TiNet S2000B Fast Ethernet Switch

User's Manual

Version：V1.1

Date：<2008-10-07>

Shenzhen New Greennet Technologies Co.Ltd

Version Control

Date	Version	Description	
2008-08-01	V1.0	First edition	
2008-10-07	V1.1		

Declaration

I n d e x

P r e f a c e

Introduction

This manual introduces TiNet S2000B（F）Fast Ethernet switch in details. This manual can help users to understand our product and also guide users to install, configure, manage and maintain it.

Audience

This manual is for the networking professional who has experience working with the concepts and terminology of the Ethernet and local area networking and is also familiar with the switch software features.

Conventions

1. General conventions

Convention	Description
Black	Headings are in black
Times New Roman	Normal paragraphs are in Times New Roman
Arial	Cautions and notes are in Ariel

2. Command conventions

Convention	Description
Boldface	The keywords of command lines are in boldface.
Italic	Command arguments are in italic
[ ]	Items (keywords or arguments) in square brackets [ ] are optional
{X| Y|…}	Alternative items are grouped in braces and separated by vertical bars. One is selected.
[X| Y|…]	Optional alternative items are grouped in square brackets and separated by vertical bars. One or none is selected.
!	A line starting with ! sign is comments.

3. Symbols

Symbol	Caution	Description
	Note, comment, tip, knowhow, thought	A complementary description
	Caution, warning, danger	Reader must be extremely careful during the operation

Technical assistance

The GreenNet website provides online documents and tools for product and software updating, manual revising, and technical serving etc.

URL：www.newgreennet.com.cn

E-mail ： service@greennet.com.cn

Hot line:800-830-6786 （Cell phone and 800 number unavailable areas please dial 0755-26717768）

Chapter 1 Accessing Device

1.1 Accessing mode

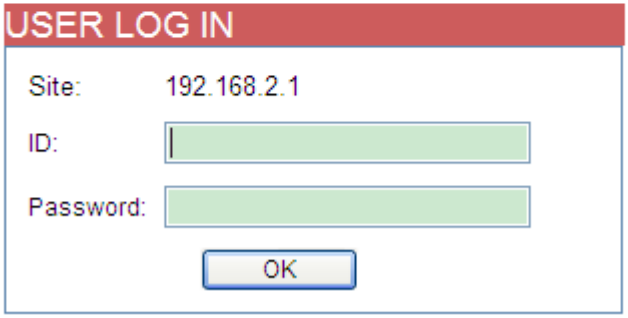
Configure the device through WEB configuration page, including: switch management, port configuration and VLAN configuration. Use your web browser （Internet Explorer5.0 or later is recommended）to configure the switch.

1.2 Web Configuration

Each netwprk interface supports WEB management, default administrative IP is 192.168.2.1，mask is 255.255.255.0 and default gateway is 192.168.2.254. PC of the administrator should connect to the device for administration.

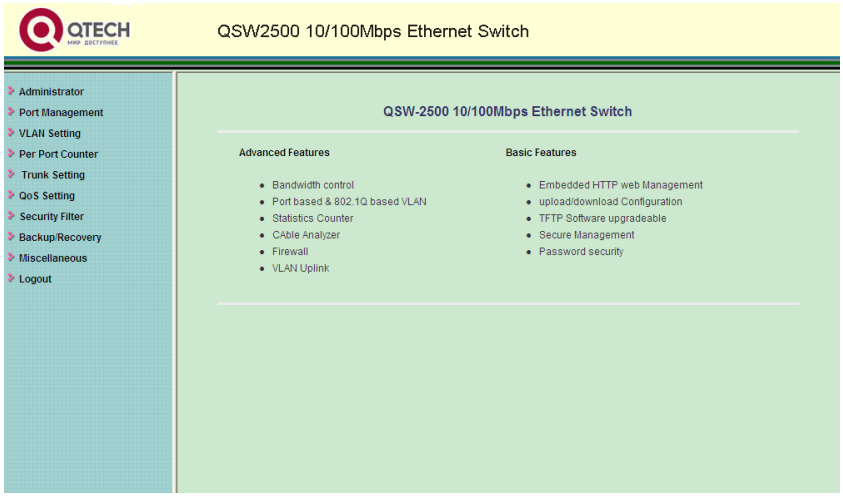
1.3 Log in

Type the IP address http://192.1668.2.1 in the location box（PC of the administrator should connect to the device for administration）and press enter or return：



Type username in 【ID】 and password in 【Password】before click 【OK】. The setup wizard page appears as following:

Note：Defaule username is **admin** and password is **123456**, which can be modified in 【Authentication Configuration】.

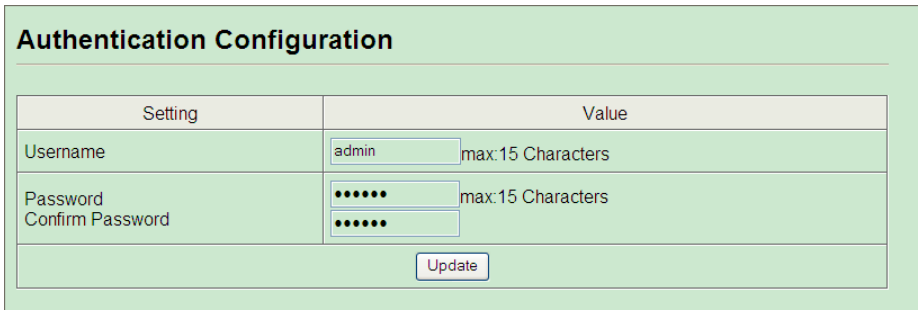


The left is index of each function options and right is the description of 【Advanced Features】 and 【Basic Features】.

Chapter 2 Management

2.1 Password Configuration

Click【Authentication Configuration】under【Administrator】on the left:



Modify current username and password on this page.

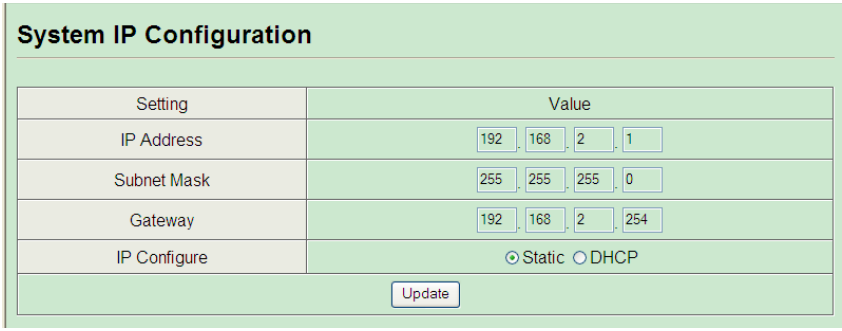
Click 【Update】to affirm configuration. Successfully modification will show as following：

Click 【Relogin】to login in again using new username and password.

Note：Username and password can only use numbers and letters.

2.2 IP Configuration

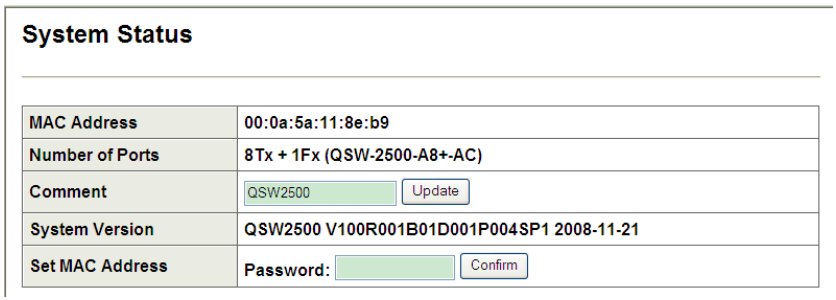
Click【System IP Configuration】under【Administrator】on the left:



Modify【IP Address】,【Subnet Mask】,【Gateway】and【IP Configure】on this page. IP address cannot be all 0, all F and multicast address. Click【Update】to affirm configuration and it needs rebooting the device.

2.3 System Status

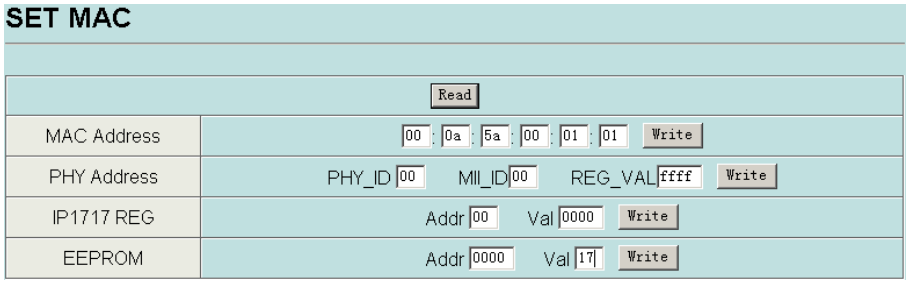
System status includes: 【MAC Address】、【Number of Ports】, 【Comment】and【System Version】as following：



2000B（F）Series switch is divided into： 15Tx+1Fx, 16Tx, 8Tx+1Fx and 8Tx.

Input device name in 【Comment】 and click【Update】to modify it. Successfully modification will show device name on the page.

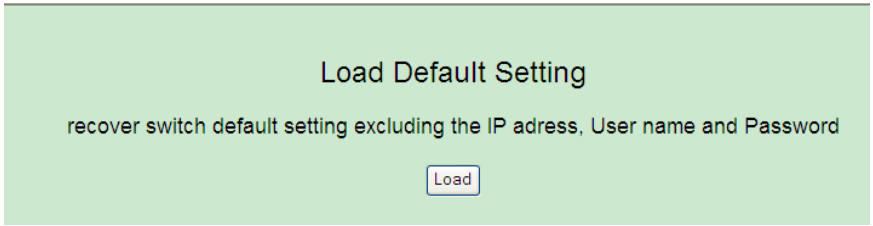
Input password ”setmac” in【Set MAC Address】and click【Confirm】to turn to following pages：



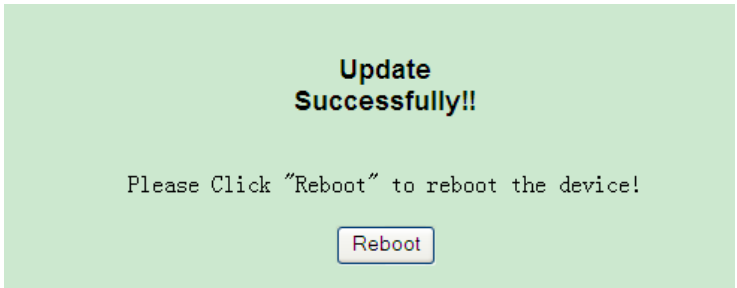
2.4 Restore to default configuration

Restoring to default configuration means to restore to factory status, not including IP address, username and password.

Click 【Load Default Setting】under【Administrator】on the left to turn to following page.



Click【load】. Reboot the device after modification.



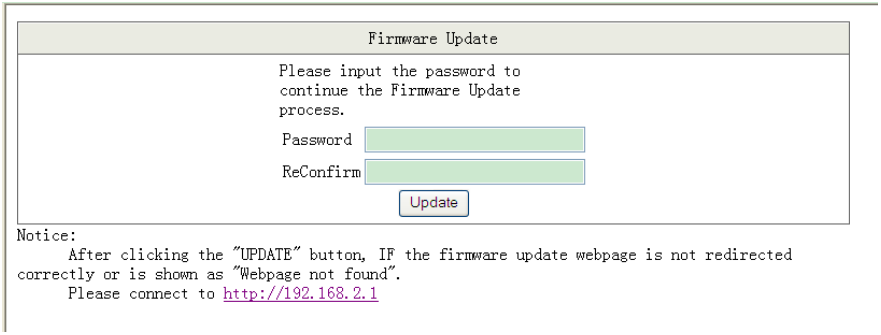
Click【Reboot】to reboot device.

2.5 Fireware update

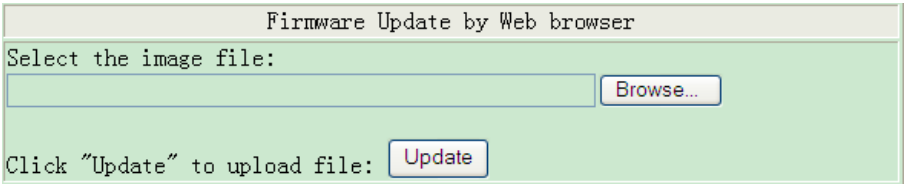
It supports following update mehods：

1. through web browser

Click【Firmware Update】under【Administrator】on the left to turn to following page:



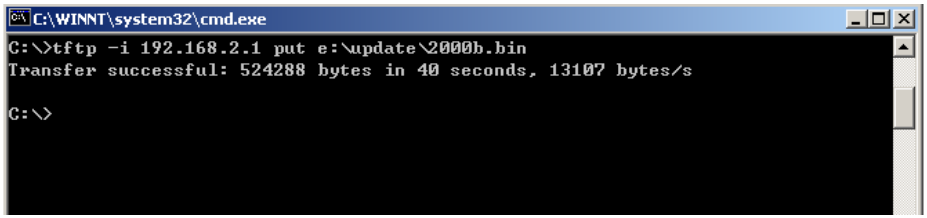
Enter password and confirm（the password is the same as the login in password）and then click【Update】to enter flash to erase the page. Following page will appear after that.



Click【Browse】to select update file before click【Update】to update. It will last about 40 seconds. After successfully update, it will turn to login page

2. through TFTP

After flash erasure, run tftp client in Microsoft command line. Suppose device IP address is 192.168.2.1. Type : c:\tftp -i 192.168.2.1 put filepath\filename.bin and then press enter as following：

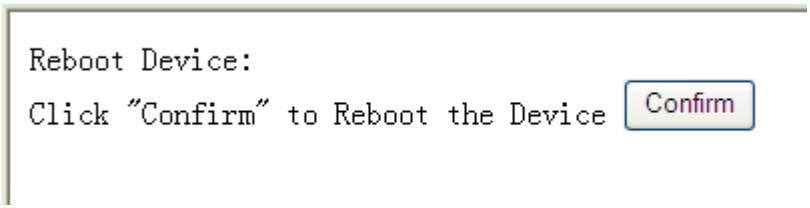


Relog in the system after update.

⚠ Caution： Default update password is **123456**. If it shows error on the page or the update period is too long, please relog in according to the prompt. Make sure the power is on.

2.6 Reboot the device

Click【Remote Device】under【Administrator】to turn to following page:

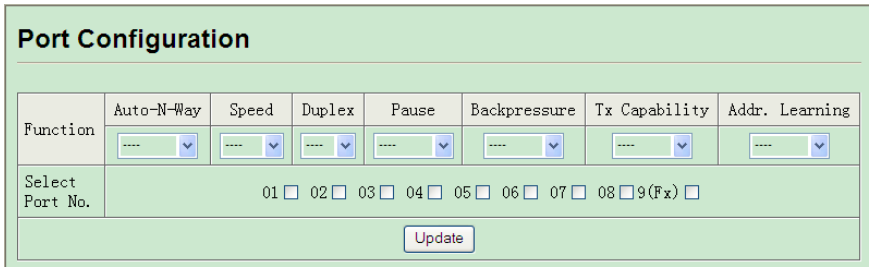


Click【Confirm】and reboot device.

Chapter 3 Port Configuration

3.1 Port Configuration

On this page, port configuration include：Auto-N-Way, Speed, Duplex, 802.3x/backpressure, Tx Capability and Addr.Learning.



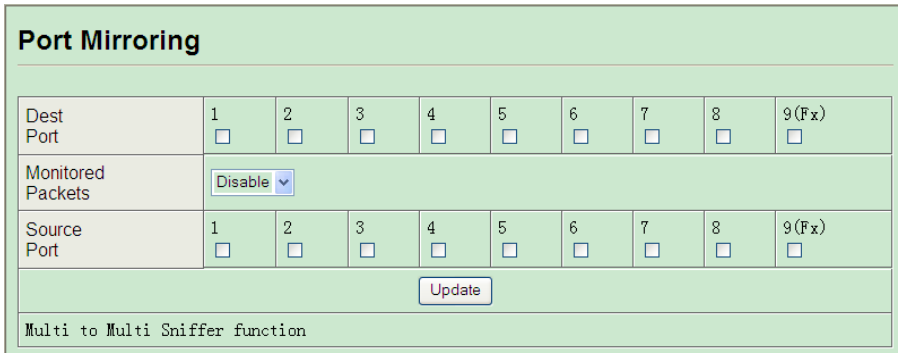
Select “configure port” in【Port Configuration】and choose corresponded ports, and thenclick【Update】.

Port	Current Status				Setting Status						
	Link	Speed	Duplex	FlowCtrl	Nway	Speed	Duplex	Pause	Backpressure	Tx Cap	Addr. Learning
1	---	---	---	---	Auto	100M	full	on	on	on	on
2	---	---	---	---	Auto	100M	full	on	on	on	on
3	---	---	---	---	Auto	100M	full	on	on	on	on
4	---	---	---	---	Auto	100M	full	on	on	on	on
5	---	---	---	---	Auto	100M	full	on	on	on	on
6	---	---	---	---	Auto	100M	full	on	on	on	on
7	---	---	---	---	Auto	100M	full	on	on	on	on
8	●	100M	Full	off	Auto	100M	full	on	on	on	on
9(Fx)	●	100M	Full	on	Auto	100M	full	on	on	on	on

【Current Status】is the real status after port link negotiation.

3.2 Port mirror

System provides port mirror, that is, copy the packets in specific or more ports to monitoring port for packet analysis and monitor. As following picture, select monitor port in【Dest Port】and monitored port in【Source Port】.【Monitored Packets】includes：disable, Rx, Tx and Rx&Tx. Choose needed configuration and click【Update】.



caution：One-to-one port monitor is not supported.

3.3 Bandwidth control

In this function, user can configure the max sending and receiving rate.

The speed granularity is：Low 32Kbps and Hight 512Kbps.

Formula：Max sending and receiving rate

=Rate control （0~255）x 32 kbps (low bandwidth)

=Rate control（0~255） x 512 kbps(high bandwidth)

Click【update】to submit configuration. Click【LoadDefault】to restore to default configuration. After that, the speed rate is connecting speed as following:

Bandwidth Control

Port No	Tx Rate	Rx Rate
01	0~255 (0:full speed)	0~255 (0:full speed)
Speed Base	Low Low:32Kbps High:512Kbps all ports use the same speed base	
Update LoadDefault		
If the link speed of selected port is lower than the rate that you seting, this system will use the value of link speed as your setting rate.		

Note：If the connecting speed rate is smaller than the bandwidth control rate, the connecting speed rate will be bandwidth control rate.

3.4 Broadcast Suppression

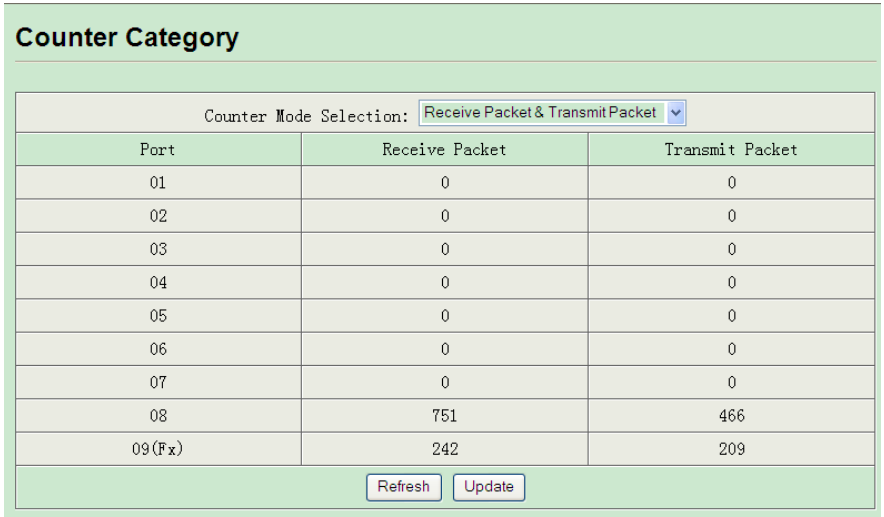
As following, select port in【Enable Port】and input 0～63 in threshold which means the max broadcast number permitting in a certain in the port. Port rate 10Mbps equals to 5000us time unit, and port rate 100Mbps equals to 500us time unit time.

Broadcast Storm Control

Threshold	63 0~63								
Enable Port	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9(Fx) ☐
Update									
This value indicates the number of broadcast packet which is allowed to enter each port in one time unit. One time unit is 500 us for 100Mbps speed and 5000us for 10Mbps speed									

3.5 Packet accounting

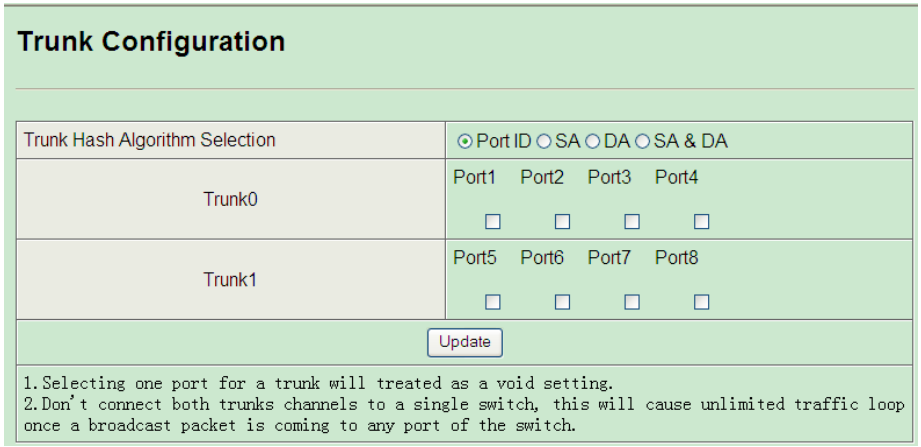
Port accounting mode includes：Receive Packet & Transmit Packet, Transmit Packet & Collision Count, Receive Packet & Drop packet and Receive Packet & CRC error packet. Click【refresh】to refresh it. click【Update】to clear the accounting number.



Note：Click【refresh】to refresh it manually.

3.6 Port Trunk configuration

Trunk can be divided into：port ID, SA, DA and SA&DA. Port ID is default one.

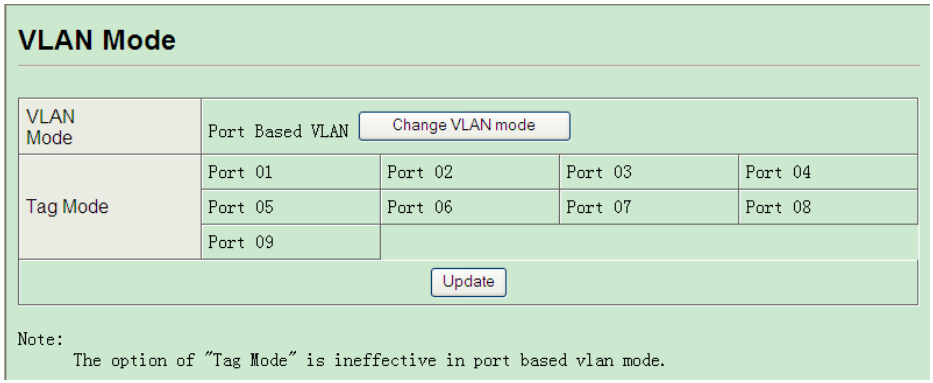


Note：Select a port to be Trunk separately is invalid configuration. Do not connect 2 Trunk channel to switch. Once the broadcast sent, the ring can not be restricted.

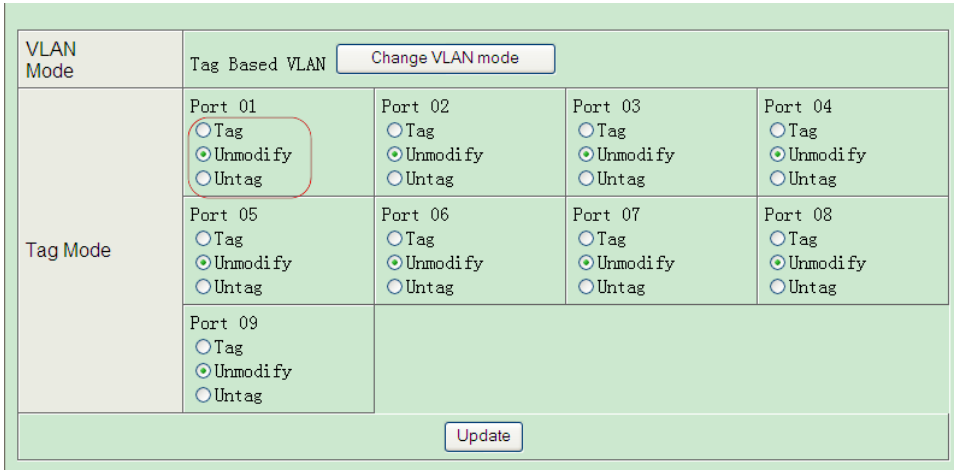
Chapter 4 VLAN Configuration

4.1 VLAN mode

VLAN mode is divided into Port Based VLAN and Tag Base VLAN. It is defaulted to be Port Based VLAN mode as following:



Click【Change VLAN mode】to shift VLAN mode. On Tag Base VLAN mode page，user can configure Tag attribution, including Tag, Unmodify and Untag as following：



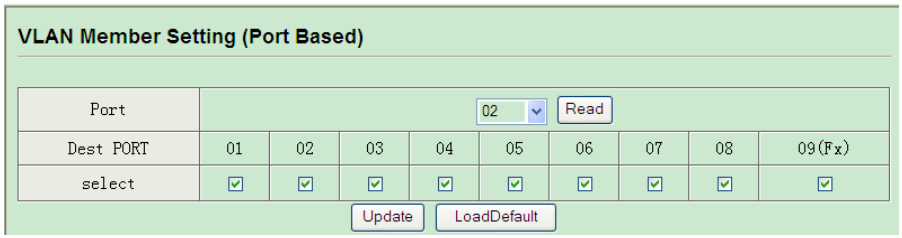
Note:

If the link partner is a network interface card, it probably cannot recognize the VLAN tag. In this case, it is strongly recommended the network administrator to remove the VLAN tag of the corresponding port.

4.2 VLAN member

It can be divided according to VLAN mode：

1. Port Based VLAN member configuration



【Port】is uplink port configuration and【Dest PORT】is downlink port configuration.【LoadDefault】is default configuration. For example: configure e0/1 to be uplink port and e0/1~16 to be downlink port to make e0/1 transmit packet to e0/2~16 as following：

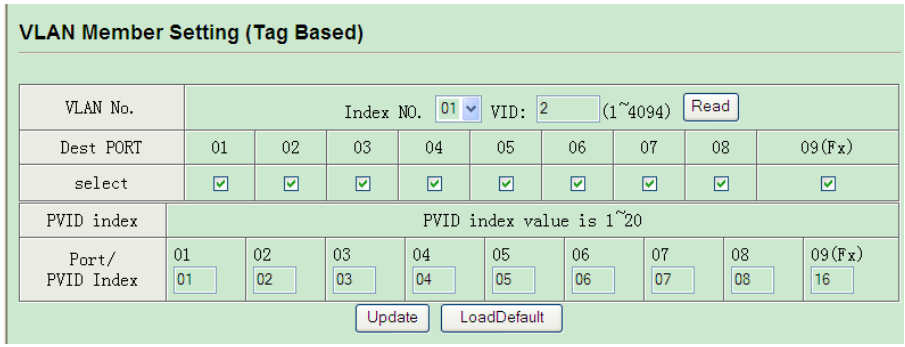
VLAN MEMBER									
Port	1	2	3	4	5	6	7	8	9(Fx)
1	v	v	v	v	v	v	v	v	v
2	v	v	v	v	v	v	v	v	v
3	v	v	v	v	v	v	v	v	v
4	v	v	v	v	v	v	v	v	v
5	v	v	v	v	v	v	v	v	v
6	v	v	v	v	v	v	v	v	v
7	v	v	v	v	v	v	v	v	v
8	v	v	v	v	v	v	v	v	v
9	v	v	v	v	v	v	v	v	v
Port	1	2	3	4	5	6	7	8	9(Fx)
VLAN MEMBER									

Click【LoadDefault】to restore to default value, that is, all【Port】contains all【Dest PORT】.

Note：Configured downlink port must contain uplink port, such as

【Dest PORT】must contain e0/1.

2. Tag Base VLAN member configuration



Divide 20 groups of VLAN（1～20）in Tag Base VLAN mode, which cannot delete and create. We suggest user click【Read】to load corresponded VID of configured VLAN and enter VID (1-4094). Select VLAN member in【Dest PORT】and enter pvid corresponded VLAN Index No. in 【PVID Index】 and click【Update】.

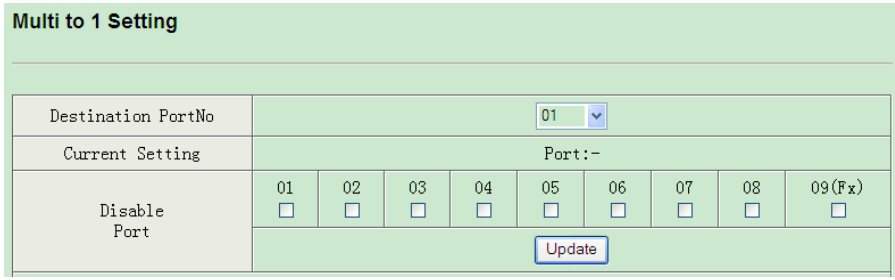
VLAN MEMBER										
VLAN No.	VID	1	2	3	4	5	6	7	8	9(Fx)
1	1	v	v	v	v	v	v	v	v	v
2	2	v	v	v	v	v	v	v	v	v
3	3	v	v	v	v	v	v	v	v	v
4	4	v	v	v	v	v	v	v	v	v
5	5	v	v	v	v	v	v	v	v	v
6	6	v	v	v	v	v	v	v	v	v
7	7	v	v	v	v	v	v	v	v	v
8	8	v	v	v	v	v	v	v	v	v
9	9	v	v	v	v	v	v	v	v	v
10	10	v	v	v	v	v	v	v	v	v
11	11	v	v	v	v	v	v	v	v	v
12	12	v	v	v	v	v	v	v	v	v
13	13	v	v	v	v	v	v	v	v	v
14	14	v	v	v	v	v	v	v	v	v
15	15	v	v	v	v	v	v	v	v	v
16	16	v	v	v	v	v	v	v	v	v
VLAN No.	-	1	2	3	4	5	6	7	8	9(Fx)
VLAN MEMBER										

Click【LoadDefault】to restore to default configuration. VID of VLAN1～20 is 1～20 and each VLAN contains all member port.

Note：VLAN which configured port PVID should contain this port, or the configuration failed.

4.3 VLAN Multi to 1 Configuration

Configure port isolation in Port Based mode.【Destination PortNo】is for uplink port and【Disable Port】in this option, non-selected port is considered to be downlink with isolation to each other and selected port is disabled doanlink port.



For example，uplink port is e0/1 and disabled port is e0/2. Click【Update】to configure. After successfully configuration, e0/1can transmit packet to all other downlink port but not to e0/2. VLAN members are as following：

VLAN MEMBER																
Port	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16(Fx)
1	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	v	-	v	-	-	-	-	-	-	-	-	-	-	-	-	-
4	v	-	-	v	-	-	-	-	-	-	-	-	-	-	-	-
5	v	-	-	-	v	-	-	-	-	-	-	-	-	-	-	-
6	v	-	-	-	-	v	-	-	-	-	-	-	-	-	-	-
7	v	-	-	-	-	-	v	-	-	-	-	-	-	-	-	-
8	v	-	-	-	-	-	-	v	-	-	-	-	-	-	-	-
9	v	-	-	-	-	-	-	-	v	-	-	-	-	-	-	-
10	v	-	-	-	-	-	-	-	-	v	-	-	-	-	-	-
11	v	-	-	-	-	-	-	-	-	-	v	-	-	-	-	-
12	v	-	-	-	-	-	-	-	-	-	-	v	-	-	-	-
13	v	-	-	-	-	-	-	-	-	-	-	-	v	-	-	-
14	v	-	-	-	-	-	-	-	-	-	-	-	-	v	-	-
15	v	-	-	-	-	-	-	-	-	-	-	-	-	-	v	-
16	v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	v
Port	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16(Fx)

Chapter 5 Qos Configuration

5.1 Priority mode

Priority mode includes：

1. FIFO (First-in first-out)

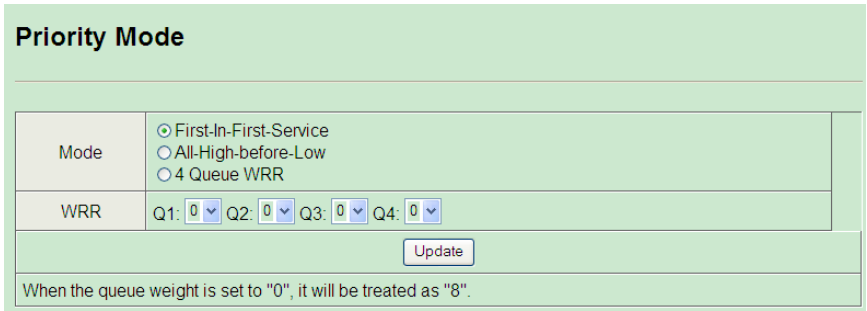
When queue scheduling, switch will handle packet with time order（the default mode）.

2. PQ (Strict-Priority Queue）

When queue schedulerimg, PQ precedently transmits the packets in superior priority according to the priority level. Transmit packet in inferior priority when the superior one is empty. Put the key service in the superior one, and non-key service (such as email) in inferior one to guarantee the packets in superior group can be first transmitted and non-key service can be transmitted in the spare time.

3. WRR（Weighted Round Robin）

WRR queue scheduler divides a port into 4 or 8 outputting queues (S2926V has 4 queues, that is, 3, 2, 1, 0) and each scheduler is in turn to guarantee the service time for each queue. WRR can configure a weighted value (that is, w3, w2, w1, w0 in turn) which means the percentage of obtaining the resources. For example: There is a port of 100M. Configure its WRR queue scheduler value to be 50, 30, 10, 10 (corresponding w3, w2, w1, w0 in turn) to guarantee the inferior priority queue to gain at least 10Mbit/s bandwidth, to avoid the shartage of PQ queue scheduler in which packets may not gain the service.



Note：When the queue weight is set to "0", it will be treated as "8".

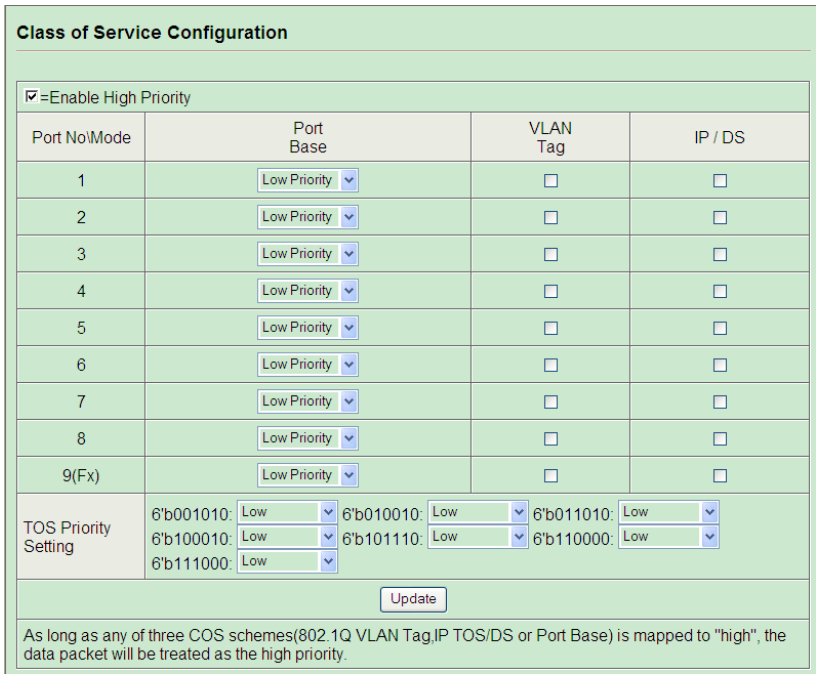
5.2 Priority type

As following, the priority type can be configured：

1.Port Base priority

2.802.1Q VLAN Tag priority

3.IP/DS priority

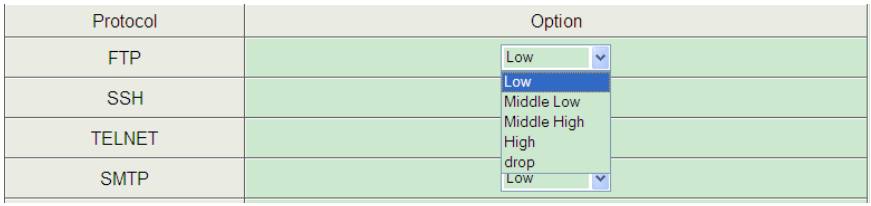


Configure Port Base priority：Low, Middle Low, Middle high and High. Enable VLAN Tag and IP/DS priority.

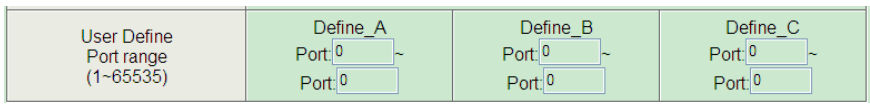
【TOS Priority】definition includes：IP/DS as 6'b001010, 6'b010010, 6'b011010, 6'b100010, 6'b101110, 6'b110000 and 6'b111000. Click【Update】to configure it.

Note：After configuring VLAN Tag, IP/DS and QoS based on TCP/UDP, Port Base priority will invalid. When configuring VLAN Tag, IP/DS and TCP/UDP at the same time，use superior one to handle packet.

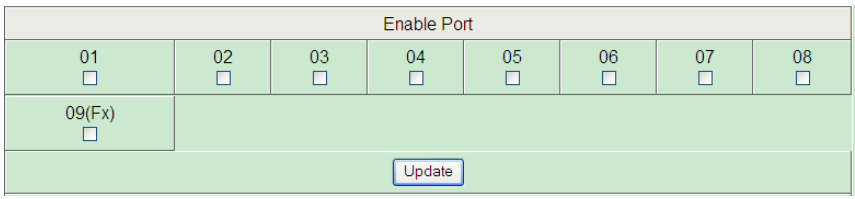
5.3 QOS based on TCP/UDP



Priority schedulering based on TCP/UDP can be applied to specified uses. As following, priority that can be configured includes：Low, Middle Low, Middle high, High and drop. 20 network protocols and user defined port protocol and TOS can also be configured.



【User Define Port range】includes 1～65535，the range of Define_a, Define_b and Define_c cannot be overlapped.



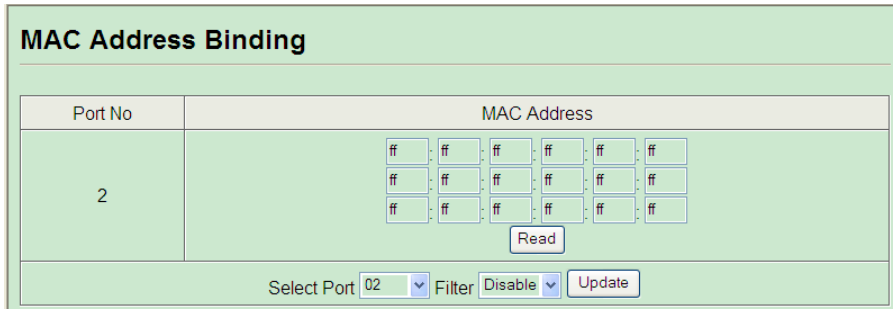
Select port and click【Update】.

Chapter 6 Packet security filtration

6.1 MAC address binding

As following picture,【Select Port】means selecting port;【Filter】means enabling effected;【Read】means reading port bounded MAC. Each port

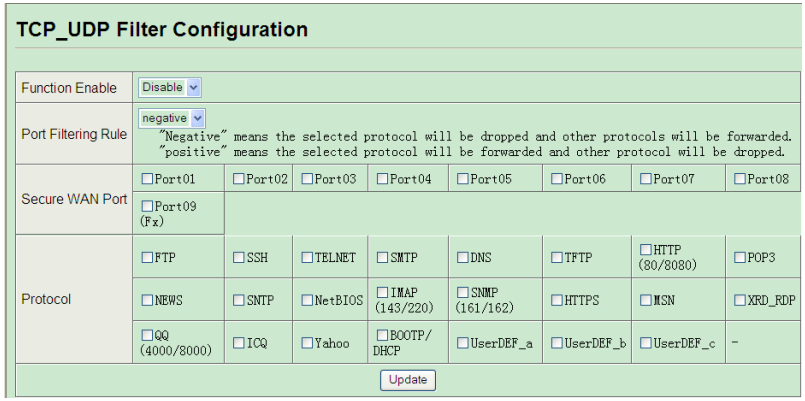
can bind 3 groups of MAC address. Packet whose MAC has not bound will not be transmitted.



For example，configure【Select Port】e0/1，select enable in【Filter】and bind MAC address 00:0a:5a:01:01:01. After successful configuration, e0/1 will only transmit packet whose source address is 00:0a:5a:01:01:01.

Note：By default, 【Filter】of each port is disabled.

6.2 TCP/UDP Filtration



When【Function Enable】is enable, it means this function is efficient.

Negative in【Port Filtering Rule】means port packet of selected protocol is droped and packet of other protocol can be transmitted. Positive means port packet of selected protocol is transmitted and packet of other protocol can be droped.

【Secure WAN Port】means configuring WAN interface of TCP/UDP filtration.；

【Protocol】includes 20 different network protocol. In addition, UserDEF_a, UserDEF_b and UserDEF_c are user defined port protocol（these three protocols need configuring on QoS page of TCP/UDP）.

Such as to enable this function, configure port filtration to be negative, select secure WAN port01，and then select Protcol FTP. After successful configuration, port01 will drop FTP packet.

Chapter 7 Backup and recovery configuration

7.1 Configure backup and recovery

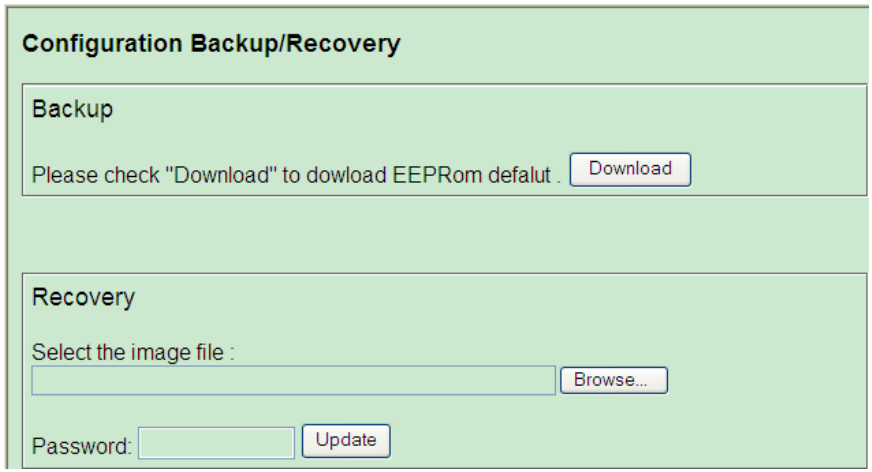
1. Configure backup

Click【Download】to get download box. Select path to save Bin file to local disk.

2. Configure recovery

Click【Browse】to get file selection box. Select corresponded path to open configuration file.

Enter password. The default password is 123456 and click【Update】. Reboot device after successful configuration.



Note：The recovery will not contain MAC address.

Chapter 8 Other functions

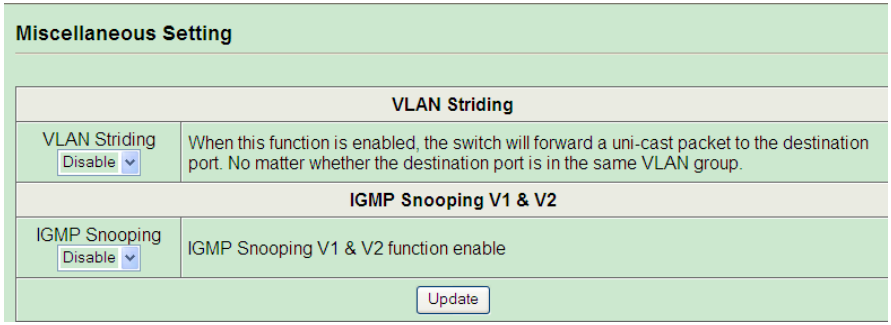
8.1 Other functions

Other functions include：

1. VLAN transparent transmit：

After enabling this function, though the two ports are not in the same VLAN, the unicast packet whose destination MAC is known will be transmitted to destination port.

2. Enable IGMP snooping



Chapter 9 Overtime exit

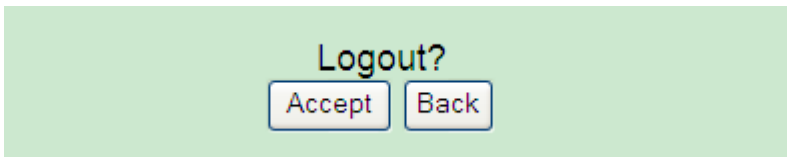
9.1 Overtime

It is defaulted to be overtime in 10 minutes and it is required to re-login as following:

Click【Relogin】to relogin.

9.2 Exit

Click【Logout】to exit and page will turn to following：



Click【Accept】to close system page and click【Back】to return to previous page.

Chapter 10 Restore to default hardware configuration

10.1 Restore to default hardware configuration

Before using the switch for the first time, it is suggested to restore to default hardware configuration. Press “Default”button until 5 seconds after the electric power is on. The switch will restore to the default hardware configuration automatically and the system indicator will flicker. Relogin the switch until the system indicator restore to normal flicker frequency （normal flicker frequency is 1Hz）.

⚠Caution： Rstoring to default hardware can restore default software parameter and also IP address, username and password, except MAC address.

Appendix

Appendix 1 Diagnosis of the common faults

Faults	Possible cause	Solutions
All indicators are not on when the electric power is on	Power connection error or abnormal power supply	Check power wire and electrical outlet
Link/Active indicator is off	Cable damaged；use wrong type of cable ； cable is beyond permitted length ； poor contacted cable ； the other end of the connection work abnormally	Change cable ； reconnect cable；check the working of the other end
Link/Active indicator is on but the network is unreachable	Working mode of switch and ethernet terminal does not matched ； network configuration error	Change working mode of Ethernet interface to match each other of to be auto-negotiation；check network configuration, including configuration of switch and the other end
All Link/Active indicators are on but network deamplificational speed or unreachable	Broadcast storm	Check if there is the ring and reasonably allocate the network；check if there is plenty broadcast packets

Stop working after normally working for a certain time	Power error； overheat； program works abnormal	Check the power connection and the voltage ； check the environment and air ventilator is unblocked ； reboot the switch after the electric power is on

Apendix 2 Terms

Terms	Description
Backbone	Part of a network that acts as the primary path for traffic that is most often sourced from, and destined for, other networks.
Bandwidth	The difference between the highest and lowest frequencies available for network signals. The term also is used to describe the rated throughput capacity of a given network medium or protocol. The frequency range necessary to convey a signal measured in units of hertz (Hz).
broadcast storm	An undesirable network event in which many broadcasts are sent simultaneously across all network segments. A broadcast storm uses substantial network bandwidth and, typically, causes network time-outs.
10BASE-T	10BaseT, which is part of the IEEE 802.3 specification, has a distance limit of approximately 328 feet (100 meters) per segment. See also EtherChannel and IEEE802.3.
100BASE-TX	100-Mbps baseband Fast Ethernet specification using two pairs of either UTP or STP wiring. The first pair of wires receives data; the second transmits data. To guarantee the proper signal timing, a 100BaseTX segment cannot exceed 328 feet (100 meters) in length. Based on the IEEE 802.3 standard.
100BASE-FX	A 100-Mbps baseband Fast Ethernet specification using two

	strands of multimode fiber-optic cable per link. To guarantee proper signal timing, a 100BaseFX link cannot exceed 1312 feet (400 meters) in length. Based on the IEEE 802.3 standard.
Autonegotiation	Autonegotiation (formerly NWay) is an Ethernet procedure by which two connected devices choose common transmission parameters, such as speed and duplex mode. In this process, the connected devices first share their capabilities as for these parameters and then choose the fastest transmission mode they both support.
QoS	Quality of Service
HOL	Head-Of-Line. HOL arises when packets arriving at different input ports are destined for the same output port.
full duplex	Capability for simultaneous data transmission between a sending station and a receiving station.
half duplex	Capability for data transmission in only one direction at a time between a sending station and a receiving station. BSC is an example of a half-duplex protocol.
MDI	A medium dependent interface (MDI) port or an uplink port is an Ethernet port connection typically used on the Network Interface Card (NIC) or Integrated NIC port on a PC.
MDIX	Medium dependent interface crossover (MDIX) (the “X” representing “crossover”) is a female RJ-45 port connection on a computer, router, hub, or switch. Straight through cables connect pins 1 & 2 (transmit) on an MDI device to pins 1 & 2 (receive) on an MDIX device.
RJ-45	The 8 Position 8 Contact (8P8C) (often called RJ45 see below) modular plugs and sockets are communications connectors.
Bridge	Device that connects and passes packets between two network segments that use the same communications protocol. Bridges operate at the data link layer (Layer 2) of

	the OSI reference model. In general, a bridge filters, forwards, or floods an incoming frame based on the MAC address of that frame.
SNMP	Simple Network Management Protocol

Apendix 3 Cable

RJ-45 connector

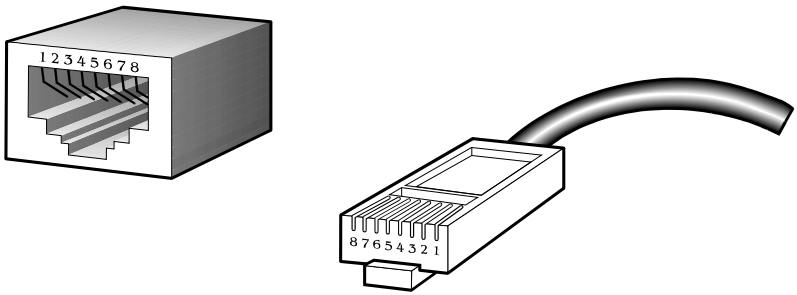
1000Base-TX interface and debug network interface of TiNet S3750G-12S GE Intelligent Routing Switch uses RJ-45 connector.

Picture 9-1 describes the plug of standard RJ-45, connector and function of each pin of RJ-45 in each mode

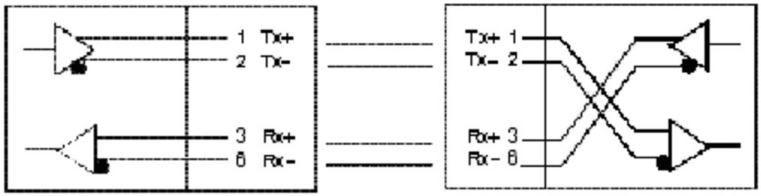
Picture 9-2, 9-3 describe the connecting of parallel reticle and crossing reticle.

Table 9-1 describes the function of each pin of RJ-45 in MDI mode;

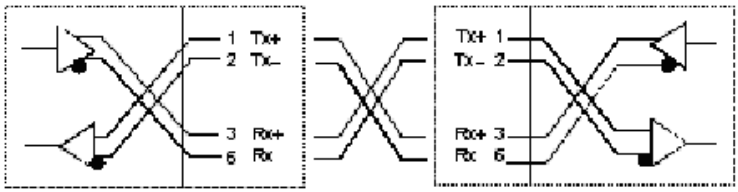
Table 9-2 describes the function of each pin of RJ-45 in MDI mode.



Picture 1-1Standard RJ-45 plug and connector



Picture 1-2Parallel reticle



Picture 1-3Crossing reticle

Pin distribution of RJ-45 MDI interface

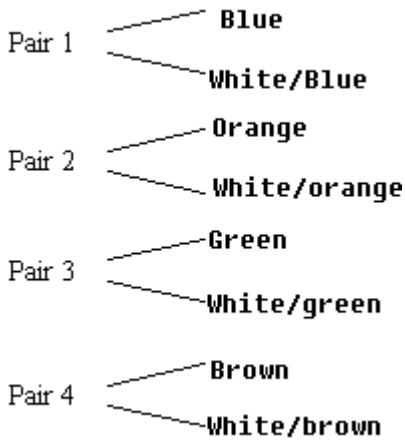
Pin number	Singnal	Function
1	TxData+	Sending data
2	TxData-	Sending data
3	RxData+	Receiving data
4	Reserved	
5	Reserved	
6	RxData-	Receiving data
7	Reserved	
8	Reserved	

Appendix table 2 Pin distribution of RJ-45 MDIX interface

Pin number	Singnal	Function
1	RxData+	Receiving data
2	RxData-	Receiving data
3	TxData+	Sending data

4	Reserved	
5	Reserved	
6	TxData-	Sending data
7	Reserved	
8	Reserved	

Appendix picture 2 is the example of making Ethernet cable of RJ-45 connector by using categories 5 twisted-pair.



Appendix picture 2 The picture of categories 5 twisted-pair

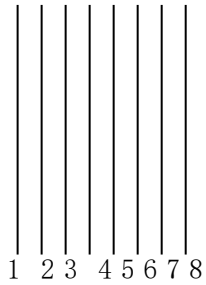
Categories 5 twisted-pair consists of 8-core filament with the color on the insulated layer being grouping sign. Usually, it uses a single color and single color with white to be a pair of standard, and sometimes uses color points to be a pair of sign. Here, take the former as an example.

Categories 5 twisted-pair consists of 8-core filament with the color on the insulated layer being grouping sign. Usually, it uses a single color and single color with white to be a pair of standard, and sometimes uses color points to be a pair of sign. Here, take the former as an example.

SIDE1 SIDE 1 SIDE 2

1 2 3 4 5 6 7 8 1 = white/orange

1=white/orange



2=orange 2=orange

3=white/green 3=white/green

4=blue 4=blue

5=white/blue 5=white/blue

6=green 6=green

7=white/brown 7=white/brown

8= brown 8

=brown

SIDE2

Appendix picture 3 Making parallel reticle

SIDE1 SIDE1 SIDE2

1 2 3 4 5 6 7 8 1=white/orange 1=white/green

2=orange 2=green

3=white/green 3=white/orange

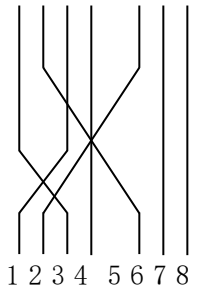
4=blue 4=blue

5=white/blue 5=white/blue

6=green 6=orange

7=white/brown 7=white/brown

8= brown 8=brown



SIDE2

Appendix picture 4 Making crossing reticle