

USB to RS-232/422/485 Isolated Converter

USB To Serial Operation Manual



First Edition, Jun 2008

Table of Contents

| | |
|---|-----------|
| 1. Introduction | 2 |
| 2. Package checklist | 3 |
| 3. Product Specification | 4 |
| 4. Product Panel Views Description | 7 |
| Product Views | 7 |
| USB Type B Connector | 7 |
| Serial I/O Port of RS-232/422/485 | 8 |
| Terminator | 8 |
| LED Indicators | 9 |
| 5. Driver installation | 10 |
| Driver Installation | 10 |
| 6. Hardware Installation & Setup | 15 |
| Hardware installation | 15 |
| Hardware setup | 17 |
| Appendix A - Pin Outs and Cable Wiring | 21 |
| USB Layout Diagram | 21 |
| RS-232 Pin Assignment | 21 |
| RS-232 Wiring Diagram | 22 |
| RS-422 Pin Assignment | 22 |
| RS-422 Wiring Diagram | 22 |
| RS-485 Wiring Diagram | 22 |

1

Introduction

Thank you for your purchase of the USB to serial adapter. Featuring USB (Universal Serial Bus) interface technology, it is converted the USB to RS-232 or industrial RS422/485, so it can be easily adopted for industrial machines with RS232 or RS422/485 interfaces. The USB to Serial converter is fully compatible with the USB V1.0~2.0 . This converter is USB bus powered and does not need any power adapter. You can connect a PC USB port or USB hub to this converter via USB cable and High-Speed RS-232/422/485 serial port (Auto-Detection) which features easy connectivity for traditional serial devices in your working environments.

The RS232 standard supports handshaking signals (such as RTS, CTS) and full-duplex communication. For the RS485 control, it is completely transparent to user and their software written for Half-Duplex COM works without any extra modification effort.

The USB to Serial Isolated Converter meets the industrial level as it provides 3000 VDC of isolation to protect the host computer or other connected equipments from ground loops and destructive voltage spikes on the RS-232/422/485 data lines. It also offers internal surge-protection on data lines. Internal high-speed transient suppressors on each data line to protect it from dangerous voltages levels or spikes.

2

Package checklist

This product is shipped with the following items:

- 1 unit of USB to RS-232/422/485 Isolated converter
- 1 unit of A type to B type USB cable
- User Operation Manual
- Software CD

NOTE: Notify your sales representative if any of the above items is missing or damaged

3

Product Specification

- **Serial Port**
 - **RS-232**
 - No. of Ports : RS-232 * 1 Port
 - Port Type : DB9 male
 - RS-232 Signals : DCD , RX , TX , GND , RTS , CTS , DTR , DSR
 - Receive buffer : 576 Byte
 - Transmit buffer : 640 Byte
 - Baud Rate Speed : 300 bps ~ 921.6k bps
 - Parity : None , Odd , Even , Space , Mark
 - Data Bit : 5 , 6 , 7 , 8
 - Stop Bit: Auto-Detection : 1 , 1.5 , 2,
 - Flow Control : X-On / X-Off or Hardware
 - Optical isolation protection : 3000V DC
 - Connected Serial port type identification : Auto-Detection
 - 15KV ESD for all signal

- **RS-422/485**

- No. of Ports : 422/485 * 1 Port (Terminal Block)
- RS-422 Signals : RxD+ , RxD- , TxD+ , TxD- in Full-duplex (Surge Protection)
- RS-485 Signals : Data+ , Data- in Half-duplex (Surge Protection)
- Receive buffer : 576 Byte
- Transmit buffer : 640 Byte
- Baud Rate Speed : 300 bps ~ 230.4k bps
- Built-in RS-422/RS-485 Terminal Resistor (Surge Protection)
- Optical isolation protection : 3000V DC
- Connected Serial port type identification : Auto-Detection
- Built in Terminal 100 Ohm Terminal resistor SW selection ON/OFF
- 15KV ESD for all signal

- **USB Port**

No. of Ports : USB * 1 Port

- Fully compatible with the USB V1.0, V1.2, V2.0
 - USB type B connector
 - Baud Rates : Full speed 12 Mbps.
- Driver OS Support
 - Windows – 98E / 2000 / XP / Server 2003 / Vista , Mac osx / os9 , Linux 2.4 / 2.6
 - Power : USB bus power as voltage DC +5V
 - Led Lamp :
SYS (Red), Rx (Orange), Tx (Green)
 - Environment :
 - Operating Temperature: 0°C ~ 70°C
 - Storage Temperature : -20°C ~ 85°C

- Humidity: 5-95% RH
- Dimensions : 88 * 91 * 27 mm (W * D * H)
- WEIGHT : 94 gm
- Regulatory Approvals :
 - EMC : FCC Class A, CE Class A
 - WARRANTY : 1 Year

4

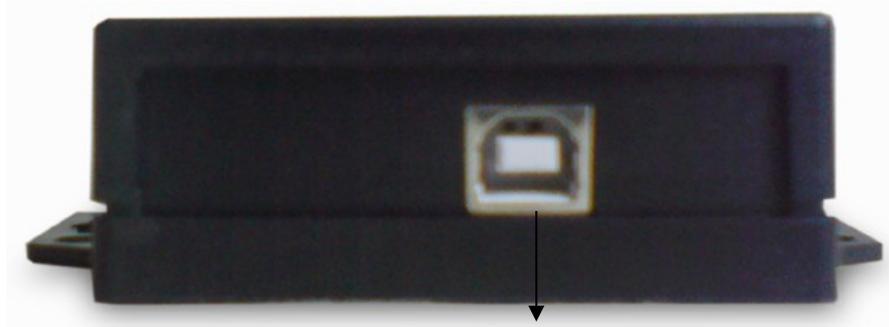
Product Panel Views Description

Product Views



USB Type B Connector

Power Outlet - The USB to Serial converter is powered by USB (Universal Serial Bus) port a single 5V DC (Inner positive/outer negative) power supply and 500mA of current. If the power is properly supplied, the SYS indicator of red color LED will be on.

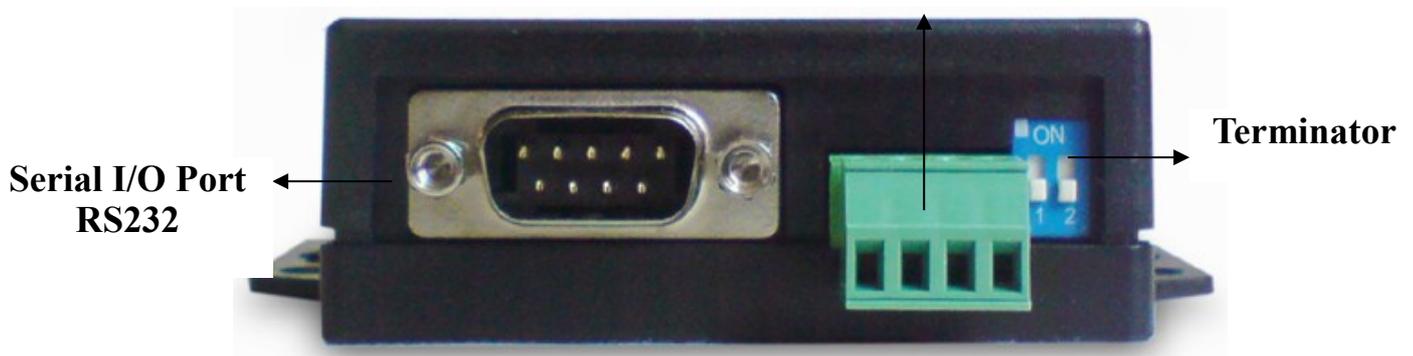


USB Type B Port

This converter's USB port is a USB type B connector and it is fully compatible with the USB V1.1 ~ 2.0.

Serial I/O Port

Serial I/O Port RS-485/RS-422



Serial I/O Port of RS-232/422/485

To connected the serial data cable between the converter and the serial device. Follow the parameter setup procedures to configure the converter (see the following chapters).

Terminator (DIP Switches)

The purpose of the Terminator (DIP Switches) is for compensating signal attenuation in a long distance connection at RS-485/422. To activate signal compensation function, please set the dip switch 1 & 2 to "ON" position. To disable signal compensation function, please set the dip switch to "OFF" position.

LED Indicators



SYS (Red) :

It is a power indicator (When the power is on, the SYS LED will be on.)

RX (Orange) :

Data received indicator (When data are received from the USB, the RX LED will be on.)

TX (Green) :

Data sent indicator (When data are sent out to the USB, the TX LED will be on.)

5

Driver Installation

When setting up this converter for the first time, you have to install the driver CP201x first in your computer device before connecting it. There are several OS as Windows 98 / XP / 2000 / Vista ..., Linux ..., Mac ... The utility CD is enclosed in the device box.

The driver of all these USB to RS-232/422/485 converters must be installed first before you use it.

- **Driver Installation**

When connecting this converter for the first time, you have to install the driver into your computer first.

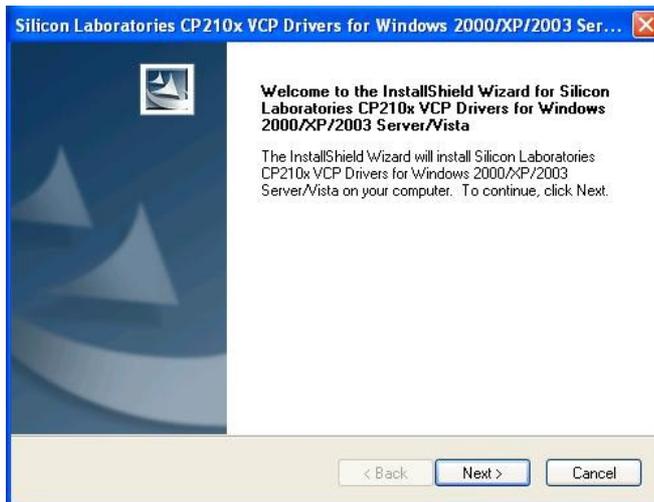
- A. Install CP210x_VCP_Win2K_XP_S2K3 software**

Through CD-ROM and find adaptable OS to your computer equipment.



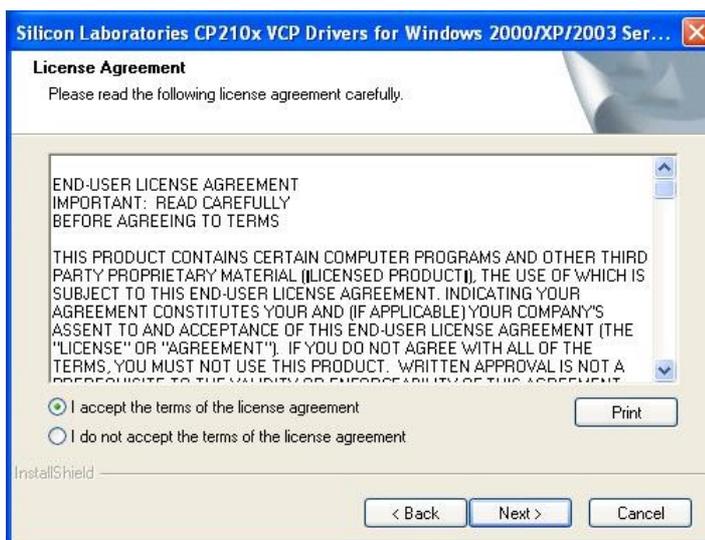
B. Choose “Next” Icon

If your computer equipment is running Windows OS that the pop-up screen of installing message will be showed as “CP210x VCP Drivers for Windows 2000/XP/2003 Server/Vista on your computer” and then to Click “Next” icon for going to next step.



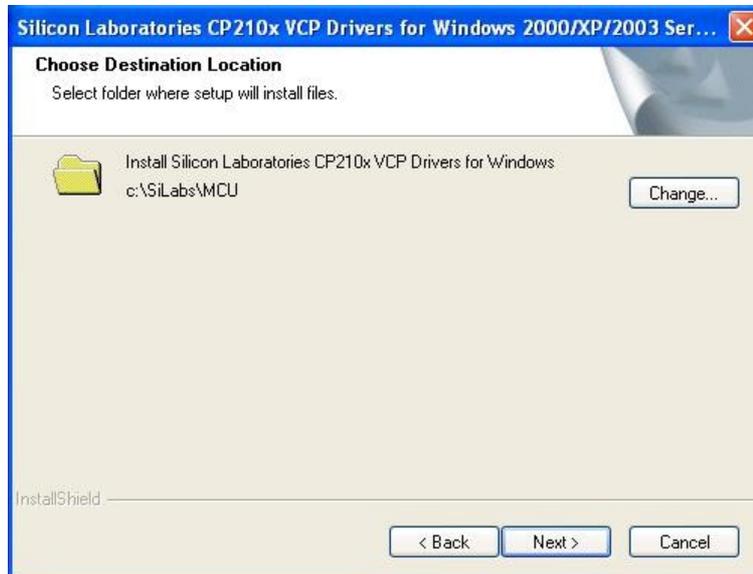
C. Choose “Accept” item of license agreement

After reading the license agreement then if you agree the terms to choose the item “I accept the term of the license agreement”.



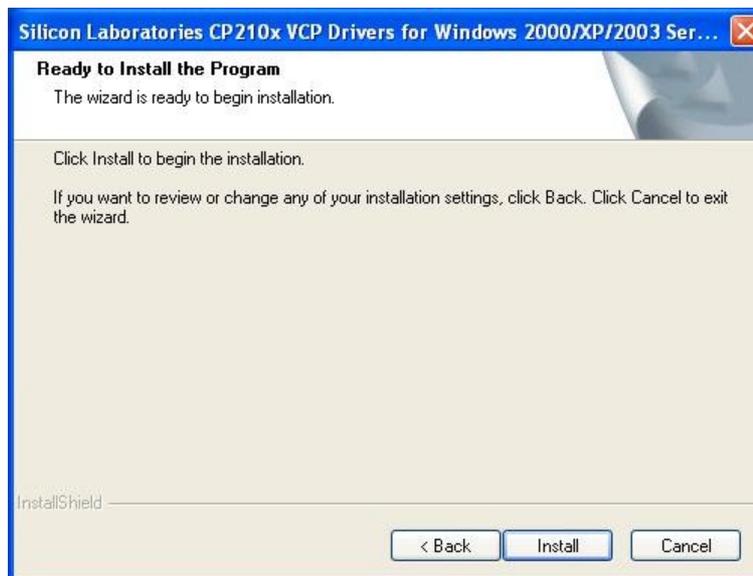
D. Choose destination location

It is for saving the CP201x driver software in destination location of computer.



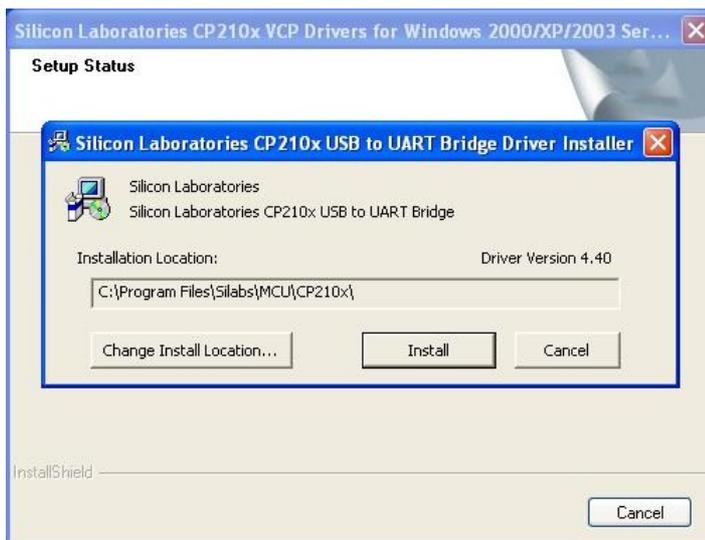
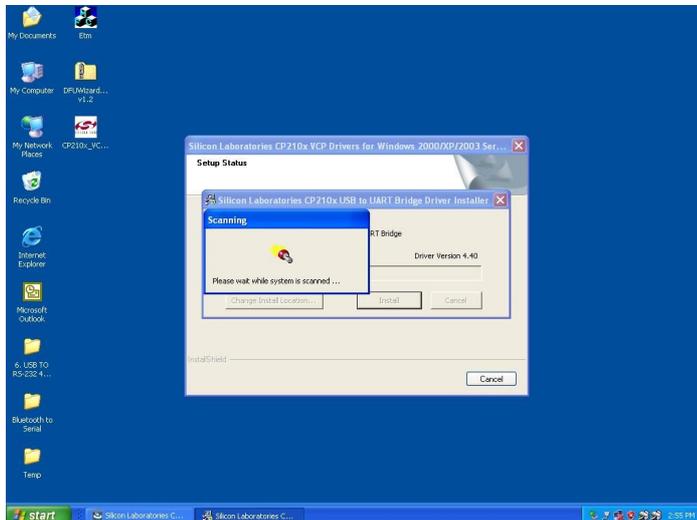
E. Execute the program installation

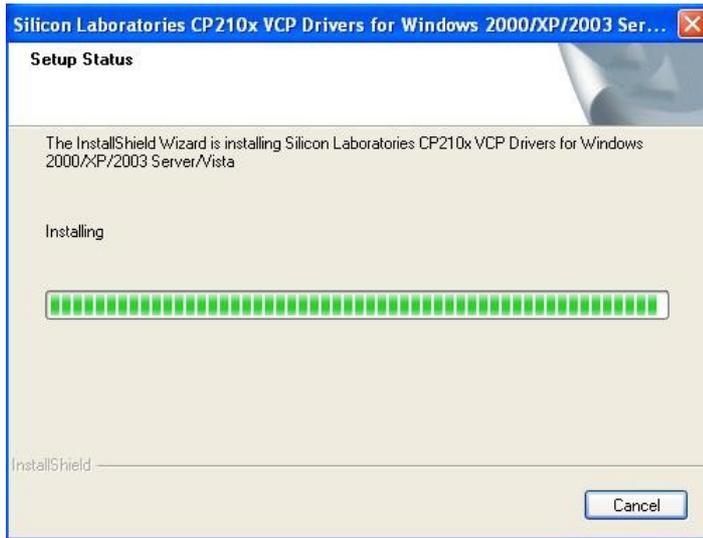
Click the "install" icon to begin installation of CP210x driver.



F. Scan and install CP210x USB to UART Bridge Driver Installer

After click “Install” icon, system is going to scan CP210x USB to UART Bridge driver installer and installation location.





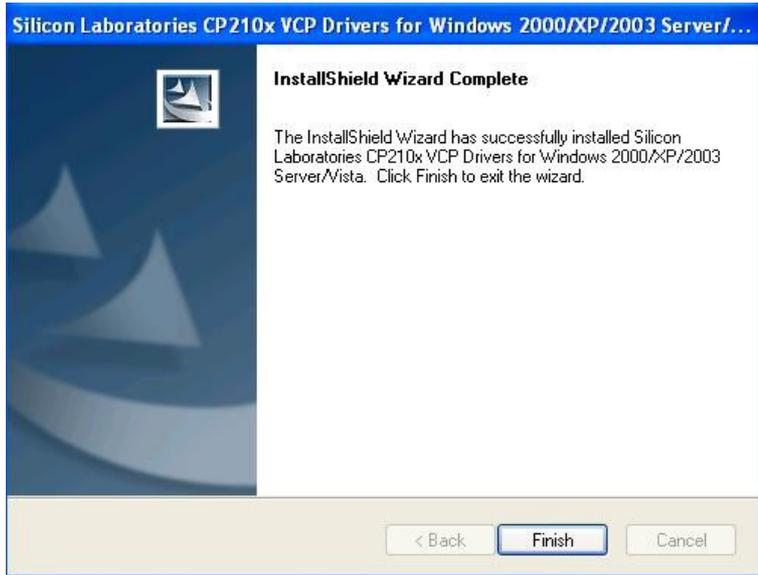
G. "System Settings Change" Notice

The message is notified you that your computer has been changed after installing of CP210x USB to UART Bridge Driver Installer. The new setting will take effect after restarting your computer.



H. InstallShield Wizard Complete

CP201x driver has successfully installed and click "Finish" icon for exiting the wizard.

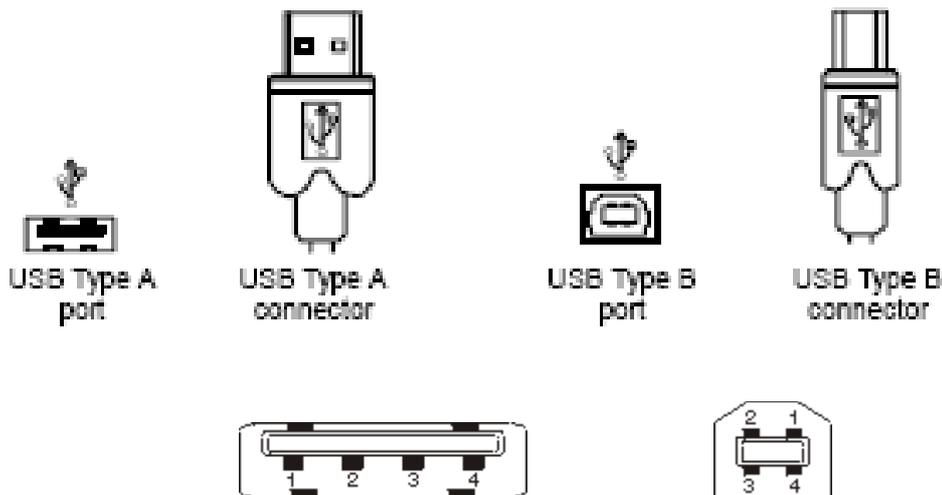


6

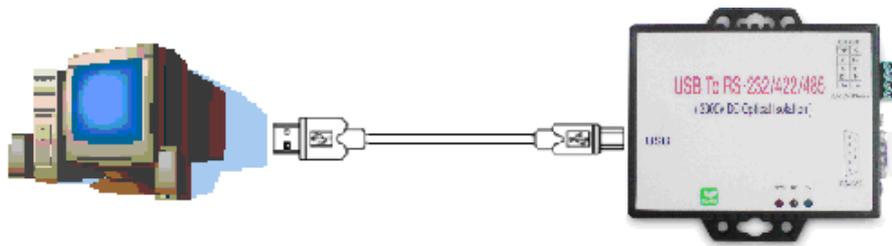
Hardware Installation & Setup

● Hardware Installation

1. Power on your computer and until OS is ready after booting
2. USB cables have two distinct connectors. The Type A connector is used to connect the cable from a USB device to the Type A port on a computer or USB hub. The Type B connector is used to attach the USB cable to a USB device.



3. Connect USB cable between a PC USB port (Or USB hub) and this converter's type B USB port.



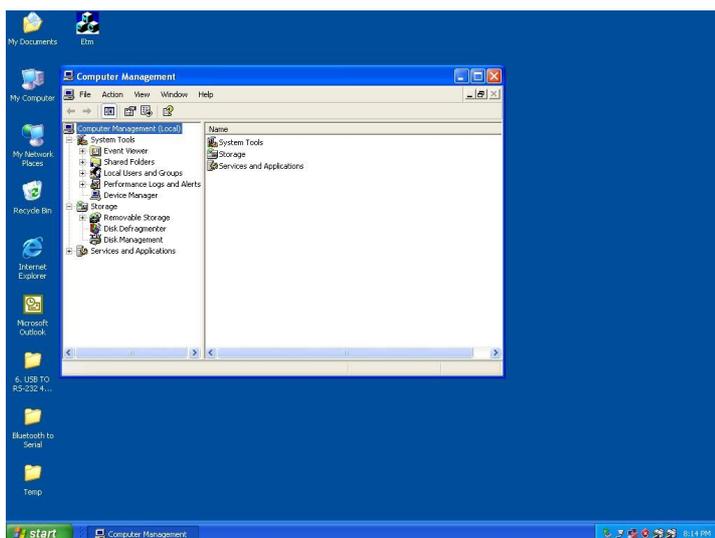
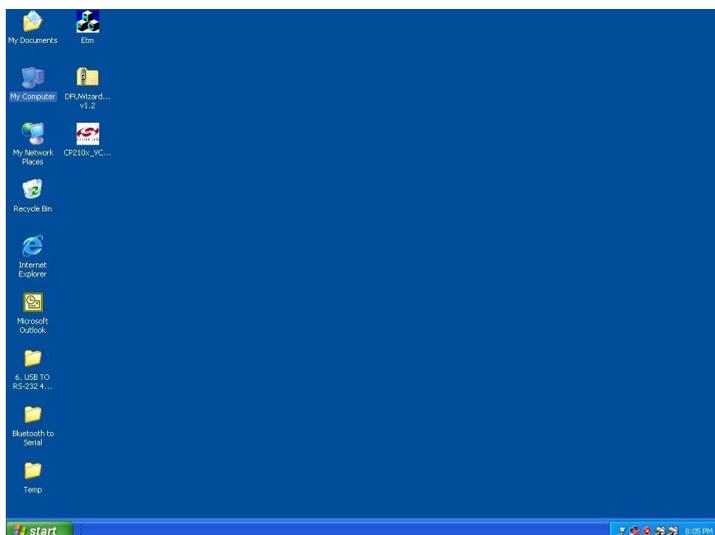
4. Connect the serial port (RS232 or RS422 or RS485) equipments to this USB to serial converter.
5. After connecting the USB to serial converter, then a message as “New device has been connected” will be pop-up on screen. However, the CT201x driver needs to be installed in PC in advance.
6. The SYS indicator of red LED will be turned into on. The USB to serial converter is active.

● Hardware Setup

When the USB to serial converter has successfully connected, you can setup more detailed parameters by Computer's Management.

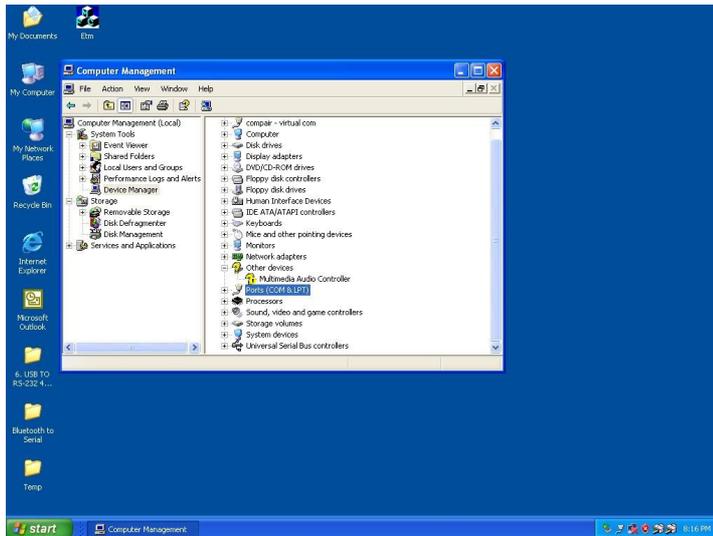
A. Into "Manage" icon in My Computer

Click "My Computer" icon and then press the right side button of mouse. After you click the manage item on list bar then "Computer Management (Local) list will pop-up.



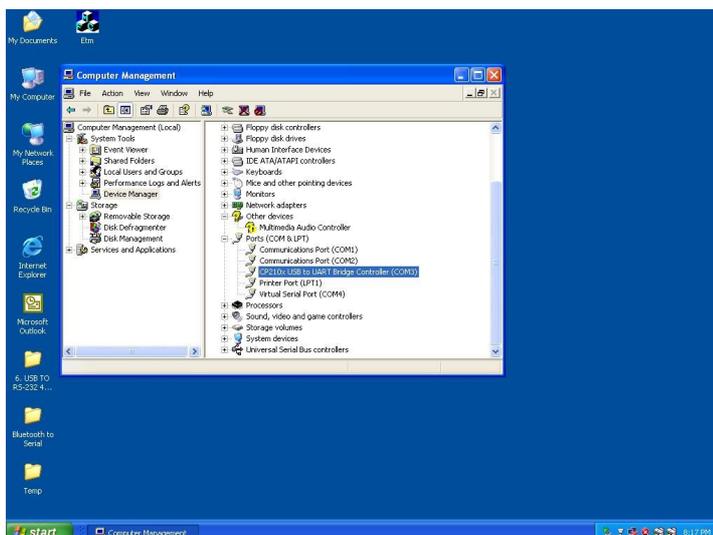
B. Choose “Device Manager” and click “Ports(COM & LPT)” in Device Manager

Click “Device Manager” item, all devices of computer will be listed on right site of screen and then click “Ports (COM & LPT)” item for looking for more COM devices.



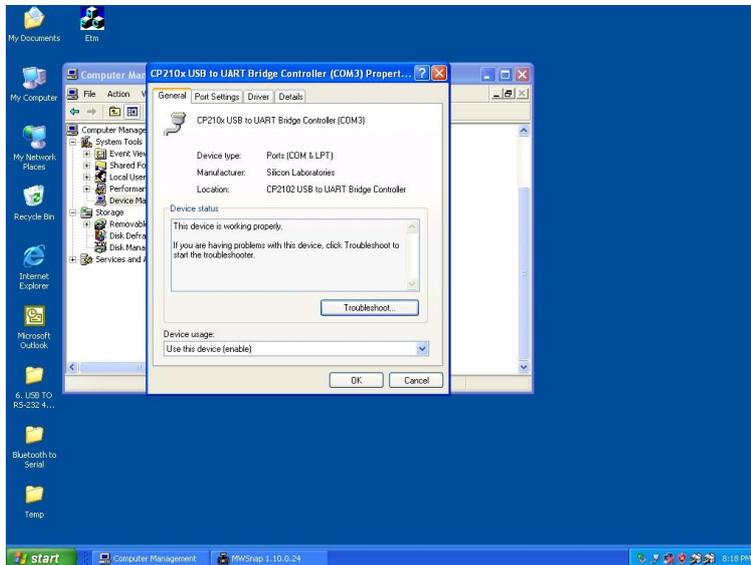
C. Detail parameters of CP210x USB to UART Bridge Controller

Click “CP210x USB to UART Bridge Controller” for getting more detail information of the device.



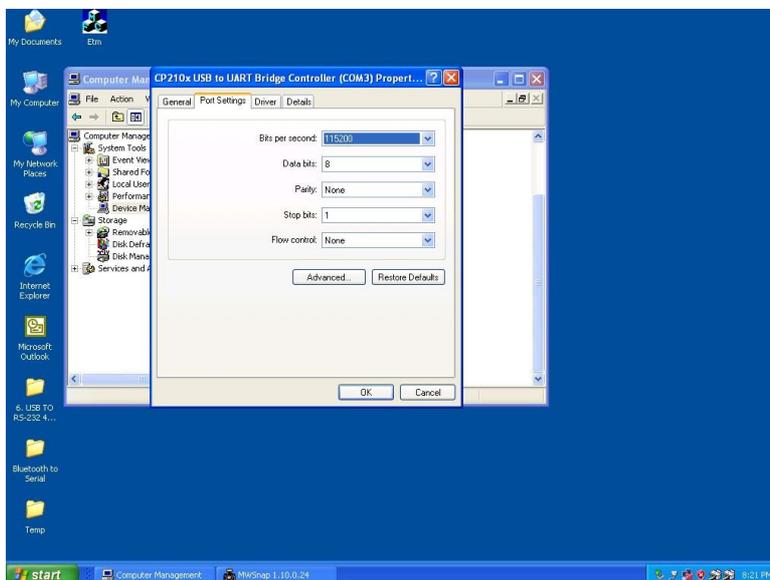
D. Device status of CP210x USB to UART Bridge Controller

This is showing the status of device and some product general information. COM port number of device is also displayed on.



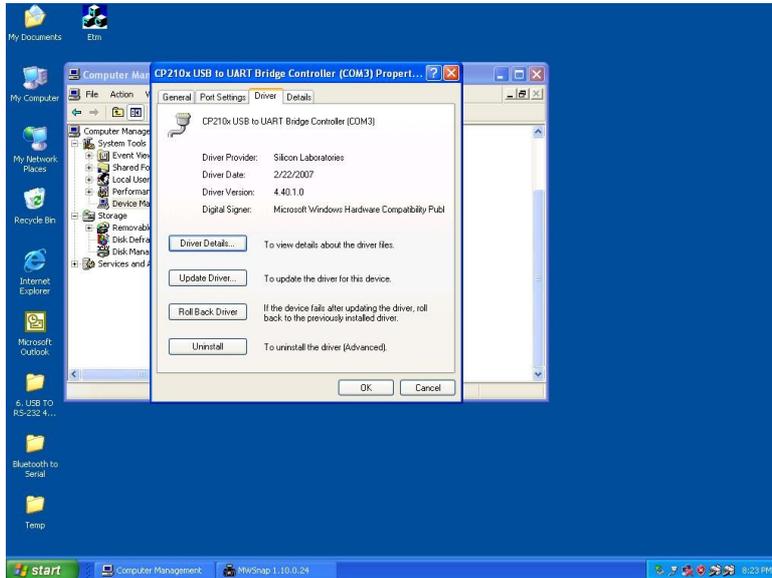
E. "Driver" detail information

This is for checking more detail information of driver in this device.



F. “Details” item

It is for checking device ID numbers as device instance ID.

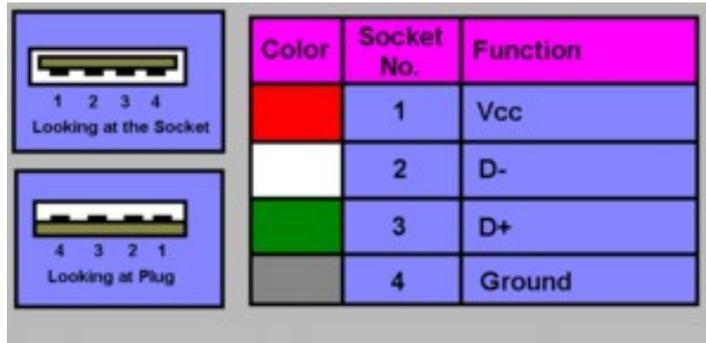


Appendix A

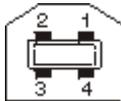
Pin outs and Connector

1□ USB Layout Diagram

Type A USB Connector

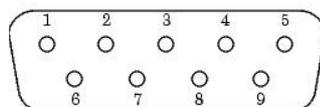


Type B USB Connector



2□ RS-232 Pin Assignment

The pin assignment scheme for a 9-pin male connector is given below.



PIN 1 : DCD PIN 2 : RXD PIN 3 : TXD
PIN 4 : DTR

PIN 5 : GND PIN 6 : DSR PIN 7 : RTS PIN 8 : CTS
PIN 9 : X

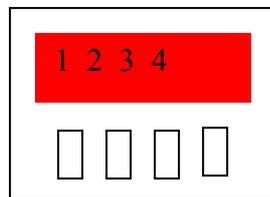
□ RS-232 Wiring Diagram

Serial Device USB to RS-232/422/485 Converter

| | | |
|--------------|--------------|----------------|
| <u>2 RX</u> | <u>3 TX</u> | |
| <u>3 TX</u> | <u>2 RX</u> | |
| <u>5 GND</u> | <u>5 GND</u> | |
| <u>7 RTS</u> | <u>8 CTS</u> | (Flow Control) |
| <u>8 CTS</u> | <u>7 RTS</u> | (Flow Control) |

3□ **RS-422 Pin Assignment**

The pin assignment scheme for a 4-pin RS-422 is given below.



RS-422: PIN 1: T+ PIN 2: T- PIN 3: R+ PIN 4: R-
 RS-485: PIN 1: D+ PIN 2: D-

4□ **RS-422 Wiring Diagram**

| | |
|---------------|---------------------------------|
| Serial Device | USB to RS-232/422/485 Converter |
| <u>R-</u> | <u>2 T-</u> |
| <u>R+</u> | <u>1 T+</u> |
| <u>T-</u> | <u>4 R-</u> |
| <u>T+</u> | <u>3 R+</u> |

5□ **RS-485 Wiring Diagram**

| | |
|---------------|---------------------------------|
| Serial Device | USB to RS-232/422/485 Converter |
| <u>D-</u> | <u>2 D-</u> |
| <u>D+</u> | <u>1 D+</u> |