

JetCon 3401G V2

Industrial Gigabit Ethernet Media Converter

User's Manual

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Korenix JetCon 3401G V2 Industrial Gigabit Ethernet Media Converter User's Manual

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Declaration of CE

This product has passed the CE certification for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his expense.

The user is cautioned that changes and modifications made to the equipment without approval of the manufacturer could void the user's authority to operate this equipment.

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1. Introduction

This document describes the method of how to use the Korenix JetCon 3401G V2 Industrial Gigabit Ethernet media converter, includes installation the specifications that it has. Following this user manual, you can get fully imagination about JetCon 3401G V2 and all information to help you construct the network infrastructure. The following are brief introduction of JetCon 3401G V2.

Real Industrial Gigabit Ethernet Media Converter

The JetCon 3401G V2- industrial Gigabit Ethernet media converter equipped a rugged aluminum alloy case with thirty-one grade ingress protection to against damaged solid objects or dust; With the excellent characteristics of heat dissipation, JetCon 3401G V2 has better survive ability than ordinary Gigabit Ethernet media converter which is enclosure by steel metal with various of heat dissipation holes. Not only single power input, the functionality of real time redundant power backup results in a real Industrial Gigabit Ethernet Media Converter with a non-stop transmission.

Flexible Optical adopt ability

As the trend of fiber interface, JetCon 3401G V2 combines a hot-swappable socket for Small Form-factor Pluggable (SFP) fiber transceiver. To adopt different type of fiber optical cable or enlarge fiber network campus, the JetCon 3401G V2 just need replace new fiber transceiver to meet the specification of optical fiber cable and achieve best inventory performance.

Activate Fault Alarm

Most of Gigabit Ethernet Media converter features Link Loss Forwarding function (L.L.F.) to forward link status change to alert remote or central management system. However, this is only for the cable event and is not enough for industrial network application. The JetCon 3401G V2 provides an alarm relay to trigger out a real alarm signal for port or power event. The alarm mechanism can be configured by a simple DIP switch and trigger an external alarm equipment to inform maintenance I.T. engineers. It makes a result of maintenance time saving.

Excellent Traffic Handling

The JetCon 3401G V2 supports graceful traffic management ability. All of traffic will be forwarded by the packet precedence or priority ID and result as different service priority. Besides, it also filter unnecessary broadcast packet by broadcast storm control and drop abnormal packet to enlarge network performance

1-1. Features

- One 10/100/1000Base-T RJ-45 and one 100/1000 SFP socket
- IEEE802.3, 802.3u, 802.3z and 802.3ab Compliance
- Auto detection Gigabit Transmission Media
- Flexible Gigabit Fiber Link Distance
- 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
- Rigid IP-31 grade Aluminum Case
- -40~75°C Hazardous Operating Temperature

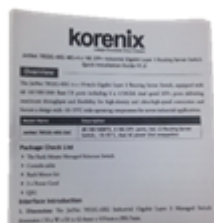
1-2. Package Checklist

JetCon 3401G V2 package includes the following items:

- JetCon 3401G V2 x1
- One DIN-Rail clip (already screwed on the back of JetCon 3401G V2 x1)



JetCon 3401G V2



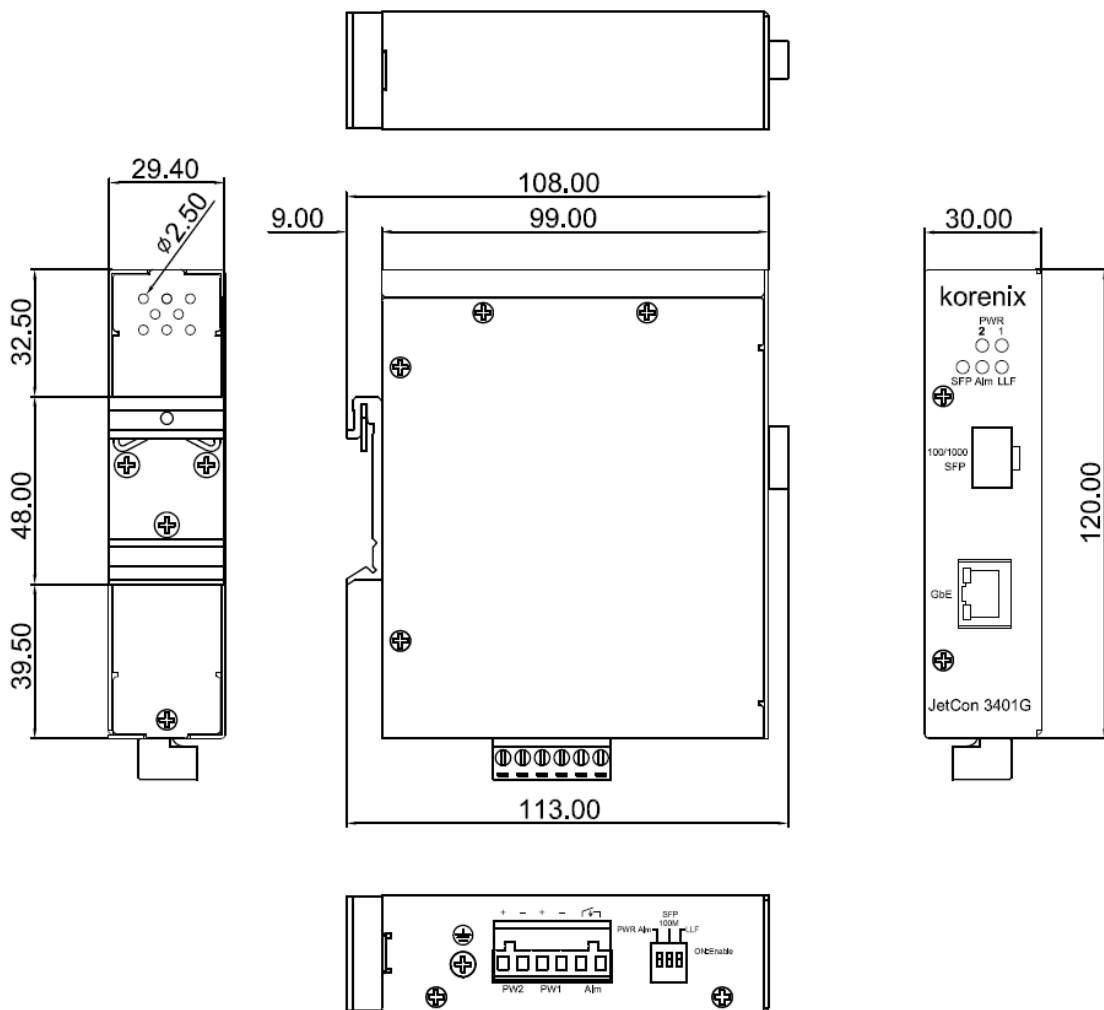
Quick Installation Guide

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

2. Hardware Description

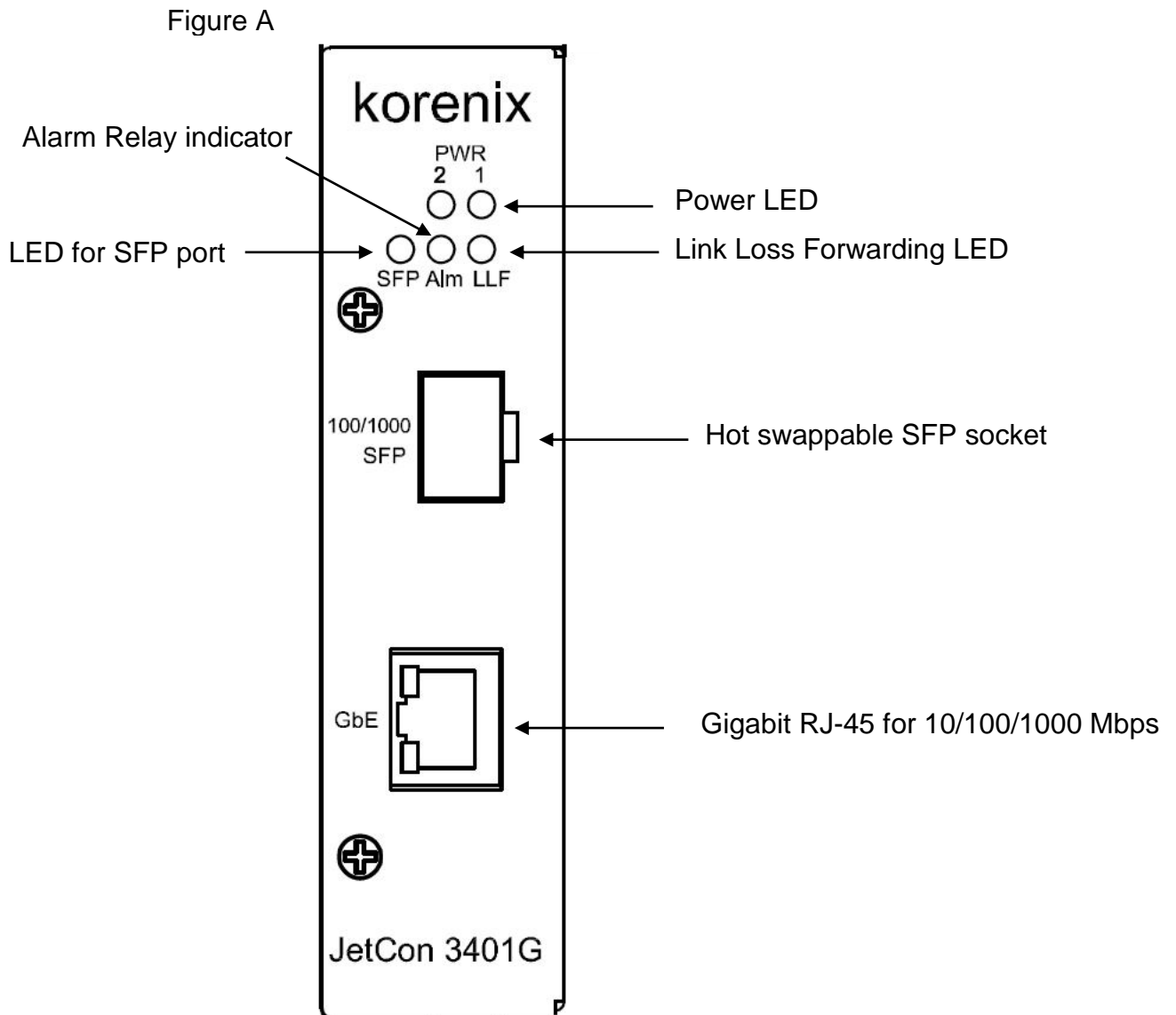
2-1. Dimensions

The dimension of JetCon 3401G V2 is **120 mm(H) x 30 mm (W) x99 mm (D) (with DIN rail clip)**



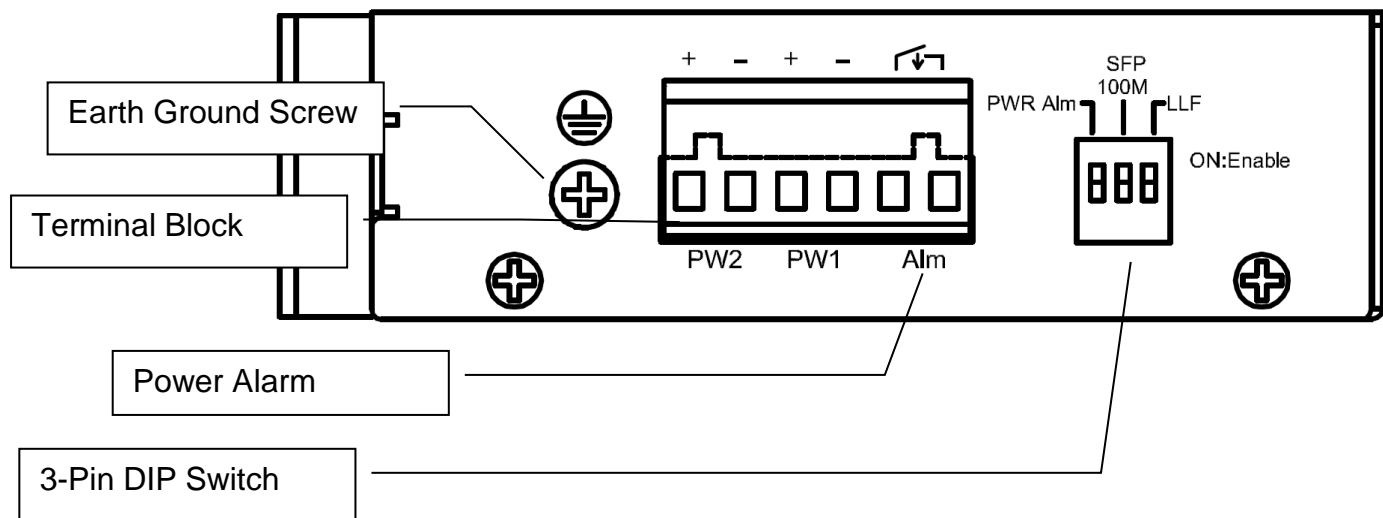
2-2. Front Panel

The Front Panel of the JetCon 3401G V2 Industrial Gigabit Ethernet Media Converter is shown in Figure A



2-3. Bottom View

The bottom side of the JetCon 3401G V2 includes one 6-pin removable terminal block connector and one 3-Pin DIP Switch for system configuration.



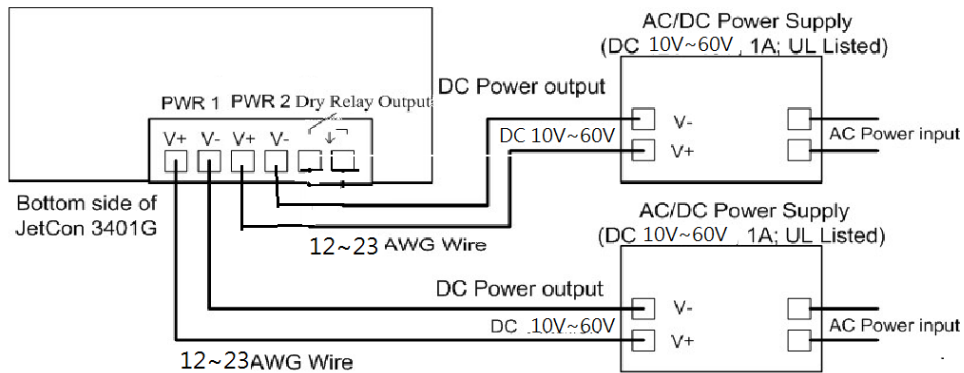
The power range of JetCon 3401G V2 is from DC 10~60V with redundancy and polarity reverse function.

To prevent interference and get better performance, it is strongly suggest make a well earth grounding by the “Earth Ground Screw”.

2-4. Wiring the DC Power Inputs

Follow the steps below to wire JetCon 3401G V2 redundant DC power inputs.

[Note] The suitable electric wire ranges from 12 to 23 AWG.

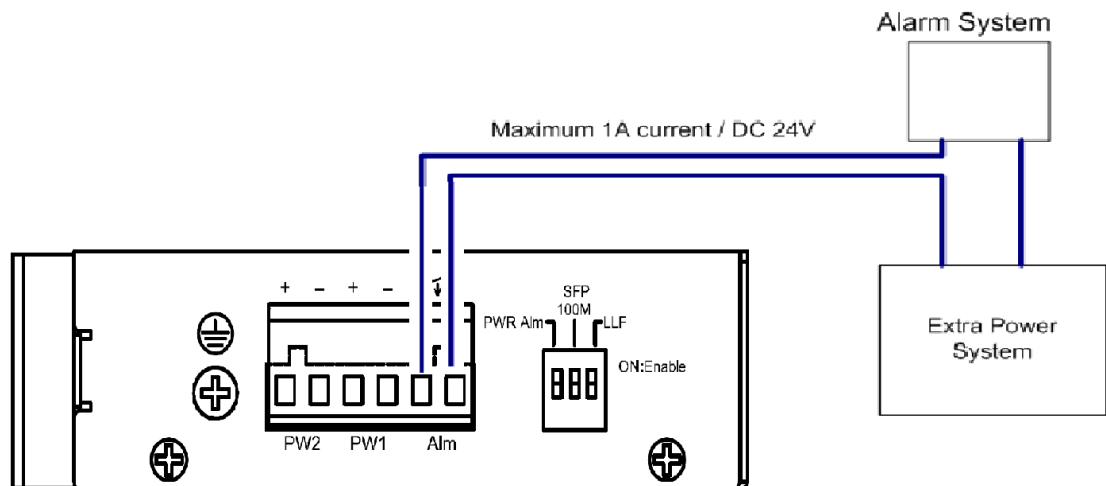


1. Insert the positive and negative wires into the V+ and V- contacts respectively of the terminal block connector
2. Tighten the wire-clamp screws to prevent the DC wires from being loosened.
3. The Power 1 and Power 2 support power redundancy and polarity reverse protection functions.
4. It accepts positive or negative power system input, but Power 1 and Power 2 have to apply the same mode.

2-5. Connect the Dry Relay Output

JetCon 3401G V2 provides one dry relay output for fault power event.

The relay conductor ability is 24W when it connects with a DC 24V power source and maximum current is 1A. In the following diagram shows how to make an alarm circuit.



About the relay function, please refer section 4-4

2-6. LED Indicators

The front panel of JetCon 3401G V2 includes 2 Power LEDs, 1 LED for Alarm Relay, 1 LED for Link Loss Forwarding status and 1 LED for port link status. Following table gives descriptions of the function for each LED indicator.

LED	Status	Description
Power 1	Green On	Power 1 is supplying DC power.
	Off	No power is being supplied.
Power 2	Green On	Power 2 is supplying DC power.
	Off	No power is being supplied.
LLF (Link Loss Forwarding)	Red On	Link Loss
	Off	Data Transfer
Alarm	Red on	Power Disconnect.

	Off	Power Connect
SFP	Green on	Link
	Fast Blinking	Link with speed 1000Mbps
	Slow Blinking	Link with speed 100Mbps
RJ-45 port	Green On	Link
	Bilking	Activity
	Amber On	Link with Speed 1000Mbps
	Amber Off	Link with Speed 10/100Mbps

Table 1

2-7. Ports

The JetCon 3401G V2 supports IEEE 802.3 10Base-T, IEEE 802.3u 100Base-T, IEEE 802.3ab 1000Base-T and IEEE 802.3z for Gigabit Fiber. This section will introduce how to wiring, install the Ethernet Cable for RJ-45 connector and Gigabit SFP transceiver.

Gigabit TX (RJ-45 connector)

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 A, B, C and D for the schematic diagram of straight through and crossover cabling.

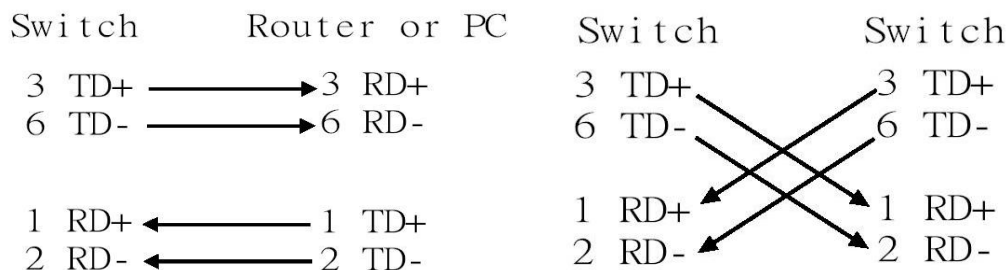


Fig A. Straight through Cabling Schematic for 10/100Mbps

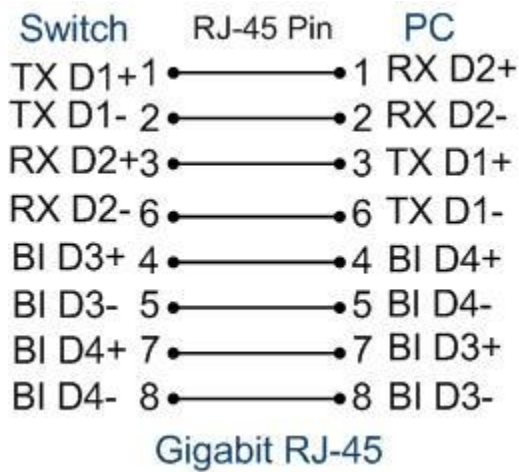


Fig. C Straight through cable schematic for 1000Mbps

Fig B. Cross Over Cabling Schematic for 10/100Mbps

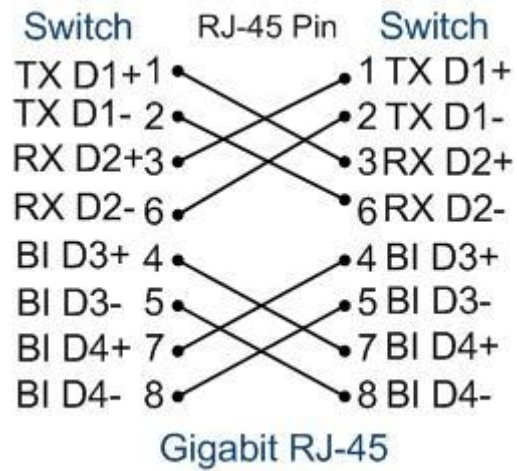


Fig. D Cross over cable schematic for 1000Mbps

The RJ-45 ports of JetCon 3401G V2 supports 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 port

The SFP port supports hot swappable function and user can change SFP fiber transceiver without system power off. This feature is useful for field site install if the fiber signal can not attach the other end device, just change the different SFP transceiver type which with large power launch power budget.

Korenix provides various type of SFP transceivers for your application. Please refer the order information.

3. Mounting Installation

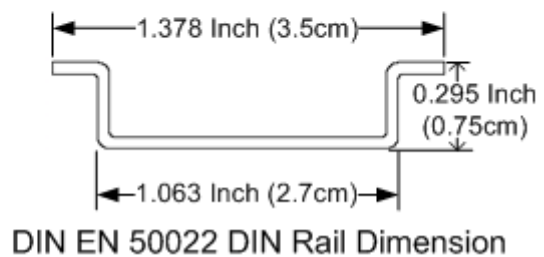
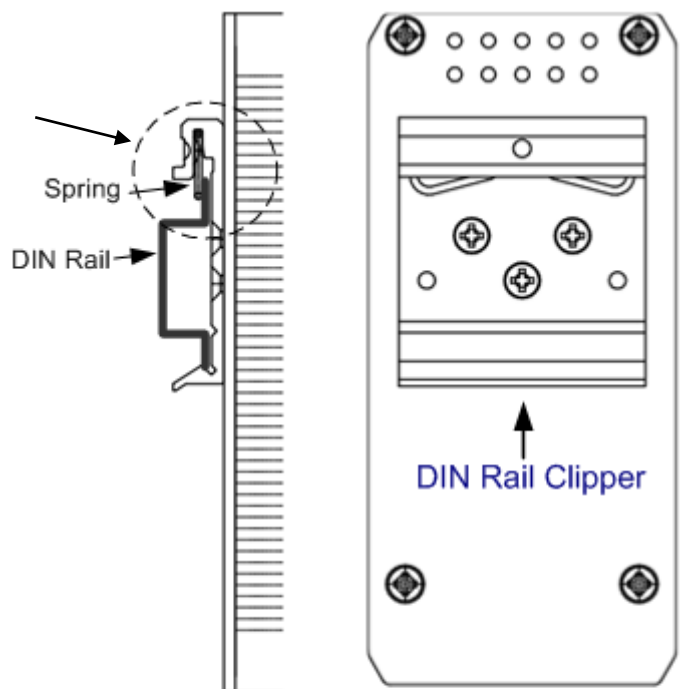
3-1. DIN-Rail Mounting

The DIN-Rail clip is already attached on the rear side of JetCon 3401G V2. JetCon 3401G V2 supports EN 50022 standard DIN Rail, in the following diagram includes the dimension of EN 50022 DIN Rail for your reference.

The DIN rail should behind the spring when install the JetCon 3401G V2 onto the standard DIN Rail.

Follow the steps below to mount the JetCon 3401G V2 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 JetCon 3401G V2 from the track, reverse the steps above.



4. System Configuration

The JetCon 3401G V2 provides Ethernet signal transfer function from electrical to optical and various packet handling and cable diagnostic features.

In this chapter, we will introduce how to configure those functions and benefits as following topics.

- 4-1. Quality of Service (QoS)
- 4-2. Packet filtering
- 4-2. Link Loss Forwarding (LLF)
- 4-3. Event Alarm Relay Configuration

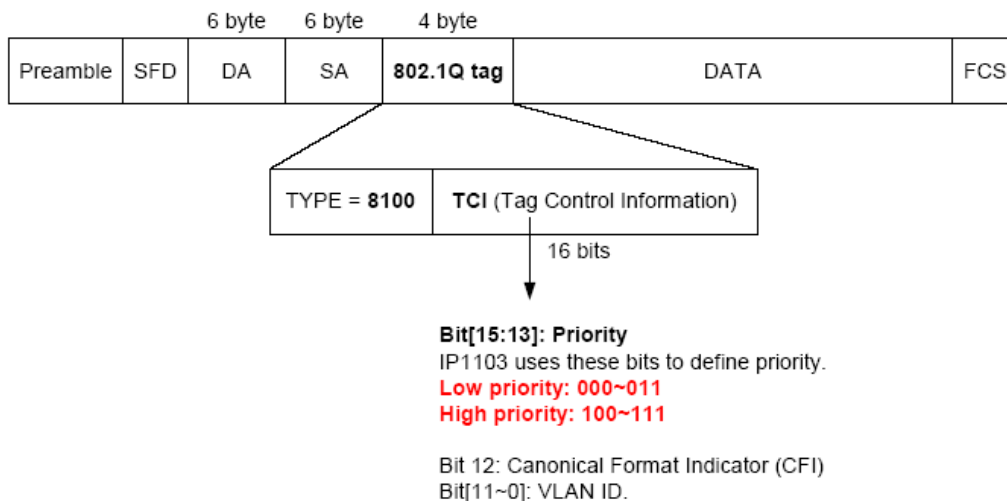
4-1. Quality of Service

The JetCon 3401G V2 supports 2 types of priority mechanisms - IEEE802.1Q priority tag based CoS and ToS of IPv4. All the packets will be examined and forwarding into high or low priority queues. The Quality of Service function is pre-configured as enabled.

The weight round robin (WRR) ratio of high/low queue is 8:1. After 8 high priority packets were progressed then 1 low priority packets.

IEEE 802.1Q tag based CoS

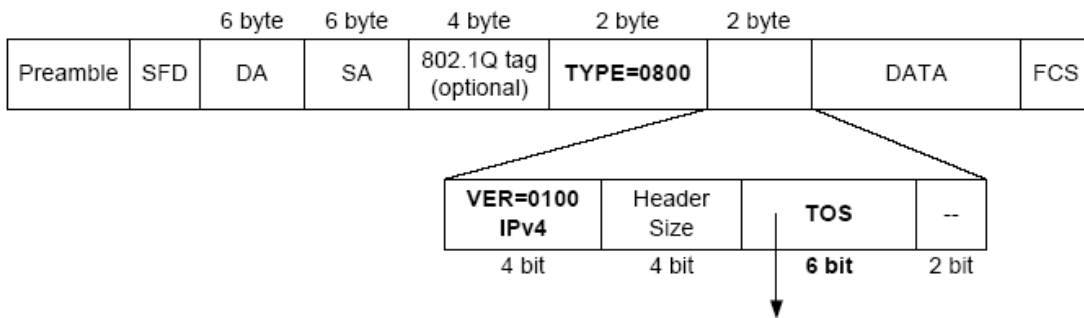
The JetCon 3401G V2 will examine the 3 bits of priority field carried by a VLAN tag and map it to the corresponding priority. A packet with priority field ranging from 0 to 3 will be treated as a low priority packet, and will be stored in low priority queue. A packet with priority field ranging from 4 to 7 will be treated as a high priority packet, and will be stored in high priority queue.



IEEE 802.1Q Type of Service for IPv4 /IPv6 packet

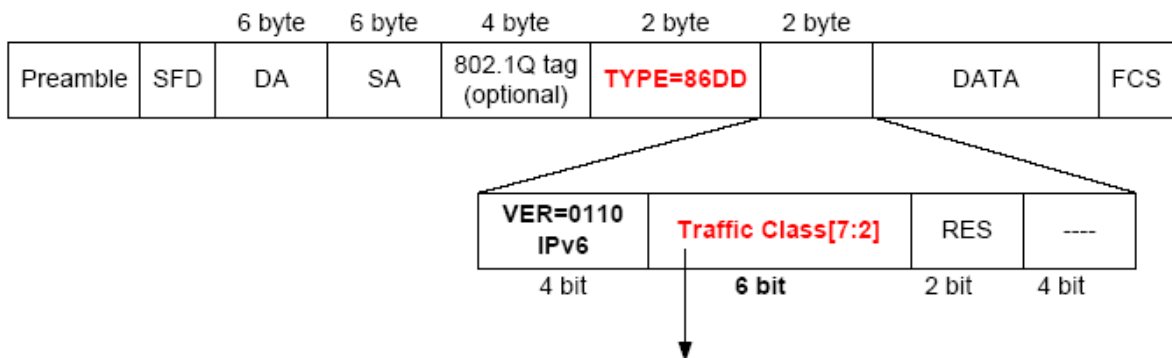
JetCon 3401G V2 provides the IP layer ToS function by recognizing the priority octet and mapping it to the corresponding priority. For an IPv4 packet, it is embedded in the TOS (type of Service) Octet. For an IPv6 data packet, the Traffic Class Octet is used to differentiate the Class of Service. When this function is enabled, the IP1103 will automatically recognize the IP version and capture the either the TOS field (IPv4) or Traffic Class field (IPv6).

IPv4 frame format



TOS[5:0]
 High priority:
 101110, 001010, 010010, 011010, 100010, 11x000
 Low priority: others

IPv6 frame format



Traffic Class[7:2]
 High priority:
 101110, 001010, 010010, 011010, 100010, 11x000
 Low priority: others

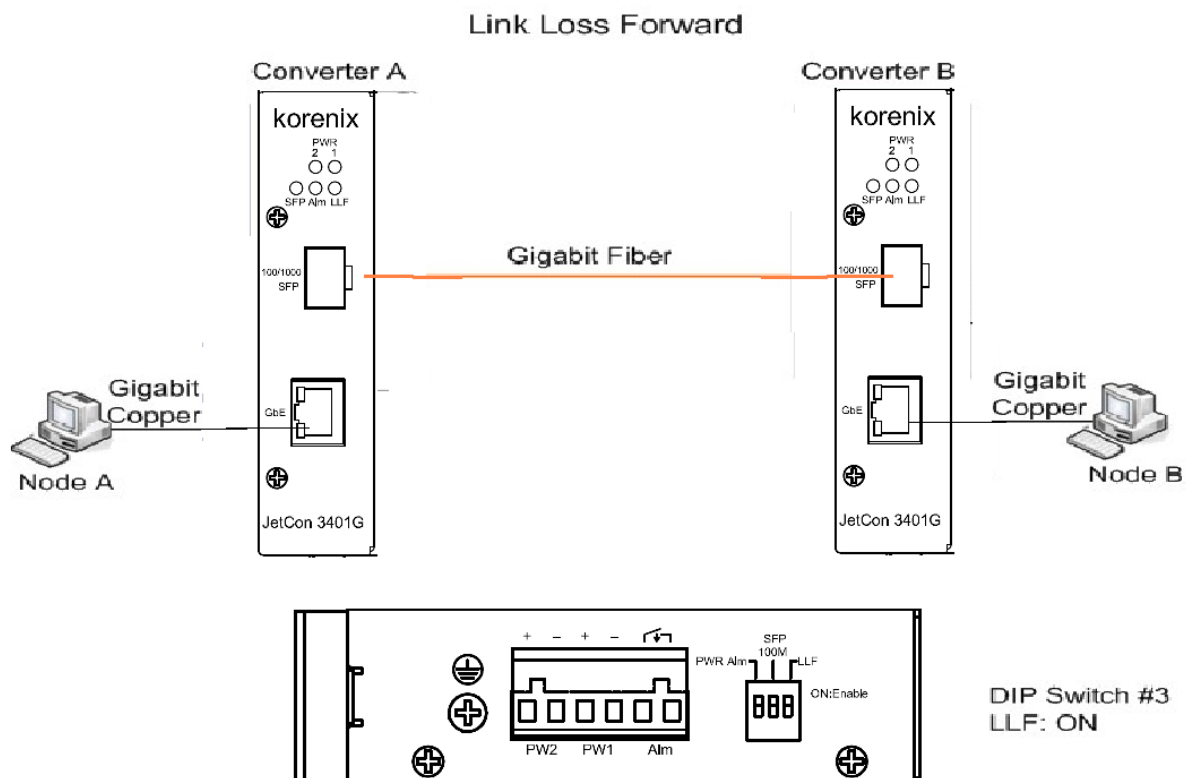
4-2. Packet Filtering

To prevent broadcast packet flooding on the network, the JetCon 3401G V2 have implemented broadcast packet control function. The port begins to drop incoming broadcast packets if the received broadcast packet counts reach the threshold as different link speed – 100Mbps at link speed 1000Mbps, 10Mbps link speed 100Mbps and 1Mbps at link speed 10Mbps.

4-3. Link Loss Forwarding (L.L.F.)

The Link Loss Forwarding provides a real time hardware based network activated diagnostics mechanism. In usually, the Gigabit Media Converter on the end of fiber cable should be equipped LLF function to provide better network performance and reduce the maintenance cost.

The JetCon 3401G V2 provides 2-way Link Loss Forwarding function which configured by the DIP-Switch. To enable the LLF function just clicks the Dipswitch-3 to “ON” to enable LLF function which is allocated on the bottom side of JetCon 3401G V2. About the Link Loss Forwarding behaviors are described in following, please refer it.



In the above diagram includes node A, B and converter A,B. Both of converters linked with Gigabit fiber. In traditional fiber network architecture; if the Gigabit copper of node A link down, the node B will not have any information, just packet can't forward between A and B.

With the Link Loss Forwarding feature, the link down event of node A will forward to converter A and B. Therefore, converter A will turn off the fiber signal and converter B will turn off Gigabit copper signal to inform node B that port link down event occurred until the node A port recovery. In some application, you also can obtain an event alarm signal by enable the port event alarm function. Please refer to the section 4-4.

The following procedures will introduce how to configure LLF function.

Step 1: power on the device A, B and connect the fiber and copper ports.

Step 2: Ensure the port link LEDs is working exactly.

Step 3: Click the LLF Dipswitch to "ON" to enable the LLF function.

Step 4: if the port link event occurred, the other port will be trigger and turn off by the LLF mechanism.

Step 5: To start the transmission and retrieve the L.L.F. function, the LLF Dipswitch should be reset again.

4-4. Event Alarm Relay Configuration

The connection of Event Alarm Relay already described in section **2-5 Connect the Dry Relay output** and this section will introduce how to enable it.

The Alarm Relay can be triggered by the port event which is configured by Dipswitch #1 2 where is allocated on the bottom side of JetCon 3401G V2.

You can select the relay trigger type for port link down event and just click the switch to "ON". The following table will show you more detail about the function of Dipswitch.

Dipswitch	Functionality
Switch #1	On: Enable power event alarm Off: Disable. If one of power inputs below DC 4V or not powering, the system will trigger relay output to form a close circuit and Alarm LED will be ON until event recovery.
Switch #2	On: SFP speed at 100Mbps Off: SFP speed at 1000Mbps

Switch #3	On: Enable LLF function Off: Disable If LLF is enabled and port link down event occurred, the normally port will be turn off. The reaction time for RJ-45 is about 2~3 seconds and SFP fiber port is below 1 second.
Note: all of the configuration change will activate without system reboot.	

5. System Installation

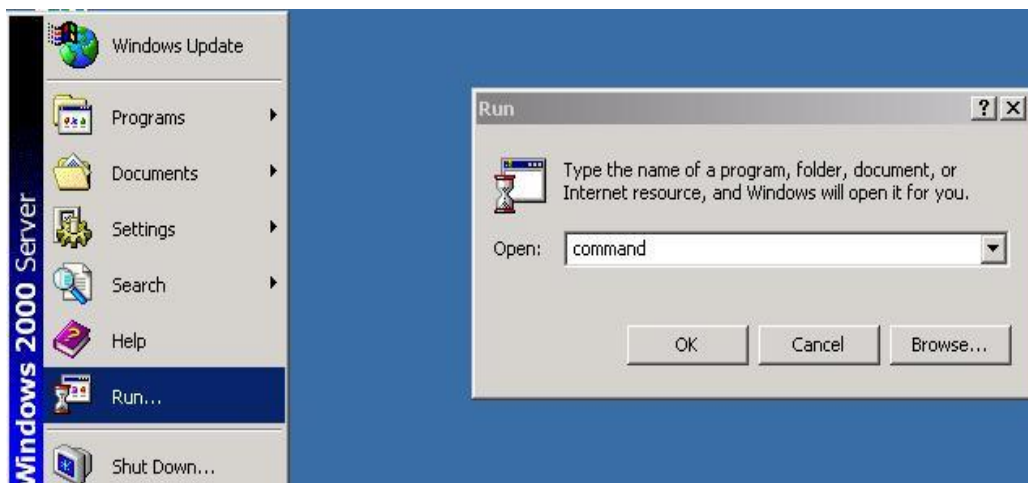
5-1. Installation and Testing

1. Take out your JetCon 3401G V2 Industrial Gigabit Media Converter from the package box.
2. Check if the DIN-Rail clip is attached to the JetCon 3401G V2. If the DIN-Rail clip is not attached to the JetCon 3401G V2, refer to **DIN-Rail Mounting** section for DIN-Rail installation.
3. To place the JetCon 3401G V2 on the DIN-Rail track or wall, refer to the **Mounting Installation** section.
4. Pull the terminal blocks off the JetCon 3401G V2 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 JetCon 3410G is operating normally.
7. Use Category 5 straight through Ethernet cables with RJ-45 connectors to connect network devices.
8. Connect one side of an Ethernet cable with a RJ-45 connector to the JetCon 3401G V2's Ethernet port (RJ-45 port), and the other side of the Ethernet cable to the network device's Gigabit Ethernet 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 JetCon 3401G V2's and the other end of device.

10. Check the LED indicator of port status (blinking green) on the JetCon 3401G V2 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 responds.

- 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.

```
C:\WINNT\System32\command.com
C:\>ping 192.168.1.1
Pinging 192.168.1.1 with 32 bytes of data:
Reply from 192.168.1.1: bytes=32 time<10ms TTL=255
Reply from 192.168.1.1: bytes=32 time<10ms TTL=255
Reply from 192.168.1.1: bytes=32 time<10ms TTL=255
Reply from 192.168.1.1: bytes=32 time<10ms TTL=255
Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>
```


6. Troubles shooting

- Make sure you are using the correct DC power supplier (DC10~ 60 V) or power adapter.
- 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

7. Technical Specifications

Technology

Standard	IEEE802.3 10Base-T IEEE802.3u 100Base-TX IEEE802.3ab 1000Base-T IEEE802.3z Gigabit Ethernet Fiber IEEE802.3x flow control and back-pressure. IEEE802.1p Class of Service IEEE802.1Q Quality of Service
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Performance

Forwarding Technology	Store and Forward technology with 64 ~1536 bytes packet forwarding ability.
System Throughput	1.48 Mpps
Packet buffer	1 Mbits
Link Loss Forwarding	Two-way loss-signature auto forwarding, configured by DIP switch.
Event Alarm	
Class of Service	2 queues for each port with 8:1 forwarding scheme for High/Low queue.
Quality of Service	Supports Tag based packet priority, IPv4 ToS and IPv6 DSCP.

Interface

Number of Ports	1x10/100/1000 Base-TX with Auto MDI/MDI-X function, Auto-Negotiation 1 x SFP socket with hot-swappable function for Gigabit Ethernet SFP Transceiver.
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Connectors	10/100/1000 Base-TX: RJ-45 SFP socket: support 3.3V Gigabit Ethernet 1.25 Gbps Fiber Transceiver and 155Mbps fiber transceiver.
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Terminal block: 4-Pin for redundant power input; 2-Pin for alarm relay output.

Cables	RJ-45 Connector: 4 pairs of Cat-5 UTP/STP cable with EIA/TIA 568B type conductor arrangement for 1000Base-T. Maximum link distance is 100 meters.
---------------	---

Configuration DIP Switch	DIP 1: Power Event Alarm Enable/Disable DIP 2: SFP speed 1000Mbps or 100Mbps DIP 3: Link Loss Forwarding Enable/Disable
---------------------------------	---

Diagnostic LED	System: Power (Green) x2 ,Link Loss Forwarding (Red) x1, Alarm (Red) x1 RJ-45 port: <ul style="list-style-type: none"> - Link/Activity (Green): On (Link), Blinking (Activity) - Speed (Amber): On (Speed 1000), Off (Speed 10/100) SFP port: <ul style="list-style-type: none"> - Link/Activity (Green): On (Link), Blinking (Activity)
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Power Requirements

System Power	DC 48V (10~60V) with polarity reverse correction and over current protection.
Power Consumption	2Watts @ DC 48V

Mechanical

Installation	DIN-Rail mount
Case	Aluminum alloy metal case with grade 31 of ingress protection.

Dimension	120mm(H) x 55mm (W) x108 mm (D) (with DIN rail clip)
Weight	900g with package 600g without package
Environmental	
Operating Temperature	-40°C ~75°C
Operating Humidity	0% ~ 95% non-condensing
Storage Temperature	-40°C ~ 80 °C
Storage Humidity	0%~ 95% non-condensing
Regulatory Approvals	
Hi-Pot	1.5KV on port to port and port to power.
EMI	FCC Class A, CE/EN55032.
EMS	EN61000-4-2,EN61000-4-3,EN61000-4-4,EN61000-4-5,EN61000-4-6, EN61000-4-8, EN61000-4-11
Shock	IEC 60068-2-27 (compliance)
Vibration	IEC 60068-2-6 (compliance)
Free Fall	IEC 60068-2-32 (compliance)
MTBF	612,000 hours

8. SFP Fiber Transceiver Order Information

Part Number	Description
SFPGSX	Gigabit SX SFP Transceiver, 850nm, multi-mode/LC, 550m
SFPGSX-w	Gigabit SX SFP Transceiver, 850nm, multi-mode/LC, 550m, -40~85°C 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°C Wide Temp.

Revision History

Edition	Date	Modifications
V1.0	11-Apr,2018	New edition

About Korenix

Less Time At Work! Fewer Budget on applications!

The Korenix business idea is to let you spend less time at work and fewer budget on your applications. Do you really want to go through all the troubles but still end up with low quality products and lousy services? Definitely not! This is why you need Korenix. Korenix offers complete product selection that fulfills all your needs for applications. We provide easier, faster, tailor-made services, and more reliable solutions. In Korenix, there is no need to compromise. Korenix takes care of everything for you!

Fusion of Outstandings

You can end your searching here. Korenix Technology is your one-stop supply center for industrial communications and networking products. Korenix Technology is established by a group of professionals with more than 10 year experience in the arenas of industrial control, data communications and industrial networking applications. Korenix Technology is well-positioned to fulfill your needs and demands by providing a great variety of tailor-made products and services. Korenix's industrial-grade products also come with quality services. No more searching, and no more worries. Korenix Technology stands by you all the way through.

Core Strength---Competitive Price and Quality

With our work experience and in-depth know-how of industrial communications and networking, Korenix Technology is able to combine Asia's research / development ability with competitive production cost and with quality service and support.

Global Sales Strategy

Korenix's global sales strategy focuses on establishing and developing trustworthy relationships with value added distributors and channel partners, and assisting OEM distributors to promote their own brands. Korenix supplies products to match local market requirements of design, quality, sales, marketing and customer services, allowing Korenix and distributors to create and enjoy profits together.

Quality Services

KoreCARE--- KoreCARE is Korenix Technology's global service center, where our professional staffs are ready to solve your problems at any time and in real-time. All of Korenix's products have passed ISO-9000/EMI/CE/FCC/UL certifications, fully satisfying your demands for product quality under critical industrial environments. Korenix global service center's e-mail is koreCARE@korenix.com

5 Years Warranty

Each of Korenix's product line is designed, produced, and tested with high industrial standard. Korenix warrants that the Product(s) shall be free from defects in materials and workmanship for a period of five (5) years from the date of delivery provided that the Product was properly installed and used. This warranty is voided if defects, malfunctions or failures of the warranted Product are caused by damage resulting from force measure (such as floods, fire, etc.), environmental and atmospheric disturbances, other external forces such as power line disturbances, host computer malfunction, plugging the board in under power, or incorrect cabling; or the warranted Product is misused, abused, or operated, altered and repaired in an unauthorized or improper way

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