



USBtinyISP

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AVR programmer & SPI interface

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Introduction

This is documentation for a simple open-source USB AVR programmer and SPI interface. It is [low cost](#), [easy to make](#), works great with [avrdude](#), is [AVRStudio-compatible](#) and tested under **Windows**, **Linux** and **MacOS X**. Perfect for students and beginners, or as a backup programmer.

The project is based off of the [USBtiny code & design](#). The main improvements are: adjusting the code to allow it to act as a [SpokePOV](#) interface, adding lowlevel bitbang commands, and addition of a "USB good" LED. Other changes are new VID/PID (to make it official), removing some of the commands, and moving around the pins a bit.

You can build this design using the [schematic and firmware](#), or buy a kit from [the Adafruit webshop](#). Having a full kit available solves the "chicken & egg" problem of purchasing or building a USB programmer that then needs a programmer of some sort to 'kick start'. (See [USBasp](#), [AVRdoper](#), [USBprog](#))

All the firmware code is distributed under the GPL, the hardware design layout files are [CC 2.5 Attrib./Share-alike](#)

Comments and suggestions should be [posted to the forum](#)

Description

Easy to make

- Ultra low cost: programmer is \$16 in parts, less than half the price of the AVRISP v2 ! (Kits are \$22 and [available from the adafruit shop](#))
- Kit comes with both 6-pin and 10-pin AVR-standard connectors and cables. Almost no programmers that are not from Atmel have both! (Including the AVRISP v2)

Easy to build: All through-hole parts, all common and available from large distributors

Easy to use

- AVRdude compatible - [support for usbtiny added in v5.5!](#)
- [USB drivers available for Windows](#) using libusb, no drivers needed for Mac OS X or Linux.
- Durable off-the-shelf enclosure
- High speed! Max clock rate is 400KHz. Write speed:1Kb/s, read speed: 2Kb/s. (Atmega8 takes 8s to write, 4s to read/verify)
- 2 LEDs to indicate "USB/Power good" and "Busy"
- I/O is buffered to allow programming of 2V-6V targets (v2)
- Works with any AVR ISP chip with 64K of flash (or less) - does not work with Atmega1281/1280/2561/2560

Easy to power

- Powered off of 5V USB bus at less than 100mA to allow it to be used with unpowered USB hubs
- Easily accessible jumper to power target project off of USB (target must be 5V tolerant, of course)
- Remove the jumper and it will self-power but buffer the I/O to match the target device. (v2)

Easy to extend

- Easily interfaced with libusb
- Existing firmware allows for fast SPI interfacing using USB
- Bit-bang commands provide 8 bits of I/O control (including LED) for open-ended project ideas