ADAM-4542+
Fiber Optic to RS-232/422/485 Converter
User Manual

Packing List

Before you begin installing your card, please make sure that the following materials have been shipped:

- 1 x ADAM-4542+ Module with DIN-rail mounting bracket
- 1 x ADAM-4542+ User Manual
- 1 x Panel Mounting Bracket
- 1 x Cable for 9 pin to 3 pin

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Introduction

Fiber optic transmission offers the benefits of wide bandwidth, immunity to EMI/RFI interface, and secure data transmission. The ADAM-4542+ can be used as an RS-232/422/485 point-to-point or point-to-multi-point connection for transmitting and converting full/half-duplex signals and their equivalents within a fiber optic environment. Fiber optics are the perfect solution for applications where the transmission medium must be protected from electrical exposure, lighting, atmospheric conditions or chemical corrosion.

The ADAM-4542+ is specially designed to link various machinery equipped with RS-232/422/485 communication ports (such as computer systems or manufacturing machines). Using standard SC connectors, the module's fiber optic port can accommodate a wide range of fiber optic cable. ADAM-4542+ also supports the redundancy requirement. You can use two pairs of ADAM-4542+ for a redundant architecture. This special design offers higher reliability.

For more information on this and other Advantech products, please visit our website at:

http://www.advantech.com

http://www.advantech.com/eAutomation

For technical support and service, please visit our support website at:

http://service.advantech.com.tw/eservice/

This manual is for ADAM-4542+.

Features

- Compact size
- Direct plug-and-play
- Easily mounted on a DIN-rail, panel, or piggybacked
- Transmission speeds of up to 115.2kbps
- Optical fibers enable transmission of up to 15 km
- Half/Full-duplex, bidirectional transmission mode
- Avoid lightning strikes and EMI/RFI
- Prevents damage from electrostatic discharge
- Stable and error-free data transmission
- Automatic internal RS-485 bus supervision
- No external flow control signals required for RS-485
- Transient suppression and over-current protection on RS-422/485 data lines
- LED for power and data flow indication

Specifications

- **Fiber Optic :** Single Mode
- **Wavelength :** 1310 nm
- **Transmission Distance :** 15 km
- **Optical Power Budget (attenuation) :** min. 8.2 dB
- **Casing :** ABS with captive mounting hardware
- **Communication Mode :** Asynchronous
- **Connector :** Plug-in screw terminal
- **Fiber port :** SC
- **Transmission Mode :** Full/Half-duplex, bidirectional
- **Transmission Rate :** Up to 115.2 kbps
- **Power Requirement :** Unregulated +10 ~ +30 VDC
- **Operating Temperature :** -10 ~ 70° C (14 ~ 158° F)
- **Operating Humidity :** 5 ~ 95% (non-condensing)
- **Accessories :** DIN-rail mounting adapter, panel mounting bracket

Two Years Warranty

Advantech warrants to you, the original purchaser, that this product will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

If your product is defective, it will be repaired or replaced at no charge during the warranty period. package and ship it prepaid to your dealer.

Switch and Jumper Settings

The ADAM-4542+ converter has two DIP switches which set the data format (number of bits) and baud rate for the RS-485 network, while one jumper set the Primary/Secondary mode for the redundant fiber connection application.

SW1

Switch 1 controls the data format. Data can be 9, 10, 11 or 12 bits. The factory default is 10 bits : one start bit, eight data bits, one stop bit and no parity bit.

Data Format	Switch 1	Switch 2
9 bits	OFF	OFF
10 bits*	ON	OFF
11 bits	OFF	ON
12 bits	ON	ON

*The default setting

When using the converter in combination with other ADAM modules, do not change the default setting of the converter, since ADAM modules have a fixed data format of ten data bits. The option of changing to 9, 11 or 12 bits is for use with other modules (other than ADAM modules) that have different data formats. Should you change the ADAM module's data format, be aware that you will also have to change the data format on all the other modules in the network.

SW2

Switch 2 sets the baud rate. The options range from 1200 bps to 115.2 kbps. The factory default is 9600 bps. Be aware that when you change the baud rate, you also have to change the baud rate for all of the connected modules accordingly. If the RS-232/422 mode is ON, the baud rate does not need to be set.

ADAM-4542+ Baud Rate Setting (SW2)

| Baud Rate	1	2	3	4	5	6	7	8	9
1200 bps	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2400 bps	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
4800 bps	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
* 9600 bps	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
19.2 kbps	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
38.4 kbps	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
57.6 kbps	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
115.2 kbps	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
RS-232/422	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON

JP2

The ADAM-4542+ supports a redundancy feature. You can use two pairs of ADAM-4542+ to create a redundant connection. The ADAM-4542+ can be set as "Primary" or "Secondary" in the redundant architecture by JP2. The "Primary" connection will be the major connection line. If any of the ADAM-4542+ modules on the "Primary" line fails, the "Secondary" line will take over the connection automatically. The default JP2 position of ADAM-4542+ is in "Primary".
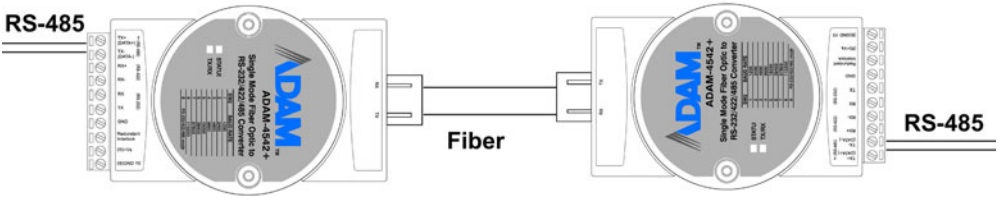
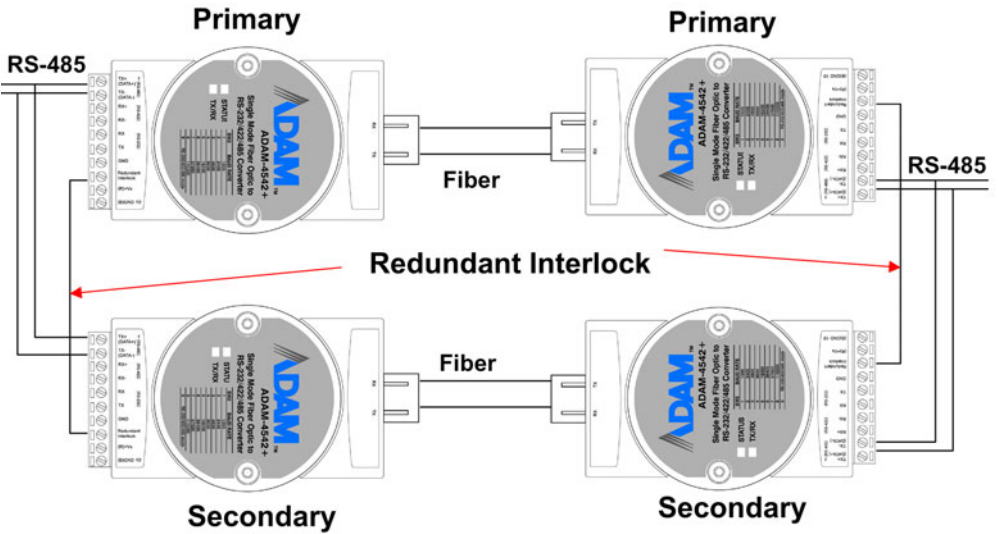| Primary Mode	Secondary Mode

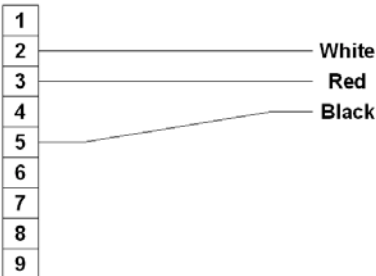See the next page for a wiring diagram.
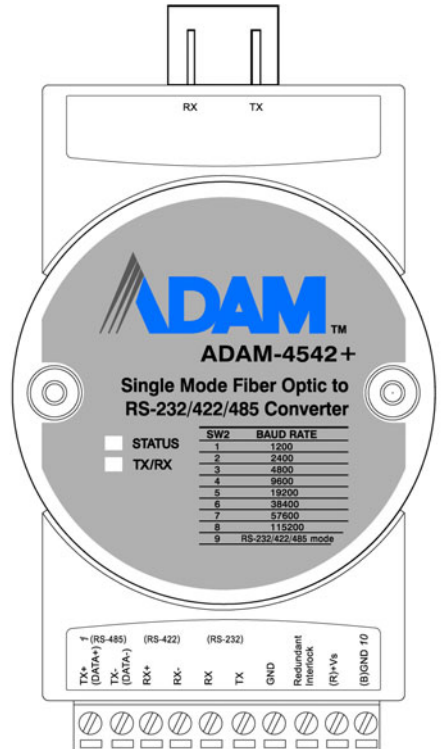
Wiring Diagrams

Non-Redundant System

Redundant System

Pin Assignment of Cable 1700090253 (DB-9 to 3 Wires Cable)

Troubleshooting

Problem	Solution
The TX and RX connections are reversed.	Make sure the fiber connection is made so that the TX of one end is connected to the RX of the other.
Poor connection between the ADAM-4542+ and the communication port in computer.	Make sure the ADAM-4542+ is securely plugged into the communication port.
Attenuation on the fiber causes the signal level to drop below the accepted level.	Reduce attenuation by reducing connector loss, transmission distances, etc.
The connection between the communication ports is neither DTE to DTE nor DCE to DCE connection.	Add a converter to one of the optical modems, so that the pin assignments from the communication port to the modem are from pin 2 to pin3 and from pin 3 to pin 2.

Damage Test

If none of the above resolved your problem, your module may be damaged. To test for damage, use the hyper terminal program of MS Windows to perform a loop-back test of the optical modem. This will detect if the module is damaged.