

littleUSB V1.0

Tiny USB-to-UART Interface Module.

littleUSB is a universal interface adapter module for connecting microcontrollers, FPGAs, etc. to the USB bus.

It is based on Silicon Laboratories' CP2102 USB-to-UART interface chip, which converts data traffic between USB and UART formats. littleUSB includes a complete USB 2.0 full-speed function controller, bridge control logic and a UART interface with transmit/receive buffers and handshake signals. A royalty-free device driver for PC (Windows 98SE/2000/XP), Macintosh and Linux platforms is available for download at www.chip45.com.

CP2102 Customizing – Furthermore the CP2102 offers an integrated EEPROM for storing USB parameters like VID, PID, product string and serial number, hence providing the possibility to individualize a product based on Crumb128, by customizing these parameters. Silabs offers a free Windows tool, as well as another tool for generating a customized Windows USB driver. By providing such a driver to your customers, your product will be recognized immediately when connected to a PC and will be registered in Windows control panel with it's unique product name. Later your product will be assigned the same COM port number each time it is connected to the PC, which simplifies access to your product from PC applications.

The tools and the corresponding application notes (AN144 and AN220) by Silabs are also available on <http://www.chip45.com>.

Due to the low price of littleUSB, it is ideally suited as an assembling option for new system designs. Simply add an appropriate IC socket to your application and add USB functionality as required at any time.

Signals – littleUSB provides an open-drain /RESET signal, which can be used to either force a reset on littleUSB or drive the reset line of the application. If not used, /RESET can be left open.

The /SUSPEND output can trigger an interrupt and signal a USB bus suspend state. If not used, /SUSPEND can be left open.

The VBUS pin provides the USB bus supply voltage. This pin is NOT internally connected to VCC! When powering the littleUSB module with the VBUS voltage is intended, it has to be connected to VCC externally (most simply by a spot of solder across the two adjacent pins).

The two SHIELD pins are connected to the USB mini-B connector's shielding. It may be used in the application for shielding or grounding purposes.

The remaining five signals provide the UART's receive (RXD) and transmit (TXD) signal, as well as the handshake/modem control signals request to send (RTS), clear to send (CTS) and data terminal ready (DTR).

ESD Protection – littleUSB provides an array of transient voltage suppressor diodes, which provide ESD protection according to EN61000-4 (ESD: Air – 15kV, Contact – 8kV, EFT: 40A – 5/50ns, Surge: 12A, 8/20µs – Level 1 Line-Gnd & Level 2 Line-Line).

Note: The UART signals are 3.3V CMOS/TTL compatible signals (5V tolerant), which can be connected to a microcontroller's UART, an FPGA etc. It is not possible to connect these signals directly to RS232 level signals! This might damage the littleUSB module!

Formfactor – Dimensions of littleUSB have been chosen such, that a standard DIL16 pin header fits into the connector pads. This allows to simply plug littleUSB into a standard DIL14/16 IC socket in the application. The pins are arranged in the standard 2.54mm grid, hence most common pin headers or receptacles will fit into littleUSB. Two (DIL14) or four (DIL16) pins have to be cut off underneath the USB mini-B connector, before assembly. The picture on the right shows the exact dimensions of littleUSB

Disclaimer – Erik Lins makes no warranty for the use of its products and assumes no responsibility for any errors which may appear in this document nor does it make a commitment to update the information contained herein. Erik Lins products are not intended for use in medical, life saving or life sustaining applications. Erik Lins retains the right to make changes to these specifications at any time, without notice. All product names referenced herein are trademarks of their respective companies. chip45.com is a registered trademark of Erik Lins.

