JetCon 2401 Series

Industrial Serial to Fiber Media Converter

Quick Installation Guide

V1.4
www.korenix.com

Introduction

JetCon2401 is a Multi-serial to fiber media converter which has RS-232/RS-422/RS-485 triple mode circuits with auto baud rate and direction control functions. It extends the distance of serial communication to 5KM (JetCon2401-m Multi-mode Optical Fiber) or 40KM (JetCon2401-s Single-mode Optical Fiber) and also provides good immunity of EMI/EMS. For the ESD protection, JetCon2401 also passed the 15KV ESD testing on serial line.

To ensure nonstop transmission in hazardous environment, JetCon2401 supports wide operating temperature range, -20℃~70℃ model (JetCon2401).

Further more, JetCon2401 supports wide range power input (DC/AC) and DIN rail mount for quick and easy installation.

Package Checklist

Unpack the box, you will find

➢ JetCon 2401 Industrial serial to fiber media Converter

➢ Quick Installation Guide

➢ DIN rail mount kits

JetCon2401

QIG

Mounting the Unit

➢ Din-Rail mount: screw up the DIN rail mount kit with 4 screws and mount JetCon2401 on the DIN Rail.

Grounding JetCon2401

There is one earth grounding pole include in power-input connector. Connect the earth grounding of JetCon2401 which is within power-input terminal block to ensure system safety and prevent noise.
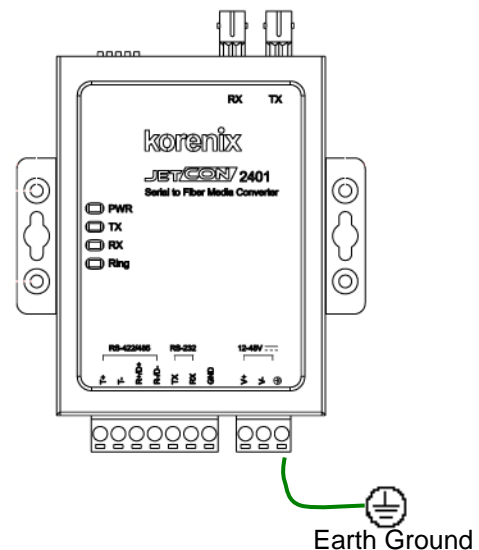
Wiring the Power Inputs

1. Insert the positive and negative wires into the V+ and V- contact on the terminal block connector.

V+ V- GND

Accept 24AWG wire.

Earth Ground
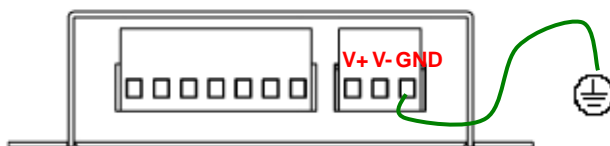
2. Tighten the wire-clamp screws to prevent the power wires from being loosened.

Notes: The recommended working voltage is DC24V (DC12~ 48 V) or AC24V (AC 12~32V) with polarity reverse protection.

Connecting to serial line

The JetCon2401 provides triple mode circuits for RS-232/RS-422/RS-485 2/4-wires and extend these signals to 5KM or 40KM by optical fiber cable. The converter operating architecture can also configure as a PTP (Peer to Peer) or SFR (Serial Fiber Ring) to enlarge the serial communication infrastructure and link more JetCon2401.

To ensure the quality of serial line signal, JetCon2401 provides 2 termination resistors for the RS-422/485 TX and RX signal by DIP switch enabled/Disable. About the DIP Switch setting, please refer to DIP Switch setting table.

The following information will show the different serial signal connectivities for your reference.
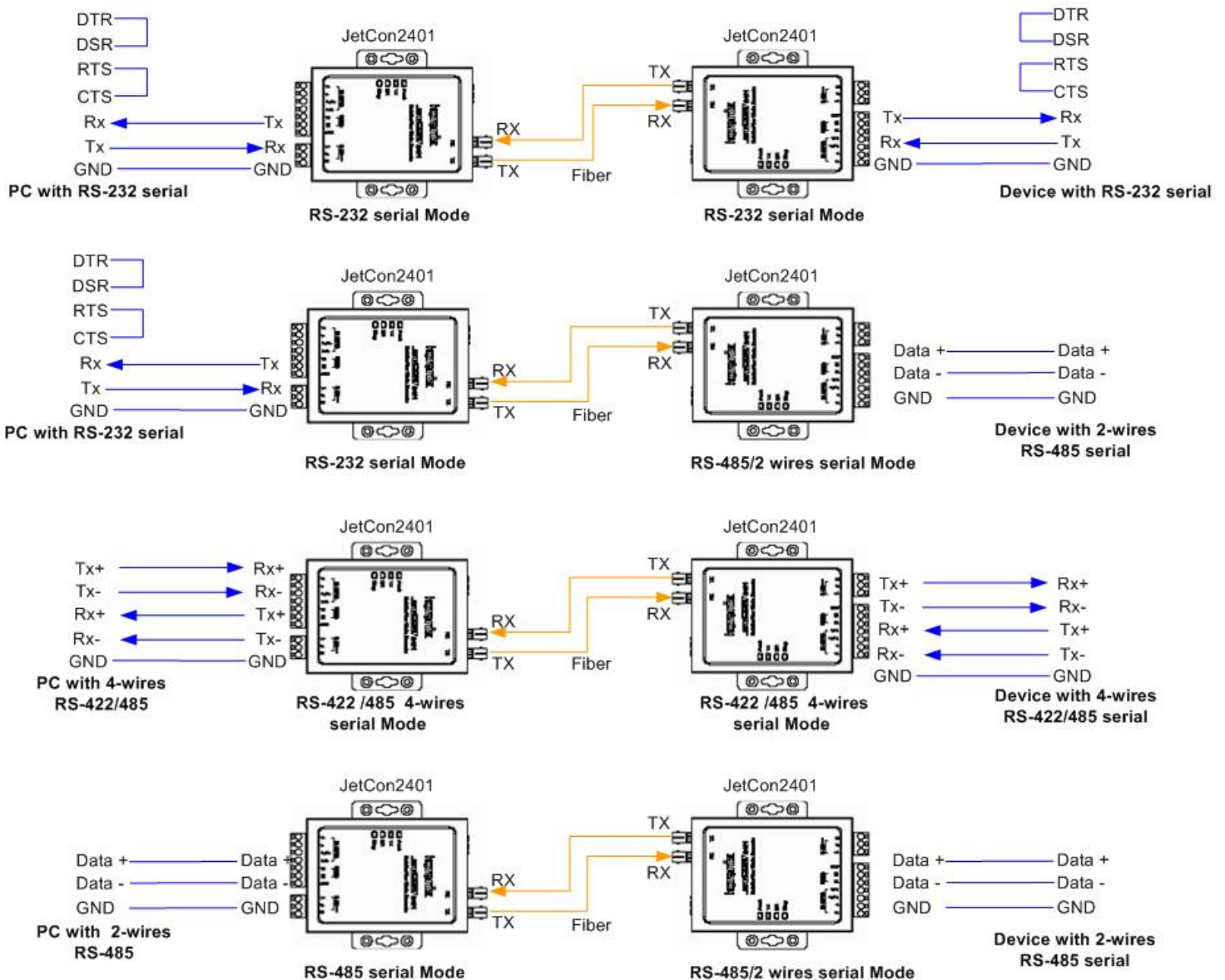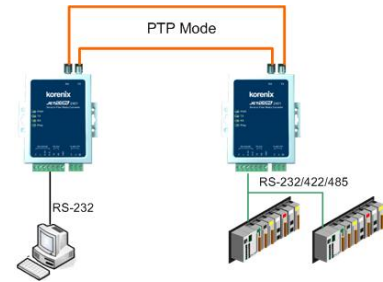
Connecting the Optical Fiber

The Fiber Optical link architecture supports PTP and SFR mode for different purposes.

1. PTP Mode (Peer to Peer)

The PTP (Peer to Peer) mode provides connection between 2 nodes. When working on this mode, JetCon 2401 can transmit data and receive it at same time, which means JetCon 2401 is working at full duplex mode.

2. SFR Mode (Serial Fiber Ring)

To extend the transmission distance and to save the fiber cable cost, JetCon 2401 can link to each other as a ring architecture, in this mode the JetCon 2401 only provides half duplex transmission and all of data communication is controlled by the host device.
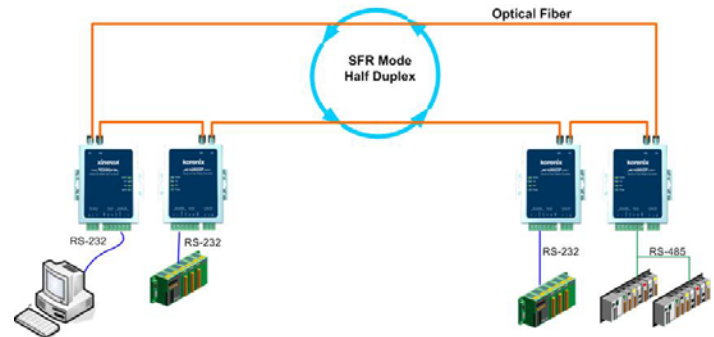
When the JetCon 2401 is working at SFR mode, there are some signal latencies will be casued by the device and the fiber cable. The following information will indicate those parameters for the link node and distance calculation.

Device Data Blocking Time= 550×10^{-6} Sec;

Propagation Delay of Fiber Cable= 3.33564×10^{-9} Sec/m

JetCOnn 2401-m Node propagation delay=112×10^{-9} Sec

JetCon 2401-s Node propagation delay=54×10^{-9} Sec

The Delay Time of SFR Ring should small than Data Blocking Time.

For example 1: JetCon 2401-M node to node distance is 5KM, then the maximum node to be supported is 32.

550×10^{-6} Sec/ (16.6782×10^{-6} Sec + 0.112×10^{-6} Sec) = 32 nodes.

Example 2 : JetCon 2401-S node to node distance is 40KM, then the maximum node to be supported is 4.

550×10^{-6} Sec/ (133.43×10^{-6} Sec + 0.054×10^{-6} Sec) = 4 nodes.

Beside, the distortion of the fiber wave-form will effect the availiable data rate, the following table indicates the avaliable node and forwarding rate that have been tested in lab with 2m fiber cable.

	2401-s		2401-m	
	Node	Rate	Node	Rate
RS-232 RS-422/485 4-w RS-485 2-w	32	115.2kbps	32	115.2kbps
RS-232 RS-422/485 4-w RS-485 2-w	16	230kbps	16	230kbps
RS-232 RS-422/485 4-w RS-485 2-w	8	460kbps	8	460kbps

RS-232 RS-422/485 4-w RS-485 2-w	4	921.6kbps	4	921.6kbps

Additional Note: According the SFR architecture, each device and fiber fiber segment has propagration delay and light signal latency; So, we suggest the serial communication host pulling interval time should be enalrged and over the data blocking time. The suggestion interval time is 1ms.

The table below illustrates fiber transceiver specifications.

Model	Fiber (um)	Connecter	Wavelength(um)	TXPwr(min)	TxPwr(Max)	RxPwr(Min)	RxPwr(Max)	LinkBudg(dBm)	Distance(km)
JetCon 2401-m	Multi-mode 50~62.5/125	ST	820nm	-12dBm	-9dBm	-28dBm	N/A	16dBm	5km
JetCon 2401-s	Single-mode 8~10/125	ST	1310nm	-9dBm	-8dBm	-27dBm	N/A	18dBm	40km

TxPwr(Min):Minimum Launch Power   TxPwr(Max):Maximum Launch Power

RxPwr(Min):Maximum Receive Sensitivity   RxPwr(Max):Minimum Receive Sensitivity

Link Budget=Minimum Launch Power –Maximum Receive Sensitivity

Note: To ensure your fiber converter transmission/receiving of data between the 2 nodes, the attenuation of the optical fiber cable should be smaller than the fiber converter's Link Budget.

JetCon2401 DIP Switch Setting

Function	DIP Switch 1	DIP Switch 2
RS-422/4 wires (Default)	OFF (Default)	OFF (Default)
RS-485/4 wires	OFF	OFF
RS-485/2 wires	OFF	ON
RS-232	ON	OFF

Function	DIP Switch	Switch position
120 Ohm Terminator (RX)	Switch 3	Off (Disable)/On (Enable), Default off
120 Ohm Terminator (TX)	Switch 4	Off (Disable)/On (Enable), Default off
Point to Point /Serial Ring	Switch 5	Off (PTP)/On (SFR), Default off (PTP)

Note: After adjusting the DIP-switch, please reboot the unit to activate the new settings.

Dimensions

24.7mm(H) x 96mm (W) x 99mm (L) with DIN
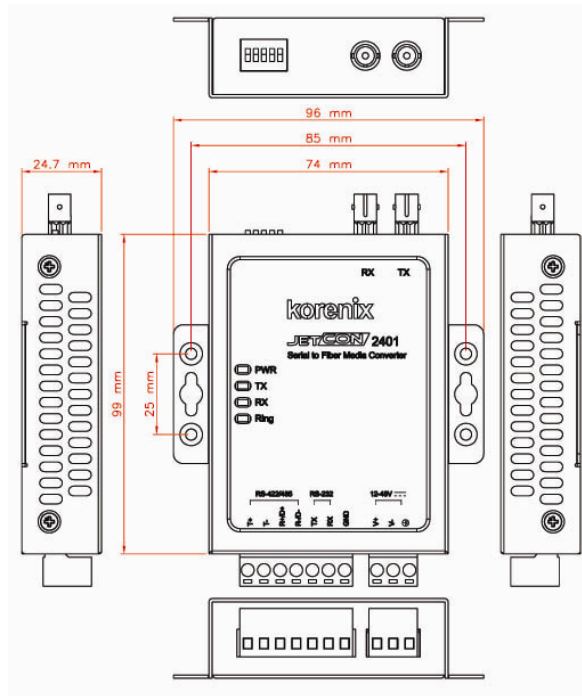
Regulatory Approvals

Safety : CE/EN60950

EMI: FCC Class B, CE/EN55022, CE/EN61000-3-2

    CE/EN61000-3-3

EMS: EN61000-4-2 ESD, Level 3, Criterion performance A

    EN61000-4-3 RS, Level 3, Criterion performance A

    EN61000-4-4 EFT, Level 3, Criterion performance A

    EN61000-4-5 Surge, Level 3, Criterion performance A

    EN61000-4-6 CS, Level 3, Criterion performance A

Korenix Customer Service

KoreCARE is Korenix Technology's global service center, where our professional staffs are ready to answer your questions at any time.

Email of Korenix global service center: KoreCARE@korenix.com

Revision History			
Version	**Issued Date**	**Description**	**Editor**
V1.2	3/9,2009	Add SFR ring information about number of node and distance.	Richard
1.3	18,Mar,2009	Add SFR support nodes and rate information	Richard
1.4	9-Ap,2009	Add SFR notes	Richard