

---

## CP2102 EVALUATION KIT USER'S GUIDE

---

### 1. Kit Contents

The CP2102 Evaluation Kit contains the following items:

- CP2102 Evaluation Board
- RS232 Serial Cable
- USB Cable
- 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-apnotes](http://www.silabs.com/interface-apnotes).

- **AN721: USBXpress™ Device Configuration and Programming Guide** — Customize the VID, PID, serial number, and other parameters stored in the CP2102 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: USB Driver Customization** — VCP or USBXpress driver customization tool.
- **AN571: CP210x Virtual COM Port Interface** — USB interface details for CP210x devices.

### 3. Software Setup

The software packages and documentation for the CP2102 kit can be found on the device page (<https://www.silabs.com/interface/usb-bridges/classic/device.cp2102>) and include the following:

- CP210x Drivers (Software & Tools Tab)
- USBXpress Host SDK (Software & Tools Tab)
- Documentation: (Tech Docs Tab)
  - CP2102 data sheet
  - CP2102 evaluation kit user's guide (this document)

#### 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: <https://www.silabs.com/developers/direct-access-drivers>

Click the USBXpress Development Kit link in the Downloads section to download the USBXpress drivers. Run the installer and follow the steps to install the software to the desired location. The default installation directory is *C:\SiliconLabsMCU\USBXpress\_SDK*.

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

## 4. CP2102 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 CP2102 evaluation board.
3. Connect one end of the RS232 serial cable to the DB-9 connector on the CP2102 evaluation board.
4. Connect the other end of the RS232 serial cable to the target serial device.

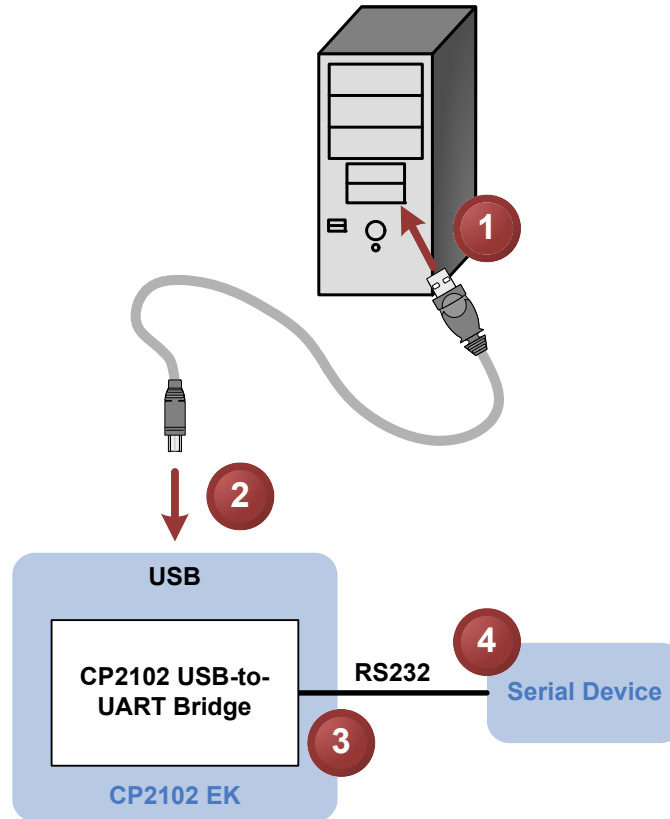


Figure 1. Hardware Setup

## 5. CP2102 Software Interface

If the Virtual COM Port drivers are used, the CP2102 will appear as a COM port in the Device Manager, as shown in Figure 2. The CP2102 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 CP2102 will use COM 3.

The CP2102 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<sup>®</sup> 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](http://www.silabs.com/interface-appnotes) page or in the SDK.

If the USBXpress drivers are used, the CP2102 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](http://www.silabs.com/interface-appnotes) page.

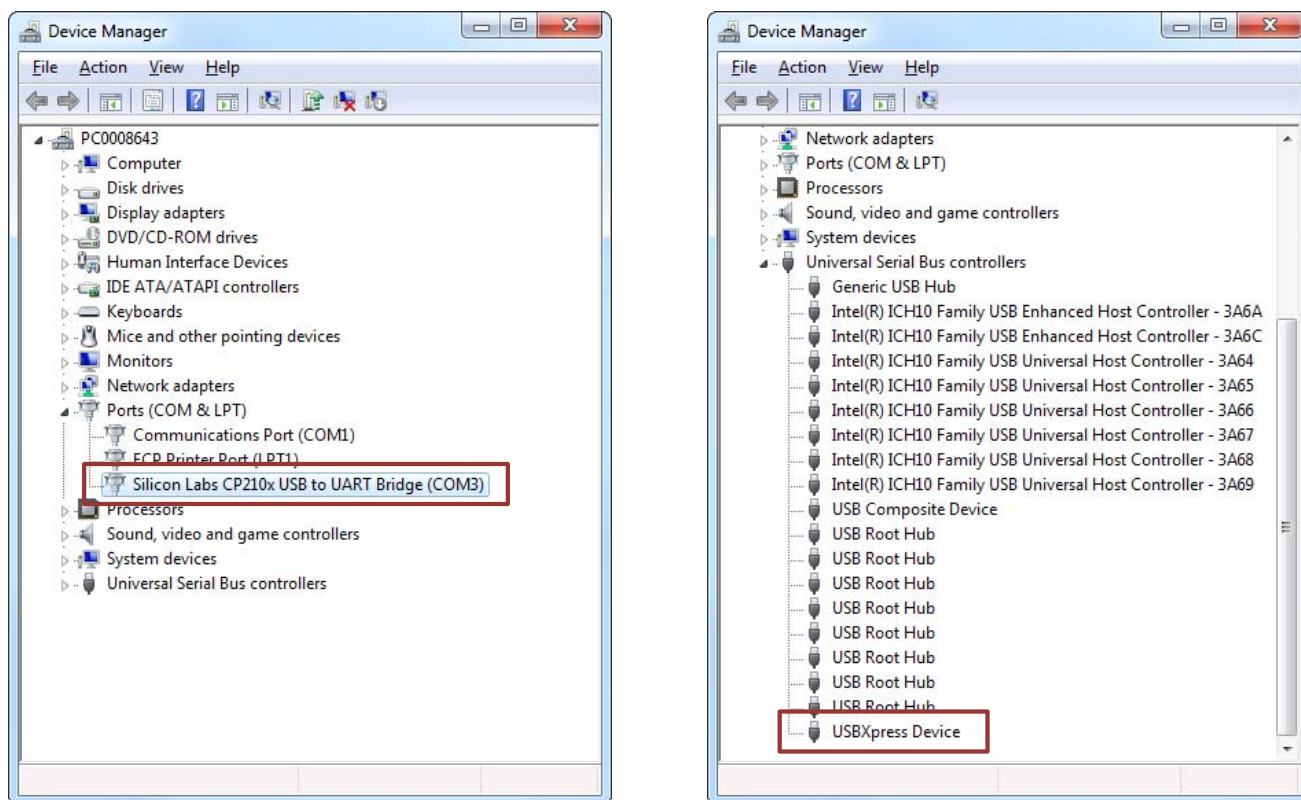


Figure 2. CP2102 in Device Manager

# CP2102-EK

## 6. Target Board

The CP2102 Evaluation Kit includes an evaluation board with a CP2102 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 Not used
- D1 SUSPEND indicator LED

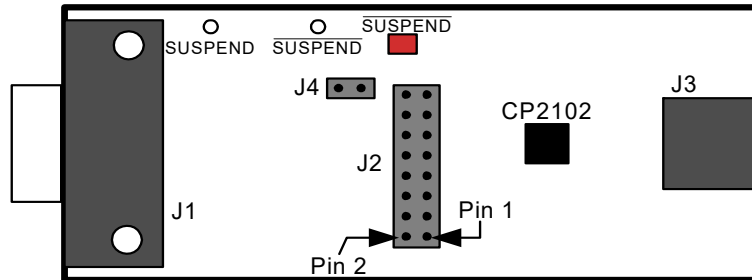


Figure 3. CP2102 Evaluation Board

### 6.1. Universal Serial Bus (USB) Interface (J3)

A Universal Serial Bus (USB) connector (J3) is provided to facilitate connections to the USB interface on the CP2102. See Table 1 for the USB pin definitions.

Table 1. USB Connector Pin Descriptions

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

## 6.2. UART Signals (J1, J2)

A RS232 transceiver circuit and DB-9 connector (J1) are provided on the evaluation board to connect the CP2102 virtual serial port to external serial devices. See Table 2 for the RS232 J1 pin descriptions. The J2 connector is provided to facilitate direct access to the CP2102's UART signals. Shorting blocks on J2 are required to connect the UART signals to J1. See Table 3 for J2 pin descriptions.

**Table 2. RS232 Pin Descriptions**

Pin	Signal	CP2102 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 3. J2 Pin Descriptions**

Pins	Signal	CP2102 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
9-10	DCD		Data Carrier Detect
11-12	DSR	Input	Data Set Ready
13-14	CTS	Input	Clear to Send
15-16	RTS	Output	Request to Send

## 7. Schematic

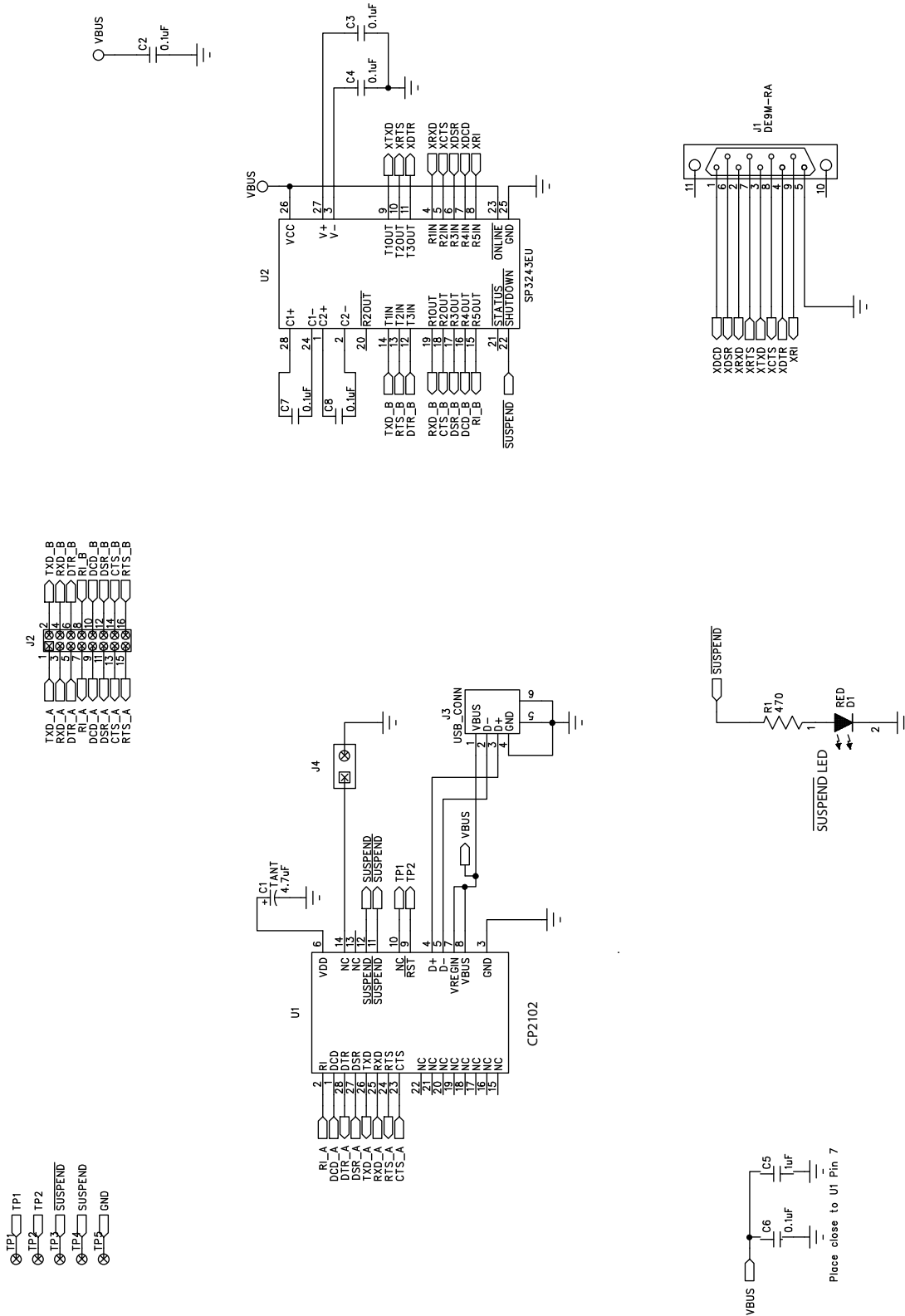


Figure 4. CP2102 Evaluation Board Schematic

## DOCUMENT CHANGE LIST

### Revision 0.1 to Revision 0.2

- Updated Figure 3 on page 4:
  - Pin 1 and Pin 2 labels have been corrected

### Revision 0.2 to Revision 0.3

- 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. CP2102 Software Interface”, for the Device Manager window after correct installation of driver software.

### Revision 0.3 to Revision 0.4

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

### Revision 0.4 to Revision 0.5

- 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.

### Revision 0.5 to Revision 0.6

- Updated “1. Kit Contents” to remove DVD.
- Updated “2. Relevant Documentation”.
- Updated “3. Software Setup”.
- Updated “3.1. USBXpress Driver Development Kit”.
- Updated Table 3 to correct pin "Data Carrier Detect" 8-10 to 9-10.

# Simplicity Studio

One-click access to MCU and wireless tools, documentation, software, source code libraries & more. Available for Windows, Mac and Linux!



**IoT Portfolio**

[www.silabs.com/IoT](http://www.silabs.com/IoT)



**SW/HW**

[www.silabs.com/simplicity](http://www.silabs.com/simplicity)



**Quality**

[www.silabs.com/quality](http://www.silabs.com/quality)



**Support & Community**

[www.silabs.com/community](http://www.silabs.com/community)

## Disclaimer

Silicon Labs intends to provide customers with the latest, accurate, and in-depth documentation of all peripherals and modules available for system and software implementers using or intending to use the Silicon Labs products. Characterization data, available modules and peripherals, memory sizes and memory addresses refer to each specific device, and "Typical" parameters provided can and do vary in different applications. Application examples described herein are for illustrative purposes only. Silicon Labs reserves the right to make changes without further notice to the product information, specifications, and descriptions herein, and does not give warranties as to the accuracy or completeness of the included information. Without prior notification, Silicon Labs may update product firmware during the manufacturing process for security or reliability reasons. Such changes will not alter the specifications or the performance of the product. Silicon Labs shall have no liability for the consequences of use of the information supplied in this document. This document does not imply or expressly grant any license to design or fabricate any integrated circuits. The products are not designed or authorized to be used within any FDA Class III devices, applications for which FDA premarket approval is required, or Life Support Systems without the specific written consent of Silicon Labs. A "Life Support System" is any product or system intended to support or sustain life and/or health, which, if it fails, can be reasonably expected to result in significant personal injury or death. Silicon Labs products are not designed or authorized for military applications. Silicon Labs products shall under no circumstances be used in weapons of mass destruction including (but not limited to) nuclear, biological or chemical weapons, or missiles capable of delivering such weapons. Silicon Labs disclaims all express and implied warranties and shall not be responsible or liable for any injuries or damages related to use of a Silicon Labs product in such unauthorized applications.

## Trademark Information

Silicon Laboratories Inc.®, Silicon Laboratories®, Silicon Labs®, SiLabs® and the Silicon Labs logo®, Bluegiga®, Bluegiga Logo®, ClockBuilder®, CMEMS®, DSPLL®, EFM®, EFM32®, EFR, Ember®, Energy Micro, Energy Micro logo and combinations thereof, "the world's most energy friendly microcontrollers", Ember®, EZLink®, EZRadio®, EZRadioPRO®, Gecko®, Gecko OS, Gecko OS Studio, ISOModem®, Precision32®, ProSLIC®, Simplicity Studio®, SiPHY®, Telegesis, the Telegesis Logo®, USBXpress®, Zentri, the Zentri logo and Zentri DMS, Z-Wave®, and others are trademarks or registered trademarks of Silicon Labs. ARM, CORTEX, Cortex-M3 and THUMB are trademarks or registered trademarks of ARM Holdings. Keil is a registered trademark of ARM Limited. Wi-Fi is a registered trademark of the Wi-Fi Alliance. All other products or brand names mentioned herein are trademarks of their respective holders.



Silicon Laboratories Inc.  
400 West Cesar Chavez  
Austin, TX 78701  
USA

<http://www.silabs.com>