DIREKTRONIK

USB to RS422/485 USER'S MANUAL Part no: 20119022

2025 Edition

Contents

INTRODUCTION

The 20119022 USB-to-Industrial Single RS-422/485 Adapter is designed to make industrial communication port expansion quick and simple. Connecting to a USB port on your computer or USB hub, the USB-COMi-TB instantly adds an industrial communication port to your system. By taking advantage of the USB bus, the USB Industrial I/O Adapter makes it easier than ever to add RS-422 or RS- 485 device to your system with easy plug-and-play and hot plug features. Adapting the new technology, the industrial I/O communication port expansion now takes the new bus with easy and convenient connectivity.

Plugging the 20119022 to the USB port, the adapter is automatically detected and installed. There are no IRQ & COM port conflicts, since the port doesn't require any additional IRQ, DMA, or memory as resources on the system. The RS-422 /485 port functions as native Windows COM port, and it is compatible with Windows serial communication applications.

The USB Industrial I/O Adapter provides instant connectivity to RS-422/485 communication device for factory automation equipment, multi-drop data collection devices, barcode readers, time clocks, scales , data entry terminals, PC to PC long distance communications and serial communication in harsh environments. The USB Industrial I/O provides industrial solution for applications requiring single node or multi-drop communicationsover short and long distances.

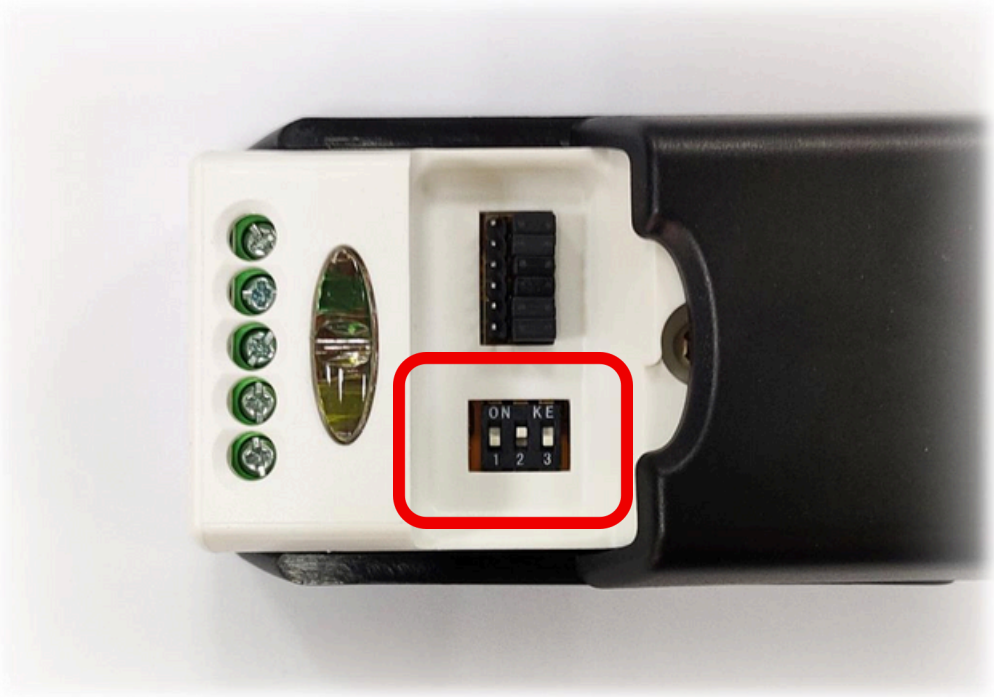
SPECIFICATIONS & FEATURES

- Adds a high speed RS-422/485 serial port by connecting to a USB port
- Serial operation mode can be easily changed by sliding open the upper case
- Robust and compact plastic housing
- Powered by USB port, no external power adapter required
- LEDs indicate TxD and RxD for easy port monitoring and diagnosis
- Installs as a standard Windows COM port
- Automatic transmit and receive control for 2-wire RS-485 half-duplex mode
- Built-in termination and biasing
- Serial port protected with 15KV ESD protection
- Non-standard baudrates supported
- Easy plug and play installation and RS-422/485 device connection
- High speed serial port with baud rate up to 3Mbps
- Supports Windows 11, 10, 8.1, 8, 7, XP, Windows Server 2025, 2022, 2019, 2016, 2012 R2, 2012 and 2008 R2
- Supports Linux Kernel version 3.0 and later
- Supports Apple-provided VCP on OS X 10.9 and later

HARDWARE INSTALLATION

Outside the unit, there is a 3-pin DIP switch used to select the mode of operation. You will need to set the switch settings to RS-422 mode, or RS-485 mode, as per the requirements of your application. After setting the switches, plug in the adapter to a USB port to start driver installation. The RS-422 & RS-485 mode block configuration settings are listed as follows.

RS-422 & RS-485 MODE BLOCK CONFIGURATION

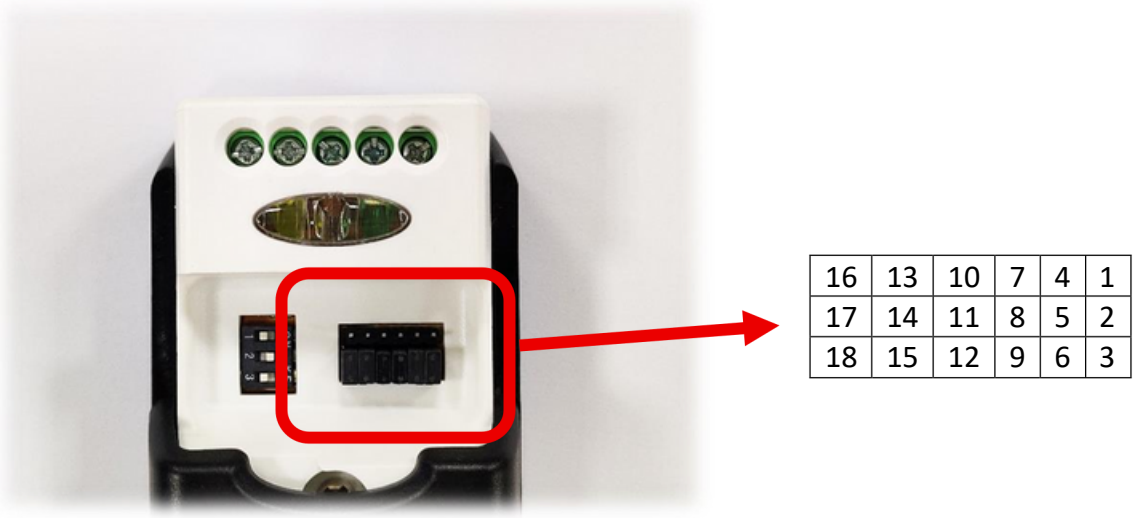


SW (External DIP Switch) for Mode Setting

	Operation Mode	S1	S2	S3
RS-422	4-wire with Handshaking	OFF	ON	OFF
RS-485	Full-Duplex (4-wire)	ON	ON	OFF
	Half-Duplex (2-wire) – with Echo	ON	OFF	OFF
	Half-Duplex (2-wire) – without Echo	ON	OFF	ON

JP1: Termination and Biasing Option Configuration

Inside the unit, there are 6x3 (18-pin) header block which are jumpered to enable Tx, Rx, 120 Ohm termination resistors and Rx, Tx 750 Ohm biasing resistor. You will need to open up the 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:



16	13	10	7	4	1
17	14	11	8	5	2
18	15	12	9	6	3

6x3 (18-pin) Header Block for Termination and Biasing Option Configuration

JP1 Jumper		Function
1-2 2-3	**Enable** **Disable**	Tx+/- Termination of 120 Ohm. This jumper should always be populated for RS485 half-Duplex mode.
4-5 **5-6**	**Enable** **Disable**	Pull-up Tx+ to VCC by 750 Ohm Bias resistor. This jumper should be populated for pull-up Tx+
7-8 **8-9**	**Enable** **Disable**	Pull-down Tx- to GND by 750 Ohm Bias resistor. This jumper should be populated for pull-down Tx-.
10-11 **11-12**	**Enable** **Disable**	Rx+/- Termination of 120 Ohm. This jumper should always be populated for RS-422/485 full-duplex mode
13-14 **14-15**	**Enable** **Disable**	Pull-up Rx+ to VCC by 750 Ohm Bias resistor. This jumper should be populated for pull-up Rx+.
16-17 **17-18**	**Enable** **Disable**	Pull-down Rx- to GND by 750 Ohm Bias resistor. This jumper should be populated for pull-down Rx

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.

Biasing of data lines must only occur at a single point anywhere in the cabling. USB-COMi-TB provides biasing for ease of installation. If your cabling already provides biasing, please be sure to disable this inside the unit.

Termination must not be installed in the middle of the cable. It is only permitted at both ends. Since a computer controlled serial port is almost always at one end of the cable, termination is disabled by default.

SERIAL PORT CONNECTOR PINOUT

Pinout of 5-pin Terminal Block

RS-422 Mode Pinout

Pin Number	PinType	Description	
1	Output	TxD-	Transmit Data, negative polarity
2	Output	TxD+	Transmit Data, positive polarity
3	Input	RxD+	Receive Data, positive polarity
4	Input	RxD-	Receive Data, negative polarity
5	Ground	GND	Signal Ground

RS-485 Full-Duplex Mode Pinout

Pin Number	PinType	Description	
1	Output	TxD-	Transmit Data, negative polarity
2	Output	TxD+	Transmit Data, positive polarity
3	Input	RxD+	Receive Data, positive polarity
4	Input	RxD-	Receive Data, negative polarity
5	Ground	GND	Signal Ground

RS-485 Half-Duplex Mode Pinout

Pin Number	Pin Type	Description	
1	Output/Input	Data-	Transmit/Receive Data, negative polarity
2	Output/Input	Data+	Transmit/Receive Data, positive polarity
5	Ground	GND	Signal Ground

PROPER WIRING FOR RS-422/485 OPERATION

This section will provide proper wiring information about RS-422 and RS-485 data communication. It is necessary to have the basic knowledge in order to avoid or find errors in data transmission. Failures in cabling are responsible for the vast majority of transmission problems.

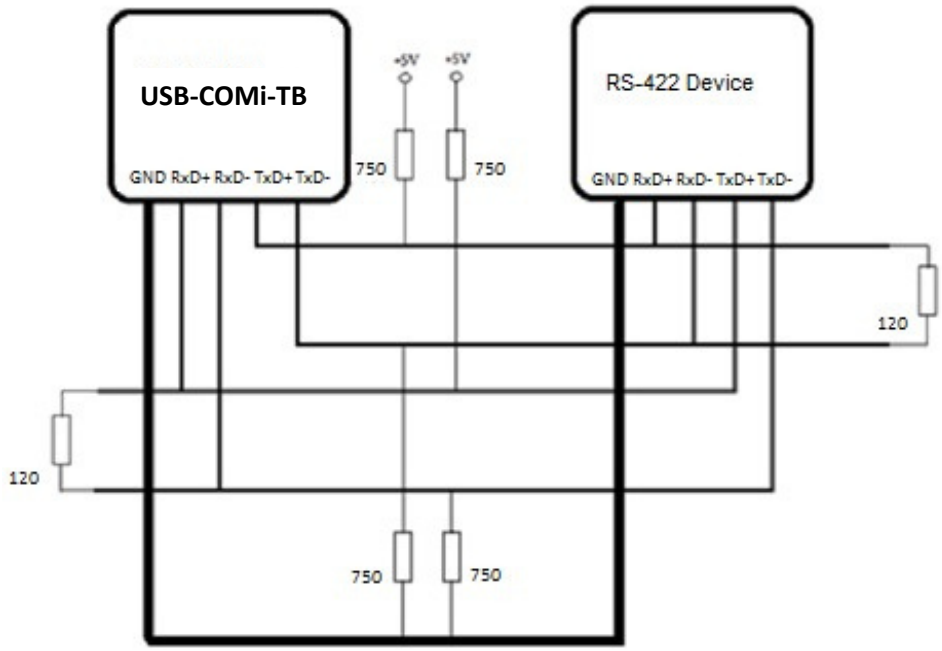
RS-422 & RS-485 Transmission Technique

The RS-422 and RS-485 use the same balanced transmission method. Signals are not transmitted as voltage on a single wire, like in RS-232. Instead, two wires are used; when one carries high voltage, the other one carries low voltage. The signal is defined by the difference in voltage between those two wires. This hardens the transmission against noise. Usually twisted pair cables are used, which further reduces the sensitivity for noise.

To make sure the signals meet the common voltage range, the GND of sender and receiver must be connected somehow. To ensure the signals are in the valid voltage range and the differential voltage can be correctly sensed by the receiver, the GND lines of the transmitter and receiver must be connected.

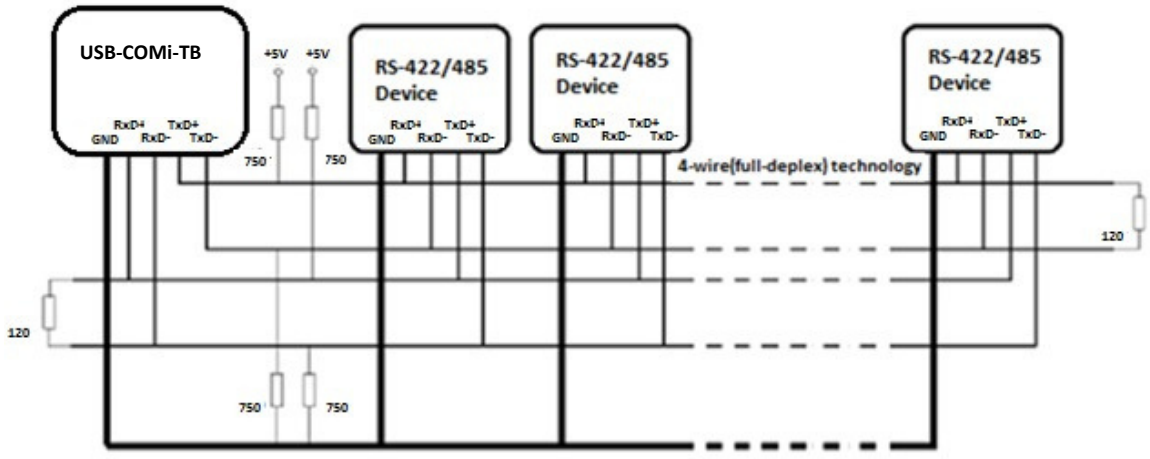
RS-422 Signals Connected

The following diagram shows how RS-422 signals are connected.



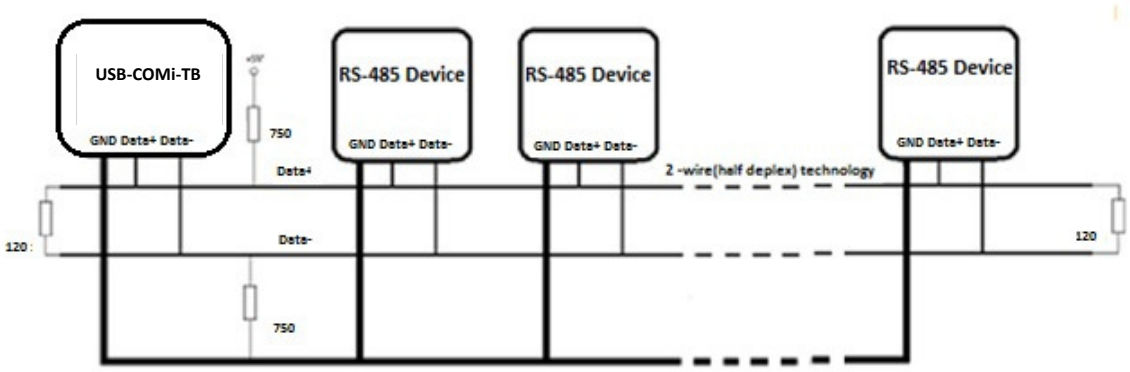
RS-422 & RS-485 4-wire Scheme

The RS-422 requires dedicated wire pairs for transmit and receive. The transmit wires are used to send data to as many as 10 receivers, as stated in the specifications of RS-422. Since the USB-to-Industrial Single RS-422/485 Adapter uses the RS-485's line driver technology, up to 32 receivers are possible. The following diagram shows RS-422 and RS-485 4-wire scheme:



RS-485 2-wire Scheme

The following diagram shows RS-485 2-wire scheme:



INSTALLING WINDOWS DRIVER

In most cases, the Windows driver of the USB-to-Industrial Single RS-422/485 Adapter will be installed automatically.

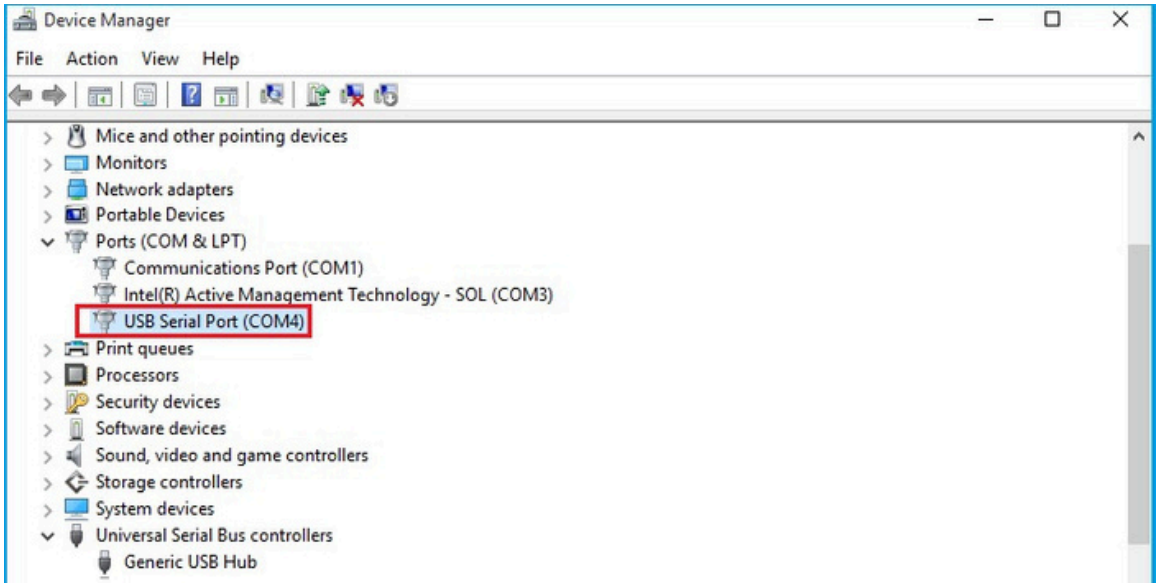
Installing in Windows 11, 10, 8.1, 8, 7, Server 2012 and 2008 R2

Connect your computer to Internet and plug USB-to-Industrial Single RS-422/485 Adapter to the USB port. The driver will be installed automatically via Internet.

Installing in Windows XP, Vista, Server 2003 and 2008

Connect your computer to Internet and plug the USB-to-Industrial Single RS-422/485 Adapter to the USB port. When asked to install the drivers, allow your computer to search the Internet to load and install the drivers from Windows Update website automatically.

When USB-to-Industrial Single RS-422/485 Adapter driver installation is done, you will find “USB Serial Port (COMX)” under “Ports (COM & LPT)” of device manager.

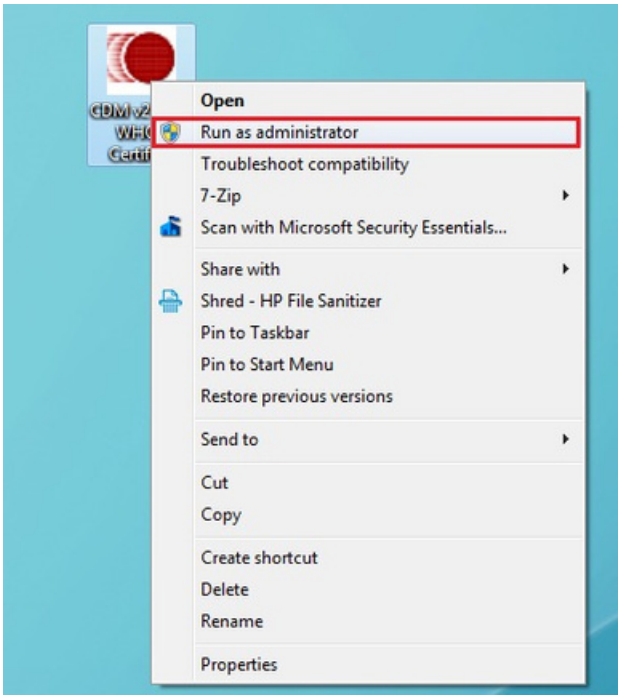


PRE-INSTALLING WINDOWS DRIVER

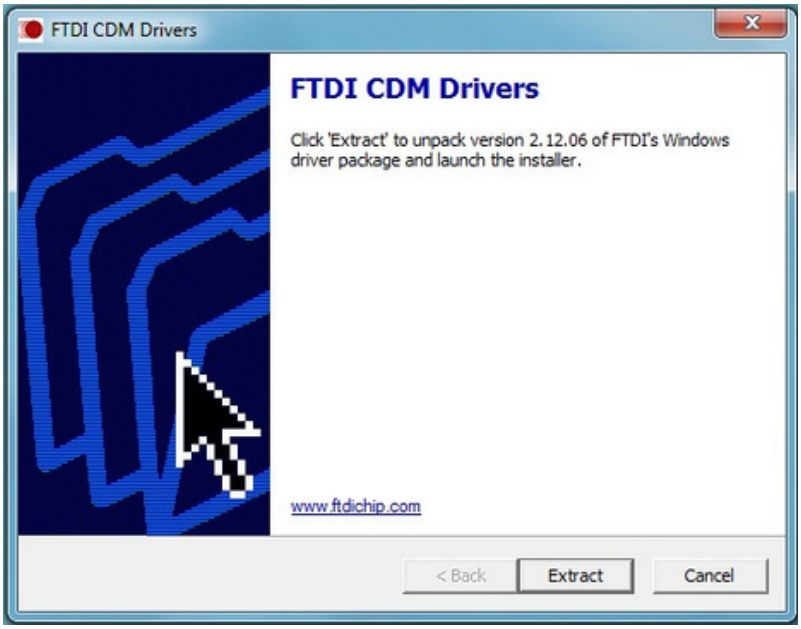
The Windows driver is also available as a setup program to pre-install Windows driver into your PC. Run the pre-install setup program before plugging the USB-to-Industrial Single RS-422/485 Adapter into the PC. You can download the setup program from:

https://www.titan.tw/download/usb-to-serial-driver/

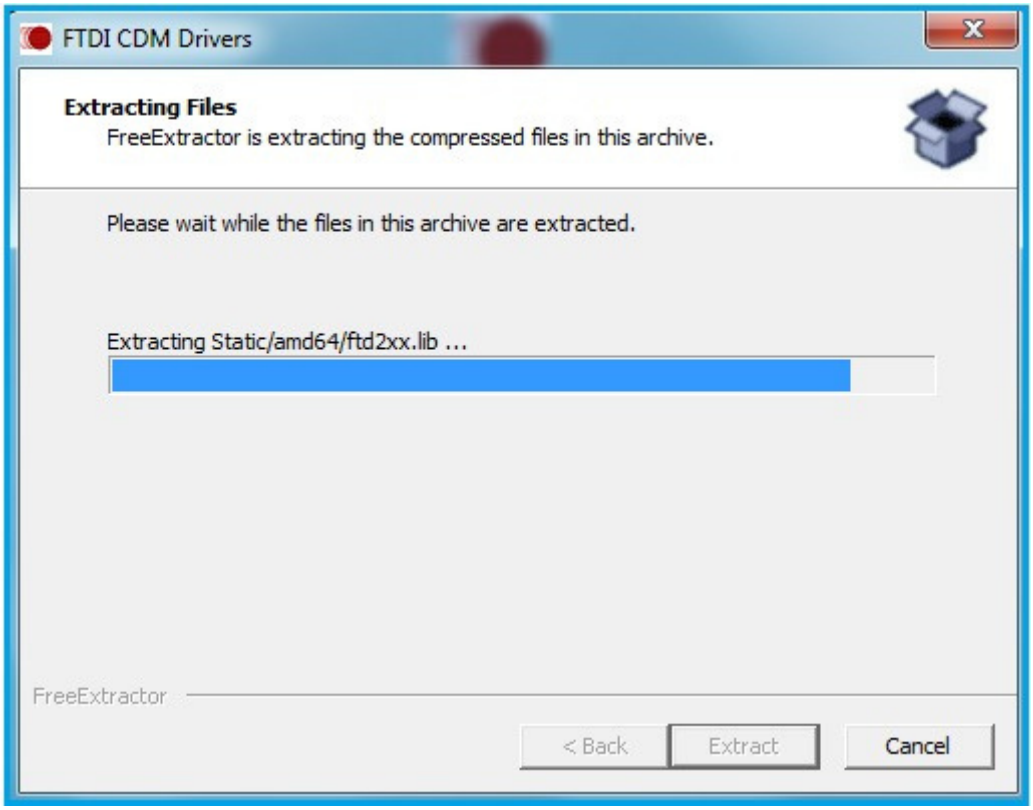
After downloading the driver setup program right click it and select “Run as administrator”



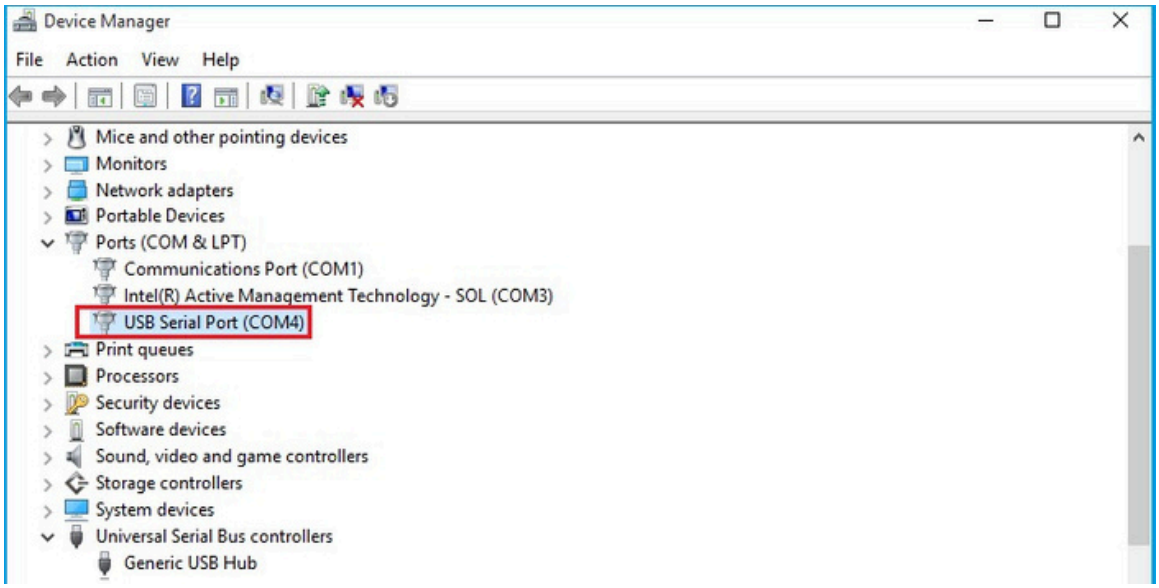
Press the “Extract” button



The driver will now be automatically installed.



Whenever the USB-to-Industrial Single RS-422/485 Adapter is plugged into the PC, the Windows driver will be installed and listed in device manager.



UNINSTALLING WINDOWS DRIVER

The program CDMuninstallerGUI.exe is used to remove installed drivers from the user's system and clean them from the Windows registry. You can download this program from:

https://www.titan.tw/download/usb-serial-driver-uninstalling

Supported Operating Systems

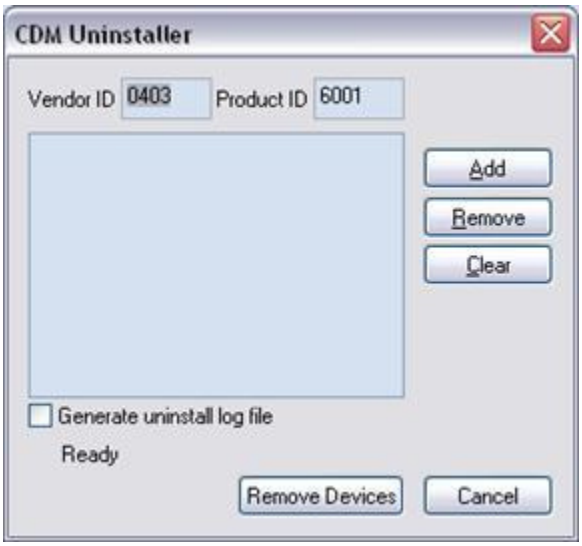
The uninstaller is currently supported on the following operating systems:
- Windows 11/10/8.1/8/7 (32 and 64-bit)
- Windows Vista (32 and 64-bit)

Running the Application

To run the application, simply double click on the .exe file.

Removing a Driver

The figure below shows the window displayed upon running the application. The vendor ID and product ID text boxes allows the user to enter a 4-character hex value specifying the device that they wish to remove. All installed device drivers can be viewed from within the Windows device manager. The USB- to-Industrial Single RS-422/485 Adapter uses the FTDI default Vendor ID (0x0403). Depending on the specific model of USB-COMi-TB, the valid Product IDs may be: 0x6001, 0x6010 or 0x6011…etc.



To remove a device, it must be added into the device window. They must all have a unique vendor ID and product ID combination. To remove the device(s) click on the '*Remove Devices*' button.

The '*Remove*' button will remove the currently selected item from the device window and the '*Clear'* button will remove all the devices from the device window.

A message box will confirm successful removal from the system and the device will be removed from the device window. To create an uninstall log file, check '*Generate uninstall log file*' prior to removing the device. This will create a text file outlining all operations that were attempted during the removal process that will be saved in the same directory as the .exe file.

Error Messages

Ifthere are no devices specified within the device window the following message will appear. Make sure that at least one device has been specified within the window by using the '*Add'* button.

If the application is unable to find any devices matching the vendor ID and product ID when removing a device, the following message box will appear. In this situation make sure that the details that you have entered are indeed correct by checking with the windows device manager.

The Vendor ID and Product ID must be a unique combination, if an attempt is made to add the same device twice the following message box will appear.