Trademarks

Disclaimer

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If you find information in this manual that is incorrect, misleading, or incomplete, we would appreciate your comments and suggestions.

FCC Warning

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

CE Mark Warning

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

Revision

PPLANET 16/24 ports 10/100Mbps + 2 Gigabit-slot Ethernet Smart Switch User's Manual

FOR MODELS: FGSW-1602RS/FGSW-2402RS

Part No.: 2010-000028-001

Table of Contents

Chapter 1
INTRODUCTION

1.1 Package Contents

Check the contents of your package for following parts:

- FGSW-2402RS Gigabit Ethernet Smart Switch or FGSW-1602RS Gigabit Ethernet Smart Switch
- Power Cord
- RS-232 cable
- User's Manual
- Rock-mounting blackest

✍ NOTE: if any of these pieces are missing or damage please contact your dialer immediately.

1.2 About this Switch

In the following section, the terms "Switch" will represent both FGSW-2402RS and FGSW-1602RS, the terms "switch" will be any other Ethernet switch.

The Switch is a latest 10/100Mbps + 2 GbE-slot smart switch from PLANET. Both of these switches provide 16/24 10/100Mbps ports and 2 Gigabit expansion slots for optional modules. The switch is high performance switch that provides users with high-speed network connections with a store-and-forward architecture to eliminate faulty packets.

The Switch is equipped with a console interface and is able to manage basic switch functions such as bandwidth control, port status configuration, QOS, port trunking and VLAN parameters. The Switch supports auto learning and storage up to 8K of MAC addresses, as well as a non-blocking 8.8Gbps back plane for packet transmission. Also this Switch supports two different types of VLAN, which are port-based VLAN and 802.1Q VLAN.

The Switch is suitable for the following application:

Workgroup switch

The Switch has 16/24 10/100mbps ports and 2-slot available for a 10/100Mbps Ethernet ports optional 1000SX/1000LX/1000GT module. Both switches provides a high performance solution for a variety of user applications

Department Switch

With its 8.8 Gigabits per second, non-blocking switch fabric, the Switch can easily provide a local, high bandwidth network for your departmental backbone. Choice for Gigabit optic module also can be deployed to extend the network distance

1.3 Product Features

- 16/24 (10/100Mbps), 2-slot (10/100/1000Mbps) Gigabit Smart Switch
- Provide 8.8Gbps switch fabric, non-blocking switch architecture
- 8K MAC address, auto-aging
- 2.5Mbit as packet buffer
- Store-and-forward architecture, broadcast control
- 16/24 TP ports 10/100Mbps Auto-Negotiation
- 2 expansion slots, work with MII-SX/LX, GT and FX modules
- Smart function support, Port Trunk, Port status configure, VLAN
- 19-inch rack mount size
- Comply with IEEE802.3, IEEE802.3u 10/100Base-TX, IEEE802.3ab, IEEE802.3z 1000Base-T, 1000Base-SX/LX Standard
- Console interface for switch basic management and setup
- Auto-MDI/MDI-X detection on each RJ-45 port

1.4 Product Specifications

Model	FGSW-2402RS 24-port 10/100Mbps + 2 Gigabit-slot Ethernet Smart Switch	FGSW-1602RS 16-port 10/100Mbps + 2 Gigabit-slot Ethernet Smart Switch
Hardware Specification		
Ports	24 10/100Base-TX 1 RS-232 RJ-45 Auto-MDI ports 2 open slots	16 10/100Base-TX 1 RS-232 RJ45 Auto-MDI ports 2 open slots
Environment	Operating Temp: 5 ~ 50°C (32 ~ 122°F) Storage Temp: -30 ~ 70°C (-22 ~ 158°F) Humidity 0 ~ 90% non-condensing	
Dimensions	440 x 200 x 44 mm 1U height	
Power supply	100 ~ 240V AC (± 10%), 50/60Hz (± 3%) auto-sensing	
Power Consumption	30 watts / 100BTU maximum	
Switch Specification		

Switch architecture	Store-and-forward
Switch Fabric	8.8Gbps
MAC Address table	8K entries, auto learning/ageing
Memory	2.5Mbits for packet buffer
Auto-MDI/MDI-X	Support on all RJ-45 ports
Flow Control	Back pressure for half duplex, IEEE 802.3x for full duplex
Rate Control	Per port TX/RX at 128K, 256K, 512K, 1M, 2M, 4M, 8M
Port Trunk	8 Trunk with up to 4port per trunk
Standard / Emission	
Network Standards	IEEE802.3 10BASE-T IEEE802.3u 100BASE-TX/100BASE-FX IEEE802.3z, ab Gigabit Ethernet 1000Base-SX/LX, 1000Base-T IEEE802.3x Flow Control IEEE802.1p Class of service IEEE802.1Q VLAN Tagging
Emission	FCC, CE Class A

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Chapter 2
HARDWARE INSTALLATION

This section is describes the hardware features and installation of the Switch, 16/24-port 10/100Mbps + 2 Gigabit-slot Ethernet Smart Switch.

2.1 Front Panel

The font panel of the Switch consist one RS-232 console port, LED indicators, 24/16 10/100Base-TX RJ45 ports and two expansion- slots. The module that can apply to the slots includes:

- ⇨ MII-SX - 1000Base-SX Gigabit Ethernet Module (SC, MM)
- ⇨ MII-LX - 1000Base-LX Gigabit Ethernet Module (SC, SM/MM)
- ⇨ MII-GT - 10/100/1000Mbps Ethernet Module (RJ-45 copper)
- ⇨ MII-ST – 100Base-FX Fast Ethernet Module (ST, MM)
- ⇨ MII-SC* - 100Base-FX Fast Ethernet Module (SC, MM)

* Different distance available upon request.

For the open slot, please refer to the MII module's installation guide for the hardware installation. The front panel of the switch is as blow.

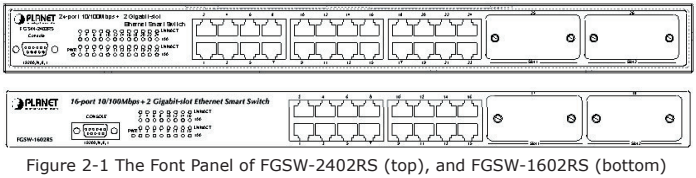


Figure 2-1 The Font Panel of FGSW-2402RS (top), and FGSW-1602RS (bottom)

LED Indication of the Switch

LED	Statu	Descript
Power	Green	Power On
	Off	Power is not connected
LNK/ ACT	Green	This indicator light green when the port is connected to an Ethernet or Fast Ethernet station, if the indicator is blinking green, it will be transmitting or receiving data on the network.
100	Orange	This LED indicator light orange when a Fast Ethernet station is connected. It remains OFF, if an Ethernet station is connected.

2.2 Rear Panel

The Rear Panel of the Switch is indicates an AC 3 pronged power socket and I/O power switch. This switch will work with AC in the range 100-240V AC, 50-60Hz

Figure 2-2 Rear Panel of FGSW-2402RS

Power Receptacle

For the compatibility with electric service in most of areas, FGSW-2402RS's power supply can automatically adjust line power in the range 100-240V AC, 50-60Hz.

✍ NOTE:

The Switch is a power-required device, it means, the Switch will not work until it is powered. If your networked PCs will need to transmit data all the time, please consider vuse an UPS (Uninterrupted Power Supply) for your Switch. It will prevent you from network data loss.

In some area, installing a surge suppression device may also help to protect your Switch from being damaged by unregulated surge or current to the Switch or the power adapter

2.3 Hardware installation

The Switch can be placed on desktop or mounted on rack. If this Switch is used as standalone standard, the user can immediately use most of the features simply by attaching the cables and turning the power on

Desktop installation

To install the Switch on a desktop or shelf, simply complete the following steps:

Step1: Attach the rubber feet to the recessed areas on the bottom of the Switch.

Step2: Place the Switch on a desktop or shelf near an AC power source.

Step3: Keep enough ventilation space between the Switch and the surrounding objects

✍ NOTE:

Do not obstruct any vents at the sides of the case and keep water off.

Rock-mount installation

To install the Switch in a 19-inch standard rack, follow the instructions described below.

Step1: Place the Switch on a hard flat surface, with the front panel positioned towards your front side.

Step2: Attach a rack-mount bracket to each side of the switch with supplied screws attached to the package. Figure 2-3 shows how to attach brackets to one side of the switch.

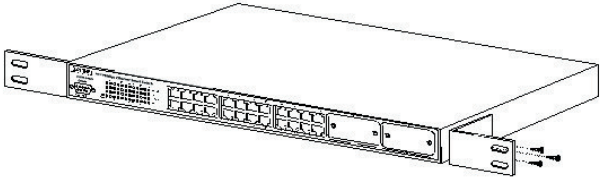


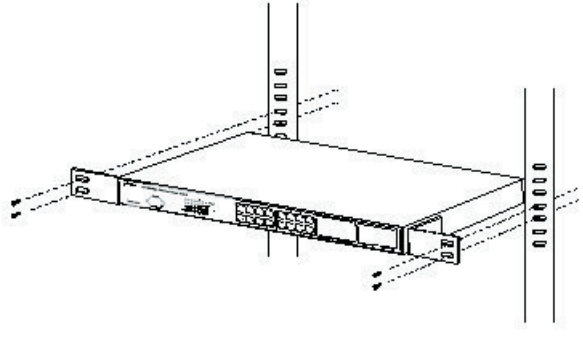
Figure 2-3 Attaching the brackets to the Switch

Caution:	You must use the screws supplied with the mounting brackets. Damage caused to the parts by using incorrect screws would invalidate your warranty.

Step3: Secure the brackets tightly.

Step4: Follow the same steps to attach the second bracket to the opposite side.

Step5: After the brackets are attached to the switch, use suitable screws to securely attach the brackets to the rack



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Chapter 3
CONFIGURATION

FGSW-1602RS and FGSW-2402RS is a Smart Ethernet Switch that can be controlled by the RS-232 console interface. This chapter describer how to configure the Switch through the RS-232 smart interface.

3.1 Connect to PC's RS-232 serial port

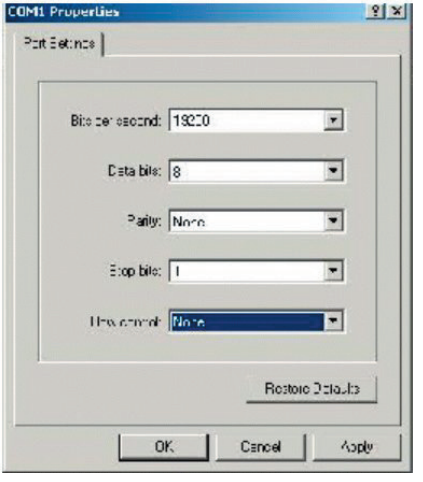
When you are ready to configure the smart functions of the Switch, make sure you had connected the supplied RS-232 serial cable to the RS-232 port at the front panel of your Switch and your PC.

✍ NOTE: The following figures will use FGSW-2402RS as the example, for FGSW-1602RS, however, the setup is the same but the port count is only 16 instead of 24 and the two Gigabit slots will be port 17/18 instead of 25/26.

Hyper Terminal

In Windows 98/2000/XP, launch "HyperTerminal", create a new connection, and adjust settings as below:

- Baud per second: 19200
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow Control: None



3.2 Main Menu

Login is required to access the command console after the self-test completes successfully. The factory default Username is "admin" without password

Control key describe:

I / M / J / L: Up / down / left / right

1 / 2: Page up / Page down

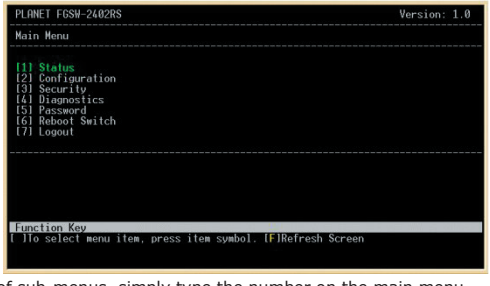
S: Save the configuration

F: Refresh

Space: Toggle selected item to change the value.

0: Exit current action

After type in username and press enter twice then you can see the screen as below:



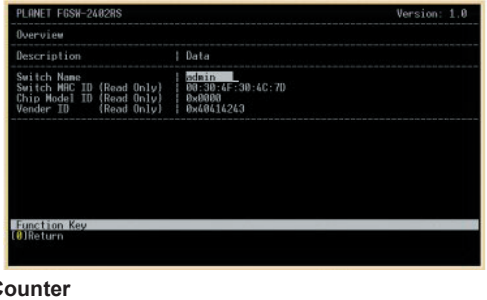
To enter any of sub-menus, simply type the number on the main menu.

3.3 Status

In this menu it shows the basic information of the Switch including, Switch overview, MIB counter and port status.

3.3.1 Overview

In this menu, there are some basic information of the Switch like, System name, Switch MAC ID, Chip Mode ID and Vender ID



3.3.2 MIB Counter

In this option, it shows transmit and receive counter of each port.

1 / 2: Page up / Page down

P / X: Start / Stop Polling

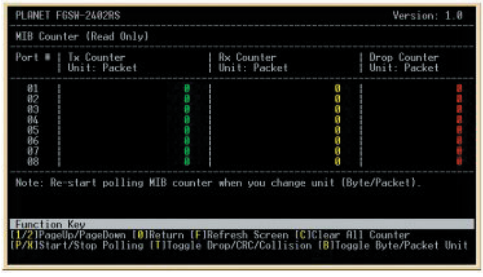
F: Refresh

0: Exit current action

C: clear all counter

T: Toggle Drop/CRC/Collision

B: Toggle Byte/Packet unit



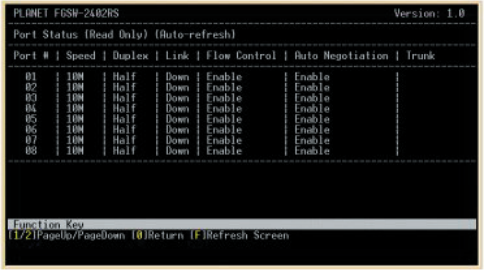
3.3.3 Port Status

In this option, it displays the real-time status of each port.

0: Exit current action

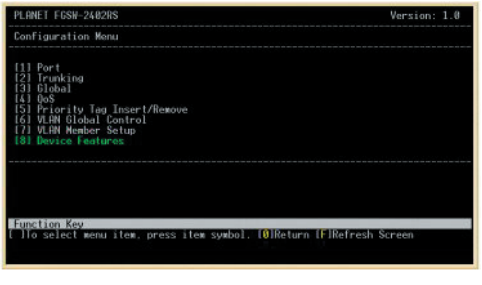
1/2: Page up/ Page down

F: Refresh



3.4 Configuration

There are 8 main functions in Configuration menu, which is Port, Trunking, Global, QOS, Priority Tag Insert/Remove, VLAN Global control, VLAN member Setup and Device features.

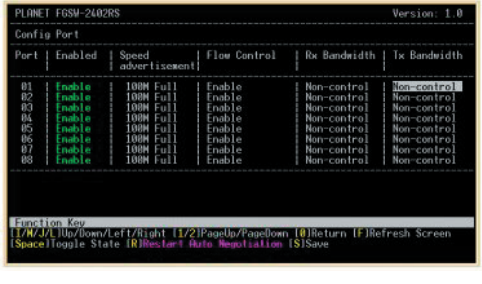


3.4.1 Port

In this function, user can set up every port's status

Use I/M/J/L key to move between items

Enabled	The port can be set enable or disable mode. If the port status is disabled then this port will not receive or transmit any packet. Default: enable.
Speed advertisement	Set the port link speed and duplex mode base on auto-negotiation. Default: 100M Full (10/100Mbps port); 1000M Full (Gigabit port)
Flow Control	Enable or disable flow control. Default: Enable
Rx Bandwidth	Per port packet transmission control (128K, 256K, 512K, 1M, 2M, 4M, 8M). Default: non-control.
Tx Bandwidth	Per port packet transmission control (128K, 256K, 512K, 1M, 2M, 4M, 8M). Default: non-control.



After the port setting, please press "S" to save the configuration. Then press "R" to restart the Auto-Negotiation to make the setting activated right away.

Be noted, the Switch support auto-negotiation at each port, please remain in option "100M Full", "1000M Full" (port#25/26 or port#17/18) if the other device do not support auto-negotiation. If a device does not support auto-negotiation, the Switch will auto-detect the optimal speed at half-duplex, i.e. 100Mbps half-duplex or 10Mbps half-duplex. Also be noted that in Gigabit module both of devices must support auto-negotiation.

Please refer to the tables below:

Link status of the device using Auto-negotiation to the Switch					
Switch's Speed Advertise setting	Device mode setting				
	1000M Full	100M Full	100M Half	10M Full	10M Half
1000M Full*	1000 Full	100M Full	100M Half	10M Full	10M Half
100M Full	100M Full	100M Full	100M Half	10M Full	10M Half
100M Half	100M Half	100M Half	100M Half	10M Full	10M Half
10M Full	10M Full	10M Full	10M Full	10M Full	10M Half
10M Half	10M Half	10M Half	10M Half	10M Half	10M Half

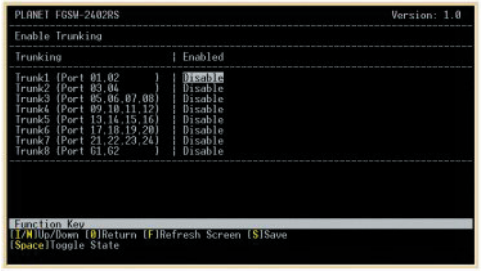
Link status of the device using Forced / non auto-negotiation to the Switch					
The Switch's Speed Advertise setting	Device mode setting				
	1000M Full	100M Full	100M Half	10M Full	10M Half
1000M Full*	NC	100 Half	100 Half	10 Half	10 Half
100M Full	NC	100M Half	100M Half	10M Half	10M Half
100M Half	NC	100M Half	100M Half	10M Half	10M Half
10M Full	NC	NC	NC	10M Half	10M Half
10M Half	NC	NC	NC	10M Half	10M Half

✍ NOTE:

1. Fields with grey color is recommended setting in the Switch.
2. NC means no communication.
3. 1000M Full setting can be found only in port 25/26 of FGSW-2402RS and port 17/18 of FGSW-1602RS.
4. Though device with forced full-duplex mode build the link with the Switch, the performance could be bad due to the devices runs in Full while the Switch runs in Half-duplex.

3.4.2 Trunking

In this function, user is able to enable or disable Trunking at each group. (8/6 trunks group base on ports)

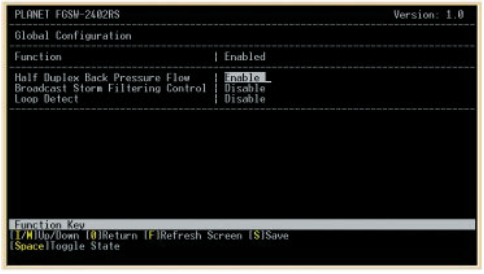


Be noted, the Switch at the other end should also turn on the port-based trunk with the same port count to get the optimal usage of the trunk-bandwidth.

3.4.3 Global

In this function, user is able to enable/disable the global setting of the Switch's ports. Options includes, Half-duplex back Pressure flow, Broadcast Storm Filtering Control and Loop Detect

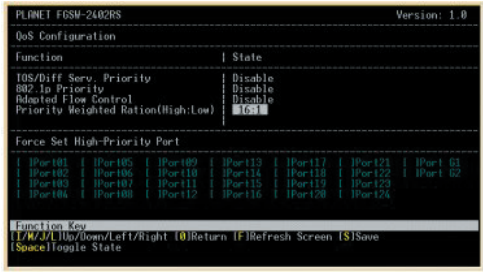
Half duplex back pressure flow	Enable or disable half duplex backpressure flow. To disable will turn off the half-duplex back pressure control and drop the packets without sending out any collision from that Switch port after the Switch's data buffer overflow. Default: Enable.
Broadcast storm filtering control	Enable or disable broadcast storm filtering. Enable will turn on the capability to drop broadcast packets after a continuous 64 broadcast packets. Default: Disable.
Loop Detect	Enable or disable loop detect function. To turn on will loop detect the connection status. This feature is used for diagnose purpose. Default: Disable.



3.4.4 QOS

In this function, user is able to enable TOS/Diff Serv Priority, 802.1p priority; adapted flow control, Priority weight ration (high: low) and Force set high-priority port.

TOS/Diff Serv priority	Enable or disable TOS priority. Check the packets' IP TOS priority tag and base on the priority to forward the packets. Default: Disable
802.1p priority	Enable or disable 802.1p priority. Check the packet's 802.1p priority and base on the priority to forward the packets. Default: Disable.
Adapted flow control	Enable or disable priority of flow control. Check the priority and turn off the flow-control when high priority packets received. Default: Disable.
Priority weight ration (high: low)	Use M key to move down to Priority weight ration then use Space key to select the ration priority. Available weights, 1: 0; 4:1, 8:1, 16:1. Default: 16:1.
Force set high-priority port	Use M key to move down the cursor and select the ports, by Space toggle, that you would like to set base on the QoS options above.



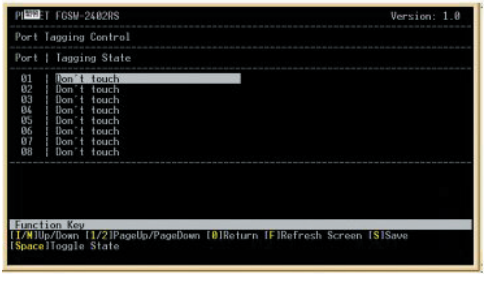
Be noted, the switch support dual priority per port, the QoS setting will base on the menu above to arrange each port's high/low priority.

3.4.5 Priority tag Insert/Remove

In this menu, user is able to insert or remove Priority tag each port. The option includes: Insert Tag (high priority only), Insert Tag (all frame), Remove Tag and Don't Touch.

Please also refer to VLAN section 3.4.6 and 3.4.7 for more.

Insert Tag (high priority only):	Insert priority tag into the untagged high-priority frame
Insert Tag (all frame):	Insert priority tag into the all untagged frame
Remove Tag:	Remove the VLAN tag from all tagged frame
Don't touch:	The default setting, which means no modify



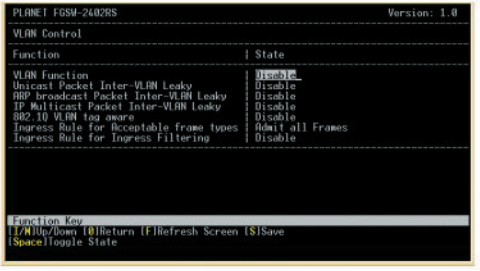
3.4.6 VLAN Global Control

This menu is allow user to enable VLAN's global capabilities including, VLAN function, Unicast packet Inter-VLAN Leaky, ARP broadcast packet Inter-VLAN Leaky, IP Multicast packet Inter-VLAN Leaky, 802.1Q VLAN tag aware, Ingress Rule for Acceptable frame type and Ingress Rule for Ingress Filtering.

VLAN function	Enable VLAN, Default disable
Unicast packet Inter-VLAN Leaky	Enable the packet to be forward to a destination port at different VLAN. Default: disable
ARP broadcast packet Inter-VLAN Leaky	Enable ARP frame to broadcast to all switch port Default: disable
IP Multicast packet Inter-VLAN Leaky	Enable multicast to be flood to all the multicast group member. Default: disable

802.1Q VLAN tag aware	Enable 802.1Q VLAN tag. Default: disable
Ingress Rule for Acceptable frame types	To permit all frames or VLAN-tagged frames only. Default: Admin all frames
Ingress Rule for Ingress filtering	Enable filter the frame received from a port which port is not in the classified VLAN group member. Default: disable

✍ Notice: Ingress rule only for 802.1Q VLAN mode



3.4.7 VLAN Member Setup

This menu is for user to add VLAN member to each port. The Switch supports up to 32 VLAN groups for port-based VLAN and 802.1q tag VLAN.

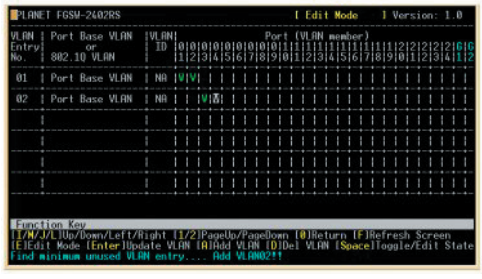
1. Press number 7 from Configuration menu for VLAN Member setup
2. Press E to change to edit mode
3. Press A to add VLAN

Setup a PORT based VLAN:

4. Press Space key to change to port-base VLAN
5. Use L key move to the Port (VLAN member)
6. Press Space key to add VLAN group

7 After complete the configuration Press Enter to Update VLAN

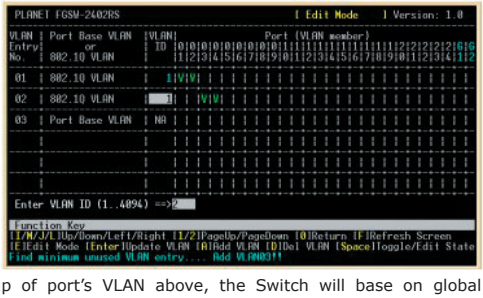
8. Press S to save the configuration



Setup an 802.1Q VLAN:

Follow from Step 1 to Step 3 above

4. Press Space key to change to 802.1Q mode
5. Use L key move to the right hand side
6. Move to VLAN ID then Press Enter to add VLAN ID
7. Move to the Port Press Space key to add VLAN group
8. After complete the configuration Press Enter to Update VLAN
9. Press S to save the configuration



After the setup of port's VLAN above, the Switch will base on global VLAN setting (section 3.4.6) and VLAN tag priority insertion (section 3.4.5) and the VLAN setting here to filter/forward the packets to each switching port. Please also consult your network administrator for the detailed VLAN plan of the network.

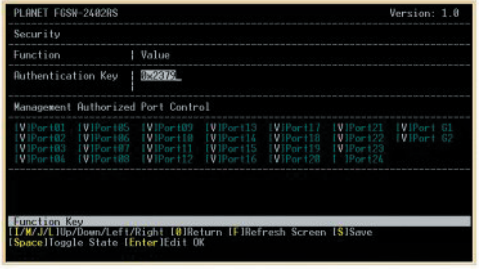
3.4.8 Device Feature

This function is allow user to enable IGMP Snooping and display the IP multicast router port

IGMP Snooping	Enable IGMP Snooping. This function is support the ability of IGMP Control packets and IP multicast data packets to learn the multicast router port and group address member port into multicast address table. Default is disable.

3.5 Security

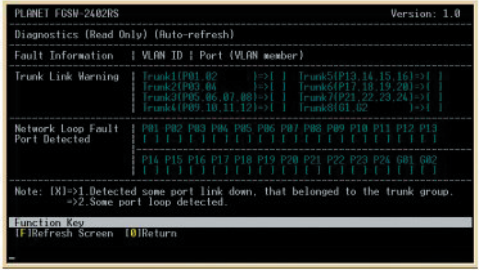
This function is for Future management purpose.



3.6 Diagnostics

This function is to display the information about Trunk link and Network loop

Trunk link warning	Display the information about trunk at each group when trunk is enabled.
Network loop fault port detected	Display the information loop detect when loop occur on each port.



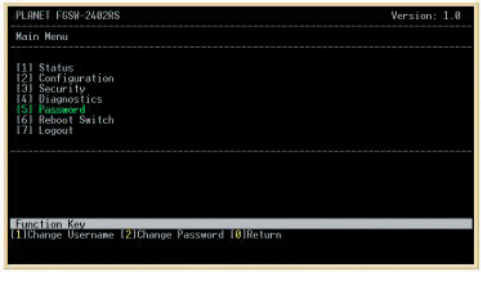
3.7 Password

This function is allow user to modify username and password. The factory default Username is "admin" without password

Press number 5 from the main menu to select password

Press 1 to modify the username

Press 2 to modify the password



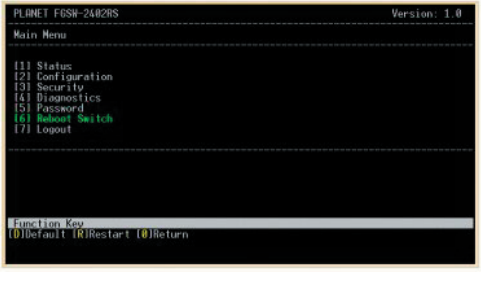
3.8 Reboot switch

In this function, it provides two different reboot functions which is to reset the switch to Default and restart switch

Press number 6 from main menu to select reboots

Press D to reset the switch to default setting and reboot.

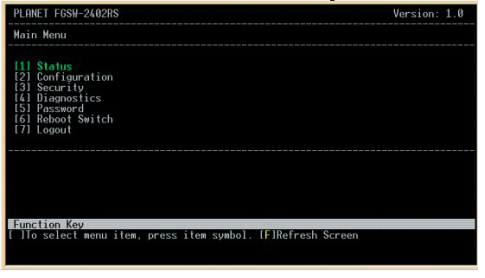
Press R to restart switch right away.



3.9 logout

Logout the switch

Press number 7 from the main menu will logout to the Switch.



After Press number 7 you can see logout screen as below. If you press enter again, the Switch will prompt login screen again.

Chapter 4
TROUBLESHOOTING

This chapter contains information to help you solve problems. If Switch is not functioning properly, make sure the Ethernet Switch was set up according to instructions in this manual.

The Link LED is not lit

Solution:

Check the cable connection and duplex mode of the Switch. Port 1 to Port 16/24 of the Switch support 10/100Mbps auto- negotiation, the connected end should also support auto- negotiation, if not, it will work at 10 Half or 100 Half.

The cable distance is within 100meters Cat. 3 or above, EIA568 cable with 2-pair or 4-pair.

For port 25/26, 17/18 of the Switch, it will vary on the module installed. For 1000Base-T interface, Cat.5/5e cable with 4-pair below 100 meters is required. For 1000Base-SX, multi-mode 62.5/125 or 50/125μm below 220/550 meters. And 10/125 or 9/125μm single mode cable 10km is allowed.

Some stations cannot talk to other stations located on the other port

Solution:

The address table may contain older information than of the address table of that node. Please power down to refresh the address information.

Performance is bad

Solution:

Check the full duplex status of the Ethernet Switch. If the Ethernet Switch is not at the same duplex mode, then the performance will be poor. The Switch support auto-negotiation, if the connected party does not support auto-negotiation, please do not set as full-duplex at that connected party. The Switch will auto sense the connecting speed 10,100Mbps and work at half-duplex mode.

Console can not display

Solution:

Check the connection between the PC and the Switch. Please use the supplied console cable to connect the two ends firmly.

Then check the COM port (1 or 2) and baudrate of the terminal program, it should be 19200, n, 8, 1.

If you are using HyperTeminal, please exit the program and restart again. Then power off, and power on the Switch. The Switch should prompt the login screen.

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A.1 Switch's RJ-45 Pin Assignments

1000Mbps, 1000Base T

Contact	MDI	MDI-X
1	BI_DA+	BI_DB+
2	BI_DA-	BI_DB-
3	BI_DB+	BI_DA+
4	BI_DC+	BI_DD+
5	BI_DC-	BI_DD-
6	BI_DB-	BI_DA-
7	BI_DD+	BI_DC+
8	BI_DD-	BI_DC-

Implicit implementation of the crossover function within a twisted-pair cable, or at a wiring panel, while not expressly forbidden, is beyond the scope of this standard.

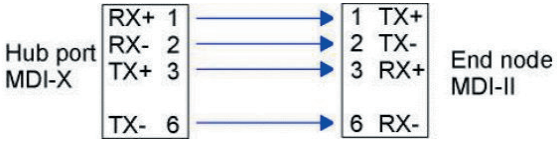
A.2 10/100Mbps, 10/100Base-TX

Contact	MDI	MDI-X
1	1	3
2	2	6
3	3	1
6	6	2

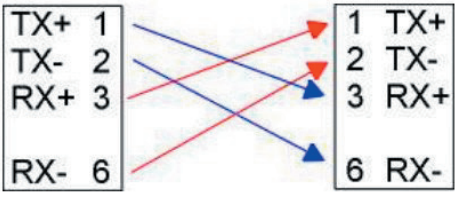
The TP ports of the Switch supports Auto-MDI detection, if the connected device is MDI-device like Ethernet Adapter, the Switch all auto adjust the contact to MDI-X. In contrast, if the connected end is MDI-X, the Switch will adjust to MDI.

A.3 Cable Specification

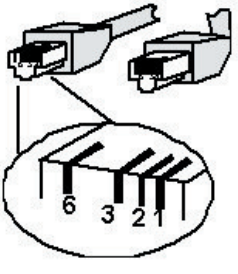
Straight through cable



Cross over cable



A.4 RJ-45 Pin assignment



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