USBasp - USB programmer for Atmel AVR controllers

USBasp is a USB in-circuit programmer for Atmel AVR controllers. It simply consists of an ATMega88 or an ATMega8 and a couple of passive components. The programmer uses a firmware-only USB driver, no special USB controller is needed.

Features

- Works under multiple platforms. Linux, Mac OS X and Windows are tested.
- No special controllers or smd components are needed.
- Programming speed is up to 5kBytes/sec.
- SCK option to support targets with low clock speed (< 1,5MHz).

Download

USBasp is OpenSource, it's free!
Like it? You can support via PayPal:

€ 5 € 10 € 15

Firmware and circuit

The following packages include circuit and firmware.
usbasp.2011-05-28.tar.gz (519 kB) TPI support, supports programmers with ATMega88 and ATMega8.
usbasp.2009-02-28.tar.gz (260 kB)
usbasp.2007-10-23.tar.gz (172 kB)
usbasp.2007-07-23.tar.gz (176 kB)
usbasp.2006-12-29.tar.gz (118 kB) Supports programmers with ATMega48 and ATMega8.
usbasp.2006-09-16.tar.gz (116 kB) New VID/PID!
usbasp.2005-11-14.tar.gz (175 kB)
usbasp.2005-07-03.tar.gz (166 kB)
usbasp.2005-04-21.tar.gz (169 kB)

Please refer to Readme.txt for details on building, installing and using USBasp.

Drivers

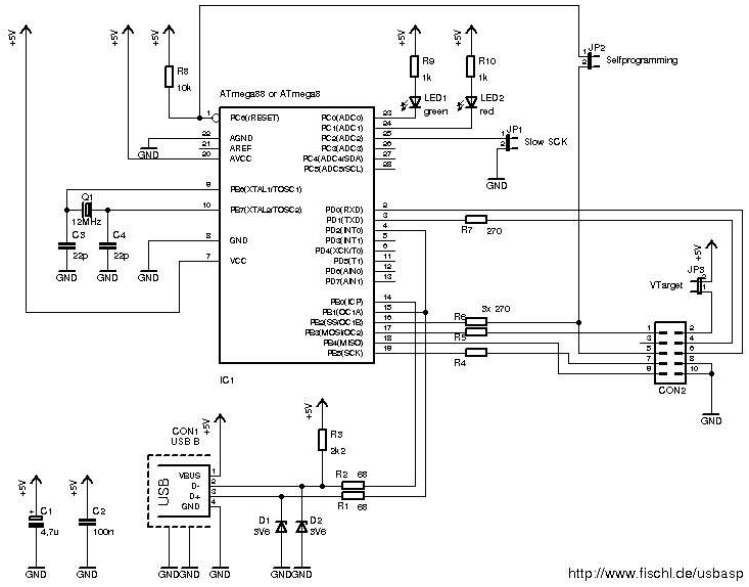
On Linux and MacOS X no kernel driver is needed. Windows requires a driver for USBasp. Please use this driver installation tool for Windows (see also: successful setup on Windows 10):
Zadig - USB driver installation made easy

Software

- AVRDUDE supports USBasp since version 5.2.
- BASCOM-AVR supports USBasp since version 1.11.9.6.
- Khazama AVR Programmer is a Windows XP/Vista GUI application for USBasp and avrdude.
- eXtreme Burner - AVR is a Windows GUI Software for USBasp based USB AVR programmers.

Hardware

Schematic



Partlist

Partnumber	Value	Reichelt No
C1	4,7u	RAD 4,7/35
C2	100n	X7R-5 100N
C3, C4	22p	KERKO 22P
D1, D2	3V6 zener	ZF 3,6
CON1	USB-B	USB BW
CON2	10pol	WSL 10W
IC1	ATmega8-16	ATMEGA 8-16 (not programmed!)
JP1, JP2	2pol 2,54mm	SL 1X36G 2,54
LED1	3mm LED green	LED 3MM 2MA GN
LED2	3mm LED red	LED 3MM 2MA RT
Q1	12Mhz	12,0000-HC49U-S
R1, R2	68	1/4W 68
R3	2,2k	1/4W 2,2k
R4, R5, R6, R7	270	1/4W 270
R8	10k	1/4W 10k
R9, R10	1k	1/4W 1k
M1, M2	Jumper	JUMPER 2,54GL SW
M3	Socket 28S	GS 28-S
M4	Case	TEKO 10007
M5	PCB	-

User PCB layouts

Here is a list of tested PCB layouts. If you have designed your own PCB, please let me know.

usbasp_single_side.t3001.zip
by Thomas Fischl
Single-Side PCB, TARGET 3001! layout file
Size: 90x40 mm (optimized for case Hammond 1591ATBU)

lv_usbasp.tar.gz
by Pawel Szramowski (11/2007)
With **Low-voltage front-end.**
Single-Side PCB, EAGLE layout files, some SMD components

by Bernhard Walle
Double-Side PCB, EAGLE layout files, part list with order numbers for Reichelt.de and Conrad.de
Size: optimized for case Hammond 1591ATBU

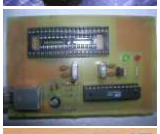
http://thomaspfeifer.net/atmel_usb_programmer.htm
by Thomas Pfeifer
Single-Side PCB, PDF layout files, SMD components

by Tomasz Ostrowski
Single-Side PCB, PDF and EPS layout files, only four 0805 SMD parts, rest discrete components

USBasp_CH.zip
by Christian Heigemeyr
Single-Side PCB, with some SMD 0805 components, PDF-files
With additional buttons for reset and disconnection of the target

USBasp.sch, USBasp.pcb
ComponentSide.pdf, TopSide.pdf, Schematics.pdf
by Zhurov Pavel
Single-Side PCB, P-CAD 2002 format and PDF files
Crosspiece TXD and RXD are added for the ISP connector

usbasp_gr.rar
by J.A. de Groot
The board is single sided (EAGLE format), measures 3 by 8 cm and uses only regular components.

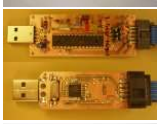


usbasb_mg.zip
by Matthias Görner
Single-Side PCB, eagle-format, with PS/PDF-files
integrated sockets for target chips ATmega8 and ATmega32

Tarball with layout
by Hannes Östlund
Doubleside-Side PCB, SMD components, very small

by Sergiy Bogdancev (01/2010)
3.3V version, ATMega48 only. Single-side PCB, ExpressPCB layout format + socket board for varies AVRs. Without future serial interface, chip initially must be programmed with another programmer.

Eaglefiles (sch/brd) and CAD case design (dxf)
by Hans Hafner, HTL Mössingerstrasse-Klagenfurt, Österreich, hans.hafner (at) htl-klu (dot) at
(01/2010)
CNC-milled case (DXF file available), Eagle layout, only a few SMD parts

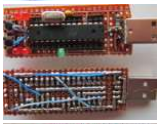


Different USBasp versions: Easy to built non-smd, smd version and a very small USBasp
by Sven Hedin (01/2011)
Eagle files available.

USB Key AVR Programmer
by Fabio Baltieri (09/2011)
Very small USB key like dimensions. SMD parts.

AVR ISP Programmer
by Jaroslav Vadel (04/2012)
Small programmer. SMD parts.

Target project and PDFs (layout/schematics)
by Marius Schäfer (09/2013)



tinyUSBboard with USBasp-compatible firmware
by Stephan Bärwolf (04/2014)

USBasp on breadboard with socket for controller daughter boards.
by Fabian Hummel (11/2018)

Tjaart van Aswegen designed an SMD board: DIP TRACE and GERBER files.
by Tjaart van Aswegen (09/2019)

Feature rich (e.g. different voltage levels, integrated USB to serial converter, USB-C connector) USBasp compatible design. AVR Programmer Github project.
by Brian Pepin (12/2019)

USBasp board with additional 6pin header and selectable target supply (3.3V/off/5.0V).
by Marty E. (10/2020)

John included a 40 pin universal socket which takes 8, 14, 20 and 28 pin devices. He also added a versatile crystal oscillator with outputs of 1, 2, 4, 8 and 16 Mhz to clock the chips. There is also the standard 6pin ICSP connector and a user led connected to the MOSI pin.
by John P. (11/2020)

QUSBASP features a small size and flexibility (different connection options: USB-A or pin header, ICSP with 6 or 10 or pogo pins).
by Qetesh (07/2021)

Open hardware USBasp with USB-C with 6 and 10 pin ICSP header.
by littleliu (10/2021)

USBasp with nice enclosure, buttons for slow SCK and target power and option for small 6-pin 1.27mm target connector.
by Thomas J. (01/2022)

Makeriot2020's version of USBasp adds logic level conversion and 3.3v regulator to allow programming of 3.3v targets.
by Makeriot2020 (03/2022)

USBasp with ZIF socket and through hole components.
by IOElectro (08/2022)

USBasp with ZIF socket and through hole components: KiCad 6 project.
by Poly Electronics (09/2022)

On Marvin's board, all parts are DIP, just SMD for the fuse and the voltage regulator. Jumper for voltage: 5V or 3.3V.
Gerber files: usbasp_marvin_b_v1.1_gerber.zip
by Marvin B. (04/2023)

Links

http://www.obdev.at/products/avrusb/ Firmware-only AVR USB driver
http://libusb.sourceforge.net/ libusb
http://libusb-win32.sourceforge.net/ LibUsb-Win32
http://www.nongnu.org/avrdude/ AVRDUDE - AVR Downloader/UploaDEr

HEX file checksum online calculator