JetNet3010G

7 10/100TX + 3 Gigabit SFP/Gigabit Copper

Industrial Gigabit Switch

User's Manual

Version:V1.0.1   Date: 12-OCT-2007

Korenix JetNet 3010G Series Industrial Gigabit Ethernet Switch User's Manual

Copyright Notice

Index

1. Introduction

In the traditional industrial communication, the communicate infrastructure is combined with proprietary protocol and hard to connect with different layer. Today, the new trend of industrial communication is integrated all of layers to Ethernet protocol. As the band width demands is growing up by several of applications, like video security, traffic signal monitoring and control; this is a need of Gigabit Ethernet becomes popular in recently. The JetNet3010G is a 10-port Gigabit Industrial switch which embedded 7-port 10/100TX and 3 combo ports for Gigabit copper and SFP for Gigabit Ethernet uplink. With the high bandwidth switch fabric, JetNet3010G can deliver full wire speed without packet loss. This manual will introduce JetNet3010G hardware specification, system installation and the applications.

1-1. Features

- 7 10/100TX and 3 Gigabit copper/SFP combo
- IEEE802.3, 802.3u, 802.3z and 802.3ab Compliance
- Auto detection Gigabit Transmission Media
- Flexible Gigabit Fiber Link Distance
- High performance 32Gbps Switch fabric
- Supports Auto MID/MDI-X with Flow control
- IEEE802.1p for Quality of Service (QoS)
- Power redundancy with wide range input
- 1.5KV Hi-pot passed for Port, Power, Case
- Rigid IP31 grade Aluminum Case
- -10~70℃ Hazardous Operating Temperature

1-2. Package Checklist

JetNet3010G package include the following items:

- JetNet3010G x1
- One DIN-Rail clip (already screwed on the back of JetNet3010G) x1
- One wall mounting plate
- User's manual
- Quick Installation Guide

JetNet3010G Industrial Switch   User's Manual CD-ROM   Quick Installation Guide
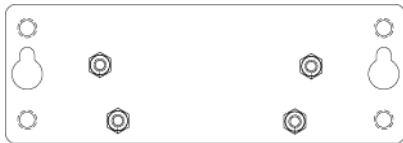
Wall Mounting Plate

Contact your sales representative if any item is missing or damaged.

2. Hardware Description

2-1. Dimensions

The dimension of JetNet3010G is **96 mm (w) x 137 mm (H) x 119 mm (D)**

2-2. Front Panel

The Front Panel of the JetNet3010G Industrial Gigabit Switch is shown in Figure A.
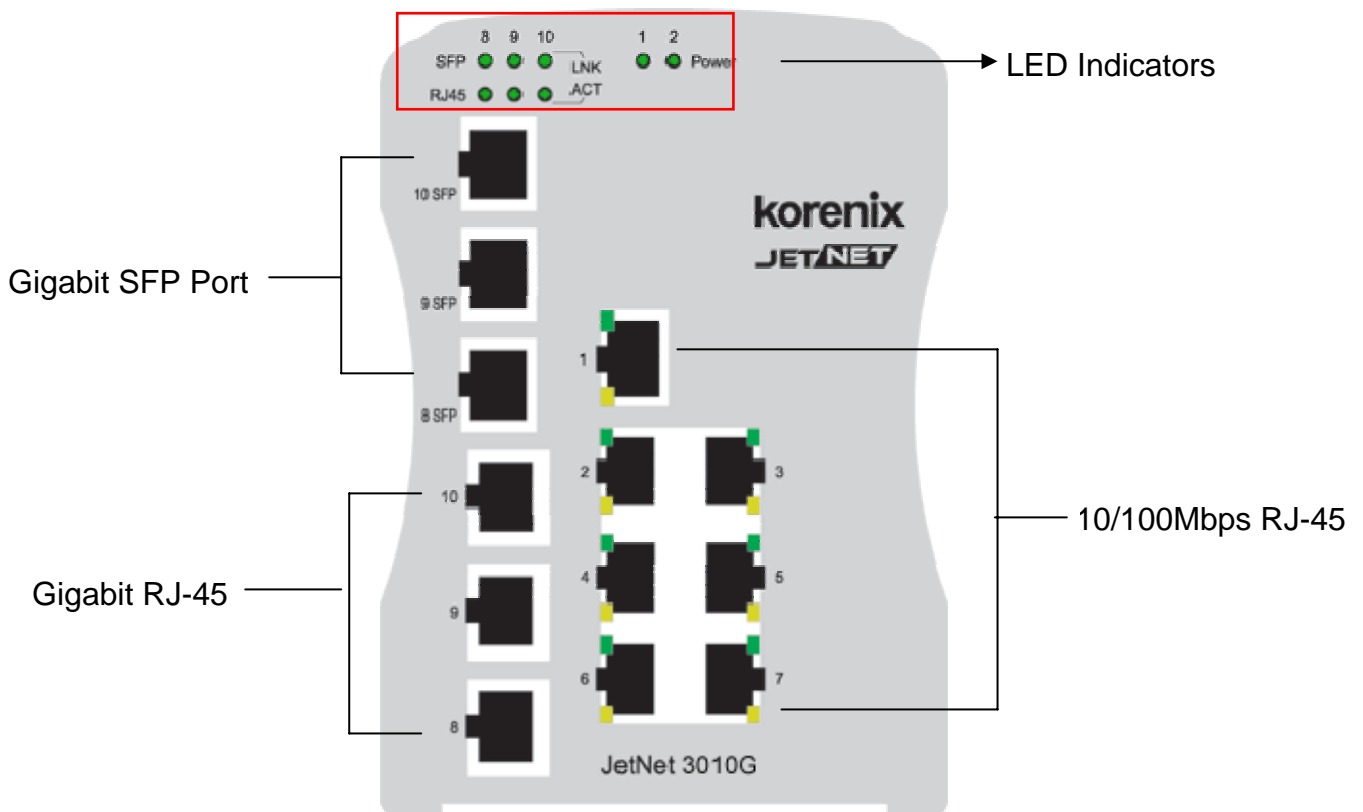

Figure A. Front Panel of the JetNet3010G Industrial Gigabit Switch

2-3. Bottom View

The bottom view of the JetNet3010G Industrial Gigabit Switch consists of one terminal block connector with two DC power inputs.
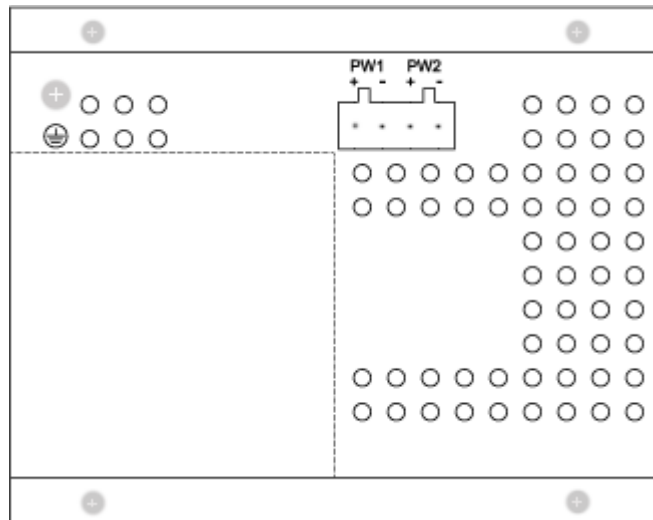
Figure B. Bottom view of the JetNet3010G Industrial Gigabit Switch

2-4. Wiring the DC Power Inputs

Follow the steps below to wire JetNet 3010G redundant DC power inputs.

[Note] The suitable electric wire ranges from 12 to 24 AWG.

1. Insert the positive and negative wires into the V+ and V- contacts respectively of the terminal block connector

2. Tighten the wire-clamp screws to prevent the DC wires from being loosened.

3. The Power 1 and Power 2 support power redundancy and polarity reverse protection functions.

4. It accepts positive or negative power system input, but Power 1 and Power 2 have to apply the same mode.

2-5. Wiring the Earth Ground

To ensure that the system will not be damaged by noise or any electrical shock, we suggest you make exactly connection with JetNet3010G with Earth Ground. On the bottom side of JetNet3010G, there is one earth ground screw, loosen the earth ground screw by screw drive and tighten the screw after earth ground wire connected.

Earth Ground
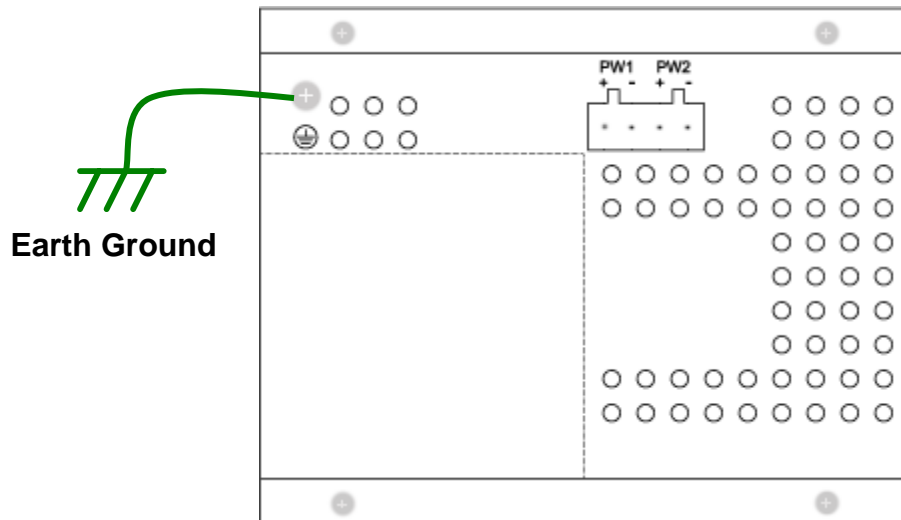
2-6. LED Indicators

The front panel of JetNet3010G includes 2 Power LEDs, 6 LEDs for Gigabit SFP and RJ-45 ports. Each 10/100Base-TX ports includes 2 LEDs with Green and Yellow color. These LED indicators provide administrators with real-time system status. Table 1 gives descriptions of the function of each LED indicator.

LED	Status	Description
Power 1	Green	Power 1 is supplying DC power.
	Off	No power is being supplied.
Power 2	Green	Power 2 is supplying DC power.
	Off	No power is being supplied.
RJ-45 (Gigabit Port 8~10)	Green	A network device is detected.
	Blinks	The port is transmitting or receiving packets from the TX device.
	Off	No device is attached or not link with RJ-45 port.

	Green	The port is transmitting or receiving packets from the TX device.
SFP (Gigabit Port 8~10)	Blinks	The port is transmitting or receiving packets from the TX device
	Off	No device is attached or not link with RJ-45 port.
	Green	A network device is detected.
10/100Mbps (Port 1 ~7)	Blinks	The port is transmitting or receiving packets from the TX device
	off	No device is attached or not link with RJ-45 port.

Table 1

Notes 1: The Gigabit SFP with higher link prioritizes than Gigabit RJ-45 port. Therefore, JetNet 3010G will light SFP link LED only when both of RJ-45 and SFP linked with another device.

Notes 2: Gigabit Port 10 supports 1000Base-T (1000Mbps) or Gigabit Fiber only, but port 8 and 9 support 10/100/1000Mbps or Gigabit Fiber.

2-7. Ports

RJ-45 ports (Auto MDI/MDIX): JetNet3010G has 7 10/100Mbps and 3 Gigabit RJ-45 auto-sensing ports. The 10/100Mbps RJ-45 supports 10Base-T and 100Base-TX with full/half duplex. And the Gigabit RJ-45 support 1000Base-T, also with full/half duplex function, except 10Mbps half duplex.

All of RJ-45 ports will auto detect 10Base-T and 100Base-TX or 1000Base-T (Gigabit RJ45 only) connections. Auto MDI/MDIX allows users to connect another switch or workstation without changing straight through or crossover cabling. See Figure C, C-1, C-2 and C-3 for the schematic diagram of straight through and crossover cabling.
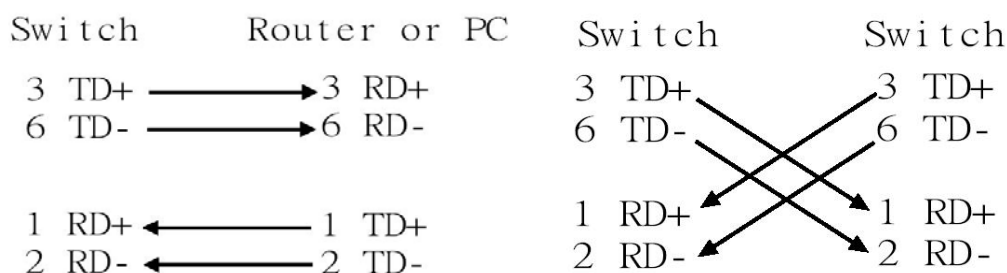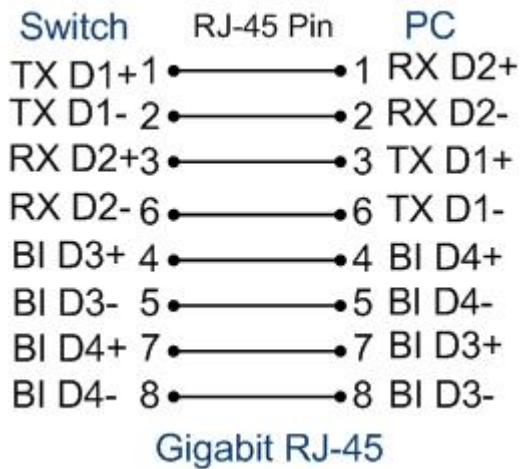
Fig C Straight through Cabling Schematic   Fig C-1 Cross Over Cabling Schematic
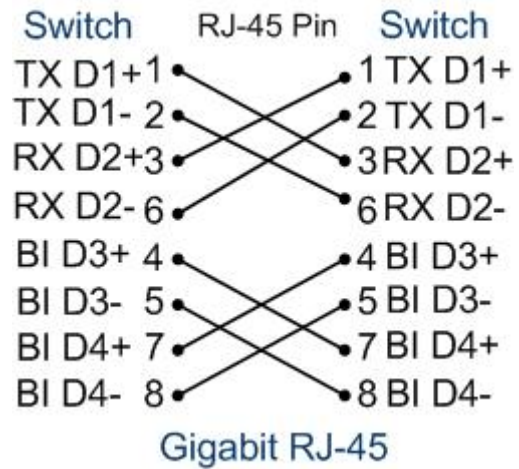
Fig. C-2 Gigabit   straight RJ-45 cable   Fig. C-3 Gigabit RJ-45 crossover cable

All ports of JetNet3010G support auto-MDI/MDI-X function without any cable change when you use an Ethernet cable to connect other devices, such as computers, switches or hubs.

Gigabit SFP ports: JetNet3010G has 3 Gigabit SFP port and combo with Gigabit RJ-45. The SFP ports accept standard MINI GBIC SFP transceiver and with higher link priority than RJ-45 ports.

To ensure the system reliability, Korenix recommend customers purchase and install Korenix Gigabit SFP Transceiver. About Korenix SFP Transceivers, please reference the last session of SFP Specification for JetNet3010G.

2-8. Quality of Service

The JetNet3010G supports IEEE802.1p Tag based Quality of Service (QoS) and based on the priority ID which is embedded in VLAN Tag. The Jetnet3010G per port provides 4 priority queues for packet service and with 8:4:2:1 (Higher: High: Low: Lower) Weight Round Robin (W.R.R.) scheduling. The following table indicates the priority ID and queuing mapping for JetNet3010G.

JetNet3010G Rule	
Queue	Priority ID
High Queue	6,7
Middle Queue	4,5
Low Queue	0,3
Lowest Queue	1,2

(QoS priority Table)

2-9. Cabling

RJ-45 port: The RJ-45 cable connection between the JetNet3010G and the attached devices (switches, hubs, workstations, etc.) must be less than 100 meters (328 ft.) long and follows up IEEE 802.3 standard.

SFP port: The SFP port permits standard SFP fiber transceiver, which is provided by Korenix with 3.3v DC power supply. The fiber cable of SFP transceiver will depends on SFP fiber transceiver specification. Please notice that the link connection supports either one of RJ-45 or SFP. The SFP Link/Activity LED will be on when Gigabit RJ-45 and SFP Transceiver link with device, because the Fiber link connection always with high priority than RJ-45 port.

3. Mounting Installation

3-1. DIN-Rail Mounting

The DIN-Rail clip is already attached to the JetNet3010G when packed. If the DIN-Rail clip is not screwed on the JetNet3010G, follow the instructions and the figure below to attach the DIN-Rail clip to the JetNet3010G.

Rear Panel of the JetNet3010G
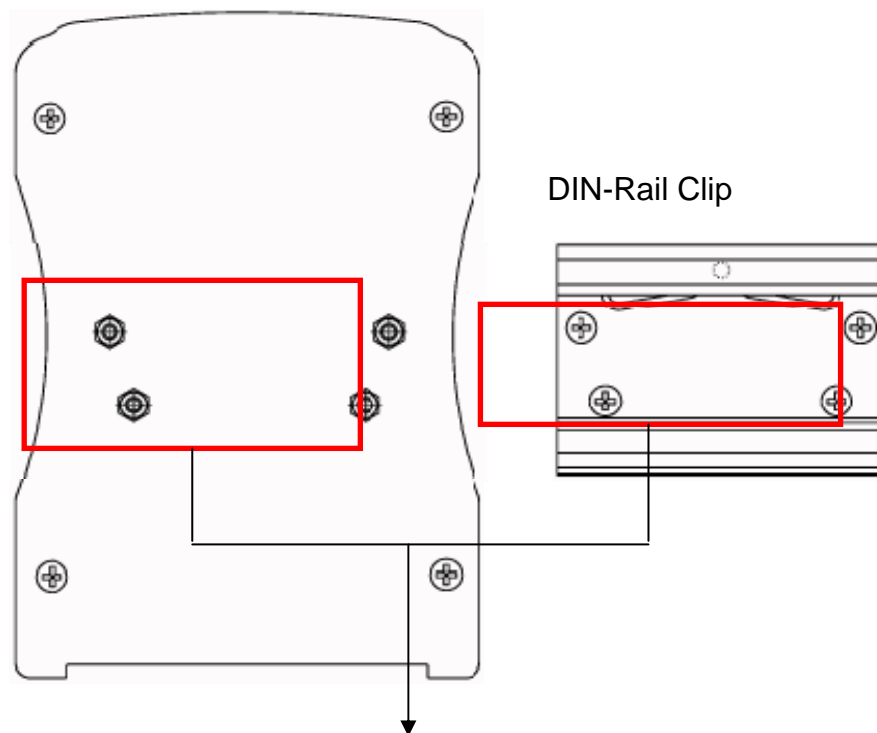
DIN-Rail Clip

1. Use the screws to attach the DIN-Rail clip to the real panel of the JetNet3010G.
2. To remove the DIN-Rail clip, reverse step 1.

Follow the steps below to mount the JetNet3010G to the DIN-Rail track:

1. Insert the upper end of the DIN-Rail clip into the back of the DIN-Rail track from its upper side.
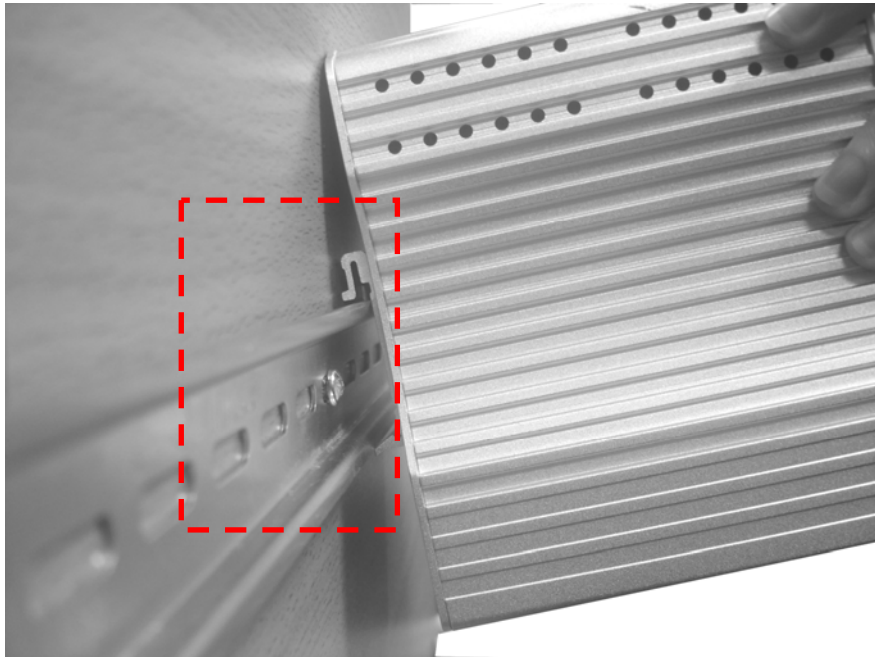
2. Lightly push the bottom of the DIN-Rail clip into the track.
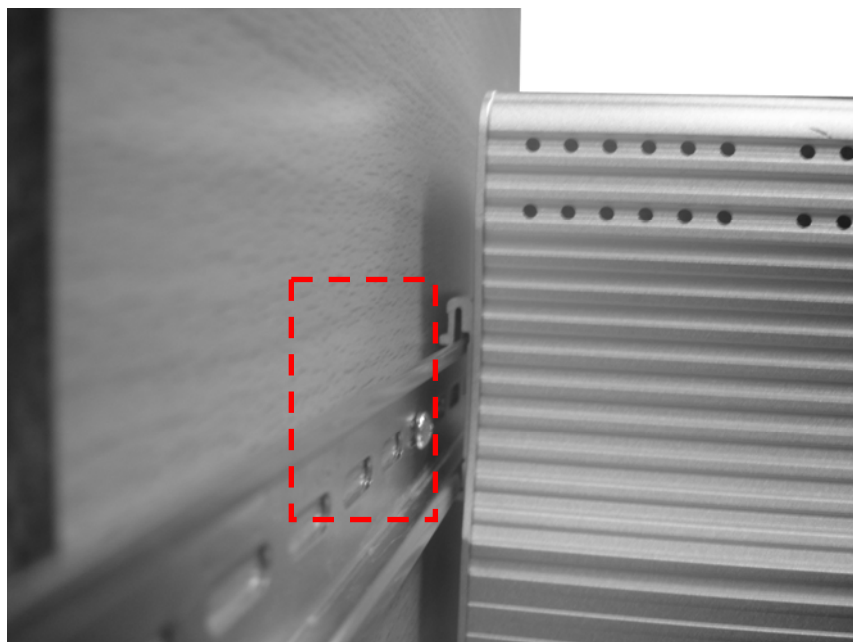
3. Check if the DIN-Rail clip is tightly attached to the track.

4. To remove the JetNet3010G from the track, reverse the steps above.

3-2. Wall Mounting

Follow the steps below to install the JetNet3010G with the wall mounting plate.

1. To remove the DIN-Rail clip from the JetNet3010G, loosen the screws from the DIN-Rail clip.

2. Place the wall mounting plate on the rear panel of the JetNet3010G.

3. Use the screws to tighten the wall mounting plate onto the JetNet3010G.

4. Use the hook holes at the corners of the wall mounting plate to hang the JetNet3010G onto the wall.

5. To remove the wall mounting plate, reverse the steps above.
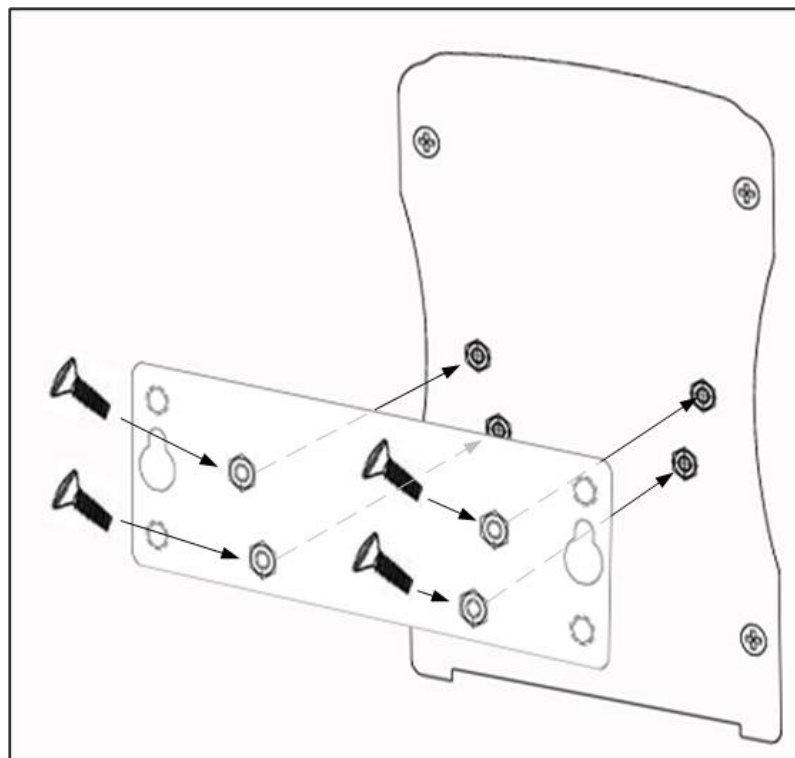
4. Hardware Installation

The following figure illustrates a typical application of JetNet3010G Industrial Gigabit Switch.
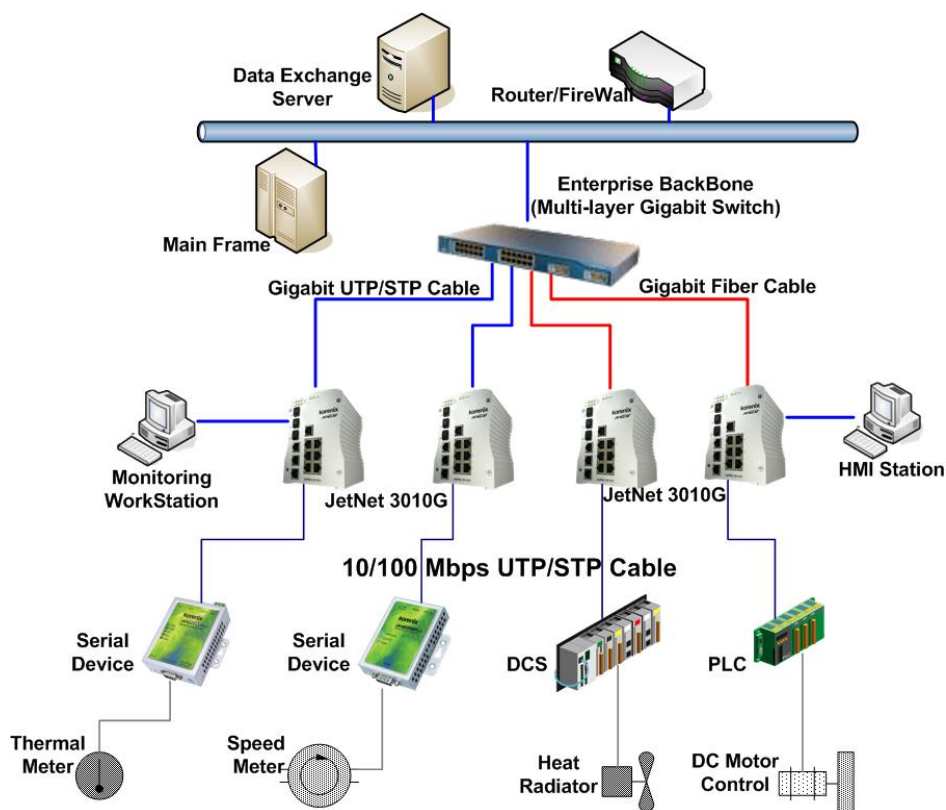
This figure illustrates an application of JetNet3010G in factory automation. In the figure, JetNet3010G handle entry level control device, like P.Q., O.K.'S. or serial communication device and provides faster uplink ability with a backbone switch, and also provides gigabit interface for monitoring and H.M.I. stations. It aggregates 10/100Mbps bandwidth to Gigabit 1000Mbps and forward to higher level switch.

4-1. Installation and Testing

1. Take out your JetNet3010G Industrial Gigabit Switch from the package box.

2. Check if the DIN-Rail clip is attached to the JetNet3010G. If the DIN-Rail clip is not attached to the JetNet3010G, refer to **DIN-Rail Mounting** section for DIN-Rail installation. If you want to wall-mount the JetNet3010G, refer to **Wall Mounting** section for wall mounting installation.

3. To place the JetNet3010G on the DIN-Rail track or wall, refer to the **Mounting**

Installation section.

4. Pull the terminal block off the JetNet3010G and wire the power lines. Refer to the **Wiring the DC Power Inputs** section for how to wire the power inputs.

5. PWR1 and PWR2 dual power inputs can be connected to power sources simultaneously. When the primary power source fails (the default setting is PWR1), the system will automatically switch to the secondary power source (PWR2), preventing any power interruption.
Both of Power 1 and Power 2 support positive electricity and negative electricity power system. Please notice the power system for power 1 and power 2 only accept either positive or negative electricity power system at one time

6. Check the LEDs of PWR1 and PWR2 to make sure that JetNet3010G is operating normally.

7. Use Category 5 straight through Ethernet cables with RJ45 connectors to connect network devices.

8. Connect one side of an Ethernet cable with a RJ45 connector to the JetNet3010G's Ethernet port (RJ-45 port), and the other side of the Ethernet cable to the network device's Ethernet port (RJ-45 port).

9. If you want to connect with Gigabit Fiber, please install appropriate SFP fiber transceiver and fiber cable. To ensure the connection is working, please notice the type of fiber transceiver of JetNet3010G's and the other end of device.

10. Check the port status LED indicator (blinking green) on the JetNet3010G to see if the network connection is successfully established.
Power on the PC host, activate the Command Line mode, and ping the connected Ethernet device to see if it will respond.

10.1 To enable the "Command Line mode", click **Run** in the Start menu, type **Command**, and click **OK** to continue.
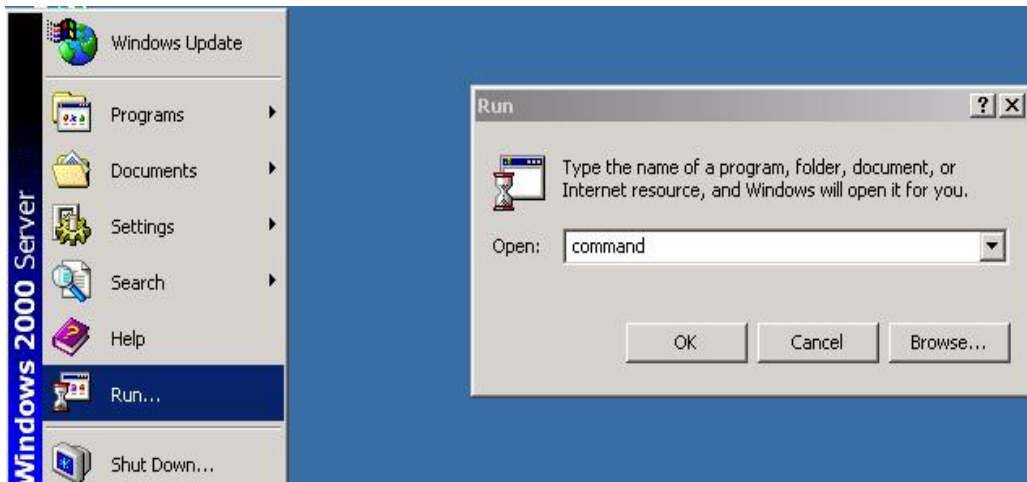
10.2 Type **ping 192.168.1.1** command to check the connection. Here we use IP address 192.168.1.1 as an example. Before the testing, be sure your PC host and target device are in the same subnet.
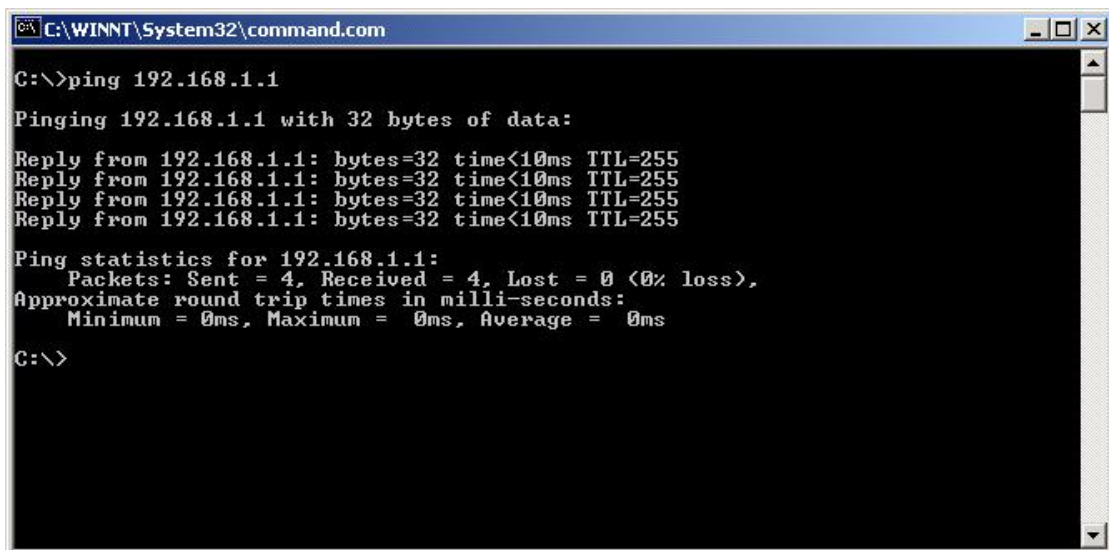
11. Repeat step 10 to make sure that the connection of each device connected to the JetNet3010G is successfully established.

12. Power on the host, activate the Command Line mode, and ping the connected Ethernet device by typing "ping –t 192.168.1.1" command to see if it will respond.

13. The parameter-"t" allow you to continue to ping the network device, as shown in the figure below.

```
C:\WINDOWS\system32\cmd.exe                                    _ □ X

C:\>ping -t 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
```

Before you continue, make sure that both PWR1 and PWR2 are successfully connected to power sources. When PWR1 fails, the LED for PWR1 will go out. At that moment, if the ping command is still replying, then it proves that redundant power input function works normally.

14. Exit the Command Line mode, and connect PWR1 power input. At this stage, your JetNet3010G has been tested and the installation is completed.

The industrial network is now established successfully. Computer A is able to connect serial to Ethernet Device via JetNet3010G Industrial Gigabit Switch, providing a reliable network environment. About the test wiring architecture, please refer to the figures as following:

5. Troubles shooting

- Make sure you are using the correct DC power suppliers (DC12~ 48 V) or power adapters.
- Select Ethernet cables with specifications suitable for your applications to set up your systems. Ethernet cables are categorized into unshielded twisted-pair (UTP) and shielded twisted-pair (STP) cables. Category 3, 4, 5 Ethernet cables are suitable for systems with 10 Mbps transmission speed. For systems with 100/1000 Mbps transmission speed, Category 5 Ethernet cables are the only suitable specifications for this environment. Also make sure that the distance between each node cannot be longer than 100 meters (328 feet).
- If the power LEDs goes off as the power cord plugged in, a power failure might occur. Check the power output connection to see if there is any error at the power source. If you still cannot solve the problem, contact your local dealer for assistance

6. Technical Specifications

Standards	IEEE 802.3 10Base-T Ethernet IEEE 802.3u 100Base-TX Fast Ethernet IEEE 802.3ab 1000Base-T IEEE 802.3z Gigabit Fiber IEEE 802.3x Flow Control and Back pressure
Protocols	CSMA/CD
Technology	Store and Forward
Transmission Rate	14,880 pps for Ethernet port 148,800 pps for Fast Ethernet port 1488000 pps for Gigabit Ethernet
MAC address table size	8K MAC address table
Memory Buffer	1Mbits
Quality of Service	Provides Tag Based Class of Service, per port 4 priority queues with 8:4:2:1 W.R.R. rule. Priority ID: High (6,7),Middle (4,5), Low (0,3), Lowest (1,2)
LEDs	**Per Fast Ethernet:** Link/Activity (Green) Full duplex/Collision (Orange) **Per Gigabit Ethernet:** Link/Activity (Green) **Per unit:** Power 1,Power 2(Green)
Network Cables	**10Base-T:** twisted-pair UTP/STP Cat. 3, 5 cable EIA/TIA-568B 100-ohm (100m) **100Base-TX:** twisted-pair UTP/STP Cat. 5 cable EIA/TIA-568B 100-ohm (100m) **1000Base-T:** twisted-pair UTP/STP Cat. 5/5e cable EIA/TIA-568B 100-ohm (100m)

Power Supply	12 to 48 VDC, redundant dual DC power inputs with reverse polarity protection.
Power consumption	15 Watts
Performance	Switch Fabric: 32Gbps System throughput: 11Mpps
Installation	DIN-Rail kit or panel wall mounting
Operating Temperature	-10℃ to 70℃ (14℉ to 158℉)
Operating Relative Humidity	5 to 95% (non-condensing)
Storage Temperature	-40 to 85°C
Storage Relative Humidity	5 to 95%(non-condensing)
Dimensions	96 mm (W) x 137 mm (H) x 119mm (D)
EMI	FCC Class A, CE/EN55022
EMS	CE/EN61000-4-2 CE/EN61000-4-3 CE/EN-61000-4-4 CE/EN61000-4-5 CE/EN61000-4-6
Safety	CE/EN60950, IP-31 case protection
Stability testing	IEC60068-2-32 (Free fall) IEC60068-2-27 (Shock) IEC60068-2-6 (Vibration)

SFP Fiber Transceiver Order Information

Part Number	Description
SFPGSX	Gigabit SX SFP Transceiver, 850nm, multi-mode/LC, 550m
SFPGSX-w	Gigabit SX SFPTransceiver, 850nm, multi-mode/LC,550m, -40~85℃ Wide Temp.
SFPGLX10	Gigabit LX SFP Transceiver, 1310nm, single-mode/LC,10km
SFPLX10-w	Gigabit LX SFP Transceiver, 1310nm, single-mode/LC,10km, -40~85℃ Wide Temp.
SFPGSX2	Gigabit SX SFP Transceiver, 850nm, multi-mode/LC, 2km
SFPGSX2-w	Gigabit SX SFP Transceiver, 850nm, multi-mode/LC, 2km, -40~85℃ Wide Temp.
SFPGLHX30	Gigabit LHX SFP Transceiver,1310nm, single-mode/LC,30km
SFPGLHX30-w	Gigabit LHX SFP Transceiver,1310nm, single-mode/LC,30km, -40~85℃Wide Temp.
SFPGXD50	Gigabit XD SFP Transceiver,1310nm, single-mode/LC,50km
SFPGXD50-w	Gigabit XD SFP Transceiver,1310nm, single-mode/LC,50km, -40~85℃Wide Temp.
SFPGZX70	Gigabit ZX SFP Transceiver,1310nm, single-mode/LC,70km
SFPGZX70-w	Gigabit ZX SFP Transceiver,1310nm, single-mode/LC,70km, -40~85℃Wide Temp.