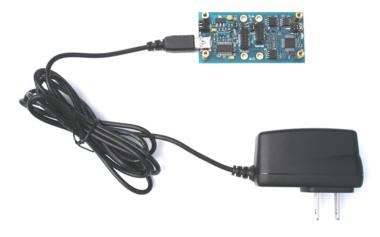
Web Site: www.parallax.com Forums: forums.parallax.com Sales: sales@parallax.com Technical: support@parallax.com Office: (916) 624-8333 Fax: (916) 624-8003 Sales: (888) 512-1024 Tech Support: (888) 997-8267

App Note: Standalone Power for Parallax Motherboards via the USB Connector

Introduction

Parallax motherboards, like the MoBoStamp-pe (p/n 28300), along with some of their daughterboards, accommodate a variety of power sources. For example, they can be powered from a PC's USB port, from the onboard **Vin** connector via the MOBO Power Cable (p/n 800-28300), from an external RS232 device via the (upcoming) RS232-DB daughterboard (p/n 28315), or from a wall transformer via the PWR-I/O-DB daughterboard (p/n 28301). This application note describes yet another way: using a 5V regulated DC wall transformer that includes a USB mini-B connector. Such a power supply is made by Phihong (among others). The Phihong unit (p/n PSAA05A-050 for the U.S. model) may be obtained from Mouser Electronics (<u>www.mouser.com</u>). It is shown plugged into a MoBoStamp-pe in the photo below.



Setup

For power from the USB port to be switched onto the motherboard's 5V supply rail, the onboard FTDI USB interface chip must undergo a handshaking transaction with an attached PC. Once this takes place, it will turn on the USB-supplied power to the rest of the board. Therefore, simply plugging one of the Phihong power supplies into the motherboard's USB port will not power up the board, since there's no PC with which to do the handshaking. But the FTDI chip can be configured (*i.e.* tricked) to bypass this important function and power up the downstream electronics whenever it receives power from the USB connector.

To configure the FTDI chip, you will need to obtain the **MPROG** utility from FTDI's website: <u>http://www.ftdichip.com/Resources/Utilities.htm</u>. Download and install the **MPROG** utility, then start it up. You will se a screen like the following:

MProg - Multi Device EEPROM Programmer ¥ 3.0a				
Eile Device Tools Help Image: State	₽ ≝ ≯ ? 0			
Basic Details Device Type None USB VID / PID FTDI Default Vendor ID 0403 Product ID 6001	USB Power Options Bus Powered Self Powered USB Serial Number Control	FT2232C Options FT232R		
BM / C Device Specific Options USB Version Number Disable USB Serial Number Pull Down IO Pins in USB Suspend	Serial Number Prefix (2 digits) FT Use Fixed Serial Number Fixed Serial Number (8 digits) 00000001 USB Remote Wake Up Enable USB Remote Wake Up Plug & Play (FT232 Series Only)			
Product and Manufacturer Descriptor Strings Manufacturer Product Description FTDI USB <-> Serial cabl Programming Options Only Program Blank Devices	Enable Plug And Play			
	×			

Now, connect your motherboard via the USB port. Then click **Tools -> Read and Parse**. You will see a screen that looks something like this:

MProg - Multi Device EEPROM Programmer (Edit Mode)			
<u>File D</u> evice <u>T</u> ools <u>H</u> elp			
	🔎 🖆 🗡 ? 🥹	<u> </u>	
Basic Details Device Type FT232R USB VID / PID FTDI Default Vendor ID 0403 Product ID 6001 BM / C Device Specific Options USB Version Number USB 2.0 Disable USB Serial Number	USB Power Options Bus Powered Self Powered USB Serial Number Control Serial Number Prefix (2 digits) Use Fixed Serial Number Fixed Serial Number (8 digits) A1000IV	FT2232C Options FT232R	
Pull Down IO Pins in USB Suspend	USB Remote Wake Up Enable USB Remote Wake Up Plug & Play (FT232 Series Only) Enable Plug And Play	I/O Controls TXLED# C0 RXLED# C1 TXDEN C2	
Product and Manufacturer Descriptor Strings Manufacturer Product Description FTDI FT232R USB UART	1	PWRON# C3 SLEEP# C4	
Programming Options Only Program Blank Devices Read EEPROM successful Device 0	×	☐ High Current I/O's ☐ Load D2XX driver	

There are two things you will need to set:

- Check the box that says, "Use Fixed Serial Number". This will keep the serial number of your FTDI chip from changing. *Do not change the serial number in the "Fixed Serial Number (6 digits)"* box.
- 2. Under C3 in the righthand column, select WR# instead of the default PWRON# setting.

Your screen will look like this:

🌌 MProg - Multi Device EEPROM Programm	ner (Program Mode)	×
<u>File Device Tools H</u> elp		
	🔎 🖆 🗡 ? 🥝	T
Basic Details	USB Power Options Max Bus Power	FT2232C Options FT232R
Device Type FT232R	Bus Powered	Laura Danaga giung da
	C Self Powered 90 milli Amps	Invert RS232 Signals
USB VID / PID FTDI Default	USB Serial Number Control	Invert RXD
Vendor ID 0403 Product ID 6001		Invert RTS#
		🔲 Invert CTS#
BM / C Device Specific Options	Se Fixed Serial Number	Invert DTR#
USB Version Number USB 2.0	Fixed Serial Number (8 digits)	Invert DSR#
Disable USB Serial Number	A1000IIV	□ Invert RI#
Pull Down IO Pins in USB Suspend	USB Remote Wake Up	-I/O Controls
	Enable USB Remote Wake Up	TXLED# CO
	· · · · · · · · · · · · · · · · · · ·	RXLED# C1
	Plug & Play (FT232 Series Only)	
	Enable Plug And Play	TXDEN C2
Product and Manufacturer Descriptor Strings		[/vℝ# <u>-</u> c3
Manufacturer Product Description FTDI FT232R USB UART		SLEEP# C4
FTDI FTZ32K 03B 0AKT		
Programming Options		
Conly Program Blank Devices		
Read EEPROM successful Device 0		High Current I/O's
Read EEPROM successful Device 0	<u> </u>	🗖 Load D2XX driver
	T	

Now do a **File** -> **Save As** ... and save your new settings under whatever filename you want. (This is necessary to enable **MPROG** for programming.) Finally, to program the new settings, do a **Device** -> **Program**. At this point, your motherboard should be capable of receiving power from the Phihong wall transformer. (Be sure the EXT/USB jumper is set to USB.)

You will also be able to program the BASIC Stamp, as usual, via the USB port. However, before connecting the USB cable, it will be best to unplug any daughterboards that consume a lot of power, since the usual power-up sequence will not be followed.

It is also possible to allow the Phihong unit to power the system and to *prevent any further programming of the BASIC Stamp.* This can be useful when others are using your motherboard system and you don't want them to change the program. This is done simply by selecting **TXDEN** in the above screen for **C3**, instead of **WR#**. Of course, this will prevent *you* from reprogramming the BASIC Stamp, too. So, to reverse this lockout, you will need to run **MPROG** again and restore **C3** to either **WR#** or **PWRON#**.