KGS-2423

Managed 24-Port Stackable Gigabit Ethernet Switches

with 4 SFP Slots

Installation Guide

For more information, contact:

United States   KTI Networks Inc.
P.O. BOX 631008
Houston, Texas 77263-1008

Phone: 713-2663891
Fax: 713-2663893
E-mail: kti@ktinet.com
URL: http://www.ktinet.com/

International   Fax: 886-2-26983873
E-mail: kti@ktinet.com.tw
URL: http://www.ktinet.com.tw/

TRADEMARKS

Ethernet is a registered trademark of Xerox Corp.

FCC NOTICE

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including the interference that may cause undesired operation.

CE NOTICE

Marking by the symbol indicates compliance of this equipment to the EMC directive of the European Community. Such marking is indicative that this equipment meets or exceeds the following technical standards:

EMC Class A
EN55022:2006/A1:2007
          EN61000-3-2:2006
          EN61000-3-3:1995/A1:2001/A2:2005 Class A
EN 55024:1998/A1:2001/A2:2003
          IEC 61000-4-2:2001
          IEC 61000-4-3:2002/A1:2002
          IEC 61000-4-4:2004
          IEC 61000-4-5:2001
          IEC 61000-4-6:2003
          IEC 61000-4-8:2001
          IEC 61000-4-11:2001

VCCI-A Notice

この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。　　　　ＶＣＣＩ－Ａ

Table of Contents

1. Introduction

The managed 24-port Stackable Gigabit Ethernet Switches are standard L2 switches that meets all IEEE 802.3/u/x/z Gigabit, Fast Ethernet specifications. The switch has 20 10/100/1000Mbps copper ports and 4 combo ports with four additional Gigabit SFP slots. The SFP slots support standard SFP fiber optical transceivers for fiber optic application.

To expand the number of the connected users, the switch provides two 5G stack ports for cascading more than one switch together. Up to five switches are allowed to cascade as one single switch stack that is able to support 120 users and 20 fiber connections. The stack can also be managed with a single IP address and as a single entity for greater management simplicity. For more and more Power over Ethernet applications, the switch provides optional PoE function on all copper ports. With PoE function, the ports can deliver power to the connected powered devices over Cat.5.

The switches support Telnet CLI, Web GUI, SNMP and console CLI interface for switch stack management. The network administrator can logon the switch to monitor and configure port operating mode, Quality of Service, and powerful L2 switching functions such as VLAN, IGMP, RSTP etc. In addition, the switches are also featured with powerful security functions such as SSH, HTTPS, IEEE 802.1x & MAC-based authentication, and ACL control to make them suitable for office core applications.

The switch is featured with the following switched ports and advantages in a 1U rack box:

- 20 10/100/1000Mbps Gigabit copper ports
- 4 combo ports - 10/100/1000Mbps copper & 1000Base-X SFP
- 2 stack ports

Model Definition

Model	Description	PoE+ Featured	Power Input

KGS-2423-S	AC powered model	-	AC 100 ~ 240V
KGS-2423-PS	AC powered model with PoE	√	AC 100 ~ 240V
KGS-2423-D	DC powered model	-	DC ±40~72V
KGS-2423-PD	DC powered model with PoE	√	DC ±40~72V, PoE DC +45~57V

1.1 Features

- Provides 24 10/100/1000Mbps RJ-45 and four Gigabit SFP slots (4 combo ports)

- Provides optional 24 802.3af and 802.3at compliant PoE/PoE+ PSE ports

- Provides two 5G stack ports for stacking multiple switches and single point of management

- All copper ports support auto-negotiation and auto-MDI/MDI-X detection

- The SFP slots support 1000BASE-X SFP transceivers

- Supports Gigabit full wire speed forwarding

- Supports power saving mode when port link down

- Supports 802.3x flow control for full-duplex and backpressure for half-duplex

- Supports console and in-band Web/Telnet/SSH/HTTPS/SNMP/CLI interfaces for stack switch management with single IP

- Supports configurable maximum frame length from 1518 up to 9600 jumbo frame

- Supports port-based ,802.1Q tag-based VLAN and private VLAN

- Provides QoS function

- Supports port bandwidth control for ingress and egress

- Supports packets storm control function for broadcast, unicast and multicast

- Supports MAC address learning, ageing and filtering control

- Supports static and LACP port link aggregation

- Supports IEEE 802.1d, 802.1w, 802.1s STP (Spanning Tree Protocol), RSTP, MSTP

- Provides port mirroring function

- Provides IP Multicasting with IGMP Snooping function

- Supports DHCP client for dynamic IP configuration

- Supports 802.1X port-based radius authentication for access security

- Provides ACL filtering function

- Provides port data rate control function

- Supports SNTP Client

- Supports LLDP

- Provides SNMP v1/v2C/v3 agent and event trap function

- Supports Configuration download and upload

- Supports SFP with Digital Diagnostic Monitoring DDM support

- Supports Green Ethernet power saving

- Both AC powered model and DC powered model are available for choice

Management Features:
- Port Control
  - Port Speed/Duplex Mode/Flow Control/Power saving configuration
  - Port frame size control (Jumbo frame support)
- QoS
  - Traffic Classification up to 4 active priorities
  - Port QoS configuration
  - QoS Control List for policy rules
  - Port bandwidth control for ingress and egress
  - Storm Control for UC, MC and BC
- Layer2
  - Auto MAC address learning and ageing
  - Static MAC address filtering
  - Port-based and 802.1Q Tag-based VLAN
  - Link Aggregation - LACP
  - Rapid Spanning tree - RSTP
  - Port Mirroring
  - IGMP snooping
  - DHCP client for IP configuration
- Security features
  - Access Control List for L2/L3 protocol filtering, ingress rate limit, port copy
  - Port Access Control based on IEEE 802.1X
- Management
  - Web management
  - Console CLI
  - Telnet CLI
  - Software Download via Web
  - SNTP Client
  - SNMP v1/v2c Agent
  - SSH v2 & HTTPS

- Restore to default configuration
- Configuration download and upload
- System syslog
● SNMP MIBs

1.2 Product Panels

The following figure illustrates the front panel and rear panel of the switch:

Front panel
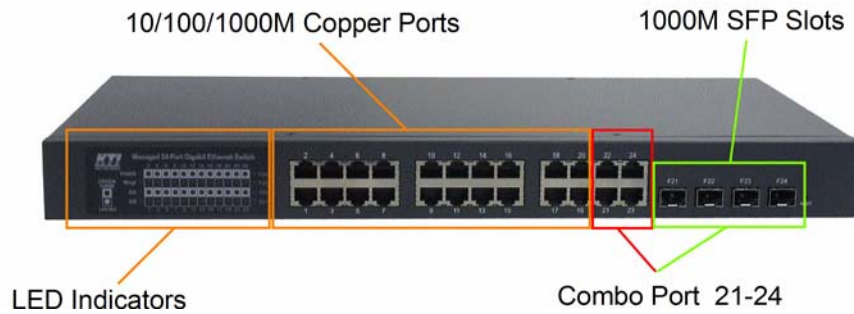
Rear panel
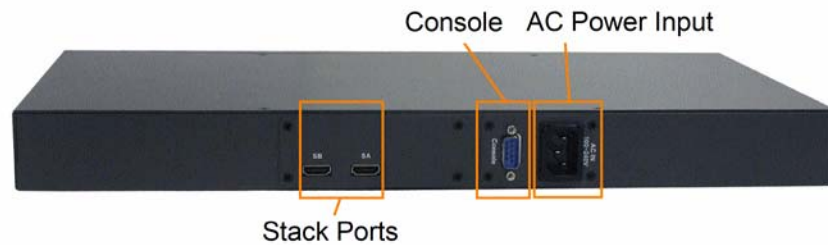
AC powered model
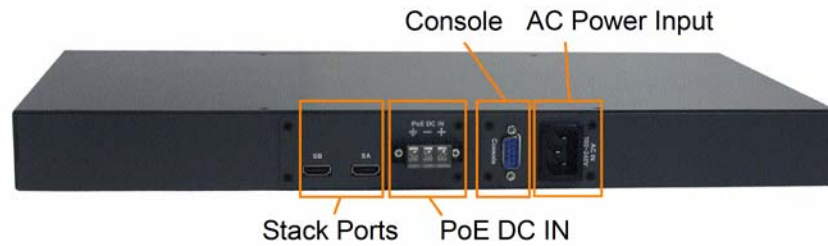
AC powered model with PoE
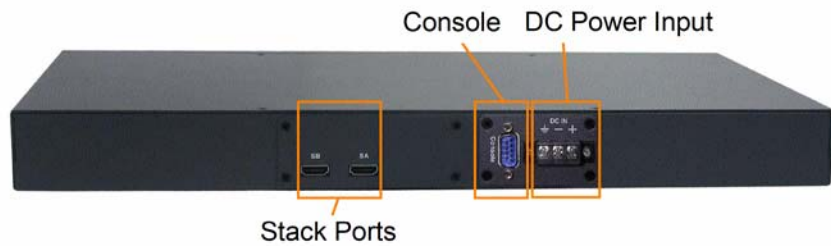
DC powered model
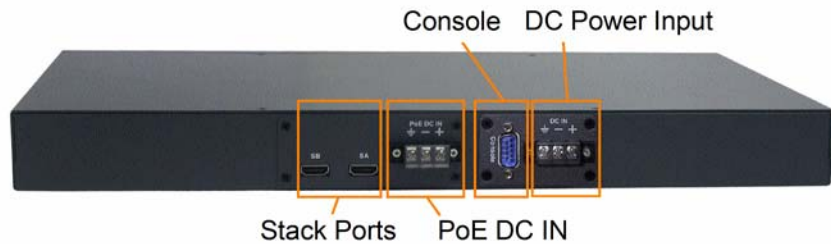
DC powered model with PoE

1.3 LED Indicators

LED	Function
POWER	Power status
Mngt	Management status
SA, SB	Stack port status
1000M	Port speed 1000Mbps status and PoE status (Port 1 – Port 24)
Link/Act.	Port link and activity status (Port 1 – Port 24)
F21 – F24	SFP Fiber is selected on Port 21 – Port 24

1.4 Specifications

10/100/1000 Copper Ports

Compliance	IEEE 802.3 10Base-T, IEEE 802.3u 100Base-TX, IEEE 802.3u 1000Base-T
Connectors	Shielded RJ-45 jacks
Pin assignments	Auto MDI/MDI-X detection
Configuration	Auto-negotiation or software control
Transmission rate	10Mbps, 100Mbps, 1000Mbps
Duplex support	Full/Half duplex
Network cable	Cat.5 UTP
Power over Ethernet	PoE+ PSE port

Combo Ports (Port 21 ~ Port 24) with 10/100/1000 RJ-45 and 1000Mbps SFP

10/100/1000 Copper Port Interface

Same as above 10/100/1000 Copper Ports

Fiber interface

Compliance	IEEE 802.3z 1000Base-SX/LX (mini-GBIC)
Connectors	SFP slot for optional SFP type fiber transceivers
Configuration	Auto/Forced, 1000Mbps, Full duplex
Transmission rate	1000Mbps
DDM support	Yes
Network cables	MMF 50/125 60/125, SMF 9/125
Eye safety	IEC 825 compliant

Console Port

Interface	RS-232, DTE type
Connector	9-pin D-sub

Switch Functions

MAC Addresses Table	8K entries
Forwarding & filtering	Non-blocking, full wire speed
Switching technology	Store and forward
Maximum packet length	9600 bytes (Jumbo frame support)
Flow control	IEEE 802.3x pause frame base for full duplex operation
	Back pressure for half duplex operation
VLAN function	Port-based VLAN and IEEE 802.1Q Tag-based VLAN
VLAN support	4096 VLANs (IEEE 802.1Q)
Aggregation	Static and LACP Port link aggregation (port trunking)
QoS function	Ethernet type, IP-based, DSCP, TOS-based, VID-based, VLAN Tag-based packet classification
	Port rate control, storm control
Port Mirroring	Mirror received frames to a sniffer port

AC Power Input (AC powered models)

Interfaces	IEC320 receptacle
Operating Input Voltages	100 ~ 240VAC
Power Consumption	39W max. (PoE power is excluded)

<u>DC Power Input (DC powered models)</u>

Interfaces   Screw-type terminal block

Operating Input Voltages ±40 ~ 72VDC

Power Consumption   39W max. (PoE power is excluded)

<u>PoE DC Power Input (PoE featured models)</u>

Interfaces   Screw-type terminal block

Operating Input Voltages +45 ~ +57VDC

<u>Mechanical</u>

Dimension (base)   443 x 245 x 43 mm (WxDxH)

Housing   Enclosed metal

Mounting   Desktop mounting, 19" rack mounting

<u>Environmental</u>

Operating Temperature   Typical -5°C ~ +40°C

Storage Temperature   -20°C ~ +85°C

Relative Humidity   10% ~ 90% non-condensing

<u>Electrical Approvals</u>

FCC   Part 15 rule Class A

CE   EMC, CISPR22 Class A

Safety   TUV LVD, TUV IEC60950-1, TUV EN60950-1

VCCI   V-3 V-4 Class A

2. Installation

2.1 Unpacking

The product package contains:

- The switch unit
- One AC power cord (AC powered Model)
- One 19" rack mounting kit
- One product CD-ROM

2.2 Safety Cautions

To reduce the risk of bodily injury, electrical shock, fire and damage to the product, observe the following precautions.

- Do not service any product except as explained in your system documentation.

- Opening or removing covers may expose you to electrical shock.

- Only a trained service technician should service components inside these compartments.

- If any of the following conditions occur, unplug the product from the electrical outlet and replace the part or contact your trained service provider:

  - The power cable, extension cable, or plug is damaged.

  - An object has fallen into the product.

  - The product has been exposed to water.

  - The product has been dropped or damaged.

  - The product does not operate correctly when you follow the operating instructions.

- Do not push any objects into the openings of your system. Doing so can cause fire or electric shock by shorting out interior components.

- Operate the product only from the type of external power source indicated on the electrical ratings label. If you are not sure of the type of power source required, consult your service provider or local power company.

2.3 Mounting the Switch

Desktop Mounting

The switch can be mounted on a desktop or shelf. Make sure that there is proper heat dissipation from and adequate ventilation around the device. Do not place heavy objects on the device.

Rack Mounting

Two 19-inch rack mounting brackets are supplied with the switch for 19-inch rack mounting.

The steps to mount the switch onto a 19-inch rack are:

1. Turn the power to the switch off.

2. Install two brackets with supplied screws onto the switch as shown in figure below.

Install rack mounting brackets

After mounting bracket installation

2. Mount the switch onto 19-inch rack with rack screws securely.

3. Turn the power to the switch on.

2.4 Applying AC Power Supply

If the purchased switch is with AC power input, one AC power cord which meets the specification of your country of origin was supplied in package. Before installing AC power cord to the switch, make sure the AC power is OFF and the AC power to the power cord is turned off.

AC power input specifications

Connector: IEC320 type

Power Rating: 100 ~ 240VAC, 50/60Hz

Voltage Range: 90 ~ 264VAC

Frequency: 47 ~ 63 Hz

Power Consumption: 39W max. (PoE power is excluded)

*** Important Notice*

An approved AC power supply cord should be used and not lighter than IEC 60227, H03VV-F, 3G, 0.75mm^2 or alternatively IEC 60245, H05RR-F, 3G, 0.75mm^2.

2.5 Applying DC Power Supply

If the purchased switch is with DC power input, the power connector is shown below:

DC power input specifications

Receptacle: Screw-type terminal block

Operating Voltages: ±40 ~ 72VDC

Power Consumption: 39W max. @48VDC (PoE power is excluded)

Contacts

+   Vdc+ input

–   Vdc- input

⏚   Protective earth

*** Important Notice*

1. For safety, a readily accessible disconnected device (breaker) shall be incorporated external to the equipment.

2. The wiring between the DC power supply and the switch must be stranded copper wire within the range of 10 to 24 AWG.

2.6 Reset Button

The reset button is used to perform a reset to the switch. It is not used in normal cases and can be used for diagnostic purpose. If any network hanging problem is suspected, it is useful to push the button to reset the

switch without turning off the power. Check whether the network is recovered.

The button can also be used to restore the software configuration settings to factory default values. The operations are:

Operation	Function
Press the button during system boot-up and release it after boot-up. The boot-up takes about 17 seconds and ends with LED diagnostics.	Restore factory default settings (only applicable to the master unit)
Press the button and release during switch operation	Re-boot the switch unit

2.7 Making UTP Connections

The 10/100/1000 RJ-45 copper ports support the following connection types and distances:

Network Cables
10BASE-T: 2-pair UTP Cat. 3, 4, 5, EIA/TIA-568B 100-ohm
100BASE-TX: 2-pair UTP Cat. 5, EIA/TIA-568B 100-ohm
1000BASE-T: 4-pair UTP Cat. 5 or higher (Cat.5e is recommended), EIA/TIA-568B 100-ohm
Link distance: Up to 100 meters

Auto MDI/MDI-X Function
This function allows the port to auto-detect the twisted-pair signals and adapts itself to form a valid MDI to MDI-X connection with the remote connected device automatically. No matter a straight through cable or crossover cable are connected, the ports can sense the receiving pair automatically and configure themselves to match the rule for MDI to MDI-X connection. It simplifies the cable installation.

Auto-negotiation Function
The ports are featured with auto-negotiation function and full capability to support connection to any Ethernet devices. The port performs a negotiation process for the speed and duplex configuration with the connected device automatically when each time a link is being established. If the connected device is also auto-negotiation capable, both devices will come out the best configuration after negotiation process. If the connected device is incapable in auto-negotiation, the switch will sense the speed and use half duplex for the connection.

Port Configuration Management
For making proper connection to an auto-negotiation INCAPABLE device, it is suggested to use port control function via software management to set forced mode and specify speed and duplex mode which match the

configuration used by the connected device.

2.8 Making Fiber Connection

The SFP slot must be installed with an SFP fiber transceiver for making fiber connection. Your switch may come with some SFP transceivers pre-installed when it was shipped.

Installing SFP Fiber Transceiver

To install an SFP fiber transceiver into SFP slot, the steps are:

1. Turn off the power to the switch.
2. Insert the SFP fiber transceiver into the SFP slot. Normally, a bail is provided for every SFP transceiver. Hold the bail and make insertion.
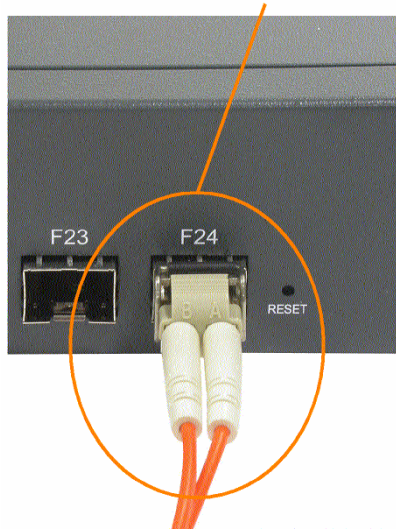
Insert the transceiver into the SFP slot.
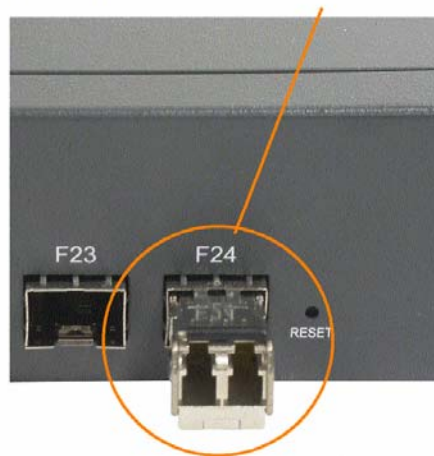
3. Until the SFP transceiver is seated securely in the slot, place the bail in lock position.

Connecting Fiber Cables

LC connectors are commonly equipped on most SFP transceiver modules. Identify TX and RX connector before making cable connection.

Connect the fiber cables.

The following figure illustrates a connection example between two fiber ports:
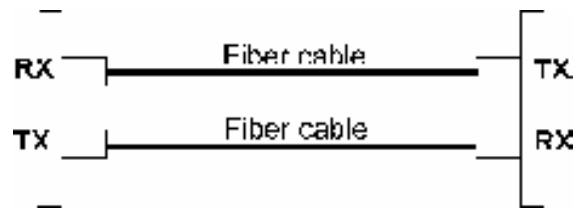
Make sure the Rx-to-Tx connection rule is followed on the both ends of the fiber cable.

Network Cables

Multimode (MMF) - 50/125μm, 62.5/125 μm

Single mode (SMF) - 9/125 μm

Fiber Port Configuration

For 1000M fiber application on Port 21, 22, 23, and 24, just leave the default port configuration *Auto* for fiber connection.

2.9 Using Power over Ethernet

The PoE featured switch models can deliver PoE power via the UTP connection over all copper ports. They require an external DC power input dedicated for PoE connections.

2.9.1 Applying PoE DC IN power

The PoE DC IN interface is shown below:

PoE DC power input specifications

Receptacle: Screw-type terminal block

IEEE 802.3af compliant (PoE) operating voltage Vpoe: +45 ~ +57VDC

IEEE 802.3at compliant (PoE+) operating voltage Vpoe: +51 ~ +57VDC

Remark: IEEE 802.3af standard is often abbreviated as "PoE". IEEE 802.3at PoE standard is also known as "PoE+" or "PoE plus".

PoE DC IN Contacts

+	Vpoe+ input
−	Vpoe- input
⏚	Chassis ground for connecting earth

** Important Notice

3. For safety, a readily accessible disconnected device (breaker) shall be incorporated external to the equipment.

4. The wiring between the DC power supply and the switch must be stranded copper wire within the range of 10 to 24 AWG.

2.9.2 PoE Power Output

PoE power on Port RJ-45 jack

Pin 4,5	Vpoe+ pins
Pin 7,8	Vpoe- pins
Cable	Cat.5 or better
Distance	100 meters max.

PoE Class Individual Rating

Standard	Class	Power output max.	Max. current	Limit

PoE	Type 1 Class 0	15.4W	338mA Vpoe@48VDC	425mA
PoE	Type 1 Class 1	4W	94mA Vpoe@48VDC	425mA
PoE	Type 1 Class 2	7W	150mA Vpoe@48VDC	425mA
PoE	Type 1 Class 3	15.4W	338mA Vpoe@48VDC	425mA
PoE+	Type 2 Class 4	30W	562mA Vpoe@54VDC	850mA

The maximum total of PoE power

Standard	PoE Class	Voltages	Power max.	Total (24 ports)
PoE	Class 0 ~ 3	+45 ~ +57VDC	15.4W	15.4 x 24 = 370W
PoE+	Class 4	+51 ~ +57VDC	30W	30 x 24 = 720W

2.9.3 Protection Mechanism

Event	Action
Incompliant PD discovery	PoE Shut down
PD disconnection	PoE Shut down immediately
Over voltage	PoE Shut down immediately
Under voltage	PoE Shut down immediately
PD over load *[1]	PoE Shut down
PD Short circuit*[2]	PoE Shut down immediately

*Remark: *1. The detected PD load is over class allocation or user demand configuration.*

*   *2. The detected port current is over the max. limit current.*

2.10 Making Stack Connection

To expand the number of the connected users, the switch provides two 5G stack ports for cascading more than one switch together. Up to five switches are allowed to cascade as one single switch stack that is able to support 120 users and 20 fiber connections. The stack can also be managed with a single IP address and as a single entity for greater management simplicity.

The stack ports, SA and SB locate on the rear panel as illustrated below:

To connect two switches via stacking, use the stack cable which is bundled in product package. Connect one end to the SA port of one switch and connect the other end to the SB port of the other switch as shown below:

To make stack connection in a switch stack, the steps are:

1. Follow the connection rule of "SA to SB" from one switch to another.
2. Connect all switches in the stack sequentially via stack cables.
3. Make sure all SA-to-SB connections become a loop as illustrated in the following figure:

In user-interface under software management, Port 25 represents stack port labeled SB and Port 26 represents stack port labeled SA.

2.11 LED Indication

LED	Function	Color	State	Interpretation
POWER	Power status	Green	ON	The power is supplied to the switch.
			OFF	The power is not supplied to the switch.
Mngt	Management status	Green	OFF	The switch is in initialization and diagnostics.

				BLINK	The switch is initialized completely with diagnostic error.
				ON	The switch is initialized completely and normal.
SA	Stack port A status	Green	ON	Stack port A link up
			OFF	Stack port A link down
SB	Stack port A status	Green	ON	Stack port B link up
			OFF	Stack port B link down
1000M	Port speed status	Green	ON	1000Mbps is selected and PoE power is OFF.
			BLINK	1000Mbps is selected and PoE power is ON.
		Amber	ON	10/100Mbps is selected and PoE power is OFF.
			BLINK	10/100Mbps is selected and PoE power is ON.
Link/Act.	Port link status	Green	ON	Port link is established. (No traffic)
			BLINK	Port link is up and there is traffic.
			OFF	Port link is down.
F21	Port F21 status	Green	OFF	RJ-45 copper connection is selected on Port 21.
			ON	SFP fiber connection is selected on Port 21.
F22	Port F22 status	Green	OFF	RJ-45 copper connection is selected on Port 22.
			ON	SFP fiber connection is selected on Port 22.
F23	Port F23 status	Green	OFF	RJ-45 copper connection is selected on Port 23.
			ON	SFP fiber connection is selected on Port 23.
F24	Port F24 status	Green	OFF	RJ-45 copper connection is selected on Port 24.
			ON	SFP fiber connection is selected on Port 24.

2.12 Making Console Connection

Console port is a DB9 connector. It serves as an RS-232 DTE port.

Pin Definitions

Pin 2   RXD

Pin 3   TXD

Pin 5   GND

Pin 1,4,6-9   NC

Use simple RS232 null modem without handshaking to connect the console port to PC's DB9 COM port as follows:

Console Pins   **COM Port Pins**

Pin 2   RXD ---------------------------- Pin 3   TXD

Pin 3   TXD ---------------------------- Pin 2   RXD

Pin 5   GND ---------------------------- Pin 5   GND

<u>Baud Rate Information</u>

Baud rate: 115200

Data bits: 8

Parity: none

Stop bit: 1

Flow control: disabled

3. Managing the Switch Stack

The switch stack provides the following methods to configure and monitor the switch stack as follows:

● Making out of band management via RS-232 console port

● Making in-band management via telnet interface over TCP/IP network

● Making in-band management via web interface over TCP/IP network

● Making in-band SNMP management over TCP/IP network

After making stack connection as the procedure described in section 2.9, it is required to do the system stack configuration and IP configuration via web interface or telnet interface.

It is not necessary to perform any pre-configuration for each individual switch before they are connected via stack ports.

Under the condition that all member switches in a stack are with factory default configuration, the following default IP and username are used for stack management access.

Default IP address of the switch: *192.168.0.2 / 255.255.255.0*

Fixed Username: *admin*

No password

The switch uses local authentication instead of RADIUS authentication with factory defaults.

3.1 Stack Configuration
3.1.1 Stack Configuration via Web Interface

Start Web Browser

Start your browser software and enter the default IP address to which you want to connect. The IP address is used as URL for the browser software to search the device.

URL: http:/192.168.0.2/

Login to the switch stack

When browser software connects to the switch stack successfully, a Login screen is provided for you to login to the device as the left display below:

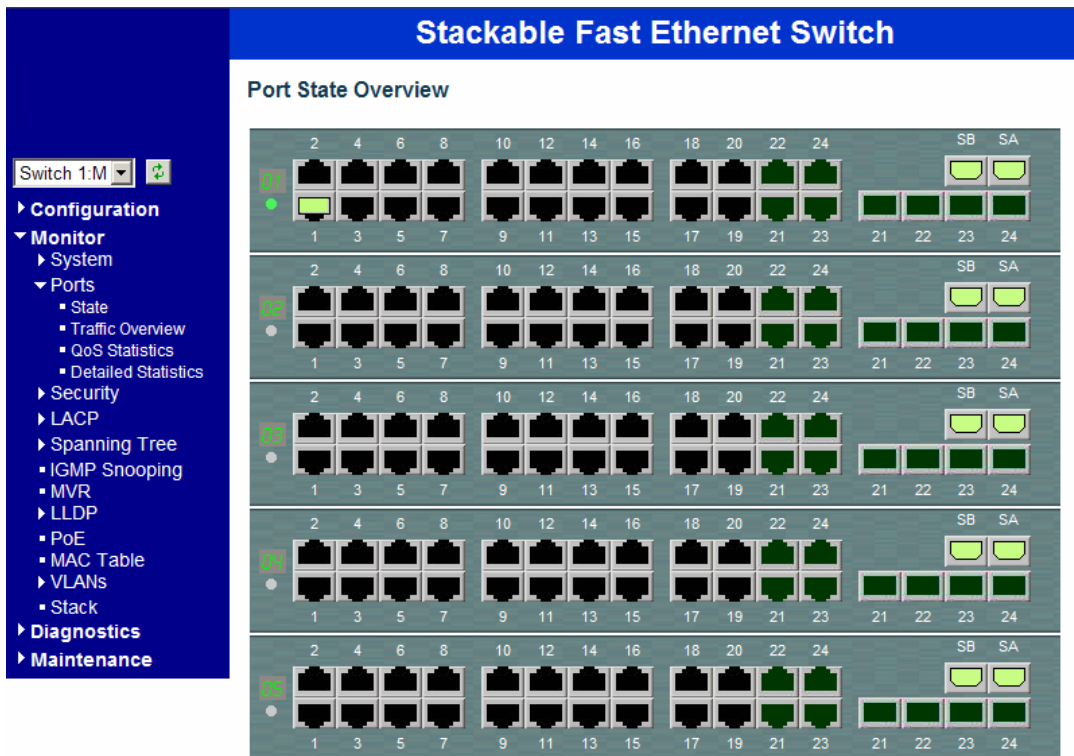Enter the following default values in the login page:

Fixed User Name: *admin*

Default password:

No password is required.

Click OK to login into the switch.

The following page is displayed after a successful login:

A stack icon is displayed and each member switch is assigned a unique Switch ID shown on left side. The blue block provides menu list for management operations.

Select [Configuration] -> [Stack] -> [Password] to perform stack configuration

Configuration	Description
Delete	Deletes this switch from the stack configuration.
Stack Member	The MAC address of the switch
Switch ID	The Switch ID (1-16) assigned to a switch
Master Capable	Indicates whether a switch is capable of being master.
Master Priority	The priority that the switch has in the master election process. The smaller the priority, the more likely the switch will become master during the master election process.
Switch Type	The product name of the switch
Start Master Election	By checking this option, the "Save" operation will also start the master election process.
Save	Click to save the changes.
Reset	Click to reset to default values.

3.1.2 Assigning Switch ID

Assigning and Swapping Switch IDs

When a switch is added to the stack, a Switch ID is automatically assigned to the switch. The automatic SID

assignment can be modified by choosing a different Switch ID on the Stack Configuration page. This method allows Switch IDs to be assigned so that it is easier for the user to remember the ID of each switch.

The Switch IDs of two switches can be swapped by simply interchanging the values in the Switch ID column. Changing Switch IDs does not result in any interruption of the stack operation.

Removing a Switch from the Stack

When a switch is removed from the stack, the configuration for the switch is preserved, and the switch still appears on the Stack Configuration page. If the configuration of the switch is not to be transferred to another switch, then the configuration may be deleted by choosing Delete, followed by "Save".

Replacing a Switch

If a switch is to be replaced with another switch (for example, replacing failing hardware), the following procedure must be used to assign the configuration of the failing switch to the new hardware:

1. Remove the failing switch from the stack. For example, assume that the failing switch had Switch ID 3.
2. Insert the new switch into the stack. The new switch is assigned an unused Switch ID.
3. To remove the automatic switch ID assignment, choose "Delete", followed by "Save". The new switch is then shown with Switch ID set to "-".
4. To assign the configuration of Switch ID 3 to the new hardware, simply choose 3 in the Switch ID column and click "Save". The new hardware has now taken over the configuration of the failing hardware.

General Switch ID Assignment Rules

When assigning Switch IDs to the devices in the stack, you must note the following:

✓ Switches with assigned IDs can be changed to use any other switch ID (possibly by swapping Switch ID with another active switch).

✓ When swapping two Switch IDs, the devices will retain their (own) configuration.

✓ Switches without an assigned Switch ID can only be assigned to any *unused* ID.

✓ When assigning a Switch ID of an inactive switch to a new switch, the new switch will inherit the former's configuration (see "Replacing a Switch" above).

✓ Deleting a switch will remove any configuration pertaining to it.

✓ Deleting an *active* switch will leave it with an unassigned Switch ID until rebooted or manually assigning a Switch ID.

3.1.3 Master Switch Election in a Stack

Within a managed stack, *one* master switch (or just "master") must be elected. Any switch not being master is a slave switch (or just "slave").

To elect a master, the following criteria are evaluated sequentially:

1. If any switch already claims to have been master for more than 30 seconds, then that switch will become master.
2. If multiple switches claim to have been master for more than 30 seconds, then the switch which has been master for the longest period of time will become master.
3. The switch with the smallest master priority.
4. The switch with the smallest MAC address.

The above algorithm ensures that once a master has been elected and has been master for more than 30 seconds, it will remain master. However in some cases the user may want to enforce a new master election. This is done by clicking "**Start Master Election**", followed by "**Save**". This causes the first two criteria to be ignored, thereby basing master election only on master priority and MAC address. When master election is enforced, the first two criteria are ignored for a period of 10-15 seconds. On the Stack State Monitor web page, this is shown by "Reelect" being set to "Yes" for one of the switches in the stack.

Select[Monitor] -> [Stack] to monitor the stack status

Stack Topology

Stack Topology	Chain
Stack Member Count	5
Last Topology Change	1970-01-01 20:52:15 +0000
Master Switch	00-40-f6-e4-11-02
Last Master Change	1970-01-01 00:14:45 +0000

Stack List

Stack Member	Switch ID	Product		Master		
		Name	Version	Priority	Time	Reelect
00-40-f6-e4-11-02	2	KGS-2423	v1.0115	2	0d 20:50:54	No
00-40-f6-e4-13-02	3	KGS-2423	v1.0115	2	-	No
00-40-f6-e4-14-02	4	KGS-2423	v1.0115	2	-	No
00-40-f6-e4-12-02	5	KGS-2423	v1.0115	2	-	No
00-40-f6-e4-10-02	-	N	A	N	A	-

Master Forwarding Table

Stack Member	Switch ID	Distance		Forwarding	
		Port 25	Port 26	Port 25	Port 26
00-40-f6-e4-11-02	2	0	0	Local	Local
00-40-f6-e4-13-02	3	-	2	-	Primary
00-40-f6-e4-14-02	4	-	3	-	Primary
00-40-f6-e4-12-02	5	-	1	-	Primary
00-40-f6-e4-10-02	-	1	-	Primary	-

3.1.4 Stack Configuration via Telnet Interface

Start Telnet with default IP and login the switch with username "admin" as follows

```
Telnet 192.168.0.2

Username: admin
Password:
Login in progress...
Welcome to KGS-2423 Command Line Interface.
Type 'help' or '?' to get help.
```

No password is required under factory default settings.

Telnet command syntax and command groups are:

```
Master>?
General Commands:
------------------
Help/?: Get help on a group or a specific command
Up    : Move one command level up
Logout: Exit CLI

Command Groups:
----------------
System     : System settings and reset options
Stack      : Stack management
IP         : IP configuration and Ping
Port       : Port management
MAC        : MAC address table
VLAN       : Virtual LAN
PVLAN      : Private VLAN
Security   : Security management
STP        : Spanning Tree Protocol
IGMP       : Internet Group Management Protocol snooping
Aggr       : Link Aggregation
LACP       : Link Aggregation Control Protocol
LLDP       : Link Layer Discovery Protocol
LLDPMED    : Link Layer Discovery Protocol Media
PoE        : Power Over Ethernet
QoS        : Quality of Service
Mirror     : Port mirroring
Config     : Load/Save of configuration via TFTP
SFP DDM    : SFP with Digital Diagnostic Monitoring
Firmware   : Download of firmware via TFTP
UPnP       : Universal Plug and Play
MVR        : Multicast VLAN Registration
Voice VLAN: Specific VLAN for voice traffic

Type '<group>' to enter command group, e.g. 'port'.
Type '<group> ?' to get list of group commands, e.g. 'port ?'.
Type '<command> ?' to get help on a command, e.g. 'port mode ?'.
Commands may be abbreviated, e.g. 'po co' instead of 'port configuration'.
```

[Stack] command group.

>Stack↵

```
Master>stack
Type 'up' to move up one level or '/' to go to root level
Master:/Stack>?
Available Commands:

Stack List [detailed|productinfo]
Stack Master Priority <sid>|local <mst_elect_prio>
Stack Master Reelect
Stack Select [<sid>|all]
Stack SID Swap <sid> <sid>
Stack SID Delete <sid>
Stack SID Assign <sid> <mac_addr>
Master:/Stack>
```

The keywords and parameters in stack command group are same as described in section 3.1.

<sid>:   Switch ID

<mst_elect_prio>   Master election priority

<mac_addr>   MAC address

3.2 IP Configuration for Stack

Although a stack is composed of multiple managed switches connected together via stack ports and each might have been configured with different IP address, the stack can be accessed by a single IP address to all the member switches. The IP address of the elected master switch is used as the IP address of the stack.

The switch is shipped with the following factory default settings for software management:

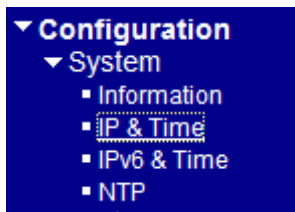Default IP address of the switch: *192.168.0.2 / 255.255.255.0*

Fixed Username: *admin*

Default password:

The switch uses local authentication instead of RADIUS authentication with factory defaults.

No password is required with factory default. However, the password is used for local authentication in accessing to the stack via console, telnet and Http web-based interface. For security reason, it is recommended to change the default settings for the stack before deploying it to your network.

Select [Configuration] -> [System] -> [IP & Time] to configure IP address

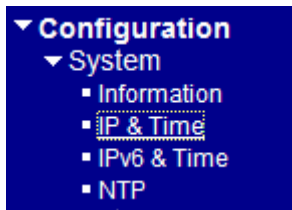**IP Configuration web page**

Configuration	Description
DHCP Client	Enable the DHCP client by checking this box.
IP Address	Provide the IP address of this switch unit.
IP Mask	Provide the IP mask of this switch unit.
IP Router	Provide the IP address of the default router for this switch unit.
VLAN ID	Provide the managed VLAN ID. The allowed range is *1* through *4095*.
DNS Server	Provide the IP address of the DNS Server in dotted decimal notation.
DNS Proxy	When DNS proxy is enabled, the switch will relay DNS requests to the current configured DNS server, and reply as a DNS resolver to the client device on the network.
Save	Click to save the changes.
Reset	Click to undo any changes made locally and revert to previously saved values.
Renew	Click to renew DHCP. This button is only available if DHCP is enabled.

Note:

1. *If DHCP fails and the configured IP address is zero, DHCP will retry. If DHCP fails and the configured IP address is non-zero, DHCP will stop and the configured IP settings will be used. The DHCP client will announce the configured System Name as hostname to provide DNS lookup.*

2. *The IP addresses should be in dotted decimal notation.*

3.3 IPv6 Configuration for Stack

Select [Configuration] -> [System] -> [IPv6 & Time] to configure IPv6 address

IPv6 Configuration web page

IPv6 Configuration

	Configured	Current
Auto Configuration	☐	
Address	::192.168.0.2	::192.168.0.2 Link-Local Address: fe80::240:f6ff:fee4:1002
Prefix	96	96
Router	::	::
VLAN ID	1	1

Save Reset

Configuration	Description
Auto Configuration	Enable IPv6 auto-configuration by checking this box. If fails, the configured IPv6 address is zero. The router may delay responding to a router solicitation for a few seconds, the total time needed to complete auto-configuration can be significantly longer.
Address	Provide the IPv6 address of this switch. IPv6 address is in 128-bit records represented as eight fields of up to four hexadecimal digits with a colon separates each field (:). For example, 'fe80::215:c5ff:fe03:4dc7'. The symbol '::' is a special syntax that can be used as a shorthand way of representing multiple 16-bit groups of contiguous zeros;

	but it can only appear once. It also used a following legally IPv4 address. For example, '::192.1.2.34'.
Prefix	Provide the IPv6 Prefix of this switch. The allowed range is 1 through 128.
Gateway	Provide the IPv6 gateway address of this switch. IPv6 address is in 128-bit records represented as eight fields of up to four hexadecimal digits with a colon separates each field (:). For example, 'fe80::215:c5ff:fe03:4dc7'. The symbol '::' is a special syntax that can be used as a shorthand way of representing multiple 16-bit groups of contiguous zeros; but it can only appear once. It also used a following legally IPv4 address. For example, '::192.1.2.34'.
VLAN ID	Provide the managed VLAN ID. The allowed range is 1 through 4095.
Save	Click to save the changes.
Reset	Click to undo any changes made locally and revert to previously saved values.

3.4 Configuring IP Address via console and telnet

IP command group.

```
Master>IP
Type 'up' to move up one level or '/' to go to root level
Master:/IP>?
Available Commands:

IP Configuration
IP DHCP [enable|disable]
IP Setup [<ip_addr>] [<ip_mask>] [<ip_router>] [<vid>]
IP Ping <ip_addr_string> [<ping_length>]
IP DNS [<ip_addr>]
IP DNS_Proxy [enable|disable]
IP IPv6 AUTOCONFIG [enable|disable]
IP IPv6 Setup [<ipv6_addr>] [<ipv6_prefix>] [<ipv6_router>] [<vid>]
IP IPv6 Ping6 <ipv6_addr> [<ping_length>]
IP NTP Configuration
IP NTP Mode [enable|disable]
IP NTP Server Add <server_index> <ip_addr_string>
IP NTP Server Ipv6 Add <server_index> <server_ipv6>
IP NTP Server Delete <server_index>
Master:/IP>
```

IP Configuration related commands:

>*IP DHCP [Enable|disable]*

>*IP Setup [<ip_addr>][<ip_mask>][<ip_router>][<vid>]*

>*IP DNS [<ip_addr>]*

>*IP DNS_Proxy [Enable|disable]*

>*IPv6 AUTOCONFIG [Enable|disable]*

>*IPv6 Setup [<ipv6_addr>][<ipv6_prefix>][<ipv6_router>][<vid>]*

Note: <vid> means VLAN ID.

The keywords and parameters are same as described in section 3.2 and section 3.3.

3.5 Reference Manuals for Web, Console, Telnet Management

The following operation manuals are also provided separately for Console, Telnet and Web management:

Operation manual - telnet & console management xxxxxx.doc

Operation manual - web management xxxxx.doc

The manuals describe the detailed commands and information.

3.6 Configuration for SNMP Management

The switch supports SNMP v1, SNMP v2c, and SNMP v3 management. Make sure the related settings are well-configured for the switch before you start the SNMP management from an SNMP manager.

Using Telnet Interface

Master>Security>Switch>SNMP Configuration

The following are available commands in telnet SNMP command group to configure SNMP-related settings:

>*SNMP Configuration*

>*SNMP Mode [enable|disable]*

>*SNMP Version [1|2c|3]*

>*SNMP Read Community [<community>]*

>*SNMP Write Community [<community>]*

>*SNMP Trap Mode [enable|disable]*

>*SNMP Trap Version [1|2c|3]*

>*SNMP Trap Community [<community>]*

>*SNMP Trap Destination [<ip_addr_string>]*

>*SNMP Trap IPv6 Destination [<ipv6_addr >]*

>*SNMP Trap Authentication Failure [enable|disable]*

>*SNMP Trap Link-up [enable|disable]*

>SNMP Trap Inform Mode [enable|disable]

>SNMP Trap Inform Timeout [<timeout>]

>SNMP Trap Inform Retry Times [<retries>]

>SNMP Trap Probe Security Engine ID [enable|disable]

>SNMP Trap Security Engine ID [<engineid>]

>SNMP Trap Security Name [<security_name>]

>SNMP Engine ID [<engineid>]

>SNMP Community Add <community> [<ip_addr>] [<ip_mask>]

>SNMP Community Delete <index>

>SNMP Community Lookup [<index>]

>SNMP User Add <engineid> <user_name> [MD5|SHA] [<auth_password>] [DES] [<priv_password>]

>SNMP User Delete <index>

>SNMP User Changekey <engineid> <user_name> <auth_password> [<priv_password>]

>SNMP User Lookup [<index>]

>SNMP Group Add <security_model> <security_name> <group_name>

>SNMP Group Delete <index>

>SNMP Group Lookup [<index>]

>SNMP View Add <view_name> [included|excluded] <oid_subtree>

>SNMP View Delete <index>

>SNMP View Lookup [<index>]

>SNMP Access Add <group_name> <security_model> <security_level> [<read_view_name>] [<write_view_name>]

>SNMP Access Delete <index>

>SNMP Access Lookup [<index>]

Using Web Interface

Select [Configuration] -> [Security] -> [Switch] -> [SNMP]

The commands supports configuration for:

- Basic system configuration for SNMP v1 and SNMP v2c
- Basic system configuration for SNMP v1 trap, SNMP v2c trap and SNMP v3 trap
- Communities that permit to access to SNMPv3 agent
- USM (User-based Security Model) user table for SNMPv3
- VACM (View-based Access Control Model) Viewer table for SNMPv3
- Group table for SNMPv3
- Accesses group table for SNMPv3

3.7 SNMP MIBs

The switch provides the following SNMP MIBs:

- RFC 1213 MIB II
- RFC 4188 Bridge MIB
- RFC 3635 Ethernet-like MIB
- RFC 2863 Interface Group MIB using SMI v2
- RFC 2933 IGMP MIB
- RFC 3636 802.3 Medium Attachment Units (MAUs) MIB
- RFC 4133 Entity MIB v3
- IEEE 802.3AB LLDP MIB
- RFC 4668 RADIUS Authentication Client MIB
- RFC 4670 RADIUS Accounting Client MIB
- RFC 2674 VLAN MIB
- RFC 3414 - User based Security Model (USM) for SNMPv3
- RFC 3415 View-based Access Control Model (VACM) for SNMP

One product MIB file is also available in the product CD for SNMP manager software.