

Sparkfun mini-Bully PIC24 Breakout Board

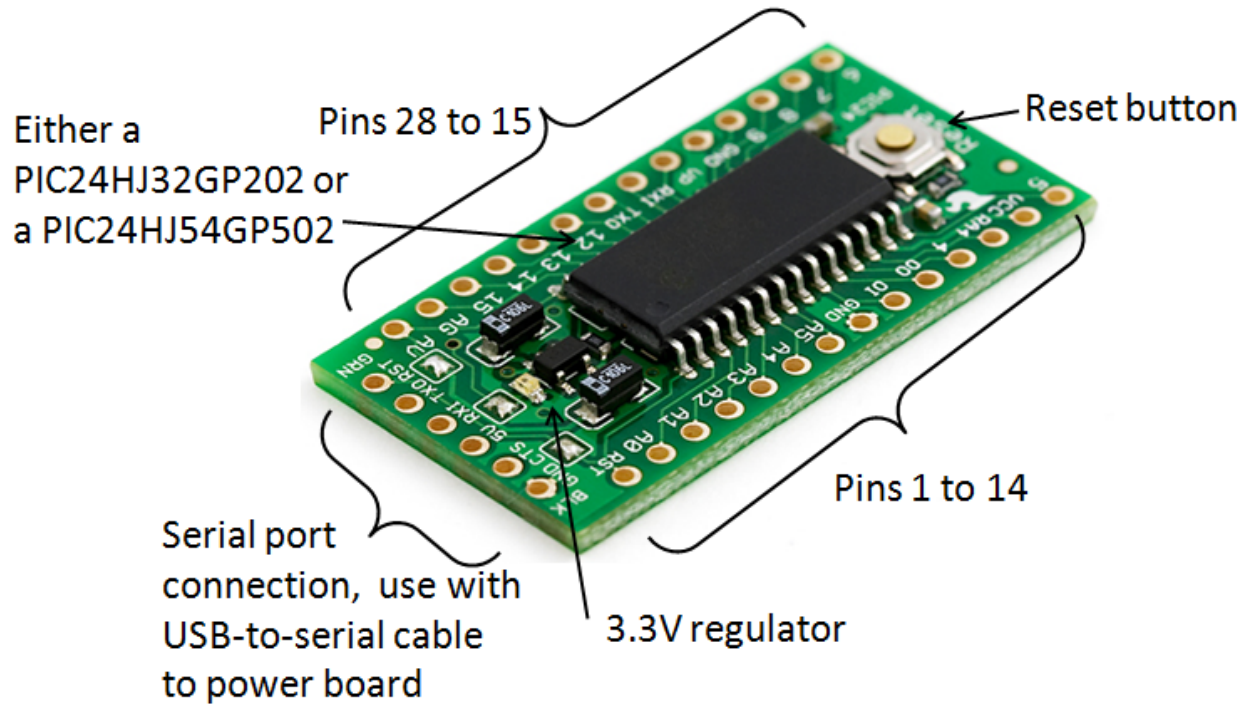
This is some minimal documentation on the Sparkfun mini-Bully PIC24 breakout board. More documentation, including a video tutorial on usage and code examples/libraries for this board can be found at www.reesemicro.com.

This zip archive contains:

- /bootloader_gui/winbootldr.exe, devices.txt - PC GUI for Bully bootloader serial bootloader, see PIC24_Bully_bootloader.pdf for more information. Copy these files to a local folder and execute winbootldr.exe to bring up the Bully Bootloader GUI.
- /bootloader_firmware – Bully bootloader firmware for PIC24HJ32GP202, *PIC24H64GP502* targets. The baudrate for serial bootloader is fixed in these hex files at 57600.
- /application_hex – the ‘reset.c’ application hex files compatible with the Bully bootloader; hex files are provided for the PIC24HJ32GP202, PIC24H64GP502. Source code for this application can be found in the PIC24 code library at www.reesemicro.com.

Overview

The mini-Bully offers a convenient platform for experimenting with a PIC24H CPU. The board contains a PIC24HJ32GP202 processor, a 3.3 V regulator, a power LED, holes for all 28-pins and holes for a 6-pin USB-to-serial cable connection.



You will need to populate the holes with pin headers. Good choices are straight headers for pins 1-28, and a right angle header for the USB-to-Serial cable connection. These headers are available from Sparkfun.



Two options for connecting the board's serial port to a PC is the FTDI basic breakout board available from Sparkfun,



or the FTDI USB-to-Serial cable with 3.3V IOs (FTDI TTL-232R-3V3) available from numerous vendors.



The board comes preprogrammed with the Bully bootloader firmware, and the `reset.c` application. The board is powered by the cable, so when you connect the USB cable the application begins running and you should see the power LED being blinked by the `reset.c` application. The source code for the `reset.c` application is found in the PIC24 code archive at www.reesemicro.com.

The baud rate used by the application is 57600 baud with 8 data, 1 stop bit and no hardware handshaking. This picture shows a portion of the serial output produced by the `reset.c` application.

```
reset.c, built on Oct  8 2008 at 09:42:39

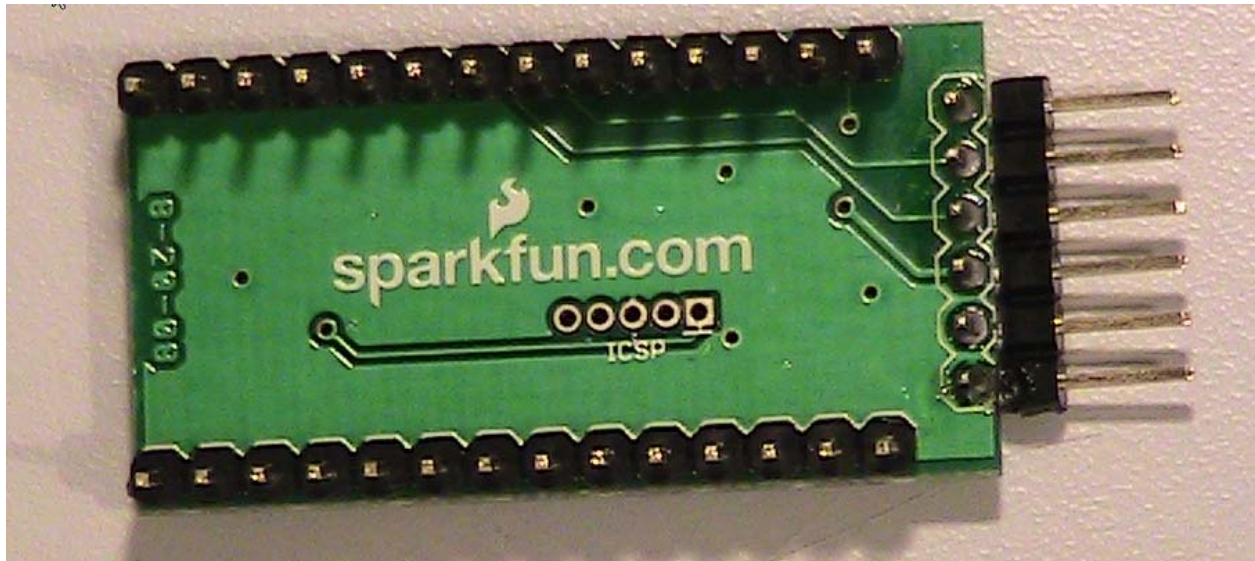
Reset cause: MCLR assertion.
Device ID = 0x00000F1D (PIC24HJ32GP202), revision 0x00003002 (A3)
Fast RC Osc with PLL
The reset count is 0x02
'1' enable watchdog timer
'2' enter sleep mode
'3' enter idle mode
'4' enable watchdog timer and enter sleep mode
'5' doze = divide by 2
'6' doze = divide by 128
'7' execute reset instruction
Choice:

COM4  57600   OpenCom   MCLR#
```

Note that the CPU is identified as a PIC24HJ32GP202. A later version of the mini-Bully uses the PIC24HJ64GP502; the CPUs are pin-compatible but the PIC24HJ64GP502 has more on-board peripherals.

In-Circuit Serial Programming

The board also has an in-circuit serial programming (ICSP) interface available on the back of the board as shown here. The square pin is pin #1.



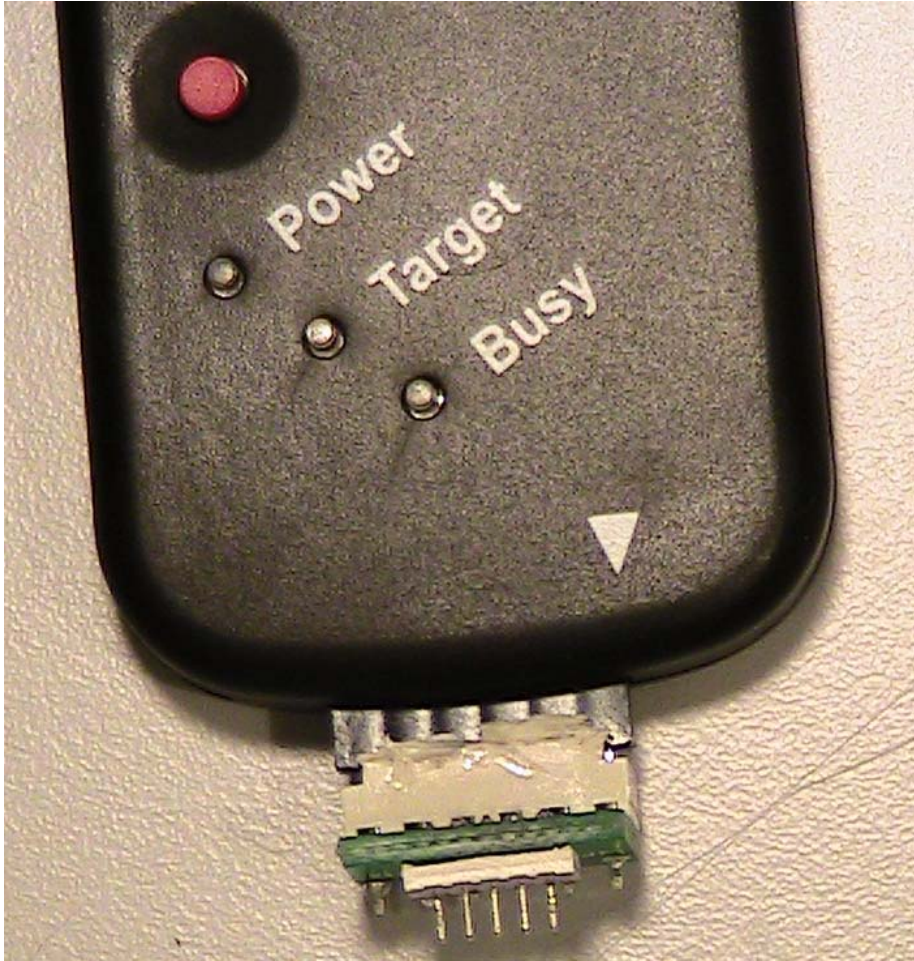
If you wish to use the PICKIT2 to perform in-circuit serial programming on the mini-Bully instead of using the serial bootloader, then you will need an inexpensive adapter board available from Sparkfun that allows the PICKIT2 to interface with the mini-Bully as shown here:



● BOB-00194

Adapter board for SFE ICSP Connections

This picture shows the adapter plugged into the PICKIT2 programmer. The adapter has a plastic tab that must be trimmed before it can be plugged into the PICKIT2.



The adapter board allows the Pickit2 access to the ICSP pins, and the PICKIT2 must be held in place during programming as shown in this picture.



Serial Bootloading

The following is applicable if you are using the Bully bootloader for programming by serial bootloading.

The master clear pin on the mini-Bully is connected to a hardware handshaking pin on the usb-to-serial connector. This means that you can reset the processor by toggling the MCLR checkbox in the Bully Bootloader window, or download a new program by selecting the MCLR and Program button.

If your mini-Bully has a PIC24HJ64GP502 CPU and you wish to use the PIC24 code examples at www.reesemicro.com along with the serial bootloader for downloading, be sure to change the linker file in the MPLAB projects from *pic24HJ32GP202_bootldr.gld* to *pic24HJ64GP502_bootldr.gld* (by default, all of the projects are configured for the PIC24HJ64GP202 CPU). These linker files are in the *lkr/* subdirectory.