

KIEN3016M/3024M Industrial Ethernet Switch User's Manual

KYLAND Telecom Technology Co., Ltd.

KIEN3016M/3024M **Industrial Ethernet Switch**

User's Manual

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Preface

KIEN3016M/3024M is a high-performance managed industrial Ethernet switch specially designed by KYLAND Telecom Technology CO., LTD. for industrial applications including star, tree and chain topology network. Its high-performance switch engine, solid and closed case design, high-efficient ribbed shape case heat dispersion surface without fans, overcurrent, overvoltage and EMC protection at power input side, and excellent EMC protection of RJ45 port allows KIEN3016M/3024M applicable in harsh and dangerous industrial environments. Meanwhile, it is suitable for the broadband network for building automation.

The User's Manual for KIEN3016M/3024M Industrial Ethernet Switch mainly introduces the information on technical principles, performance indexes, installation and commissioning, network management etc. to provide users with references in startup, expansion and routine maintenance. It is a practical teaching material that can be used by users in trainings and helps the relevant technical personnel to increase their knowledge and understanding of industrial Ethernet switch.

This manual mainly includes the following contents:

Chapter 1: Overview & System Features

Chapter 2: Performance & Service Functions

Chapter 3: Hardware of KIEN3016M

Chapter 4: Hardware of KIEN3024M

Chapter 5: Installations

Chapter 6: Testing Method

Chapter 7: Networking & System Configurations

Chapter 8: WEB Management Software

Chapter 9: Console Port Management

Appendix A Twisted pair and pin distribution rules

Appendix B Cable types and specifications

Appendix C Glossary

Statement: as product and technology upgrades and improves constantly, the contents of this document may not completely accord with the actual product. For product upgrading information, please access our company's website or directly contact with our company's business representative.

Safety Notice

This product offers reliable performances as long as it is used within the designed scope. Artificial damage or destruction of the equipment should be avoided.

- Carefully read this manual and well preserve this manual for future reference;
- Do not place the equipments near water sources or damp places;
- Do not place anything on power cable which should be placed in unreachable places;
- Do not tie or wrap the cable to prevent fire.
- Power connectors and connectors for other equipments should be firmly interconnected and frequently checked.

In the following cases, please immediately disconnect the power supply and contact with our company:

1. Water gets into the equipments;
 2. Equipment damage or shell breakage;
 3. Abnormal operation conditions of equipment or the demonstrated performances have changed;
 4. The equipment emits odor, smoke or noise.
- Please keep optical fiber plugs and sockets clean. During operation of equipments, do not stare directly into the cross section of optical fiber;
 - Please keep the equipment clean; if necessary, wipe the equipment with soft cotton cloth;
 - Do not repair the equipment by yourself, unless it is clearly specified in the manual.

Warning Marks:

This manual uses two kinds of noticeable warning signs to arouse special attention of users during operation. The implications of these signs are as follows:



Warning: pay special attention to the notes behind the mark, improper operation will result in serious damage of the switch or injury of operation personnel.



Caution, attention, warning, danger: remind the positions requiring attention during operation.

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Chapter One Overview

1.1 Product Overview

KIEN3016M/3024M is a high-performance managed industrial Ethernet switch specially designed by KYLAND Telecom Technology CO., LTD. for industrial applications including star, tree and chain topology network. Its high-performance switch engine, solid and closed case design, high-efficient ribbed shape case heat dispersion surface without fans, overcurrent, overvoltage and EMC protection at power input side, and excellent EMC protection of RJ45 port allows KIEN3016M/3024M applicable in harsh and dangerous industrial environments. Meanwhile, it is suitable for the broadband network for building automation

KIEN3016M offers 16 RJ45 ports of 10Base-T/100Base-TX in its real panel. Each RJ45 port is adaptive to 10Base-T or 100Base-TX and half-duplex or full-duplex, and can be connected automatically in MDI/MDI-X way. In the front panel, there are four slots for fiber ports and can offer 0 to 4 pairs of fiber ports 100Base-FX of full-duplex with SM or MM optical fiber cables. The switches can be connected uplink via these fiber ports

KIEN3024M offers 24 RJ45 ports of 10Base-T/100Base-TX in its real panel. Each RJ45 port is adaptive to 10Base-T or 100Base-TX and half-duplex or full-duplex, and can be connected automatically in MDI/MDI-X way. In the front panel, there are two slots for fiber ports and can offer 0 to 2 pairs of fiber ports 100Base-FX of full-duplex with SM or MM optical fiber cables. The switches can be connected uplink via these fiber ports

KIEN3016M and KIEN3024M also offer a console interface in their rear panel, by which you can manage and configure the switch via hyper terminal. You can enter into WEB interface of the switch from any RJ45 port and manage the switch.

1.2 System Features

1. High Performance Industrial Ethernet Switch

Adaptive to Base-T/100Base-TX, half-duplex or full-duplex, auto MDI/MDI-X connection.

Full-duplex fiber ports of 100Base-FX, single mode or multimode.

Broadcasting storm protection.

Conform to IEEE802.3/802.U/802.3X

Transparent transmission of VLAN tag packets.

Powerful management realizes VLAN, IGMP-Snooping, TRUNK, port mirroring etc.

Hyper terminal interface offers convenience for project field.

2. Optional Industrial Power Design

Industrial AC power supply (220V)

Industrial DC power supply DC+24V、DC-48V) .

EMC protection and protection against over-current, over-voltage.

3. Rugged Design

Ribbed case without fan, operation at -35°C~+75°C.

IP40 protection class

1.3 Packing list and unpacking check

1. Packing list

The packing case includes the following items:

| | |
|----------------------------|---|
| KIEN3016M or KIEN3024M | 1 |
| 3-core DC power terminal | 1 |
| User's Manual | 1 |
| Customer Service Guideline | 1 |

2. Unpacking check

Before opening the case, place it stably, pay attention to the direction of the packing case, and ensure its right side is facing upward, so as to prevent switch from falling apart after opening the case. If a hard object is used to unclench the case, do not overly extend the hard object into the case to avoid damage of the equipments inside the case.

After opening the case, check the amount of equipments (including main unit of parts of equipment, user's manual, customer service guideline) according to the packing list, and check the appearance quality of switch.



Warning:

For the built-in precise parts of equipments, please handle with care and avoid strenuous vibration to avoid affecting the performances of equipments.

Chapter Two Performance Specifications

2.1 System Specifications

The system specifications of KIEN3016M industrial Ethernet switch is shown as table 2-1.

Table 2-1 System Specifications

| Specs | Description |
|-----------------------|---|
| Management Port | 1 x RS232 , RJ45 socket |
| Port Quantity & Type | 16 x 10Base-T/100Base-TX |
| | 0~4 x 100Base-FX-SM/MM |
| System Performance | Standard: IEEE802.3、IEEE 802.3x、IEEE 802.3u Storage and forward rate: 148810 pps Maximum filtering rate: 148810 pps Switch method: Store and forward System switching bandwidth: 8.8G EMC: EN55022; EN50082-2 |
| Ethernet Port | Physical interface: RJ-45(shielded) RJ-45: 10/100Base-T/TX, auto-negotiatable Standard: IEEE802.3 Transmission Distance: <100m |
| Fiber Port | Optical Power >-13dbm(SM) >-20dbm(MM) Optical Sensitivity : <-28dbm(SM) <-35dbm(MM) Wavelength : 1310nm(SM) 1550nm(SM) 1310 nm(MM) Transmission Distance : 20 ~ 80Km(SM) <2Km(MM) Connector : SC/FC Rate : 125Mbps |
| Power Requirement | Power Supply : AC 220V (AC 200V ~ 240V , 50Hz ~ 60Hz) DC24V (DC 18V ~ 36V) DC-48V (DC -36V ~ -72V) Consumption : <15W Over-current protection: Built-in |
| Mechanical Parameters | Dimension (H×W×D) : 44 mm×482.6 mm×245 mm Installation: 19' Rack Heat removal: Ribbed aluminum casing without fan Outlet: rear Protection class: IP40 Weight: 4 kg |
| Ambient Conditions | Operation temperature:-35°C ~ 75°C Storage temperature: -45°C ~ 85°C Humidity: 10% ~ 95% (non-condensing) |

The system specifications of KIEN3024M industrial Ethernet switch is shown as table 2-2:

Table 2-2 System Specifications

| Specs | Description |
|-----------------------|---|
| Management Port | 1 x RS232 , RJ45 socket |
| Port Quantity & Type | 24 ×10Base-T/100Base-TX |
| | 0~2 x 100Base-FX-SM/MM |
| System Performance | Standard: IEEE802.3、 IEEE 802.3x、 IEEE 802.3u Storage and forward rate: 148810 pps Maximum filtering rate: 148810 pps Switch method: Store and forward System switching bandwidth: 8.8G EMC: EN55022; EN50082-2 |
| Ethernet Port | Physical interface: RJ-45(shielded) RJ-45: 10/100Base-T/TX, auto-negotiable Standard: IEEE802.3 Transmission Distance: <100m |
| Fiber Port | Optical Power >-13dbm(SM) >-20dbm(MM) Optical Sensitivity : <-28dbm(SM) <-35dbm(MM) Wavelength : 1310nm(SM) 1550nm(SM) 1310 nm(MM) Transmission Distance : 20 ~ 80Km(SM) <2Km(MM) Connector : SC/FC Rate : 125Mbps |
| Power Requirement | Power Supply : AC 220V (AC 200V ~ 240V , 50Hz ~ 60Hz) DC24V (DC 18V ~ 36V) DC-48V (DC -36V ~ -72V) Consumption : <15W Over-current protection: Built-in |
| Mechanical Parameters | Dimension (H×W×D) : 44 mm×482.6 mm×245 mm Installation: 19' Rack Heat removal: Ribbed aluminum casing without fan Outlet: rear Protection class: IP40 Weight: 4 kg |
| Ambient Conditions | Operation temperature:-35°C ~ 75°C Storage temperature: -45°C ~ 85°C Humidity: 10% ~ 95% (non-condensing) |

2.2 Service Interface

- 1 . KIEN3016M offers 16 RJ45 ports of 10Base-T/100Base-TX, and KIEN3024M offers 24 RJ45 ports of 10Base-T/100Base-TX. Each RJ45 port is adaptive. KIEN3016M also offers 0 to 4 fiber ports of 100Base-FX and KIEN3024M offers 0 to 2 fiber ports of 100Base-FX. The throughput of each fiber port is max 100Mbps.
- 2 . Comply with IEEE802.3/802.U/802.3X.
- 3 . RJ45 port is adaptive to half-duplex or full-duplex mode. The fiber port is enforced to full-duplex mode.
- 4 . RJ45 port is adaptive to 10/100M and supports for auto MDI/MDI-X connection. Transmission distance is less than 100m.
- 5 . Indicator of RJ45 : yellow for rate, ON for 100M, OFF for 10M

Green for link status, ON for active connection, BLINK for active network, OFF for no connection.

2.3 Service Functions

offer such service functions as following :

1 . LED Indicator

The LEDs of the front panel indicate the port status correctly including transmission rate, link status and system status.

2 . Layer-2 Switching

Switches work in two ways: Cut-Through and Store-and-Forward. In Cut-Through, a data packet is immediately relayed further after detecting the target address; in Store-and-Forward, a data packet is first read-in completely and checked for errors before the switch relays the same. KIEN3016M and KIEN3024M employ Store-and-Forward that is a switching mode widely used.

3 . VLAN

The network can be divided into several VLANs, based on port, through which the users in one VLAN can communicate each other. The VLAN of KIEN3016M/3024M conform to IEEE802.1Q and can realize the communication

within one VLAN of different switches. It supports up to sixteen VLANs. You can divide the VLANs through console or WEB management easily.

4 . Port Aggregation(TRUNK)

Ethernet TRUNK can bind up to 8 physical Ethernet ports. The bound Eth-trunk port is the same as normal Ethernet port and supports for all the service functions. You can configure the service functions on the Eth-trunk port, but note to configure the OoS in the physical ports.

5 . Multicasting (IGMP)

IGMP means Internet Group Multicast Protocol. KIEN3016M/KIEN3024M supports IGMP surveillance and inquiry.

6 . Configuring working mode of port

KIEN3016M/3024M is able to set the working mode of all ports through management: full/half duplex, auto-sensing, enforced full/half duplex, enforced 10M/100M.

7 . Port Mirroring

The switch can mirror the data of one port to another port to realize the real communication of data.

Chapter Three KIEN3016M Hardware Structure

3.1 System Structure

KIEN3016M hardware is structured as Figure3-1:

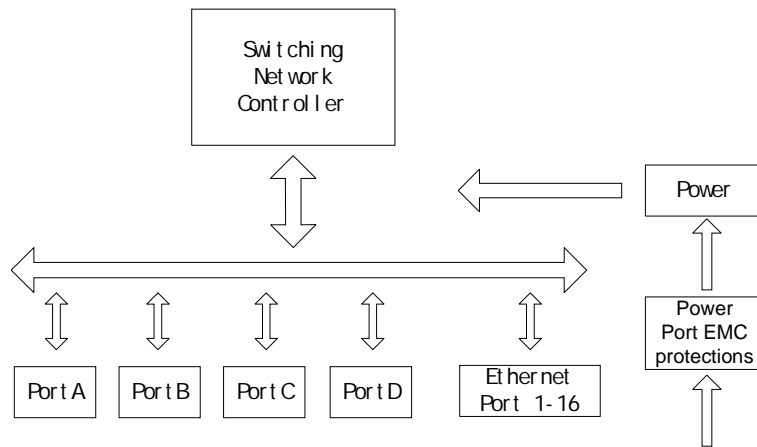


Figure 3-1 Hardware Structure

System hardware mainly consist the following parts:

- 1 . Switching network controller employs ASIC chip technology, offering layer-2 wire-speed transfer of data packets.
- 2 . Integrated module of transmitting and receiving.
- 3 . Industrial isolated power supply with protection of over-current, over-voltage and EMC.
- 4 . EMC protection for all Ethernet ports.

3.2 Switch Structure

3.2.1 Chassis

KIEN3016M is a standard 19’ chassis with up to IP40 protection class. The chassis is made of aluminum with ribbed case as one part of the heat removal system. The chassis of KIEN3016M is shown in Figure 3-2:

Dimensions : 44 mm×482.6 mm×245 mm (H×W×D) :

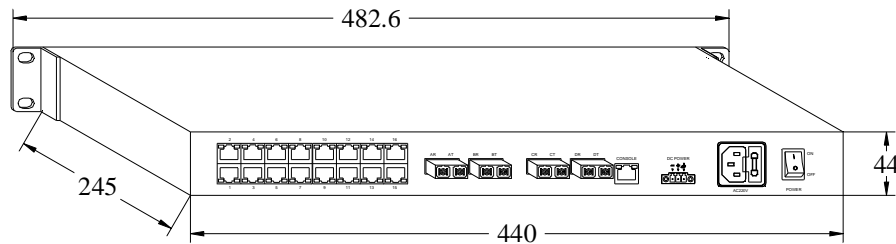


Figure 3-2 Chassis of KIEN3016M

3.2.2 Front Panel

The front panel of KIEN3016M is shown in Figure 3-3 :

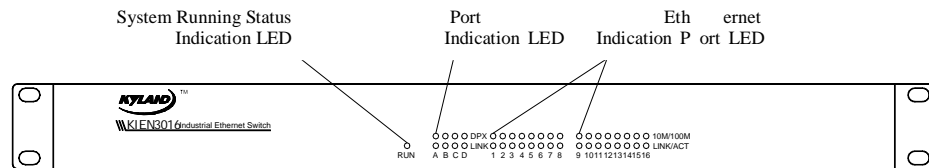


Figure 3-3 Front Panel

Indicators show the status of system operation and ports to find and correct faults. The Table 3-1 shows the meanings of these LED indicators in the front panel.

Table 3-1 LED Indicator Description

| LED | Conditions | Status |
|------------------------------|------------|------------------------|
| System Status LED | | |
| RUN | ON | Running normally |
| Fiber Port Status LED | | |
| Fiber Port A-D | | |
| DPX | ON | full-duplex connection |
| | OFF | half-duplex connection |

| | | |
|--------------------|----------|--------------------|
| LINK | ON | correct connection |
| | Blinking | active network |
| | OFF | connection fault |
| Ethernet Port 1-16 | | |
| 10M/100M | ON | 100M) |
| | OFF | 10M |
| LINK/ACT | ON | correct connection |
| | Blinking | active network |
| | OFF | connection fault |

3.2.3 Rear Panel

There are totally 4 pair of fiber ports and 16 RJ45 port, 1 DC/AC power terminal at the rear panel shown in Figure 3-4:

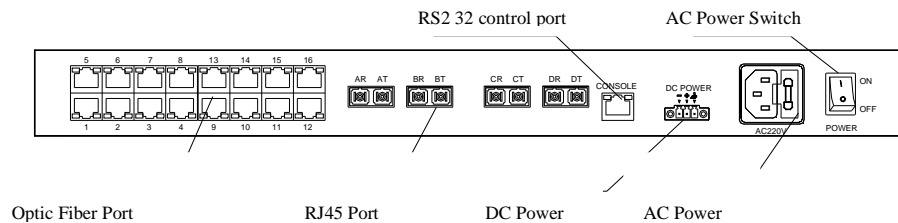


Figure 3-4 Rear Panel

Fiber Port :

KIEN3016M offers 4 slots for fiber ports as A,B,C,D and is custom-made for 0 to 4 fiber ports of 100Base-FX. The connector is SC. The fiber ports must be used in pair. xT is for transmitting and is connected to remote xR port. xR is for receiving and is connected to XT port.(X means A,B).

Ethernet Port :

KIEN3016M offers 16 RJ45 ports of 10Base-T/100Base-TX. Each port is adaptive and supports for auto MDI/MDI-X connection. You can connect it to terminal device, server, hub or switches by straight-through or cross-over cables. Each port supports for IEEE802.3x and is adaptive to half/full-duplex or 10 or 100Mbps. If the connected devices don't support such feature, the port will transmit the correct rate.

RS232 (CONSOLE)

The RS232 console port is a shielded RJ45 connector, the standard is 3-wire

RS232, you can connect. You can use a serial cable with one end RJ45 and another end DB9F to connect the RJ232 console port with the 9-pin serial port of the PC. You can run the hyper terminal software of WINDOWS system to configure and manage the switch.

CONSOLE port :Baud rate :9600 ,data :8 ,check :no ,stop :1 traffic control :no.

You should connect the RS232 console port with the 9-pin serial port of PC as in Figure 3-5:

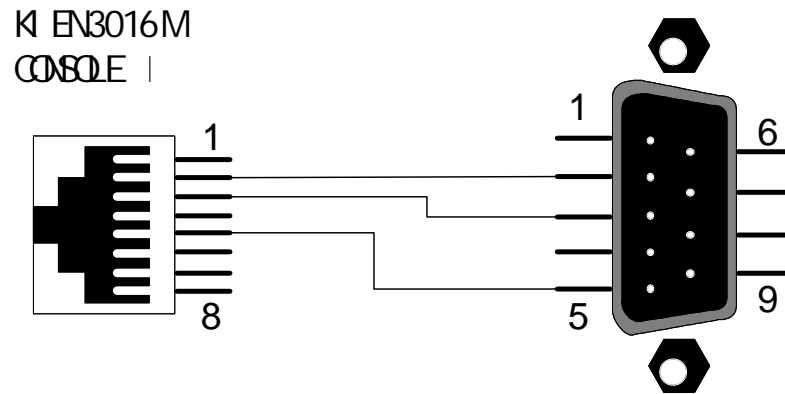


Figure 3-5 KIEN3016M Ethernet cable connection

DC Power Supply :

If the product shows DC power supply (DC24V 或 DC-48V), use this term to connect power supply. The power cable must more than 0.3 mm^2 shown in Figure 3-6:

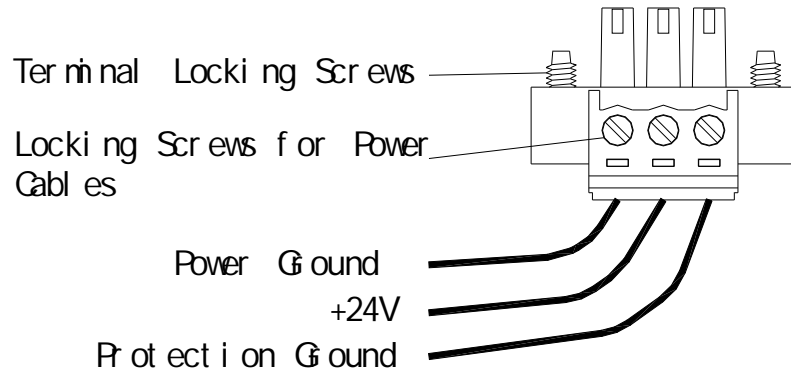


Figure 3-6 DC power terminal

AC power supply :

If the product shows AC power supply (AC220V), use this terminal to connect power supply. This terminal offers a fuse socket and you can change the fuse easily. 2A fuse is used here:

- 1 . Plug a 2A fuse into the socket and press a standby sue into the slot for next time change as in Figure 3-7a
- 2 . As in Figure 3-7b , plug the fuse into the AC power socket:

Standby Fuse

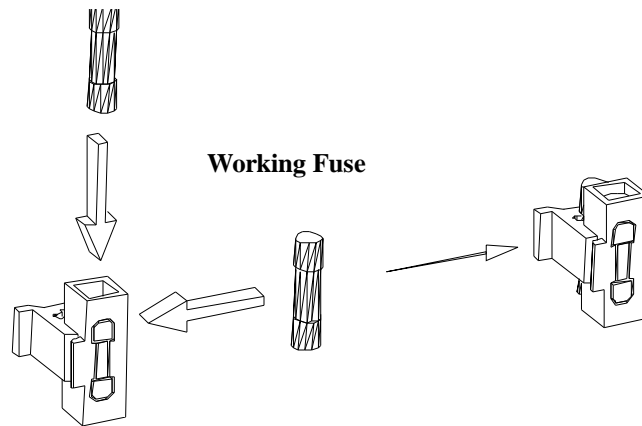


Figure 3-7 a 1st step

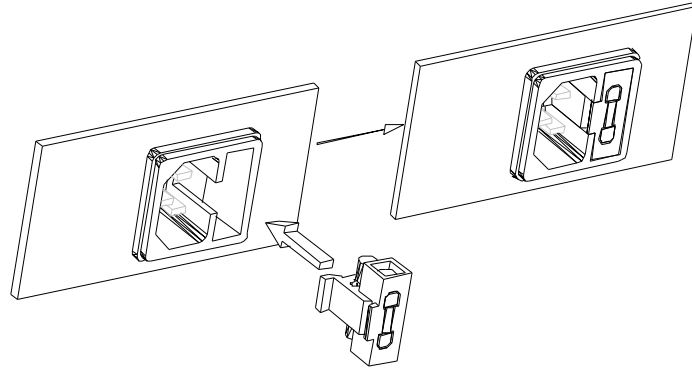


Figure 3-7 b 2nd step

Chapter Four KIEN3024M Hardware Structure

4.1 System Structure

KIEN3024M is structured in Figure 4-1:

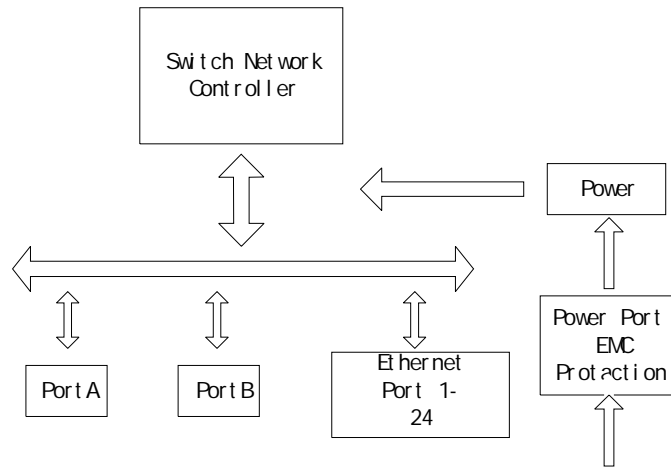


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System hardware mainly consist the following parts:

- 5 . Switching network controller employs ASIC chip technology, offering layer-2 wire-speed transfer of data packets.
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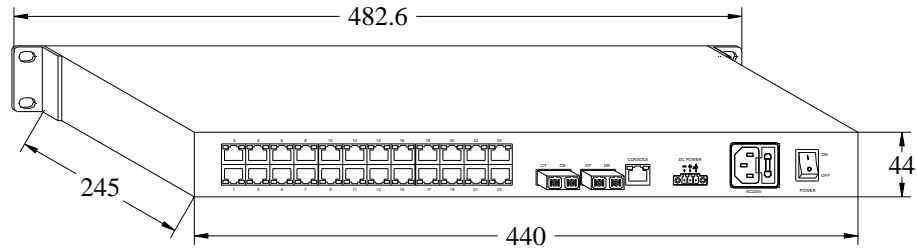


Figure 4-2 Chassis

4.2.2 Front Panel

The front panel of KIEN3024M is shown in Figure 4-3 :

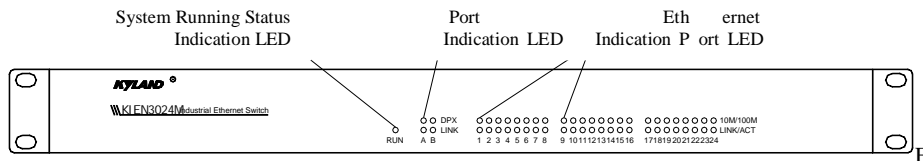


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| Fiber Port Status LED | | |
| Fiber Port A-D | | |
| DPX | ON | full-duplex connection |
| | OFF | half-duplex connection |
| LINK | ON | correct connection |
| | Blinking | active network |
| | OFF | connection fault |
| Ethernet Port 1-16 | | |
| 10M/100M | ON | 100M) |
| | OFF | 10M |
| LINK/ACT | ON | correct connection |

| | | |
|--|----------|------------------|
| | Blinking | active network |
| | OFF | connection fault |

4.2.3 Rear Panel

There are totally 2 pair of fiber ports and 24 RJ45 ports, 1 DC/AC power terminal at the rear panel shown in Figure 4-4:

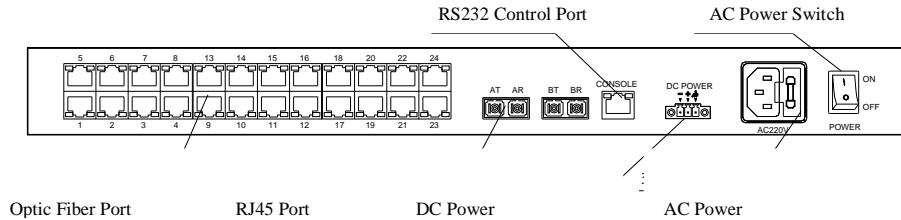


Figure 4-4 Rear Panel

Fiber Port :

KIEN3024M offers 2 slots for fiber ports as A,B and is custom-made for 0 to 2 fiber ports of 100Base-FX. The connector is SC. The fiber ports must be used in pair. xT is for transmitting and is connected to remote xR port. xR is for receiving and is connected to XT port.(X means A,B).

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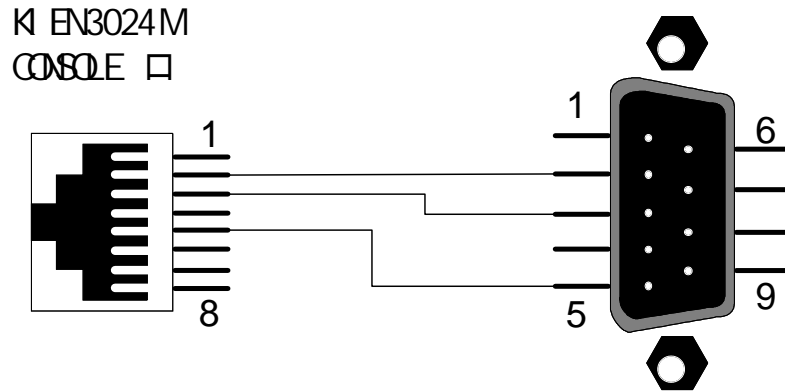


Figure 4-5 KIEN3024M Ethernet cable connection

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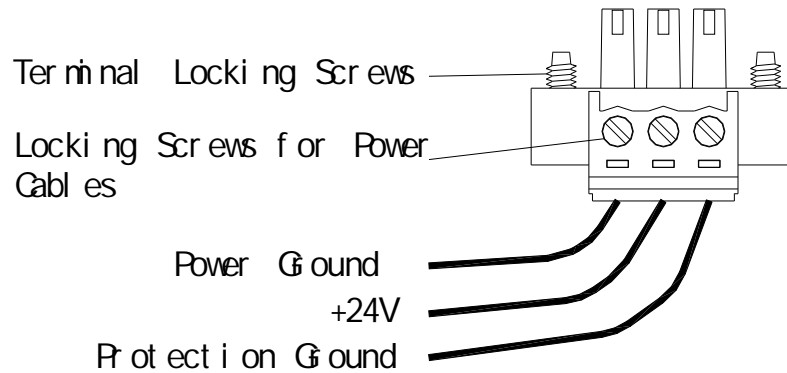


Figure 4-6 DC Power Terminal

AC power supply :

If the product shows AC power supply (AC220V), use this terminal to

connect power supply. This terminal offers a fuse socket and you can change the fuse easily. 2A fuse is used here:

1 . Plug a 2A fuse into the socket and press a standby fuse into the slot for next time change as in Figure 4-7a

2 . As in Figure 4-7b , plug the fuse into the AC power socket:

Standby Fuse

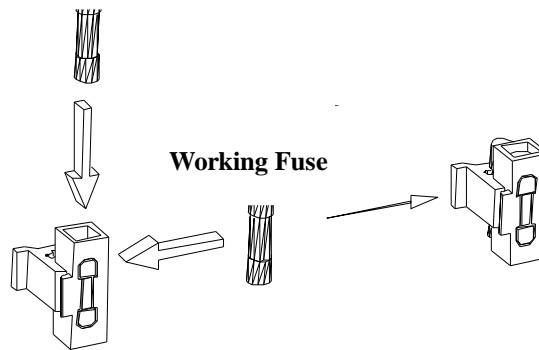


Figure 4-7 a 1st Step

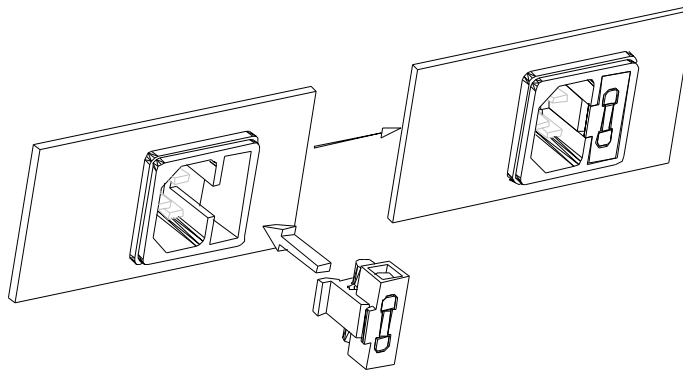


Figure 4-7 b 2nd Step

Chapter Five Hardware Mounting

5.1 Installation Requirements

KIEN3016M and KIEN3024M is a single body and can be installed in the 19' standard rack. Before installation, make sure of the suitable environment including power requirements, installation space, close to other devices. The details are as below:

- 1 . Power requirement: select the correct power supply according to the product, AC220V(200VAC ~ 240VAC ,50Hz ~ 60Hz) or DC-48V(-36VDC ~ -72VDC) or DC24V (18VDC ~ 36VDC) .
- 2 . Ambient Conditions: operation temperature: -35°C ~ 75°C , relative humidity: 10 % ~ 950%.
- 3 . Grounding resistance : $<5\Omega$
- 4 . Check if the uplink fiber/TP port is available and ready.
- 5 . Avoid direct sunshine and keep it away from heating sources or areas where have strong electromagnetic interference.
- 6 . Prepare for necessary tools for rack mounting like screws, rack etc.
- 7 . Check availability of cables and connectors required for mounting.

5.2 Mounting Main Unit

KIEN3016M and KIEN3024M can be installed in any standard 19' rack, the mounting dimensions are shown in Figure 5-1. To mount it in rack, check the mounting situation of the rack, check mainly:

- 1 . Enough space in the rack.
- 2 . Suitable power supply for the switch in the rack.

Select the suitable mounting position of KIEN3016M and KIEN3024M, make sure of the hole of switch and rack in one line, and fix with screw as shown in Figure 5-2. The screw is M5X14.

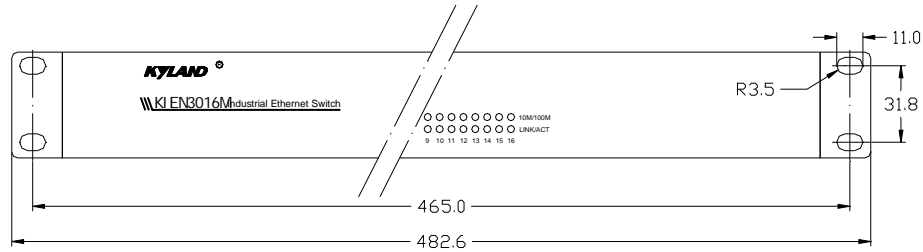


Figure 5-1 KIEN3016M and KIEN3024M Mounting Dimensions

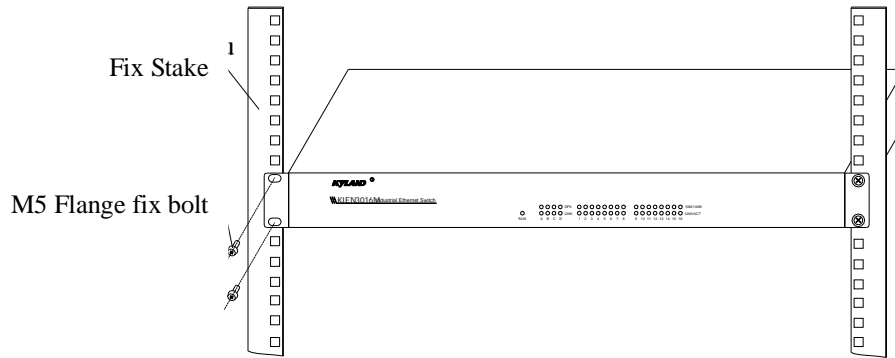


Figure 5-2 Mounting KIEN3016M or KIEN3024M In the Rack

5.3 Cable Connection

After properly mounting KIEN3016M/KIEN3024, it is ready for cable mounting and connection, mainly including cable connection for the following interfaces:

1 . Service interface

KIEN3016M/KIEN3024 provides 10Base-T/100Base-TX RJ45 Ethernet interface for the connection to end equipments in straight-through way and to network equipments in cross-over way.

2 . Power connection

Use DC24V, DC-48V or AC220V power supply for KIEN3016M/KIEN3024 equipment according to the indications on product label. Connect power supply after completing connection for all other cables.

5.4 Optical fiber connection

KIEN3016M/KIEN3024 provides 0~4 or 0~2 pair of ports of 100Base-FX full duplex single mode or multi-mode optical fiber interfaces. These optical fiber interfaces can be used to realize the uplink connection between switches. SC connector is required.



Warning:

This switch uses laser to transmit signal on optical fiber cable. The laser meets class 1 laser product requirements and harmless to eyes under normal operation. However, when the equipment is switched on, do not stare directly into the optical fiber transmitting interface and the end of optical fiber terminator.

Connect pluggable optical fiber module according to the following procedures:

- 1 . Remove and keep the rubber sleeve of SC port. When it is not in use, cover SC port with the rubber sleeve to protect the optical fiber terminator.
- 2 . Check whether the optical fiber terminator is clean. Slightly wet a clean tissue or cotton ball and carefully wipe cable plugs. Contaminated If the optical fiber terminator is contaminated, transmitting quality of optical fiber will reduce, affecting port performances.
- 3 . Connect one end of optical fiber cable to the optical fiber interface of the switch and the other end to the optical port of another equipment.

5.5 Cable Wiring

Cable wiring should meet the following requirements:

- 1 . Before cable wiring, check whether the specifications, models and quantities of all cables comply with the construction drawing design and contract requirements.
- 2 . Before cable wiring, it is necessary to check whether there is damaged cable and whether the cables are accompanied by ex-factory records and vouchers attesting their quality such as quality assurance certificate etc.

- 3 . The specifications, quantities, route directions and laying position of the cables to be laid should meet the design requirements of construction drawings. The laying length of each cable should be determined according to its actual position.
- 4 . No intermediate break or joint is allowed for the cables to be laid.
- 5 . User's cables and power cable should be laid separately.
- 6 . Inside walkways, the cables should be properly arranged in good order, with uniform, smooth and flat turnings.
- 7 . Cables should be straightly laid in cable channels. Extruding of cable from cable channels to block other outlet or inlet holes is not allowed. The cables at the outlet part of cable channel or at turnings should be bundled and fixed.
- 8 . If cables, power line and grounding conductor are laid in the same channel, cables, power line and grounding conductor should be not folded or blended together. If a cable line is overly long, coil and place it in the middle of the cabling rack, do not let it cover on other cables.
- 9 . When laying the pigtail, avoid knotting of optical fiber cable, minimize the amount of turnings and avoid turnings with overly small radius. Bundle pigtails in proper tightness and avoid too tightly bundling. If laid on a cabling rack, it should be placed separately from other cables.
- 10 . There must be the relevant marks at both ends of cable and the information on the marks should be explicit to facilitate maintenance.

**Attention:**

When laying pigtails, prevent optical fiber cable from knotting, minimize the amount of turnings and avoid turnings with too small radius, because turning with too small radius will result in serious consumption of optical signal of links, affecting communication quality.

Chapter Six Testing Method

6.1 Self-Check

When the power is connected, all service indicators(except for POWER OUT) on the front panel will flash one time, which means normal running of these ports. Later on, the RUN indicator is on and DPX is always on..

6.2 Testing Ethernet Ports

Power KIEN3016M/3024M as shown in Fig. 6-1, make any two Ethernet interfaces connect with the network port of the two testing computers by straight-through network cable, transmit Ping command mutually, both sides can correctly Ping to each other and no data package is lost. At the same time, the yellow lamp on the corresponding port should keep on (computer network interface card operates in 100M state), or keep off (computer network card operates in 10M state), and the green lamp on the corresponding port should flash. This indicates the tested hardware of the two electrical operates normally. The same testing method will be used to test all the rest Ethernet interfaces (For detailed operation of the Ping command, please refer to the following examples).

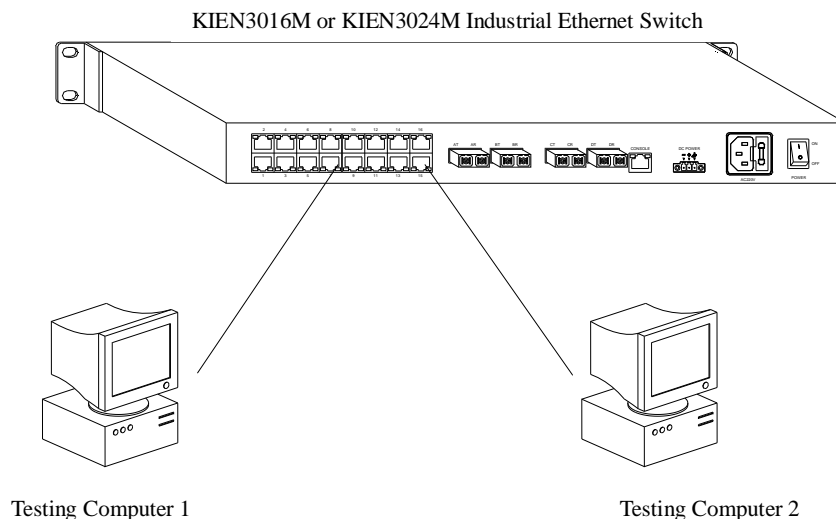


Figure 6-1 Testing Ethernet port

6.3 Testing Fiber Ports

Let the equipment of KIEN3016M.3024M at both ends to form a fiber link network as shown in Fig. 6-2., connect any one Ethernet interface of each equipment to the testing computer by straight-through network cable, transmit Ping command mutually, both sides can correctly Ping to each other and no data package is lost. At the same time, DPX light is always on and the LINK blinks. This indicates the tested hardware of the two electrical operates normally. The same testing method will be used to test the other pair of optical ports (For detailed operation of the Ping command, please refer to the following examples)

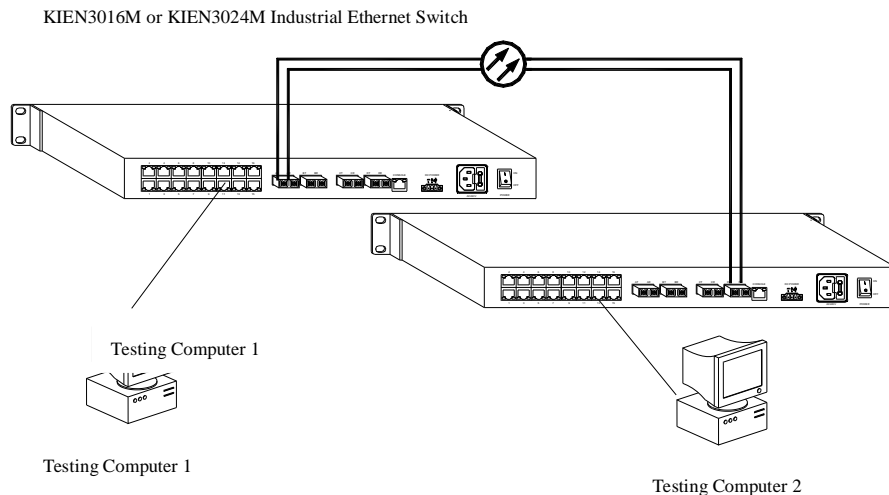


Figure 6-2 Testing Fiber Ports

PING Command

The IP address of the testing computer 1 is 192.168.100.10 and the 2 is 192.168.100.11. On the testing computer 1, run “cmd” in the WIN2000 operating system or “command” in the WIN98/95 operating system from “Run” in the “Start” menu. Send “ping 192.168.100.11 -l 1000 -t”. (-l means byte number of the sent data package; -t means continuously sending data). On the testing computer 2, run “cmd” in the WIN2000 operating system or “command” in the WIN98/95 operating system from “Run” in the “Start” menu. Send “ping 192.168.100.10 -l 1000 -t”. If switches run normally, the testing computer 1 returns “Reply from 192.168.100.11 : bytes=1000 time<10ms TTL=128” and the 2 returns “Reply from 192.168.100.10 : bytes=1000 time<10ms TTL=128”, and the counted package loss rate is zero checked by the CTL+C command ten minutes after running

Chapter Seven Networking Mode and System Configuration

7.1 KIEN3016M Networking

KIEN3016M offers 0 to 4 pair of fiber ports of 100Base-FX to be connected to KIEN2000B, KOM300 to form a large star, chain, tree topology network. It can be widely used in power, transportation, energy and water, factory automation etc, also to form broadband network in building.

For the applications in power, transportation, energy, water and factory automation, KIEN3016M make use of the 0 to 4 pair of fiber ports to form multiple network topology flexibly and offers 16 ports of 10Base-T/100Base-TX to connect multiple terminal devices to form tree (Figure 7-1), star (Figure 7-2), chain(Figure 7-3):

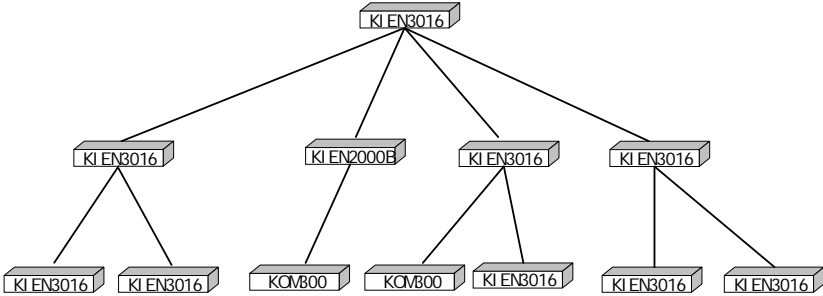


Figure 7-1 KIEN3016M Tree Topology

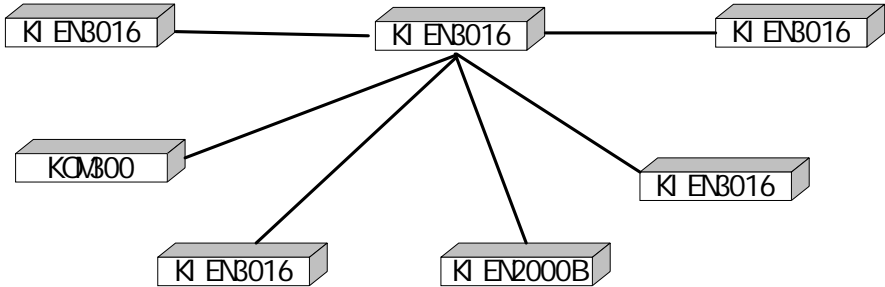


Figure 7-2 KIEN3016M Star Topology

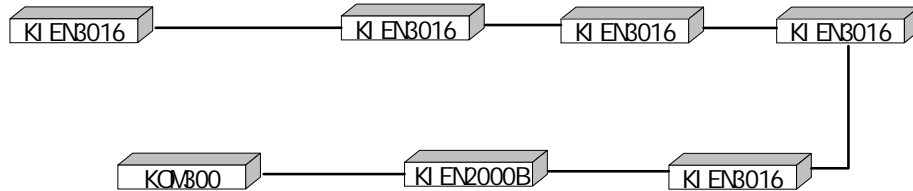


Figure 7-3 KIEN3016M Chain Topology

In the broadband network in living district, KIEN3016M is suitable for the connection layer and building convergence layer. You can use the cat5 cable to connect the 10/100M broadband and one pair fiber port of 100Base-FX to uplink to the convergence point to support the server networking shown in Figure 7-4:

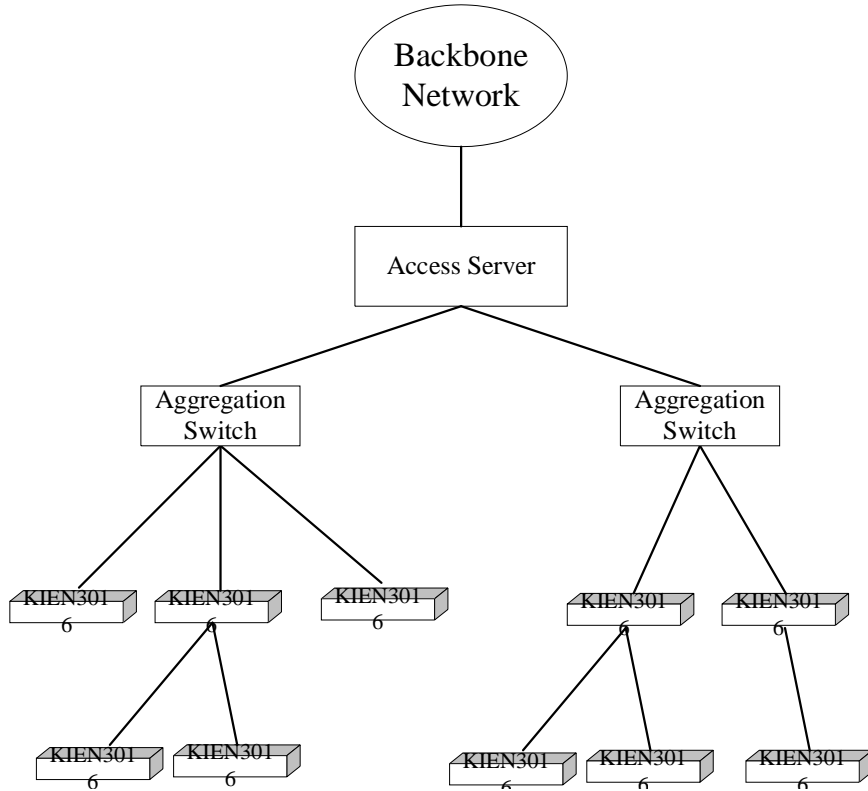


Figure 7-4 KIEN3016M Broadband Networking

7.2 KIEN3024M Networking

KIEN3024M offers 0 to 2 pair of fiber ports of 100Base-FX to be connected to KIEN2000B, KOM300, KIEN3016 to form a large, chain, tree topology network. It can be widely used in power, transportation, energy and water, factory automation etc, also to form broadband network in building.

For the applications in power, transportation, energy, water and factory automation, KIEN3024M make use of the 0 to 2 pair of fiber ports to form multiple network topology flexibly and offers 24 ports of 10Base-T/100Base-TX to connect multiple terminal devices to form chain(Figure 7-5):

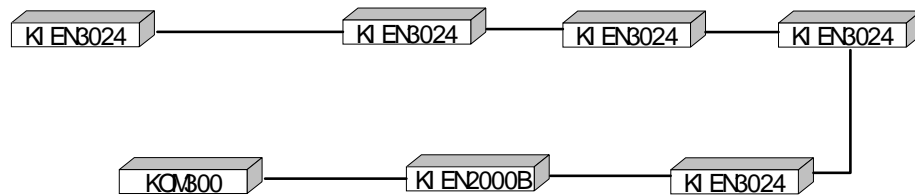


Figure 7-5 KIEN3024M Networking

In the broadband network in living district, KIEN3024M is suitable for the connection layer and building convergence layer. You can use the cat5 cable to connect the 10/100M broadband and one pair fiber port of 100Base-FX to uplink to the convergence point to support the server networking shown in Figure 7-6:

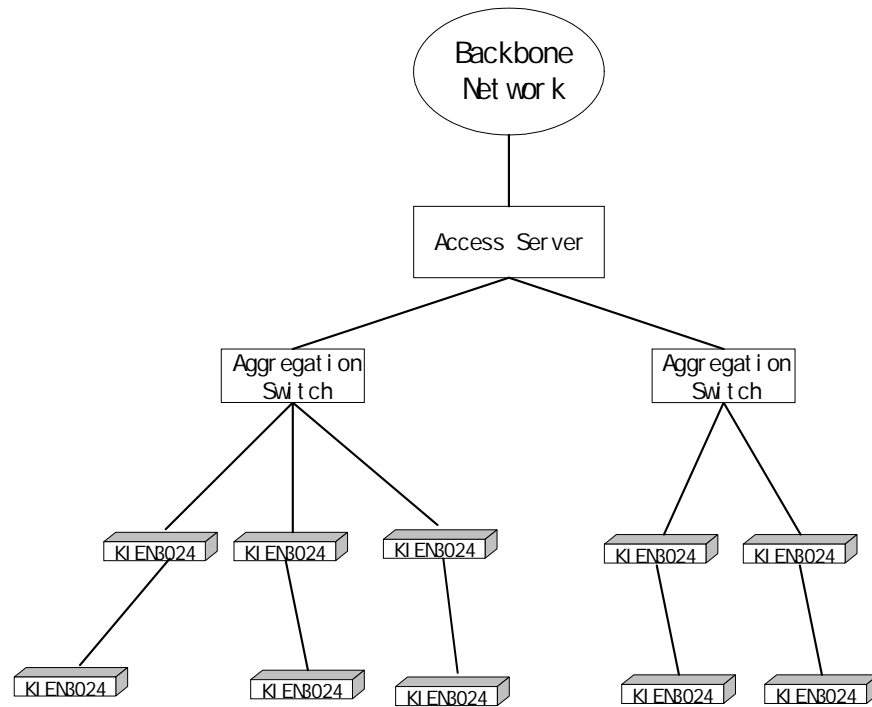


Figure 7-6 KIEN3024M Broadband Network

7.3 System Configurations

KIEN3016M and KIEN3024M are integrated structures offering 16 or 24 Ethernet ports of 10Base-T/100Base-TX which are fixed. Additionally, they offer 4 or 2 fiber modules of 100Base-FX. The power supply can custom-made as AC220V、DC220V、DC-48V、DC24V. The details are shown in Table 6-1:

Table 6-1 KIEN3016M、KIEN3024M Configuraations

| Model | Description |
|--------------|---|
| KIEN3016M | |
| KIEN3016M-4S | 4 x 100Base-FX, SM , 16 x 10Base-T/100Base-TX, RJ-45 |
| KIEN3016M-3S | 3 x 100Base-FX, SM , 16 x 10Base-T/100Base-TX, RJ-45 |
| KIEN3016M-2S | 2 x 100Base-FX, SM , 16 x 10Base-T/100Base-TX, RJ-45 |
| KIEN3016M-1S | 1 x 100Base-FX, SM , 16 x 10Base-T/100Base-TX, RJ-45 |
| KIEN3016M | 16 x 10Base-T/100Base-TX, RJ-45 |
| KIEN3016M-4M | 4 x 100Base-FX, MM , 16 x 10Base-T/100Base-TX, RJ-45 |
| KIEN3016M-3M | 3 x 100Base-FX,MM , 16 x 10Base-T/100Base-TX, RJ-45 |
| KIEN3016M-2M | 2 x 100Base-FX, MM , 16 x 10Base-T/100Base-TX, RJ-45 |
| KIEN3016M-1M | 1 x 100Base-FX, MM , 16 x 10Base-T/100Base-TX, RJ-45 |
| KIEN3024M | |
| KIEN3024M-2S | 2 x100Base-FX, SM 24 x 10Base-T/100Base-TX, RJ-45 |
| KIEN3024M-1S | 1 x100Base-FX, SM 24 x 10Base-T/100Base-TX, RJ-45 |
| KIEN3024M | 24 x 10Base-T/100Base-TX, RJ-45 |
| KIEN3024M-2M | 2 x100Base-FX, MM 24 x 10Base-T/100Base-TX, RJ-45 |
| KIEN3024M-1M | 1 x100Base-FX, MM 24 x 10Base-T/100Base-TX, RJ-45 |

Chapter Eight Web Management Software

8.1 Software Login

You can configure and manage via console or web software. This chapter will cover all details of the web management software. The serial port management will be introduced in next chapter.

Open IE browser and enter IP address, press “ENTER” to login with user name of “admin”, password of “admin”, click “advanced setting”.

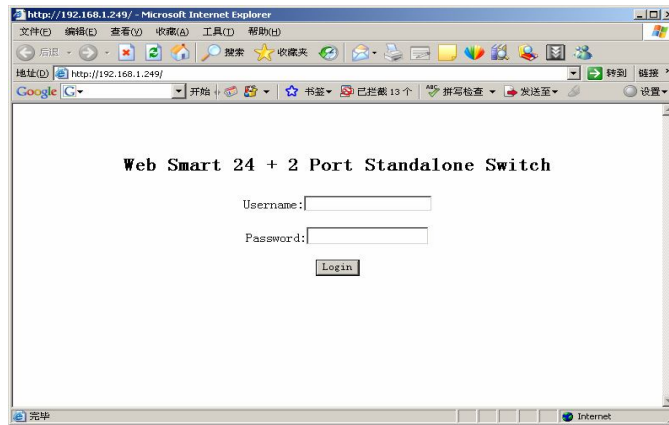


Figure 8-1 Login Page

8.2 Main Page

The left menu of main page includes Port status、Port configuration、Trunk configuration、VLAN configuration、Port Monitoring Configuration、Bandwidth Control、QoS Configuration etc. Click any to enter into the page:

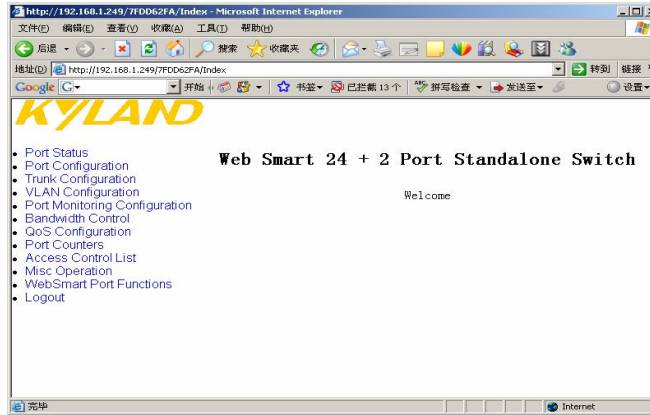


Figure 8-2 WEB Main Page

8.3 Port Status

Click Port status to show the status of each port:enable、up/down、100F/10T、 traffic control ON/OFF.

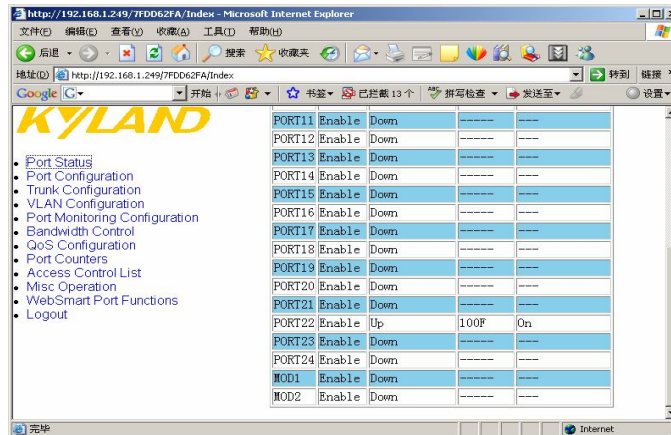


Figure 8-3 Port Status Page

8.4 Port Configuration

Click Port configuration to enter into the page port configuration to show the parameters: enable/disable、adaptive (AUTO) on/off、port rate auto/100f/100h/10f/10h、 traffic control (ON/OFF) .

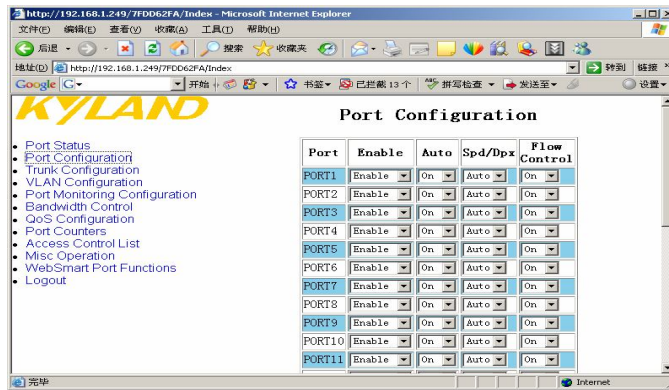


Figure 8-4 Port Configuration

8.5 Trunk Configuration

Click Trunk configuration to enter into the page of trunk. For KIEN3016M, up to 7 TRUNK is possible. You can bind 2 to 8 ports for each trunk. MOD1 and MOD2 must be binding together without other ports.

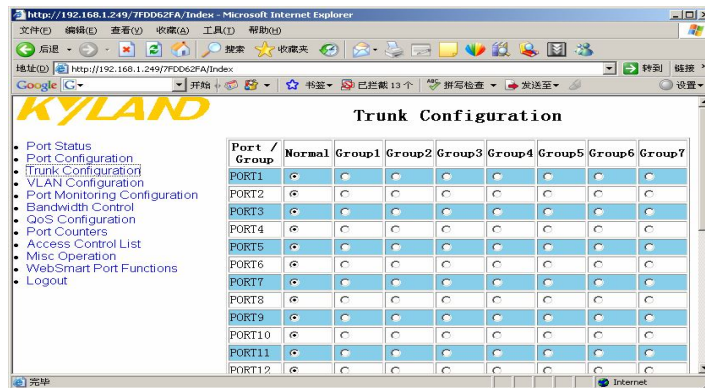


Figure 8-5 Port Trunking

8.6 VLAN Configuration

Click the VLAN configuration to enter VLAN page, and select VLAN mode: PORTBASED、802.1Q, and click the key of ADDNEW.

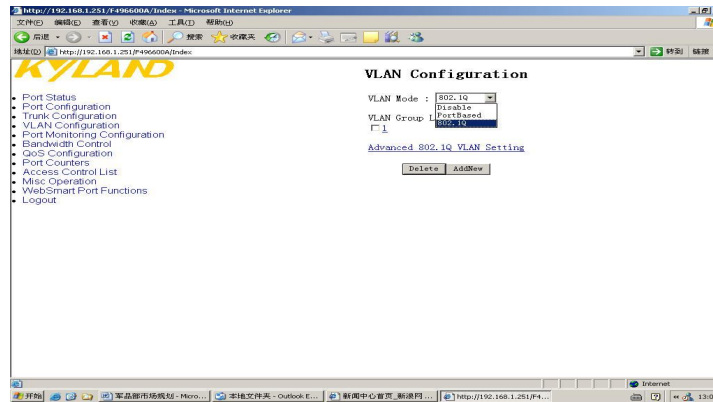


Figure 8-6 VLAN Configuration

8.6.1 Port-based VLAN Configuration

Add VLAN ID number in the volume of GROUP ID in the range of 1 to 4094. Select the port. For example, port 1, 4 is member state and click APPLY key. VLAN is configured successfully. Back to VLAN CONFIGURATION and check the VLAN state.

Click VLAN " 4" to check the configurations.

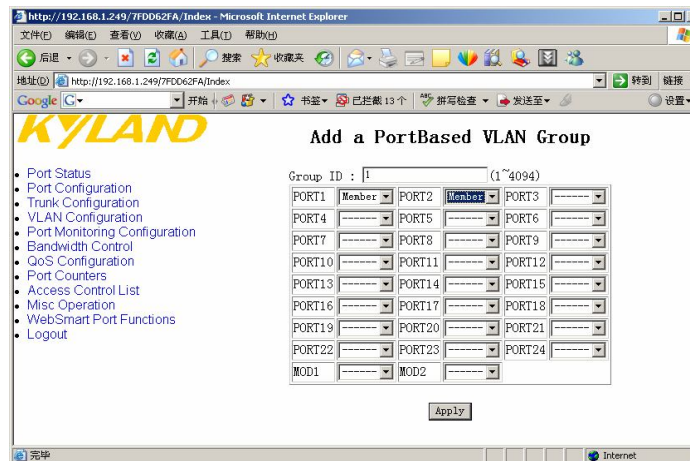


Figure 8-7 Port-based VLAN Configuration

8.6.2 802.1Q-based VLAN Configuration

Add VLAN ID number in the volume of GROUP ID in the range of 2 to 4094, for example, the ID is "4". Select Untag/tag and click APPLY key.

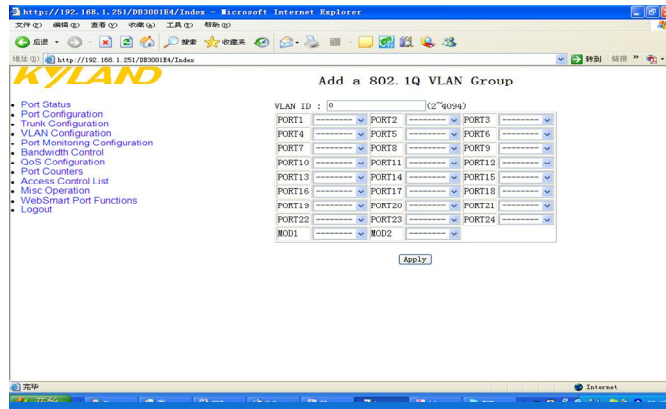


Figure 8-8 802.1qQ-based VLAN Configuration a

Click "Advanced 802.1Q VLAN Setting" to enter into Advanced 802.1Q VLAN Setting interface, set the port as nonmember(drop/forward)、untag(drop/forward).

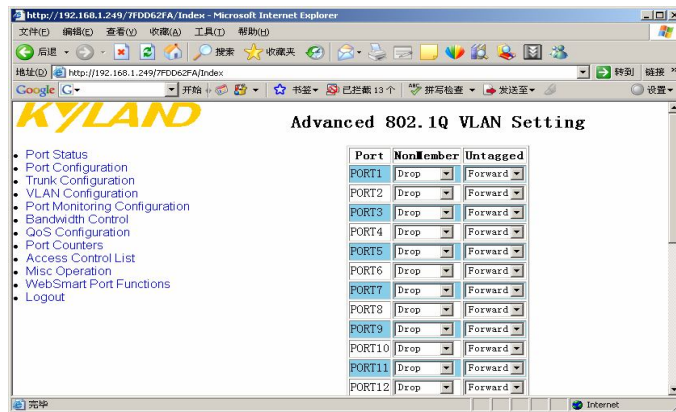


Figure 8-9 802.1qQ-based VLAN Configuration b

8.7 Port Monitoring Configuration

Click "Port Monitoring Configuration" to enter into port mirroring page, select mirroring contents:RX/TX/RX&TX and click APPLY key.

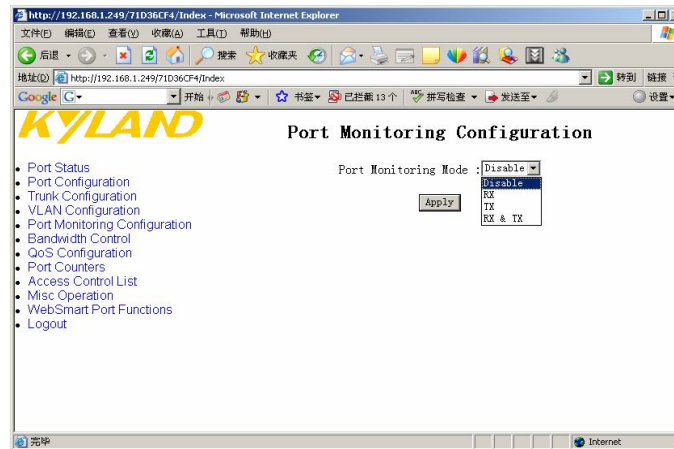


Figure 8-10 Port Monitoring Configuration

Select mirrored and mirroring port and click APPLY to finish configurations:

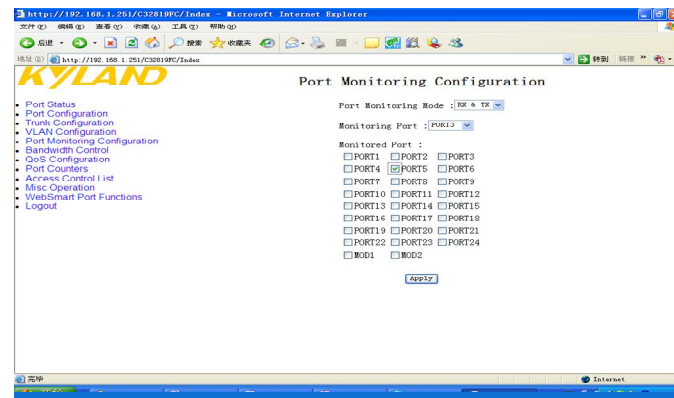


Figure 8-11 Select Port

8.8 Port Rate Configuration

Click "Bandwidth Control" to enter into Bandwidth Control page and configure the rate of each port with each unit of 1MBIT. Click APPLY to finish configuration.

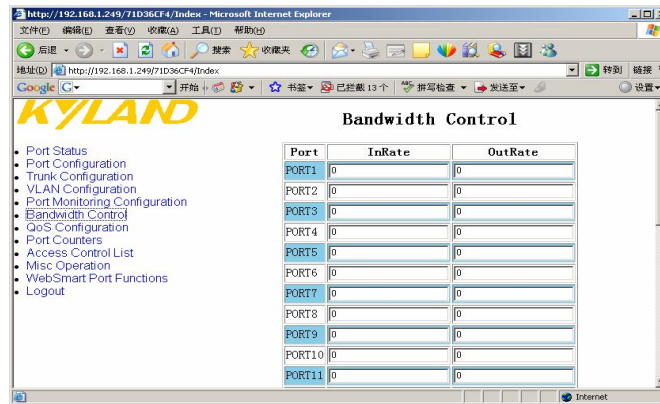


Figure 8-12 Port Rate Configuration

8.9 QOS

Click the left menu: " QOS Configuration" to enter into QOS page:

Select QOS mode : Disable / High Empty Then Low / weight8:4:2:1 / 15:7:3:1 / 15:10:5:1

QoS default mode : Weight 8:4:2:1

Options for each port : 0~7

802.1p priority mode : Highest / SecHigh / SecLow / Lowest

Click APPLY to finish:

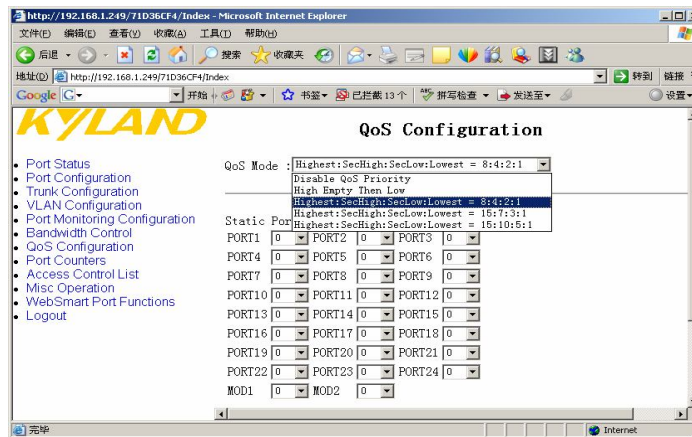


Figure 8-13 QOS

8.10 ACL

Click left menu "ACCESS control list" to enter "ACCESS control list" page ,access control list includes : Ipv4 ACL Configuration、 Non-Ipv4 ACL Configuration.

For the two configurations , Group ID (1~246)、 action(permit/deny)、 VLAN are all applicable.

Click APPLY to finish.

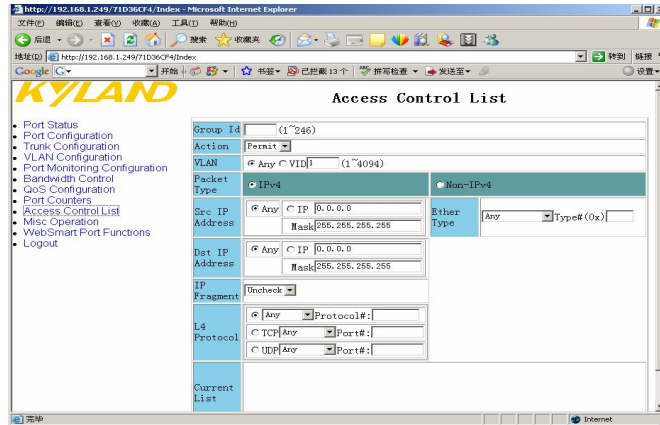


Figure 8-14 ACL

8.10.1 Ipv4 ACL Configuration

| Item | option | default |
|----------------|--|---------------|
| Group ID | 1 ~ 255 (max. 255 ACL group) | 0 |
| Action | Permit / Deny. a. Permit: Permit packet cross switch. b. Deny: Drop packet. | Permit Any |
| Vlan | Any / Specify. a. Any: Any Vlan id. b. Specify: A certain vlan id. | |
| VID | 1 ~ 4094 | 0 |
| IP Fragment | Uncheck / Check a. Uncheck: Not check IP fragment field. b. Check: Check IP fragment field | Uncheck |
| Src IP | Any / Specify a. Any: Any IP address. b. Specify: A certain IP address | Any |
| Src IP Address | ***.***.***.*** * is represent a digit from 0~9, | 0.0.0.0 |

| | | |
|----------------|--|-----------------|
| | *** is range from 0 to 255. | |
| Src IP NetMask | ***.***.***.*** * is represent a digit from 0~9, ** is range from 0 to 255. Notice: This is not subnet mask. | 255.255.255.255 |
| Dst IP | Any / Specify a. Any: Any IP address. b. Specify: A certain IP address | Any |
| Dst IP Address | ***.***.***.*** * is represent a digit from 0~9, *** is range from 0 to 255. | 0.0.0.0 |
| Dst IP NetMask | ***.***.***.*** * is represent a digit from 0~9, *** is range from 0 to 255. | 255.255.255.255 |
| L4 Protocol | Any / ICMP(1) / IGMP(2) / TCP(6) / UDP(17) | Any |
| Proto | 0~255 If protocol not find in L4 Protocol field, you can direct assign number. | 0 |
| TCP | Any / FTP(21) / HTTP(80) | Any |
| Port | 0~65535 If TCP port not find in TCP field, you can direct assign number. | 0 |
| UDP | Any / TFTP(69) | Any |
| Port | 0~65535 If UDP port not find in UDP field, you can direct assign number. | 0 |

8.10.2 Non-Ipv4 ACL Configuration

| Item | Option | Default |
|------------|---|---------------|
| Group ID | 1 ~ 255 (max. 255 ACL group) | 0 |
| Action | Permit / Deny. a. Permit: Permit packet cross switch. b. Deny: Drop packet. | Permit Any |
| Vlan | Any / Specify. a. Any: Any Vlan id. b. Specify: A certain vlan id. | |
| VID | 1 ~ 4094 | 0 |
| Ether Type | Any / ARP(0x0806) / IPX(0x8137) | Any |
| Other Type | 0~0xFFFF If ether type not find in Ether Type field, you can direct assign number. | 0x0 |

8.11 Other Configurations

Click left " Misc Operation" to enter into other configuration page.

8.11.1 Advanced Configuration

Click " Advanced switch configuration" ,to configure " Broadcast storm" ,and set the bandwidth of the broadcasting data as "1/2、1/4、1/8、1/16、OFF" .

Collision retry forever is Enable or disable.

Configure the MAC address aging time : 150ms\300ms\600ms\disable

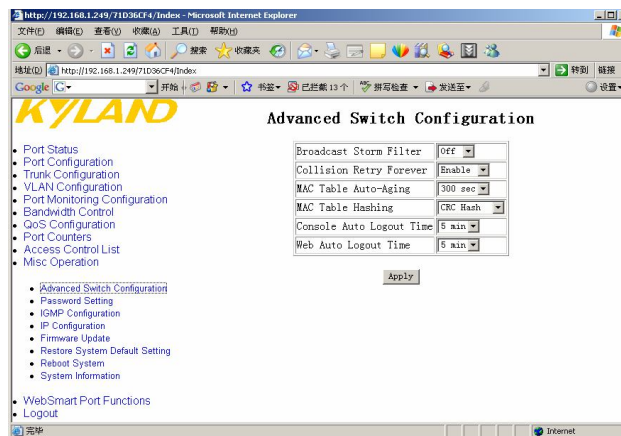


Figure 8-15 Advanced Configuration

8.11.2 PASSWORD Setup

Click" Password Setting" , to enter into switch user name configuration page and click APPLY to finish.

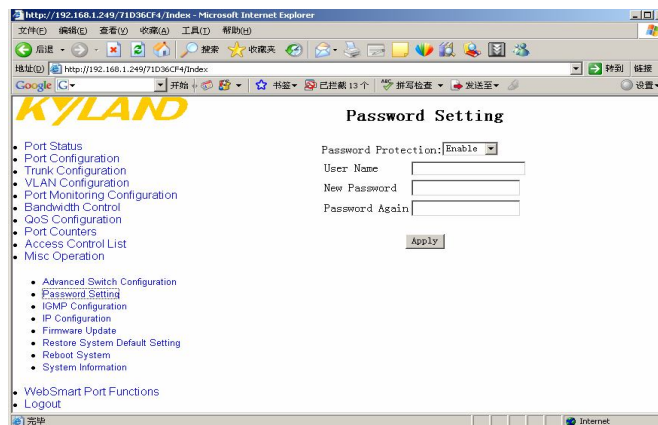


Figure 8-16 Password Setup

8.11.3 IGMP-snooping Enable

Click " IGMP configuration", to enter IGMP-Snooping starting page and select Disable/enable. Click APPLY to finish.

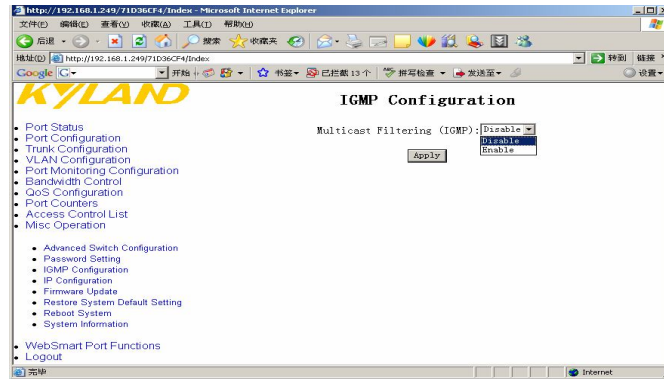


Figure 8-17 IGMP Configuration

8.11.4 IP Address Configuration

Click " IP Configuration" to enter page and change the IP address, gateway, subnet etc and click APPLY to finish.

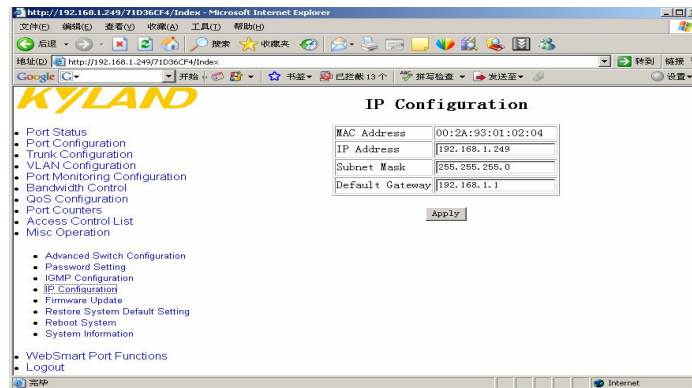


Figure 8-18 IP Address Configuration

8.11.5 Update Configuration

Click "Firmware Update" to enter into update page and key into IP address and software name, click APPLY to finish.

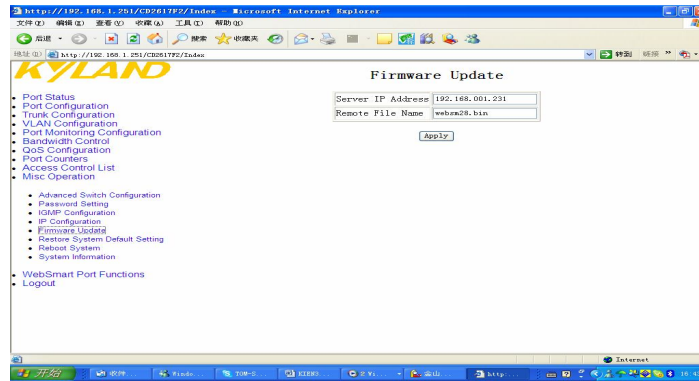


Figure 8-19 Update

Chapter Nine Console Management

9.1 Functional Key and Command

9.1.1 Functional Key

Table 9-1

| Key | Description |
|--------------|---|
| TAB/ → | Move the cursor to right item. |
| Backspace/ ← | Move the cursor to left item. |
| ↓ | Move the cursor to up item. |
| ↑ | Move the cursor to down item. |
| space | Toggle selected item to next configuration. |
| enter | Select action. |
| esc | Back to previous status. |

9.1.2 Console Command

Table 9-2

| Key | Description |
|-------------|---|
| <Quit> | Exit this page and return to previous menu. |
| <Edit> | Configure all items. Press "Enter" key will set configure and press "Esc" key will go back to action menu line. |
| <Add> | Create a new item. |
| <Delete> | Remove selected item |
| <Save> | Save the configuration that you had changed. |
| <Page Up> | Back to previous page. |
| <Page Down> | Go to next page. |
| <Refresh> | Update the latest information. |

| | |
|----------------|--|
| <NextPage> | Display information out of a screen exhibition |
| <ClearALLCntr> | Reset all counter |
| <List> | Display the information of the selected list |

9.2 Serial Port Console Interface

9.2.1 Serial Port Console Main Page

Enter into hyper terminal and configure the parameters of port, connect PC with KIEN3016M or KIEN3024M , click“ ENTER” , to enter the main page: enter into username of admin and password of admin, click “ENTER” to the main menu: shown in Figure 9-2:

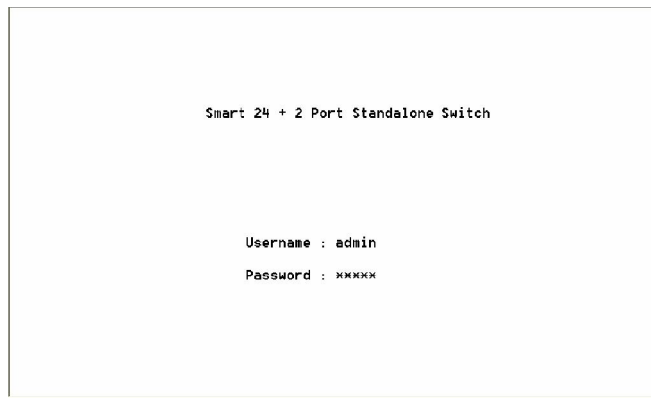


Figure 9-1 Serial Port Console Interface

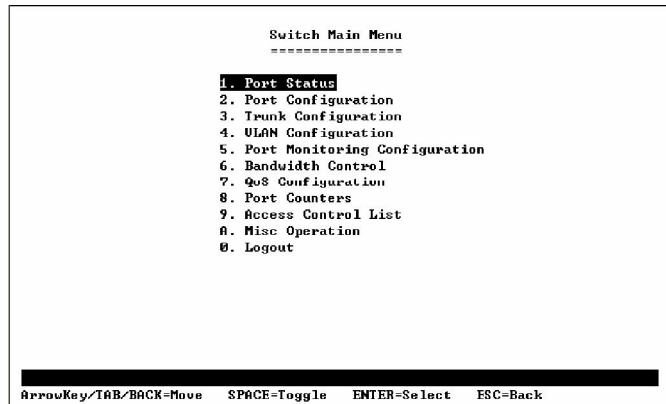


Figure 9-2 Main Menu

9.2.2 Port Status

In Figure 9-2, select " Port Status" to show status , as figure 9-3 ; " Quit" to return to last menu:

| Port Status | | | | | | | | | |
|-------------|---------|------|---------|-----------|--------|--------|------|---------|-----------|
| Port | Enable | Link | Spd Dpx | Flow Ctrl | Port | Enable | Link | Spd Dpx | Flow Ctrl |
| PORT1 | Disable | ---- | ---- | --- | PORT14 | Enable | Down | ---- | --- |
| PORT2 | Enable | Down | ---- | --- | PORT15 | Enable | Down | ---- | --- |
| PORT3 | Enable | Up | 10H | 0n | PORT16 | Enable | Down | ---- | --- |
| PORT4 | Enable | Up | 10F | 0n | PORT17 | Enable | Down | ---- | --- |
| PORT5 | Enable | Up | 100H | 0n | PORT18 | Enable | Down | ---- | --- |
| PORT6 | Enable | Up | 100F | 0n | PORT19 | Enable | Down | ---- | --- |
| PORT7 | Enable | Up | 100F | Off | PORT20 | Enable | Down | ---- | --- |
| PORT8 | Enable | Down | ---- | --- | PORT21 | Enable | Down | ---- | --- |
| PORT9 | Enable | Down | ---- | --- | PORT22 | Enable | Down | ---- | --- |
| PORT10 | Enable | Down | ---- | --- | PORT23 | Enable | Down | ---- | --- |
| PORT11 | Enable | Down | ---- | --- | PORT24 | Enable | Down | ---- | --- |
| PORT12 | Enable | Down | ---- | --- | MOD1 | Enable | Down | ---- | --- |
| PORT13 | Enable | Down | ---- | --- | MOD2 | Enable | Down | ---- | --- |

Actions-> <Quit> <Refresh>

ArrowKey/TAB/BACK=Move SPACE=Toggle ENTER=Select ESC=Back

Figure 9-3 Port Status

9.2.3 Port Configuration

In figure 9-2, select " Port Configuration" to enter into page , as in figure 9-4 , select " Edit" to configure port for " Enable/Disable" ," Auto" ," Spd/Dpx" ; " Flow Ctrl" ; " Auto" : on/off ; " Spd/Dpx" : 100F, 100H, 10H, 10F, auto; " Flow Ctrl" : on/off. Click " ESC" exit edit state ,select " Save" and click " ENTER" , to save the current configurations.

| Port Configuration | | | | | | | | | |
|--------------------|---------|------|---------|-----------|--------|--------|------|---------|-----------|
| Port | Enable | Auto | Spd/Dpx | Flow Ctrl | Port | Enable | Auto | Spd/Dpx | Flow Ctrl |
| PORT1 | Disable | 0n | Auto | 0n | PORT15 | Enable | 0n | Auto | 0n |
| PORT2 | Enable | 0n | Auto | 0n | PORT16 | Enable | 0n | Auto | 0n |
| PORT3 | Enable | Off | 10H | 0n | PORT17 | Enable | 0n | Auto | 0n |
| PORT4 | Enable | Off | 10F | 0n | PORT18 | Enable | 0n | Auto | 0n |
| PORT5 | Enable | Off | 100H | 0n | PORT19 | Enable | 0n | Auto | 0n |
| PORT6 | Enable | Off | 100F | 0n | PORT20 | Enable | 0n | Auto | 0n |
| PORT7 | Enable | 0n | Auto | Off | PORT21 | Enable | 0n | Auto | 0n |
| PORT8 | Enable | 0n | Auto | 0n | PORT22 | Enable | 0n | Auto | 0n |
| PORT9 | Enable | 0n | Auto | 0n | PORT23 | Enable | 0n | Auto | 0n |
| PORT10 | Enable | 0n | Auto | 0n | PORT24 | Enable | 0n | Auto | 0n |
| PORT11 | Enable | 0n | Auto | 0n | | | | | |
| PORT12 | Enable | 0n | Auto | 0n | | | | | |
| PORT13 | Enable | 0n | Auto | 0n | M1-COB | Enable | 0n | Auto | 0n |
| PORT14 | Enable | 0n | Auto | 0n | M2-COB | Enable | 0n | Auto | 0n |

Actions-> <Quit> <Edit> <Save>

ArrowKey/TAB/BACK=Move SPACE=Toggle ENTER=Select ESC=Back

Figure 9-4 Port Configuration

9.2.4 Trunk Configuration

In figure 9-2 select " Trunk Configuration" to enter into TRUNK page and as shown in figure 9-5, select "Edit" to edit the trunk state. For example, change disable to enable for TRUNK1, move and select port, when the state of port is changed from "--" to " V" , the port is trunked into TRUNK1. Click "ESC" quit. Click " Save" and" ENTER" to save configurations.

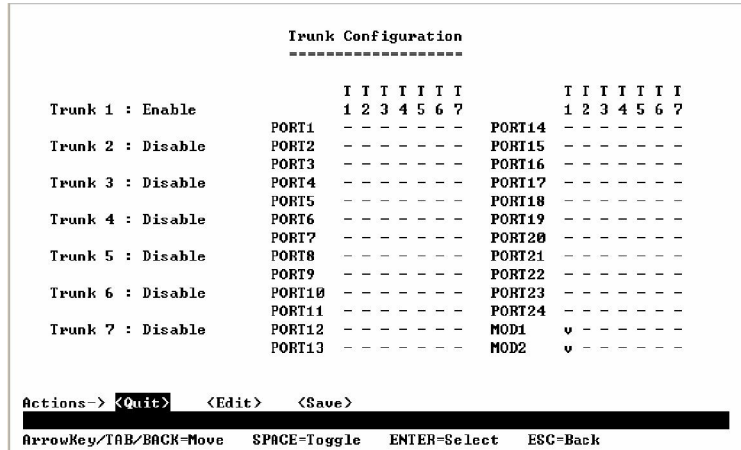


Figure 9-5 Port Trunking

9.2.5 VLAN Configuration

Port-based and 802.1q-based VLAN is supported.

9.2.5.1 Port-based

In figure 9-2, select " VLAN Configuration" , click" enter" to enter VLAN configuration mode. As shown in figure 9-6, select the first item to configure port-based VLAN in Figure 9-7:

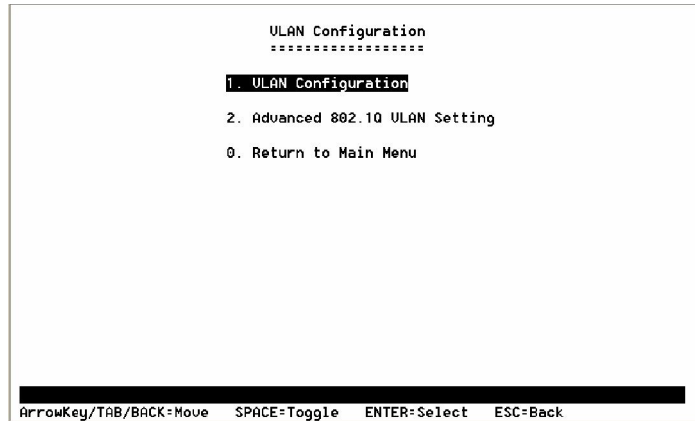


Figure 9-6 VLAN configuration

Select " Edit" and click " enter". VLAN Mode : Portbased. Select " ADD" click " enter" to add VLAN , enter " ADD Portbased VLAN Group" as shown in Figure 9-8 , select Group ID (ID=1~4094) ,Select port (port1~port24、 mod1~mod2 any) Save the configuration.

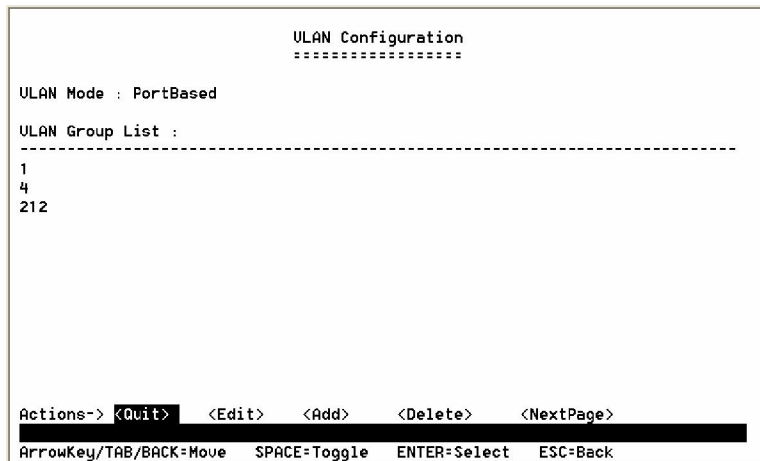


Figure 9-7 Port-Based VLAN

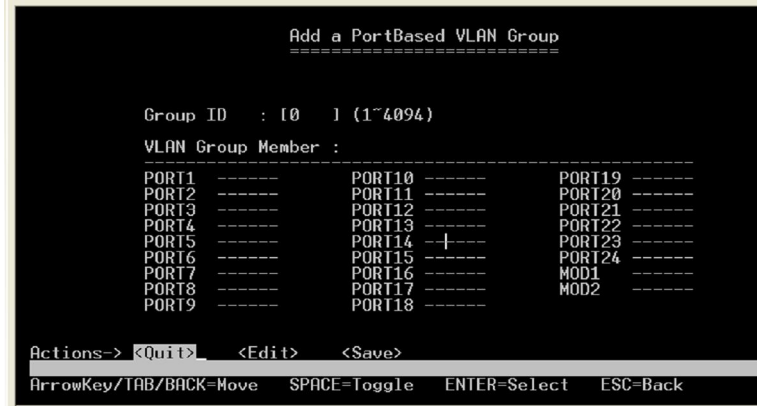


Figure 9-8 Port Configuration

9.2.5.2 IEEE 802.1Q (tag) -based

In Figure 9-9, select " Edit " and click " enter ". VLAN Mode : 802.1q. Select " ADD " and click " enter " to add VLAN , enter " ADD A 802.1Q VLAN Group " As shown in Figure 9-10 , select Group ID (ID=2~4094) , select port (port1~port24, mod1~mod2 any). Save the configuration.

In figure 9-6 ,select " Advanced 802.1Q VLAN Setting " ,click " enter " into 802.1Q VLAN advanced configuration as shown in figure 9-11.

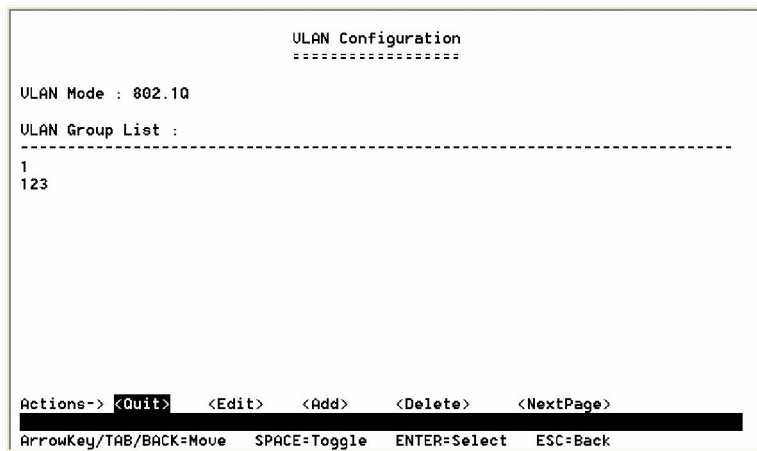


Figure 9-9

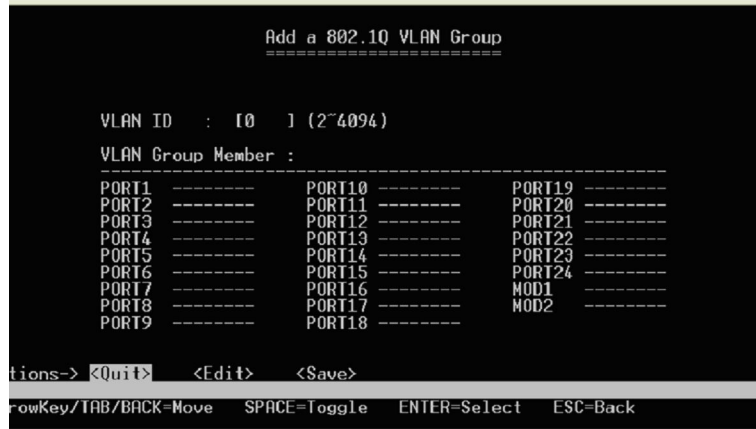


Figure 9-10

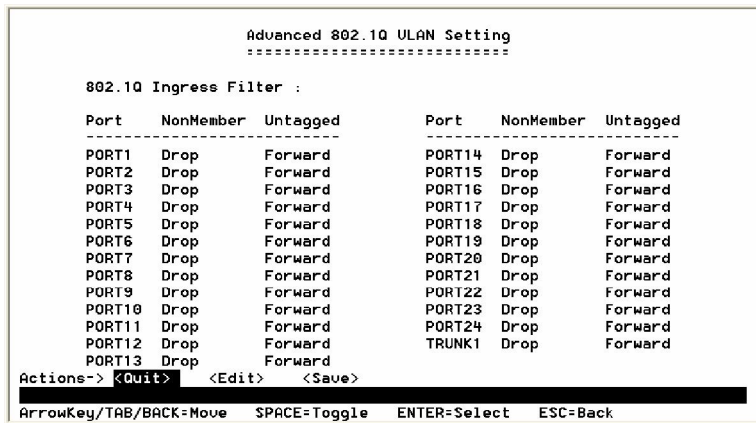


Figure 9-11

In this page, configure the two status of port: " nonmember" , default at " drop" ie drop the tagged packet but not fromVID. " forward" means forward.

" Untagged" ,default at " forward" ,to forward the untagged packets. " drop" means drop. Save the configuration after finish configuration.

9.2.6 Port Monitoring Configuration

In figure 9-2, select " Port Monitoring Configuration" ,click" enter" to enter into page ,as shown in figure 9-12 ;select Port Monitoring Mode:Disable, RX, TX, RX&TX; and click" ENTER" to enter into figure 9-13 , select Monitoring port , and select mirrored port, save the configuration.

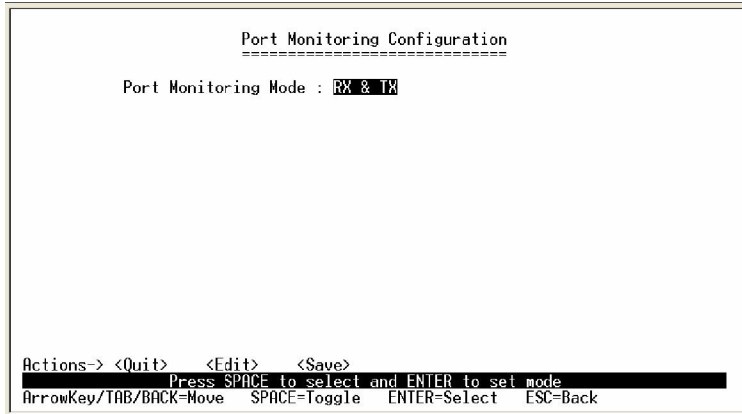


Figure 9-12

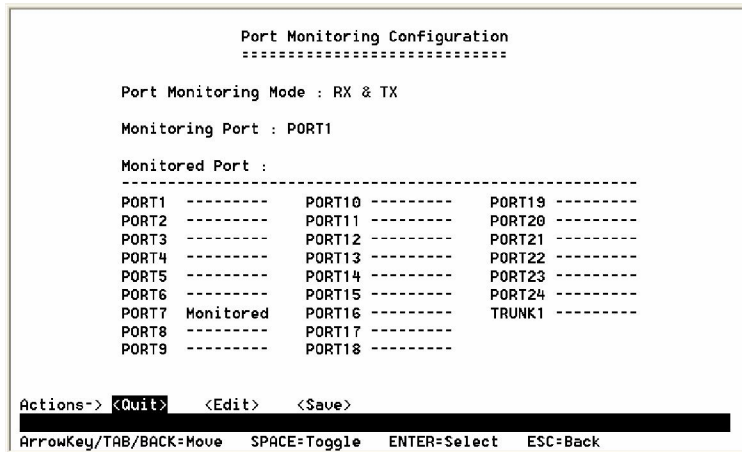


Figure 9-13

9.2.7 Bandwidth Control

In figure 9-2, select " Bandwidth Cotrol" and click " enter" to enter into " Bandwidth Cotrol" page ,as shown in figure 9-14, select the inrate and outrate and save.

Port1-24 rate can be set up from 0 to 100Mbps ; MOD1~2 port rate can be configured from 0 to 100Mbps for KIEN3024M.

```

Bandwidth Control
=====
Port      InRate  OutRate      Port      InRate  OutRate
-----
PORT1    10      5            PORT14    0        0
PORT2    10      5            PORT15    0        0
PORT3    50      50          PORT16    0        0
PORT4    0        0            PORT17    0        0
PORT5    0        0            PORT18    0        0
PORT6    0        0            PORT19    0        0
PORT7    0        0            PORT20    0        0
PORT8    0        0            PORT21    0        0
PORT9    0        0            PORT22    0        0
PORT10   0        0            PORT23    0        0
PORT11   0        0            PORT24    0        0
PORT12   0        0            MOD1     0        0
PORT13   0        0            MOD2     0        0

Actions-> <Quit>   <Edit>   <Save>
Operation completed successfully
ArrowKey/TAB/BACK=Move  SPACE=toggle  ENTER=Select  ESC=Back
    
```

Figure 9-14 Bandwidth Control

9.2.8 QoS Configuration

In figure 9-2, select " Qos Configuration" , and click " enter" to enter into " Qos Configuration" page, as shown in figure 9-15 , select QOS Mode: Disable / High Empty Then Low / weight=8:4:2:1 / 15:7:3:1 / 15:10:5:1; default at weight=8:4:2:1。

The data are queued in two ways: 802.1p-based and port-based. For 802.1p-based, there are such levels: Highest / SecHigh / SecLow / Lowest ; For port-based, there are such levels: 7~0/OFF.

Select priority status and save:

```

QoS Configuration
=====
QoS Mode : Highest:SecHigh:SecLow:Lowest = 8:4:2:1

Static Port Ingress Priority :
-----
PORT1  0      PORT10  0      PORT19  0
PORT2  0      PORT11  0      PORT20  0
PORT3  0      PORT12  0      PORT21  0
PORT4  0      PORT13  0      PORT22  0
PORT5  0      PORT14  0      PORT23  0
PORT6  0      PORT15  0      PORT24  0
PORT7  0      PORT16  0      TRUNK1  0
PORT8  0      PORT17  0
PORT9  0      PORT18  0

802.1p Priority [7-0] :
Highest Highest SecHigh SecHigh SecLow  SecLow  Lowest  Lowest

Actions-> <Quit>   <Edit>   <Save>
ArrowKey/TAB/BACK=Move  SPACE=Toggle  ENTER=Select  ESC=Back
    
```

Figure 9-15 Qos Configuration

9.2.9 Port Counters

In figure 9-2, select " Port Counter" , and click " enter" to enter " Port Counter" page, as shown in figure 9-16 , show the normal packet, abnormal packet, failed packet, dropped packet, network storm number etc.

| Port Counters | | | | | | | |
|---------------|-----------|----------|-----------|----------|---------|--------|-----------|
| Port | RxGoodPkt | RxBadPkt | TxGoodPkt | TxBadPkt | DropPkt | TxAbrt | Collision |
| PORT1 | 100 | 1 | 100 | 1 | 0 | 0 | 0 |
| PORT2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PORT3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PORT4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PORT5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PORT6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PORT7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PORT8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PORT9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PORT10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PORT11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PORT12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PORT13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Actions-> <Quit> <NextPage> <ClearAllCnt>

ArrowKey/TAB/BACK=Move SPACE=Toggle ENTER=Select ESC=Back

Figure 9-16 Port Counter

9.2.10 Access Control List

In figure 9-2, select " Access ACL Configuration" , click " enter" to enter " Access ACL Configuration" page, as shown in figure 9-17.

| Access Control List |
|-------------------------------|
| ===== |
| 1. Ipv4 ACL Configuration |
| 2. Non-Ipv4 ACL Configuration |
| 0. Return to Main Menu |

ArrowKey/TAB/BACK=Move SPACE=Toggle ENTER=Select ESC=Back

Figure 9-17 Access ACL Configuration

9.2.10.1 Ipv4 ACL Configuration

As shown in Figure 9-17 select " Ipv4 ACL Configuration" , click " enter" to enter " Ipv4 ACL Configuration" page, as shown in figure 9-18, select" Delete" to delete ACL GROUP list. Select" ADD" to enter into figure 9-19:

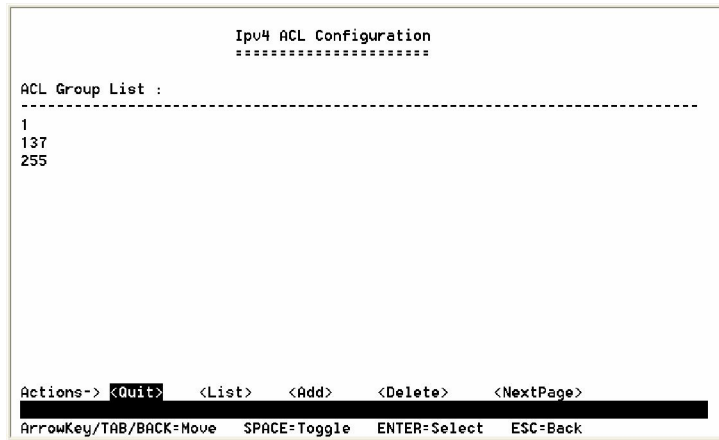


Figure 9-18

9.2.10.2 Ipv4 ACL Group <Add> / <List> Menu

In Figure 9-20, select the parameters of table9-3.

Table 9-3

| Items | Option | Default value |
|----------------|--|-----------------|
| Group ID | 1 ~ 255 (max. 255 ACL group) | 0 |
| Action | Permit / Deny. a. Permit: Permit packet cross switch. b. Deny: Drop packet. | Permit |
| Vlan | Any / Specify. a. Any: Any Vlan id. b. Specify: A certain vlan id. | Any |
| VID | 1 ~ 4094 | 0 |
| IP Fragment | Uncheck / Check a. Uncheck: Not check IP fragment field. b. Check: Check IP fragment field. | Uncheck |
| Src IP | Any / Specify a. Any: Any IP address. b. Specify: A certain IP address | Any |
| Src IP Address | ***.***.***.*** * is represent a digit from 0~9, *** is range from 0 to 255. | 0.0.0.0 |
| Src IP NetMask | ***.***.***.*** * is represent a digit from 0~9, *** is range from 0 to 255. Notice: This is not subnet mask. | 255.255.255.255 |
| Dst IP | Any / Specify a. Any: Any IP address. b. Specify: A certain IP address | Any |
| Dst IP Address | ***.***.***.*** | 0.0.0.0 |

| | | |
|----------------|--|----------------|
| | * is represent a digit from 0~9, *** is range from 0 to 255. | |
| Dst IP NetMask | ***.***.***.*** | 255.255.255.25 |
| L4 Protocol | * is represent a digit from 0~9, *** is range from 0 to 255. | 5 |
| Proto | Any / ICMP(1) / IGMP(2) / TCP(6) / UDP(17) | Any |
| TCP Port | 0~255. If protocol not find in L4 Protocol field, you can direct assign number. | 0 |
| UDP Port | Any / FTP(21) / HTTP(80) | Any |
| | 0~65535 If TCP port not find in TCP field, you can direct assign number. | 0 |
| | Any / TFTP(69) | Any |
| | 0~65535 If UDP port not find in UDP field, you can direct assign number. | 0 |

```

Add a IPv4 Group
=====
Group ID : 11 1(1~255)
Action   : Permit
Rules :
-----
Vlan : Any
VID  : 10 1(1~4094)
IP Fragment : Uncheck
Src IP      : Any
Src IP Address : 0.0.0.0
Src IP NetMask : 255.255.255.255
Rules :
-----
Dst IP      : Specify
Dst IP Address : 192.168.100.3
Dst IP NetMask : 255.255.255.255
L4 Protocol :TCP(6)   Proto : 0
TCP         :HTTP(80) Port   : 0
UDP         :Any      Port   : 0
Actions-> <Quit> <Edit> <Save>
ArrowKey/TAB/BACK=Move SPACE=Toggle ENTER=Select ESC=Back
    
```

Figure 9-19

In figure 9-19, select " list" , and click " enter" , to show the list of IP v4 Group as shown in figure 9-20.

```

List a IPv4 Group
=====
Group ID : 12 1
Action   : Deny
Rules :
-----
Vlan : Any
VID  : 10 1(1~4094)
IP Fragment : Uncheck
Src IP      : Any
Src IP Address : 000.000.000.000
Src IP NetMask : 255.255.255.255
Rules :
-----
Dst IP      : Specify
Dst IP Address : 192.168.100.000
Dst IP NetMask : 255.255.255.255
L4 Protocol :Any      Proto : 0
TCP         :Any      Port   : 0
UDP         :Any      Port   : 0
Actions-> <Quit>
ArrowKey/TAB/BACK=Move SPACE=Toggle ENTER=Select ESC=Back
    
```

Figure 9-20

9.2.10.3 Non-Ipv4 ACL Configuration

In figure 9-17, select “ Non-Ipv4 ACL Configuration” , enter into “ Non-Ipv4 ACL Configuration” page , as shown in figure 9-21

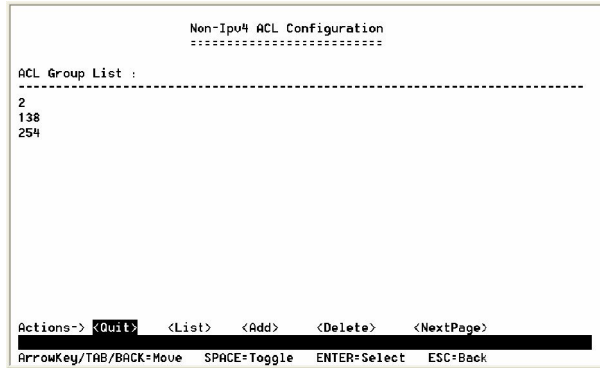


Figure 9-21

9.2.10.4 Non-Ipv4 ACL Group <Add> / <List> Menu

In figure 9-21 select “ Delete” to delete ACL GROUP list. Select “ ADD” to enter into Figure 9-22.

Select the parameter in table 8-4:

Table 8-4

| Items | Option | Default value |
|------------|---|---------------|
| Group ID | 1 ~ 255 (max. 255 ACL group) | 0 |
| Action | Permit / Deny. Add a Non-Ipv4 Group a. Permit: Permit packet cross switch. b. Deny: Drop packet. | Permit |
| VLAN | Any / Specify (1~255) a. Any: Any VLAN ID. b. Specify: A certain VLAN ID. | Any |
| VID | 1 ~ 4094 : Any | 0 |
| Ether Type | Any / ARP(0x0806) / IPX(0x8137) | Any |
| Other Type | 0~0xFFFF If ether type not find in Ether Type field, you can direct assign number. | 0x0 |

In figure 9-21, select “ list” , and click “ enter” , to show the list of Non-IP v4 Group as shown in figure 9-22.

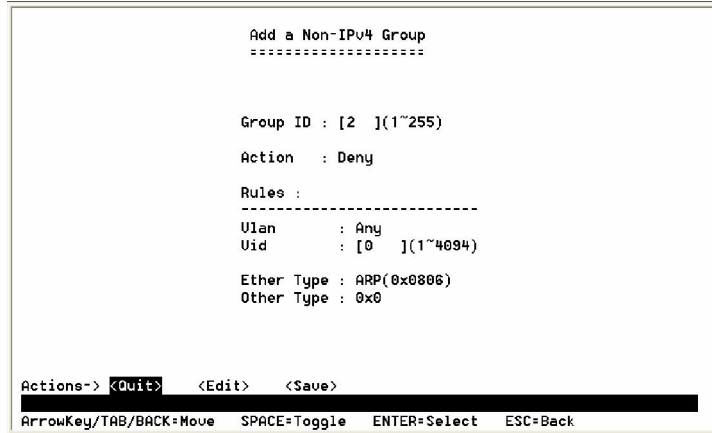


Figure 9-22

9.2.11 Misc Operation

In figure 9-2, select " Misc Operation" , click " enter" to enter " Misc Operation" page as shown in figure 9-23.

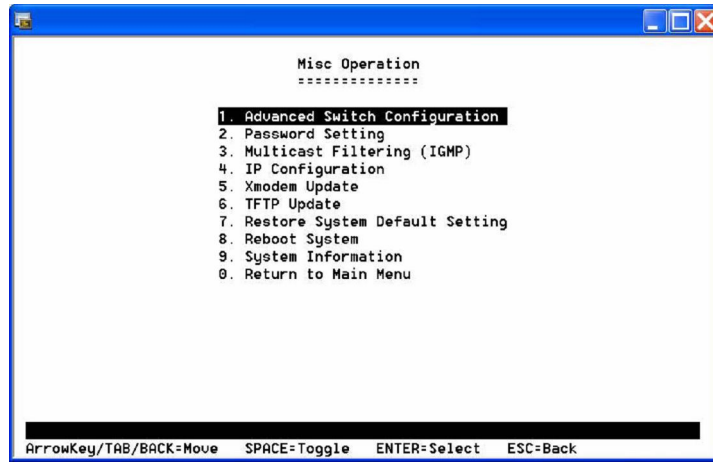


Figure 9-23.

9.2.11.1 Advanced Switch Configuration

In figure 9-23, select " Advanced Switch Configuration" , click " enter" to enter " Advanced Switch Configuration" page as shown in figure 9-24, select the parameters in table 9-5.

Table 9-5

| Items | Option | Default value |
|--------------------------|--|---------------|
| Broadcast Storm Filter | Off / 1/2 / 1/4 / 1/8 / 1/16 of ingress rate | Off |
| Collision Retry Forever | Disable / Enable | Enable |
| MAC Table Auto-Aging | Disable / 150 / 300 / 600 seconds | 300 seconds |
| MAC Table Hashing | CRC Hash / Direct Map | CRC Hash |
| Console Auto Logout Time | Never / 5 / 10 / 20 minutes | 5 minutes |
| Web Auto Logout Time | Never / 5 / 10 / 20 minutes | 5 minutes |

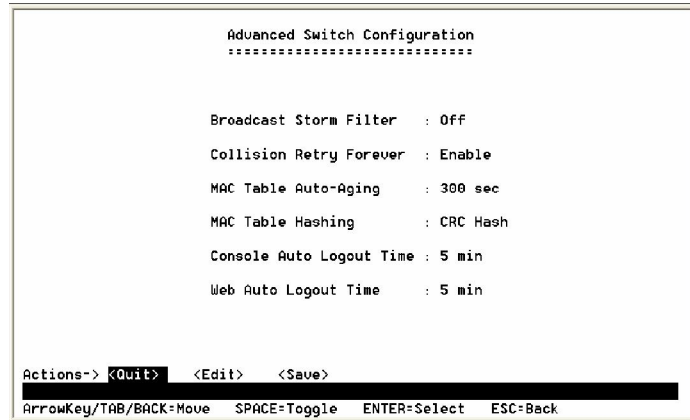


Figure 9-24

9.2.11.2 Password Setting

In figure 9-23A, select "PASSWORD SETTING" ,click "enter" to enter "PASSWORD SETTING" page as shown in figure 9-25, to change the password based on the table 9-6:

Table 9-6

| Items | Option | Default Value |
|---------------------|---|---------------|
| Password Protection | Enable / Disable | Enable |
| User Name | Max: 6, Min: 1 characters, case sensitive | admin |
| New Password | Max: 6, Min: 1 characters, case sensitive | |
| Re-enter Password | Max: 6, Min: 1 characters, case sensitive | |



Figure 9-25,

9.2.11.3 Multicast Filtering (IGMP)

In figure 9-23, select "Multicast Filtering(IGMP)", click "enter" to enter "Multicast Filtering(IGMP)" page as shown in Figure 9-26 to enable IGMP according to Table 9-7:

Table 9-7

| Items | Option | Default Value |
|----------------------------|------------------|---------------|
| Multicast Filtering (IGMP) | Enable / Disable | Disable |
| Querier IP | Can not edit | "No querier" |

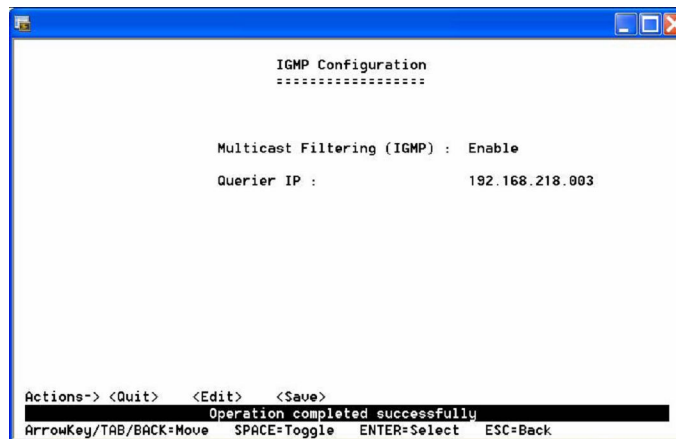


Figure 9-26,

9.2.11.4 IP Configuration

In figure 9-23, select " IP Configuration" , click" enter" to enter into " IP Configuration" page as shown in Figure 9-27 to configure according to table 9-8:

Table 9-8

| Items | Option | Default Value |
|-----------------|--|---------------|
| IP Address | ***.***.***.*** | 192.168.1.1 |
| | * is represent a digit from 0~9, *** is range from 0 to 255. | |
| Subnet Mask | ***.***.***.*** | 255.255.255.0 |
| | * is represent a digit from 0~9, *** is range from 0 to 255. | |
| Default Gateway | ***.***.***.*** * is represent a digit from 0~9, *** is range from 0 to 255. | 192.168.1.254 |

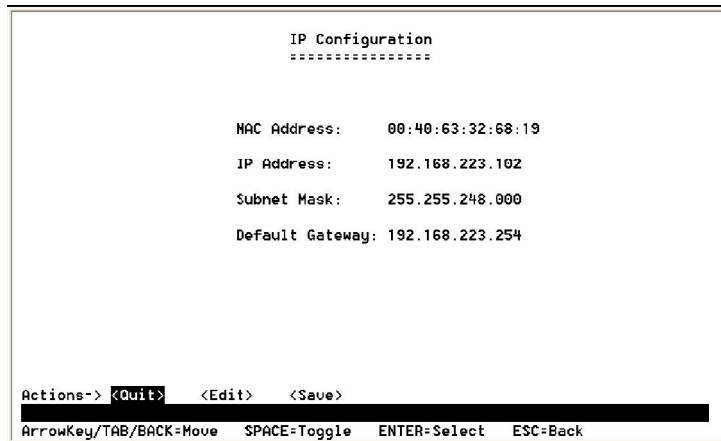


Figure 9-27

Appendix A Twisted -pair and Pin Distribution

For the 10Base-T/100Base-TX, the twisted-pair should present two pair of wires. Each pair is differentiated by different colors. For instance, the one is green and the other is the green and white interleaved. There should be the RJ-45 connector at both sides of cables.



Warning:

Don't plug the telephone jacket into any one RJ-45 port. Only the twisted-pair which complies with the FCC standard is used. Furthermore, both sides present the RJ-45 connectors.

Fig.A-1 illustrates how to number the RJ-45 connector, please confirm the consistence of the direction when it is inserted.

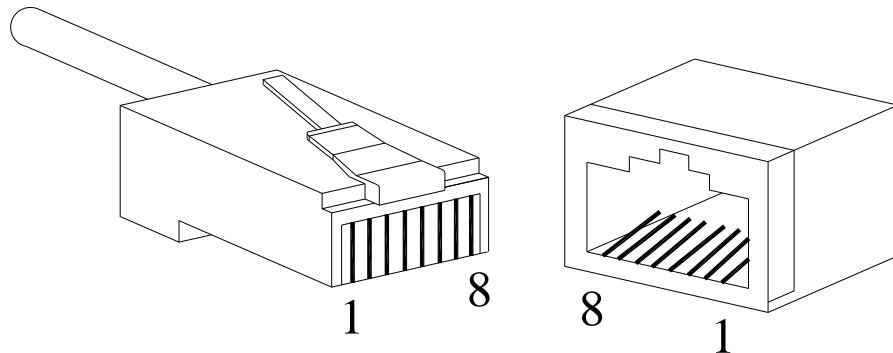


Fig.A-1 RJ-45 Connector

Pin distribution of 10Base-T/100Base-TX

RJ-45 connection adopts the Unshielded Twisted Paired (UTP) or the Shielded Twisted Pair (STP): the 10Mbps connection adopts the 100ohm of Cat3, Cat4 and Cat5, while the 100Mbps connection adopts the 100ohm of Cat5. Furthermore, keep in mind that the connection length of any twisted-pair should no be more than 100m.

The RJ-45 port supports the automatic MDI/MDI-X operation, and can use the direct connection wire to connect the PC or server, or connect other switches or

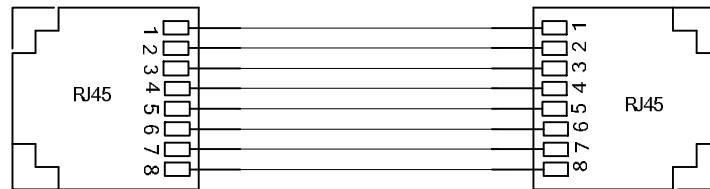
hubs. In the direct connection wire, pin 1, 2, 3 and 6 are at the same end of the cable and are connected to the pin 1, 2, 3 and 6 at the other end of the connection cable. If it is necessary to connect to the switches or hubs with MDI-X port, it needs to use the crossover wire. For the concrete condition on the 10Base-T/100Base-TX pin assignment, refer to table A-1.

Table A-1 10Base-T/100Base-TX Pin Assignment

| Pin | MDI-X signal name | MDI signal name |
|---------------|------------------------|------------------------|
| 1 | Receiving data + (RD+) | Output data + (TD+) |
| 2 | Receiving data - (RD-) | Output data - (TD-) |
| 3 | Output data + (TD+) | Receiving data + (RD+) |
| 6 | Output data - (TD-) | Receiving data - (RD-) |
| 4 , 5 , 7 , 8 | unused | unused |

Note: “+” and “-” represent the polarity of cable.

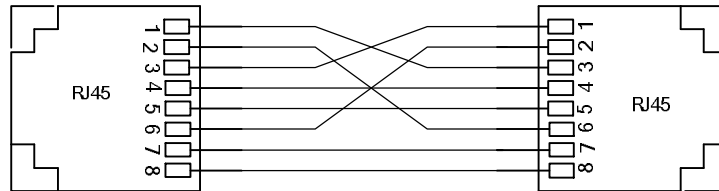
Definition for Direction Connection Cable from RJ45 (8-pin) to RJ45 (8-pin)



The connection sequence is in turn: Orange-white, Orange, Green-white, Blue, Blue-white, Green, Brown-white and Brown

Fig.A-2 Order of Straight-through Cable

Definition for Cross Connection Cable from RJ45 (8-pin) to RJ45 (8-pin)



The connection sequence is in turn: Orange-white, Orange, Green-white, Blue, Blue-white, Green, Brown-white and Brown
Green-white, Green, Orange-white, Blue, Blue-white, Orange, Brown-white and Brown

Fig.A-3 Order of Cross-over Cable

Appendix B Cable Type and Specifications

The cable type and specifications are shown as table B-1:

Table B-1 Cable type and specifications

| Cable | Type | Max. length | Connector |
|------------|--|---------------------|-----------|
| 10Base-T | Cat.3, 4 and 5 100 ohm UTP | 100m (328 foot) | RJ-45 |
| 100Base-TX | Cat.5 –100 ohm UTP | 100m (328 foot) | RJ-45 |
| 100Base-FX | 50/125 or 62.5/125 μ m core multi-mode fiber (MMF) | 2km (1.24 mile) | SC/FC |
| 100Base-FX | 9/125 μ m core single -mode fiber (SMF) | 20km (12.43 mile) | SC/FC |

Appendix C Glossary

| Terminology | Explanation |
|-----------------|---|
| 10Base-T | Twisted-pair standard of Cat3, Cat4 and Cat5 in IEEE specification for 10Mbps Ethernet |
| 100Base-TX | Twisted-pair standard of Cat5 or above in IEEE specification for 100Mbps Fast Ethernet |
| 100Base-F X | Fast Ethernet which uses one pair of multi-mode or single mode optical fiber to transmit. |
| Adaptive | A characteristic that is automatically configured to adaptive mode for the speed, duplex and traffic control port. |
| Bandwidth | The information capacity that the channel can transmit. For instance, the bandwidth of the Fast Ethernet is 100Mbps (bit per second) . |
| Baud Rate | It expresses the signaling rate which is defined as the change times of the status for the electric or optical transmission medium within 1 second. |
| Bridge | One of network equipments which run on the layer2 in the OSI layer7 model, and it can be connected to the LAN or network segment which uses the same protocol. It presents the automatic network address learning and network configuration function. |
| Traffic Control | It is a congestion control mechanism. The network equipment sends the data to the equipment which has overloaded and causes the port to congest. The traffic control can prevent the data packet from loss and avoid the congestion for the port. |
| VLAN | It is the Virtual Local Area Network, which means that it takes the network management software to establish the point to point logic network which can cross different network segment and various network on the switching LAN. |
| Broadcast | One data packet is sent to all equipments on the network. |
| Broadcast storm | Restless forward broadcast frame or multicast frame on bridge caused by the bridge ring. |
| IGMP | IGMP means Internet Group Multicast Protocol. |
| Full Duplex | Use switches to set up the point to point connection among nodes in the LAN and allow them to receive and send data packet at the same time. |
| Half Duplex | The communication for two nodes can only move toward one direction at the same time, but can not move toward both directions. |
| MDI | It is the Medium Dependent Interface, in which, one Ethernet port is taken as the receiving terminal to connect to the port of other equipment. |
| MDI-X | Medium Dependent Interface Cross-over |

