



# **16-Port Gigabit Ethernet Switch**

**KGS-1601**

## **Installation Guide**

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**NOTICE:**

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- (2) Shielded interface cables and AC power cord, if any, must be used in order to comply with the emission limits.

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This device complies with EMC directive of the European Community and meets or exceeds the following technical standard. EN 55022 - Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment. This device complies with CISPR Class A.

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EN 50082/1: Generic Immunity Standard -Part 1: Domestic Commercial and Light Industry.  
EN 60555-2: Disturbances in supply systems caused by household appliances and similar electrical equipment - Part 2: Harmonics.

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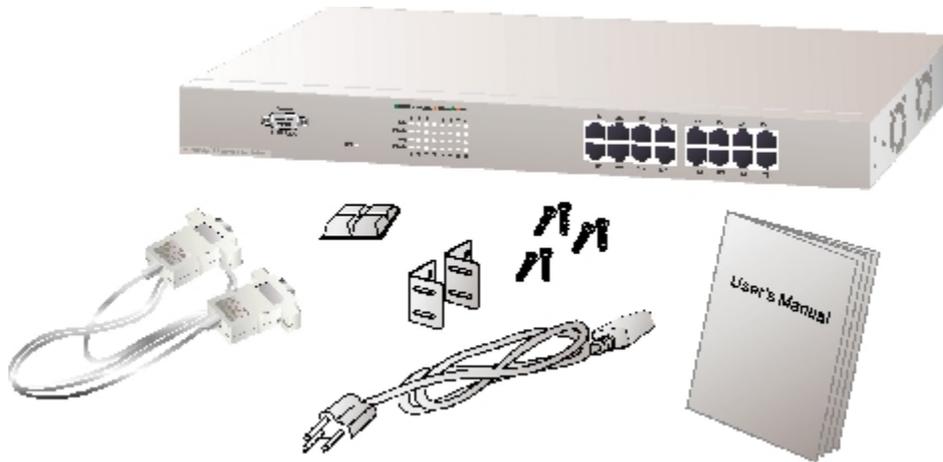
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# 1. Unpacking Information

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Thank you for purchasing the 16-port Gigabit Web Smart Switch. Before you start, please check all the contents of this package.

The product package should include the following:



1. One 16-port Gigabit Web Smart Switch
2. One power cord
3. Rubber foot and screws
4. Rack-mount brackets
5. One RS-232 Cable (Optional)
6. Product CD

## 2. Introduction to 16-port Gigabit Web Smart Switch

---

### 2.1 General Description

The device is a 16-port 10/100/1000Mbps Ethernet Web Smart Switch.

Compare to the traditional 10/100Mbps Ethernet, the switch delivers a dedicated Gigabit connection to every attached client with no congestion issue. The gigabit ports also provide the fat pipe to the server or backbone connectivity for boosting the total system performance. Moreover, the NWay auto-negotiation operation automatically negotiates with the connected partners on the network speed and duplex mode; that provides an easy way to integrate 10/100/1000Mbps networks with no pain. It is ideal for micro-segmenting large networks into smaller, connected subnets for improved performance, enabling the bandwidth demanding multimedia and imaging applications.

Out of the ordinary dumb switches, the 16-port Gigabit Web Smart Switch embedded advanced management capability; that the device can be managed through console port or web-based UI. This is much useful for system manager to monitor and control the system efficiently.

Store-and-forward switching mode promises the low latency plus eliminates all the network errors, including runt and CRC error packets. To work under full-duplex mode, transmission and reception of the frames can occur simultaneously without causing collisions as well as double the network bandwidth.

The switch is plug-n-play without any software to configure and also fully compliant with all kinds of network protocols. Moreover, the rich diagnostic LEDs on the front-panel provide the operating status of individual port and whole system.

### 2.2 Key Features

- 16 fixed 10/100/1000Mbps Gigabit Ethernet ports for easy network connecting application.
- Provide Auto-discovery Function for easy Network management.
- Provide 8K MAC address entries and 16 groups VLAN table
- Support up to 8 ports and 8 groups port aggregation.
- Support QoS-TOS, Egress rate control, Ingress rate control and Storm control for better Network management.
- Support full duplex flow control and half duplex back pressure
- Store-and-forward forwarding scheme
- Error packet filtering
- Support Jumbo frame 9.6kbytes
- Supports 400K buffer Memory
- Support local Console port or Web-based UI for configuration
- Internal switching power supply (100-240Vac/50-60Hz)

## 2.3 The Front Panel

The front panel of the switch is shown as below:



### Port Operation

There are 16 \* 1000Mbps RJ-45 (copper) ports on the front panel.

The auto-negotiation feature of the switch allows each port of the device running at one of the following operation modes:

<u>Speed</u>	<u>Duplex Mode</u>
<i>10Mbps</i>	Full Duplex Half Duplex
<i>100Mbps</i>	Full Duplex Half Duplex
<i>1000Mbps</i>	Full Duplex

All ports supports MDI/MDI-X **auto crossover** capability that is the port can connect either the PC or hub without crossover cable adjustment.

### Wiring for 10/100/1000Mbps (Copper)

Following are the summaries of cabling required:

<u>Media</u>	<u>Speed</u>	<u>Wiring</u>
<i>10/100/1000Mbps copper</i>	<i>10Mbps</i>	Category 3,4,5 UTP/STP
	<i>100Mbps</i>	Category 5 UTP/STP
	<i>1000Mbps</i>	Category 5,5e UTP/STP

### LEDs Definition

The rich diagnostic LEDs on the front panel can provide the operating status of individual port and whole system.

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Power LED	This indicator lights green when the switch is receiving power; otherwise, it is off.
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Port LEDs	Every RJ-45 port on the front panel relevant two LEDs (10/100M; 1000Mbps) for indicating the connection speed and activity status.
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## Port LED summary table

<b><u>LEDs</u></b>	<b><u>Status</u></b>	<b><u>Interpretation</u></b>
<i>10/100M</i>	Steady /Blinking Amber	Connected as 10Mbps/Active
	Steady/Blinking green	Connected as 100Mbps/Active
<i>1000M</i>	Steady/Blinking green	Connected as 1000Mbps/Active

If the port is connected but the Port LED is dark, check the following items:

- The switch and the connected device power are on or not.
- The connecting cable is good and with correct type
- The cable is firmly seated in its connectors in the switch and in the associated device
- The connecting device, including any network adapter is well installed and functioning

## 2.4 The Rear Panel

The rear panel of the switch is shown as below:



## 3. Installing 16-Port Gigabit Web Smart Switch

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This switch can be placed directly on your desktop, or mounted in a rack. Users can immediately use most of the features simply by attaching the cables and turning the power on.

### 2.1 Desktop Installation

For desktop installation, the switch needs to put on a clean, flat desk or table close to a power outlet. Plug in all network cables and the power cord, then the system is ready.

Before installing the switch, you must ensure:

1. It is accessible and cables can be connected easily
2. Cabling is away from:
  - Sources of electrical noise such as radios, transmitters and broadband amplifiers
  - Power lines and fluorescent lighting fixtures.
3. Keep water or moisture off
4. Airflow around the unit and through the vents in the side of the case is great for heat radiation (company recommend that you provide a minimum of 25 mm clearance)

To prolong the operational life of your units:

1. Never stack unit more than eight sets high if freestanding
2. Do not place objects on top of any unit or stack
3. Do not obstruct any vents at the sides of the case

### 3.2 Rack-mount Installation

The switch may stand alone, or may be mounted in a standard 19-inch equipment rack. Rack mounting produces an orderly installation when you have a number of related network devices. The switch is supplied with rack mounting brackets and screws. These are used for rack mounting the unit.

Rack Mounting the Switch in the 19-inch rack:

1. Disconnect all cables from the switch before continuing.
2. Place the unit the right way up on a hard, flat surface with the front facing toward you.
3. Locate a mounting bracket over the mounting holes on one side of the unit.
4. Insert the screws and fully tighten with a suitable screwdriver.
5. Repeat the two previous steps for the other side of the unit.
6. Insert the unit into the 19" rack and secure with suitable screws (not provided).
7. Reconnect all cables.

### 3.3 Installing Network Cables

#### Station Connections

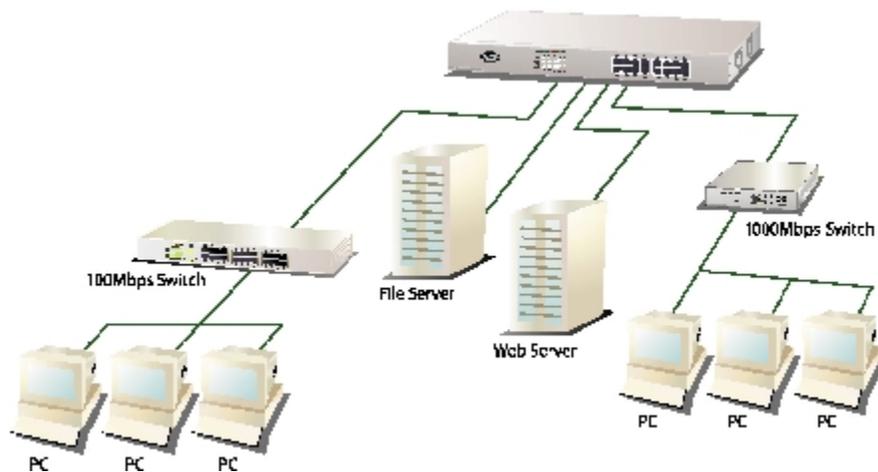
Reference to the wiring statement of the previous section; connect each station to the switch with correct type of cables.

#### Switch-to-Switch Connections

In making a switch-to-switch connection, use every ports to connect another switch or backbone is strongly recommended. The Gigabit ports provide the fat pipe to the server or backbone connectivity for boosting the total system performance. Reference to the wiring statement of the previous section; connect each station to the switch with correct type of cables.

Furthermore, as the switch supports Port Aggregation (Port Trunk) capability and up to 8 groups, it is also great to build up switch-to-switch connectivity.

### 3.4 Network Application



## 4. Functional Description

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### 4.1 PHY Monitoring and Port Mode Set-up

It is a major task of the software to continuously monitor the PHYs in order to set up the switch ports according to whether the link is down or up and in the latter case what the current speed, duplex mode and pause capabilities are.

PHYs are being polled every 100 ms.

### 4.2 Flow Control

In the 16-port switch flow control (back pressure) is also supported in half duplex. Flow control can be enabled or disabled on a per-port basis from the command line interface.

If flow control is enabled for a port the associated PHY will be set to advertise support of **Symmetric Pause**, but not **Asymmetric Pause**. If the station connected to the port also supports **Symmetric Pause**, flow control will be enabled on the switch port.

### 4.3 Ageing

To prevent that an automatically learned MAC address of a station that has been detached will remain in the MAC address table permanently, the ageing function in the switch is activated on a regular basis. The period for doing the ageing function is determined by the ageing time parameter. The ageing time parameter can be set from the command line interface. Default value is 300 seconds. Setting the ageing time parameter to 0 disables the ageing function.

### 4.4 VLAN

The device supports 802.1Q tag based VLAN. With tagging to the header of packets, the network can be segmented in groups to reduce the collisions from widely broadcasting. A maximum of 16 VLANs can be stored in EEPROM.

### 4.5 Link Aggregation

Link aggregation groups (or channels) can be defined statically. LACP (Link Aggregation Control Protocol) is not supported.

Maximum number of aggregation groups is 8.

The software will automatically detect that a link has gone down and then reassign packet distribution on the other links in the group.

### 4.6 Quality of Service

Various classifications and prioritization such as TOS, Egress rate control, Ingress rate control and Storm are supported in order to enable Quality of Service for real time applications such as VoIP (Voice over IP).

## 5. Web Management guide

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This section instructs you how to enter and set up the configurations, which can be accessed by RS-232 serial port (out-of-band) on the rear panel or by Internet Browser over the network (in-band).

### Factory Default value:

IP : 192.168.1.1  
Subnet Mask: 255.255.255.0  
Default Gateway: 192.168.1.254

### 5.1 Access the Switch

#### Console Port (Out-of-band) connection

The operating mode of the console port is:

- DCE
- 115200 (Fix baud rate)
- n (No parity checking)
- 8 (8 Data bits)
- 1 (1 stop bit)
- None (No flow control)

After attaching a RS-232 cable (Straight-through) to the serial port of a PC running a terminal emulation program, press **Enter** key then login screen appears. Enter your username and password to login the management console.

#### **Note:**

For the detail Command line Interface instructions, refer to the chapter 7.

#### **Attention:**

1. The factory default value of UserName and Password is **admin**.
2. System configurations via the Console Port only will be allowed by the way of master device.

#### In-Band Connections (Web Browser)

To manage the switch through in-band access, you should configure the management station with an IP address and subnet mask compatible with your switch.

1. Running your Web Browser and enter the IP address **192.168.1.1** as the URL in the address field.
2. Key in the User name and password to pass the authentication. The factory default value of User Name and Password is **admin**.

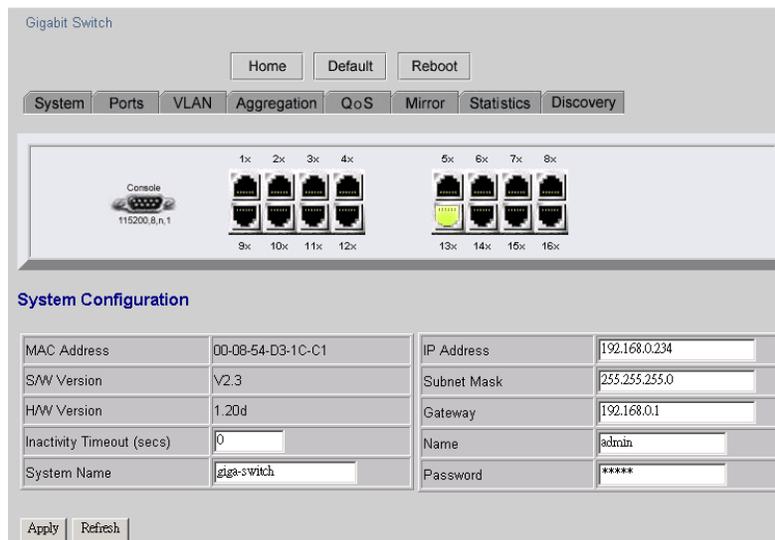


3. After authentication procedure, the home page shows up.

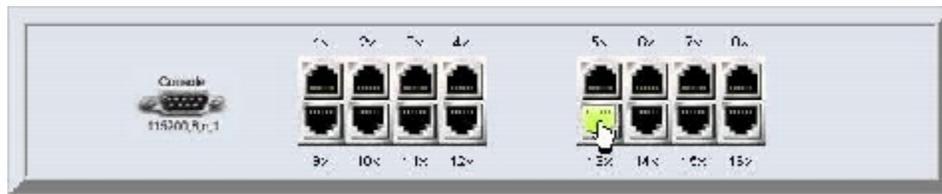
## 5.2 Home Page

On the Home page, you can select the configuration by clicking the menu tabs located on the upside of the UI. It includes,

- System
- Ports
- VLAN
- Aggregation
- QoS
- Mirror
- Statistics
- Discovery



To restore the **default** Values of switch, click the **[Default]** button. If you want to **reboot** the switch, click the **[Reboot]** button. To check the connection status of each port from 1 to 16, take a look at the port monitor. When the port shows **green**, it is connected and link up. Otherwise it is **dark**. To know the detail statistics of one port, click on it and the window will show.



Port Statistics Detail - Microsoft Internet Explorer

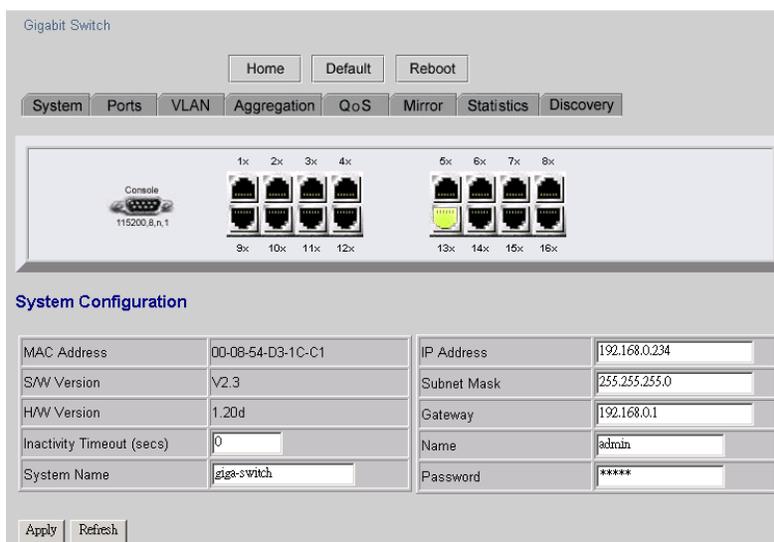
### Port 1 Detail Statistics

Clear Refresh

Receive Total		Transmit Total	
Packets:	647	Packets:	237
Octets:	83914	Octets:	79395
High Priority Packets:	648	High Priority Packets:	0
Low Priority Packets:	0	Low Priority Packets:	240
Broadcast:	407	Broadcast:	1
Multicast:	28	Multicast:	0
Receive Size Counters		Transmit Size Counters	
64 Bytes:	246	64 Bytes:	65
65-127 Bytes:	230	65-127 Bytes:	32
128-255 Bytes:	128	128-255 Bytes:	49
256-511 Bytes:	42	256-511 Bytes:	14
512-1023 Bytes:	5	512-1023 Bytes:	80
1024- Bytes:	0	1024- Bytes:	6
Receive Error Counters		Transmit Error Counters	
CRC/Alignment:	0	Collisions:	0
Undersize:	0	Drops:	0
Oversize:	0		
Fragments:	0		
Jabbers:	0		
Drops:	0		

## 5.2.1 System

To set up the system configurations such as login value, time-out value and enabling the VLAN Management.



The screenshot displays the configuration page for a Gigabit Switch. At the top, there are navigation buttons for 'Home', 'Default', and 'Reboot'. Below these are tabs for 'System', 'Ports', 'VLAN', 'Aggregation', 'QoS', 'Mirror', 'Statistics', and 'Discovery'. The 'System' tab is active, showing a console port (115200, 8, n, 1) and 16 Ethernet ports (1x-16x). The 'System Configuration' section contains a table of settings:

MAC Address	00-08-54-D3-1C-C1	IP Address	192.168.0.234
S/W Version	V2.3	Subnet Mask	255.255.255.0
H/W Version	1.20d	Gateway	192.168.0.1
Inactivity Timeout (secs)	0	Name	admin
System Name	giga-switch	Password	*****

At the bottom of the configuration table are 'Apply' and 'Refresh' buttons.

### Status & Setting

Mac Address

S/W Version

H/W Version

Inactivity Timeout (Secs)

System name

IP Address

Subnet Mask

Gateway

Name

Password

Apply

### Functions

The Mac Address of the switch

To check up the Software Version, see this.

The Hardware version

Set the console inactivity timeout in seconds. The value zero disables timeout. Timeout value in seconds, 0, 60-10000.

Name of the Switch

Set up the IP of Switch

Set up the Subnet mask of Switch

Set up the Gateway of Switch

The Login name (default admin)

The Login password (default admin)

Click this button to save the configuration.

### **Note:**

After you change the IP address, the switch will reboot itself. You may click the new address to link the New IP with your Browser.

The primary IP address is being changed to 192.168.0.239 netmask 255.255.255.0 gateway 192.168.0.1

Please go to <http://192.168.0.239> to continue.

Your browser communicates with the web server via the LAN connection, and changing the IP address may temporarily disrupt this communication. If nothing happens, wait for a short while, and then try the new address, <http://192.168.0.239>, again.

## 5.2.2 Ports

On the page, you can view the Port status, set up the Speed mode and enable the FDX flow control.

Port Configuration				
Port	Link	Mode	FDX Flow Control	Max Frame (1518-9600)
1	Down	Auto Speed	<input type="checkbox"/>	1518
2	Down	Auto Speed	<input type="checkbox"/>	1518
3	Down	Auto Speed	<input type="checkbox"/>	1518
4	1000 FDX	Auto Speed	<input type="checkbox"/>	1518
5	Down	Auto Speed	<input type="checkbox"/>	1518
6	Down	Auto Speed	<input type="checkbox"/>	1518
7	Down	Auto Speed	<input type="checkbox"/>	1518

### Status & Settings

Link

Mode

FDX Flow Control

Max Frame length

Apply

Refresh

### Functions

To show the status of each port. When it is red, it means the connection is down. Otherwise, it is green.

Choose the Speed mode of port 10/100/1000, Half/Full. To disable the port, choose **Disable**. If you set to auto speed, it will be auto-negotiation.

To Enable the FDX Flow control, click the check box.

To adjust the Frame length, enter the value you need. The larger value it is, the better network performance you will have. Default is 1518. The Maximum value is 9600.

Click this button to save the configuration.

Click this button to refresh the latest status of ports.

### **Note:**

To make the maximum frame length control works properly, FDX Flow Control of the port must be enabled. The port link partner must also be enabled for supporting flow control.

## 5.2.3 VLAN

VLAN Configuration is for dividing the LAN into subnet groups for better network management. The benefit is that the user can move one client to another subnet group without actually moving the machine.

### VLAN Entry

There are 16 entries to set up.

#### To add new VLAN Entry,

1. Select the ports by clicking the check box.
2. Enter the VLAN ID number (1 ~ 4094) for the entry.
3. Select the member ports (PORT MEMBER) for the new VLAN entry.
4. Click **[Add]** to add it in the table.
5. Do not forget to click the **[Apply]** to save the setting.

#### To remove the VLAN entry,

Select the entry you want to remove, click **[Remove]** to delete it.

#### **Note:**

If the entry VID (VLAN ID) value exists in any port PVID configuration, the entry can not be removed.

#### To modify the entry,

Select the entry you want to change and set up the new configurations. After the changes are made, Click **[Modify]** to save.

#### **Caution:**

Because settings in VLAN, Port aggregation, and Mirror functions are correlative, make sure that the setting will not influence others. It is suggested not to activate more than one function for one port.

VLAN Entry [PVID](#)

VLAN Entry( MAX 16 )

VID:1	PORT MEMBER: 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16
-------	---

VID:

PORT MEMBER:

01  02  03  04  05  06  07  08

09  10  11  12  13  14  15  16

**Note:**

1.VLAN entry can be removed only when the VID is not used in any PVID.  
2.The settings of VLAN, Aggregation, and Mirror function may influence each other.  
Make sure only one function is activated on the same port.

## PVID

When the VLAN-enabled switch receives a untagged packet, the packet will be sent to the port default VLAN according to the PVID (port VLAN ID) of the ingress port.

### Settings

Port

### Functions

Port Number 1~16

PVID

Port VLAN ID(1~4094)

For Ingress VLAN mapping rules, refer to the following table:

#### **Only Tagged   Received Packet Type   VLAN entry mapped**

Disable	Untagged	Ingress port PVID
Disable	Tagged	Received packet VID
Enable	Untagged	Drop received packet
Enable	Tagged	Received packet VID

EgressTagging

Check the box to enable egress tagging before packet transmission.  
For the detail egress tagging rules, refer to the following table:

#### **Tagging   Received Packet   Egress Packet**

Disable	Untagged	Untagged (no modification)
	Tagged	Untagged (VID tag is removed)
Enable	Untagged	Insert VID Tag with ingress port PVID
	Tagged	Tagged (no modification)

Only Tagged

Check box to enable the port to drop all received untagged frames

Apply

Click button to save the changes you made.

[VLAN Entry](#)   [PVID](#)

**Egress Tagging:**  
Enable to insert VID tag with input port's PVID for untagged packet and remain unchanged for tagged packet for egress operation.  
Disable to remove tag for tagged packet and remain unchanged for untagged packet.

**Only Tagged:**  
Accept only tagged frame from this port.

PORT	PVID	Egress Tagging	OnlyTagged
1	<input type="text" value="1"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="text" value="1"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="text" value="1"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	<input type="text" value="1"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	<input type="text" value="1"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	<input type="text" value="1"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	<input type="text" value="1"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	<input type="text" value="1"/>	<input type="checkbox"/>	<input type="checkbox"/>

## 5.2.4 Aggregation/ Trunking Configuration

To set up the Port trunk groups, put the ports number into the same Aggregation group line. There are eight groups to choose. The maximum number of ports for one group is 8.

There three aggregation modes for selection, SMAC (Source MAC), DMAC (Destination MAC), and XOR.

**Aggregation/Trunking Configuration. --Member Port(Max:8)--**

Aggregation Mode:

GroupPort	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Normal	<input checked="" type="radio"/>															
Group 1	<input type="radio"/>															
Group 2	<input type="radio"/>															
Group 3	<input type="radio"/>															
Group 4	<input type="radio"/>															
Group 5	<input type="radio"/>															
Group 6	<input type="radio"/>															
Group 7	<input type="radio"/>															
Group 8	<input type="radio"/>															

## 5.2.5 QoS

The switch provides four functions for Quality of Service. They are custom TOS, Egress Rate Control, Ingress Rate Control, and Custom Storm.

Gigabit Switch

**Quality of Service (QoS) Configuration**

[Custom TOS](#)

[Egress Rate Control](#)

[Ingress Rate Control](#)

[Custom Storm](#)

## 5.2.5.1 Quality of Service (QoS) TOS Configuration

To improve the network performance by applying the TOS for IP packets, set up the priority of eight groups of precedence bits on this page. There are two priority levels to choose, high or Low.

### Settings    Functions

- Port            To select the switch port, from 1 to 16
- Bit 0-2        TOS bit value
- Priority        Select the priority of TOS group

The following table lists the type of Precedence for TOS values:

<u>TOS Value</u>	<u>Precedence</u>
111	Network Control
110	Internetwork Control
101	CRITIC/ECP
100	Flash Override
011	Flash
010	Immediate
001	Priority
000	Routine

Quality of Service (QoS) TOS Configuration

**TCP/IP TOS Priorities**

Port	Bit 0	Bit 1	Bit 2	Priority
Port 1 ▾	0	0	0	High ▾
	0	0	1	High ▾
	0	1	0	High ▾
	0	1	1	High ▾
	1	0	0	High ▾
	1	0	1	High ▾
	1	1	0	High ▾
	1	1	1	High ▾

Apply    Refresh

### 5.2.5.2 QoS Port Egress Rate Control

To limit the out-going packet rate, select **[Enable]** and enter the value you need from 250~1000000Kbps. The packet rate over the limitation will be discarded. Click **[Apply]** to save settings.

Port's Egress Rate Configuration

Port	Enable/Disable	Rate(250~1000000Kbps)
1	Disable	250 kbps
2	Disable	250 kbps
3	Disable	250 kbps
4	Disable	250 kbps
5	Disable	250 kbps
6	Disable	250 kbps
7	Disable	250 kbps
8	Disable	250 kbps

### 5.2.5.3 QoS Port Ingress Rate Control

To limit the in-coming packet rate, select **[Enable]** and enter the value you need from 250~1000000Kbps. If the packet rate is larger than the limitation, the switch will make the connected device on the port to suspend the frame transmission by using flow control mechanism. Click **[Apply]** to save settings.

Port's Ingress Rate Configuration

Port	Enable/Disable	Rate(250~1000000Kbps)
1	Disable	250 kbps
2	Disable	250 kbps
3	Disable	250 kbps
4	Disable	250 kbps
5	Disable	250 kbps
6	Disable	250 kbps
7	Disable	250 kbps
8	Disable	250 kbps

### 5.2.5.4 QoS Port Broadcast Storm

To prevent the broadcast storm, the switch provides the multicast packet rate control setting. You can select **[Enable]** and enter the value, and click **[Apply]** to save the setting.

Port's Storm Configuration

Port	Enable/Disable	Rate(250~1000000Kbps)
1	Disable	250 kbps
2	Disable	250 kbps
3	Disable	250 kbps
4	Disable	250 kbps
5	Disable	250 kbps
6	Disable	250 kbps
7	Disable	250 kbps
8	Disable	250 kbps

## 5.2.6 Mirror

Port mirror function is used to mirror traffic from source port to a target port for analysis. Only 2 ports can be monitored (mirrored) simultaneously to 1 Monitor port (target port). (Note that the target port must be in the same VLAN as the source ports.)

**Mirror Port Configuration**

Monitor Port: Port 1

Source Ports:

Port1  Port2  Port3  Port4  Port5  Port6  
 Port7  Port8  Port9  Port10  Port11  Port12  
 Port13  Port14  Port15  Port16

Apply Refresh

### Settings

Monitor Port

Source Ports

Apply

### Functions

Select the switch port, from 1 to 16 to be the target port to collect traffic info

To select the mirror ports, Click the check box of the port.

Click button to save settings.

### **Caution:**

Because settings in VLAN, Port aggregation, and Mirror functions are correlative, make sure that the setting will not influence others. It is suggested not to activate more than one function for one port.

## 5.2.7 Statistics

To check the status of port traffic, click statistic tab. You can click **[Clear]** button to erase all records or click **[Refresh]** to show the latest status.

**Statistics Overview for all ports**

Clear Refresh

Port	Tx Bytes	Rx Bytes	Tx Frames	Rx Frames	Tx Errors	Rx Errors
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	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

## 5.2.8 Discovery

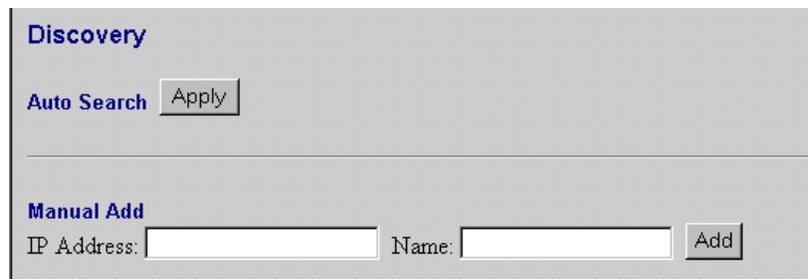
When you install several switches in the network, the discovery management tool helps you to search and access those switches easily. Therefore you can access any switch without memorizing the respective IP addresses.

**Note:**

The Maximum number of Address list is 16 for each mode.

### Auto Search

1. Click the Auto search [**Apply**] button to find the switches.
2. The IP address & name of Switch list will appear.
3. Click the one you want to access.



**Discovery**

Auto Search

---

**Manual Add**

IP Address:  Name:

### Manual Add

1. Enter the IP address & name in the text box
2. Click [**Add**] to add the new IP address on the table

### Remove

1. Click the check box of the switch you want to remove from the list.
2. Click [**Delete**] to remove.



**Manual Add**

IP Address:  Name:

1	<a href="#">192.168.0.232</a>	David	<a href="#">modify</a>	<input type="checkbox"/>	<input type="button" value="Delete"/>
---	-------------------------------	-------	------------------------	--------------------------	---------------------------------------

## 5.2.9 Default

To restore all settings to factory default values,

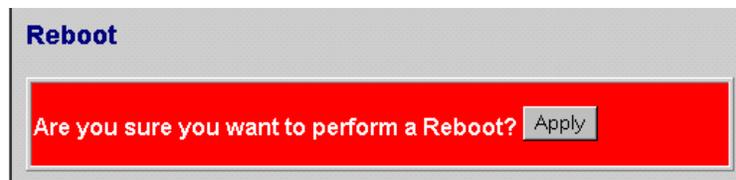
1. Click [**Default**] button on the Home page
2. Click [**Yes**] to confirm the action.



## 5.2.10 Reboot

To reboot the switch,

1. Click [**Reboot**] button on the Home page
2. Click [**Yes**] to confirm the action.



## 6. Product Specifications

---

<b>Standard</b>	IEEE802.3 10BASE-T IEEE802.3u 100BASE-TX IEEE802.3x full-duplex operation and flow control IEEE802.3ab 1000BASE-T IEEE802.1Q VLAN interoperability
<b>Interface</b>	16 * 10/100/1000Mbps auto MDI/MDI-X RJ-45 switching ports 1 * RS-232 Console port
<b>Cable Connections</b>	RJ-45 (10BASE-T): Category 3,4,5 UTP/STP RJ-45 (100BASE-TX): Category 5 UTP/STP RJ-45 (1000BASE-T): Category 5,5e or enhanced UTP/STP
<b>Network Data Rate</b>	10/100/1000Mbps Auto-negotiation
<b>Transmission Mode</b>	10/100Mbps Full-duplex, Half-duplex 1000Mbps Full-duplex
<b>LED indications</b>	System Power RJ-45 Port 10/100M; 1000M link/act
<b>Memory</b>	4K MAC entries 400K Buffer Memory
<b>Emission</b>	FCC Class A, CE
<b>Operating Temperature</b>	0° ~ 50°C (32° ~ 122°F)
<b>Operating Humidity</b>	10% - 90%
<b>Power Supply</b>	Internal power supply 5V 10A 100-240V/ 50-60H
<b>Power Consumption</b>	38W max.

## 7. Command Line Interface

---

### 7.1 Start-up and Terminal configuration

To start-up the command line interface, connect a PC COM port to the RS-232 connector and activate a terminal emulation software (e.g. HyperTerminal of Windows.). The terminal emulation software should be set up as follows:

1. Data rate: 115200 baud
2. Data format: 8 data bits, 1 stop bit and no parity
3. Flow control: none.
4. Click the property icon, select settings, make sure that:  
The Function, arrow, and ctrl keys act as: Terminal keys  
Emulation: VT100

### 7.2 Login/Logout Procedures

To get access to the CLI, you will have to get the username and password for login. One set of default username/password is identified with admin/admin.

You may logout at any time and at any context level using the exit command.

**Note:**

It is suggested to change the default and configure a new username/password to prevent unauthorized users from accessing to the device.

### 7.3 Command Hierarchy

The CLI (Command Line Interface) is hierarchical with two levels: a top level and a group level. The group level consists of the following groups:

- System
- Console
- Port
- MAC
- VLAN
- Aggr(Aggregation)
- QoS
- Mirror
- IP

When you are at the top level, the prompt shows :>, and if you are at the group level, the prompt displays the group name, e.g. System>.

To be under a certain group, you may enter the group name at top level or add / in front of the group name then press enter at any level. Examples:

At top level: >system <enter> New prompt -> System>

At any level: system>/ip <enter> New prompt -> IP>

To be at top level, you may enter **up** at any level. (ex, system>up <enter>).

**Note:**

All the characters entered in the command line interface are **NOT** case-sensitive.

## 7.4 Help Utility

You can get command information by entering ? or **help**.

### Prompt at top level

System	System commands
Console	Console commands
Port	Port commands
MAC	MAC table commands
VLAN	VLAN commands
Aggregation	Aggregation/Trunking commands
QoS	QoS commands
Mirror	Mirror commands
IP	IP commands

### Prompt at group level (Example: System>? <enter>)

```
System Configuration [all]
System Restore default [keepip]
System UserName [<name>]
System Password [<password>]
System systemname [<systemname>]
System Reboot
```

### Help after a specific command (Example: System>configuration ?)

Syntax:

```
System Configuration [all]
```

Description:

Show System Name, Username, Password, Software Version, Hardware Version and management MAC address. Optionally show the full configuration [all]: Show the total switch configuration (default: System configuration only)

## 7.5 Entering Commands

Commands are given by entering the command string. The command string is not case-sensitive.

There are three possible situations for entering the command:

1. At any level or group: you should enter the full syntax of the command with a / in front of the syntax (ex, enter **/system configuration** in any level to check the system status.)
2. At top level or under the group that contains the command: enter the full command syntax (ex, enter **system configuration** at top level or at prompt **System>**)
3. Under the group that contains the command: Users are allowed to enter the command skipping the group name (ex, enter **configuration** under the prompt **System>**)

Some of the commands have optional parameters (parenthesized after a syntax). If the optional parameter is omitted, a default value may be used or the command may display the current setting (i.e. functions as a getting a command).

Example 1, omitted parameter interpreted as display command:

```
Syntax:  
Systemname [<systemname>]  
System>systemname <enter>  
systemname: gi ga-swi tch
```

Example 2, omitted parameter interpreted as default value (VLAN ID 1):

```
Syntax:  
MAC Add <macaddress> <port list> [<vid>]  
>mac add 010203ABCDEF 16 <enter>
```

You may use the horizontal arrow-keys <- and -> to move the cursor within the command you are entering. And you can also use the backspace key (provided by a terminal that sends the BS (8) character when the backspace key is pressed) to delete characters from the command you are entering.

If your terminal software (e.g. HyperTerminal) supports <home> and <end> keys, you may use these keys to move the cursor to respectively the start and the end of the command line.

## 7.6 Terminology

The following table shows general parameter types used in command syntaxes and descriptions.

<port>	The port number
<portlist>	Comma and/or dash separated port list. This type can be used for specifying individual ports or a range of ports. The keyword <b>none</b> can be used to specify an empty port list. The keyword <b>all</b> can be used to specify all ports. Example: 1,3,8-12.
<macaddress>	MAC Address; format: <b>hh-hh-hh-hh-hh-hh</b> , <b>hh:hh:hh:hh:hh:hh</b> or <b>hhhhhhhhhhhhhh</b> . The hh is Hexadecimal number in the range 0x00 to 0xFF. Example: 00-00-24-F1-02-03
<vid>	VLAN ID: Decimal number in the range 1-4095. The keyword <b>all</b> can be used to specify all VLAN IDs.
<vidlist>	Comma and/or dash separated VLAN ID list. This type can be used for specifying individual VLAN IDs or a range of VLAN IDs. The keyword <b>none</b> can be used to specify an empty VLAN ID list. Example: 1,2,4-6
<UDP/TCP port>	UDP/TCP port number: Decimal number in the range 0-65535.
<rate>	Leaky bucket rate in Kbit/s [0-1000000k] or Mbit/s [0-1000m]

The <portlist> type is helpful when setting up multiple ports in the same mode. For example, the following commands divide the ports into two untagged VLANs and enable VLAN awareness:

```
vlan add 1 1-8
vlan add 2 9-16
vlan pvid 1-8 1
vlan pvid 9-16 2
vlan aware all enable
```

## 7.7 Command Description

In this session, the commands in each group and the descriptions to those commands are provided respectively in the following group order:

1. System
2. Console
3. Port
4. MAC
5. VLAN
6. Aggregation
7. QoS
8. Mirror
9. IP

## 7.7.1 System Commands

Commands at the System level:

System Configuration [all]  
System Restore default [keepip]  
System Username [<name>]  
System Password [<password>]  
System systemname [<systemname>]  
System Reboot

### 1. System Configuration:

**Syntax:**

System Configuration [all]

**Description:**

Show system name, software version, hardware version and management MAC address. Optionally show the full configuration

[all]: Show the total switch configuration (default: System configuration only).

### 2. System Restore default

**Syntax:**

System Restore Default

**Description:**

Restore factory default configuration.

[keepip]: Keep current IP settings.

### 3. System Username

**Syntax:**

Username [<name>]

**Description:**

Set or show the user name.

### 4. System Password

**Syntax:**

Password [<password>]

**Description:**

Set or show the password. The password can not be empty.

[<password>]: Password string of up to 16 characters

### 5. Systemname

**Syntax:**

Systemname [<systemname>]

**Description:**

Set or show the system name. The systemname can not be empty.

[<systemname>]: String of up to 16 characters.

### 6. System Reboot

**Syntax:**

## System Reboot

### Description:

Reboot the switch.

## 7.7.2 Console Commands

Commands at Console level:

### Console Configuration

Console Timeout [<timeout>]

Console Prompt [<prompt string>]

#### 1. Console Configuration

##### Syntax:

Console Configuration

##### Description:

Show configured Console password and timeout.

#### 2. Console Timeout

##### Syntax:

Console Timeout [<timeout>]

##### Description:

Set or show the Console inactivity timeout in seconds. The value zero disables timeout.

[<timeout>]: Timeout value in seconds, 0, 60-10000.

#### 3. Console Prompt

##### Syntax:

Console Prompt [<prompt\_string>]

##### Description:

Set or show the Console prompt string. The empty string ("") clears the prompt string.

[<prompt\_string>]: Command prompt string of up to 10 characters.

## 7.7.3 Port Commands

Commands at Port level:

Port Configuration [<portlist>]

Port Mode [<portlist>] [<mode>]

Port Flow Control [<portlist>] [enable|disable]

Port State [<portlist>] [enable|disable]

Port MaxFrame [<portlist>] [<framesize>|reset]

Port Statistics [<portlist>] [clear]

#### 1. Port Configuration

##### Syntax:

Port Configuration [<portlist>]

##### Description:

Show the configured and current speed, duplex mode, flow control mode and state for the port.

<portlist>: Port list (Default: All ports).

## 2. Port Mode

### Syntax:

Port Mode [<portlist>] [<mode>]

### Description:

Set or show the speed and duplex mode for the port.

<portlist>: Port list (Default: All ports).

<mode> : Port speed and duplex mode (Default: Show configured and current mode).

10hdx : 10 Mbit/s, half duplex.

10fdx : 10 Mbit/s, full duplex.

100hdx : 100 Mbit/s, half duplex.

100fdx : 100 Mbit/s, full duplex.

1000fdx: 1 Gbit/s, full duplex.

auto : Auto negotiation of speed and duplex.

## 3. Port Flow Control

### Syntax:

Port Flow Control [<portlist>] [enable|disable]

### Description:

Set or show flow control mode for the port.

<portlist> : Port list (default: All ports).

[enable|disable]: Enable/disable flow control (default: Show flow control mode).

## 4. Port State

### Syntax:

Port State [<portlist>] [enable/disable]

### Description:

Set or show the state for the port.

<portlist> : Port list (default: All ports).

[enable|disable]: Enable or disable port state (default: Show state).

## 5. Port MaxFrame

### Syntax:

Port MaxFrame [<portlist>] [<framesize>|reset]

### Description:

Set or show the maximum frame size in bytes (including FCS) for frames received on the port. Tagged frames are allowed to be 4 bytes longer than the maximum frame size. Use the reset option to return to the default setting.

[<portlist>] : Port list (default: All ports).

[<framesize>|reset]: Maximum frame size or reset to 1518 bytes (default: Show maximum frame size).

## 6. Port Statistics

### Syntax:

Port Statistics [<portlist>] [clear]

### Description:

Show or clear statistics for the port.  
<portlist>: Port list (default: All ports).  
[clear] : Clear port statistics (default: Show statistics).

## 7.7.4 MAC Table Commands

Commands at MAC level:

MAC Configuration  
MAC Add <macaddress> <portlist>|none [<vid>]  
MAC Delete <macaddress> [<vid>]  
MAC Lookup <macaddress> [<vid>]  
MAC Flush  
MAC Age time [<agetime>]

### 1. MAC Configuration

Syntax:

MAC Configuration

Description:

Show the permanently stored MAC table and the MAC ageing timer.

### 2. MAC Add

Syntax:

MAC Add <macaddress> <portlist>|none [<vid>]

Description:

Add a static MAC address table entry and VLAN ID on ports.

<macaddress>: MAC address, 12-digit hex string, optionally separated with dashes or colons (e.g. 010203ABCDEF or 01-02-03-AB-CD-EF or 01:02:03:AB:CD:EF).

<portlist> : Port list. Use "none" to specify no ports.

[<vid>] : VLAN ID, 1-4094 (default: 1).

### 3. MAC Delete

Syntax:

MAC Delete <macaddress> [<vid>]

Description:

Delete MAC address and VLAN ID.

<macaddress>: MAC address, 12-digit hex string, optionally separated with dashes or colons (e.g. 010203ABCDEF or 01-02-03-AB-CD-EF or 01:02:03:AB:CD:EF).

[<vid>] : VLAN ID (default: 1).

### 4. MAC Lookup

Syntax:

MAC Lookup <macaddress> [<vid>]

Description:

Lookup MAC address and VLAN ID.

<macaddress>: MAC address, 12-digit hex string, optionally separated with dashes or colons (e.g. 010203ABCDEF or 01-02-03-AB-CD-EF or 01:02:03:AB:CD:EF).

[<vid>] : VLAN ID, 1-4094 (default: 1).

## 5. MAC Flush

### Syntax:

MAC Flush

### Description:

Removes non-static MAC address from the switch MAC table.

## 6. MAC Age Time

### Syntax:

MAC Agetime [<agetime>]

### Description:

Set or show the MAC age timer in seconds. The value zero disables ageing.

[<agetime>]: Age timer in seconds, 0 or 10-65535 (default: Show timer).

## 7.7.5 VLAN Commands

Commands at VLAN level:

VLAN Configuration [<portlist>]

VLAN Add <vidlist> [<portlist>]

VLAN Modify <vidlist> [<portlist>]

VLAN Delete <vidlist>

VLAN Lookup <vidlist>

VLAN Aware [<portlist>] [enable|disable]

VLAN PVID [<portlist>] [<vid>|none]

VLAN Frame Type [<portlist>] [all|tagged]

### 1. VLAN Configuration

#### Syntax:

VLAN Configuration [<portlist>]

#### Description:

Show the VLAN aware mode, port VLAN ID and accepted frame type for the port

and the permanently stored VLAN table.

[<portlist>]: Port list (default: All ports).

### 2. VLAN Add

#### Syntax:

VLAN Add <vidlist> [<portlist>]

#### Description:

Add VLAN entry and include ports in member set.

<vidlist> : VLAN ID list.

[<portlist>]: Port list (default: All ports).

### 3. VLAN Delete

#### Syntax:

VLAN Delete <vidlist>

#### Description:

Delete VLAN entry (all ports excluded from member set).

<vidlist> : VLAN ID list.

#### 4. VLAN Lookup

**Syntax:**

VLAN Lookup <vidlist>

**Description:**

Lookup VLAN entry and show port list.

<vidlist> : VLAN ID list.

#### 5. VLAN EgressTagging

**Syntax:**

VLAN EgressTagging [<portlist>] [enable|disable]

**Description:**

Set or show the VLAN Egress Tagging mode for the port. The enabled ports will strip the VLAN tag from received frames and insert the tag in transmitted frames (except PVID). The disabled ports will not strip the tag from received frames or insert the tag in transmitted frames.

[<portlist>]: Port list (default: All ports).

[enable|disable]: Enable/disable VLAN egress tagging (default: Show awareness).

#### 6. VLAN PVID

**Syntax:**

VLAN PVID [<portlist>] [<vid>|none]

**Description:**

Set or show the port VLAN ID. Untagged frames received on the port will be classified to this VLAN ID. Frames classified to this VLAN ID will be sent untagged on the port.

[<portlist>]: Port list (default: All ports).

[<vid>|none]: Port VLAN ID, 1-4094 (default: Show PVID).

The none option can be used for trunk links.

#### 7. VLAN Frame Type

**Syntax:**

VLAN Frame Type [<portlist>] [all|tagged]

**Description:**

Set or show the accepted frame type for the port.

[<portlist>]: Port list (default: All ports).

[all|tagged]: Accept all or only tagged (default: Show frame type).

### 7.7.6 Aggregation/trunking Commands

Commands at Aggr level:

Aggr Configuration

Aggr Add <portlist>

Aggr Delete <portlist>

Aggr Lookup <portlist>

Aggr Mode [smac|dmac|xor]

#### 1. Aggregation Configuration

**Syntax:**

## Aggr Configuration

### Description:

Shows the aggregation groups and the aggregation mode.

### 2. Aggregation Add

#### Syntax:

Aggr Add <portlist>

#### Description:

Add link aggregation group including ports.

<portlist>: Aggregation port list.

### 3. Aggregation Delete

#### Syntax:

Aggr Delete <portlist>

#### Description:

Delete link aggregation group.

<portlist>: Port list. Aggregations including any of the ports will be deleted.

### 4. Aggregation Lookup

#### Syntax:

Aggr Lookup <portlist>

#### Description:

Lookup and display link aggregation group.

<portlist>: Port list. Aggregations including any of the ports will be shown.

### 5. Aggregation Mode

#### Syntax:

Aggr Mode [smac|dmac|xor]

#### Description:

Set or show link aggregation traffic distribution mode.

[smac|dmac|xor]: Aggregation mode, SMAC, DMAC or XOR (default: Show mode).

## 7.7.7 QoS Commands

Commands at QoS level:

QoS Configuration [<portlist>]

QoS TosPrecedence [<portlist>] [<tosprecedencelist>] [low|high]

QoS EgressRate [<portlist>] [enable|disable] [<rate>]

QoS IngressRate [<portlist>] [enable|disable] [<rate>]

QoS Storm Control [<portlist>] [enable|disable] [<rate>]

### 1. QoS Configuration

#### Syntax:

QoS Configuration [<portlist>]

#### Description:

Show the configured IP ToS Precedence priority mapping, egress rate con-

trol  
configuration, ingress rate control configuration and multicast storm control  
[<portlist>]: Port list (default: All ports).

## 2. QoS Tosprecedence

Syntax:

QoS Tosprecedence [<portlist>] [<tosprecedencelist>] [low|high]

Description:

Set or show the IP ToS precedence priority mapping.

[<portlist>] : Port list (default: All ports).

[<tosprecedencelist>]: IP ToS precedence list, 0-7 (default: All precedence values).

[low|high] : Internal priority (default: Show priority).

## 3. QoS Egress Rate

Syntax:

QoS EgressRate [<portlist>] [enable|disable] [<rate>]

Description:

Set or show the Egress rate configuration.

[<portlist>] : Port list (default: All ports).

[enable|disable]: Enable/disable Egress Rate control (default: Show shaper mode).

[<rate>] : Leaky bucket rate in Kbit/s [250-1000000k] or Mbit/s [1-1000m] (default: Show EgressRate rate).

## 4. QoS Ingress Rate

Syntax:

QoS IngressRate [<portlist>] [enable|disable] [<rate>]

Description:

Set or show the ingress rate configuration.

[<portlist>] : Port list (default: All ports).

[enable|disable]: Enable/disable ingress rate control (default: Show IngressRate mode).

[<rate>] : Leaky bucket rate in Kbit/s [250-1000000k] or Mbit/s [1-1000m] (default: Show Ingress rate).

## 5. QoS Storm Control

Syntax:

QoS Storm Control [<portlist>] [enable|disable] [<rate>]

Description:

Set or show the multicast storm control configuration. Multicasts and broadcasts are controlled using a multicast ingress rate control.

[<portlist>] : Port list (default: All ports).

[enable|disable]: Enable/disable the multicast ingress rate control (default: Show multicast IngressRate mode).

[<rate>] : Leaky bucket rate in Kbit/s [250-1000000k] or Mbit/s [1-1000m] (default: Show multicast Ingress rate).

## 7.7.8 Mirror Commands

Commands at Mirror level:

Mirror Configuration

Mirror Port [<port>]

Mirror Source [<portlist>] [enable|disable]

### 1. Mirror Configuration

Syntax:

Mirror Configuration

Description:

Show the mirror destination port and mirror mode for source ports.

### 2. Mirror Port

Syntax:

Mirror Port [<port>]

Description:

Set or show the mirror destination port.

[<port>]: Mirror destination port (default: Show mirror port).

### 3. Mirror Source

Syntax:

Mirror Source [<portlist>] [enable|disable]

Description:

Set or show the source port mirror mode.

[<portlist>] : Source port list (default: All ports).

[enable|disable]: Enable/disable mirroring of frames received on port (default: Show mirror mode).

## 7.7.9 IP Commands

Commands at IP level:

IP Configuration

IP Setup [<i paddress> [<i pmask> [<i pgateway>]]]

### 1. IP Configuration

Syntax

IP Configuration

Description:

Show the IP status, including IP, Subnet Mask, and Default Gateway

### 2. IP Setup

Syntax

IP Setup [<i paddress> [<i pmask> [<i pgateway>]]]

Description:

Set the IP, Subnet Mask, and Default Gateway

## 7.8 Example

This example shows how to configure two VLANs with the following setup:

- VID 1 spans ports 2-16 and VID 2 spans ports 1-3, so port 2 and 3 are members of both VLANs and all 16 ports must be VLAN Egress Tagging enabled.
- Port 1 is the access port for VID 2, so PVID of port 1 must be set to 2.
- Port 2 is the trunk port for VID 1 and VID 2, so the PVID of port 2 must be set to **none** and port 2 must be set to accept tagged frames only
- Port 3 is the hybrid port for VID 1 and VID 2, where VID 1 is the untagged VLAN, so PVID must be set to 1.
- Ports 4-16 are access ports for VID 1.

The following CLI session does the above setup provided that the initial configuration is the default configuration:

```
>vlan
VLAN>add 1 2-16
*** Warning: Existing entry overwritten
VLAN>add 2 1-3
VLAN>egresstagging enable
VLAN>pvid 1 2
VLAN>pvid 2 none
VLAN>frame type 2 tagged
VLAN>conf
VLAN Configuration:
Port  EgressTagging  PVID  FrameType
1:    enabled        2     All
2:    enabled        none   Tagged
3:    enabled        1     All
4:    enabled        1     All
5:    enabled        1     All
6:    enabled        1     All
7:    enabled        1     All
8:    enabled        1     All
9:    enabled        1     All
10:   enabled        1     All
11:   enabled        1     All
12:   enabled        1     All
13:   enabled        1     All
14:   enabled        1     All
15:   enabled        1     All
16:   enabled        1     All
Entries in permanent table:
1:  2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16
2:  1, 2, 3
VLAN>
```

## 8. Factory Default Configuration

---

The factory default configuration is a VLAN aware L2 switch with automatic learning/ageing and auto negotiation enabled on all ports:

System:	The system name string is empty.
Console:	The password string is empty and inactivity timeout is disabled. The prompt is >.
Port:	All ports are enabled for auto negotiation and flow control is disabled. Max frame size is 1518.
MAC table:	The table is empty, auto learning and ageing is enabled. The ageing timer is 300 seconds.
VLAN:	Only VLAN 1 is present in the table and includes all ports. All ports are VLAN egress tagging disabled with Port VLAN ID 1. All ports accept all frame types.
Aggregation:	No ports are aggregated, but aggregation mode is set to XOR.
QoS:	IP ToS Precedence priority is enabled and all Precedence values are given high priority. The 4 highest VLAN tag priorities are given high priority. The UDP/TCP port list is empty. Default priority is high. Default user priority is 0. L4 default priority and match priority are low. All EgressRate control and IngressRate control are disabled.
Mirror:	Mirroring is disabled.