



KGS-1260/G (Basic)
KGS-1260/I (IEC 61850-3 enhanced)

Industrial Managed
12-port Gigabit Ethernet Switches

Installation Guide



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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 2014/30/EU of the European Community. Such marking is indicative that this equipment meets or exceeds the following technical standards:

EMC

EN 55032 Class A

CISPR 32

IEC 55024

IEC 61000-4-2

IEC 61000-4-3

IEC 61000-4-4

IEC 61000-4-5

IEC 61000-4-6

IEC 61000-4-8

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1. Introduction

The KGS-1260 is a 12-port industrial managed Gigabit Ethernet switch series which is featured with the following communication ports:

- Eight 10/100/1000Mbps Gigabit copper ports
- Four dual-speed SFP slots for 100Base-FX 1000Base-X
- One RS-232 console port



1.1 Model Definitions

Model	Description	IEC 61850-3 & IEEE 1613 Enhanced
KGS-1260/G	Industrial Managed 12-port Gigabit Ethernet Switch	N/A
KGS-1260/I	IEC 61850-3 Managed 12-port Gigabit Ethernet Switch	Yes

1.2 Features

- Eight 10/100/1000Mbps RJ-45 and four dual-speed SFP slots
- All copper ports support auto-negotiation and auto-MDI/MDI-X detection.
- Four SFP slots support dual speed for 100BASE-FX and 1000BASE-X SFP transceivers.
- Full wire speed forwarding
- Supports 802.3x flow control for full-duplex and backpressure for half-duplex
- Supports SFP with Digital Diagnostic Monitoring (DDM)
- Supports redundant power inputs
- Provides fiber Optical Power Alarm (OPA) function
- Provides Automatic Laser Shutdown (ALS) function
- Management:
 - HTTP/HTTPS/SSHv2/CLI telnet/CLI console/SNMP v1/v2c/v3/RMON
 - DHCP/DHCPv6 client, DHCP relay, DNS client, NTPv4
 - IPv6 support, System Syslog, Configuration download/upload, Software upload
- Security:
 - NAS, 802.1X, MAC-based/Web/CLI authentication
 - IP MAC binding, TACACS+, IP source guard
- Layer 2:
 - QoS, 802.1Q/MAC-based/Protocol-based/Private/IP subnet VLAN, Port Isolation
 - Storm control for UC/MC/BC packets, Static MAC configuration
 - IGMP v2/v3 snooping, MLD v1/v2 snooping, DHCP snooping
 - Multiple Spanning Tree - MSTP, RSTP, STP
- Auto Multi-Ring (KAMR) Technology:
 - Fast failover response time
 - Auto recovery when failure is repaired
 - Supports up to five redundant rings
 - Works with RSTP network
- Specific SNMP implementation:
 - Private MIB for reading DDM status
 - Private MIB for remote boot the device over SNMP
 - Private MIB for TFTP firmware update over SNMP
 - Private MIB for configuring OPA function
 - Private MIB for configuring ALS function
 - OPA alarm traps

1.3 LED Indicators

<u>LED</u>	<u>Function</u>
PWR	Power status
Mgt.	Management status
Port 1~ 8 SPEED LEDs	Speed status
Port 1~ 8 LINK LEDs	Link & activity status
SFP 9~12 LEDs	Speed & link & activity status of SFP port

1.4 Specifications

10/100/1000 Copper Ports (Port 1 ~ Port 8)

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

Dual-speed SFP Slots (Port 9 ~ Port 12)

Compliance	IEEE 802.3u 100Base-FX IEEE 802.3z 1000Base-SX/LX (mini-GBIC)
Connectors	SFP for optional SFP type fiber transceivers
Configuration	Auto 1000Mbps, Full duplex Forced 100Mbps, Full duplex
Transmission rate	100Mbps and 1000Mbps
Network cables	MMF 50/125 62.5/125, SMF 9/125
Eye safety	IEC 825 compliant

Console Port

Interface	RS-232, DTE type, galvanic isolation
Connector	Shielded RJ-45
Pin assignments	

Pin	RS-232 signals	IN/OUT
1, 2, 7, 8	NC	
3	RxD	IN
6	TxD	OUT

4, 5	GND	
------	-----	--

Switch Functions

MAC Addresses Table 8K entries
 Forwarding & filtering Non-blocking, full wire speed
 Switching technology Store and forward
 Maximum packet length 9.6K bytes
 IP Multicast groups 8192 supported
 Flow control IEEE 802.3x pause frame base for full duplex operation
 Back pressure for half duplex operation

DC IN Terminal Block

Pin assignments

Pin	Marking	Remark
1	A -	DC power input A (-)
2	A +	DC power input A (+)
3	B -	DC power input B (-)
4	B +	DC power input B(+)

Redundancy Input A & Input B
 Power input voltages +12 ~ +60VDC
 Power consumption 8.5W max. @24V
 Protection Polarity Reversal shutdown
 Isolation Power lines vs. frame ground

Alarm Relay Output Terminal Block

Pin assignments 3 terminal contacts (30VDC/1A max. or 120VAC/0.5A max.)

Pin	Marking	Alarm Relay Output contacts
1,2	AR/NO	NO pair: Normal – open, Alarm - shorted
2,3	AR/NC	NC pair: Normal – shorted, Alarm - open

Alarm events Power failure, Specific port link fault (software configured), OPA

RESET

Push Button Short push - System reset
 Long push – Restore factory default settings

Mechanical

Dimension	140 x 106 x 60 mm (HxDxW)
Housing	Enclosed metal with no fan
Mounting	Din-rail mounting, Panel mounting (with optional bracket)

Environmental

Operating Temperature	Typical -40°C ~ +70°C
Storage Temperature	-40°C ~ +85°C
Relative Humidity	5% ~ 95% non-condensing

MTBF

KGS-1260/G	212K hours
KGS-1260/I	212K hours

Tests and Approvals

- FCC Part 15 rule Class A
- CE EMC Class A
- VCCI Class A
- EN 55032 Emission
- IEC 55024 Immunity
- IEC 61850-3 EMC & environment for power substation (Enhanced model)
- IEEE 1613 for power substation (Enhanced model)
- LVD, IEC60950-1 Safety
- IEC 60068-2-64 Vibration
- IEC 60068-2-27 30G Shock test

Management:

Management	Web-based browser interface, SNMP manager
Port Control	Operating mode, Flow control, LLDP
Packet Filtering	802.1Q tagged packet filtering, Untagged packet filtering
802.1Q VLAN	Ingress 802.1Q tag stripping, Egress 802.1Q tagging (tag insertion) S-tag tagging (802.1ad double tagging)
OPA Control	Configuration
ALS Control	Configuration
Maintenance	Restore factory default, reboot, firmware update, configuration file save & upload
SNMP Private MIB	DDM status, OPA control, ALS control
SNMP Trap	Trap events: Boot up, Port link change, OPA trap
Power saving	Disable, Link Up, Link Down, Full

1.5 IEC 61850-3 & IEEE 1613

KGS-1260/I model has been enhanced and verified with compliance for IEC 61850-3 EMC, environmental and mechanical requirements and IEEE 1613 requirements for power substations.

IEC 61850-3

IEC 61850-3 defines the general requirements, mainly regarding construction, design and environmental conditions for utility communication and automation IEDs (intelligent electronic devices) and systems in power plant and substation environments.

IEEE 1613

IEEE Standard Environmental and Testing Requirements for Communications Networking Devices in Electric Power Substations

IEC 61850-3 EMC Test Specifications

IEC 61850-3	Test	Level
C 6.7.4 / EN 55022	DC IN conducted emission	Class A
C 6.7.4 / EN 55022	LAN conducted emission	Class A
C 6.7.4 / EN 55022	Radiated emission	Class A
C 6.7.3 / IEC 61000-4-2	ESD	+/-15kV Air, +/-8kV Contact
C 6.7.3 / IEC 61000-4-3	RS	10V/m
C 6.7.3 / IEC 61000-4-4	EFT	DC IN & LAN: +/-4kV
C 6.7.3 / IEC 61000-4-5	Surge	DC IN +/-1kV, LAN +/-4kV
C 6.7.3 / IEC 61000-4-6	CS	DC IN & LAN: 10V
C 6.7.3 / IEC 61000-4-8	PFMF	100A/m, 1000A/m
C 6.7.3 / IEC 61000-4-11	AC-DIP	N/A: No AC input in the device
C 6.7.3 / IEC 61000-4-16	LFCS	DC IN & LAN: 30V/300V
C 6.7.3 / IEC 61000-4-17	DC-Ripple	10% of DC IN
C 6.7.3 / IEC 61000-4-18	Damped Oscillatory Wave	DC IN & LAN: +/-2.5kV
C 6.7.3 / IEC 61000-4-29	DC dips and interruption	DC IN 30% 0.1s, 0% 50ms

IEC 61850-3 Environmental Test Specifications

IEC 61850-3	Test	Specification
C 6.9.3	Dry heat - operational	+70°C , 30%RH, 72hrs
C 6.9.3	Cold – operational	-40°C , 72hrs
C 6.9.3	Change of temperature - operational	-40 ~ +75°C , 3hr, 6 cycles
C 6.9.3	Damp heat - operational	+70°C , 95%RH, 72hrs

C 6.9.3	Damp heat – steady state	+40°C , 95%RH, 48hrs
C 6.9.3	Humidity	+25°C 95%RH 12hrs/ 55°C 95%RH 12hrs, 2 cycles
C 6.9.3	Dry heat - storage	+85°C , 30%RH, 96hrs
C 6.9.3	Cold – storage	-40°C , 96hrs

IEC 61850-3 Mechanical Test Specifications

IEC 61850-3	Test	Specification
C 6.10	Vibration – resonant search	Class 2, 1Gn, 1/axis
C 6.10	Vibration – endurance	Class 2, 2Gn, 20/axis
C 6.10	Shock - responds	Class 2, 10Gn, 11ms, 3/axis
C 6.10	Shock - withstand	Class 2, 30Gn, 11ms, 3/axis
C 6.10	Shock – bump	Class 2, 20Gn, 16ms, 1000/axis
C 6.10	Seismic	Class 2, x – 2Gn, y – 1Gn, 10min.
C 6.10	Enclosure protection	Ingress of solid foreign subjects >=2.5mm

IEEE 1613 Test Specifications

IEEE 1613	Test	Level
Clause 4.1	DC rated control power inputs	80% 100% Max. DC IN
Clause 4.2	Ripple on DC power input	10%
Clause 4.3	AC rated control power inputs	N/A: No AC input in the device
Clause 5.2	Dielectric strength	DC IN vs. LAN ports: 2.8kV
Clause 5.3	Impulse voltage	DC IN vs. LAN ports: 1000Vac
Clause 6 / EMC	1Mhz oscillatory wave	DC IN & LAN: +/-2.5kV
Clause 6 / EMC	EFT	DC IN & LAN: +/-4kV
Clause 7 / EMC	RS	10V/m
Clause 8 / EMC	ESD	+/-15kV Air, +/-8kV Contact

2. Installation



2.1 Unpacking

The product package contains:

- The device unit for Din-rail mounting
- QR code label linking to product documentation cloud

2.2 Safety Cautions

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

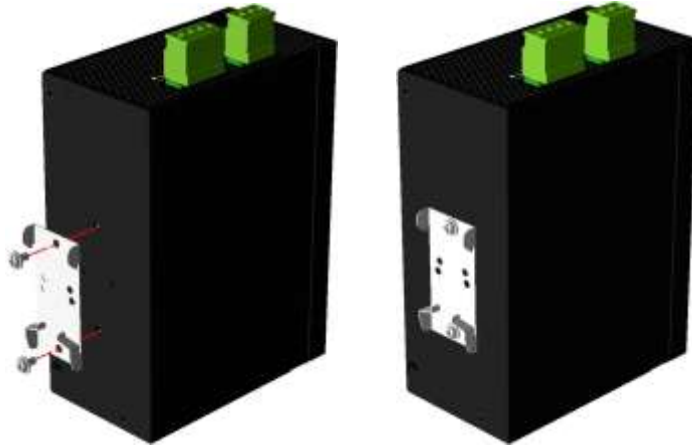
	Do not service any product except as explained in your system documentation.		
	Opening or removing covers may expose you to electrical shock.		
	Only a trained service technician should service components inside these compartments.		
	<p>If any of the following conditions occur, unplug the product from the electrical outlet and replace the part or contact your trained service provider:</p> <ul style="list-style-type: none"> - 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.		
		<p>Since the surface temperature of the device may be higher than 70°C in range of the rated operating temperatures, install and operate the product only by authorized personnel only. Install the product at a restricted area where un-authorized persons cannot reach.</p>	

2.3 DIN-Rail Mounting

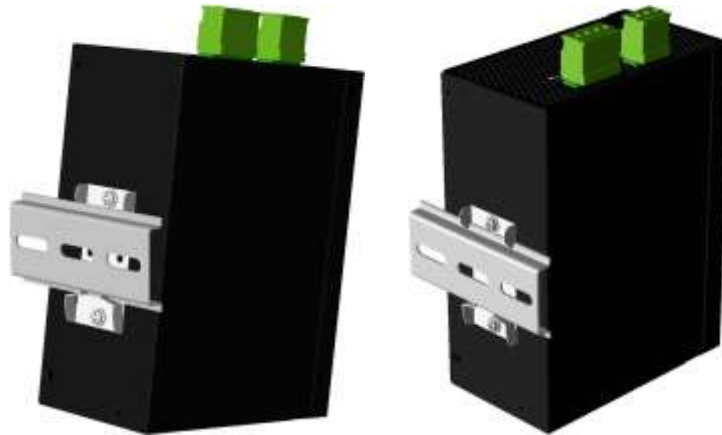
In the product package, a DIN-rail bracket is provided for mounting the switch in an industrial DIN-rail enclosure.

The steps to mount the switch onto a DIN rail are:

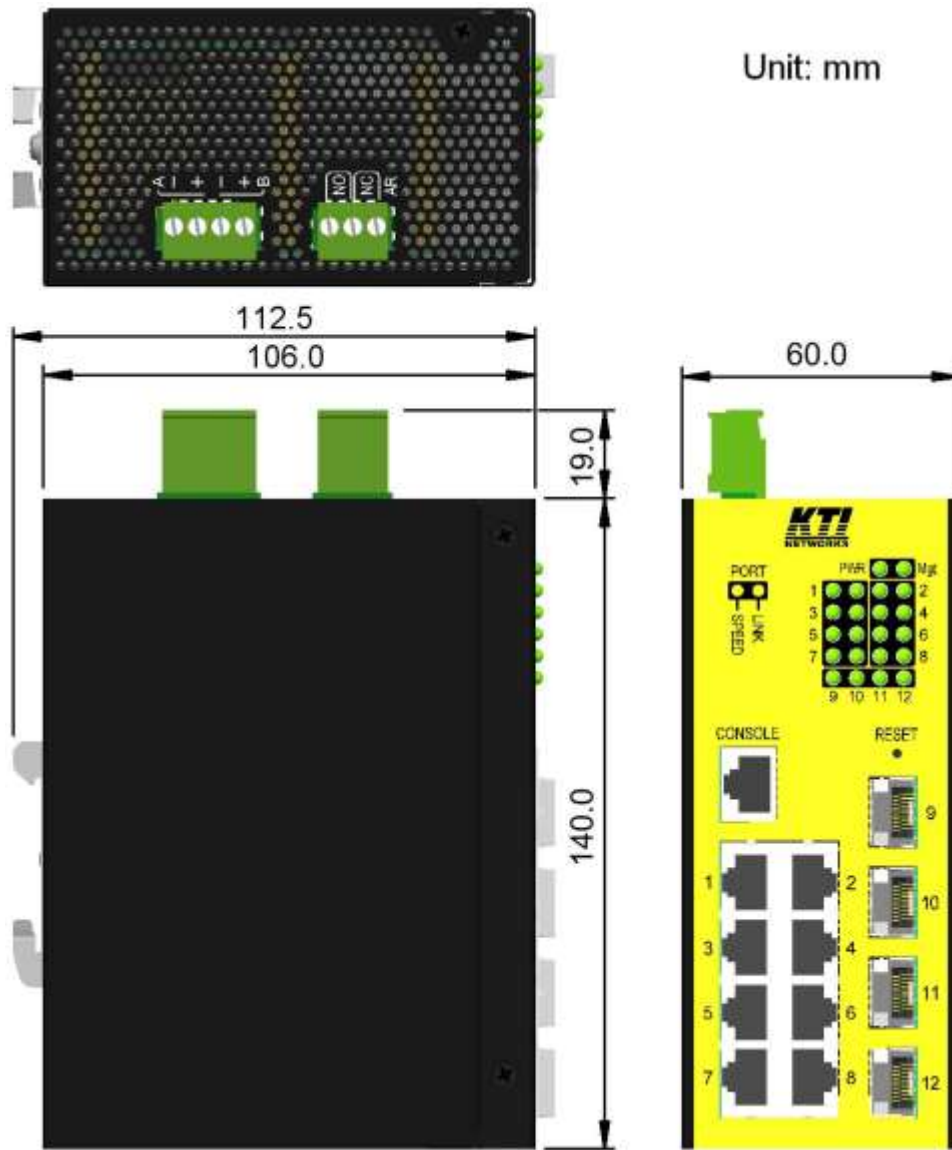
1. Install the mounting bracket onto the switch unit as shown below:



2. Attach bracket to the lower edge of the DIN rail and push the unit upward a little bit until the bracket can clamp on the upper edge of the DIN rail.
3. Clamp the unit to the DIN rail and make sure it is mounted securely.



KGS-1260/G and KGS-1260/I have the same dimension as follows:



2.4 Panel Mounting

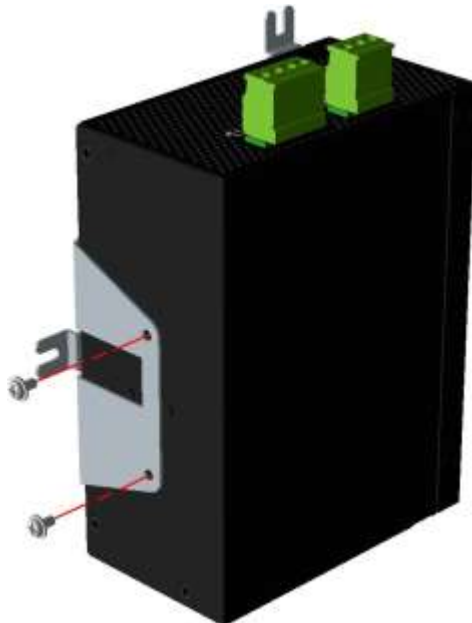
The switch is provided with an optional panel mounting bracket. The bracket supports mounting the switch on a plane surface securely.

The mounting steps are:

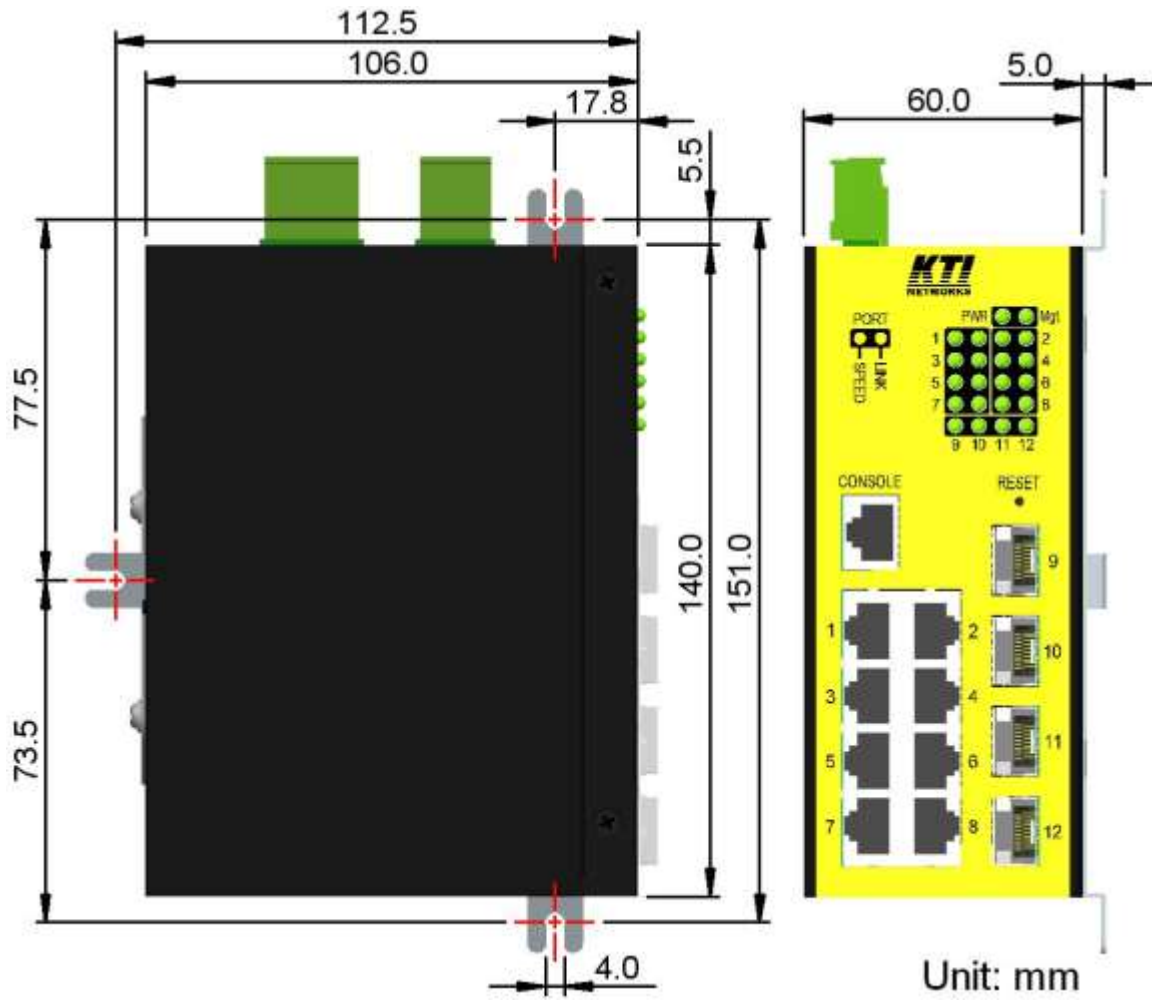
1. Install the mounting bracket on the switch unit.



2. Screw the bracket on the switch unit.
3. Screw the switch unit on a panel. Three screw locations are shown below:



KGS-1260/G and KGS-1260/I have the same dimension as follows:

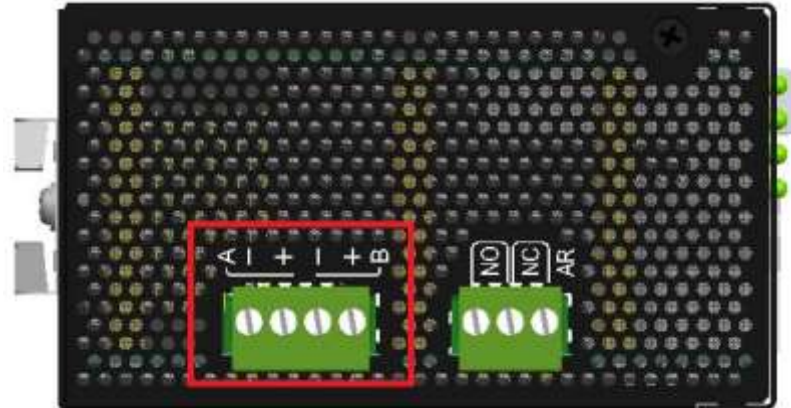


2.5 Applying Power

DC Power Terminal Block

For supporting power redundancy, the device is featured with two DC power input interfaces, DC input A and input B that enable to receive power from two different power sources.

2.5.1 DC power Terminal Block



Connector: European 4P terminal block & plug

DC Power input contacts:

Redundant input A & B

Pin	1	A -	DC power input A (-) terminal
	2	A +	DC power input A (+) terminal
	3	B -	DC power input B (-) terminal
	4	B +	DC power input B (+) terminal

DC power input voltages: +12 ~ +60VDC

Power consumption: 8.5W max. @24V

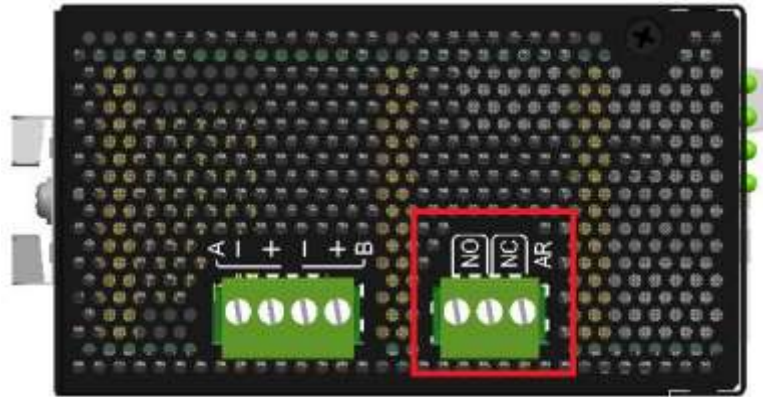
Power wires: 24 ~ 12AWG (IEC 0.5~2.5mm²)

Wire length: 1 meter max.

Protection: Polarity Reversal shutdown

2.6 Alarm Relay Output

Alarm relay output is provided for reporting failure events to a remote alarm relay monitoring system. The relay output is provided with three contacts on a terminal block connector.



Alarm Relay (AR) output pins and logic:

Pin	1	2	Alarm relay output, NO (Normal Open) contacts
	NO		Normal: Open, Alarm: Shorted
	2	3	Alarm relay output, NC (Normal Close) contacts
	NC		Normal: Shorted, Alarm: Open

The relay output can connect relay monitoring system. Both of NO and NC logic are provided individually for logic selection.

Alarm Events

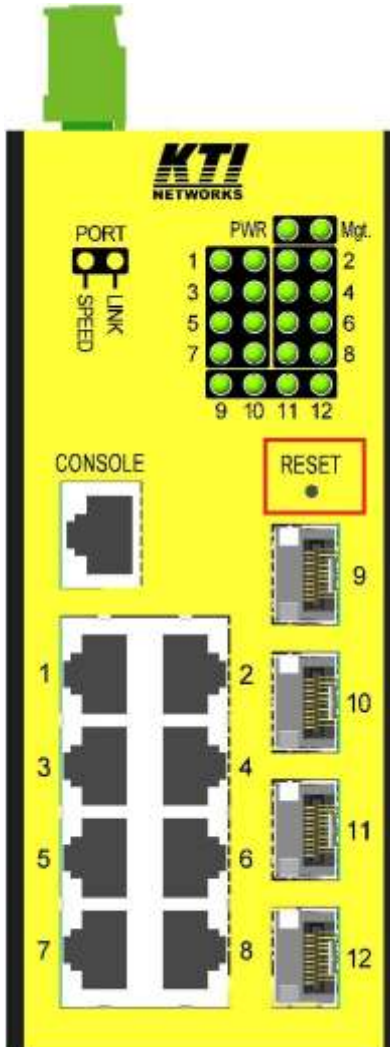
- Input power failure
- Configured port link fault
- OPA alarm

Note:

Be sure the voltage applied on the relay contacts is within the specification of 30VDC/1A max. or 120VAC/0.5A max.

2.7 Reset Button

The reset button is used to perform a reset to the device. 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 device without turning off the power. Check whether the network is recovered.



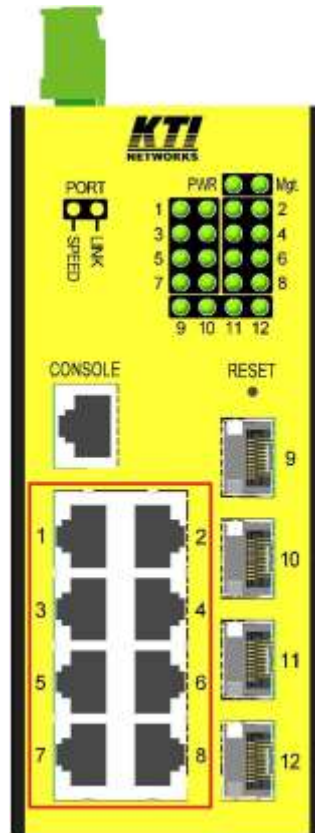
The button can also be used to restore the software configuration settings to factory default values.

The operations are:

Operation	Function
Press the button and release during operation	Reset & boot up the device. The behavior is same as power boot procedure.
Press the button when boot-up until all LEDs blink.	Boot & restore all factory default settings

3. Making LAN Connections

3.1 10/100/1000 TP Copper Port



The 10/100/1000 TP copper port supports 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 for all above

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.

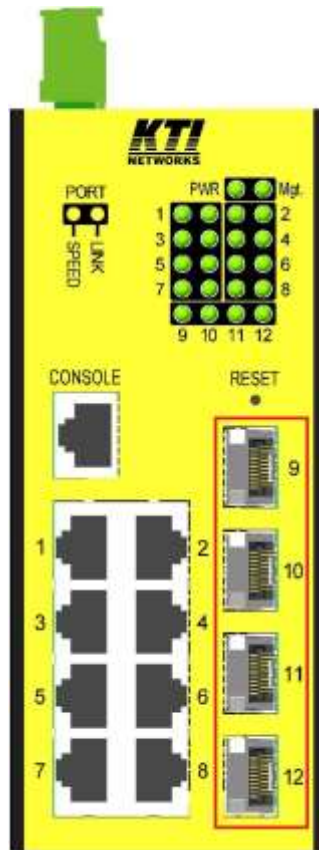
Auto-negotiation Function

The port is 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 link partners will come out the best configuration after negotiation process. If the connected device is incapable in auto-negotiation, the port will sense the speed and use half duplex for the connection.

3.2 Making Fiber Connection

The SFP slots (FX port) must be installed with an SFP fiber transceiver for making fiber connection. Your device may come with an SFP transceiver 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 device unit.
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.
3. Until the SFP transceiver is seated securely in the slot, place the bail in lock position.

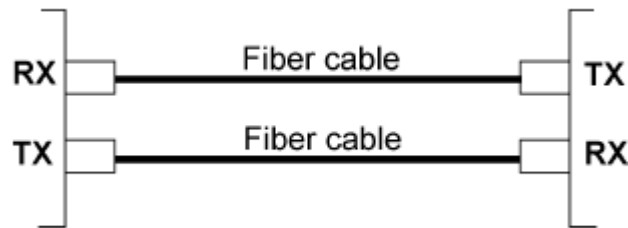
Dual Speed Support

The SFP slot supports 1000BASE-X based SFP fiber transceivers and 100BASE-FX based SFP fiber

transceivers.

Connecting Fiber Cables

LC connectors are commonly equipped on most SFP transceiver modules. Identify TX and RX connector before making cable connection. The following figure illustrates a connection example between two fiber ports:



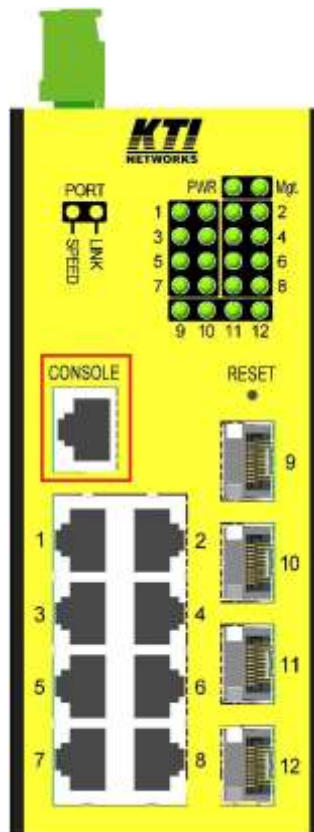
Make sure the Rx-to-Tx connection rule is followed on the both ends of the fiber cable.

Network Cables

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

Single mode (SMF) - 9/125

3.3 Making Console Connection



The connector designed for the console port is RJ-45.

Pin Assignments

Pin	RS-232 signals	IN/OUT
1, 2, 7, 8	NC	
3	RxD	IN
6	TxD	OUT
4, 5	GND	

Baud Rate information

Baud rate - 115200

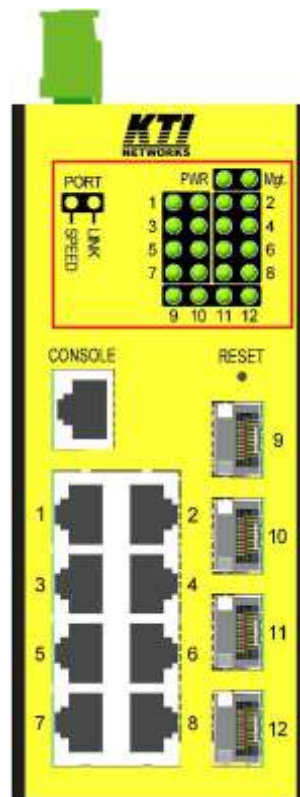
Data bits - 8

Parity - None

Stop bit - 1

Flow control – None

3.4 LED Indication



LED	Function	Color	State	Interpretation
PWR	Power status	Green	ON	The power is supplied to the switch.
			OFF	The power is not supplied to the switch.
Mgt	Management status	Green	BLINK	The switch is in initialization and diagnostics.
		Yellow	BLINK	Initialization completed with diagnostic error
		Green	ON	Initialization completed with no error
Port1 ~ Port 8				
SPEED_LED	Port speed status	Green	ON	Speed is 1000Mbps.
		Yellow	ON	Speed is 10Mbps or 100Mbps.
LINK_LED	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.
Port 9 ~ Port 12				
SPEED_LED	Port speed/link status	Green	ON	A 1000Mbps link is established.
		Yellow	ON	A 100Mbps link is established.
			BLINK	Activity status
			OFF	Port link is down.

4. Manage the Switch

The switches provide the following methods to configure and monitor the switch as follows:

- Making out of band telnet CLI management via the console port
- Making in-band management via telnet CLI over TCP/IP network
- Making in-band management via web interface over TCP/IP network
- Making in-band SNMP management over TCP/IP network

4.1 IP Address & Password

The IP Address is an identification of the switch in a TCP/IP network. Each switch should be designated a new and unique IP address in the network. 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**

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

Fixed Username: **admin**

Default password:

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

4.2 Configuring IP Address & Password via console and telnet

[IP Address] setting command is in IP command group.

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

Parameters:

```
<ip_addr>      : IP address (a.b.c.d)
<ip_mask>     : IPv4 subnet mask (a.b.c.d)
<ip_router>   : IPv4 router (a.b.c.d)
<vid>        : VLAN ID (1-4095)
```

[IPv6 Address] setting command is also in IP command group.

```
>IP IPv6 Setup [<ipv6_addr>] [<ipv6_prefix>] [<ipv6_router>]
```

Parameters:

- <ipv6_addr> : IPv6 address is in 128-bit records represented as eight fields of up to four hexadecimal digits with a colon separates each field (:).
- <ipv6_prefix> : IPv6 subnet mask
- <ipv6_router> : IPv6 router

[Password] setting command is also in Security/Switch/Users command group.

Security Switch Users Configuration

Security Switch Users Add <user_name> <password> <privilege_level>

Security Switch Users Delete <user_name>

Refer to “Operation manual for telnet and console management”.

4.3 Configuring IP Address via Web Interface

Start Web Browser

Start your browser software and enter the default IP address of the switch unit 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 Switch Unit

When browser software connects to the switch unit 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:

Default username: *admin*

Default password: ↵

No password is required.

Click to login into the switch.

Web Page after a Successful Login

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

IP Configuration

	Configured	Current
DHCP Client	<input type="checkbox"/>	<input type="button" value="Renew"/>
IP Address	192.168.0.179	192.168.0.179
IP Mask	255.255.255.0	255.255.255.0
IP Router	0.0.0.0	0.0.0.0
VLAN ID	1	1
DNS Server	0.0.0.0	0.0.0.0

IP DNS Proxy Configuration

DNS Proxy

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, DUT will relay DNS requests to the current configured DNS server on DUT, and reply as a DNS resolver to the client device on the network.
<input type="button" value="Save"/>	Click to save the changes.
<input type="button" value="Reset"/>	Click to undo any changes made locally and revert to previously saved values.
<input type="button" value="Renew"/>	Click to renew DHCP. This button is only available if DHCP is enabled.

4.4 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.

4.5 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

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] -> [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

4.6 SNMP MIBs

The switch provides the following SNMP MIBs:

- RFC 1213 - MIB II
- RFC 2674 - QBridge MIB (VLAN MIB)
- RFC 2819 - RMON (Group 1, 2, 3 & 9)
- RFC 2863 - Interface Group (IF) MIB
- RFC 3411 - SNMP Management Frameworks
- RFC 3414 - User Based Security Model (USM)
- RFC 3415 - View Based Access Control Model (VACM)
- RFC 3621 - Power Ethernet MIB
- RFC 3635 - EtherLike MIB
- RFC 3636 - 802.3 Medium Attachment Units (MAUs) MIB
- RFC 4133 - Entity MIB

- RFC 4188 - Bridge MIB
- RFC 4668 - RADIUS Authentication Client MIB
- RFC 5519 - Multicast Group Membership Discovery (MGMD) MIB
- IEEE 802.1 MSTP MIB
- IEEE 802.1AB LLDP MIB
- IEEE 802.1X Port Access Entity (PAE) MIB
- TIA 1057 LLDP Media Endpoint Discovery (MED) MIB
- IEEE 802.1-Q-BRIDGE MIB
- Private SFPDDM MIB (Read DDM status of the SFP ports)
- Private reboot MIB (Remote boot over SNMP)
- Private TFTP firmware update MIB (TFTP Firmware update over SNMP)
- Private OPA function MIB (OPA configuration for the SFP ports)
- Private ALS function MIB (ALS configuration for the SFP ports)

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

4.6.1 SNMP Traps

In addition to the SNMP standard traps, the device is equipped with private OPA alarm traps.

The traps are:

- Alarm trap – Port TX power lower than the minimal value
- Alarm trap – Port TX power higher than the maximal value
- Normal trap – Port TX power back to normal (higher than the minimal value)
- Normal trap – Port TX power back to normal (lower than the maximal value)

5. Redundant Ring Applications

5.1 Auto Multi-Ring Technology

Auto Multi-Ring Technology was developed especially for switches connected in ring topology which needs redundant support when any failure occurs in ring. For large network, more than one ring connections are very common. Auto Multi-Ring Technology implementation can support more than one ring connection within a switch. It is also able to work with RSTP support concurrently in the switch.

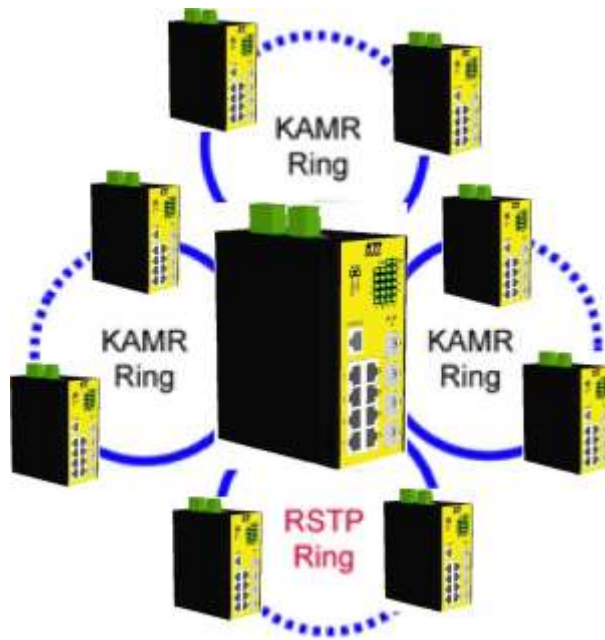
Some basic information is:

- Supports up to six rings in one switch
- Supports up to 100 member switches in one ring
- Provides fast response time than RSTP protocol
- Works with RSTP protocol concurrently within one switch

The following figure illustrates a configuration that three redundant rings and one RSTP ring hook on a main redundant ring. Some switches support two redundant rings concurrently.



The following figure shows one switch is configured to support three redundant rings and one RSTP ring at the same time.



5.2 Redundant Ring Applications with industrial standard RSTP protocol

It also can be done to support a ring connection using industrial standard RSTP function and establish a backup path. In case that any link failure occurs, the backup path can link up immediately to recover the network operation.