JetCon 1301 / 1301-48V(*JetCon 1301-48V is Phase Out)

Slim-sized Fast Ethernet to Fiber Media Converter

Best Buy

ETHERNET POWERLINK

CE FC RoHS

EtherCAT | LLF | Low Latency | Ethernet POWERLINK

Switching Converter | Store & Forward Mode | Pure Converter Mode | -10~70°C

- One 10/100 TX port to One 100FX port media converter
- Dual Forwarding modes- Switching and Pure converter
- Supports Auto MDI/MDI-X, Auto Negotiation
- Supports Multi-mode 2KM, Single-mode 30KM
- Extreme Low Data Forwarding Latency- 1.6 x 10^{-6} Sec
- Auto Link Loss Forwarding for fault detection
- Wide range of DC18-32V and DC36-60 (JetCon 1301-48V) power inputs with DC polarity protection
- Aluminum case with IP31 grade protection
- Supports AC 1.5KV Hi-Pot isolation protection
- Supports single fiber transmission – WDM
- Operating temperature -10~70°C (-40~80°C wide operating temperature model available by request)

Overview

JetCon 1301 is a compact 1-port Fast Ethernet media converter designed as small as a cigarette box, making it an ideal model that would physically fit into a chassis with limited space, such as machinery control box and duct assembly room. It also supports switch forwarding mode with abnormal packet filtering and pure converter mode for extreme low latency requirement – fieldbus and EtherCAT, which needs invariant forwarding latency in 64~1522 bytes packet length. For easy maintenance and time-saving, JetCon 1301 features remote Link Loss Forwarding technology which provides remote link down signal forwarding, acknowledging link events occurred on each end of JetCon 1301. To activate forwarding mode and LLF functions, simply adjust DIP switch and reset the converter and the reconfiguration will be applied.

For the field site harsh environmental installations such as vibrating machinery or duct assembly room applications, JetCon 1301 can be easily mounted directly onto DIN rail and powered with DC 18 ~ 32V for applications, where DC input is not available.

Besides, for particular 48V DC industrial environments, JetCon 1301-48V model is available to be powered with DC 36~60V input. With the Ingress Protection grade 31 and rigid aluminum case, JetCon 1301 can survive and have excellent performance under -10~70°C temperature range, severe electromagnetic interference and outcoming vibration.

The high MTBF value of over 500,000 hours, 5-year global warranty and endurable performance of JetCon 1301 series give you the reliable choices for hazardous applications.

Reliable Life Vibration & Life Shock Tests

To ensure the reliability of the networking devices while operating under harsh environments, Korenix JetCon 1301 has passed the following life vibration and life shock tests :

- IEC 61000-2-6 life vibration
  5~100Hz/Amplitude 1mm, 0.7G/ 90Min. X.Y.Z. 6 axis
  3~50Hz/Amplitude 3.5mm, 1.0G/ 90Min. X.Y.Z. 6 axis
- IEC 61000-2-27 life shock
  50G, 11ms duration, X,Y, Z, 3 shock/axes (Total 18 shocks)

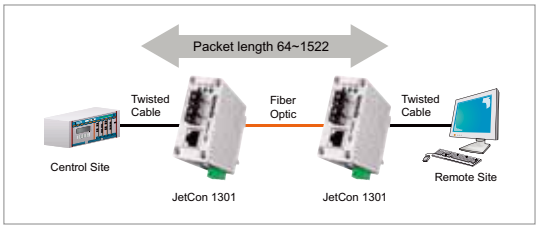
Switching Converter Mode and Pure Converter Mode

The JetCon 1301 can be used in two different modes, switching converter mode and pure converter mode. The store-and-forward technology is implemented in switching converter mode. It will filter out abnormal packets to maintain network efficiency, and support the data forwarding rate up to 148810 pps in full wire speed with packet length from 64 to 1522 bytes. In the pure converter mode, the JetCon 1301 only converts signal between copper and fiber port without any packet check, and operates in the speed of minimum data forwarding latency.

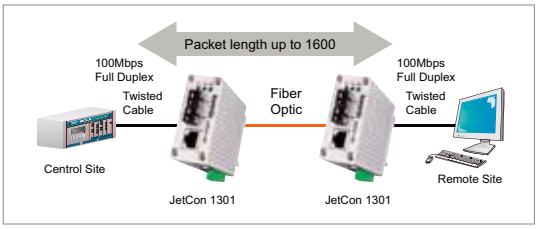
Traditionally, media converter is used for the signal conversion between electronic and optical. Most of media converters are not capable of handling all kinds of packet sizes. A major drawback is that they cannot support 10/100Mbps auto negotiation and auto detection function for the cross-over or straight cable. The pure converter mode has the advantage of supporting extreme low transfer latency, even when the packet is with a CRC error, and when the packet length is below 64 bytes.

Some of special devices need pure converter and they need it to operate simply without any features. JetCon 1301 can be configured as Switching converter or Pure Converter mode by a DIP Switch. For CSMA/CD compliance, the UTP port supports 100Mbps Full Duplex when setting JetCon 1301 as pure converter. If setting as 100Mbps half duplex mode, the available link distance will be 60 meters only. In the switch mode, it will not have this limitation - the link distance can be reached up to 100 meters. In pure converter mode, the JetCon 1301 will operate with the minimum latency, 1.6 micro second. The 2 ports of JetCon 1301 series are inter-connected via MII signals, therefore the internal switch MAC and packet buffer are not used. Besides, the packet length will not be limited and will reach up to 1600bytes. The updated configuration will be available after resetting power.

Configured as Switching Converter mode:



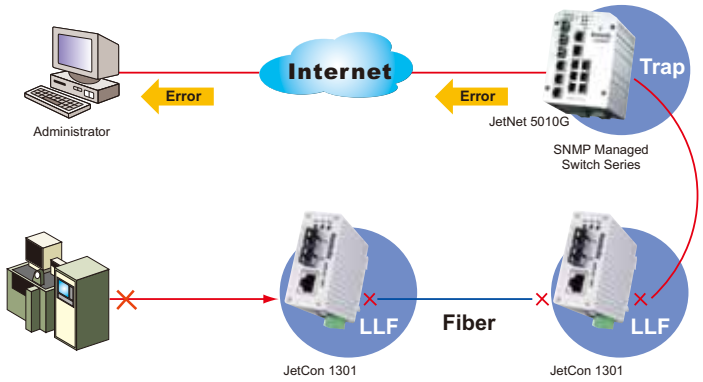
Configured as Pure Converter mode:



Auto Fault Detection through Link Loss Forwarding

When using traditional fiber converters, users often encounter the following problem: a fiber converter acting like an ordinary unmanaged 2-port switch. When one of the fiber converter's ports fails (e.g. the TX port), the other one (e.g. FX port) continues to receive data via the media (e.g. fiber), confusing the device on the other end of the media by indicating that the connection is still intact. But, by the time the disconnection is found, this error causes a great amount of loss.

If a port loses the connection for any reason, it will activate Link Loss Forwarding to shut down the other port, as a result, allowing the device on the other end of the media to detect the disconnection. The administrator over the network can be informed of the disconnection immediately, and can react promptly to the situation, greatly reducing loss caused by any link failure.

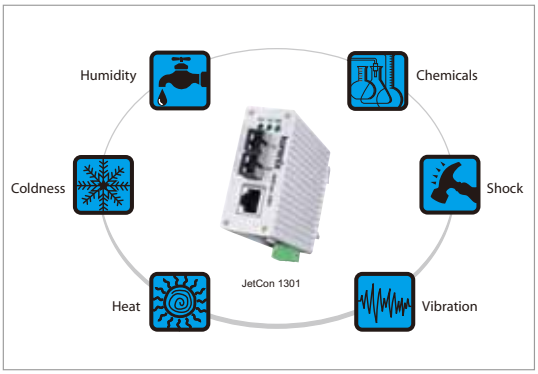


The Real Time Ethernet Solution - EtherCAT Test

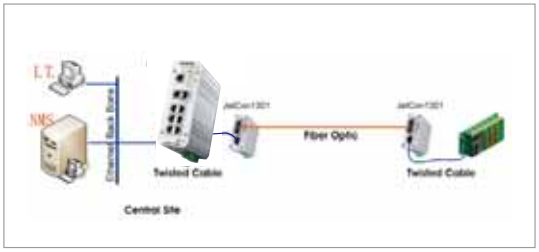
JetCon 1301, an Industrial 10/100Base-TX to 100Base-FX Multi-Mode (JetCon1301-m)/ Single- Mode (JetCon1301-s) fiber converter, has passed the system test of an open Real-Time Ethernet solution, EtherCAT. Cooperating with the testing laboratory of Backhoff, Korenix sets a successful milestone to enable Real Time Ethernet-EtherCAT, the fastest "industrial Ethernet control in the world", over fiber optics. For communication tasks, not only the defined latency (cycle time) is important, but the jitter also has to be limited. During the system test, there is no noticeable Jitter between two JetCon 1301 converters connected via fiber end, whereas EtherCAT devices attached to the other Ethernet end. The system has been setup and tested to meet all criterions of EtherCAT protocol. For standard Ethernet jitter, specifications of only 100 µs to 3 ms are possible.

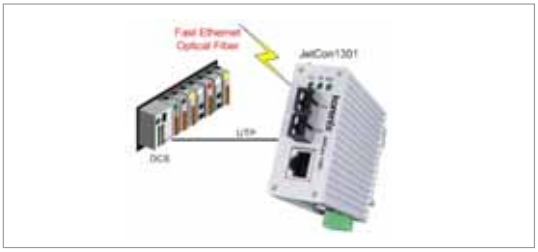
Reliable Mechanical Design

Industrial converters are often placed in harsh environments and are required to run non-stop. The quality of industrial converter is constantly being tested by rugged conditions, such as high or low temperature conditions, impact, vibration, or corrosion. To cope with demanding industrial environments, the aluminum alloy case of JetCon Industrial Converter is rigid, shock-proof, and conforms to IP31 housing design. In order to prevent power lines from damage caused by falling dust particles and water drops in an industrial environment, Korenix's engineers specially designed the terminal block for power and relay at the bottom of the unit, greatly reducing failures caused by this environment.

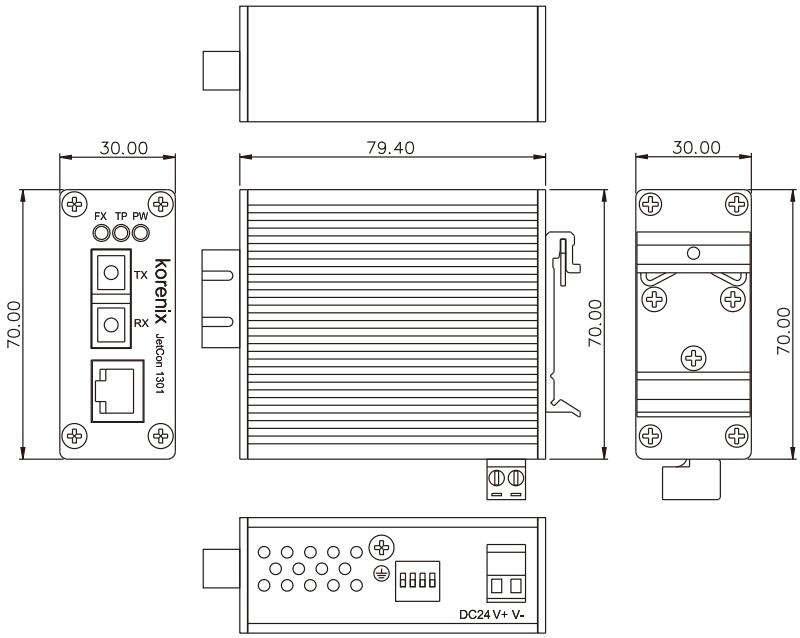


Application





Dimensions (Unit = mm)



Specification

Technology

Standard: IEEE802.3 10Base-T,IEEE802.3u 100Base-TX IEEE802.3u 100Base-FX,IEEE802.3x Flow Control and Back-Pressure

Packet transfer mode:

Support Switch mode and Pure Converter mode. This feature is select by DIP-switch.

The Switch mode will begin to forward the received data only after it received the frame completely, the forwarding latency depends on the packet length and the packet length support 64 to 1600Bytes. The pure converter operating algorithm is different with switch mode; it will direct transfer Ethernet signal without any frame checking

Link Loss Forward: Enabled/Disabled by DIP-Switch 1

Hi-pot Testing: Passed AC1.5KV Hi-pot tesing on port-port, power-case and port-power

Interface

Number of Ports: 1 x 10/100 Base-TX with Auto MDI/ MDI-X, Auto-Negotiation functions

1 x 100Base-FX

Connectors:

10/100 Base-TX: RJ-45

100Base-FX: Duplex SC for multi-mode or single-mode fiber

Power: 2-Pin Terminal Block

Cables:

RJ-45 connector: supports Cat.3, Cat.4, Cat.5 unshielded twisted pair or shielded twisted pair cable. The link distance is maximum 100 meters

Fast Ethernet Fiber Transceiver:

SC connector: supports multi-mode or single-mode optical fiber

Multi-mode fiber: 50/125um or 62.5/125um

Single-mode fiber: 8/125um, 9/125um or 10/125 um

JetCon1301-m, Multi-mode: 2KM (Max.)

Wave-length: 1310nm

Min TX Power:-19dBm

Max TX Power:-14dBm

Max RX Sensitivity:-30dBm

Link budget:11dBm

JetCon1301-s, Single-mode: 30KM (Max.)

Wave-length:1310nm

Max TX Power:-8dBm

Min TX Power:-15dBm

Max RX Sensitivity:-34dBm

Link budget: 19dBm

JetCon1301-s(WDM-A), Single-mode: 30KM (Max.)

Wave-length: TX 1310nm, RX 1550nm

Max TX Power:-3dBm

Min TX Power:-9dBm

Max RX Sensitivity:-31dBm

Link budget: 22dBm

JetCon1301-s(WDM-B), Single-mode: 30KM (Max.)

Wave-length: TX 1550nm, RX 1310nm

Max TX Power:-3dBm

Min TX Power:-9dBm

Max RX Sensitivity:-31dBm

Link budget: 22dBm

JetCon1301-m(48V), Multi-mode: 2KM (Max.)

Wave-length: 1310nm

Min TX Power:-19dBm

Max TX Power:-14dBm

Max RX Sensitivity:-30dBm

Link budget:11dBm

JetCon1301-s(48V), Single-mode: 30KM (Max.)

Wave-length:1310nm

Max TX Power:-8dBm

Min TX Power:-15dBm

Max RX Sensitivity:-34dBm

Link budget: 19dBm

Configuration DIP Switch:

DIP 1: Link loss forwarding Enable /Disable.

DIP 2: RJ-45 Auto-Negotiation/Forced 100Mbps Full Duplex

DIP 3: Fiber Full Duplex/Half Duplex

DIP 4: Switch/Pure Converter mode.

Diagnostic LED:

System: Power (Green)

RJ-45 port: Link (Green ON)/Activity (Green Blinking)

Fiber port: Link(Green ON)/Activity(Green Blinking)

Power Requirements

System Power: 2 pins terminal block for power input with auto polarity reverse.

JetCon1301: DC 24V (18~32V), 47~63Hz

JetCon1301-48V: DC 48V (36~60V)

Power Consumption:

JetCon1301: 3.5 Watts @ DC 24V(Maximum)

JetCon1301-48V: 4 Watts@ DC 48V(Maximum)

Mechanical

Installation: DIN-Rail mount

Case: Aluminum metal case with IP31 grade case protection for drop-waterproof and dustproof.

Dimension:

70mm(H) x 30mm (W) x 89mm (D) (with DIN rail clip)

70mm(H) x 30mm (W) x 80mm (D) (without DIN rail clip)

Weight:

374g with package

292g without package

Environmental

Operating Temperature: -10 ~70°C

(JetCon 1301-w/1301-w(48V) -40~80°C)

Operating Humidity: 0% ~ 95% (non-condensing)

Storage Temperature: -40 ~ 80°C

Storage Humidity: 0%~ 95% (non-condensing)

Hi-Pot: AC1.5KV on port to port and port to power

Regulatory Approvals

EMI: FCC Class B, CE/EN55022.

EMC immunity interface:

EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11

Shock: IEC60068-2-27

Vibration: IEC60068-2-6

Free Fall: IEC60068-2-32

MTBF: 506,819 Hours, MIL-HDBK-217F GB standard

Warranty: 5 years

Ordering Information

JetCon 1301-m Slim-sized Fast Ethernet to Fiber Media Converter, SC, Multi-mode/2KM

Includes:

- JetCon 1301-m
- Quick Installation Guide

JetCon 1301-s Slim-sized Fast Ethernet to Fiber Media Converter, SC, Single-mode/30KM

Includes:

- JetCon 1301-s
- Quick Installation Guide

JetCon 1301-s (WDM-A) Slim-sized Fast Ethernet to Fiber Media converter, simplex SC, Single mode 30KM WDM A Type (Tx1310/Rx1550nm)

Includes:

- JetCon 1301-s (WDM-A)
- Quick Installation Guide

JetCon 1301-s (WDM-B) Slim-sized Fast Ethernet to Fiber Media converter, simplex SC, Single mode 30KM WDM B Type (Tx1550/Rx1310nm)

Includes:

- JetCon 1301-s (WDM-B)
- Quick Installation Guide

JetCon 1301-m(48V) Slim-sized Fast Ethernet to Fiber Media Converter, SC, Multi-mode/ 2KM, for 48V DC(36~60V)

Includes:

- JetCon 1301-m (48V)
- Quick Installation Guide

JetCon 1301-s(48V) Slim-sized Fast Ethernet to Fiber Media Converter, SC, Single-mode/ 30KM, for 48V DC(36~60V)

Includes:

- JetCon 1301-s (48V)
- Quick Installation Guide