FA-ISOCON UNIVERSAL ISOLATED NETWORK ADAPTER

Product Guide

3505 HUTCHINSON ROAD
CUMMING, GA 30040-5860

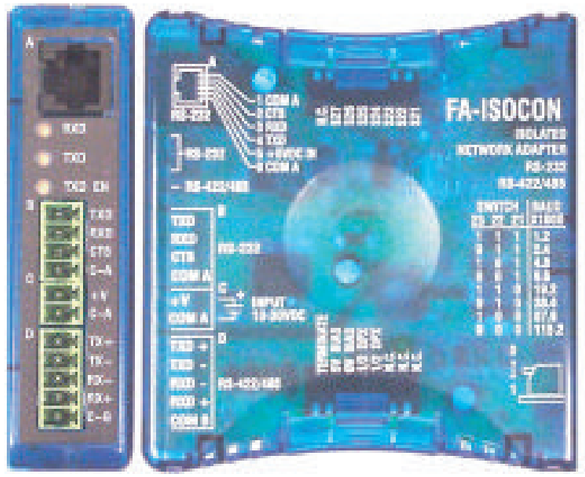
Description:

The FA-ISOCON Universal Isolated Network Adapter is used to place AutomationDirect.com CPUs and other RS-232 devices such as operator interfaces and industrial computers on a RS-422 (4-Wire) or RS-485 (2-Wire) multi-drop network. The Network Adapter converts RS-232 signal levels to isolated RS-422 or RS-485 signal levels. All AutomationDirect.com CPU ports that support multi-drop networking protocols can be used with the FA-ISOCON.

The FA-ISOCON features Automatic Network Transmitter Enable so that an RTS output is not required on the connected RS232 device.

The FA-ISOCON is a direct functional replacement for the FA-ISONET.

Expanded manual FA-ISOCON-M can be downloaded at www.facts-eng.com.



FA-ISOCON COMPONENTS:

(A) FA-ISOCON Isolated Network Adapter Module with attached mounting bracket

(B) One foot reverse modular cable with two RJ12 6P6C plugs to connect the FA-ISOCON Network Adapter to *AutomationDirect.com* CPU's with RJ12 connectors

(C) One foot cable with RJ12 6P6C plug and RJ11 4P4C plug to connect the FA-ISOCON Network Adapter directly to the DL340 CPU.

(D) DB25 Male to RJ12 6P6C Connector (for 405 CPUs, DCM, or 25-Pin PC DTE Serial Ports)

(E) DB9 Female to RJ12 6P6C Connector (for 9-Pin PC Serial Ports)

Top Dipswitch (Transmitter Control)

Transmitter Enable Delay Selection (Only needed if using ANTE)			
Delay Time	S21	S22	S23
8.33ms(1200)	ON	ON	ON
4.16ms (2400)	ON	ON	OFF
2.08ms (4800)	ON	OFF	ON
1.04ms (9600)	ON	OFF	OFF
0.52ms (19200)	OFF	ON	ON
0.26ms (38400)	OFF	ON	OFF
0.17ms (57600)	OFF	OFF	ON
0.08ms (115200)	OFF	OFF	OFF

Transmitter Control				
Delay Time	S24	S25	S26	S27
ANTE (2-wire or 4-wire)	OFF	OFF	OFF	OFF
CTS Controlled (2-wire or 4-wire)	ON	ON	OFF	ON
Transmitter Always ON (4-wire only)	ON	ON	ON	OFF

Which Transmitter Control Should I Use?

ANTE (Automatic Network Transmit Enable) is recommended for all applications except 4-wire point to point and 4-wire master node.

In a 4-wire point-to-point application or a 4-wire multi-drop application where the FA-ISOCON is the master node select, select 'Transmitter Always ON' for both nodes.

Which 'Transmitter Enable Delay' Should I Use With ANTE?

Normally for the FA-ISOCON to work properly, the Transmitter Enable Delay Time must be set to correspond to the baud rate of the devices on the network.

In some cases, a device may respond faster than one character time. If that is the case, the Transmitter Enable Delay Time must be shorter. For example an AutomationDirect.com GS Series Drive communicating at 9600 baud responds faster than the 1.04ms associated with this baud rate. If the FA-ISOCON dipswitches are set to 1.04ms there may be some communication issues. To overcome this issue, the delay time is set to 0.52ms (normally associated with 19200 baud), thus eliminating the potential communication issue. With devices using transmitter delay times other than the typical one character time, some trial and error may be required to determine the best setting.

Bottom Dipswitch (Network Interface)

Terminate

To enable the factory installed 120Ω termination resistor, set the TERMINATE switch ON. Set the switch OFF for all intermediate drops along the network (factory default). Termination resistors should only be installed at the extreme ends of a daisy chain network.

5V Bias / 0V Bias

For optimum performance, RS-422 and RS-485 receivers should be in the inactive state (marks) when their inputs are open or floating. A receiver's inputs will be floating when all transmitters on the network are disabled. The FA-ISOCON includes bias resistors to force the receivers into the inactive state when the network is idle. The network biasing must only be done at the extreme ends of the cable runs.

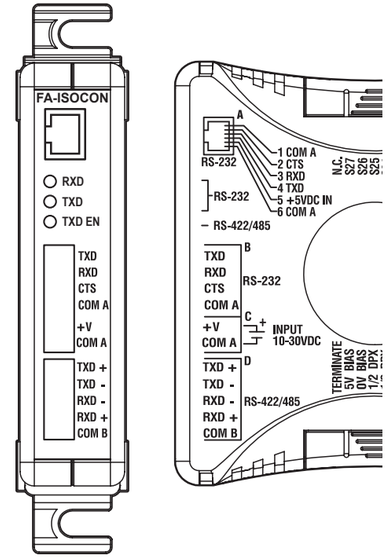
To install the bias resistors, set the '5V Bias' and '0V Bias' switches ON. Set the switches OFF for all intermediate drops along the network (factory default).

If the RS-422 driver of the network master is always enabled then the last slave does not need to be biased. In all other configurations it is normally better to bias the network at both ends. Some host computer software packages will not work without network biasing resistors on the host computer RS-422 or RS-485 receivers.

1/2 DPX

The two '1/2 DPX' switches are used to internally short TXD+ to RXD+ and TXD- to RXD-. Set both switches ON for a 2-wire (RS485) connection. Set both switches OFF for a 4-wire (RS422) connection.

Wiring Connections



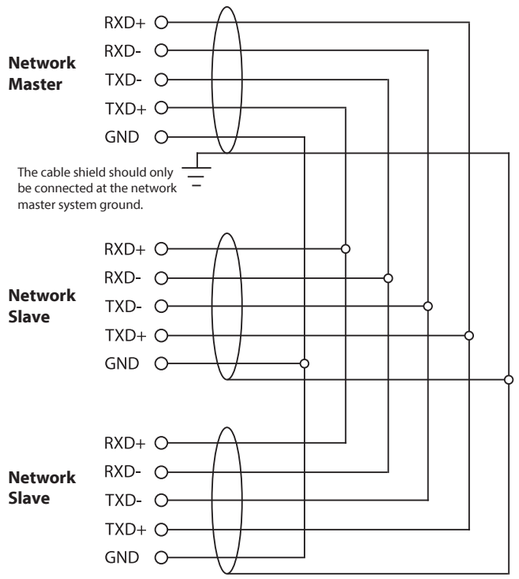
RS-232,RJ12		
Faceplate Label	***Pin***	***Description***
RJ12	1	Com A
	2	CTS
	3	RXD
	4	TXD
	5	+5VDC IN
	6	Com A

RS-232 Terminal Block
Faceplate Label
TXD
RXD
CTS
Com A

Output Terminal Block	
Faceplate Label	***Description***
+V	24VDC±10%
Com A	0V Connection

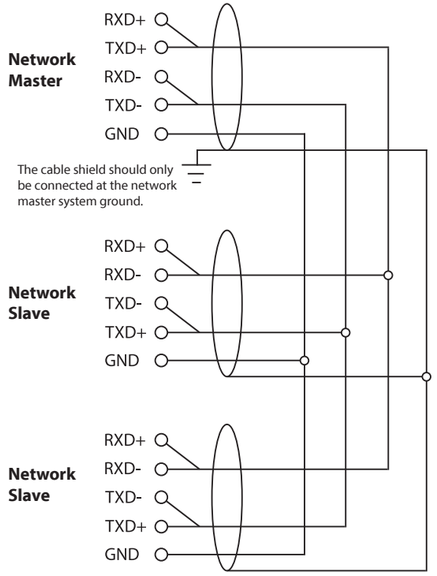
RS-422 / 485 Terminal Block
Faceplate Label
TXD+
TXD-
RXD-
RXD+
Com B

RS422 / 4-Wire Connection



- Recommended cable is Belden 9729 or equivalent

RS485 / 2-Wire Connection



- Recommended cable is Belden 9841 or equivalent
- It is not necessary to short the RXD+/TXD+ and RXD-/TXD- pins if the '1/2 DPX' dipswitches are set to ON.

  NOTE: Both drawings are shown as a bus network for clarity, all connections should be made directly to the FA-ISOCON.

- The 'Terminate', '0V Bias', and '5V Bias' dipswitches should be set ON for the extreme ends of the network and OFF for intermediate drops.

- A 4-wire connection should be used for multi-dropping AutomationDirect PLCs.
- When extending the network cable to an outside environment, precautions must be observed to protect network from outside elements such as lightning, water, snow, ice, etc.

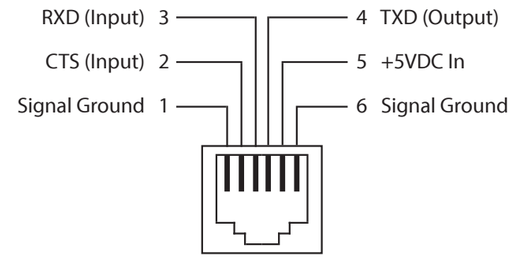
Transient suppression is provided on the FA-ISOCON, but it is not sufficient protection from induced voltage spikes due to nearby lightning strikes.

WARNING: If network cable is run in an outdoor environment then external lightning protections must be added. There are several methods to reduce the induced voltage spikes from nearby lightning strikes including but not limited to spark gap protection and larger transient suppressors. Protection for each installation must be considered on a case by case basis.

RS232 Pin Outs

WARNING: RS232 connections can be made to the RJ12 connector or to the 4 position terminal block marked B, but not to both.

The telco style RJ12 connector (6P6C, 6 Position 6 Conductor) is used to make the RS232 connection to various RS232 devices. If your RS232 device supplies 5VDC, it can be connected to pin 5 to power the FA-ISOCON, do not connect this pin if you are using 24VDC to power the FA-ISOCON.



The 4 position terminal block connections are marked TXD (Output), RXD (Input), CTS (Input), and C-A (Signal Ground). Use this connection if you prefer a terminal block connection over an RJ12 connection.

If the 'Transmitter Control' dipswitches are set for 'Automatic Network Transmit Enable' or 'Transmitter Always ON' then a connection to CTS is not required. If the 'Transmitter Control' dipswitches are set for 'CTS Controlled Transmit Enable' then a connection to CTS is required and the connectd RS232 device must properly control the RTS signal.

24VDC Connection

24VDC can be supplied to power the FA-ISOCON at the two-position terminal block below the RJ12 connector marked '+V' and 'C-A'. If you connect 24VDC at this terminal do not connect 5VDC to pin 5 of the RJ12 connector.

Mounting

There are two ways to mount the FA-ISOCON Isolated Network Adapter.

(1) Panel mount next to the CPU.

(2) Din #3 rail or A Series rail moiunt using supplied hardware.

To install the unit on a DIN rail, hook the top of the DIN connector on the DIN rail, then pull the unit down (the top of the DIN connector is designed to flex) and rotate the bottom of the DIN connector onto the DIN rail.

Specifications

Maximum Cable Length	4000 feet
Maximum Number of Devices	32 per network
Maximum Data Rate	115,200 bits per second
Maximum Driver Load	62Ω
Differential Output Volts	±1.5V to ±6V
Minimum Network Driver Active State	RXD+ 1.5V less than RXD-
Current From CPU +5VDC ***No Load*** ***Typical Load*** ***Maximum Load***	 80mA 82mA (120Ω Termination) 100mA (62Ω Termination)
External 24VDC Power Supply	10-30 VDC @ 70mA
Voltage Withstand	1.2kVrms/1 sec. 1.0kVrms/1 min.
Isolation Resistance	>1014Ω / 7pF
Operating Temperature	0 to 60°C

UL Information

A. THIS EQUIPMENT IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C AND D OR NON-HAZARDOUS LOCATIONS ONLY.

Cet équipement est conçu pour être utilisé dans des environnements de Classe I, Division 2, Groupes A, B, C, D ou non dangereux.

B. WARNING - EXPLOSION HAZARD - SUBTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2/ZONE 2.

AVERTISSEMENT : Risque d'explosion: la substitution de composants peut compromettre la convenance pour la Classe I, Division 2/Zone 2.

C. WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

AVERTISSEMENT: Risque d'explosion: Ne pas déconnecter l'équipement à moins que l'alimentation soit coupée ou que la zone soit reconnue non dangereuse.