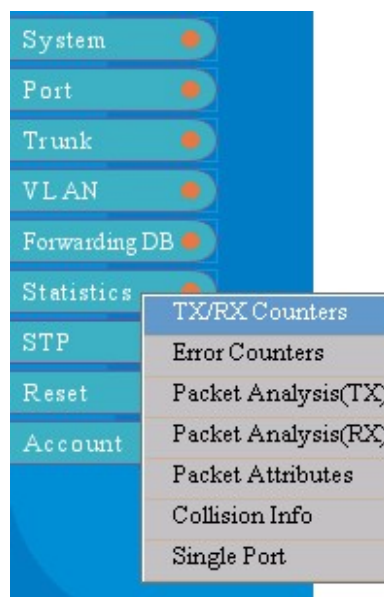


Figure 9-1 Statistics

9.2 TX/RX Counters

Move the cursor over the **Statistics** link and click **TX/RX Counters** to display the **TX/RX Counters** screen shown next.

TX/RX Counters ▶

Port ID	Packet TX	Packet RX	Byte TX	Byte RX
A	0	0	0	0
B	0	0	0	0
1	3	0	192	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	1	0	64	0
8	15	0	960	0
9	41	0	2624	0
10	0	0	0	0
11	45	0	2880	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0

Figure 9-2 TX/RX Counters

Table 9-1 TX/RX Counters Description

FIELD	DESCRIPTION
Port ID	This is the label of a port.
Packet TX	The port's total number of successfully transmitted packets. This is the sum of unicast TX, multicast TX, and broadcast TX packets.
Packet RX	The port's total number of good packets received. This is the sum of unicast RX, multicast RX, and broadcast RX packets.
Byte TX	The port's total number of successfully transmitted data bytes.
Byte RX	The port's total number of data bytes received.

9.3 Error Counters

Move the cursor over the **Statistics** link and click **Error Counters** to display the **Error Counters** screen shown next.

Error Counters ▶

Port ID	Fragment	Jabber	Alignment	Late Collision
A	0	0	0	0
B	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0

Figure 9-3 Error Counters

Table 9-2 Error Counters Description

FIELD	DESCRIPTION
Port ID	This is the label of a port.
Fragment	Represents the number of packets received that were less than 64 octets long, and had either an alignment or CRC (Cyclic Redundant Check) error.
Jabber	Represents the number of packets received that were longer than the maximum octets length (specified for the system by the configuration software) and had either a CRC or alignment error.
Alignment	The number of packets received that were of the proper size but had a CRC error and a non-integral number of octets.
Late Collision	The number of times a collision was detected later than the first 512 bits of a transmission.

9.4 Packet Analysis (TX)

Move the cursor over the **Statistics** link and click **Packet Analysis(TX)** to display the **Packet Analysis (TX)** screen shown next.

Packet Analysis (TX) ▶

Port ID	64 in_length	65-127	128-255	256-511	512-1023	1024-1518
A	0	0	0	0	0	0
B	0	0	0	0	0	0
1	3	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	0	0	0	0	0	0
7	1	0	0	0	0	0
8	15	0	0	0	0	0
9	41	0	0	0	0	0
10	0	0	0	0	0	0
11	45	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

Figure 9-4 Packet Analysis (TX)

Table 9-3 Packet Analysis (TX) Description

FIELD	DESCRIPTION
Port ID	This is the label of a port.
64 in_length	The number of packets (including bad packets) transmitted that were 64 octets in length.
65-127	The number of packets (including bad packets) transmitted that were between 65 and 127 octets in length.
128-255	The number of packets (including bad packets) transmitted that were between 128 and 255 octets in length.
256-511	The number of packets (including bad packets) transmitted that were between 256 and 511 octets in length.
512-1023	The number of packets (including bad packets) transmitted that were between 512 and 1023 octets in length.
1024-1518	The number of packets (including bad packets) transmitted that were between 1024 and 1518 octets in length.

9.5 Packet Analysis (RX)

Move the cursor over the **Statistics** link and click **Packet Analysis(RX)** to display the **Packet Analysis (RX)** screen shown next.

Packet Analysis (RX) ▶

Port ID	64 in_length	65-127	128-255	256-511	512-1023	1024-1518
A	0	0	0	0	0	0
B	38	0	9	8	5	0
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	0	0	0	0	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

Figure 9-5 Packet Analysis (RX)

Table 9-4 Packet Analysis (RX) Description

FIELD	DESCRIPTION
Port ID	This is the label of a port.
64 in_length	The number of packets (including bad packets) received that were 64 octets in length.
65-127	The number of packets (including bad packets) received that were between 65 and 127 octets in length.
128-255	The number of packets (including bad packets) received that were between 128 and 255 octets in length.
256-511	The number of packets (including bad packets) received that were between 256 and 511 octets in length.
512-1023	The number of packets (including bad packets) received that were between 512 and 1023 octets in length
1024-1518	The number of packets (including bad packets) received that were between 1024 and 1518 octets in length.

9.6 Packet Attribute

Move the cursor over the **Statistics** link and click **Packet Attributes** to display the **Packet Attribute** screen shown next.

Packet Attribute ▶

Port ID	Unicast TX	Unicast RX	Multicast TX	Multicast RX	Broadcast TX	Broadcast RX
A	0	0	0	0	0	0
B	0	15	0	7	0	38
1	0	0	0	0	3	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	0	0	0	0	0	0
7	0	0	0	0	1	0
8	0	0	0	0	15	0
9	0	0	0	0	41	0
10	0	0	0	0	0	0
11	0	0	0	0	45	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0

Figure 9-6 Packet Attribute

Table 9-5 Packet Attribute Description

FIELD	DESCRIPTION
Port ID	This is the label of a port.
Unicast TX	The total number of good packets addressed to a unicast address that the port transmitted.
Unicast RX	The total number of good packets addressed to a unicast address that the port received.
Multicast TX	The total number of good packets addressed to a multicast address that the port transmitted.
Multicast RX	The total number of good packets addressed to a multicast address that the port received.
Broadcast TX	The total number of good packets addressed to a broadcast address that the port transmitted.
Broadcast RX	The number of good broadcast packets received.

9.7 Collision Info

Move the cursor over the **Statistics** link and click **Collision Info** to display the **Collision Info** screen shown next.

Collision Info ▶

Port ID	0 Collision	1 Collision	MultiCollisions	Excessive Collision
A	0	0	0	0
B	0	0	0	0
1	3	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	1	0	0	0
8	15	0	0	0
9	41	0	0	0
10	0	0	0	0
11	45	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0

Figure 9-7 Collision Info

Table 9-6 Collision Info Description

FIELD	DESCRIPTION
Port ID	This is the label of a port.
0 Collision	The number of packets with no collision detected.
1 Collision	The number of packets with 1 collision detected.
Multi Collisions	The number of packets with 2 to 15 collisions detected.
Excessive Collision	The number of packets with more than 15 collisions detected.

9.7.1 Single Port Statistics

Move the cursor over the **Statistics** link and click **Single Port** to display the **Single Port Statistics** screen shown next. This screen displays the single port information of a selected Port ID. See earlier in this chapter for field descriptions.

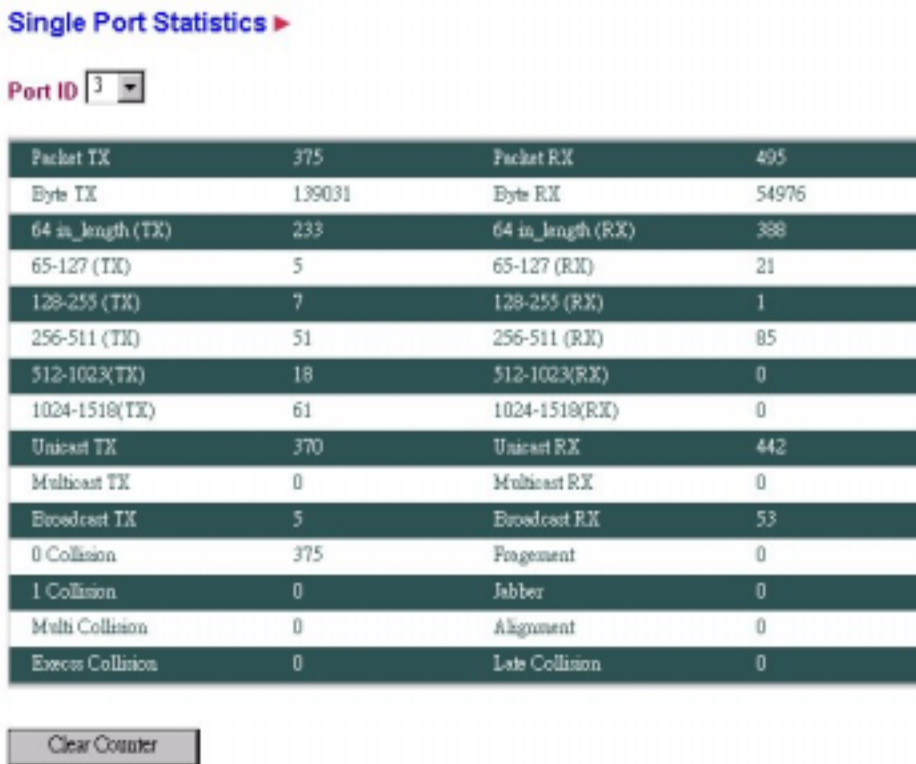


Figure 9-8 Single Port Statistics

Table 9-7 Single Port Statistics Description

FIELD	DESCRIPTION
Port ID	This is the label of a port. Select one to see its statistics.
Clear Counter	Click Clear Counter to reset a selected port's counters to zero.

Chapter 10

STP

10.1 Introduction

Spanning Tree Protocol (STP) is an IEEE standard (802.1d) that avoids looping in the network while maintaining multiple Ethernet bridges. STP can avoid loops by placing ports in forwarding state or in blocking state to establish redundant paths. When STP is enabled, the switch will execute STP Bridge Protocol Data Unit (BPDU) packets as below:

- If the port is in Block-N-Listen State or Learning State, the BPDU packet is forwarded to the CPU, other packets are discarded.
- If the port is in the Forwarding State, the BPDU packet is forwarded to the CPU, all other packets are normally forwarded based on the switch engine decision.

Move the cursor over **STP** to bring up the following submenus.

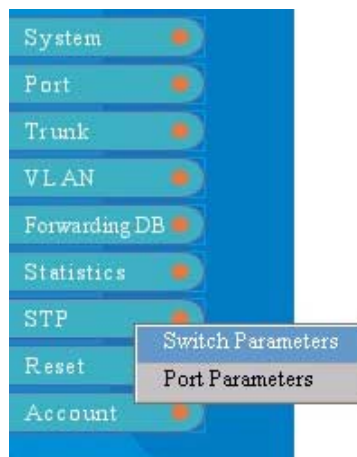


Figure 10-1 STP

10.2 Spanning Tree Configuration (Bridge) – (Switch Parameters)

Move the cursor over the **STP** link and click **Switch Parameters** to display the **Spanning Tree Configuration (Bridge)** screen shown next.

Spanning Tree Configuration (Bridge) ▶

Spanning Tree Protocol state	Disable ▾
Bridge Priority (0..65535)	32768
Root Bridge Priority	32768
Root Bridge MAC Address	00-50-00-10-10-28
Root Port	0
Root Path Cost	0
Bridge Hello Time (1..10) sec	2
Bridge Max Age (6..40) sec	20
Forward Delay (4..30) sec	15

Figure 10-2 Spanning Tree Configuration (Bridge)

Table 10-1 Spanning Tree Configuration (Bridge) Description

FIELD	DESCRIPTION	EXAMPLE
Spanning Tree Protocol state	Select Enable to activate or Disable to deactivate the Spanning Tree Protocol. Enabling the STP also enables the default VLAN. Disabling the default VLAN also disables the STP, and vice versa.	Disable (default)
Bridge Priority (0.65535)	Bridge priority decides whether a bridge in a multi-bridge network is a root bridge or not, a lower numbered bridge priority induces more chance of the switch becoming the root bridge. Bridge Priority can be set from 0 to 65535.	32768 (default)
Root Bridge Priority	This is the bridge priority of the root bridge on this network.	32768
Designated Root	This is an identifier to differentiate different roots in the spanning tree. It is used as the root identifier in all BPDU packets originating from this node. A designated root consists of the Root Bridge Priority combined with the Root Bridge MAC Address .	
Root Bridge MAC Address	This is the MAC address of the root bridge of the network.	00-50-00-10-10-28
Root Port	This read-only field shows the port that offers the lowest cost path from this bridge to the root bridge.	0
Root Path Cost	This read-only field contains the lowest cost for connecting this bridge to the root bridge through the root port.	0
Bridge Hello Time (1..10) sec	The time interval between BPDU packets in STP, all of the bridges will send the BPDU packet to elect the root bridge periodically. The root bridge will keep sending the packets to make sure it is still the root bridge after it has been elected. Bridge Hello Time can be set from 1 to 10 seconds, the default value is set at 2 seconds.	2
Bridge Max Age (6..40) sec	Bridges will begin to send BPDU packets for electing a new Root Bridge if they receive no BPDU packets from the Root Bridge for longer than the time period in Bridge Max Age . Bridge Max Age ranges from 6 to 40 seconds, the default value is 20 seconds.	20
Forward Delay (4..30) sec	Forward Delay determines how long the switch waits before changing its STP status from listening/learning to learning/forwarding. You can modify the Forward Delay time to fit your network topology. Larger	15 (default)

FIELD	DESCRIPTION	EXAMPLE
	networks need longer delay times.	
Click Apply to save your changes to working memory or click Reset to go to the previous configuration. Refer to 3.4.4 for directions on saving your changes to flash memory before you restart the switch.		

10.3 Spanning Tree Configuration (Port)

Move the cursor over the **STP** link and click **Port Parameters** to display the **Spanning Tree Configuration (Port)** screen shown next. This screen consists of the priority related settings: path cost and port state.

Spanning Tree Configuration (Port) ▶

Port ID

Priority (0..255)	<input type="text" value="128"/>
Path Cost (1..65535)	<input type="text" value="19"/>
Port State	Forwarding

Apply

Reset

Figure 10-3 Spanning Tree Configuration (Port)

Table 10-2 Spanning Tree Configuration (Port) Description

FIELD	DESCRIPTION	EXAMPLE
Port ID	Select a port to configure. Only the leading port of the trunk is shown to represent its role in the spanning tree protocol if the trunk is set.	2
Priority (0.255)	Priority decides which port should be disabled when more than two ports form a loop in a switch. A higher priority value means that the port is easier to disable. Priority ranges from 0 to 255.	128 (default)
Path Cost (1.65535)	Displays the path cost of the port. When more than one port in the switch is connected to the Root Bridge by more than one path (through different ports), only the port with lowest path cost is active. Path cost ranges from 1 to 65535.	19 (default)
Port State	This read-only field displays the Spanning Tree Port condition: Blocking forwards an incoming packet to the CPU only if it is a BPDU packet; other packets are discarded. Listening acts as blocking state, it does not forward any packet, except BPDU packets, and enters the learning state when possible. Learning state learns the source addresses of incoming packets, except BPDU packets, and immediately discarded. Forwarding state forwards all source addresses of the incoming packet are learned based on the switch engine's decision.	Forwarding

Click **Apply** to save your changes to working memory or click **Reset** to go to the previous configuration. Refer to 3.4.4 for directions on saving your changes to flash memory before you restart the switch.

Chapter 11

Reset

11.1 Introduction

Move the cursor over **Reset** to bring up the following submenus.



Figure 11-1 Reset

11.2 Reset Counters

Move the cursor over the **Reset** link and click **Reset Counters** to display the **Reset Counters** screen shown next. Use this screen to reset all the counters of your device.

[Reset Counters](#) ▶



Figure 11-2 Reset Counters

Click **Apply** to reset all counters of the device (the statistic counters) to zero.

11.3 Reset To Factory Default

Move the cursor over the **Reset** link and click **Factory Default** to display the **Reset to Factory Default** screen shown next. Use this screen to reload the factory default settings and restart the switch to make the factory defaults effective.



Figure 11-3 Reset to Factory Default

Click **Reboot** to reset the factory defaults and erase customer settings.

Resetting to factory defaults erases all customer settings (except the Networking screen in the System menu).

11.4 Reboot Device

Move the cursor over the **Reset** link and click **Factory Default** to display the **Reset to Factory Default** screen shown next. Use this screen to restart the switch and save your configuration changes.

Reboot Device ▶

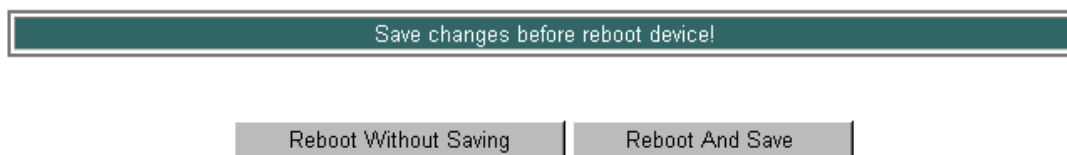


Figure 11-4 Reboot Device Screen

Click **Reboot Without Saving** to restart the device without saving changes

or

Click **Reboot and Saving** to save your setting changes (all changes will be effective after the device restarts).

Chapter 12 Account

12.1 Introduction

This system provides authentication procedures to ensure security. Up to seven pairs of user ID and Password are available. Both the User ID and Password of the factory default are null string. ZyXEL recommends adding new accounts for security protection immediately after you enter the system. Anyone trying to access the switch is prompted to type in an ID and Password after any account is properly established.

Move the cursor over **Account** to bring up the following submenus.



Figure 12-1 Account Bar

12.2 Browse Account List

Move the cursor over the **Account** link and click **Browse Account** to display the **Account List** screen shown next. This read-only screen lists all the valid accounts of the device.

Account List ▶

User ID	Password	Access Level
Bruce	*****	power user
Jaf	*****	normal user

Figure 12-2 Account List

Table 12-1 Account List Description

FIELD	DESCRIPTION	EXAMPLE
User ID	This name identifies an individual account.	Bruce
Password	This is the password that an individual must enter to access the account. "*****" is displayed.	*****
Access Level	This field divides accounts into two levels: power user and normal user . A power user has full (read-write) access to the system. A normal user is limited to read-only operations.	power user

12.3 Add/Del Account

Move the cursor over the **Account** link and click **Add/Del Account** to display the **Add/Del Account** screen shown next. Use the **Add/Del Account** screen to add or delete accounts. You must fill out all three boxes on this screen (**User ID**, **Password**, and **Access Level**) in order to add or delete accounts.

The first valid account must be a power user account. If you try to add a normal user account into the system for the first configuration, you will get an "Account operation failure" message and have to try again.

At least one power user must exist in the account. To delete the last power user will also lead to a "Account operation failure".

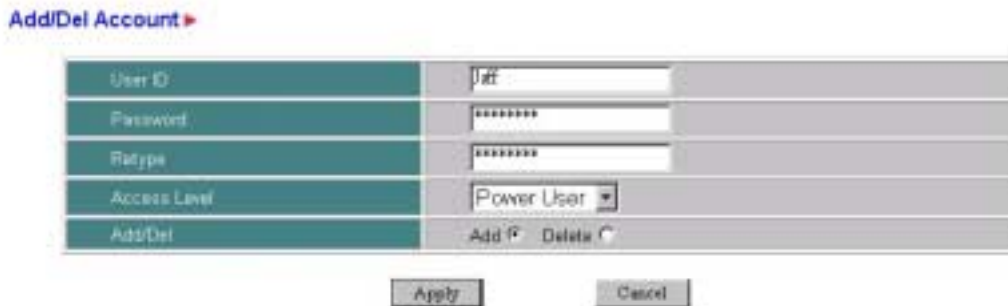


Figure 12-3 Add/Del Account

Table 12-2 Add/Del Account Description

FIELD	DESCRIPTION	EXAMPLE
User ID	Type in a name (32 characters maximum) that identifies an individual account. This field is case sensitive.	Jaff
Password	Type the password that an individual must enter to access the account. "*****" is displayed. 32 characters is the maximum length. This field is case sensitive.	*****
Retype	Type the password again to make sure you entered it correctly. "*****" is displayed. This field is case sensitive.	*****
Access Level	Select Power User to give the account full (read-write) access to the system. Select Normal User to limit the account to read-only operations.	Power User
Add/Del	Select the Add radio button to add a new account. Select the Delete radio button to delete an existing account.	
Click Apply to save your changes to working memory or click Reset to go to the previous configuration. Refer to 3.4.4 for directions on saving your changes to flash memory before you restart the switch.		

12.4 Change Password

Move the cursor over the **Account** link and click **Change Password** to display the **Change Password** screen shown next. Use this screen to change your password.

Change Password ▶

User ID	Bruce
Old Password	<input type="password"/>
New Password	<input type="password"/>
Retype Password	<input type="password"/>

Figure 12-4 Change Password

Table 12-3 Change Password Description

FIELD	DESCRIPTION	EXAMPLE
User ID	The name (32 characters maximum) that identifies an individual account. This field is case sensitive.	Bruce
Old Password	Type the current password for this account. "*****" is displayed. This field is case sensitive.	*****
New Password	Type the new password for this account. "*****" is displayed. 32 characters is the maximum length. This field is case sensitive.	*****
Retype Password	Type the password again to make sure you entered it correctly. "*****" is displayed. This field is case sensitive.	*****
Click Apply to save your changes to working memory or click Reset to go to the previous configuration. Refer to 3.4.4 for directions on saving your changes to flash memory before you restart the switch.		

You can only change the password of the account that you are logged in on.

You cannot change the Null Account Password.

Appendix A

System Parameters

System Parameters

CATEGORY	DEFAULT VALUE	OPTIONS	NOTE
System			
System Info.			
Device Name	N/A	1-255 characters	Give the system a name (case-sensitive)
Device Location	N/A	1-255 characters	Indicate the location of the system (case-sensitive)
Contact	N/A	1-255 characters	Name of the person to contact for help (case-sensitive)
System Configure			
SuperMAC	disable	enable/disable	The capability to use an aggressive backing off algorithm as collisions occur.
Aging Control	enable	enable/disable	Capability to age the entries in the dynamic learning address table
Aging Time	10 min.	0-30 min.	The time period a source MAC address can stay in the address table
Broadcast Storm Control Threshold	48	16,32,48,64	Limits the number of consecutive broadcast packets received by the switch
Panel-Refresh Time Interval	10 sec.	1-60 sec.	Refresh time interval of the switch panel
Counter-Refresh Time Interval	10 sec.	1-60 sec.	Refresh time interval of the switch counter
Port Monitoring			
Monitored Port ID	N/A	any one port	A port to be monitored for its incoming and outgoing packet flow
Snooping Port for incoming packet flow	N/A	a port except the monitored port	Assign a port to snoop the monitored port's incoming packet flow
Snooping Port for outgoing packet flow	N/A	a port except the monitored port	Assign a port to snoop the monitored port's outgoing packet flow
Status	unchecked	checked/unchecked	To activate/deactivate the function of the snooping port
Networking			
IP Address	N/A	Device IP	The IP addresses of the devices included in the network
Subnet Mask	N/A	Device IP Mask	Set up a subnet mask
Default Gateway	N/A	Default Gateway	A gateway IP is used for the switch to connect to a non-local IP

CATEGORY	DEFAULT VALUE	OPTIONS	NOTE
Set Default Route	N/A	in-band	The default transmission path of the switch
SNMP			
<i>SNMP Community</i>			
Community	public	1-12 characters	Name an SNMP community (case-sensitive)
Access Right	read-write	read-write/read	The access right of the community member
Trap Receiving	enable	enable/disable	The capability of the community to receive SNMP traps
Status	enable	enable/disable	To activate/deactivate the community for SNMP management use.
<i>SNMP Host</i>			<i>A management station</i>
IP Address	N/A	users' IP address	Indicate the IP addresses of SNMP hosts
Host Name	N/A	1-12 characters	Give a name to the host (case-sensitive)
Community	N/A	names of the 4 commu.	The community that the management host belongs to (case-sensitive)
Status	disable	enable/disable	Allow/disallow an IP address to function in SNMP
Port			
Port Configuration			
Port ID	N/A	any port in the switch	Select a port to set its configuration
Port Name	N/A	1-255 characters	Give the selected port a name for convenience (case-sensitive)
Access Status	enable	enable/disable	Turn on/off access to a port
Connector	TX	N/A	The connector type of the port (FX-fiber port, TX-ethernet port)
Security	disable	enable/disable	Turn on/off the capability to discard packets that violate security parameters
Address Learning	disable	enable/disable	The capability of dynamic address learning
Full Duplex Flow Control	enable	enable/disable	The capability of 802.3x full duplex flow control
Auto Negotiation	enable	enable/disable	The capability to automatically negotiate transmission rate and duplex mode
Speed/Duplex	100/Full	100/10-Full, 100/10-Half	Set the speed (100/10 Mbps) and duplex mode (Full/Half)
Broadcast Storm Control	enable	enable/disable	The capability to discard broadcast packets exceeding the threshold number
Port Assignment			
Source Port	N/A	any port	A port from which the settings will be duplicated to another port
Target Port	N/A	port except source port	A port to which the settings will be duplicated
Item	N/A	1-7 items	Items of settings to be duplicated

CATEGORY	DEFAULT VALUE	OPTIONS	NOTE
Trunk			
Load Balancing Method Selection			
Selection	MAC address	MAC add./port based	Choose the load balancing method for the trunks of the switch
MAC Based Mode Trunk Confi.			
Trunk	N/A	1-4 trunks	Points out the trunk ports that use the MAC address based mode
Bit Selection	N/A	1,0 / 3,2 / 5,4/7,6	The way MAC address based mode is used to distribute data to ports
Port Based Mode Trunk Confi.			
Trunk	N/A	1-4 trunks	Points out the trunk ports that use the Port based mode
Ports	N/A	2-4 ports	Each trunk port may include 2-4 ports
Port Mapping	See 6.3.5.		You may map the ports to a port included in a trunk port
Trunk ID	N/A	1/6	Select a trunk port ID for setting port mapping
VLAN			
VLAN Status			
Edit VLAN Group			
Group ID	N/A	1-128 groups	Select a VLAN group for editing port members
Status	N/A	enable/disable	Make the VLAN group active or not
Group Name	N/A	1-32 characters	Give a name to each VLAN group (case-sensitive)
Port Members	N/A	any 2 or more ports	Select ports to be included in a VLAN group
Forwarding DB			
Edit Static Entries			
Entry ID	N/A	1-256 entries	Choose a static entry ID for editing its status and port/trunk
Status	N/A	enable/disable	Activates or deactivates the selected static entry
Port/Trunk	N/A	1-24 port / 1-6 trunk	Assign the entry to a certain port or trunk
MAC Address	N/A	MAC address	Give a MAC address to each entry

CATEGORY	DEFAULT VALUE	OPTIONS	NOTE
Spanning Tree Protocol(STP)			
Spanning Tree Configuration			
Spanning Tree Protocol State	disable	enable/disable	Make the STP active or inactive in the switch
Bridge Priority	32768	1-65535	The lower the figure, the higher the chance that the switch will be a root bridge
Bridge Hello Time	2 sec.	1-10 sec.	The time interval for the sending of BPDU packets between bridges
Bridge Max Age	20 sec.	6-40 sec.	Time period a switch waits before sending BPDU packets if no BPDU packet are received from the root bridge
Forward Delay	15 sec.	4-30 sec.	Time that the switch waits before changing its STP status from listening/ learning to learning/forwarding
Port Parameters			
Port ID	N/A	1-24	Select a port for configuring STP parameters
Priority	128	0-255	The higher the value is the easier for a port to be disabled when a loop occurs
Path cost	19	1-65535	Spanning Tree Protocol path cost of the port
Port State	disable	enable/disable	If "disable" is displayed, means STP is disabled

Appendix B

Safety Warnings and Instructions

1. Be sure to read and follow all warning notices and instructions.
2. The maximum recommended ambient temperature for the PES-1014 is 50° Celsius. Care must be taken to allow sufficient air circulation or space between units when the PES-1014 is installed inside a closed rack assembly. The operating ambient temperature of the rack environment might be greater than room temperature.
3. Installation in a rack without sufficient airflow can be unsafe.
4. Racks should safely support the combined weight of all equipment.
5. The connections and equipment that supply power to the PES-1014 should be capable of operating safely with the maximum power requirements of the PES-1014. In case of a power overload, the supply circuits and supply wiring should not become hazardous. The input rating of the PES-1014 is printed on the nameplate.
6. The power cord must plug in to the right supply voltage, i.e. 110VAC for North America and 230VAC for Europe. Make sure that the supplied AC voltage is correct and stable.
7. Installation in restricted access areas must comply with Articles 110-16, 110-17, and 110-18 of the National Electrical Code, ANSI/NFPA 70.
8. Do not allow anything to rest on the power cord and do not locate the product where anyone can walk on the power cord.
9. Do not service the product by yourself. Opening or removing covers can expose you to dangerous high voltage points or other risks. Refer all servicing to qualified service personnel.
10. Generally, when installed after the final configuration, the product must comply with the applicable safety standards and regulatory requirements of the country in which it is installed. If necessary, consult the appropriate regulatory agencies and inspection authorities to ensure compliance.
11. A rare condition can create a voltage potential between the earth grounds of two or more buildings. If products installed in separate building are interconnected, the voltage potential can cause a hazardous condition. Consult a qualified electrical consultant to determine whether or not this phenomenon exists and, if necessary, implement corrective action before interconnecting the products. If the equipment is to be used with telecommunications circuit, take the following precautions:
 - Never install or modify telephone wiring during a lightning storm.
 - Never install telephone jacks in a wet location unless the jack is specially designed for use in wet locations.
 - Never touch uninsulated (bare) telephone wires or terminals unless the telephone line has been disconnected at the network interface.

Index

A	
AC INPUT	2-3
Access Level	12-2
Access Status.....	5-3
Account	12-1
Account List	12-1
Add/Del Account.....	12-2
Address Learning	5-4
Aggregating Ports.....	See Trunking
airflow	2-3
B	
Block-N-Listen State.....	10-1
BPDU	See Bridge Protocol Data Unit
Bridge Protocol Data Unit (BPDU) Packets.....	10-1
Broadband Service	1-3
Broadcast Storm Control	1-2, 5-4
C	
CE Mark Warning	iv
Change Password	12-3
Collision Info.....	9-7
Connections	
ADSL Port	2-3
Console Port	2-2
Contacting Customer Support	v
Copy Port Settings.....	5-5
Copyright.....	ii
Customer Support.....	v
D	
Daisy-chain Connections.....	2-3
Default IP Address	3-1
Default IP Addresses	3-1
Dimensions.....	1-3
Disclaimer	ii
Downloading Upgrades.....	4-8
Duplex.....	5-2
E	
Edit VLAN Group.....	7-2
Error Counters	9-3
Ethernet Cable Types.....	2-2
Ethernet Port Connections	2-2
F	
Factory Default	11-2
FCC.....	iv
FCC Rules.....	iv
FCC Warning.....	iv
Features.....	1-1
Federal Communications Commission (FCC) Interference Statement.....	iv
Firmware Upgrade	4-8
Flow control.....	1-2
Forwarding Database	8-1
Current Static Entries	8-2
Current Status	8-1
Edit Static Entry	8-3
Forwarding State.....	10-1
Front Panel.....	2-1, 3-4
Front Panel LEDs	2-1
Color, Status, Description.....	2-1
Front Panel Ports.....	2-1
Full Duplex Flow Control (802.3x)	5-4
G	
Getting to Know the PES-1014	1-1
H	
Hardware Overview	2-1
I	
IE 5.0/IE 5.0+	4-8
in-band	3-1
Information	3-3
Input Voltage Range	1-3
Interface	1-1
L	
Learning State.....	10-1
LED Descriptions	2-1
LED Indicators.....	1-2

PES-1014 User's Guide

Line Frequency Range	1-3	Port NO.	5-2
List of Figures	ix	Port-based Trunk Configuration	6-4
List of Tables	xi	Port-based Trunking	
Load Balancing Method Selection	6-2	Port Mapping.....	6-5
Load-balancing.....	6-1	Ports Status	5-2
MAC-based.....	6-1	POTS (Plain Old Telephone Service).....	1-3
Login	3-1	Preface	xii
Loop Free Network	1-2	Procedure to Save Changes	4-8
M		Q	
MAC-based Trunking	6-3	QoS.....	1-2
Bit Selection	6-3	R	
Bit Selection Example	6-4	Rear Panel.....	2-3
Trunk Configuration	6-3	Rear Panel Connections	
Main Screen	3-3	Rear Panel	2-3
Management.....	1-1	Reboot Device	11-2
MDF (Main Distribution Frame).....	2-3	Related Documentation	xii
Memory Buffer	1-1	Reset	3-6, 11-1
MTU Application.....	1-3, 1-4	Reset Counters.....	11-1
Multi-Dwelling Unit	1-1	Reset To Factory Default.....	11-2
Multi-Tenant Unit	1-1	RJ-11	2-3
N		S	
Networking	4-5	Safety Instructions	E
Number of SNMP Hosts	4-7	Save Changes	4-8
O		Saving Changes	3-6
Operating Humidity	1-3	Scalability.....	1-1
Operating Temperature	1-3	Security.....	5-3
out-of-band.....	3-1	Security Mode	1-2
P		Single Port Statistics.....	9-8
Packet Analysis (RX).....	9-5	SNMP (Simple Network Management Protocol)	4-6
Packet Analysis (TX).....	9-4	Community.....	4-6
Packet Attribute.....	9-6	Host.....	4-7
Password	3-1, 12-2	Snooping Port.....	4-4
Performance	1-1	Software Upgrade.....	1-2
PES-1014	xii	Spanning Tree Configuration	
Plain Old Telephone Service.....	1-3	Port.....	10-3
Port.....	5-1	Switch Parameters)	10-1
Port Assigned	5-4	Spanning Tree Protocol (STP).....	10-1
Port Configuration.....	5-3	Specifications	
Port Monitoring Configuration.....	4-4	Environmental and Power	1-3

Speed	5-2	Trunk Configuration	
Statistics	9-1	MAC-based	6-3
Collision Info	9-7	Trunk Status	6-2
Error Counters	9-3	Trunking	6-1
Packet Analysis (RX)	9-5	Port-based	6-5
Packet Analysis (TX)	9-4	TX/RX Counters	9-2
Packet Attribute	9-6	U	
Single Port Statistics	9-8	User ID	12-2
TX/RX Counters	9-2	User Name	3-1
Status of Ports	5-2	V	
STP Port Status	5-2	VLAN	
straight-through	2-2	Edit Group	7-2
Syntax Conventions	xii	VLAN (Virtual Local Area Network)	7-1
System	4-1	VLAN Group	1-2
System Info	3-5, 4-2	VLAN Status	7-1
System Parameters	A	W	
T		Web Browser	3-1
Table of Contents	vi	Weight	1-3
Trademarks	ii	Welcome Screen	3-2
Trunk	6-1	Z	
Port-based Configuration	6-4	ZyXEL Limited Warranty	iii