

CP2102 USB Breakout Board

Simple USB
4/27/2005

1 Overview

The CP2101 and the new CP2102 ICs from Silicon Labs are amazing little chips with lots of built-in features! The chip is perfect for embedded systems that require a serial connection to a computer. The CP2102 Breakout Board attaches directly to the USB bus via a standard type B female connector and shows up on any Windows computer as a standard serial com port. If you can make your Windows application talk to a com port, then you can talk USB! Drivers are available for Mac OS9 and OSX. Linux 2.4 is supported. Open source drivers as well as kernel specific drivers are available for Linux as well.

There are many features to the CP2102 that make it a perfect fit for many designers. The CP2102 requires no external oscillator, uses reprogrammable internal EEPROM for device description, and has an on-board voltage regulator. The CP2102 implements a full hardware UART with flow control for baud rates from 300bps up to 921600bps. The TX and RX pins from the CP2102 breakout board can be connected directly to the RX and TX pins of your preferred microcontroller or serial application for a simple serial cable replacement connection.

2 Hardware Layout

The Spark Fun Electronics breakout board brings all 9 serial interface pins from the miniature 28-pin MLP package to usable 0.1" spaced footprints which allow the customer to attach headers or wires for easy system integration.

2.1 UART Interface

All pins serial interface pins are 5V tolerant

- **TX** : Transmit *from* the breakout board - Serial Output. Normally connected to the RX Pin on any microcontroller or equivalent UART.
- **RX** : Receive *into* the breakout board - Serial Input. Normally connected to the TX Pin on any microcontroller or equivalent UART.
- **DTR** : Data Terminal Ready
- **DSR** : Data Set Ready
- **RTS** : Ready to Send
- **CTS** : Clear to Send
- **RI** : Ring Indicator
- **DCD** : Data Carrier Detect

2.2 Power Interface

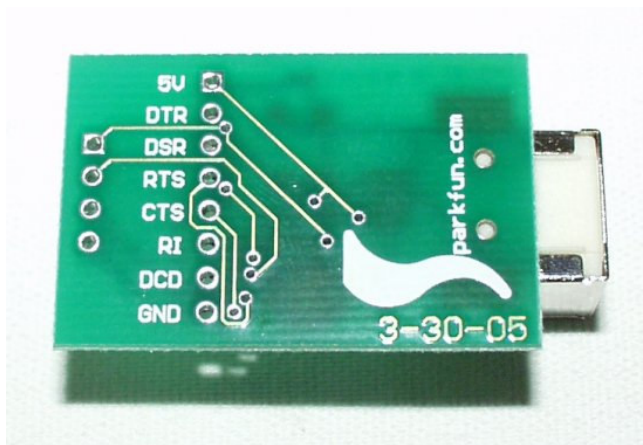
The CP2102 Breakout Board has two connections to power: 5V (unregulated) and 3.3V

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(regulated).

The 5V pin is connected directly to the USB 5V bus and can range from 4.6-5.2V depending on the regulation of the given USB port. This pin can provide a maximum of 500mA in accordance with the USB 2.0 specification (assuming the unit is attached to a USB 2.0 port).

The 3.3V pin is connected to the internal regulator of the CP2102 and can source a *maximum* of 100mA. You may use this pin to power your 3.3V circuit. Two ground connections are also provided :



3 Driver Download

Drivers are currently available for Windows, Linux, Mac OS 9, and Mac OS X. Currently, this documentation only covers the basic Windows installation.

Windows Drivers can be obtained from the Spark Fun Website :

<http://www.sparkfun.com>

[/datasheets/SFE_USB_Drivers-v011.zip](http://www.sparkfun.com/datasheets/SFE_USB_Drivers-v011.zip)

Linux (kernel 2.4) and MacOS X drivers can be obtained from the SiLabs FTP server:

<ftp://ftp.silabs.com/Release>

user : **cp2101** - password : **cp2101xfer**

The drivers for Mac OS 9 are in beta. You can download those from here:

<ftp://ftp.silabs.com/Beta>

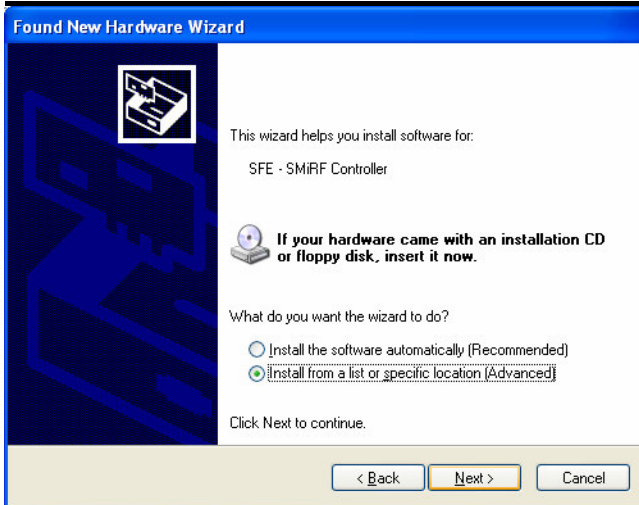
user : **cp2101** - password : **cp2101xfer**

4 Installing Windows USB Drivers

Download and unzip the Windows drivers from the Spark Fun website into a known directory - you're going to need it later. Now attach the USB device to your system. The *Found New Hardware Wizard* should pop up:



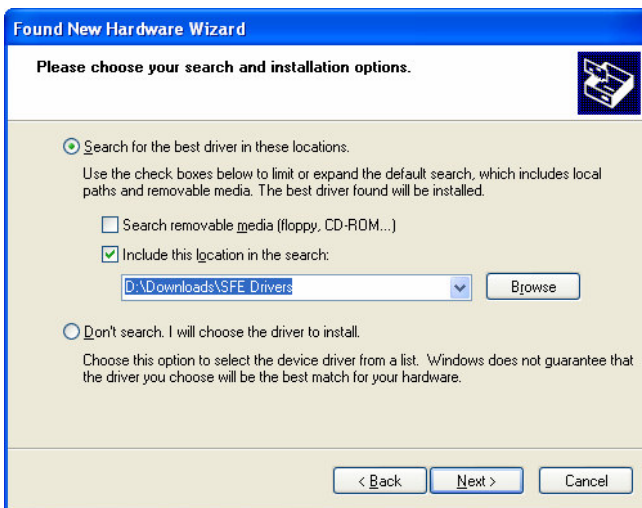
This is the new XP Service Pack 2 Wizard. Yours may look slightly different. Mainly, you want to tell your computer to look in a specific directory for the needed drivers. For XP, select *No, not this time* and click *Next*.



When asked to search automatically or from a specific location, Select *Install from a list or a specific location (Advanced)*.



Windows may warn you that the driver is not verified. This is ok, click *Continue Anyway*.



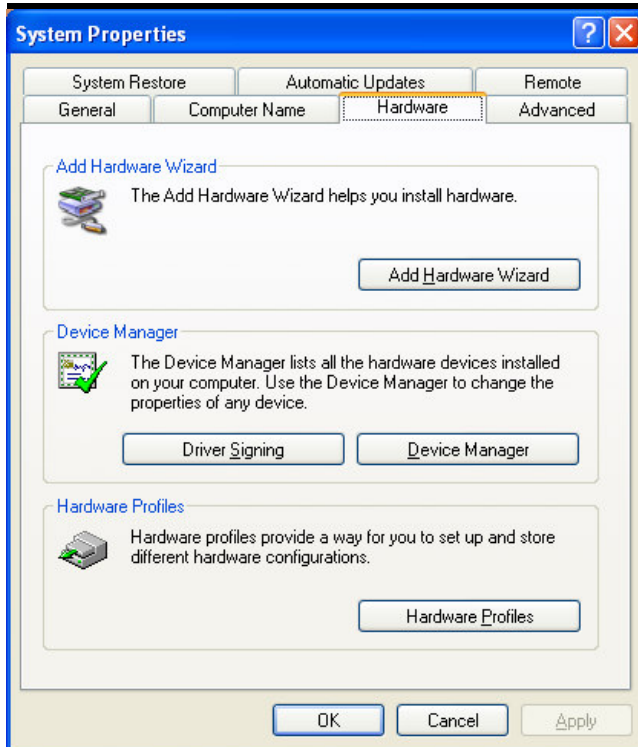
Now you will need to tell the computer where the drivers are located. Navigate to the directory in which you unzipped the SFE USB Driver file.



Installation complete!

To create a connection to the device, you will need to determine the com port onto which it installed. This is different in every case as the USB interface IC will attach itself to the first available Com Port. To find out where the **SFE USB to RS232 Controller** ended up, right click on 'My Computer' and click on *Properties*. This will open the *System Properties* window:

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Next, click on the **Hardware** tab and then **Device Manager** button. This will open the Device Manager:



Scroll down to 'Ports' and open the branch. In this example, the **SFE USB to RS232 Controller** is located on Com Port 7. You can now use Windows HyperTerminal or your favorite terminal program to connected to this device via the com port number.