USB to Optical Adapter Industrial Isolated RS-422/485

Product Manual

Coolgear, Inc.
Version 1.1
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Model Number: USB-COMi-Si-M

Revision History

Revision	Date	Author	Comments
1.0	02/27/2018	Coolgear	New Manual

About this document

This product manual outlines installation and features of the USB-COMi-Si-M USB to Optical Adapter Industrial Isolated RS-422/485.

Scope

The scope of this manual is to give the user of the product an understanding of its use with detailed diagrams and verbiage. The manual allows the users to apply the product to their application.

Intended Audience

This product is intended for use in numerous industries including but not limited to applications such as; Factory Automation, Data Centers, Serial Equipment, Kiosk, Office, and others.

Product Support

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Table of Contents

Table of Figures

1. Introduction

The USB-COMi-SI-M USB-to-Optically Isolated RS-422/485 Adapter is designed to provides instant connectivity to RS-422/485 communication devices for factory automation equipment, multi-drop data collection devices, barcode readers, time clocks, scales, data entry terminals, PC to PC long distance communications, ATMs and serial communication in harsh environment.

WEIGHT	.31 lbs
DIMENSIONS	72.10(L 81.34 w/ears))x58.13(W)x22.68mm(H)
UPC	729440690885
WARRANTY	1 year from date of purchase
COLOR	Black
PORTS	1 DB-9 Serial Port / 1 6-pin Terminal Connector

1.1 Features

- TAA Compliant
- Adds a high speed RS-422 / 485 serial port via USB connection.
- Requires no IRQ, DMA, I/O port..
- Data rates: 300 bps to 921.6K bps
- High speed serial port with the baud rate up to 921.6K bps.
- Serial Connector: one DB-9 male connector, and one 6-pin Terminal Block.
- Auto transmit buffer control for 2-wire RS-485 half-duplex operation
- 384 byte receive buffer.
- 128 byte transmit buffer for high speed data throughput.
- Termination resistors installed on-board.
- RS-422 data signals: Tx-, Tx+, Rx+, Rx-, GND, RTS-, RTS+, CTS+, CTS-.
- RS-485 data signals: Tx-, Tx+, Rx+, Rx- (4 wire), and data-, data+ (2 wire).
- Monitor LEDs of TxD, RxD indicating port status.
- External 4-pin dip switch to set RS-422, or RS-485 modes.
- Virtual COM port drivers provided for Windows 7, Vista, 2003, XP, 2000.
- Self-power (500mA, 5V)

2. Hardware Installation

Outside the unit, there is one 4-pin DIP switch which is set to select the mode of operation. You will need to set the switch settings to RS-422, or RS-485 mode as per the requirements of your application.

After the setting of DIP switch, you then plug the adapter to USB port to start driver installation. The Mode Block Configuration Settings are listed as follows:

2.1 External DIP Switch

	Operation Mode	S1	S2	S3	S4
RS-422	4 wire with handshaking	ON↑	ON↑	OFF↓	OFF↓
RS-485	Full Duplex (4 wire)	ON↑	OFF↓	OFF↓	OFF↓
	Half Duplex (2 wire) with Echo	OFF↓	OFF↓	OFF↓	ON↑ Note
	Half Duplex (2 wire) without Echo	OFF↓	OFF↓	ON↑	ON↑ Note

Note: In the most common situations, a 120 Ohm termination resistor of TxD (S4 is ON) is required in a RS485 Half Duplex configuration. Otherwise it is rarely used.

Inside the unit, there is one 2 x 6 (12 pin) header blocks which are jumpered to enable Rx, CTS 120 Ohm termination resistors and Tx, Rx 750 Ohm BIASing resistor.

You will need to open up the metal case and set the jumper setting for RS-422 mode or RS-485 mode as per the requirements of your application.

Settings are listed as follows:

Jumper	Function
1-2	Pull-up Tx+ to VCC by 750 Ohm Bias resistor. This jumper should be populated for pull-up Tx+.
3-4	Pull-down Tx- to GND by 750 Ohm Bias resistor. This jumper should be populated for pull-down Tx-.
5-6	Rx+/- Termination of 120 Ohm. This jumper should always be populated forRS-422 and RS485 Full-Duplex mode.
7-8	Pull-up Rx+ to VCC by 750 Ohm Bias resistor. This jumper should be populated for pull-up Rx+.
9-10	Pull-down Rx- to GND by 750 Ohm Bias resistor. This jumper should be populated for pull-down Rx-.
11-12	CTS Termination of 120 Ohm. This jumper should always be populated for RS-422 mode.

Note: Sometimes, when operating in RS-422 or RS-485, it is necessary to configure termination and biasing of the data transmission lines. Generally this must be done in the cabling, since this depends on the installation of connections. Before applying the option, check your cable specification for proper impedance matching.

3. Windows 7 / Vista / 2003 / XP / 2000 Driver Installation

You need to have administrator privileges to install any new drivers under Windows 7/ Vista / 2003 / XP / 2000. To install the driver or update the configuration please log onto Windows as "Administrator" or ask your system administrator to install the USB-COM driver.

You need to install driver first, prior to hardware installation. Do not connect the USB-to-Serial Adapter to the USB port of your computer, before you finish driver installation.

Please proceed with the following steps to install the driver:

1. Insert the “USB COM Series Driver and Utility” CD into your CD-ROM.
2. The “USB COM Series Driver and Utility CD” dialog box appears.
3. Under “Driver Installation”, double click “Windows 7, Vista, 2003, XP, 2000 driver” to install the device driver.
4. The USB COM install program will auto-detect the OS type and install the driver automatically. (Note: in Windows 7 or Vista OS you will find another dialog box, please click on “OK” to confirm the drivers install program).

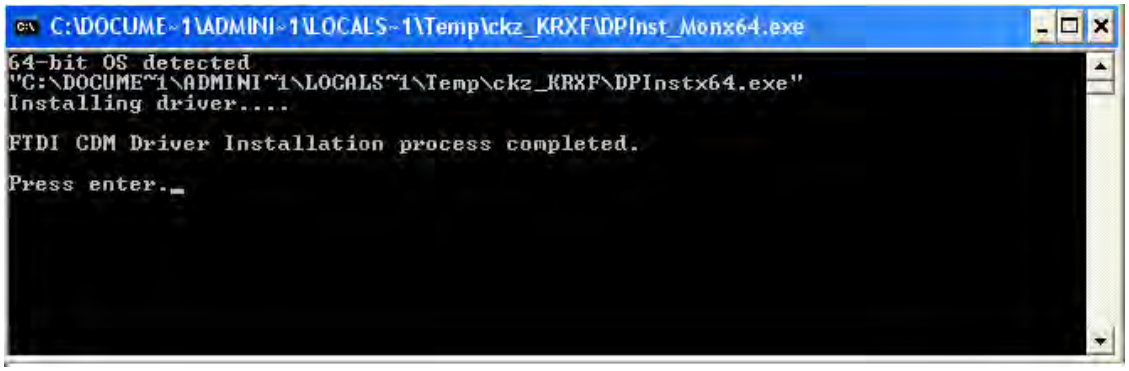


Figure 1

5. After the message “FTDI CDM Driver installation process completed” appears, press “Enter” to complete the driver installation.
6. Plug in the USB to Serial Adapter to the USB port of your computer. Windows will finish installing the driver files.

3.1 Check Installation

You can now verify the installation has been completed successfully by looking under Device Manager of the System Properties screen. (Go there by Start-Setting- Control Panel-System Properties-Hardware-Device Manager.

The device should have installed as a "USB Serial Port (COMx)" attached to "USB Serial Converter”.

3.2 Change COM Port Properties & COM Port Number

This feature is particularly useful for programs, such as HyperTerminal, which only work with COM1 through COM4. Please ensure that you do not change the COM Port Number already in use.

To change the virtual COM port properties:

- Select the "USB Serial Port"
- Click “Properties”.
- Select "Port Setting" and “Advanced”.
- Click the drop down arrow on COM Port Number and scroll to the required COM port. Select "OK".
- Return to the Device Manager Screen. You will see that the USB Serial Port installation has been changed to the new COM Port Number.

4. Uninstalling Windows 2003 / XP / 2000 Drivers

Please proceed with the following steps to uninstall the 2003/XP/2000 driver:

1. Insert the "USB COM Series Driver and Utility" CD into your CD-ROM.
2. The "USB COM Series Driver and Utility CD" dialog box appears.
3. Under "Driver Uninstalling", double click "Windows 2003, XP, 2000 driver uninstall" to uninstall the device driver.
4. When following dialog box appears, double click "Clean System" to uninstall the 2003/XP/2000 drivers.

Figure 2

5. You need to disconnect all USB-COM-I from your PC, when the message below appears. Double click "OK" to start uninstalling Windows 2003/XP/2000 USB to Serial drivers.

Figure 3

6. Double click "**Yes**" to confirm it.

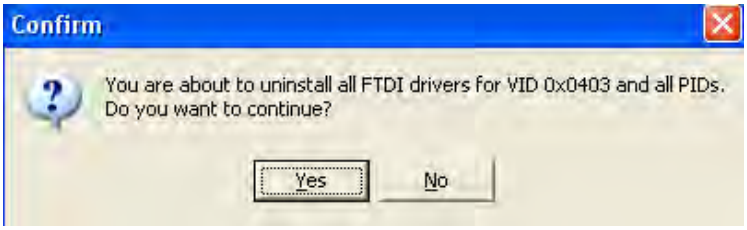


Figure 4

7. Click "**No**" to proceed.

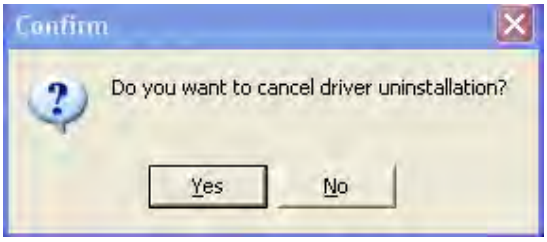


Figure 5

8. When the message “Status: System clean completed” appears, double click “Exit” to complete the USB to serial drivers uninstall.

Figure 6

9. Press “**Start**” button and select “**Control Panel**”.
10. Open the Add or Remove program.

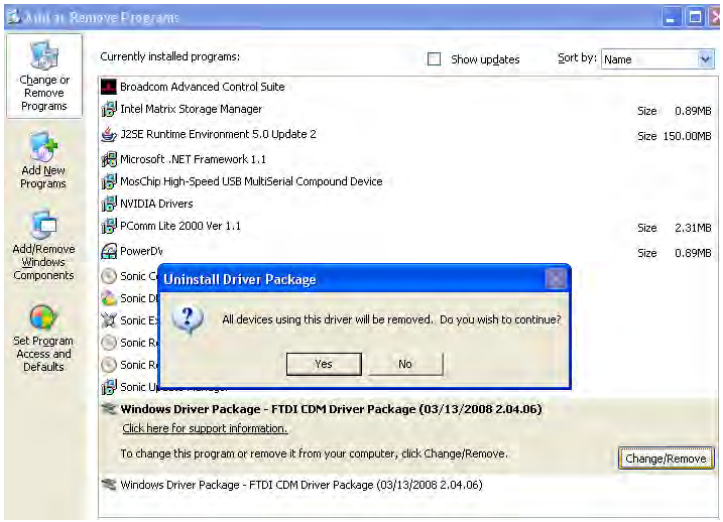


Figure 7

11. Remove the first “Windows Driver Package – FTDI CDM Driver Package (…)”.
12. Click “Change/Remove” and “Yes” to remove the first Windows Driver Package.
13. Remove the second “Windows Driver Package – FTDI CDM Driver Package (…)”.
14. Click “Change/Remove” and “Yes” to remove the second Windows Driver Package.
15. Reboot the computer to complete the driver uninstall.

4.1 Uninstalling Windows 7 or Vista Drivers

Windows 7 and Vista have many new security features. You need to proceed with the following steps to uninstall the Vista driver:

1. The USB to serial devices must connect to the PC.
2. Press “Start” button and select “Control Panel”.
3. Select “Classic View” from the top left hand corner and then “System” from the list.
4. Select “Device Manager” from the top left hand corner.

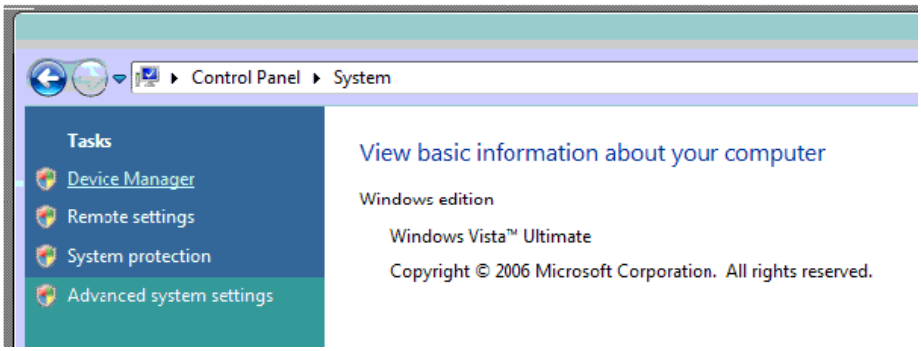


Figure 8

5. Locate your device under the ports (COM & LPT) section and right click on it to bring up the menu shown.

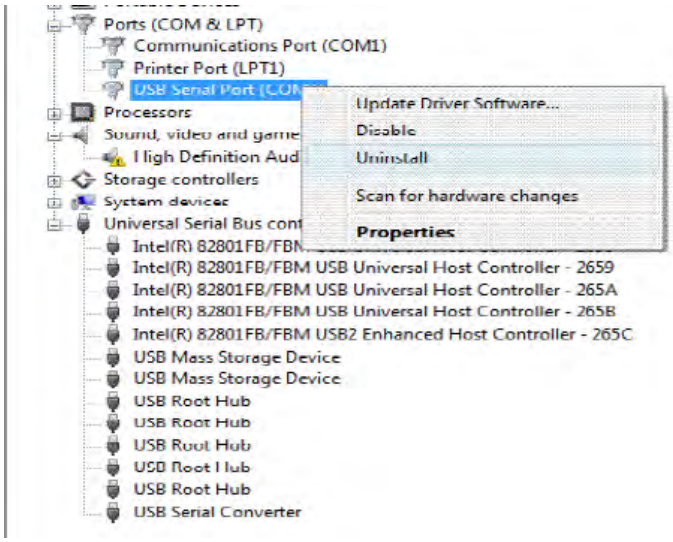


Figure 9

6. Select uninstall and be sure to click the box for "Delete the driver software for this device" in the next window and press "OK".

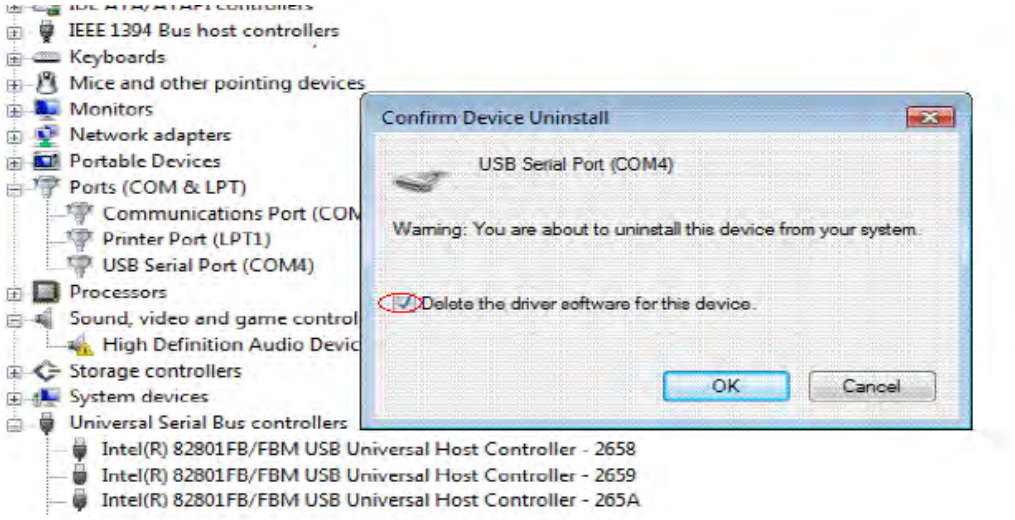


Figure 10

Note: If you have more than one USB Serial Port (COMx) installed in your PC, you need to repeat from step 5 to step 6 to delete the driver software for each port.

7. Locate your Device under the Universal Serial Bus Controllers section, and right click on it to bring up the menu shown.

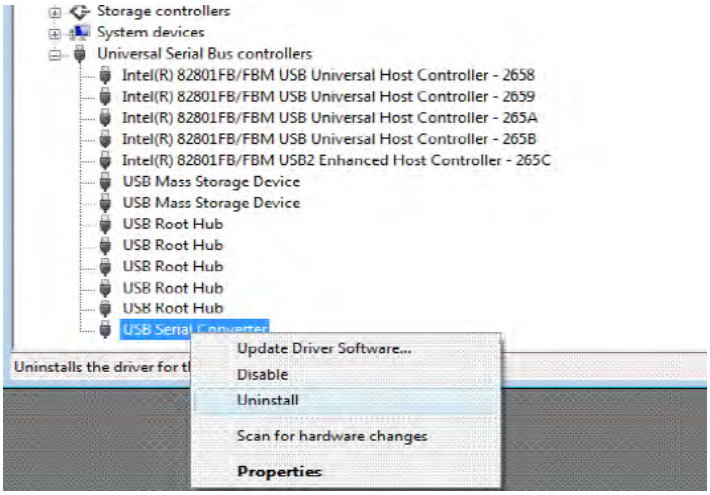


Figure 11

8. Select uninstall and be sure to click the box for “Delete the driver software for this device” in the next window and press “OK”.

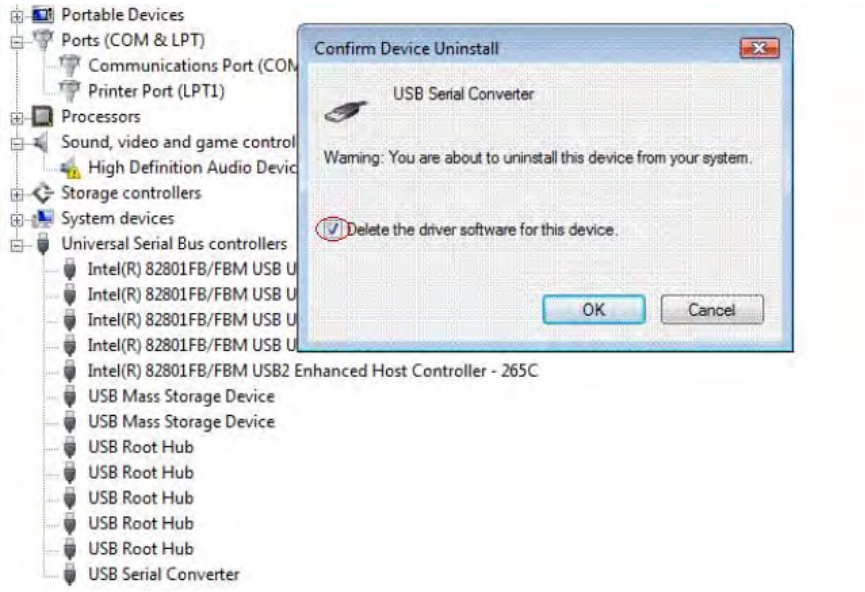


Figure 12

Note: if you have more than one USB Serial Converter installed in your PC, you need to repeat step 7 and step 8 to delete the driver software for all devices.

5. RS-422 Signal Pin-outs of DB-9 Male (CN2)

Pin 1	**Tx- (A)**
Pin 2	**Tx+ (B)**
Pin 3	**Rx+ (B)**
Pin 4	**Rx- (A)**
Pin 5	**GND**
Pin 6	**RTS- (A)**
Pin 7	**RTS+ (B)**
Pin 8	**CTS+ (B)**
Pin 9	**CTS- (A)**

5.1 RS-422 Signal Pin-outs of Terminal Block (TB1)

Pin 1	**Tx- (A)**
Pin 2	**Tx+ (B)**
Pin 3	**Rx+ (B)**
Pin 4	**Rx- (A)**
Pin 5	**GND**
Pin 6	**GND**

5.2 RS-422 Signal Wiring

- Point-to-Point 4-Wire Full Duplex

USB-COMi-SI-M		**RS-422 Device**
2 Tx+ (B)	⟷	**Rx+ (B)**
1 Tx- (A)	⟷	**Rx- (A)**
3 Rx+ (B)	⟷	**Tx+ (B)**
4 Rx- (A)	⟷	**Tx- (A)**
5 GND	⟷	**GND**

- RS-422 with Handshaking

USB-COMi-SI-M		RS-422 Device
2 Tx+ (B)		Rx+ (B)
1 Tx- (A)		Rx- (A)
3 Rx+ (B)		Tx+ (B)
4 Rx- (A)		Tx- (A)
5 GND		GND
7 RTS+ (B)		CTS+ (B)
6 RTS- (A)		CTS- (A)
8 CTS+ (B)		RTS+ (B)
9 CTS- (A)		RTS- (A)

6. RS-485 4-Wire (Full duplex) Signal Pin-outs of DB-9 Male (CN2)

Pin 1	**Tx- (A)**
Pin 2	**Tx+ (B)**
Pin 3	**Rx+ (B)**
Pin 4	**Rx- (A)**
Pin 5	**GND**

6.1 RS-485 4-Wire (Full duplex) Signal Pin-outs of Terminal Block (TB1)

Pin 1	**Tx- (A)**
Pin 2	**Tx+ (B)**
Pin 3	**Rx+ (B)**
Pin 4	**Rx- (A)**
Pin 5	**GND**
Pin 6	**GND**

6.2 RS-485 2-Wire (Half duplex) Signal Pin-outs of DB-9 Male (CN2)

Pin 1	**Data- (A)**
Pin 2	**Data+ (B)**
Pin 5	**GND**

6.3 RS-485 2-Wire (Half duplex) Signal Pin-outs of Terminal Block (TB1)

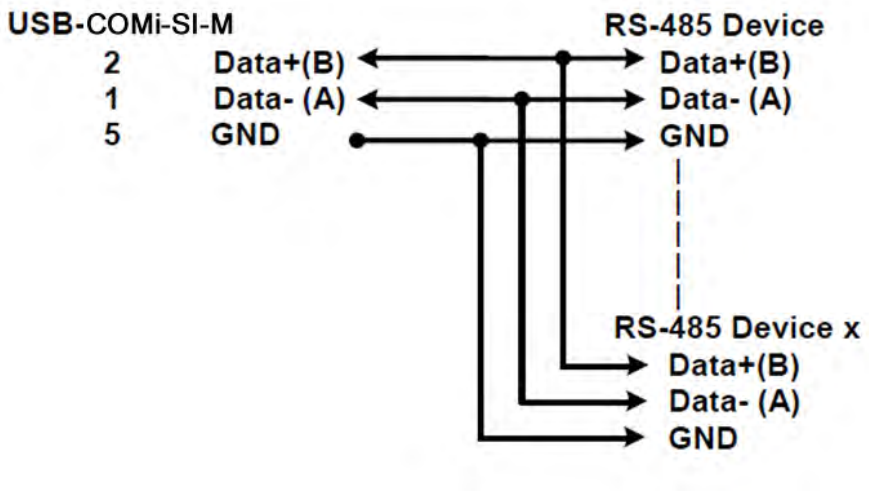
Pin 1	**Data- (A)**
Pin 2	**Data+ (B)**
Pin 5	**GND**
Pin 6	**GND**

- Point-to-Point 4 Wire Full Duplex

USB-COMi-SI-M		**RS-485 Device**
2 TxD+ (B)	⟷	**RxD+ (B)**

1 TxD- (A)	⟷	RxD- (A)
3 RxD+ (B)	⟷	TxD+ (B)
4 RxD- (A)	⟷	TxD- (A)
5 GND	⟷	GND

- Multi-drop RS485 2 Wire Half Duplex



7. Notes, Tips, and Warnings

Note	**Note**: In the most common situations, a 120 Ohm termination resistor of TxD (S4 is ON) is required in a RS485 Half Duplex configuration. Otherwise it is rarely used. Reference section 2.1 **Note**: Sometimes, when operating in RS-422 or RS-485, it is necessary to configure termination and biasing of the data transmission lines. Generally this must be done in the cabling, since this depends on the installation of connections. Before applying the option, check your cable specification for proper impedance matching. Reference section 2.1 **Note**: if you have more than one USB Serial Port (COMx) installed in your PC, you need to repeat from step 5 to step 6 to delete the driver software for each port. Reference section 4.1

Tip	N/A

Warning	N/A

Safety	• Read the entire Product Manual before implementing this product for your application. This manual contains important information about electrical connections that must be followed for safe and proper operation. • Inspect the product closely for visual defects before putting it to use. • Keep away from areas where moisture builds, this product contains electrical components that can be damaged by moisture build up, this can adversely affect your equipment connected to it. • Do not disassemble the product. Handling the product's internal components can expose it to ESD (Electro-Static Discharge) hazards that can affect the function of the device. • If this product is not functioning properly, email our support team at support@coolgear.com.

8. Supporting References

Document	Link
Website Product Page	https://www.coolgear.com/product/dual-port-usb-to-serial-rs-232-db-9-adapter-cable-ftdi-chip