



## USB GPIO

Last Revised 04/28/09

### Overview

The USB GPIO module provides a simple interface between a USB enabled PC and an embedded device. It is capable of acting as a PC controlled General Purpose Input/Output module, or as a UART interface. Based on the FTDI FT232RL, the USB GPIO module is easy to setup and use.

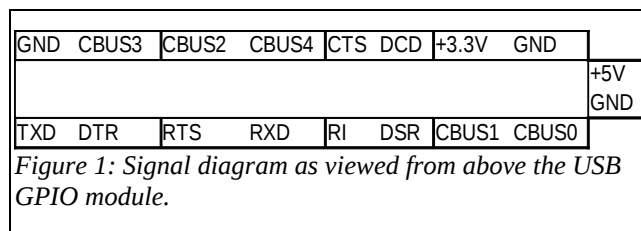
### Setup

Drivers for the USB GPIO module's FT232RL can be found here: <http://www.ftdichip.com/FTDrivers.htm>

On Windows systems, it is necessary to install drivers. Depending on the application, either the VCP or the D2XX may be used.

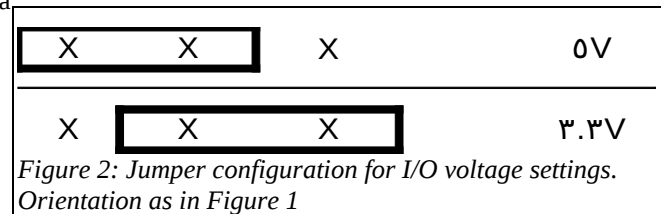
On many Linux based systems, the "ftdi\_sio" module is preinstalled, and the USB GPIO module will act as a serial interface as soon as it is connected to the host PC. For additional features, either the libftdi library (<http://www.intra2net.com/opensource/ftdi/>) or the official libftd2xx, available from FTDI may be useful.

To use the USB GPIO interface, make any desired electrical connections between the screw-terminals of the USB GPIO and the target embedded system. After ensuring that the necessary drivers are installed, insert the USB Type A plug into an appropriate receptacle on your host PC. At this point, your interface is up and running.



### IO Voltage Selection

IO voltage for the GPIO pins is either 3.3V or 5V. The jumper in the left position configures IO voltage to be 5V. In the right position, IO is configured to 3.3V. The jumper should not be left disconnected.



### Example Setup Scenario

It is desired to establish a serial interface between a host PC and the Luminary Micro LM3S6965 Ethernet Evaluation board. Specifically, a USB GPIO module will act as a connection between the LM3S6965's UART 1 interface and a host PC. The evaluation board does not have level shifters to translate from logic to RS232 voltages, preventing the usage of a standard serial cable connection.

Three electrical connections are made:

1. USB GPIO GND ↔ LM3S6965 GND.
2. USB GPIO RXD ↔ LM3S6965 U1TX
3. USB GPIO TXD ↔ LM3S6965 U1RX

The USB GPIO module is then inserted into a USB port on the host PC. After detection, the target system is accessible as a standard COM/serial port interface.

### Electrical Characteristics

The FTDI FT232RL is configured to use its internal 3.3V regulator to power the inputs and outputs. All electrical characteristics should be taken from the FTDI FT232RL datasheet<sup>1</sup>.

### References

- (1) [http://www.ftdichip.com/Documents/DataSheets/DS\\_FT232R.pdf](http://www.ftdichip.com/Documents/DataSheets/DS_FT232R.pdf)
- (2) <http://www.intra2net.com/opensource/ftdi/>
- (3) <http://www.ftdichip.com/FTDrivers.htm>