16 ports

10/100Mbps Fats Ethernet Switch Layer 2

with 1 optional port

100Base-FX Fiber Module

USER'S GUIDE

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a) Elevated Operating Ambient Temperature- If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

b) Reduced Air Flow- Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

c) Mechanical Loading- Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

d) Circuit Overloading- Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on over current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

e) Reliable Earthing- Reliable earthing of rack-mounted equipment should be maintained. Particular

attention should be given to supply connections other than direct connections to the branch circuit (e.g., use of power strips).

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ABOUT THIS GUIDE

Congratulations on your purchase of the 16-Port 10/100Mbps Fast Ethernet Smart Switch. This device integrates 100Mbps Fast Ethernet and 10Mbps Ethernet network capabilities in a highly flexible package.

Purpose

This guide discusses how to install your 16-Port 10/100Mbps Fast Ethernet Smart Switch.

Terms/Usage

In this guide, the term "**Switch**" (first letter upper case) refers to your 16-Port 10/100Mbps Fast Ethernet Smart Switch, and "**switch**" (first letter lower case) refers to other Ethernet switches.

INTRODUCTION

This chapter describes the features of the 16-Port 10/100Mbps Fast Ethernet Smart Switch and some background information about Ethernet/Fast Ethernet and Switching technology.

Fast Ethernet Technology

The growing importance of LANs and the increasing complexity of desktop computing applications are fueling the need for high performance networks. A number of high-speed LAN technologies have been proposed to provide greater bandwidth and improve client/server response times. Among them, 100BASE-T (Fast Ethernet) provides a non-disruptive, smooth evolution from the current 10BASE-T technology. The non-disruptive and smooth evolution nature, and the dominating potential market base, virtually guarantee cost-effective and high performance Fast Ethernet solutions.

100Mbps Fast Ethernet is a standard specified by the IEEE 802.3 LAN committee. It is an extension of the 10Mbps Ethernet standard with the ability to transmit and receive data at 100Mbps, while maintaining the CSMA/CD Ethernet protocol. Since the 100Mbps Fast Ethernet is compatible with all other 10Mbps Ethernet environments, it provides a straightforward upgrade and takes advantage of

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the existing investment in hardware, software, and personnel training.

Switching Technology

Another approach to pushing beyond the limits of Ethernet technology is the development of switching technology. A switch bridges Ethernet packets at the MAC address level of the Ethernet protocol transmitting among connected Ethernet or Fast Ethernet LAN segments.

Switching is a cost-effective way of increasing the total network capacity available to users on a local area network. A switch increases capacity and decreases network loading by dividing a local area network into different segments, which don't compete with each other for network transmission capacity.

The switch acts as a high-speed selective bridge between the individual segments. The switch, without interfering with any other segments, automatically forwards traffic that needs to go from one segment to another. By doing this the total network capacity is multiplied, while still maintaining the same network cabling and adapter cards.

Switching LAN technology is a marked improvement over the previous generation of network bridges, which were characterized by higher latencies. Routers have also been used to segment local area

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networks, but the cost of a router, the setup and maintenance required make routers relatively impractical. Today switches are an ideal solution to most kinds of local area network congestion problems.

VLAN (Virtual Local Area Network)

A VLAN is a group of end-stations that are not constrained by their physical location and can communicate as if a common broadcast domain, a LAN. The primary utility of using VLAN is to reduce latency and need for routers, using faster switching instead. Other VLAN utility include:

➢ **Security**

Security is increased with the reduction of opportunity in eavesdropping on a broadcast network because data will be switched to only those confidential users within the VLAN.

➢ **Cost Reduction**

VLANs can be used to create multiple broadcast domains, thus eliminating the need of expensive routers.

Port-based (or port-group) VLAN is the common method of implementing a VLAN, and is the one supplied in the Switch. Each Switch port can belong from one to sixteen VLAN.

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Features

➢ **16×10/100Mbps Auto-negotiation Ethernet ports**

➢ **All ports support auto MDI/MDIX, so there is no need to use cross-over cables or an up-link port**

➢ **Full/half duplex transfer mode for each port**

➢ **Wire speed reception and transmission**

➢ **Store-and-Forward switching scheme capability to support rate adaptation and ensure data integrity**

➢ **Broadcast storm protection**

➢ **Up to 4K unicast addresses entities per device, self-learning, and table aging**

➢ **256KBytes on-chip packet buffer for each eight ports**

➢ **Supports IEEE 802.3x flow control for full-duplex mode ports**

➢ **Supports Back-pressure flow control for half-duplex mode ports**

➢ **Optional one port 100BASE-FX Fiber module in the rear panel for length extension**

➢ **Supports Port-base VLAN and IEEE 802.1p QoS**

➢ **RS-232 DCE console port for setting up and manage the Switch via connection to a console terminal or PC using a terminal emulation program**

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➢ **Standard 19" Rack-mount size**

UNPACKING AND INSTALLATION

This chapter provides unpacking and setup information for the Switch.

Unpacking

Open the shipping cartons of the Switch and carefully unpacks its contents. The carton should contain the following items:

➢ **One 16-Port 10/100Mbps Fast Ethernet Smart Switch**

➢ **One AC power cord, suitable for your area's electrical power connections**

➢ **Four rubber feet to be used for shock cushioning**

➢ **Screws and two mounting brackets**

➢ **One console cable**

➢ **This User's Guide**

If any item is found missing or damaged, please contact your local reseller for replacement.

Installation

The site where you install the hub stack may greatly affect its performance. When installing, consider the following pointers:

➢ **Install the Switch in a fairly cool and dry place. See** *Technical Specifications* **for the acceptable temperature and humidity operating ranges.**

➢ **Install the Switch in a site free from strong electromagnetic field generators (such as motors), vibration, dust, and direct exposure to sunlight.**

➢ **Leave at least 10cm of space at the front and rear of the hub for ventilation.**

➢ **Install the Switch on a sturdy, level surface that can support its weight, or in an EIA standard-size equipment rack. For information on rack installation, see the next section,** *Rack* **.**

➢ **When installing the Switch on a level surface, attach the rubber feet to the bottom of each device. The rubber feet cushion the hub and protect the hub case from scratching.**

Rack Mounting

The switch can be mounted in an EIA standard-size, 19-inch rack, which can be placed in a wiring closet with other equipment. Attach the mounting brackets at the switch's front panel (one on each side), and secure them with the provided screws.
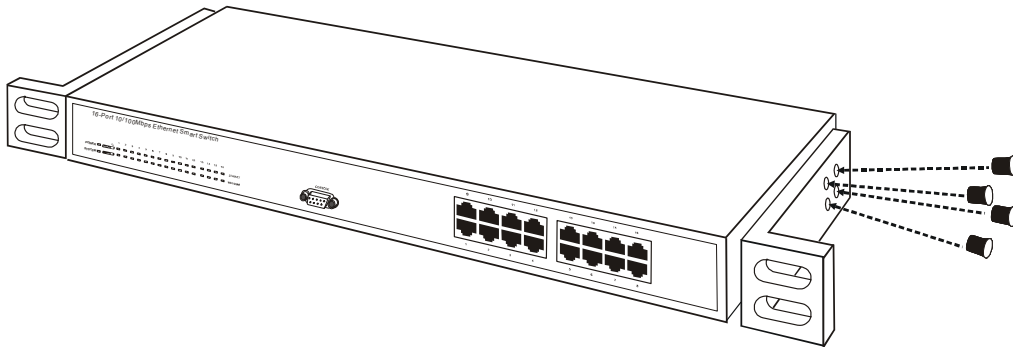
Figure 1. Combine the Switch with the provided screws

Then, use screws provided with the equipment rack to mount each switch in the rack.
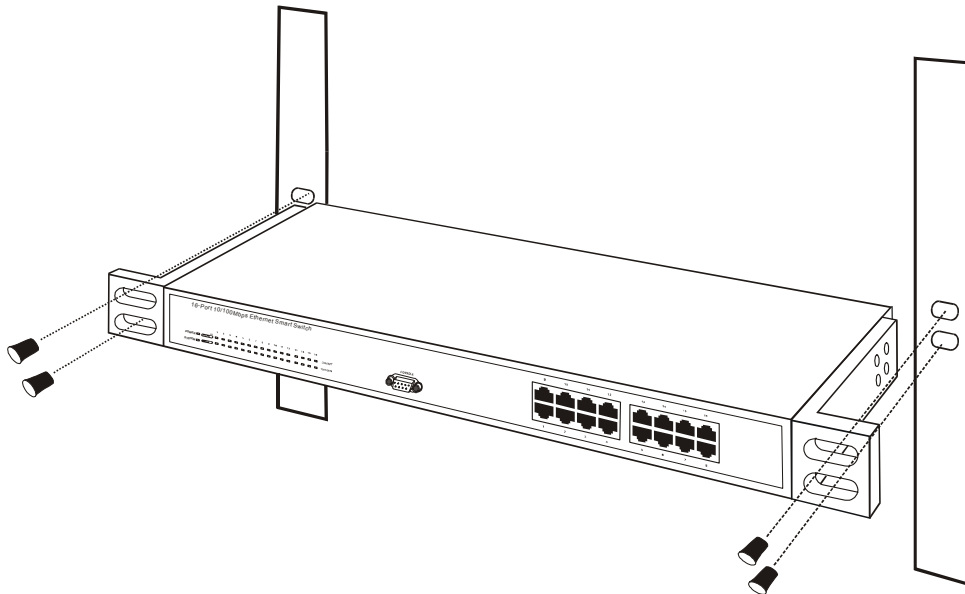
Figure 2. Mount the Switch in the rack

Connecting Network Cable

The Switch supports 10Mbps Ethernet or 100Mbps Fast Ethernet and it runs both in half and full duplex mode.

These ports are Auto-MDI type port. The Switch can auto transform to MDI-II or MDI-X type, so you can just make an easy connection that without worrying if you are using a standard or crossover cable.

AC Power

The Switch can be used with AC power supply 100~240V AC, 50~60 Hz. The power switch is located at the rear of the unit adjacent to the AC power connector and the system fan. The switch's power supply will adjust to the local power source

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automatically and may be turned on without having any or all LAN segment cables connected.

IDENTIFYING EXTERNAL COMPONENTS

This chapter describes the front panel, rear panel, and LED indicators of the Switch.

Front Panel

The figure below shows the front panels of the Switch.
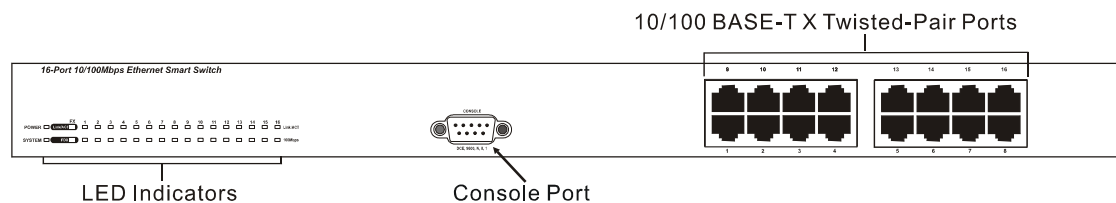
Figure 3. Front panel of 16-port 10/100Mbps Fast Ethernet Switch

➢ **LED Indicator**

Comprehensive LED indicators display the status of the switch and the network (see the *LED Indicators* chapter below).

➢ **10/100BASE-T Twisted-Pair Ports**

These ports support network speeds of either 10Mbps or 100Mbps, and can operate in half- and full- duplex transfer modes. These ports also supports automatic MDI/MDIX crossover detection function gives true "plug and play" capability, just need to plug-in the network cable to the hub directly and don't care if the end node is NIC (Network Interface Card) or switch and hub.

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> **Console Port**

An RS-232 DCE console port is set up and managed the switch via a connection to a console terminal or PC using a terminal emulation program.

Rear Panel
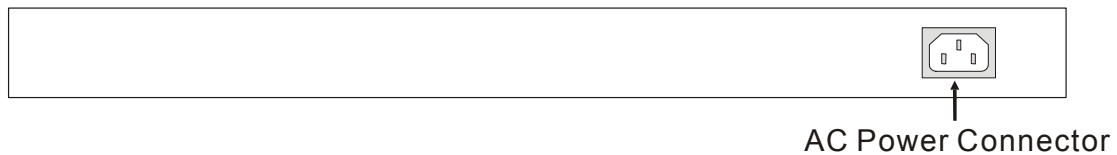
AC Power Connector

Figure 4. Rear panel of the Switch

> **AC Power Connector**

This is a three-pronged connector that supports the power cord. Plug in the female connector of the provided power cord into this connector, and the male into a power outlet. Supported input voltages range from 100~240V AC at 50~60Hz.

UNDERSTANDING LED INDICATORS

The front panel LEDs provides instant status feedback, and help monitor and troubleshoot when needed.

16-Port 10/100Mbps Ethernet Smart Switch

	FX	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
POWER ☐	Link/ACT	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Link/ACT
SYSTEM ☐	FDX	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	100Mbps
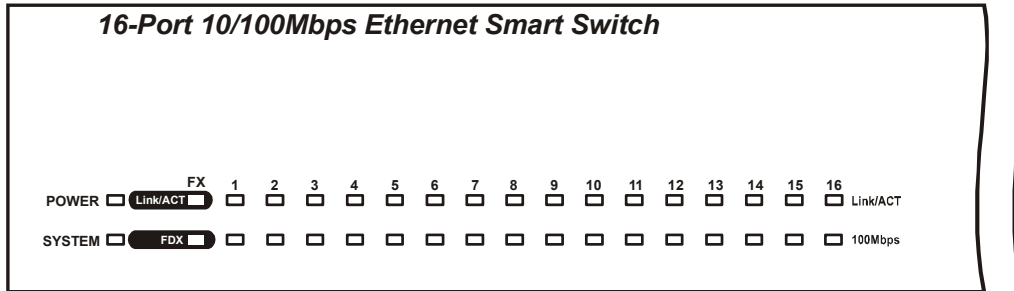
Figure 5. LED indicators of the Switch

Power and System LEDs

➢ **POWER**

On	:	When the Power LED lights on, the Switch is receiving power.
Off	:	When the Power turns off or the power cord has improper connection.

➢ **SYSTEM**

Blinking	:	When the CPU is working, the System LED is blinking.
On/Off	:	The CPU is not working.

Ports 1~16 Status LEDs

➢ **Link/ACT**

On	:	When the Link/ACT LED lights on, the respective port is successfully connected to an Ethernet network.
Blinking	:	When the Link/ACT LED is blinking, the port is transmitting or receiving data on the Ethernet network.
Off	:	No link.

➢ **100Mbps**

On	:	When the 100Mbps LED lights on, the respective port is connected to a 100Mbps Fast Ethernet network.
Off	:	When the respective port is connected to a 10Mbps Ethernet network

Fiber Module LEDs

➢ **FX Link/ACT**

On	:	When the fiber module is installed and connected to an Ethernet network, the FX Link/ACT LED lights on.
Blinking	:	When the FX Link/ACT LED is blinking, the fiber module is transmitting or receiving data on an Ethernet network.
Off	:	No link.

➢ **FDX**

On	:	When the FDX LED lights on, the fiber port is in full duplex mode.
Off	:	When the green light is off, the fiber port is in half duplex mode.

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CONFIGURATION

This Switch is an unmanaged, but "smart" Switch because programmable administration parameters make the Switch operate more effectively than unmanaged (dumb) switches. This chapter will describe how to configure the Switch.

Console Port (RS-232 DCE)

The console configuration requires connecting a terminal, such as a Workstation or a PC running a terminal emulation program (such as HyperTerminal, which is automatically installed with Microsoft Windows) a to the RS-232 DCE console port of the Switch.

The console port is set at the factory for following configuration:

Baud rate: 9,600

Data width: 8 bits

Parity: none

Stop bits: 1

Flow control: None

Make sure the terminal or PC you are using to make this connection is configured to match these settings.

.

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Configuring the Switch

The 16-Port 10/100Mbps Fast Ethernet Smart Switch has a menu-driven console interface for smart switch configuration. The Switch can be configured through the serial port. A network administrator can manage, control and monitor the switch from the console program. This section indicates how to configure the Switch to enable its smart functions including:

➢ **Setup**

There are two items such as Port Configuration and VLAN, shown in the Setup screen. Each function of these two items will be illustrated in the following sections.

➢ **System**

In the System screen, Factory Reset, Change Password, Confirm Password, Refresh Time, and Login Timeout, can be viewed and changed. System Uptime can't be altered and governed by the Switch.

➢ **File**

The Switch can be uploaded or downloaded its configuration file by using Upload Configuration or Download Configuration in the File setting screen.

➢ **Statistics**

In the Statistics menu screen, each port's data transferring and receiving status can be viewed, but can't be changed.

Login

First execute the terminal emulation program on the remote workstation, and turn on the Switch. When login to the Switch, the following screen (Figure 10) prompt:

Password:

```
Smart Switch                                              V0.90t




                        Password : [_                    ]





                                                          Login
[DOWN/TAB] [UP] [ENTER] [SPACE] [BACKSPACE] [DIGIT] [LETTER]
Please Enter Password
```
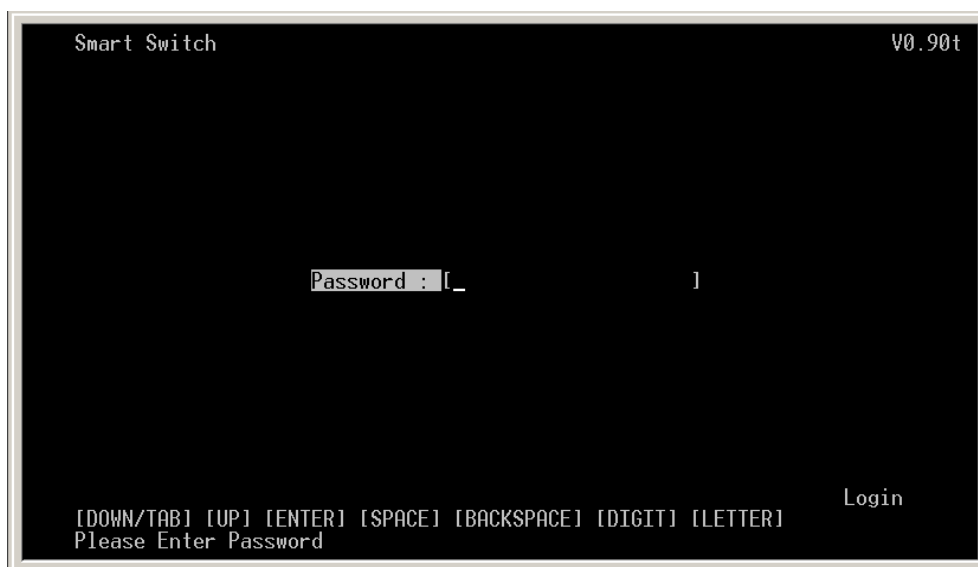
Figure 10. Login

Input the password in the blank, and then press *Enter* to login Main Menu. If you manage the Switch for the first time, you should input the factory default password "***admin***" to login to the Switch. For changing the password, first highlight ***System > Change Password*** to input your new password, and then highlight ***Confirm Password*** to input your new password again to ascertain it.

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Main Menu

The main menu appears, as shown in Figure 11. Find the console keys in the lower part of the screen. Move to highlight a desired option by using *Up Arrow*, *Down Arrow* and *Tab* keys, and then press *Enter* key to confirm. There are four options: Setup, System, File, and Statistics, shown in the Main Menu screen.

Figure 11. Main Menu

Configuring Setup Setting

Find that there are two items, including Port Configuration and VLAN in Setup menu, shown as Figure 12.


```
Smart Switch                                                V0.90t
/Setup




                        Port Configuration
                        VLAN




                                                           Exit
[DOWN/TAB] [UP] [ENTER]
Configure Fast Ethernet Ports
```

Figure 12. Setup Menu

➢ **Port Configuration**

In Port Configuration menu (Figure 13), each port's (port 17: Fiber Port) Speed, Flow Control, and QoS can be controlled. Link Status is automatically determined by the Switch and can't be shifted.

```
Smart Switch                                                    V0.90t
/Setup/Port Configuration
<====================== STATUS ========================>
 Port       Speed        FlowCtrl    QoS     | Link Status
 ------     ---------    ---------   -------  | -----------
  01        Auto         ON          High    | Down
  02        Auto         ON          High    | Down
  03        Auto         ON          High    | Down
  04        Auto         ON          High    | Down
  05        Auto         ON          High    | Down
  06        Auto         ON          High    | Down
  07        Auto         ON          High    | Down
  08        Auto         ON          High    | Down
  09        Auto         ON          High    | Down
  10        Auto         ON          High    | Down
  11        Auto         ON          High    | Down
  12        Auto         ON          High    | Down
<====================== SETTING ========================>
                                                         Save
 Port[01]  {Auto    }   {ON }      {High  }              Next

                                                         Exit
 [DOWN/TAB] [UP] [ENTER] [BACKSPACE] [DIGIT]
```

Figure 13. Port Configuration

(1) Speed

There are five modes— ***Auto***, ***100M Full***, ***100M Half***, ***10M Full***, and ***10M Half***—for speed selections. To change the speed setting, highlight Port and enter the port number to select the desired port, next highlight Speed, click *Enter*, and use *Space Bar* to toggle back and forth between the five different options.

(2) Flow Control

This setting determines whether or not the Switch will be handling flow control. To change the flow control setting, highlight Port and enter the port number to select the desired port. Set ***FlowCtrl*** to ***ON*** for avoiding data transfer overflow. Or it sets to ***OFF***, there is either no flow control or other hardware/software management.

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(3) QoS

If some ports need to have the priority to manage the data transfer, QoS should be change. QoS has two functions to alter, **High** and **Low**. The default settings of all ports' QoS are **High**. To change the QoS setting, highlight Port and enter the port number to select the desired port. The default settings of QoS are **High**. Set QoS to determine which ports will always transfer their data first.

(4) Link Status

This value is automatically determined by the Switch and can't be changed. If there is a valid connection to the Switch through that assigned port, the Link Status will show the connecting speed. The status will be **Down** if there is no connection through that port.

➢ **VLAN (Virtual Local Area Network)**

Group individual ports into a small "virtual" network of their own to be independent of the other ports. Changing the VLAN, locate the port that needed to set, select the "V" for joining the VLAN group and the "-" for not joining. The default setting of VLAN is shown as Figure 14.

```
Smart Switch                                                    V0.90b
/Setup/VLAN
<============  STATUS  ============>
              0         1      F
Port          1         1      X
--------     |---------|-------|
VLAN  1      |υυυυυυυυυυ|υυυυυυυ|
VLAN  2      |---------|-------|
VLAN  3      |---------|-------|
VLAN  4      |---------|-------|
VLAN  5      |---------|-------|
VLAN  6      |---------|-------|
VLAN  7      |---------|-------|
VLAN  8      |---------|-------|
VLAN  9      |---------|-------|
VLAN 10      |---------|-------|
VLAN 11      |---------|-------|
<============  SETTING  ============>
              0         1      F
              1         1      X                          Save
VLAN[01]     [υυυυυυυυυυ|υυυυυυυ]                          Next

                                                          Exit

[DOWN/TAB] [UP] [ENTER] [BACKSPACE] [DIGIT]
```

Figure 14. VLAN Configuration

For example, there are five computers (PC1~PC5) connected to the Switch's port 1~5. They had been divided into two VLAN groups: VLAN1 (PC1~PC4) and VLAN2 (PC2~PC5). There is no way to connect PC1 and PC5 shown as Figure 15. If PC1 has to connect to PC5, it should joint PC1 and PC5 in the same VLAN.
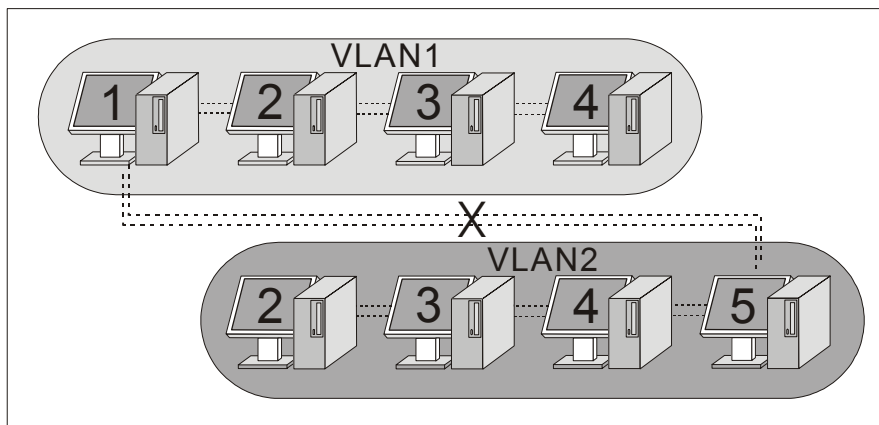
Figure 15. There is no connection between PC1 and PC5

Using VLAN, it can divide the Switch into many independent small switches. For example, in Figure 16, the Switch has been

divided into two VLAN groups. Both VLAN groups are independent and there's no link between these VLAN groups. The Switch can be regarded as two smaller switches.
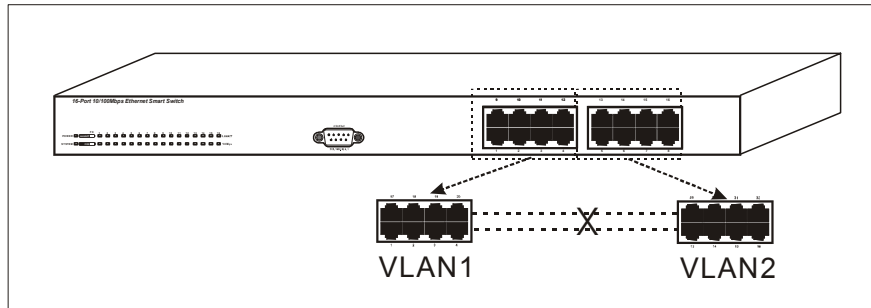
Figure 16. Dividing the Switch into two smaller switches

Configuring System Setting

The System Configuration Menu screen (shown in Figure 17) indicates the following information:

➢ **Factory Reset**: Press to turn back to factory setting once the setting in blur.

➢ **Change Password**: Change the input password.

➢ **Confirm Password**: Confirm the new input password.

➢ **Refresh Time**: Set the refresh time of the device for Statistics.

➢ **Login Timeout**: Set the console idle time-out to log out the smart menu when forgot to log out.

➢ **System Uptime**: Indicate the time on powered up the Switch.

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```
Smart Switch                                              V0.90t
/System




                    Factory Reset
                    Change Password  : [                      ]
                    Confirm Password : [                      ]
                    Refresh Time     : {5 Sec. }
                    Login Timeout    : {5 Min. }
                    System Uptime : 0 days, 0 hours, 6 mins, 9 secs


                                              Save


                                              Exit
        [DOWN/TAB] [UP] [ENTER]
```

Figure 17. System Setting

Configuring File Setting

The Switch can be uploaded or downloaded its configuration files by using the File screen shown in Figure 18.

➢ **Upload Configuration**: Select this for back up a file the setting from the device. (in Hyper Terminal, Transfer > Receive File)

➢ **Download Configuration**: Select this for downlading the back up file to the device. (in Hyper Terminal, Transfer > Send File)

```
                    Upload Configuration
                    Download Configuration




        NOTE: Use Xmodem protocol to Upload/Download the configuration file


                                                        Exit

    [DOWN/TAB] [UP] [ENTER]
```

Figure 18. File installation

Statistics

> ➢ **Statistics Menu**

In the Statistics menu screen (shown Figure 19), all ports' transferring (Tx) and receiving (Rx) status summaries can be viewed.

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```
Smart Switch                                                    V0.90t
/Statistics
<=========================  STATUS  ==========================>
  Port    TxOk          RxOk         TxError      RxError  (Pkts)
 ------   ----------    ----------   ----------   ----------
  01                0            0            0            0
  02                0            0            0            0
  03                0            0            0            0
  04                0            0            0            0
  05                0            0            0            0
  06                0            0            0            0
  07                0            0            0            0
  08                0            0            0            0
  09                0            0            0            0
  10                0            0            0            0
  11                0            0            0            0
  12                0            0            0            0

<=========================  SETTING  =========================>
 Port[01]  Detail                                          Next

                                                           Exit

[DOWN/TAB] [UP] [ENTER] [BACKSPACE] [DIGIT]
```

Figure 19. Statistics

➢ **Statistics Detail**

Highlight Port and enter port number to view the statistics details (see Figure 20).

```
Smart Switch                                                              V0.90t
/Statistics/Detail
<=========================  Port 01  ===========================>
 TX Octets     =          0 x 4G +        0
 TX DropPkts           =          0 TX MultipleCollision =        0
 TX BroadcastPkts      =          0 TX DeferredTransmit  =        0
 TX MulticastPkts      =          0 TX LateCollision     =        0
 TX UnicastPkts        =          0 TX ExcessiveCollision =       0
 TX Collisions         =          0 TX FrameInDisc       =        0
 TX SingleCollision    =          0 TX PausePkts         =        0
 RX Octets     =          0 x 4G +        0
 Rx Jabbers            =          0 Rx OversizePkts      =        0
 RX PausePkts          =          0 Rx AlignmentErrors   =        0
 Rx DropPkts           =          0 Rx FCSErrors         =        0
 Rx MulticastPkts      =          0 Rx UnicastPkts       =        0
 Rx SAChanges          =          0 Rx BroadcastPkts     =        0
 Rx ExcessSizeDisc     =          0 Rx Fragments         =        0
 RX UndersizePkts      =          0 Rx SymbolError       =        0
 Pkts64Octets          =          0 Pkts65to127Octets    =        0
 Pkts128to255Octets    =          0 Pkts256to511Octets   =        0
 Pkts512to1023Octets   =          0 Pkts1024to1522Octet  =        0
                                                               Exit

 [DOWN/TAB] [UP] [ENTER]
 Exit this menu
```

Figure 20. Statistics Detail

TECHNICAL SPECIFICATIONS

General	
Standards	IEEE 802.3 10BASE-T Ethernet IEEE 802.3u 100 BASE-TX, 100BASE-FX Fast Ethernet
Protocol	CSMA/CD
Data	Ethernet: 10Mbps (half duplex), 20Mbps (full duplex) Fast Ethernet: 100Mbps (half duplex), 200Mbps (full duplex)
Topology	Star
Network Media	10BASE-T: 2-pair UTP/STP Cat. 3, 4, 5; up to 100m 100BASE-TX: 2-pair UTP/STP Cat. 5; up to 100m 100BASE-FX: 50/125 or 62.5/125μm multimode fiber with SC connector

Number of	16 × 10/100Mbps Auto-MDIX STP ports 1 × expansion slot for 100BASE-FX fiber module

Physical and Environmental

AC inputs:	100~240V AC, 50/60 Hz internal universal power supply
Power Consumption:	12 watts. (max.)
Temperature:	Operating: 0°~40°C, Storage: -10°~70°C
Humidity:	Operating: 10%~90% RH, Storage: 5%~90% RH
Dimensions:	440 x 140 x 44 mm (W x H x D)
Weight:	2.0kg
Emissions:	FCC Class A, CE Mark Class A, VCCI Class A
Safety:	cUL(1950), CB(IEC60950)
Performance	
Transmits Method:	Store-and-forward
RAM Buffer:	512K bytes per device
Filtering Address Table:	4K entries per device
Packet Filtering/Forwarding Rate:	10Mbps Ethernet: 14,880/pps 100Mbps Fast Ethernet: 148,800/pps
MAC Address Learning:	Automatic update

Product Support

If you continue to have problems you should contact the dealer where you bought this product. If you have any other questions you can contact the Atlantis Land company directly at the following address:

AtlantisLand spa

Via Gandhi 5 Ing2,Scala A

20017 Mazzo di Rho(MI)

Tel: 02/93906085, 02/93907634(help desk) Fax: 02/93906161
Email: info@atlantisland.it or
tecnici@atlantisland.it
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