CP2103 Evaluation Kit User's Guide

1. Kit Contents

The CP2103 Evaluation Kit contains the following items:

- CP2103 Evaluation Board
- RS232 Serial Cable
- USB Cable
- DVD
- Quick Start Guide

2. Relevant Documentation

Application notes can be found on the Interface Application Notes page for all fixed-function devices: www.silabs.com/interface-appnotes.

- **AN721: CP210x/CP211x Device Customization Guide** — Customize the VID, PID, serial number, and other parameters stored in the CP2103 EPROM.
- **AN197: Serial Communications Guide for CP210x** — Programming guide for using the Virtual COM Port (VCP) drivers.
- **AN169: USBXpress Programmer's Guide** — Programming guide for using the USBXpress drivers.
- **AN220: C8051F32x and CP210x USB Driver Customization** — VCP or USBXpress driver customization tool.
- **AN223: Port Configuration and GPIO for CP210x** — Programming guide and DLL for runtime control of the CP2103 GPIO pins.
- **AN571: CP210x Virtual COM Port Interface** — USB interface details for CP210x devices.

3. Software Setup

The Software Development Kit (SDK) for the CP2103 kit is included on the kit DVD. The latest version of this installer can also be downloaded from the www.silabs.com/interface-software website. This package includes:

- **Device Customization Utility (AN721)**
- **Documentation** — data sheet, application notes, user's guide, quick start guide, etc.
- **CP210x Virtual COM Port (VCP) Drivers**
- **Software** — Driver Customization Utility (AN220) and programming examples

The Windows installer should launch automatically after inserting the DVD. For Mac and Linux, browse to the appropriate directory on the DVD to install the software package. Follow the instructions to install the SDK and drivers to the system.

3.1. USBXpress Driver Development Kit

The Silicon Laboratories USBXpress® Development Kit provides a complete host software solution for interfacing to CP210x devices. No USB protocol or host device driver expertise is required. Instead, a simple, high-level Application Program Interface (API) for the host software is used to provide complete USB connectivity. The USBXpress Development Kit includes Windows device drivers, Windows device driver installer, host interface function library (host API) provided in the form of a Windows Dynamic Link Library (DLL). See Application Note AN169, "USBXpress Programmer's Guide" for detailed information on using the USBXpress drivers.

The USBXpress drivers are available here: www.silabs.com/usbxpress.

Click the USBXpress Development Kit link in the Download for Windows 2000/XP/Server 2003/Vista/Win7 section to download the USBXpress drivers. Run the installer and follow the steps to install the software to the desired

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location. The default installation directory is *C:\SiLabs\MCU\USBXpress_SDK*.

Further installation instructions for the WinCE drivers can be found in the *ReadMe.txt* file contained inside the driver package.

4. CP2103 Hardware Interface

The evaluation board is connected to a PC as shown in Figure 1.

1. Connect one end of the USB cable to a USB Port on the PC.
2. Connect the other end of the USB cable to the USB connector on the CP2103 evaluation board.
3. Connect one end of the RS232 serial cable to the DB-9 connector on the CP2103 evaluation board.
4. Connect the other end of the RS232 serial cable to the target serial device.

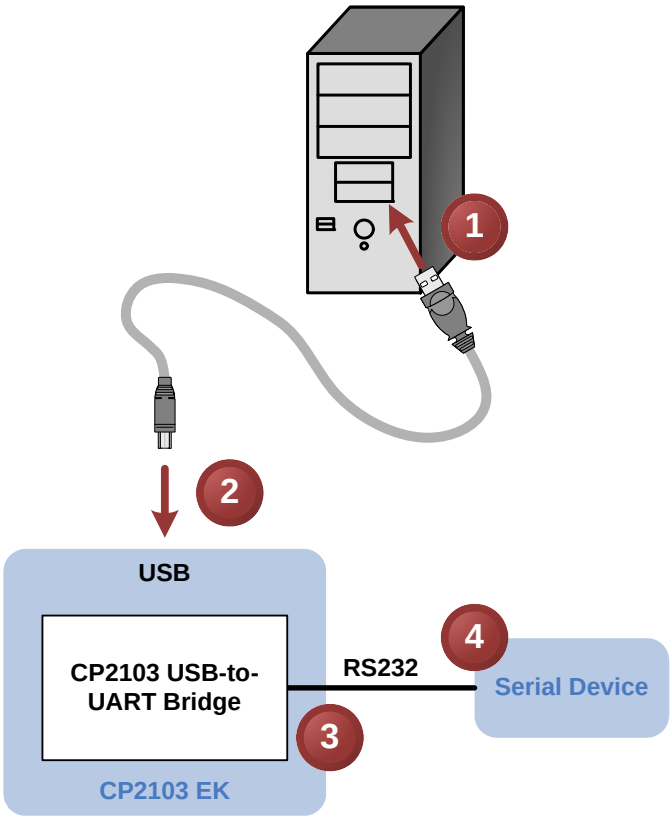


Figure 1. Hardware Setup

5. CP2103 Software Interface

If the Virtual COM Port drivers are used, the CP2103 will appear as a COM port in the Device Manager, as shown in Figure 2. The CP2103 will always use the lowest available COM port for operation. For instance, if COM ports 1 and 2 are in use by other peripherals and applications, the CP2103 will use COM 3.

The CP2103 functions identically to a COM port from the reference point of both the host application and the serial device, and it can support serial device control requests defined in the Microsoft Win32® Communications API. Examples for how to communicate with the device as a serial COM port are included in AN197 on the www.silabs.com/interface-appnotes page or in the SDK.

If the USBXpress drivers are used, the CP2103 will appear as a USB USBXpress device as shown in Figure 2. Examples for how to communicate with the device using the USBXpress interface are included in AN169 on the www.silabs.com/interface-appnotes page.

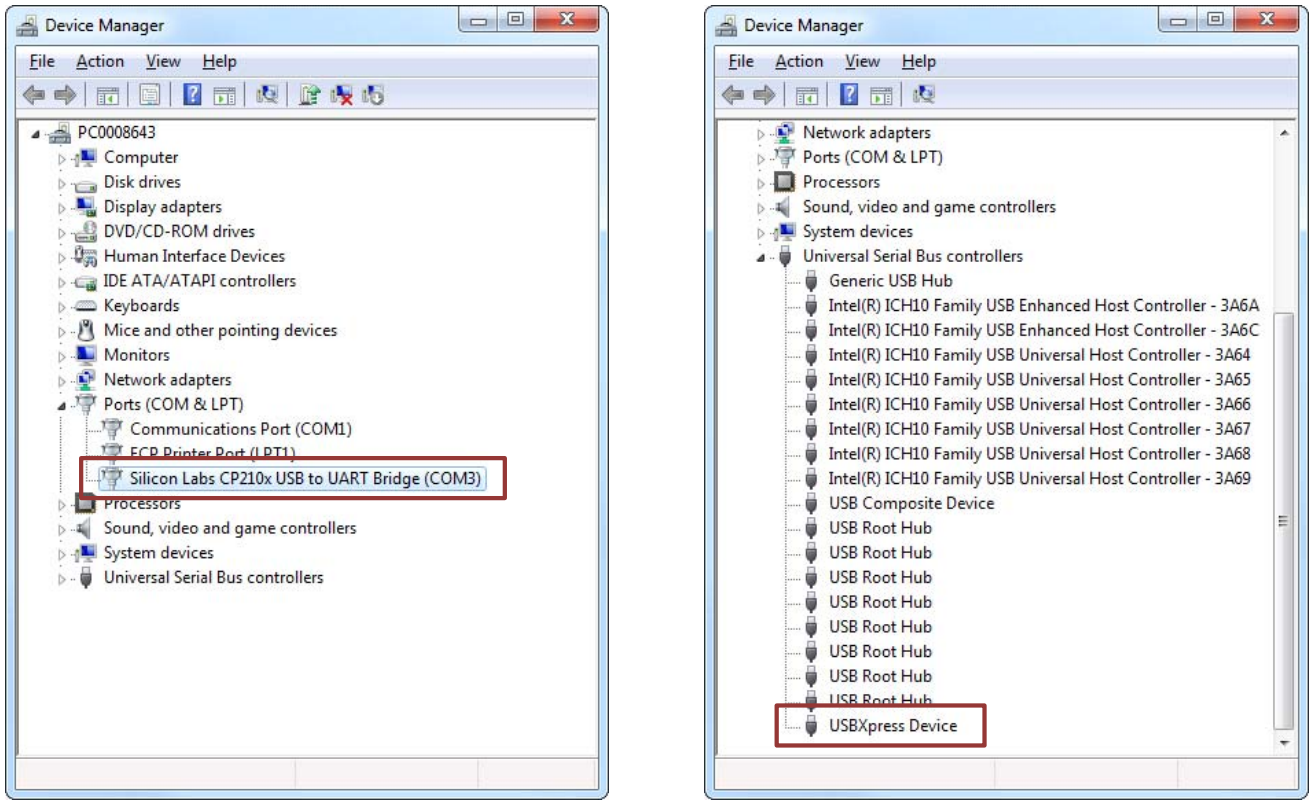


Figure 2. CP2103 in Device Manager

6. Target Board

The CP2103 Evaluation Kit includes an evaluation board with a CP2103 device pre-installed for evaluation and preliminary software development. Numerous input/output (I/O) connections are provided to facilitate prototyping using the evaluation board. Refer to Figure 3 for the locations of the various I/O connectors.

J1	DB9 connector for RS232 interface
J2	UART signal access connector
J3	USB connector for USB interface
J4, J7	Power Connector
J5, J6	GPIO Access Connector
D0–D3	Green GPIO LEDs
D4	Red SUSPEND indicator LED

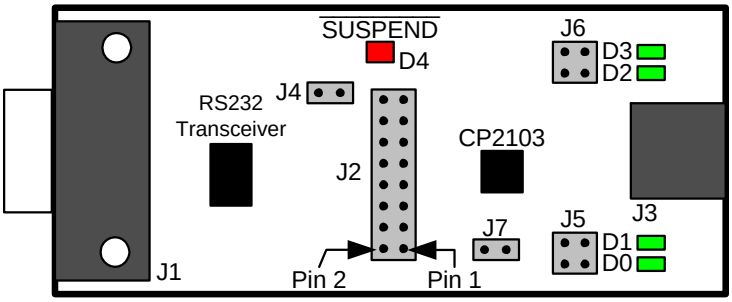


Figure 3. CP2103 Evaluation Board

6.1. LED Headers (J5, J6)

Connectors J5 and J6 are provided to allow access to the GPIO pins on the CP2103. Place shorting blocks on J5 and J6 to connect the GPIO pins to the four green LEDs D0 - D3. These LEDs can be used to indicate active communications through the CP2103. Table 1 shows the LED corresponding to each header position.

Table 1. J5 and J6 LED Locations

LED	Pins
D0	J5[3:4]
D1	J5[1:2]
D2	J6[3:4]
D3	J6[1:2]

6.2. Universal Serial Bus (USB) Interface (J3)

A Universal Serial Bus (USB) connector (J3) is provided to facilitate connections to the USB interface on the CP2103. See Table 2 for the USB pin definitions.

Table 2. USB Connector Pin Descriptions

Pin #	Description
1	VBUS
2	D-
3	D+
4	GND (Ground)

6.3. UART Signals (J1, J2)

A RS232 transceiver circuit and DB-9 connector (J1) are provided on the evaluation board to connect the CP2103 virtual serial port to external serial devices. See Table 3 for the RS232 J1 pin descriptions. The J2 connector is provided to facilitate direct access to the CP2103's UART signals. Shorting blocks on J2 are required to connect the UART signals to J1. See Table 4 for J2 pin descriptions.

Table 3. RS232 Pin Descriptions

Pin	Signal	CP2103 Direction	Description
1	DCD	Input	Data Carrier Detect
2	RXD	Input	Receive Data
3	TXD	Output	Transmit Data
4	DTR	Output	Data Terminal Ready
5	GND		Ground
6	DSR	Input	Data Set Ready
7	RTS	Output	Request to Send
8	CTS	Input	Clear to Send
9	RI	Input	Ring Indicator

Table 4. J2 Pin Descriptions

Pins	Signal	CP2103 Direction	Description
1-2	TXD	Output	Transmit Data
3-4	RXD	Input	Receive Data
5-6	DTR	Output	Data Terminal Ready
7-8	RI	Input	Ring Indicator
8-10	DCD	Input	Data Carrier Detect
11-12	DSR	Input	Data Set Ready
13-14	CTS	Input	Clear to Send
15-16	RTS	Output	Request to Send

6.4. Power Connectors (J4, J7)

Two headers, J4 and J7, are included on the evaluation board to provide several power options. The following describes the function of each connector:

- J4 - Connects the CP2103 VDD (pin 6) to the main +3 V net that powers the other components (4 green LEDs and RS-232 Sipex Part) on the board.
- J7 - Connects CP2103 VIO input (pin 5) to the main +3 V net. Remove the shorting block to power VIO from an external source.

7. Schematic

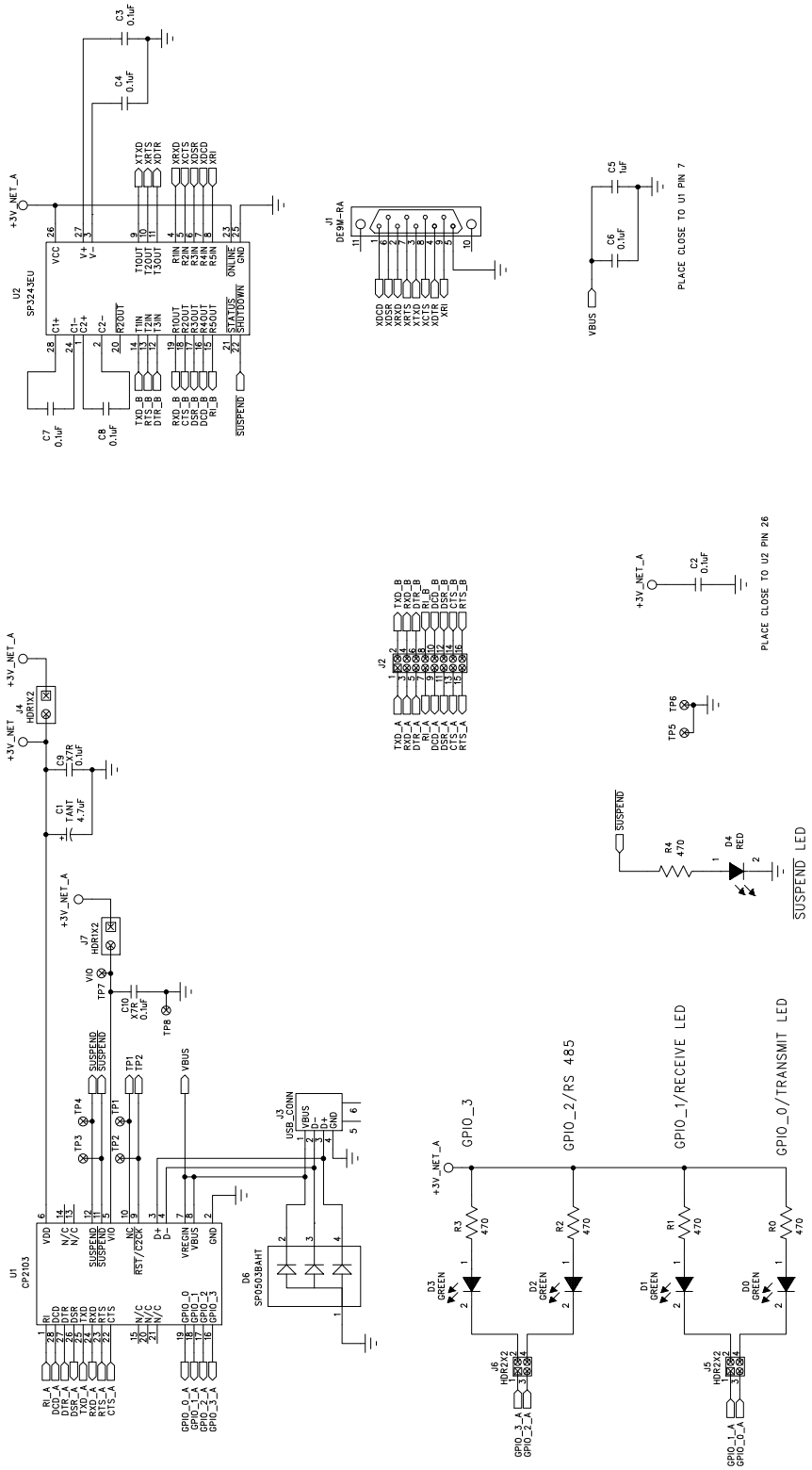


Figure 4. CP2103 Evaluation Board Schematic

DOCUMENT CHANGE LIST

Revision 0.1 to Revision 0.2

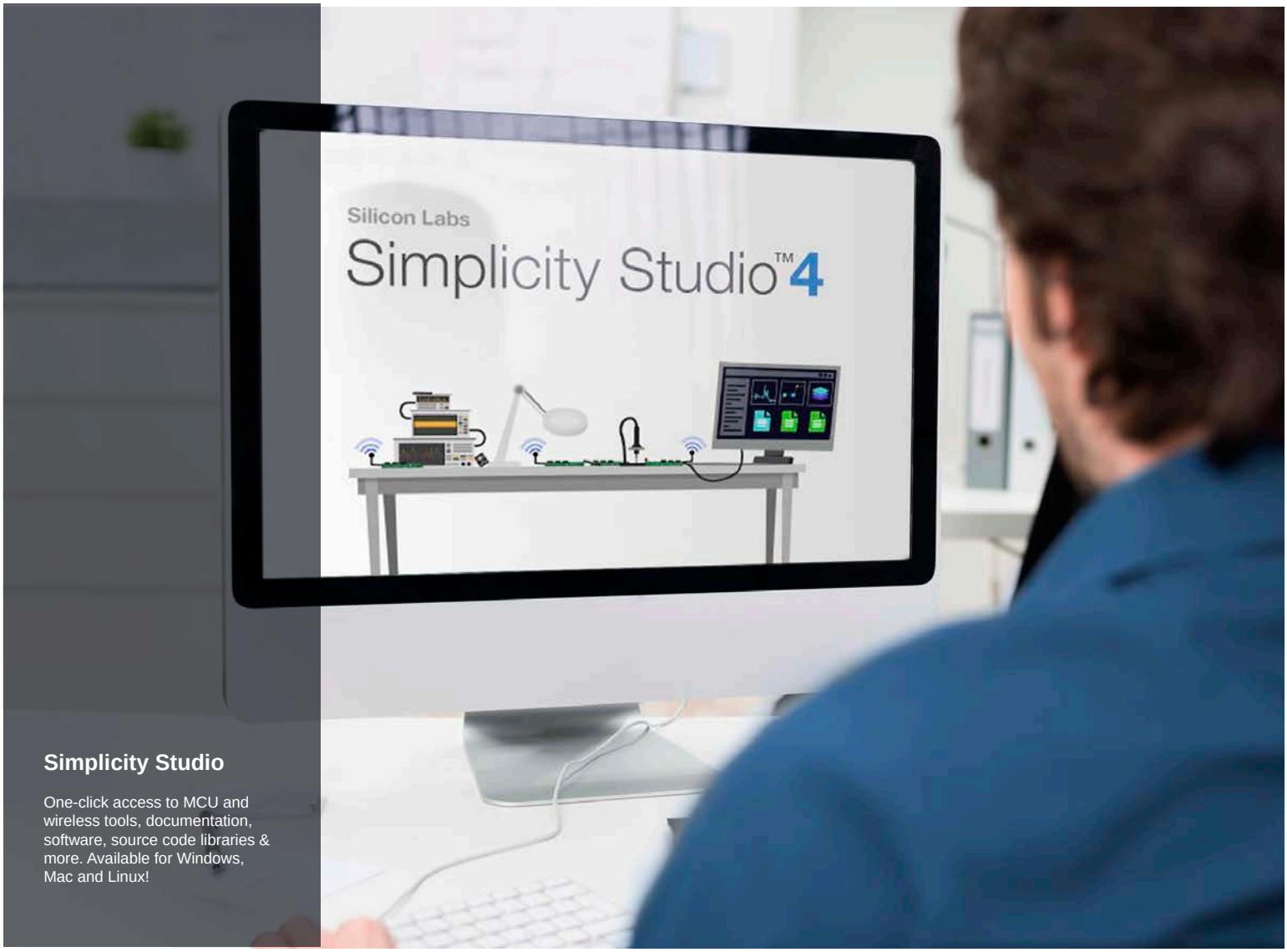
- Updated CD-ROM contents in Section “1. Kit Contents” to correspond with versions 4.0 and later of the CP210x Drivers and Product Information CD-ROM.
- Updated Section “3. Software Setup” to include installation instructions for software included on versions 4.0 and later of the CP210x Drivers and Product Information CD-ROM.
- Added installation instructions for USBXpress Driver Development Kit in Section “3. Software Setup”.
- Added screenshots in Section “5. CP2103 Software Interface”, for the Device Manager window after correct installation of driver software.

Revision 0.2 to Revision 0.3

- Updated "3. Software Setup" on page 1.

Revision 0.3 to Revision 0.4

- Updated “1. Kit Contents” to change CD-ROM to DVD.
- Added “2. Relevant Documentation”.
- Updated “3. Software Setup” to point to the drivers on the website.
- Updated Figure 1 and Figure 2.



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