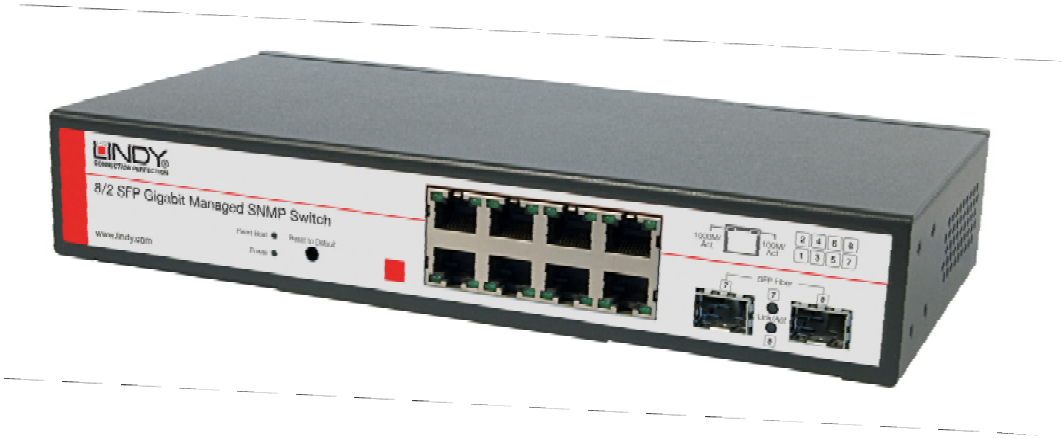
CONNECTION PERFECTION

8 Port Gigabit Smart Switch

Manual *English*



LINDY No. 25004

www.lindy.com

1.0 Introduction

Thank you for purchasing the LINDY 8 Port Gigabit Smart Switch with 2 shared mini GBIC ports. This high-performance Layer 2 network switch is ideal for use in either the home or the office
All of its ports are capable of 10, 100 or 1000Mbps auto-negotiation, while the 10/100/1000Mbps auto-sensing ability provides the easiest, most hassle-free way to migrate from a Fast Ethernet to a Gigabit Ethernet network.
This switch delivers a dedicated 10/100/1000Mbps connection to every attached client with no bandwidth congestion issues. It also supports an auto MDI/MDI-X function, which means that each port can be used to connect to another switch or hub without the need for crossover cables!
Store-and-forward architecture is used by the switch to filter and forward data after each packet is received and examined to be free of errors. All of the ports support full and half-duplex operation which doubles the network bandwidth and allows the simultaneous transmission and reception of frames without causing collisions.
The switch provides 9KB Jumbo frame support which can improve network performance by allowing more data to be sent per transmitted frame.

2.0 Features

- Non-blocking, full-line speed, store-and-forward architecture
- Supports 9KB jumbo frame
- Auto-Negotiation and Auto MDI-X on all 10/100/1000Mbps copper ports
- Up to 8 10/100/1000 RJ-45 copper ports
- 2 x Mini GBIC slots for Gigabit Ethernet LC fibre modules (shared)
- 144K byte packet buffer, 8K MAC entries
- Supports port-based VLAN and tag-based (802.1Q) VLAN
- Supports RSTP, IGMP, DHCP, FTP, HTTP & UPN
- Supports “relocate port number” to “http operation”
- Port trunking with fail-over capability
- Flow control for both full/half duplex operations
- Multicast storm, Broadcast Storm control as well as Flooding Control
- Port mirroring
- Supports Telnet
- LED display for each port to show link and activity status
- Desktop and optional Rack mountable kit
- Field-code-upgrade through web browser

3.0 Managing the switch

The switch can be managed through the RS232 port or in web mode through the Ethernet port.

3.1 Web mode default setting:

Default IP Address: 192.168.223.100
Default IP mask: 255.255.255.0

Default gateway: 192.168.223.254
Default Password: “admin”

3.2 Terminal mode default setting:

Baud rate: 115,200
Attribute: 8, None, 1, None
Default Password: “admin”

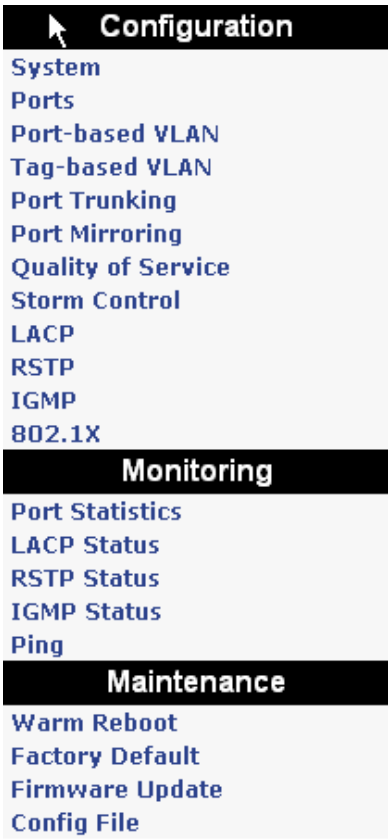
Once the terminal has connected follow the instructions below:

Press “?” to find the root operation page, then choose the command you require by typing in lower case

When you enter the command page, press “?” again to find the command parameters and the format. For more information type “command ?” to get an explanation of the command parameters
Type “u” or “/” to go back to previous page

4.0 Web Management

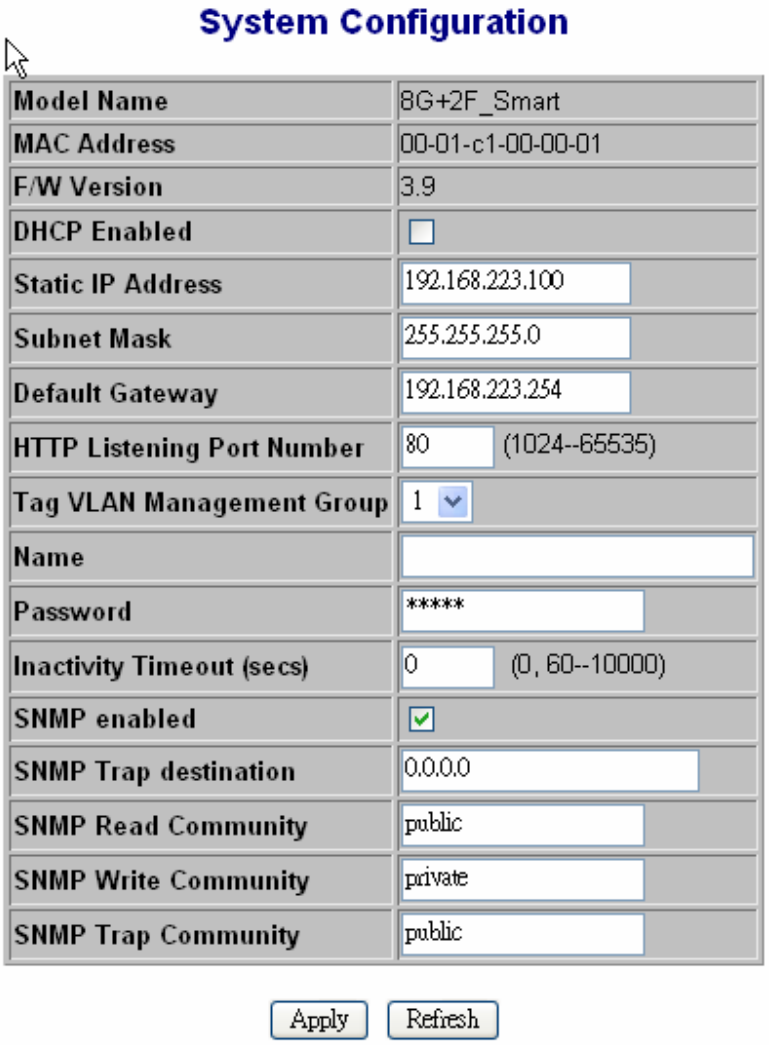
When your login has been successfully validated, the switch’s home page will appear. The left part of the page provides the function menus and the right part provides the individual configuration or system parameters values. The function manuals are divided into three categories, they are Configuration, Monitoring and Maintenance, these are shown below:



5.0 Configurations

5.1 System Information

The system configuration screen below shows the details and the status of the switch. If any changes are made you must choose “Apply” for the changes to take effect. Pressing the “Refresh” button will update the status of the system information



5.2 DHCP

By default DHCP is turned off, so a Default IP or user defined IP address is used when the switch is turned on. If the switch needs an IP assigned from a DHCP server, then tick the “DHCP Enabled” box and click on “Apply”. **Note: if you are in web page mode, connection to the switch will be lost. You will need to log back into the system configuration using the new IP address provided by the DHCP Server.**

5.3 Relocate HTTP port number

The default port number of the HTTP command is 80, unauthorised users may access the switch if they know the IP address. You may set the HTTP port number to any other value, from 1024 to 65535. Note: once the HTTP port number has been changed you will lose connection to the switch. To access the switch again use the following address replacing it with the new port number

http://192.168.223.100:port_value

5.4 Tag VLAN management group (CPU port)

The default VLAN ID group will be VID=1 for all ports. This is to allow the ports to communicate with each other and also allow you access to the Web Management via any port when powering the switch on. The web management console can only be accessed by ports on the VID=1 ID group. To access the Web management console through other ID groups, go to the system configuration page and select Tag VLAN Management group 10 and press apply. Now move the RJ-45 (web management port) from port 1 to the port selected. If you do not know which port has been selected to host the web management console you will need to "reset" the switch. This can be done by pressing the reset button for a few seconds. The switch will then return to default settings, IP Address 192.168.223.100 all ports VID=1

5.5 Port Configuration

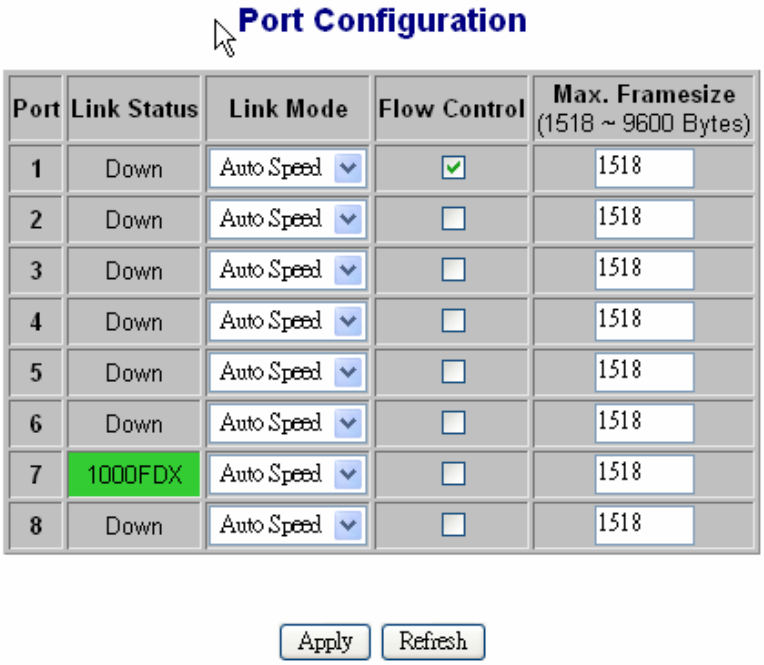
The port status page shows the current status of all 8 ports. You can set the link mode speed, enable or disable flow control and set the jumbo frame size. Note: the Framesize for all ports can only be set to the same value. An example diagram is shown below:

Port Configuration

Port	Link Status	Link Mode	Flow Control	Max. Framesize (1518 ~ 9600 Bytes)
1	Down	Auto Speed	☐	1518
2	Down	Auto Speed	☐	1518
3	Down	Auto Speed	☐	1518
4	Down	Auto Speed	☐	1518
5	Down	Auto Speed	☐	1518
6	Down	Auto Speed	☐	1518
7	1000FDX	Auto Speed	☐	1518
8	Down	Auto Speed	☐	1518

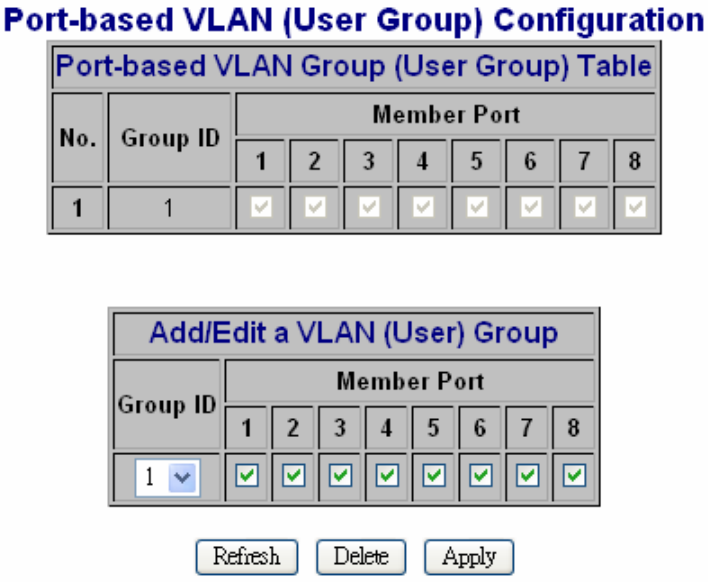
Apply Refresh

Select the changes you want to apply: Eg. If you choose port 1 to have Flow Control enabled, tick the box and then press “Apply”, the screen below will then appear upon refresh. An example diagram is shown below:

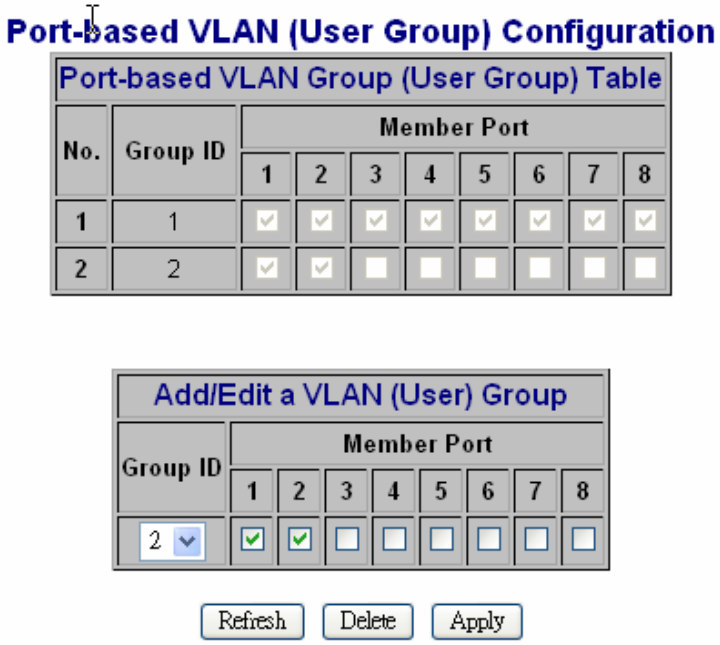


5.6 Port-based VLAN

Port-based VLAN groups ports by group ID which mean ports on different VLANs (different IDs) can’t communicate with each other. The default group ID is 1, before setting another port-based VLAN you must set up a VLAN ID group. This new group will appear in the Port-based VLAN configuration table. Note: **Only member ports in group ID 1 will be able to access other ports on the same group.** An example diagram is shown below:

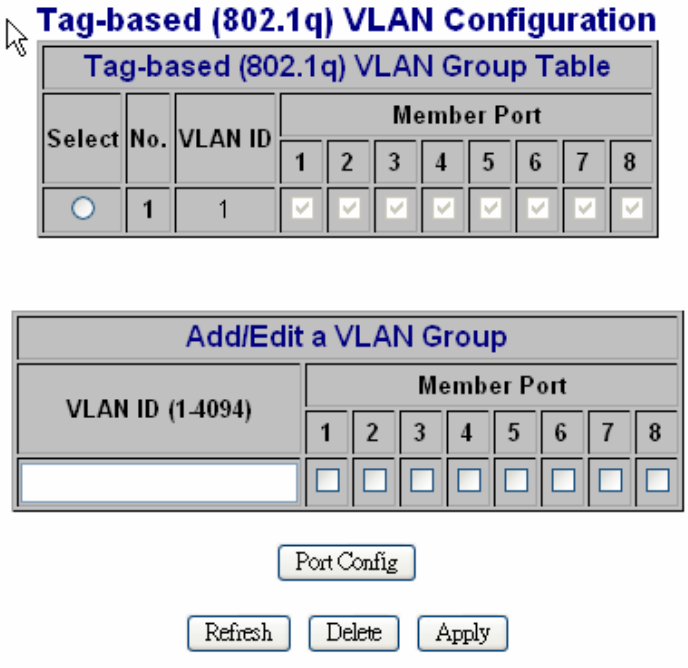


Choose and click the ports you want to group, for example, choose port 1, port 2 and set their group ID 2, then press “Apply”. An example diagram is shown below:



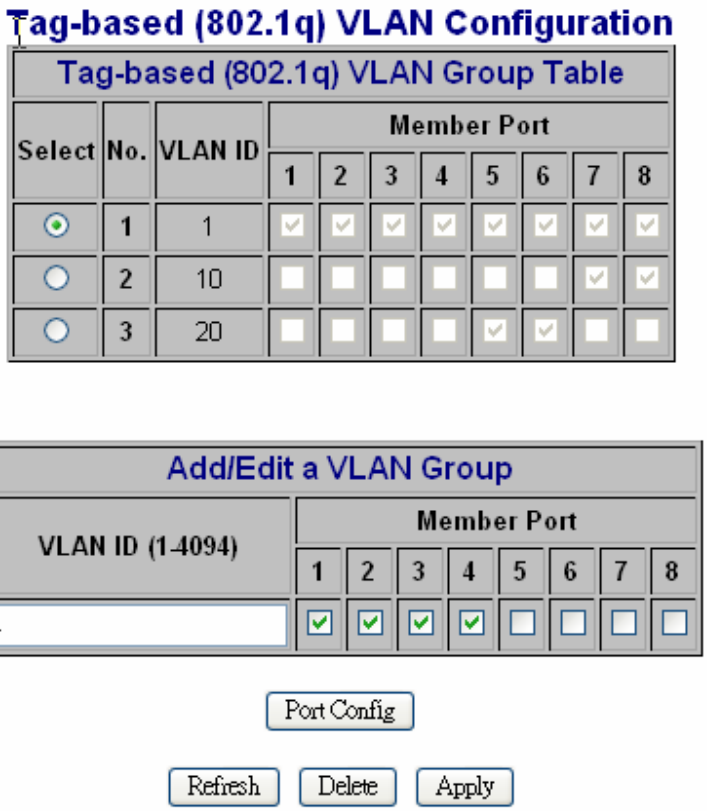
5.7 Tag-based VLAN

Tag-based VLAN allows you to assign a tag-value for each port. The same as port-based VLAN, ports on different Tag-based VLANs (different IDs) can’t communicate with each other. The default Tag-based VLAN ID is 1 (VLAN ID=1), another Tag-based VLAN can be created using numbers from 1 ~ 4094. **Note: Tag-based VLAN members are not only valid within the same device but can also cross devices as long as they are the same VLAN ID. You can only manage the switch if one of the VLAN groups are in the VLAN ID of the CPU port.** An example diagram is shown below:



The default VLAN ID group for all ports is VID=1, this is to allow any port to be used for web management communication with the CPU.

If you wish to isolate ports on a separate VLAN, then you must delete the ports from VLAN=1 and create another VLAN ID. For example, below we have added ports 7 & 8 to VLAN ID=10 and ports 5 & 6 to VLAN ID=20.



After these changes, you can perform web management on any of the 4 ports on VID=1. To perform web management on a port in another VLAN you must go to the system configuration page and select Tag VLAN management group. Once you apply the changes you must move the RJ-45 connection from port 1 to the port selected.
If you are not sure what port the CPU is active on then you can either:

1. Check for a password through the console port and the configuration of the IP
2. Reset the unit to factory default settings by holding in the reset button for five seconds

When assigning a tag VLAN, some parameters must be assigned for the tag VLAN application, here are some definitions of titles when entering the “Port Config”:

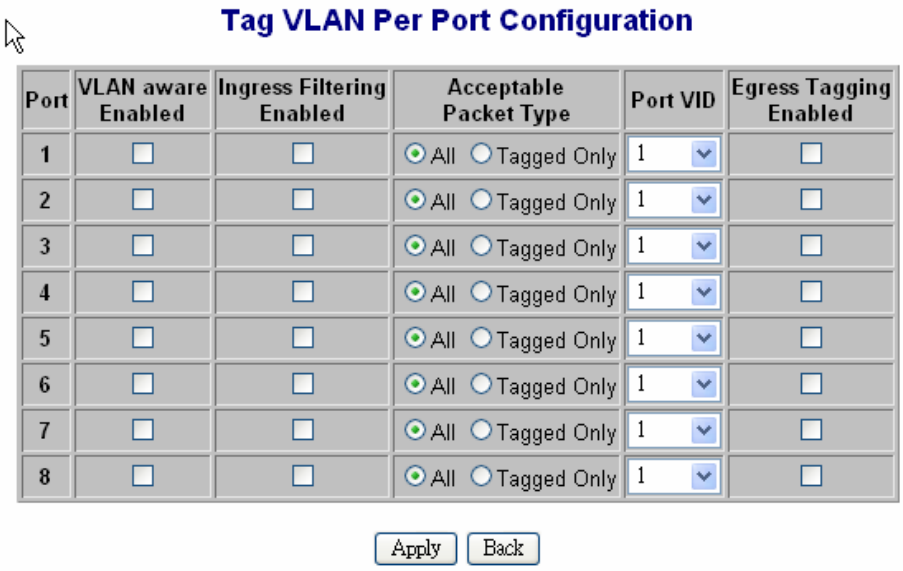
VLAN Aware mode:
Enable: When you enable the Tag-VLAN function, you may enable VLAN Aware mode associated with this port. Ingress and egress frames will be handled according to the following parameters’ setting
Disable: By default VLAN Aware mode is disabled

Ingress filtering:
Enable: Check the ingress frame VLAN ID. The Ingress frame will be dropped if this frame's VID is not the same as the VID of the ingress port which belongs to a member of a VLAN group
Disable: The Ingress frame will be flooded if the VID is not the same

3. Accept Packet Type:
ALL: Accept all ingress frames
Tagged only: Only accept ingress frames with VLAN tag

4. Port VID:
Set **Port VID** = value (1 ~ 4096), then untagged ingress frames will bear this value as its VID. Usually this port is connected to an un-tagged device (legacy device), then this frame becomes a tagged frame. This will allow it to be handled inside the switch as a member of same VID group

5. Egress Tag enable
When Egress Tag is enabled, the tag will be added into egress frames and then sent out to the device that supports tagged-VLAN. When this is disabled, a tag will not be added into egress.



5.8 Port Trunking

The default diagram is shown below, and up to 4 groups are provided:

Aggregation/Trunking Configuration

Group\Port	1	2	3	4	5	6	7	8
Normal	◉	◉	◉	◉	◉	◉	◉	◉
Group 1	○	○	○	○	○	○	○	○
Group 2								
Group 3								
Group 4								

Apply Refresh

Choose and click the trunk ports you want to group, for example, choose port 1, port 2 into group 1, then press “Apply”. An example diagram is shown below:

Aggregation/Trunking Configuration

Group\Port	1	2	3	4	5	6	7	8
Normal	○	○	◉	◉	◉	◉	◉	◉
Group 1	◉	◉	○	○	○	○	○	○
Group 2	○	○	○	○	○	○	○	○
Group 3								
Group 4								

Apply Refresh

5.9 Port Mirroring

Choose and click the ports you want to monitor, for example, mirror port 2 with port 5. then press “Apply”. An example diagram is shown below:

Port Mirroring Configuration

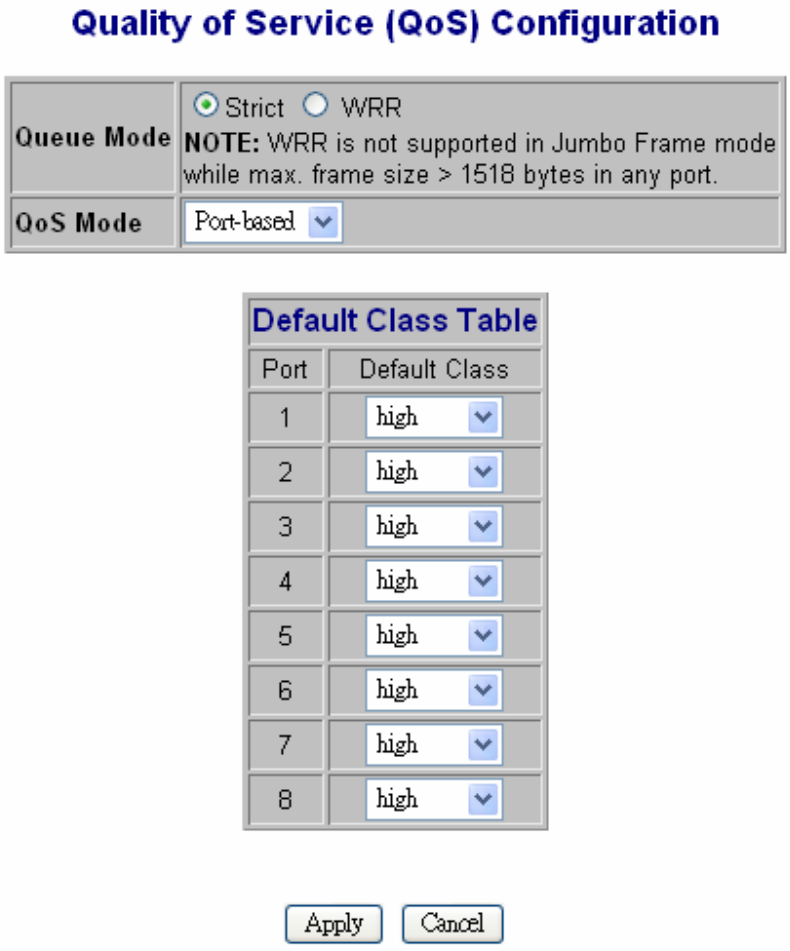
Mirror Port	2

Port	Mirror Source
1	☐
2	☐
3	☐
4	☐
5	☑
6	☐
7	☐
8	☐

Apply Refresh

5.10 Quality of Service

There are 8 priority levels (0 – 7) each port can be mapped to one of 4 classes (Low, Normal, Medium and High) this can be done in QoS control.
There are 3 QoS Modes: Port-based, 802.1P and DSCP. The frames are sent by the priority and Queue Mode settings. Strict Mode means the highest priority setting gets first service to send frames. The lower priority frames must wait until all other higher priority frames are sent. An example diagram is shown below with Strict Queue Mode:



When you choose 802.1P priority, the frames have VLAN Tag inside the switch. The priority in the Tagged frame (2 bytes Tag in total) must be set by the application program.

Quality of Service (QoS) Configuration

Queue Mode	(•) Strict ( ) WRR **NOTE:** WRR is not supported in Jumbo Frame mode while max. frame size > 1518 bytes in any port.
QoS Mode	802.1p
Prioritize Traffic	Custom

802.1p Priority - Class Mapping Table

Priority	Class	Priority	Class	Priority	Class	Priority	Class
0	normal	1	low	2	low	3	normal
4	medium	5	medium	6	high	7	high

Apply Cancel

5.11 Storm Control

A default diagram is shown below,

Storm Control Configuration

Storm Control Number of frames per second	
Broadcast Rate	No Limit
Multicast Rate	No Limit
Flooded Unicast Rate	No Limit

Apply Refresh

Choose the type of storm you want to control, for example, if you choose Broadcast storm with 3,964 fps as the upper limit, once this frame rate is reached the port will be disabled. An example diagram is shown below:

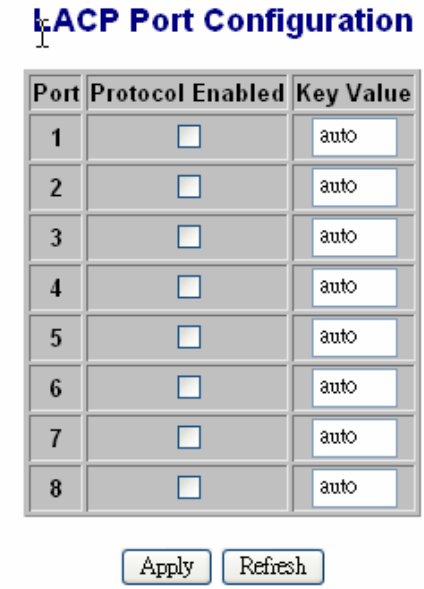
Storm Control Configuration

Storm Control Number of frames per second	
Broadcast Rate	3964
Multicast Rate	No Limit
Flooded Unicast Rate	No Limit

Apply Refresh

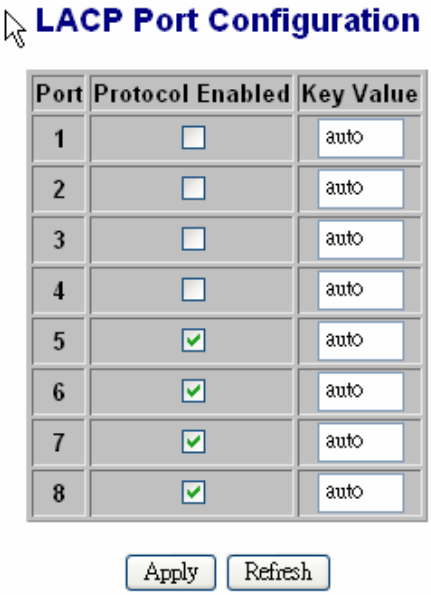
5.12 LACP

Similar to static port trunking, LACP provides another way to dynamically aggregate a port to a group (trunk) according to IEEE 802.3ad. Once the protocol is enabled, the ports to be trunked by LACP will be executed automatically after pressing “apply”. An example diagram is shown below:



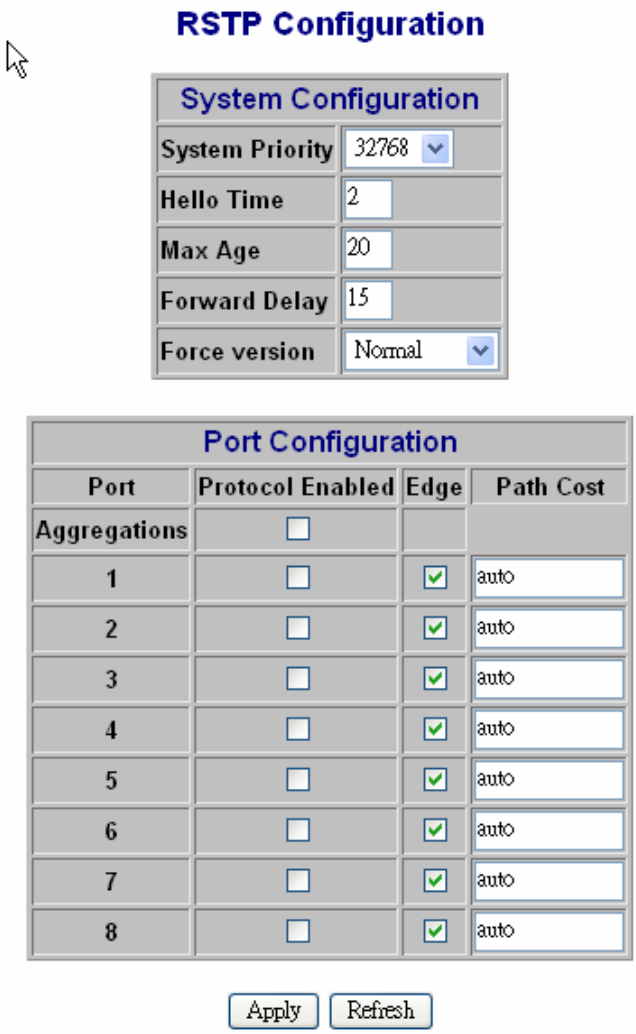
Protocol Enabled: To enable/disable LACP protocol for a port.
Key Value: A number (1~255) to identify the LACP group for a port. All member ports in a LACP group have the same key values. A Key number will be automatically generated if the “auto” value is set

Choose and click the trunk ports you want to group. For example, select port 5,6,7 and port 8 to group into an LACP group with key value “auto”. Then press “Apply” to activate the setting. An example diagram is shown below:



5.13 RSTP

The Spanning-Tree Protocol (STP) is the IEEE 802.1d standardised method for avoiding loops in switched networks. Enable STP to ensure that only one path at a time is active between any two nodes on the network.
The Rapid-Spanning-Tree-Protocol (RSTP) is a more advanced protocol than STP according to the IEEE 802.1w standard. RSTP can shorten spanning tree convergent time while network topology is changed. An example diagram is shown below:



System Configuration

System Priority: A value to identify the root bridge. The bridge with lowest value has the highest priority and is selected as the root. 16 numbers are provided in this field from 0 to 61140 in increments of 4096.
Hello Time: The number of seconds among the transmission of Spanning-Tree Protocol configuration messages. Enter a number 1 through 10. (default is 2)
Max Age: The number of seconds the bridge waits without receiving Spanning-Tree

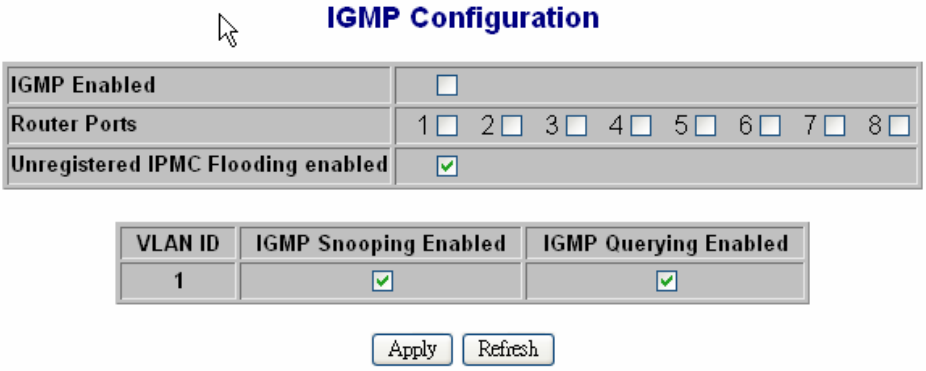
Protocol configuration messages before attempting a reconfiguration. Enter a number between 6 & 40. (default is 20)
Forward Delay: The number of seconds a port waits before changing from Spanning-Tree Protocol learning and listening state to the forwarding state. Enter a number between 4 & 30. (default is 15)
Force Version: Normal: use RSTP/Compatible: compatible with the old STP protocol

Port Configuration

Aggregations: Enable/Disable the RSTP protocol on aggregation links
Protocol Enabled: Enable/Disable the RSTP protocol per port basis
Edge: Enable/Disable to expect a port to be an edge port (an end station) or a link to another STP device
Path Cost: A value on a port the switch uses to determine which port are the forwarding ports. The lowest number is forwarding ports. The value can be set from 1 to 200000000 or “auto” to be automatically generated

5.14 IGMP

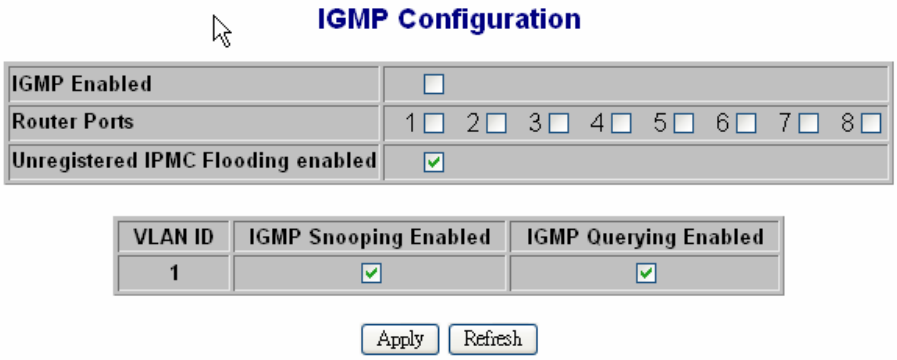
The Internet Group Management Protocol (IGMP) is an internal protocol of the Internet Protocol (IP) suite. IGMP can manage the multicast traffic if the members (switches, router or other network devices) of the group support IGMP. This switch provides IGMP snooping feature to detect IGMP queries, report packets and manages the IP multicast traffic through the switch. This feature can limit the forwarding multicast frames only to those ports that are a member of multicast group. Only IPv4 IGMP frames are recognized for this system.



IGMP Enabled: Globally enable/disable IGMP snooping function
Router Ports: The port that is usually with source of multicast traffic stream
Unregistered IPMC Flooding Enabled: To set the forwarding option for unregistered (not joined) IP multicast traffic.
Enabled: to flood frames to every port;
Disable: to forward frames only to those IGMP member ports
Two options can be set for each existing group:
IGMP Snooping Enabled: To enable/disable snooping IGMP frames
IGMP Querying Enabled: To enable/disable sending IGMP querying frames. In one

Ethernet section, there is only one Querier, and this is usually the router

For example, video traffic comes from port 8 which is connected to a router, and port 3,4,5 are Connected to IGMP member, then the configuration may be set as below



5.15 802.1x

A default diagram is shown below, user must contact the manager of RADIUS server, and then get the IP, UDP port number (usually fixed at 1812) and secret password to operate 802.1X.

Admin Mode:

Auto: The client will be authorised by authentication process

Force Authorised: The client will be authorized anyway

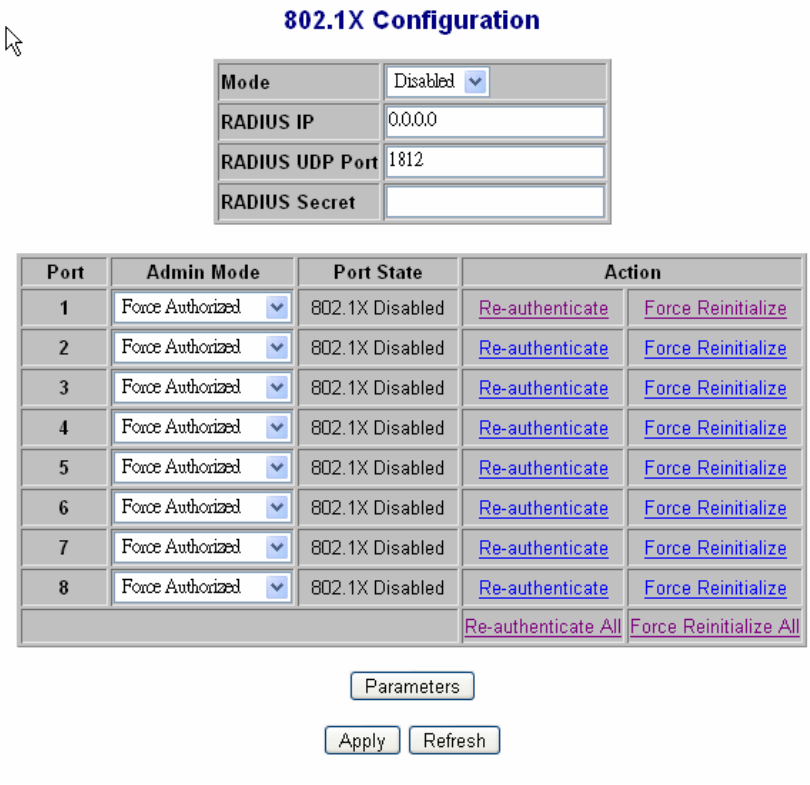
Force Unauthorised: The client won't be authorized anyway

Action: Execute the command on single port or all ports when click

Re-authenticate: Authorized again on that port

Force Reinitialize: Force the port initialization

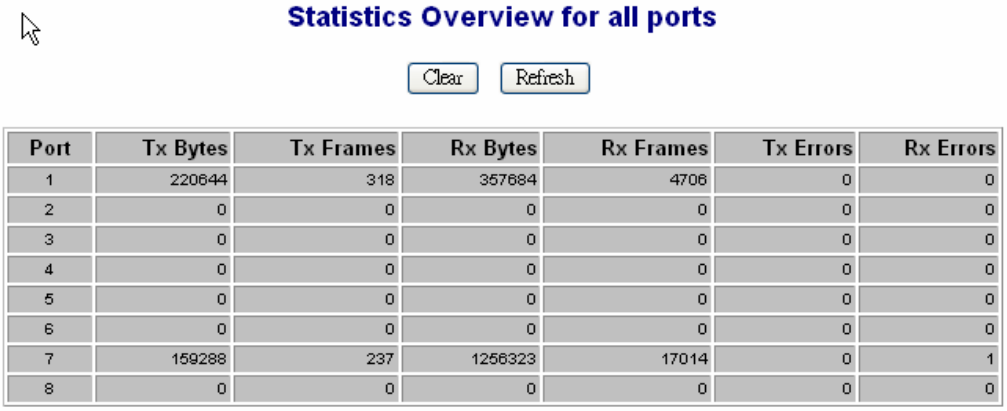
Statistic: See statistic frames



6.0 Monitoring

6.1 Port Statistics

The diagram below shows a statistical overview of all ports:



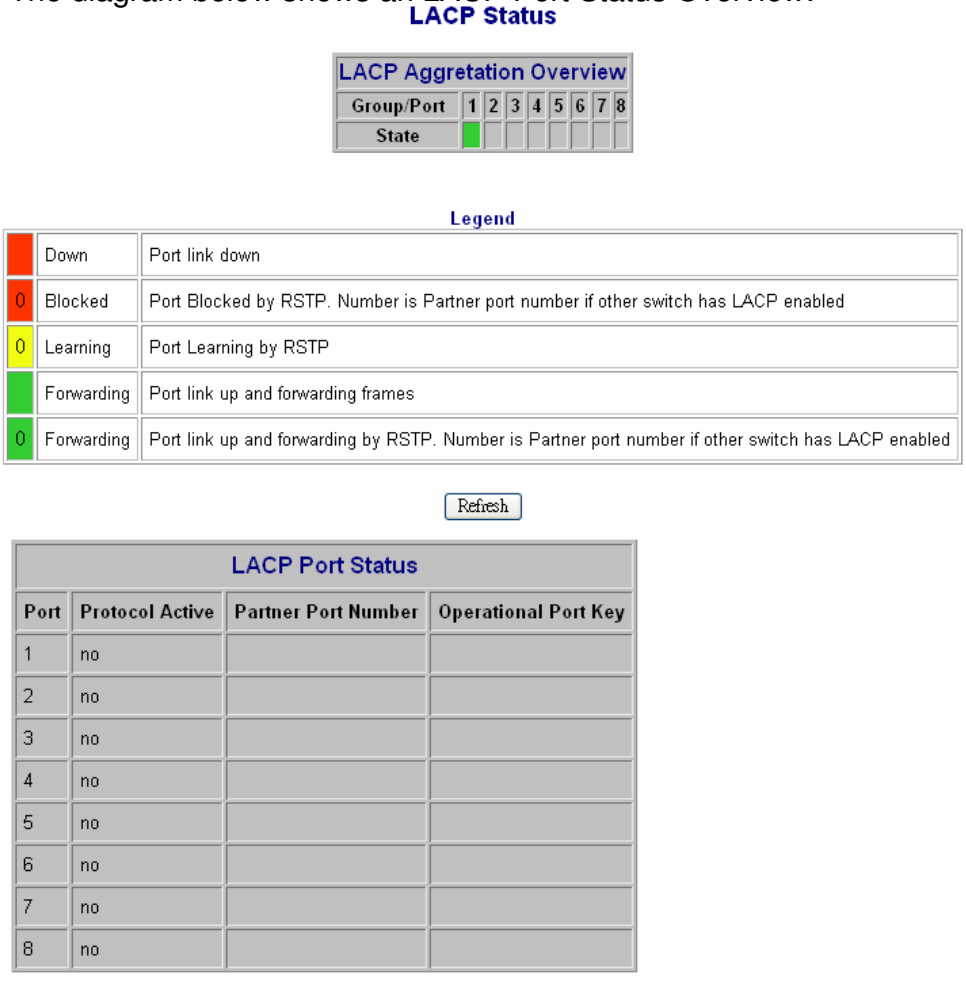
Statistics Overview for all ports

Clear Refresh

Port	Tx Bytes	Tx Frames	Rx Bytes	Rx Frames	Tx Errors	Rx Errors
1	220644	318	357684	4706	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	159288	237	1256323	17014	0	1
8	0	0	0	0	0	0

6.2 LACP Status

The diagram below shows an LACP Port Status Overview:



LACP Status

LACP Aggretation Overview								
Group/Port	1	2	3	4	5	6	7	8
State								

Legend

	Down	Port link down
0	Blocked	Port Blocked by RSTP. Number is Partner port number if other switch has LACP enabled
0	Learning	Port Learning by RSTP
	Forwarding	Port link up and forwarding frames
0	Forwarding	Port link up and forwarding by RSTP. Number is Partner port number if other switch has LACP enabled

Refresh

LACP Port Status			
Port	Protocol Active	Partner Port Number	Operational Port Key
1	no		
2	no		
3	no		
4	no		
5	no		
6	no		
7	no		
8	no		

6.3 RSTP Status

The diagram below shows an RSTP VLAN Bridge Overview:

RSTP Status

RSTP VLAN Bridge Overview						
VLAN Id	Bridge Id	Hello Time	Max Age	Fwd Delay	Topology	Root Id
1	32769:00-01-c1-00-00-02	2	20	15	Steady	This switch is Root!

Refresh

RSTP Port Status						
Port/Group	Vlan Id	Path Cost	Edge Port	P2p Port	Protocol	Port State
Port 1						Non-STP
Port 2						Non-STP
Port 3						Non-STP
Port 4						Non-STP
Port 5						Non-STP
Port 6						Non-STP
Port 7						Non-STP
Port 8						Non-STP

6.4 IGMP Status

The diagram below shows an IGMP Status Overview: This can be refreshed at any time. The IGMP v1, v2, & v3 frames will be shown in the network, the switch will only support IGMP V2, but it will handle some IGMP V3 frames. If this switch is a Querier, it will show Querier state and Query frames it transmitted, if it is not a Querier, it will only show how many Querier frames it receives. Only one Querier is allowed in a network section, usually the Querier is in router.

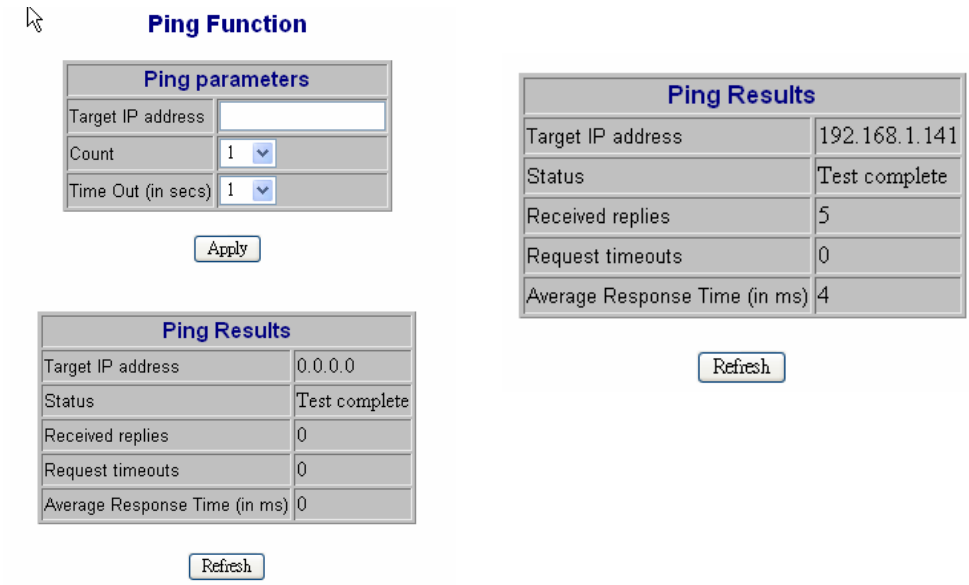
IGMP Status

VLAN ID	Querier	Queries transmitted	Queries received	v1 Reports	v2 Reports	v3 Reports	v2 Leaves
1	Disabled	0	0	0	0	0	0

Refresh

6.5 Ping

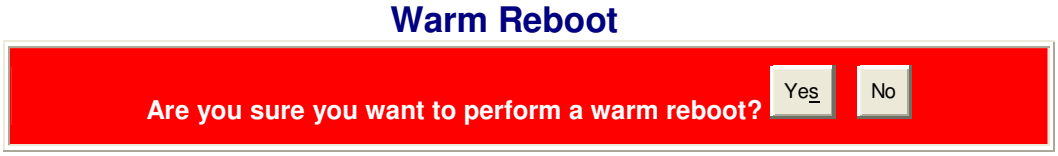
Insert the IP address you want to ping, set the Time Out time and Counts. For example, IP=192.168.1.141, count=5, time out=5 sec, then “Apply” and “refresh”. An example diagram is shown below:



7.0 Maintenance

7.1 Warm Reboot

Select “yes” to perform a warm reboot

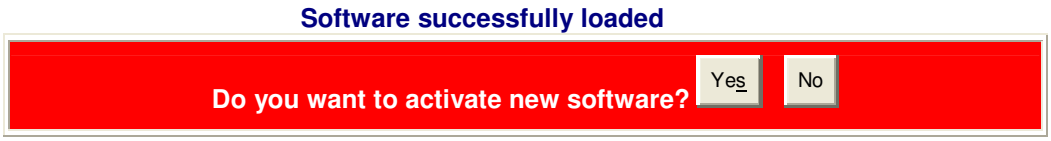


7.2 Factory Default

Select “yes” to perform a reset to factory default settings

7.3 Firmware Update

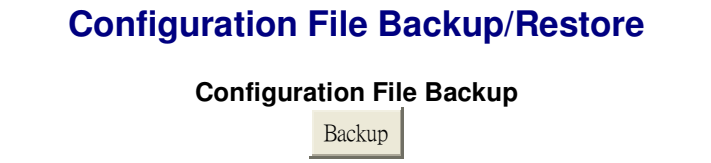
Once the firmware update has completed choose yes to activate your new software version. An example diagram is shown below:



Once you select “yes” you will get a new code to execute. Ten seconds after activating the new code press the “reset button” on the front panel so that the new default setting will be also updated.

7.4 Config File

Select the backup command and choose a location to save the backup. Select a name for your backup file and then click “backup”.



Select the restore command and select the location of the file to be restored. Select “restore”, when the file has successfully restored you will get a message saying the transfer was complete.

8.0 Terminal Mode management

To use Terminal Mode Management you must set up the terminal parameters, such as Hyper terminal in Microsoft Windows,

Select COM #: COM 1, COM 2, …then,
Set Baud rate to: 115,200, per second
Set Attribute to 8, None, 1, None (8 bit, No parity, 1 stop bit, No protocol in hardware)

Once the terminal is connected, enter the password, the basic operation are shown, and then when press “?”, the commands at top level will be shown as follows:

```
>?
Commands at top level:
System      - System commands
Console     - Console commands
Port        - Port commands
MAC         - MAC commands
VLAN        - 802.1q (Tag-based) VLAN commands
Aggr        - Aggregation commands
LACP        - IEEE 802.3ad Link Aggregation commands
RSTP        - IEEE 802.1w Rapid Spanning Tree commands
User Group  - User Group (Port-based VLAN) commands
QoS         - QoS commands
Mirror      - Mirror commands
IP          - IP commands
Dot1x       - Dot1x commands
IGMP        - IGMP Snooping commands
>
```

Key in “Command” and then key in “?”, second level will be shown, for example:

```
>vlan
VLAN>?
Commands at VLAN level:
VLAN Configuration [<portlist>]
VLAN Add <vidlist> [<portlist>]
VLAN Delete <vidlist>
VLAN Lookup <vidlist>
VLAN Aware [<portlist>] [enable|disable]
VLAN PVID [<portlist>] [<vid>|none]
VLAN Frame Type [<portlist>] [all|tagged]
VLAN Ingress Filtering [<portlist>] [enable|disable]
VLAN Egress Tagging [<portlist>] [enable/disable]
```

```
VLAN>conf
VLAN Configuration:
    Port  Aware    PVID  Ingress Filtering  Frame Type  Egress Tagging
     1:  disabled    1       disabled          All         disabled
     2:  disabled    1       disabled          All         disabled
     3:  disabled    1       disabled          All         disabled
     4:  disabled    1       disabled          All         disabled
     5:  disabled    1       disabled          All         disabled
     6:  disabled    1       disabled          All         disabled
     7:  disabled    1       disabled          All         disabled
     8:  disabled    1       disabled          All         disabled

    Entries in permanent table:
       1:  1,2,3,4,5,6,7,8
VLAN>
```

To check the IP related information:

```
IP>conf
IP Configuration:
    dhcp: disabled
    Static Address: 192.168.223.100
    Subnet Mask: 255.255.255.0
    Gateway: 192.168.223.254
    VID: 1
    HTTP Port No.: 80
    Mode:  enabled
    tftp: disabled
IP>
```

Type “up” or “/” go back to previous page

CE/FCC & WEEE Information

CE Certification

This equipment complies with the requirements relating to electromagnetic compatibility, EN55022/EN55024 class B for IEC/EN61000-4-2/3 the essential protection requirement of Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility.

FCC Certification

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 residential installation.
This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

You are cautioned that changes or modification not expressly approved by the party responsible for compliance could void your authority to operate the equipment.
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, and
2. This device must accept any interference received, including interference that may cause undesired operation.

WEEE (Waste of Electrical and Electronic Equipment), Recycling of Electronic Products

United Kingdom

In 2006 the European Union introduced regulations (WEEE) for the collection and recycling of all waste electrical and electronic equipment. It is no longer allowable to simply throw away electrical and electronic equipment. Instead, these products must enter the recycling process.
Each individual EU member state has implemented the WEEE regulations into national law in slightly different ways. Please follow your national law when you want to dispose of any electrical or electronic products. More details can be obtained from your national WEEE recycling agency.

Germany

Die Europäische Union hat mit der WEEE Direktive umfassende Regelungen für die Verschrottung und das Recycling von Elektro- und Elektronikprodukten geschaffen. Diese wurden von der Bundesregierung im Elektro- und Elektronikgerätegesetz – ElektroG in deutsches Recht umgesetzt. Dieses Gesetz verbietet vom 24.März 2006 an das Entsorgen von entsprechenden, auch alten, Elektro- und Elektronikgeräten über die Hausmülltonne! Diese Geräte müssen den lokalen Sammelsystemen bzw. örtlichen Sammelstellen zugeführt werden! Dort werden sie kostenlos entgegen genommen. Die Kosten für den weiteren Recyclingprozess übernimmt die Gesamtheit der Gerätehersteller.

France

En 2006, l'union Européenne a introduit la nouvelle réglementation (DEEE) pour le recyclage de tout équipement électrique et électronique.
Chaque Etat membre de l' Union Européenne a mis en application la nouvelle réglementation DEEE de manières légèrement différentes. Veuillez suivre le décret d'application correspondant à l'élimination des déchets électriques ou électroniques de votre pays.

Italy

Nel 2006 l'unione europea ha introdotto regolamentazioni (WEEE) per la raccolta e il riciclo di apparecchi elettrici ed elettronici. Non è più consentito semplicemente gettare queste apparecchiature, devono essere riciclate. Ogni stato membro dell' EU ha tramutato le direttive WEEE in leggi statali in varie misure. Fare riferimento alle leggi del proprio Stato quando si dispone di un apparecchio elettrico o elettronico.
Per ulteriori dettagli fare riferimento alla direttiva WEEE sul riciclaggio del proprio Stato.

LINDY No. 25004

1st Edition July 2008

www.lindy.com