



JetCon 2302

Industrial 2-Channel Fast Ethernet to Fiber Media Converter

User's Manual

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JetCon 2302

Industrial 2-Channel Media Converter

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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

JetCon 2302 is not only a compact 4-port switch, but also a 2 channel RJ45 to fiber media converter - an ideal model that would physically fit in harsh environments with intensive severe electromagnetic interference. In switch mode, JetCon 2302 is an Industrial 4-port 10/100Mbps Fast Ethernet Fiber Switch, incorporating 3.2Gbps switching fabric with non-blocking store and forward technology to fulfill the high transmission performance requirements. In converter mode, JetCon 2302 is an Industrial 2-channel 10/100 TX to 100 FX media converter with an alarm relay to trigger out a real alarm signal for port or power events.

Moreover, JetCon 2302 provides alarm relay to trigger out a real alarm signal for port or power events. To avoid interferences as well as to extend the network coverage, Single-mode or Multi-mode fiber optic ports meet your needs for up to 30KM long distance transmission.

In addition, to withstand under hazardous environmental conditions, JetCon 2302, compliant with NEMA-TS2 standard, has dual redundant power inputs with wide DC10~60V range, 1.5KV Hi-Pot isolation protection and wide operating temperature for avoiding any power interruption and providing reliable network performance. With IP31 rigid aluminum case, CE/FCC regulatory approvals and 5-year global warranty, JetCon 2302 is your reliable choice for industrial field site applications.

Two Channels Media Converter and 4 Ports Fiber Switch

The JetCon 2302 can be configured by DIP switch in two different operation modes: media converter or fiber switch. In media converter operation mode JetCon 2302 has 2 channels 10/100 TX to 100 FX. For traditional media converter it only has one channel TX to FX. Therefore, JetCon 2302 can be used to substitute two traditional media converters as a result saving cost and power use.

Switch Mode – the device works as a switch equipped with 2 10/100TX RJ-45 ports and 2 100Mbps fiber ports. The packet forwarding uses store and forward technology, which means all the packet flow that goes through the device will be checked and dropped in case if it contains error information. The MAC address table can be updated per 300 micro seconds.

Converter Mode- the device works as a 2-Channel media convert with independent traffic path, channel-A and channel-B. The forwarding technology still supports store and forward technology, but the device will not learn and update the MAC address table. All the traffic will be recognized as unknown destination packet flooding with each other and will act as a 2-channel Fast Ethernet media converter.

Wide Range Redundant Power Inputs & True Reliability

In field site applications, unstable power input always impacts on the reliability of system and causes an interruption of communication. To provide a higher reliability, JetCon 2302 has a wide range redundant power input 10~60VDC that meets the NEMA-TS2 requirements for power variation. In addition, with -25~75°C and -40~75°C (JetCon 2302-w model) wide operating temperature range, the JetCon 2302 series can ensure high performance data transmission under harsh environments.

1-1. Features

- Two Channels 10/100TX to 100FX Media Converter
- Two 10/100TX to two 100FX Fast Ethernet Fiber Switch
- RJ45 ports support Auto MDI/MDI-X, Auto negotiation
- Supports Multi-mode 2KM, Single-mode 30KM, SC connector
- 3.2Gbps Non-blocking Switch Fabric
- Fault alert for port and power
- Redundant 10~60V DC power inputs with DC polarity protection
- NEMA -TS2 Compliance (applying)
- Aluminum case with IP31 grade protection
- Negative or Positive power system for Telecom application
- Supports 1.5KV Hi-pot isolations protection
- Wide operating temperature for hazardous environment application :
JetCon 2302 : -25°C~75°C / JetCon 2302-w : -40°C~75°C

1-2. Packing checklist

JetCon 2302 includes following items:

- 1 set of JetCon 2302 with DIN Rail Clip
- Quick Installation Guide x1



JetCon 2302



Quick Installation Guide

To get more information about operating instructions, please visit <http://www.korenix.com/downloads.htm> for user's manual download.

2. Hardware Description

This session introduces JetCon 2302 enclosure port information, panel design and describes how to install the system with other equipments.

2-1. Dimensions

2-2. Front Panel

2-3. Bottom View

2-4. Wiring System Power Inputs

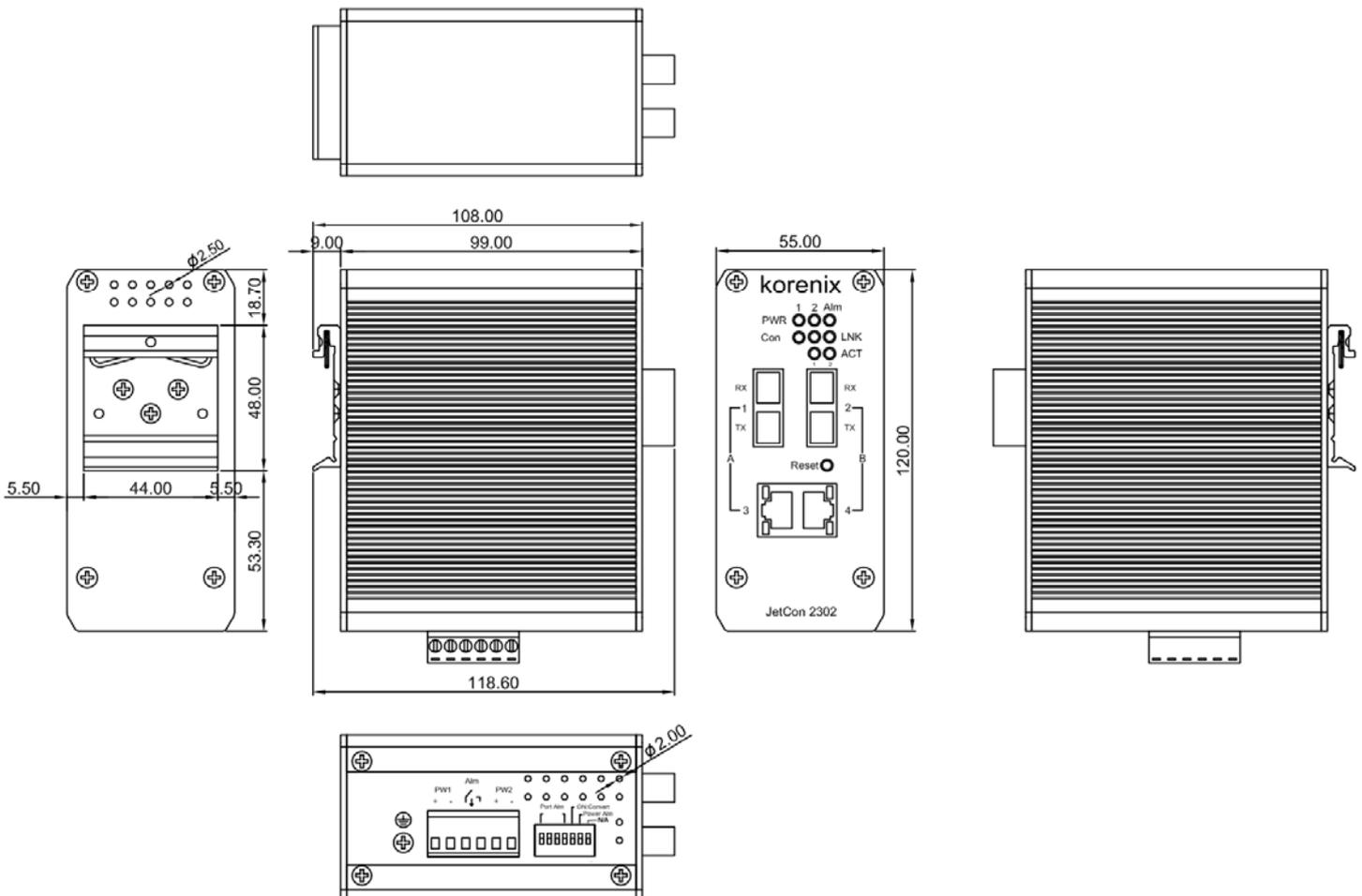
2-5. Wiring the Alarm Event Relay Output

2-6. System LED indicators

2-7. Connecting the Ethernet Port

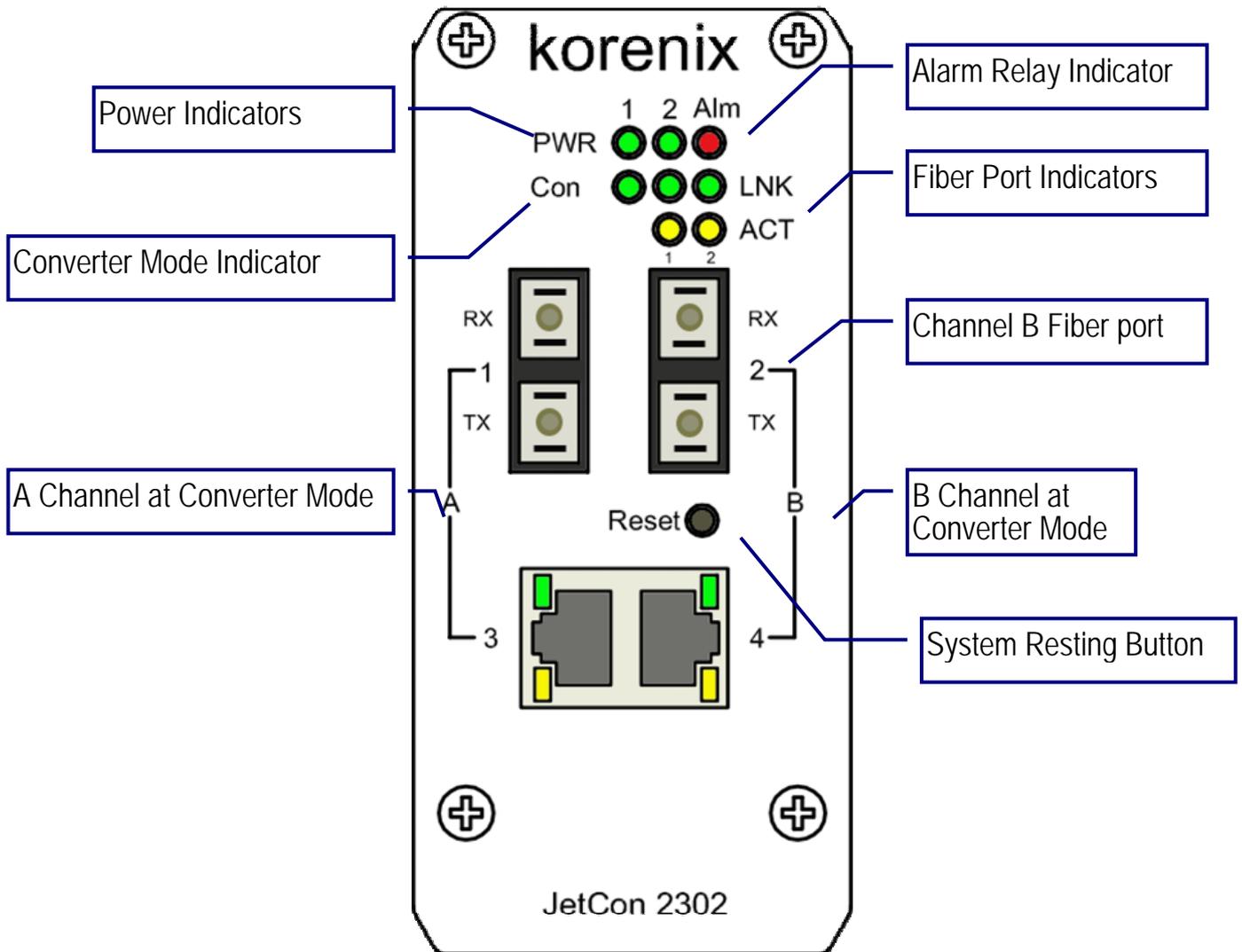
2-1. Dimensions

The dimensions of JetCon 2302 are **120 mm (H) x 55 mm (W) x 108 mm (D)**. Detailed mechanical design drawings are illustrated below:



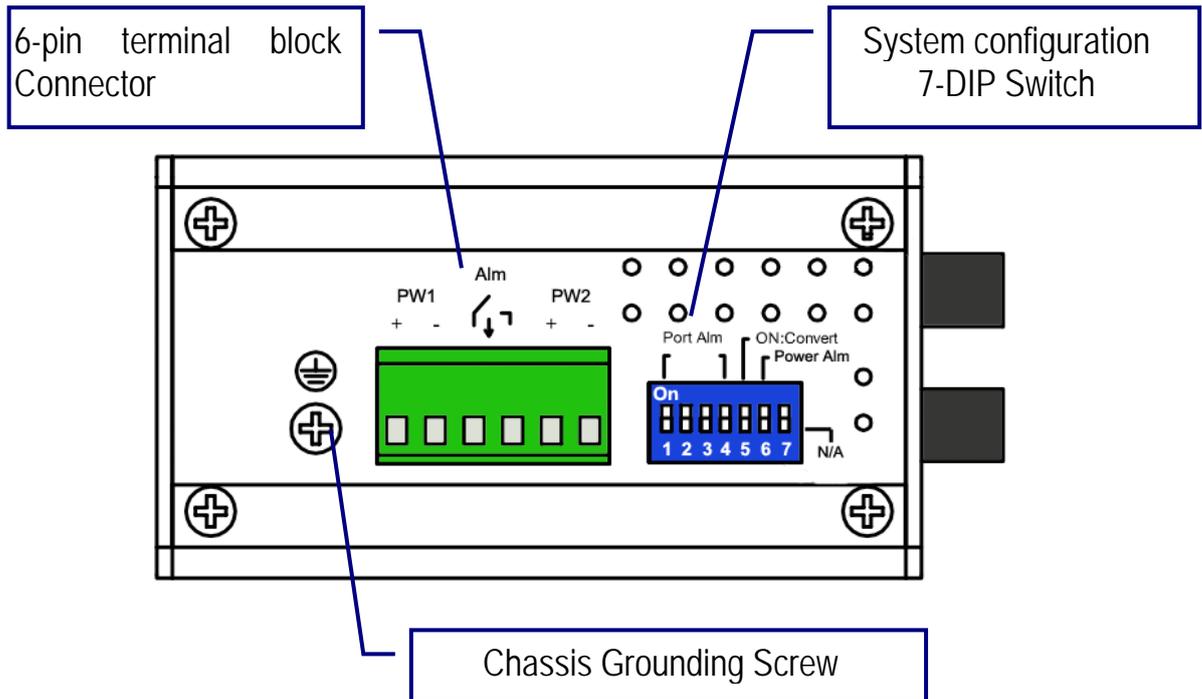
2-2. Front Panel

The Front Panel of the JetCon 2302 is shown in Figure A as below.



2-3. Bottom View

The bottom side of JetCon 2302 is shown in the below Figure B. It includes one 7-pin DIP switch for system configuration and one 6-pin removable terminal block for the redundant power inputs and event alarm relay output.

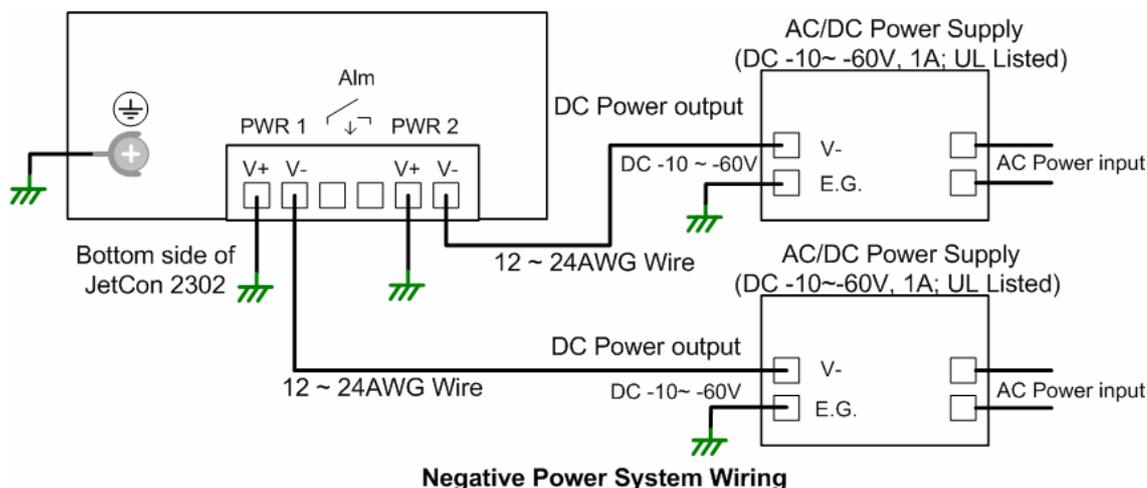
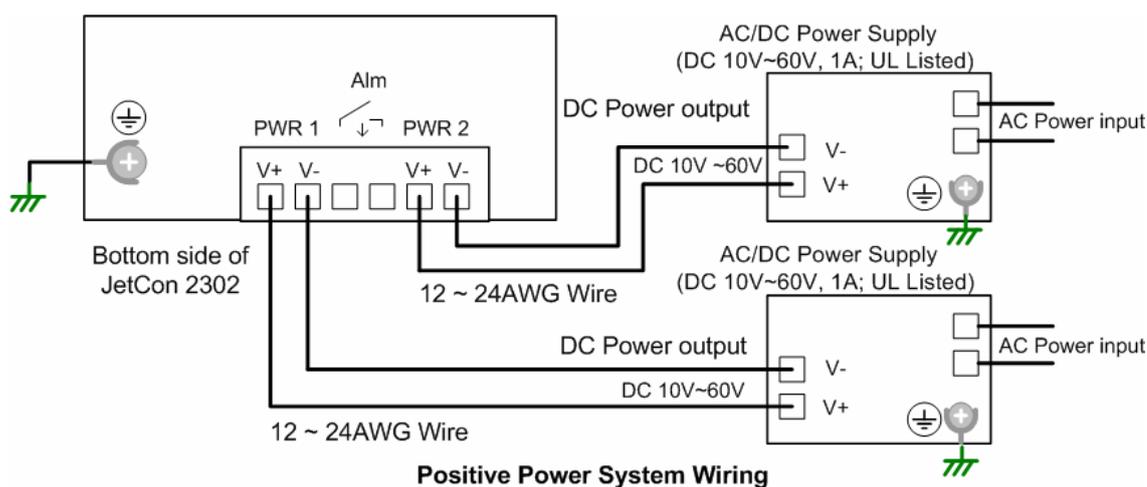


To provide better communication quality and to prevent the interference, it is strongly recommended to make well earth grounding by the “Chassis Earth Ground Screw”.

For other configuration of DIP Switch, power input and alarm relay wiring, please refer to the following sessions.

2-4. Wiring System Power Inputs

The JetCon 2302 supports DC 10~60V wide range redundant power input and also supports negative power system for telecom applications. The following diagrams show the wiring architectures of positive and negative power systems.



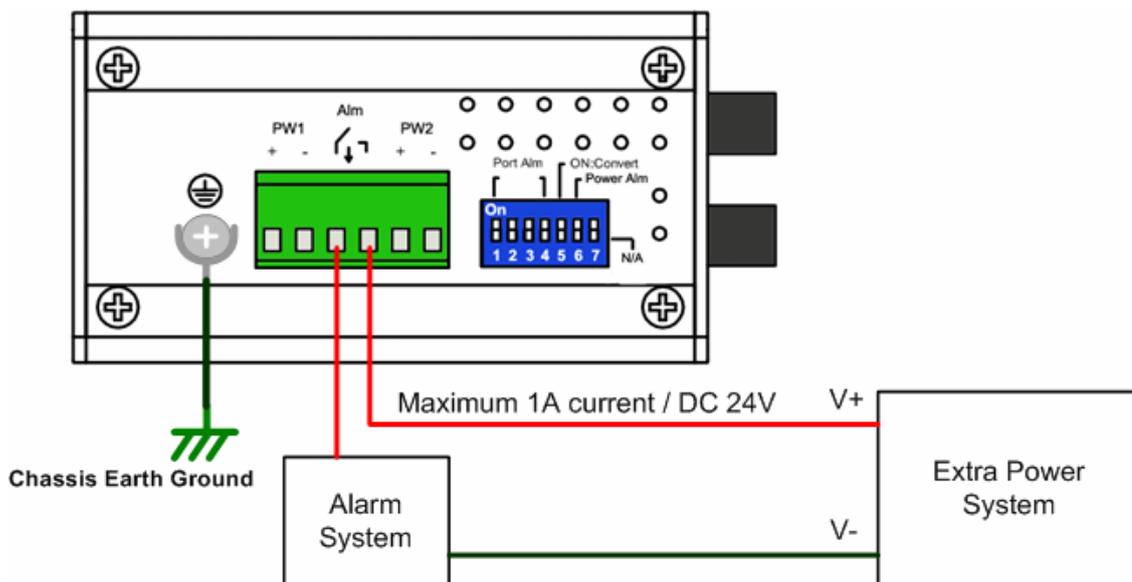
1. Insert the power wires into the V+ and V- contacts of the terminal block connector respectively.
2. Tighten the wire-clamp screws to prevent the DC wires from being loosened.
3. Power 1 and Power 2 support power redundancy and polarity reverse protection functions.
4. The device accepts positive or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

Note: Please ensure all wirings and connectors are well connected with the device before powering on the systems.

2-5 Connecting the Alarm Relay Output

JetCon 2302 supports one dry alarm relay output for power and port event to alert administrator.

The specification of relay conductor is 24W when it connects with a DC 24V power source. The maximum current is 1A. Following diagram shows how to make an alarm circuit.



For information about the alarm relay configuration, please refer to the Session- 4.

2-6. System LED Indicators

The front panel of JetCon 2302 includes 2 Power LEDs, 1 LED for alarm relay active indication, 1 LED for operating mode indication, 2 LEDs per each Fiber port for link and activity indication. The following table describes the functions for each LED indicator.

LED	Status	Description
PWR1, PWR2	Green on	The power is on applying.
	Off	No power.
Alm	Red on	Event alarm relay is active and forms a short circuit.
	Off	No event occurs.
Con.	Green on	It indicates device is working at converter mode, and the port 1 and 3 are grouped as channel-A, port 2 and 4 are grouped as channel-B.
Fiber port 1, 2	Green on (Link)	The fiber port is linked up and well connected with far end fiber port.
	Yellow blinks (Activity)	The fiber port is on communicating with far end port.
RJ-45 port 3, 4	Green on (Link)	The Ethernet port is linked up and well connected with far end port.
	Yellow blinks (Activity)	The Ethernet port is on communicating with far end port.

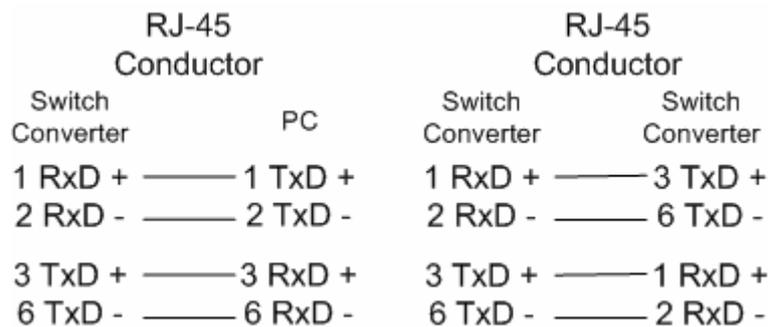
Table 1

2-7. Connecting the Ethernet ports

The JetCon 2302 supports 2 10/100TX RJ-45 ports and 2 100Base-FX fiber ports. The wiring methods for the RJ-45 and fiber ports are described in this session. They also include the specifications of fiber port.

RJ-45 Fast Ethernet port

The RJ-45 port supports 10Base-T and 100Base-TX with Auto MDI/MDI-X and auto negotiation features that allow users to connect with other devices with straight through or cross-over cabling. It also supports speed auto-negotiation for 10/100Mbps. The following diagram shows the straight through and cross-over cablings.

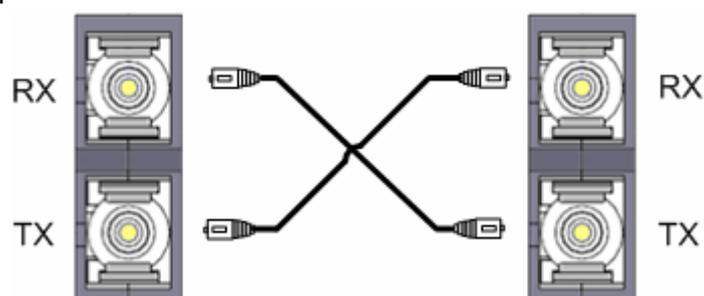


The RJ-45 ports support auto-MDI/MDI-X function without any cable change in case an Ethernet cable is used to connect other devices, such as computers, switches or hubs.

Fast Ethernet Fiber port

The Fiber port supports IEEE 802.3u 100Base-FX standard for the single mode or multi-mode type fiber cable with different link distances. For more cable information, please refer to the product label stick on the rear side of the device.

Before installing the fiber cable, please ensure that the cable type is matched with the specifications of fiber transceiver. The following diagram shows how to install fiber cable between 2 fiber ports. The RX must cross connect with the remote device's TX port, and TX port must cross connect with remote device's RX port.



Specification of Fiber port

The fiber port is provided in the JetCon 2302 only with different link distances shown on the label that sticks on the rear side. To get a good transmission quality, the attenuation of fiber cable should be noticed and be considered when executing system design. To help you with your system design, the specifications of fiber transceiver are shown in the following table.

Fiber Port type	Parameter
Multi-mode 2KM	Link Distance: 2KM (Max.)
	Wave-length: 1310nm
	Launch Power: -20dBm ~ -14dBm
	Receive sensitivity: -31dBm~0dBm
	Link Budget: 11dBm
Single-mode 30 KM	Link Distance: 30KM (Max.)
	Wave-length: 1310nm
	Launch Power: -15dBm ~ -8dBm
	Receive sensitivity: -34dBm~0dBm
	Link Budget: 19dBm

Notes: for more than 30KM distance transmission, please contact with your distributor for the long distance transmission product inquiries.

IEEE 802.3x Flow Control and Backpressure

The IEEE 802.3x flow control feature is available only in the switch mode.

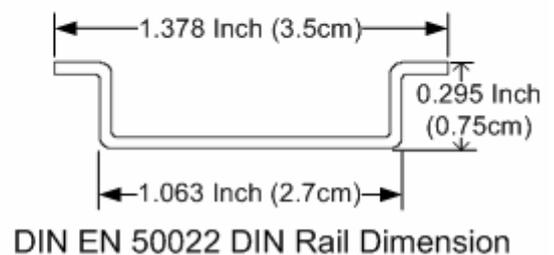
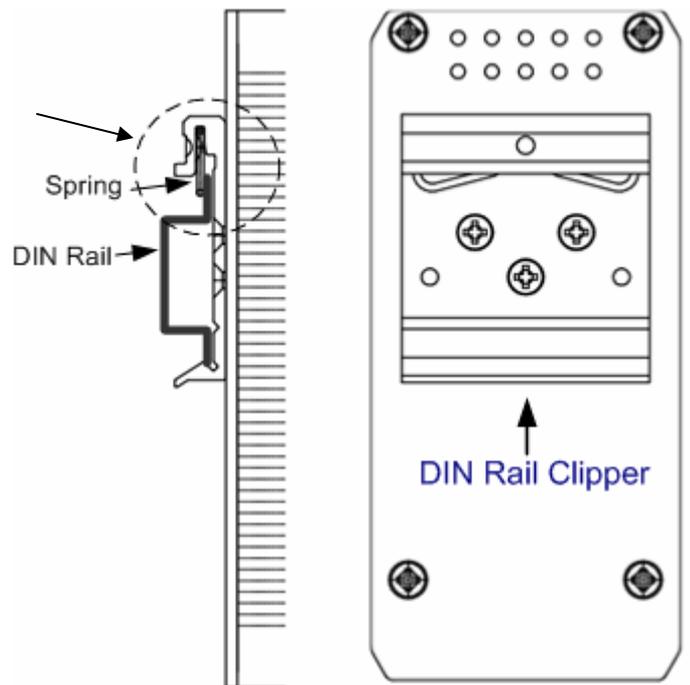
3. DIN Rail Mounting

The DIN Rail clip is screwed on the rear panel of the device which supports EN 50022 type rail installation. The following diagram includes EN50022 rail dimensions for your reference.

The DIN rail should be behind the spring when installing the JetCon device onto the standard DIN Rail.

Follow the steps below to mount the JetCon 2302 on 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 rack.
4. To remove the JetCon 2302 from the track, reverse the steps above.



4. System Configuration

All of the JetCon 2302 features are configured by a 7-pin DIP Switch, after changing the settings, JetCon 2302 should execute resetting procedure.

The following table describes the function of each DIP switch:

DIP switch	Status	Description
DIP 1~4	ON	Port link down event alarm enabled.
	Off	Port link down event alarm disabled. (Default)
DIP 5	ON	Enabled Converter mode
	Off	Switch mode. (Default)
DIP 6	ON	Enabled power event alarm
	Off	Disabled power event alarm (Default)
DIP 7	Not Available(N/A)	

Note: It is necessary to execute system reset or power reset when changing the operating mode.

4-1. Event Alarm Configuration

The alarm relay output can be triggered and can form a closed circuit by the port or power event. In the DIP Switch, DIP 1~4 is for port link down event and DIP 6 is for power. The alarm relay conductor supports DC 24V / 1A currents rating. For wiring information, please refer to session 2-5 “Connecting the Alarm Relay Output”.

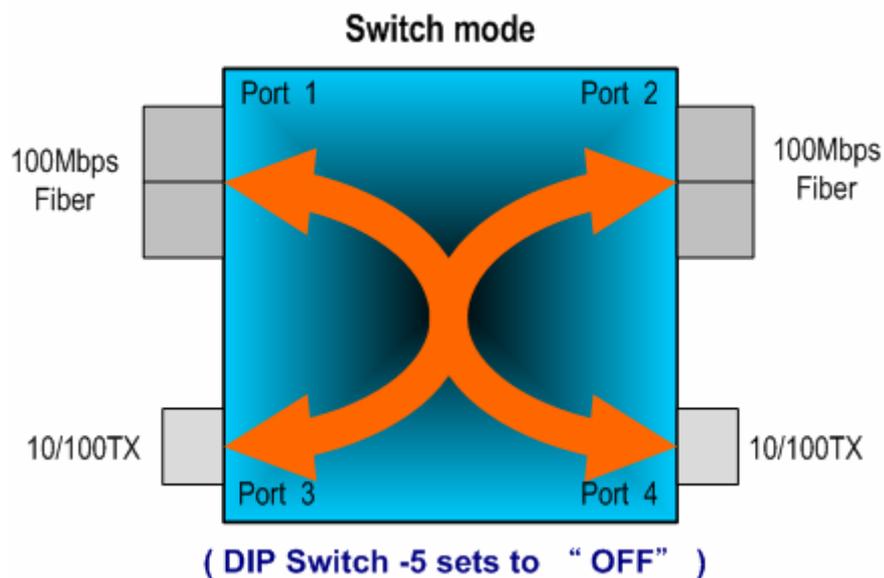
4-2. Switch / Converter Mode

The JetCon 2302 features 2 operating modes – Switch and Converter. Both operating modes use store and forward technology, but with different network performance. The mode configuration is controlled by DIP switch 5, when it turns on, the mode will change to converter. The converter mode

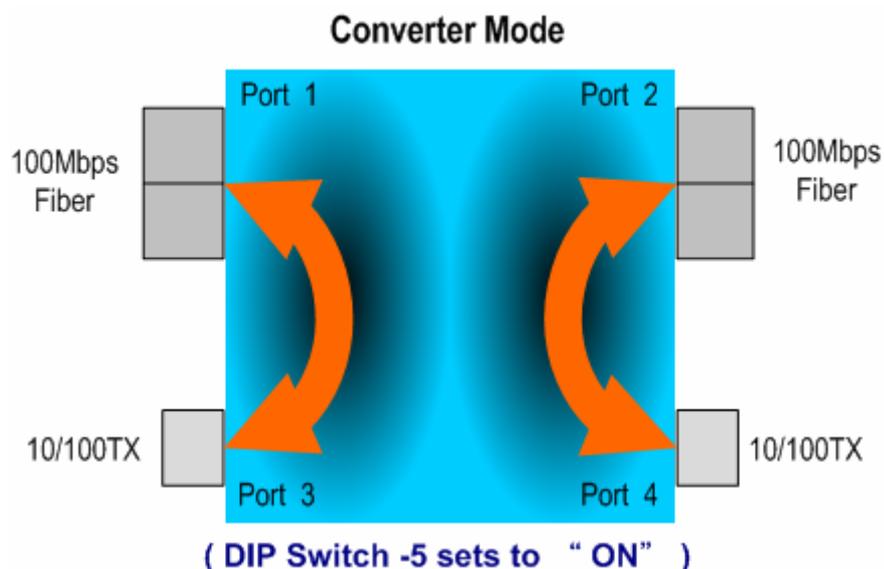
makes the device a cost effective solution eliminating the need of multiple fiber network installations.

The exact operating behaviors of Switch mode and Converter mode are shown in the following descriptions and figures.

Switch Mode – the device works as a switch, which is equipped with 2 10/100TX RJ-45 ports and 2 100Mbps fiber ports. The packet forwarding uses store and forward technology, which means all the packet flow that goes through the device will be checked and dropped in case if it contains error information. The MAC address table can be updated per 300 micro seconds.



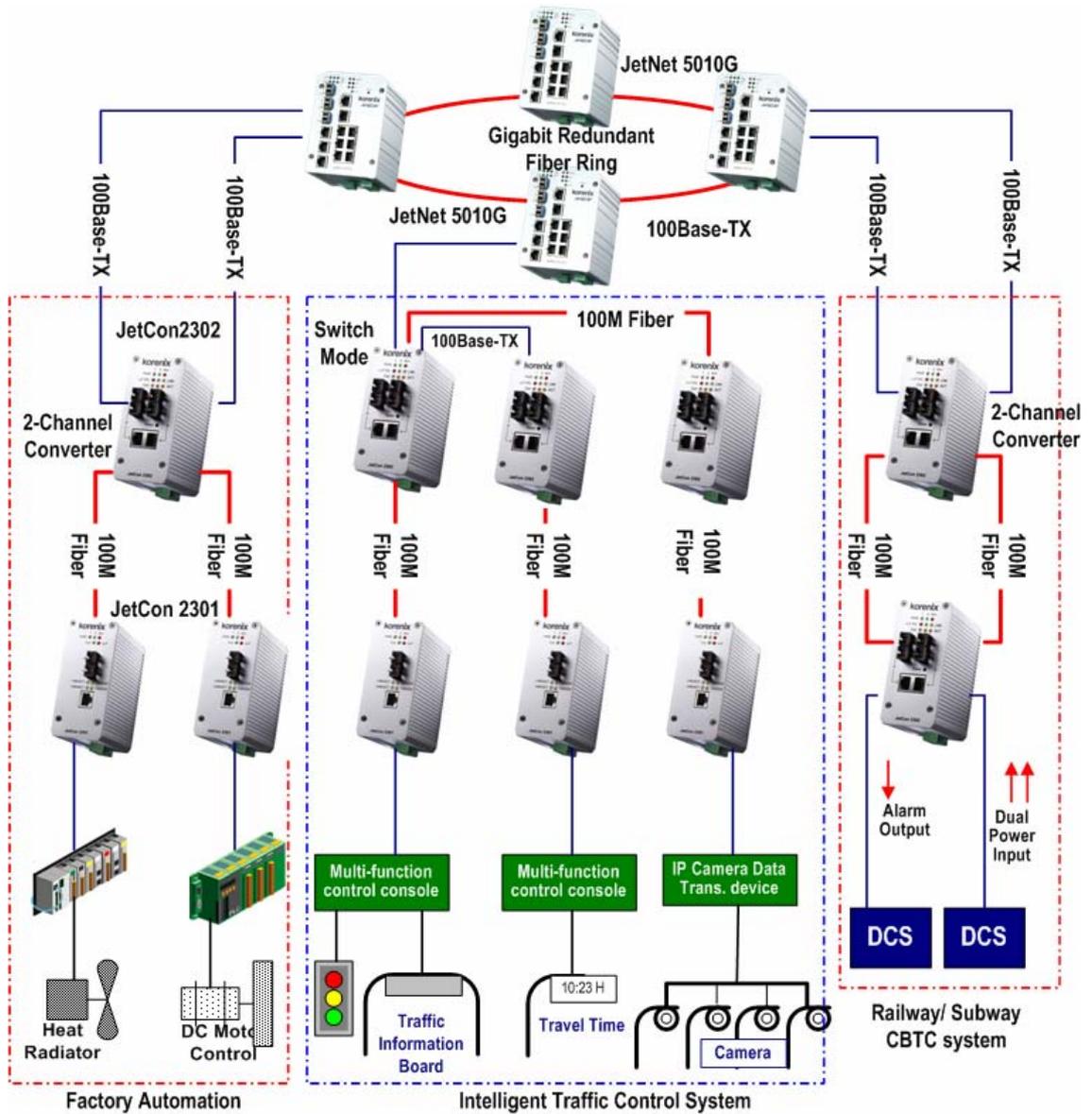
Converter Mode- the device works as a 2-Channel media convert with independent traffic path, channel-A and channel-B. The forwarding technology still supports store and forward technology, but the device will not learn and update the MAC address table. All the traffic will be recognized as unknown destination packet flooding with each other and will act as a 2-channel Fast Ethernet media converter.



Note: It is necessary to execute system reset or power reset when changing the operating mode; otherwise the new operating setting will not apply.

5. System Installation

Following figure illustrates a typical application of JetCon 2302 in Switch mode and Converter mode:



In the application diagram, JetCon 2302 provides graceful anti-electromagnetic interference that ensures the reliable communication not interfered by the noises generated from the motors of facility, railway/subway power system or Intelligent Traffic Control System.

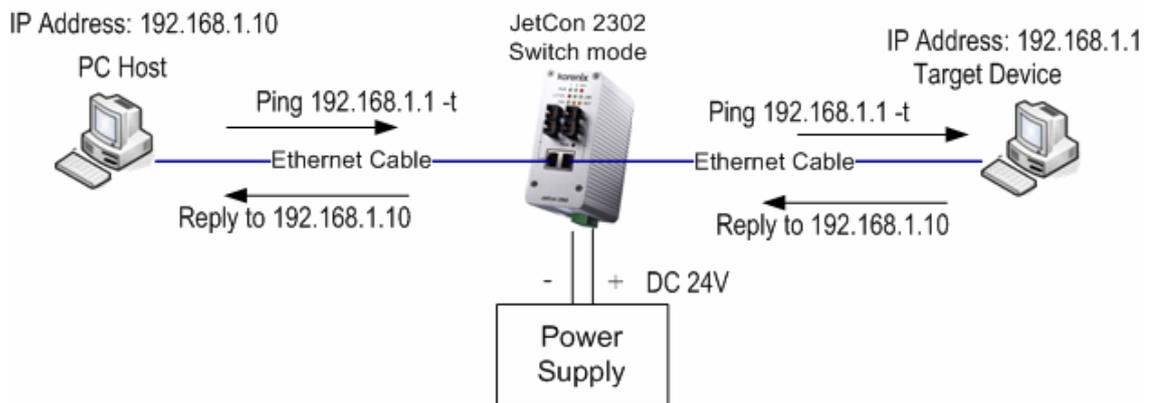
The dual channel media converter mode allows reducing the integration

cost by simply replacing 2 independent media converters. The switch mode provides flexible connection ability for the network construction.

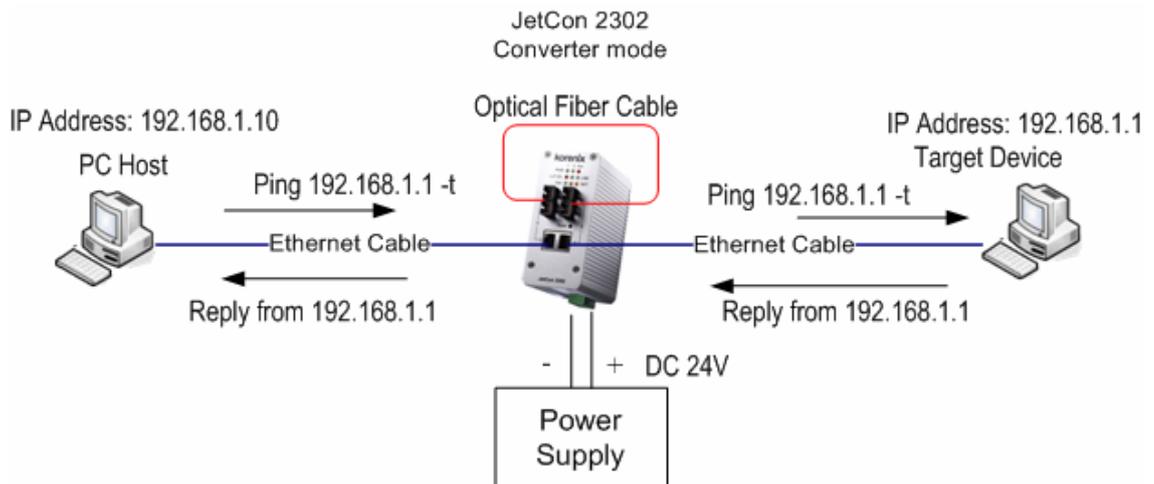
5-1. Installation and Testing

1. Take your JetCon 2302 out from the package box.
2. Check if the DIN-Rail clip is attached to the JetCon converter. If the DIN-Rail clip is not attached to the device, check with your supplier to solve the problem.
3. To place the device on the DIN-Rail track, refer to the **DIN-Rail Mounting** section.
4. Pull the terminal block off from the device and wire the power lines. Refer to the **Wiring 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.
6. Check the LEDs for PWR1 and PWR2 to make sure that your JetCon 2302 is operating normally.
7. Use Category-5 or above straight through Ethernet cables with RJ-45 connectors to connect the JetCon 2302 RJ-45 and your desktop PC.
8. Connect the other RJ-45 port with Category-5 UTP/STP cable with another targeting device which provides IP address and supports ICMP protocol.
9. Make sure the JetCon 2302 is working at switch mode. If it doesn't, set the DIP switch to off and reset the JetCon 2302.
10. Execute "Ping 192.168.1.1 -t" from the desktop pc command line mode and make sure these are echo packets from target device. The figure of testing architecture is as follows.

Test Diagram of JetCo 2302



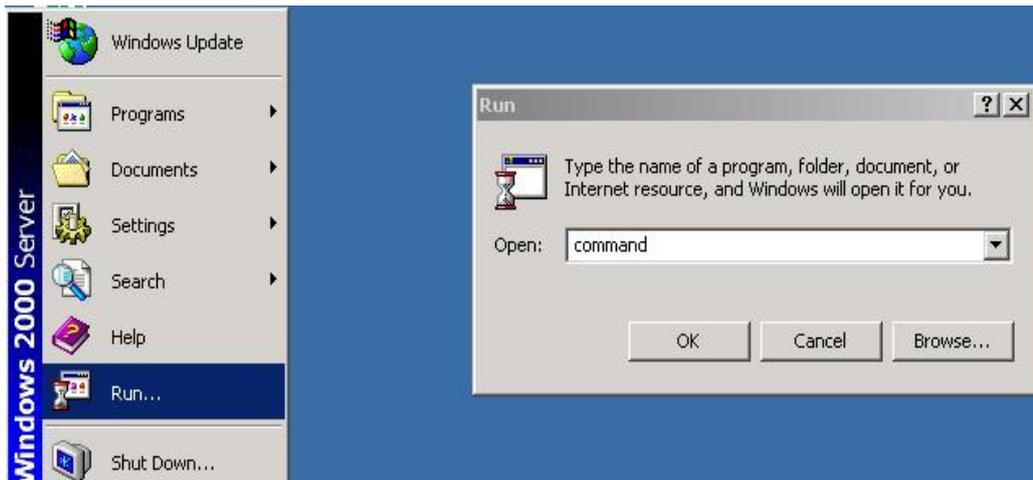
11. Change the mode to converter mode and connect both fiber ports using proper fiber cable, then test the fiber port by sending the ICMP packet process as the procedure-10. The figure of testing architecture is as follows.



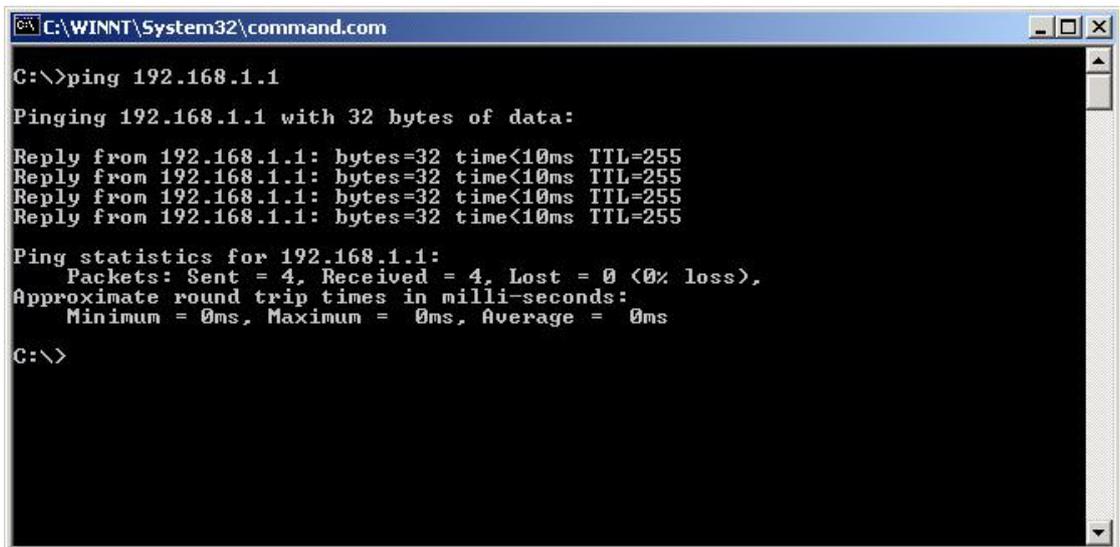
[Note] Make sure that the connected network switches support MDI/MDI-X function. If they do not support this function, use a crossover Ethernet cable.

The following information illustrates how to enable the command line mode and execute ping command in Windows System.

1. To enable the “Command Line mode”, click on **Run** in the Start menu, type **Command**, and click on **OK** to continue.



2. Type **ping 192.168.1.1** command to check the connection. Here we use IP address 192.168.1.1 as an example.



3. Repeat step 10 to make sure that the connection of each device linked to the JetCon Converter is successfully established.
4. Power on the PC host, activate the Command Line mode, and ping the connected Ethernet device by typing “ping 192.168.1.1 -t” command to see if it will respond. Remember that the PC host IP address is the same subnet address as that of target device – 192.168.1.1.
5. The parameter-”t” allows you to continue to ping the network device, as shown in the figure below.

6. Troubleshooting

- Make sure you are using the correct DC power supplies and that the voltage measured at the power connector is DC10 to 60 V. Do not use power supplies with DC output over 60V. It may damage the device.
- Select Ethernet cable 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, 6 Ethernet cables are suitable for systems with 10 Mbps transmission speed. For systems with 100 Mbps transmission speed, Category 5, 6 Ethernet cables provide the only suitable specifications for this environment. You also need to make sure that the distance between each node cannot be longer than 100 meters (328 feet).
- If the power LEDs goes off when the power cord is 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	IEEE 802.3 10Base-T IEEE 802.3u 100Base-TX IEEE 802.3u 100Base-FX IEEE 802.3x Flow Control and Back Pressure
Performance	
Switch Technology	3.2 Gbps Store and Forwarding Technology
System forwarding performance	1.19 Mega packets per second, 64 bytes packet size. (Switch Mode) 14880 pps for 10Base-T 148810 pps for 100Base-TX/ FX
Mac address	1K MAC address entries with automatic learning and aging (Switch Mode only)
Packet Buffer Forwarding Technology	512Kbits shared memory Store and Forward
Operating Mode	Converter/ Switch mode selected by DIP switch Switch Mode: data exchange on 4 ports (Channel A, B exchange) Converter mode: data forwarding on independent channel (A, B)
Digital Output	Dry Relay Output with 1A @24V DC ability
Interface	
Ethernet copper port	2 × 10/100TX ports with Auto MDI/MDI-X, Auto Negotiation.
Fiber port	2 × 100Mbps Fiber port, SC or ST (optioned). JetCon 2302-m: Multi-mode (Channel A,B) JetCon 2302-s : Single-mode (Channel A,B) JetCon 2302-ms : Multi-mode (Channel A), Single-mode (Channel B) (Please contact with sales)
Ethernet Copper Cable	RJ-45 Ethernet port : 100 Meters 10Base-T: 2-pairs UTP/STP Cat-3,4 TIA/EIA 568-B cable 100Base-TX : 2/4 pairs UTP/STP Cat.5 TIA/EIA 568-B cable
Ethernet Fiber Cable	JetCon 2302-m: 2KM distance, 50~62.5/125um Multi-mode fiber Cabel. JetCon 2302-s: 30KM distance,8~10/125um Single-mode fiber cable.
Diagnostic LEDs	System Power (Green on) : Power 1 , 2 Relay Alarm: Active (Red) Op. Mode: Convert (Green on) Fast Ethernet Fiber Port(Channel A/B): Link (Green on) ,Activity (Yellow Blinking) Fast Ethernet RJ-45 Port: Link(Green on) ,Activity (Yellow Blinking)
Reset Button	For Operating mode change
DIP Switch	DIP Switch 1~4: Port event alarm control, Enable(On)/ Disable (Off) DIP Switch 5: Operating mode select, Converter mode (On)/ Switch mode (Off)

	DIP Switch 6: Power Event Alarm Control, Enable(On)/ Disable (Off)
	DIP Switch 7: Not available.
Power Connector	6-pin Removable Terminal Block
Digital Output	Included in 6-pin Removable Terminal Block
Power Requirements	
System power	DC 10~60V with polarity reverses correction. Supports Positive/Negative power system
System power consumption	6Watts / DC 24V
Mechanical	
System Installation	DIN Rail mount installation
Enclosure protection	Ingress Protection code - 31
Dimensions	99 (D) x55(W)x 120(H), unit:mm (without Din-rail kit)
Weight	0.505Kg / 0.675Kg with package
Environmental	
Operating Temperature	-25°C ~75°C
Operating Humidity	0% ~ 95% non-condensing
Storage Temperature	-40°C ~ 75 °C
Storage Humidity	0%~ 95% non-condensing
Regulatory Approvals	
EMI	CE/EN 61000-6-4, CISPR-16-1-2:2003, CISPR-16-2-1:2003, CISPR-16-2-3:2006, CISPR-22 :2005+A1 :2005(9.6), FCC part 15B Class A
EMS	CE/ EN 61000-6-2 :2005 IEC 61000-4-2 :2008, IEC 61000-4-3 :2006+A1 :2007,IEC 61000-4-4 :2004, IEC 61000-4-5 :2005, IEC 61000-4-6 :2008, IEC 61000-4-8 :1993+A1 :2000
Safety Shock	Hi-pot Testing – AC 1.5KV IEC 60068-2-27
Vibration	IEC 60068-2-6
Free fall	IEC 60068-2-32 with Unit Box

Revision History

Edition	Date	Modifications
V01	23-July,2010	New edition
V02	26-Aug,2010	Remove LLF function, modify all drawing.
V1.0	30-Aug, 2010	

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 staff is 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