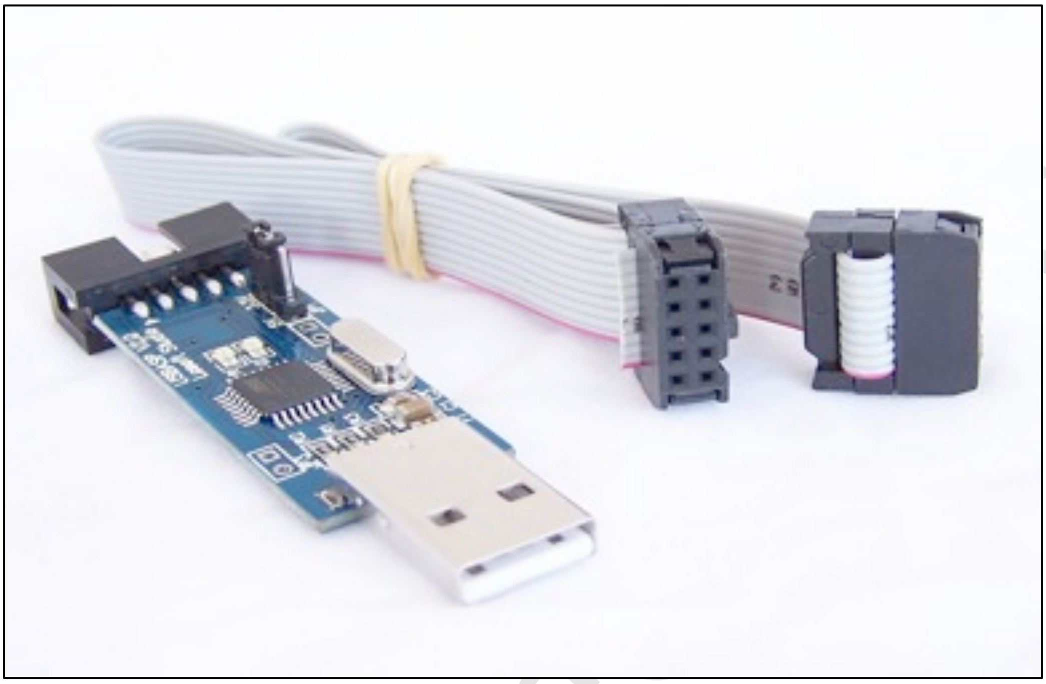
USBASP AVR Programmer



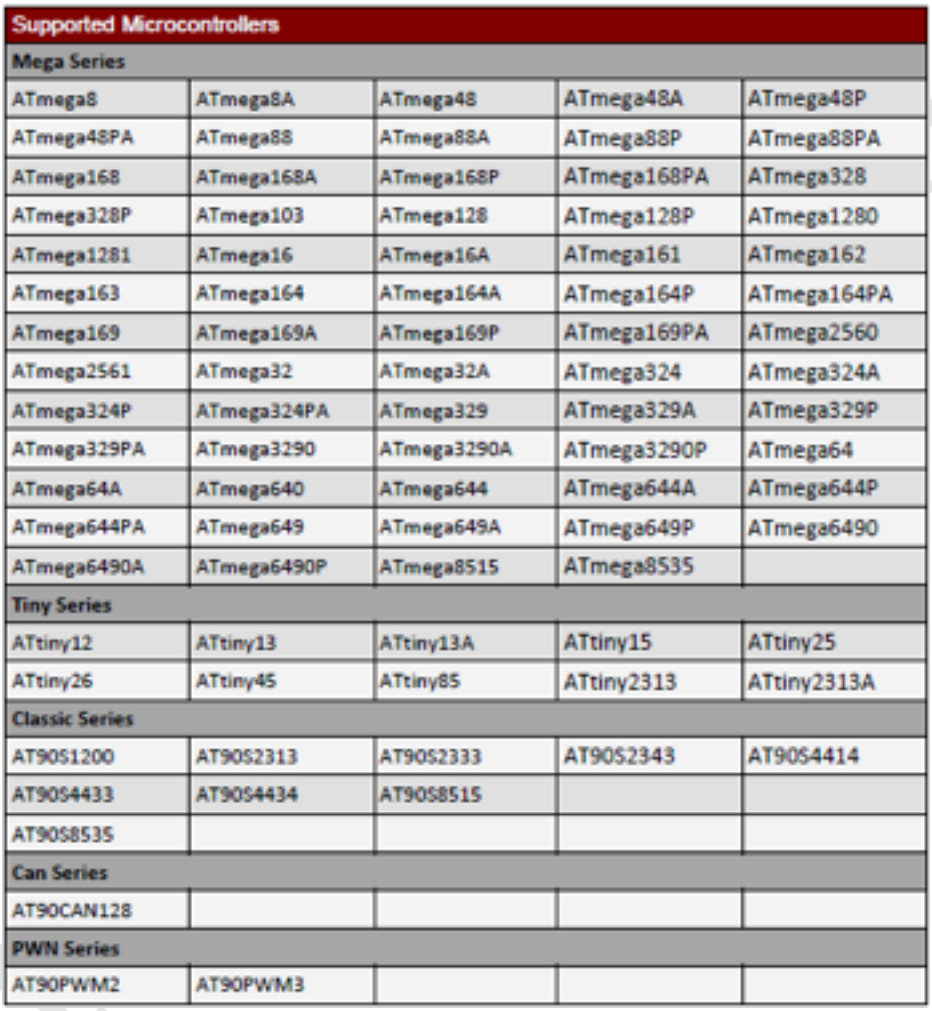
Introduction

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

Features

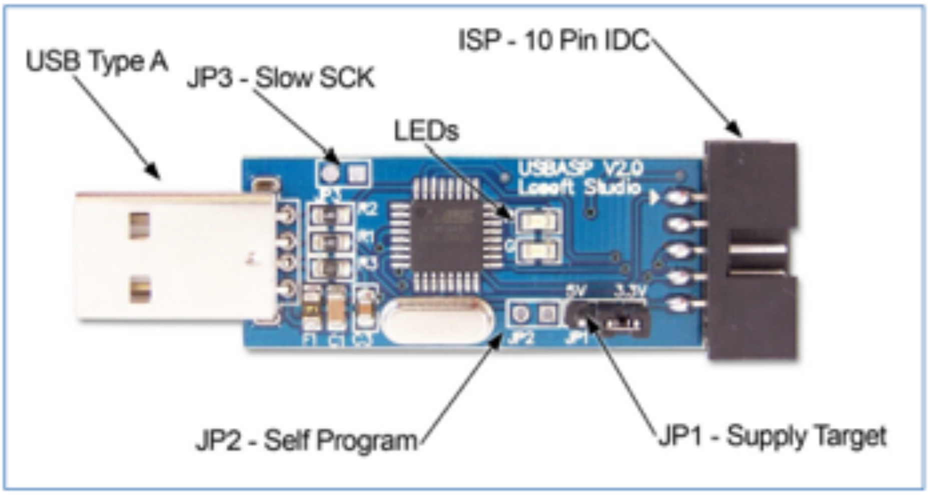
- Allows you to read or write the microcontroller EEPROM, firmware, fuse bits and lock bits
- Support for Windows, Mac OS X and Linux (will work on Windows 8.1)
- Programming speed is up to 5kBytes/sec
- Software controlled SCK option to support targets with low clock speed (< 1.5MHz)
- 10 pin ISP interface (conforms to standard ISP 10-pin pinout)

Supported Microcontroller



Supported Microcontrollers				
Mega Series				
ATmega8	ATmega8A	ATmega48	ATmega48A	ATmega48P
ATmega48PA	ATmega88	ATmega88A	ATmega88P	ATmega88PA
ATmega168	ATmega168A	ATmega168P	ATmega168PA	ATmega328
ATmega328P	ATmega103	ATmega128	ATmega128P	ATmega1280
ATmega1281	ATmega16	ATmega16A	ATmega161	ATmega162
ATmega163	ATmega164	ATmega164A	ATmega164P	ATmega164PA
ATmega169	ATmega169A	ATmega169P	ATmega169PA	ATmega2560
ATmega2561	ATmega32	ATmega32A	ATmega324	ATmega324A
ATmega324P	ATmega324PA	ATmega329	ATmega329A	ATmega329P
ATmega329PA	ATmega3290	ATmega3290A	ATmega3290P	ATmega64
ATmega64A	ATmega640	ATmega644	ATmega644A	ATmega644P
ATmega644PA	ATmega649	ATmega649A	ATmega649P	ATmega6490
ATmega6490A	ATmega6490P	ATmega8515	ATmega8535	
Tiny Series				
ATtiny12	ATtiny13	ATtiny13A	ATtiny15	ATtiny25
ATtiny26	ATtiny45	ATtiny85	ATtiny2313	ATtiny2313A
Classic Series				
AT90S1200	AT90S2313	AT90S2333	AT90S2343	AT90S4414
AT90S4433	AT90S4434	AT90S8515		
AT90S8535				
Can Series				
AT90CAN128				
PWN Series				
AT90PWM2	AT90PWM3			

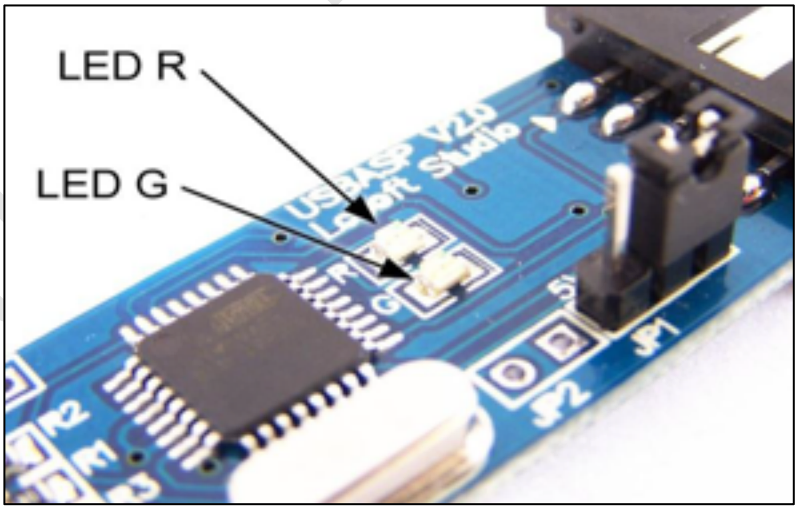
Layout



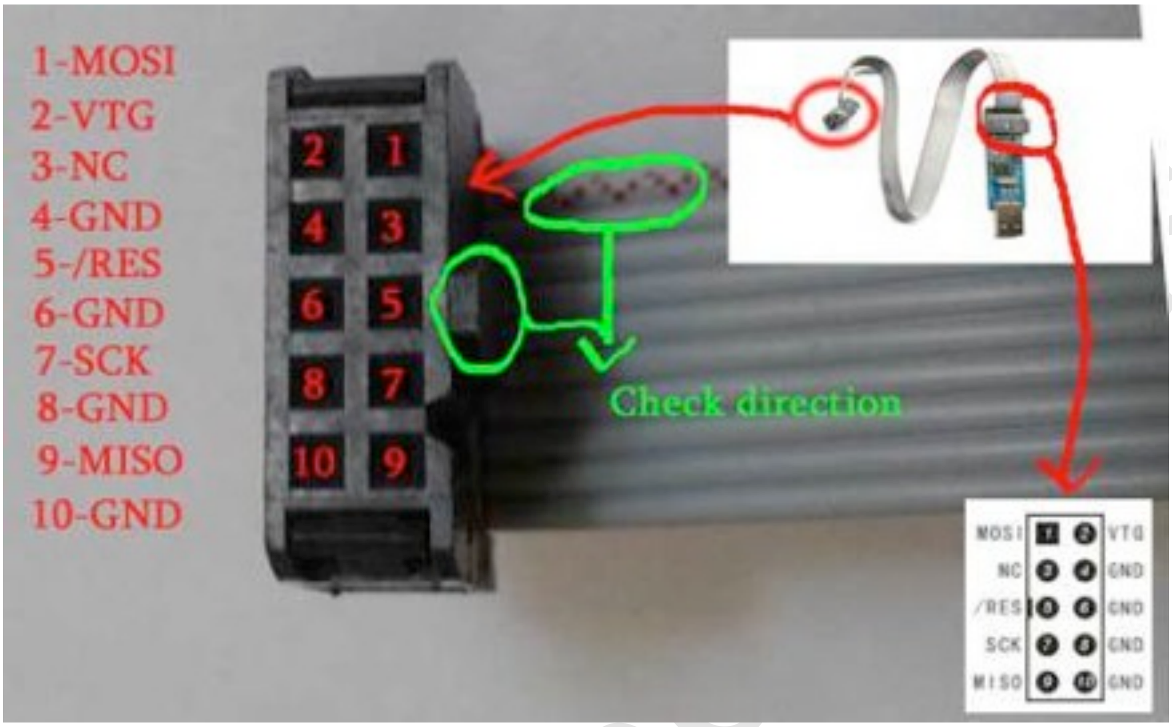
LEDs

The USBASP programmer has 2 LEDs near the ISP connection. These have the following functions:
a. LED R – Programmer communicating with target device

b. LED G – Power



Pin definition



Connecting the programmer to your computer

Connecting the programmer to your computer comprises of 2 steps:

a. Physically connecting the programmer to the USB port, and

b. Installing drivers in order for it to work.

Windows 7 (32 and 64 Bit)

Required items

Items required to run this procedure are:
a. USBasp programmer

b. Computer with USB port and Windows 7 installed

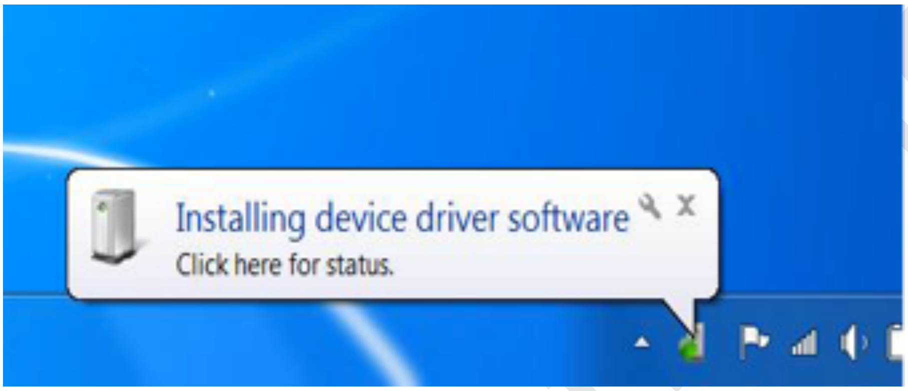
c. USBasp drivers downloaded and unzipped from

(1) http://www.protostack.com/download/USBasp-win-driver-x86-x64-ia64-v1.2.5.zip or

(2) http://www.protostack.com/download/USBasp-win-driver-x86-x64-ia64-v1.2.5.rar .

Some people have problems with the zip file so rar file is available as well

Installing Driver



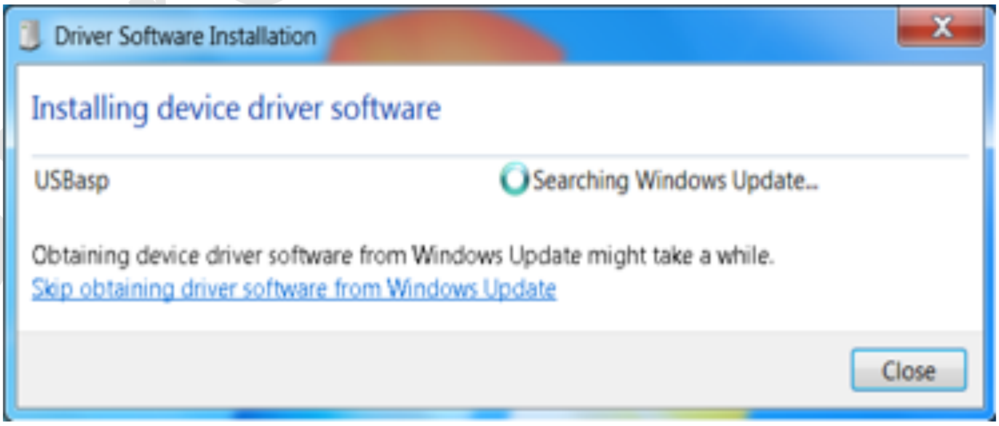
Installing device driver software

Click here for status.

a. Insert the programmer into an available USB port

b. A message will appear in the system tray, as shown below. Click on "Click here for status" to see what is going on.

c. Windows will attempt to install a driver from Windows Update



Driver Software Installation

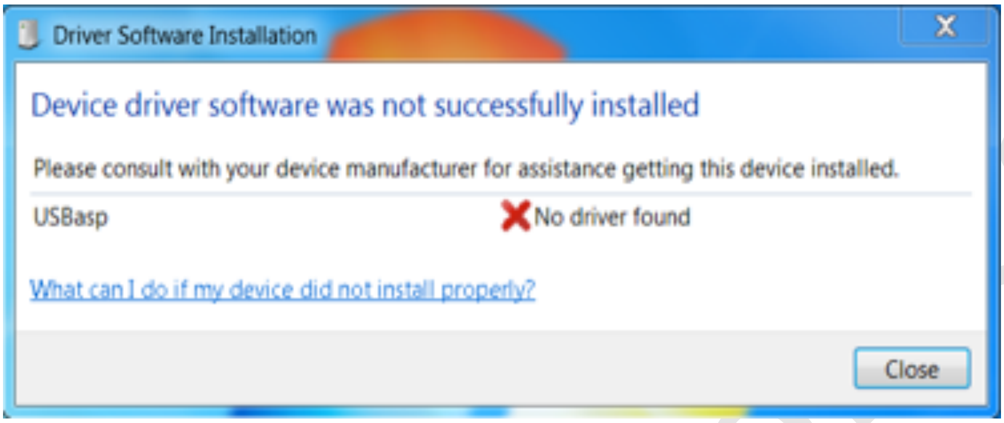
Installing device driver software

USBasp Searching Windows Update...

Obtaining device driver software from Windows Update might take a while.

Skip obtaining driver software from Windows Update

d. and will fail



Driver Software Installation

Device driver software was not successfully installed

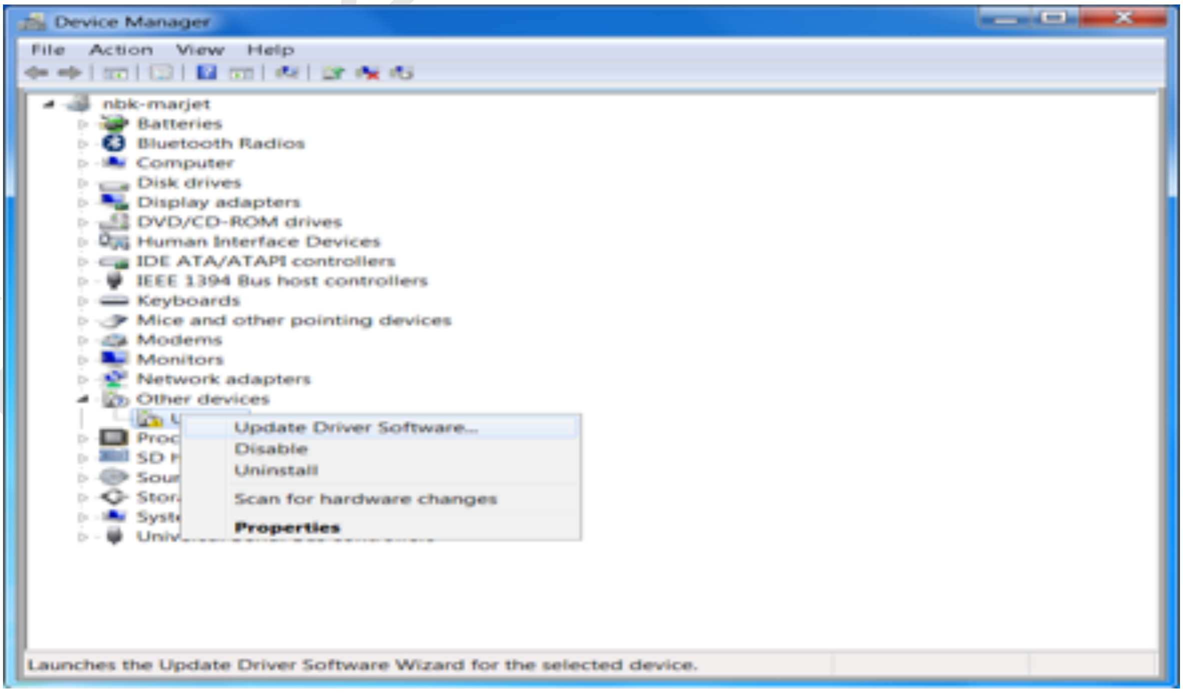
Please consult with your device manufacturer for assistance getting this device installed.

USBasp ✗ No driver found

What can I do if my device did not install properly?

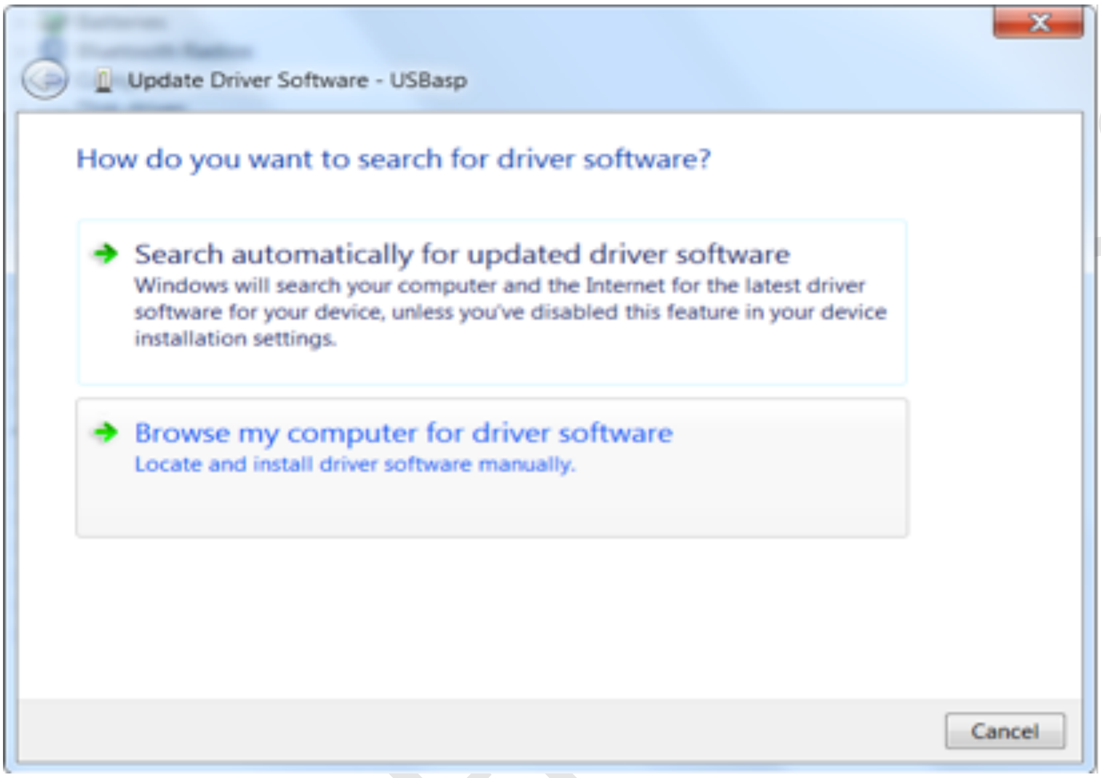
e. At this point, go into device manager and find the entry for the USBASP programmer. It should be displayed with a yellow alert icon next to it.

f. Right click on the device and select “Update Driver Software”



Launches the Update Driver Software Wizard for the selected device.

g. When prompted "How do you want to search for driver software", select "Browse my computer for driver software"



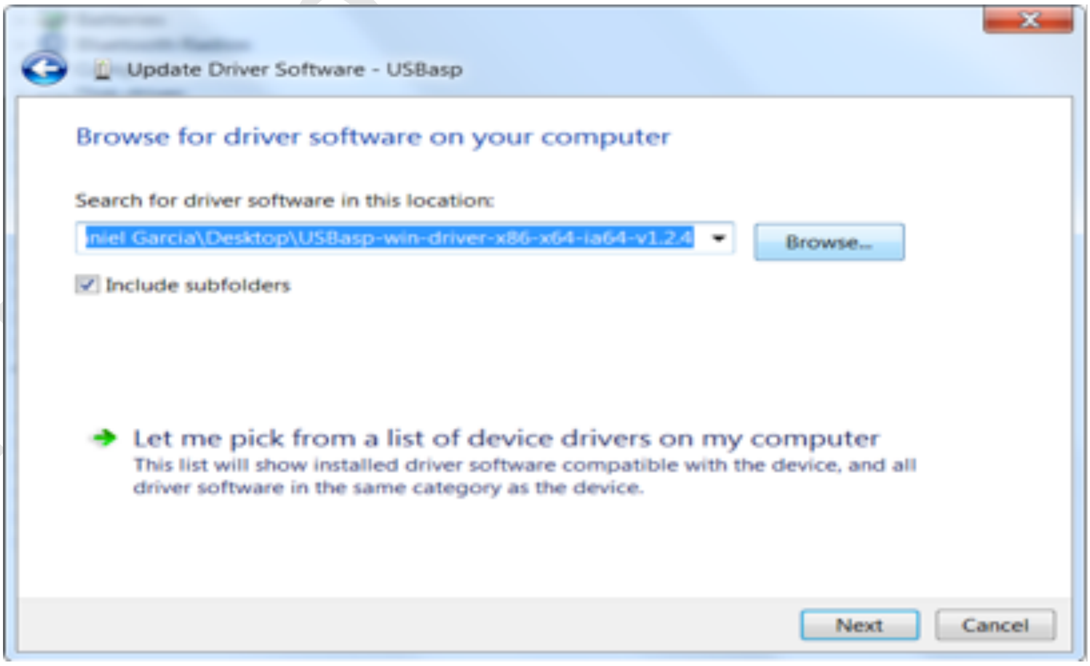
Update Driver Software - USBasp

How do you want to search for driver software?

Search automatically for updated driver software
Windows will search your computer and the Internet for the latest driver software for your device, unless you've disabled this feature in your device installation settings.

Browse my computer for driver software
Locate and install driver software manually.

h. Select the folder where you unzipped the driver files then click "Next"



Update Driver Software - USBasp

Browse for driver software on your computer

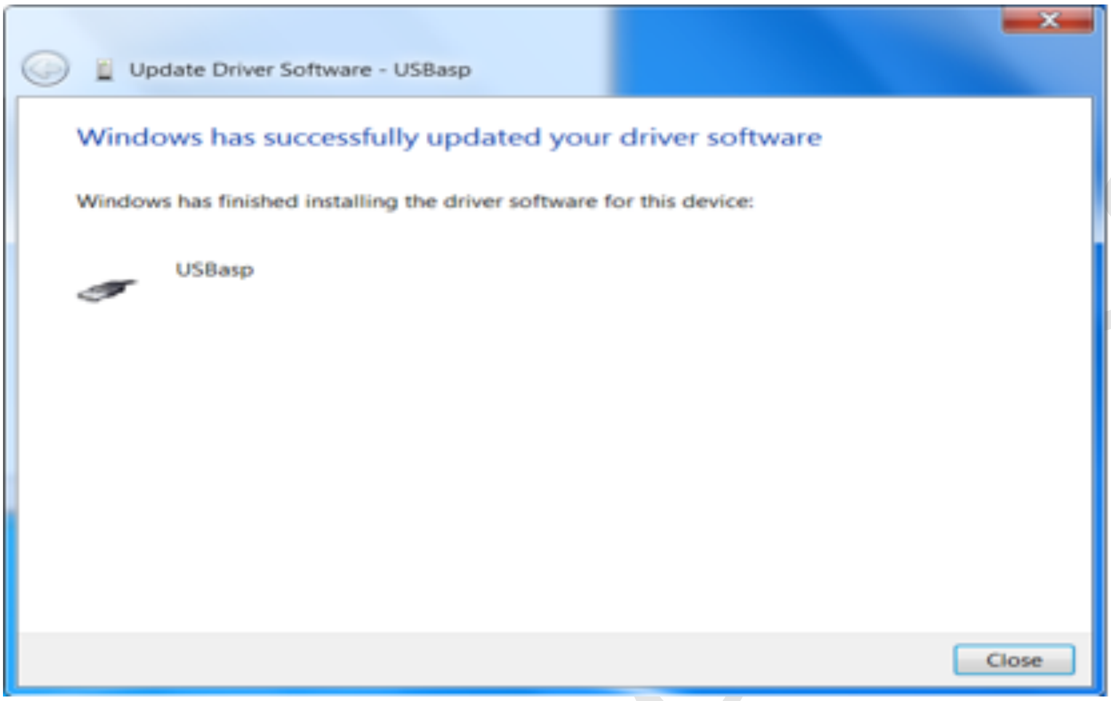
Search for driver software in this location:

niel Garcia\Desktop\USBasp-win-driver-x86-x64-ia64-v1.2.4

☑ Include subfolders

Let me pick from a list of device drivers on my computer
This list will show installed driver software compatible with the device, and all driver software in the same category as the device.

i. When the installation is complete, a confirmation screen will be displayed. Click close to close it.



Windows has successfully updated your driver software

Windows has finished installing the driver software for this device:

USBasp

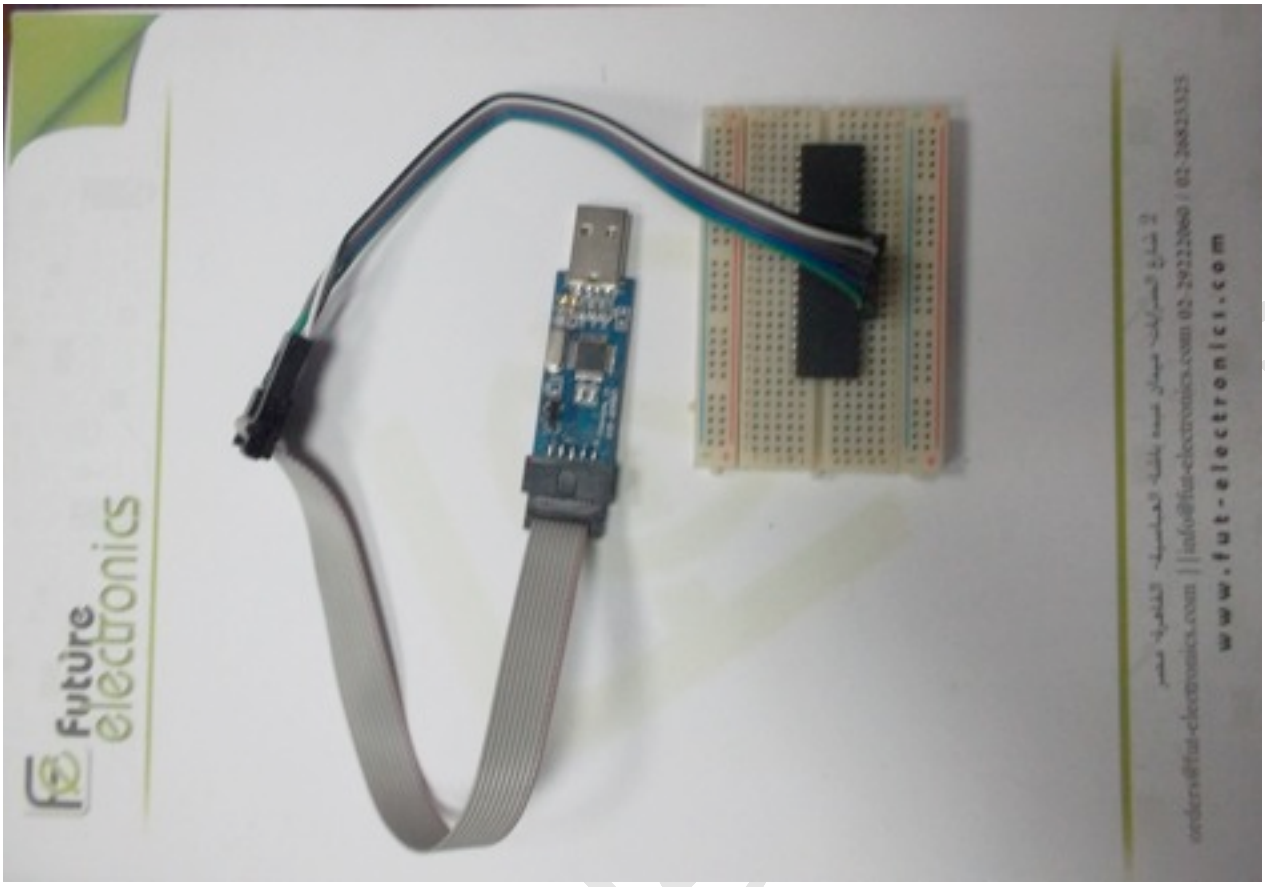
j. your programmer is now ready for use.

PROGRAMMING (ATMEGA16A) WITH A USBASP DEVICE

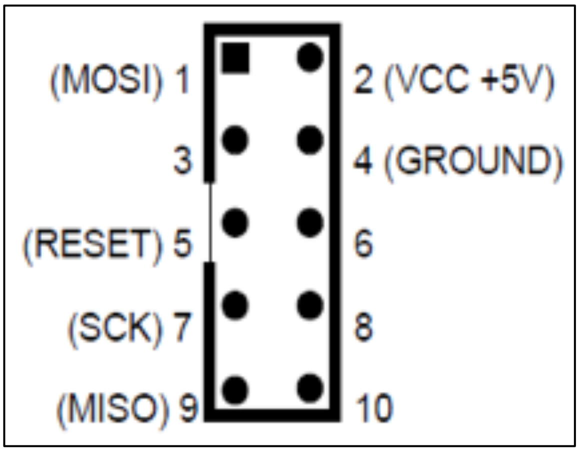
Required items

- A USB ASP Device
- An AVR Microcontroller Unit (MCU)
- A precompiled .hex file simple blinking LED program (download a precompiled one here)
- Command Prompt Software (download from here)
- Jumper wires

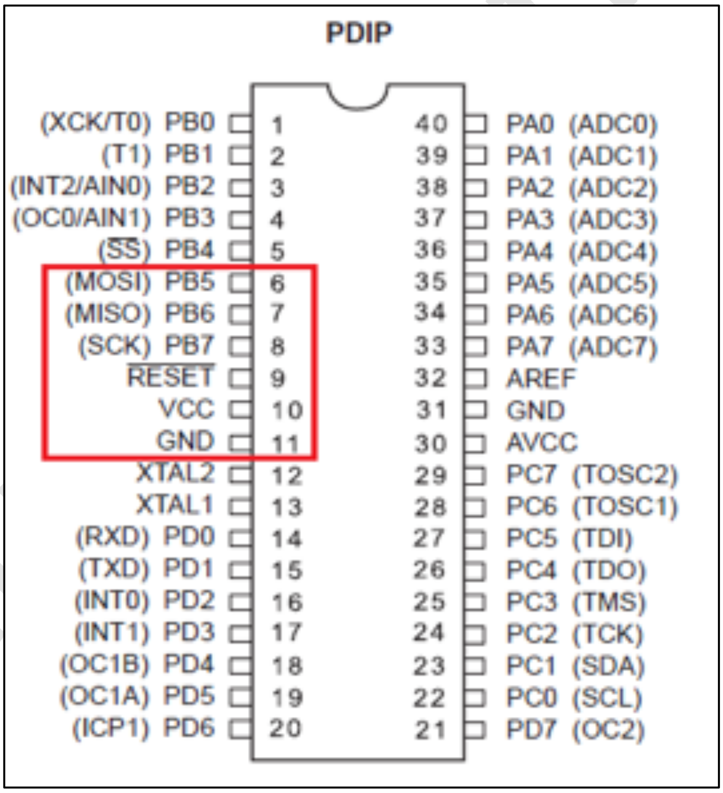
1- Now build the connector for connecting your 10pin IDC cable to the MCU. You need to have the pinout of both your microcontroller and the 10pin cable to do so.



2- The pinout of the 10 pin IDC connector is given below:



3- The pinout of the Atmega 16A. The six pins needed for programming are highlighted in red.



4- Now you are all set for programming. Open up Command Prompt on windows and issue the AVRDUDE command to program the MCU

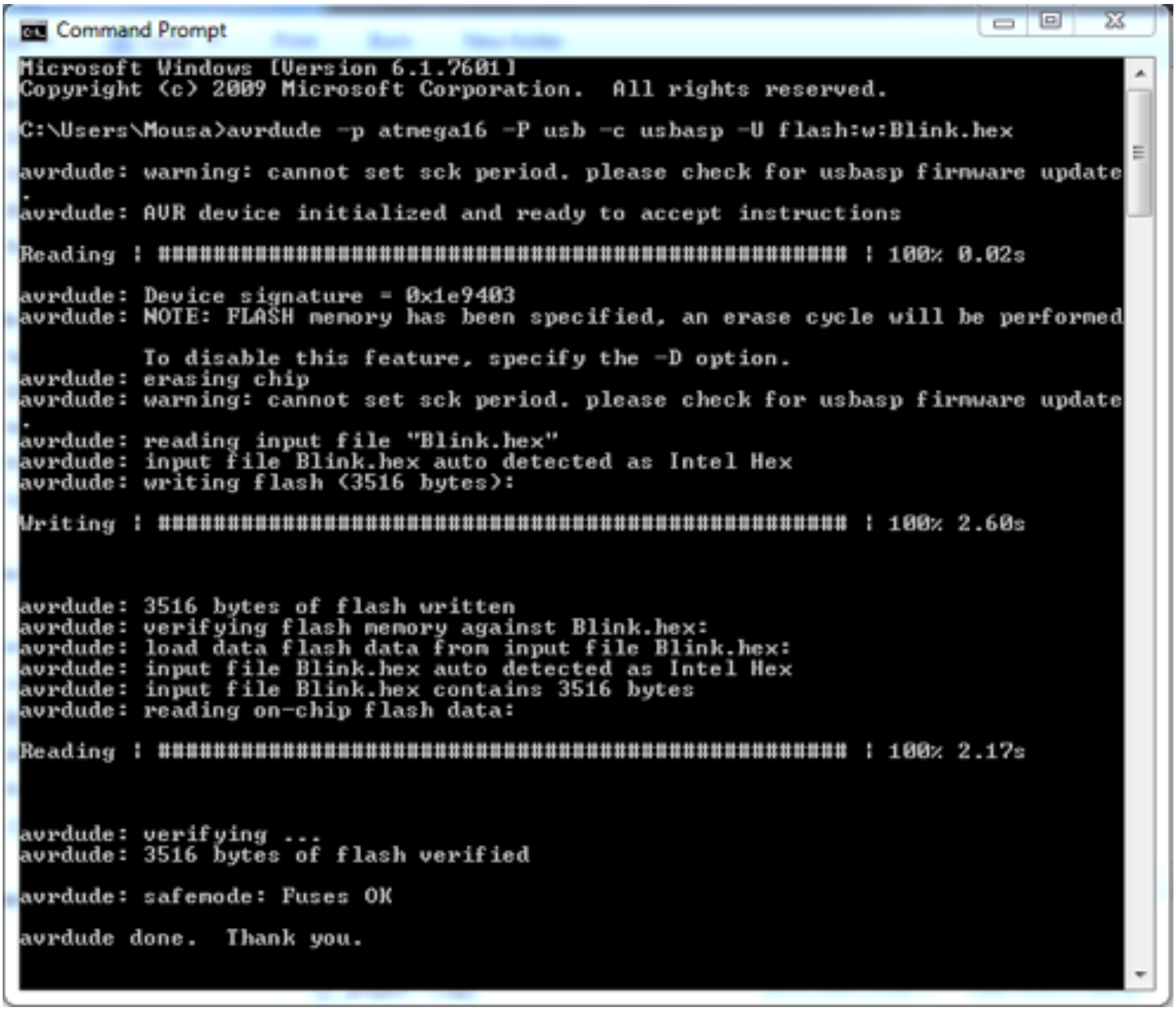
```
avrdude -p <DEVICE> -P usb -c usbasp -U flash:w:<FILE>
```

In my case, it would be

```
avrdude -p atmega16 -P usb -c usbasp -U flash:w:Blink.hex
```

This is when I am currently in the directory of the file Blink.hex.

5- Now sit back and relax while AVRDUDE burns your code to the MCU. During this time, the red light on the USBASP will be lit showing that it is communicating with the AVR.



```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation.  All rights reserved.

C:\Users\Mousa>avrdude -p atmega16 -P usb -c usbasp -U flash:w:Blink.hex

avrdude: warning: cannot set sck period. please check for usbasp firmware update
.
avrdude: AVR device initialized and ready to accept instructions

Reading | ################################################## | 100% 0.02s

avrdude: Device signature = 0x1e9403
avrdude: NOTE: FLASH memory has been specified, an erase cycle will be performed

         To disable this feature, specify the -D option.
avrdude: erasing chip
avrdude: warning: cannot set sck period. please check for usbasp firmware update
.
avrdude: reading input file "Blink.hex"
avrdude: input file Blink.hex auto detected as Intel Hex
avrdude: writing flash (3516 bytes):

Writing | ################################################## | 100% 2.60s



avrdude: 3516 bytes of flash written
avrdude: verifying flash memory against Blink.hex:
avrdude: load data flash data from input file Blink.hex:
avrdude: input file Blink.hex auto detected as Intel Hex
avrdude: input file Blink.hex contains 3516 bytes
avrdude: reading on-chip flash data:

Reading | ################################################## | 100% 2.17s



avrdude: verifying ...
avrdude: 3516 bytes of flash verified

avrdude: safemode: Fuses OK

avrdude done.  Thank you.
```

6- After that, simply remove the microcontroller from the ASP interface and build your circuit. This is a simple Blinking LED project, connect two LEDs each to the pins B0 and B1 respectively. Don't forget the current limiting resistors!

7- Now its time you powered up the micro from an external supply. The LEDs would start to blink. One remains on for 1 sec while other for half a sec.