Chipsmall

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!


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SparkFun USB to serial UART Boards Hookup Guide

Introduction

SparkFun has a line of USB to serial UART bridge products designed to allow a user to communicate with a serial UART through a common USB port. It is harder to find computers with serial UART ports on them these days, but super common to find serial devices. Many of the official Arduino and clones share a common interface. This interface is essentially the 6 pin Single-In-Line (SIL), 0.1" pitch version of FTDI's TTL-232R cables.

The key change from the FTDI cables to our Arduino compatible boards is that we swapped pin 6 from $\overline{RTS}$ to $\overline{DTR}$. This change was required to match Arduino's method of resetting the ATmega328P using the $\overline{DTR}$ signal.
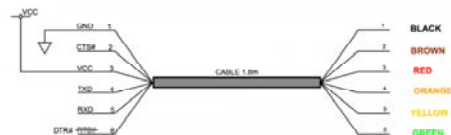
Arduino compatible pinout is slightly different from the FTDI cable (pin 6)

> **Note** The signal difference on pin 6 may cause these devices to not be 100% compatible with devices designed for use with the FTDI TTL-232R cables.

Advantages

Having a detachable USB to UART bridge comes with several advantages over boards like the Arduino Uno.

- Removing the computer interface makes the board smaller.

- You only need to buy the circuit once and can program many Arduinos.
- The bridge circuitry draws power (up to 500 mW) that's not needed in many installed applications. Removing this parasitic drain makes your project more power efficient & your batteries last longer.

Suggested Reading

Before we get started, you might want to review this other tutorial:

- Installing FTDI Drivers

Hardware Tour

The interface to this line of boards is simple. One side has a TTL-232R cable compatible 6 pin SIL, 0.1" pitch female header. This side connects to the Arduino (TTL serial UART) board. We often use right angle headers on the Arduino Pro Mini to make connecting a serial bridge trivial. Our boards have silkscreen labels of where the black and green wires of the FTDI TTL-232R cables would be.
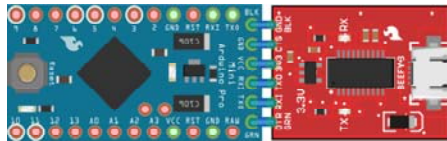
Fritzing diagram showing the connection between a USB to UART bridge and a Pro Mini

6 pin SIL, 0.1" pitch header at top of PCBA

The other side has a USB mini-B or USB micro-B jack. A standard USB cable is used to connect this jack to a host computer.

This line of products comes in a few forms. Here is a table comparing the most common options.

Name	Voltage	Current Limit	Connector
SparkFun FTDI Basic Breakout - 5V	5.0 V	N/A[1]	USB Mini-B
SparkFun FTDI Basic Breakout - 3.3V	3.3 V	< 50 mA	USB Mini-B
Beefy 3	3.3 V	< 600 mA[2]	USB Micro-B

Name	Voltage	Current Limit	Connector
LilyPad FTDI Basic Breakout - 5V	5.0 V	N/A[1]	USB Mini-B

Table 1. Comparison of common SparkFun offerings

> **Warning:** These boards are for prototyping ONLY. Unlike commercial devices, power negotiation and suspend mode do not occur, and it is possible to overload the USB host. Exercise caution when connecting a load, and *never connect a load that draws too much current*.

1. [5V is taken directly from V_{BUS} and is *only limited by the USB host controller.*]↩

2. [This 3.3V regulator is powered directly from V_{BUS} and is *only limited by the USB host controller.*]↩

Connecting the USB to Serial UART Boards

These bridges have two connections. On one end there is a USB device connection. See table 1 for more details on the exact connector for the specific product. This interface is USB 1.1 / USB 2.0 full-speed compatible. A standard USB A to some sort of B cable is used to connect the bridge to the computer.

The other connection is a 0.1" pitch female header designed to connect to the microcontroller. Many of our products come with a compatible row of plated-through holes. These are designed to have 0.1" male headers soldered in. Some cases will best be served with straight headers, other with right-angle headers. The desired connection varies from design to design as discussed here. Some products come prepopulated with these headers.
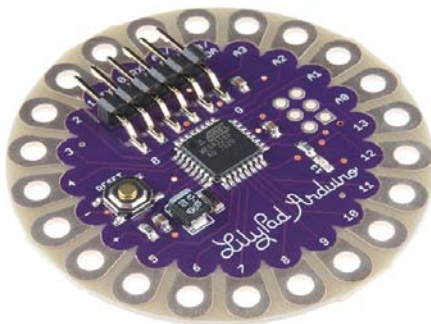
Prepopulated FTDI header example