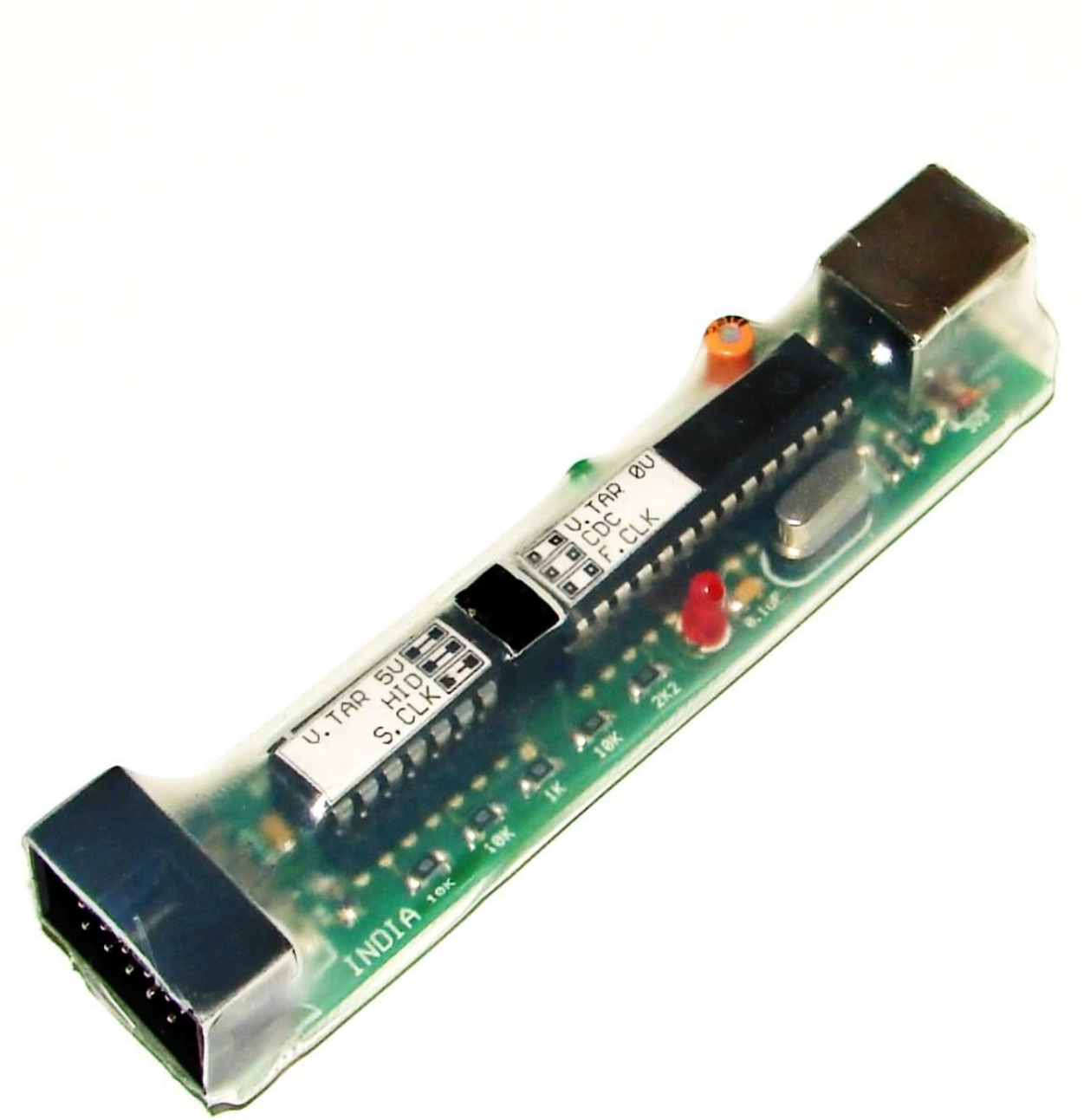
NEX AVR USB ISP STK500V2



1.1 Introduction

NEX AVR USB ISP STK500V2 is a high speed USB powered STK500V2 compatible In-System USB programmer for AVR family of microcontrollers. It can be used with AVR Studio on Win XP platforms. For Windows7 it can be used in HID mode with **Avrdude** command prompt as programming interface. Its adjustable clock speed allows programming of microcontrollers with lower clock speeds. The programmer is powered directly from a USB port which eliminates need for an external power supply. The programmer can also power the target board from a USB port with limited supply current of up to 100mA.

Note: The USB port of PC provides 5V DC. For 3.3V microcontrollers, please use appropriate voltage regulators.

The compatibility with different window platform is given in below table.

Compatibility Chart

Operating System	AVR Studio (CDC)	Avrdude (HID)	GUI
Windows XP	YES	YES	YES
Windows Vista	X	YES	YES
Windows 7	X	YES	YES

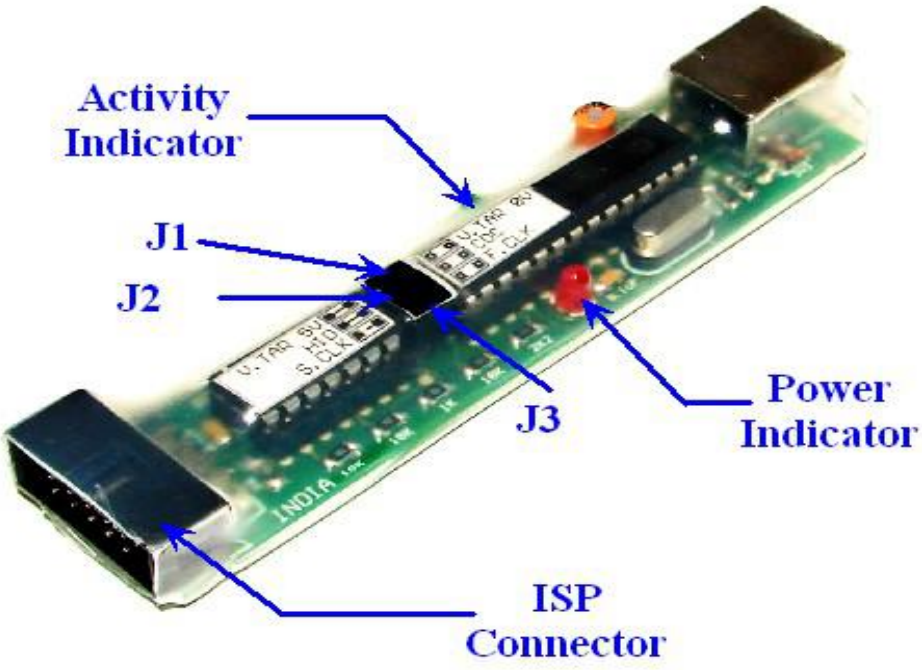
Table 1: - STK500v2 Compatibility Chart

Note: If mode is HID, insert HID/CDC jumper (J2) and if mode is CDC, remove HID/CDC jumper (J2).

Features

- Low cost USB compatible (No legacy RS232 required)
- Compatible with STK500V2
- Can be used with AVR Studio as STK500 programmer (only WinXP)
- Can be used with AVRdude on Win7/XP/Vista
- Jumper adjustable programming clock speeds for low clock speed microcontrollers. Low speeds from 32 KHz to 1MHz are supported.
- Programs almost all AVR microcontrollers (Refer Table below)
- Jumper selectable HID/CDC mode.
- USB powered
- Jumper selectable 5V power supply for target boards
- Standard 10 pin (5x2) programming connector
- Power and programming activity indicator LEDs
- No external power supply required

NEX AVR USB ISP STK500V2 Overview



Jumper Description

J1: If inserted, provides 5V at VTG (pin no.2) of ISP connector. If removed 0V at VTG (pin no.2) of ISP connector. **In default mode, this jumper is not inserted.**

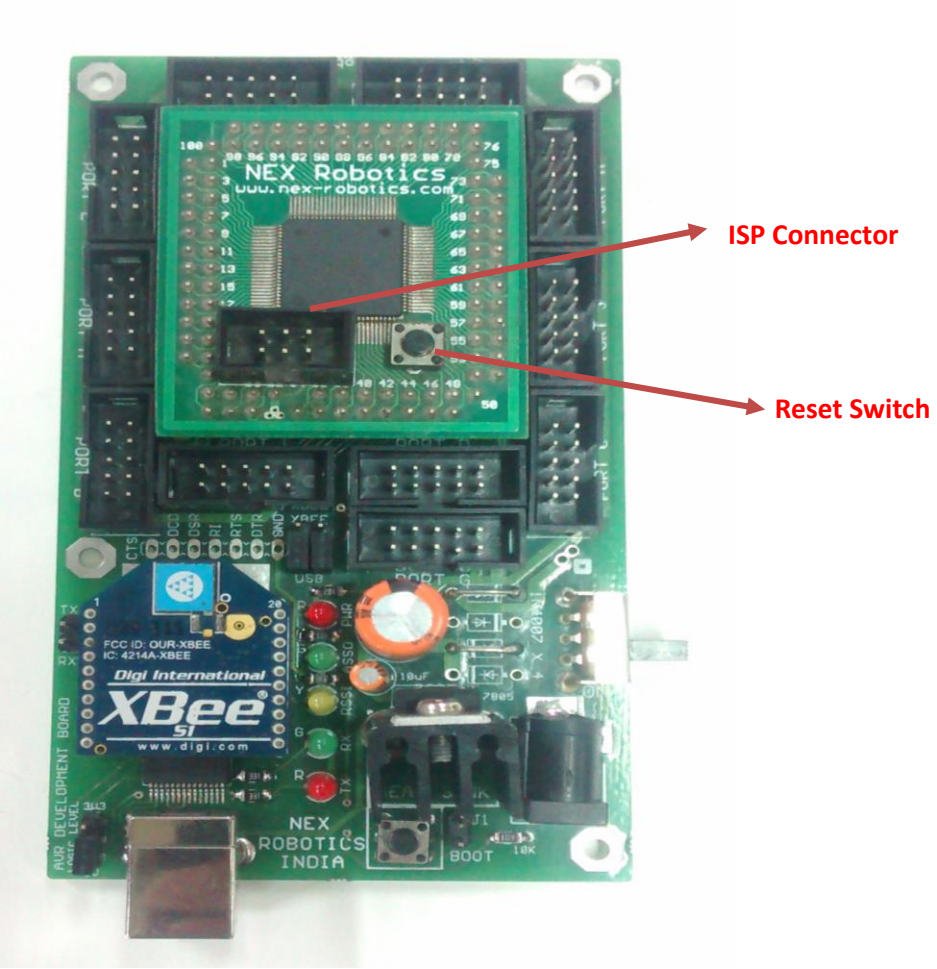
J2: If inserted, enables UBS HID mode. If removed enables USB CDC mode. **In default mode, this jumper is not inserted.**

J3: If inserted, enables slow clock speed (for 32 KHz to 1MHz speed microcontrollers). If removed enables normal clock speed. **In default mode, this jumper is not inserted.**

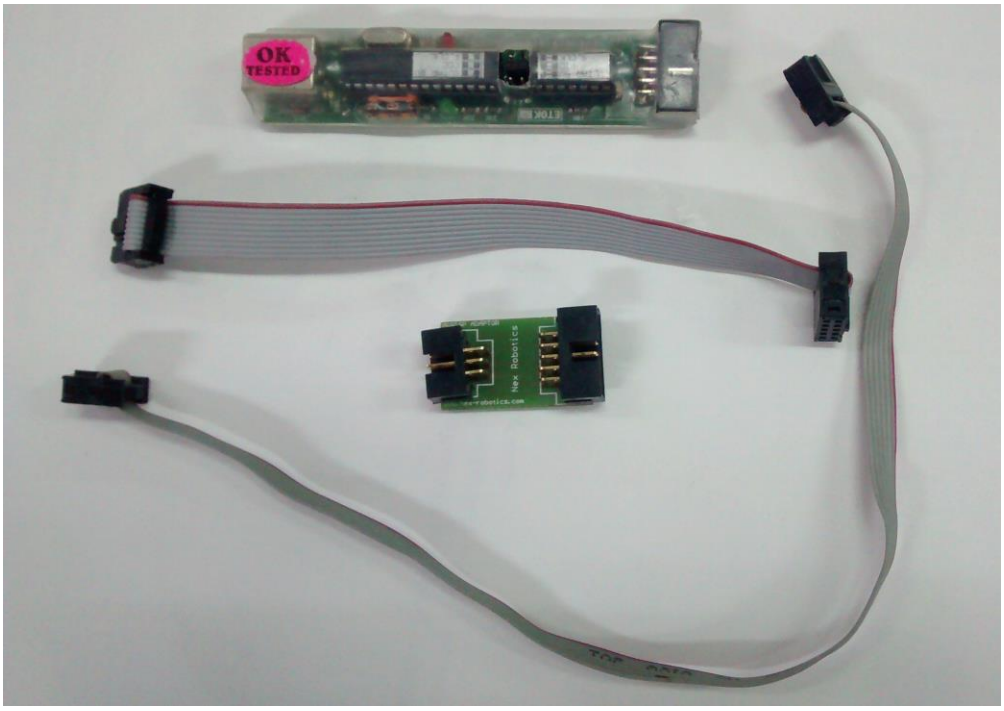
Connections between STK500v2 and ATmega 2560

Please follow the steps to connect STK500v2 and ATmega 2560

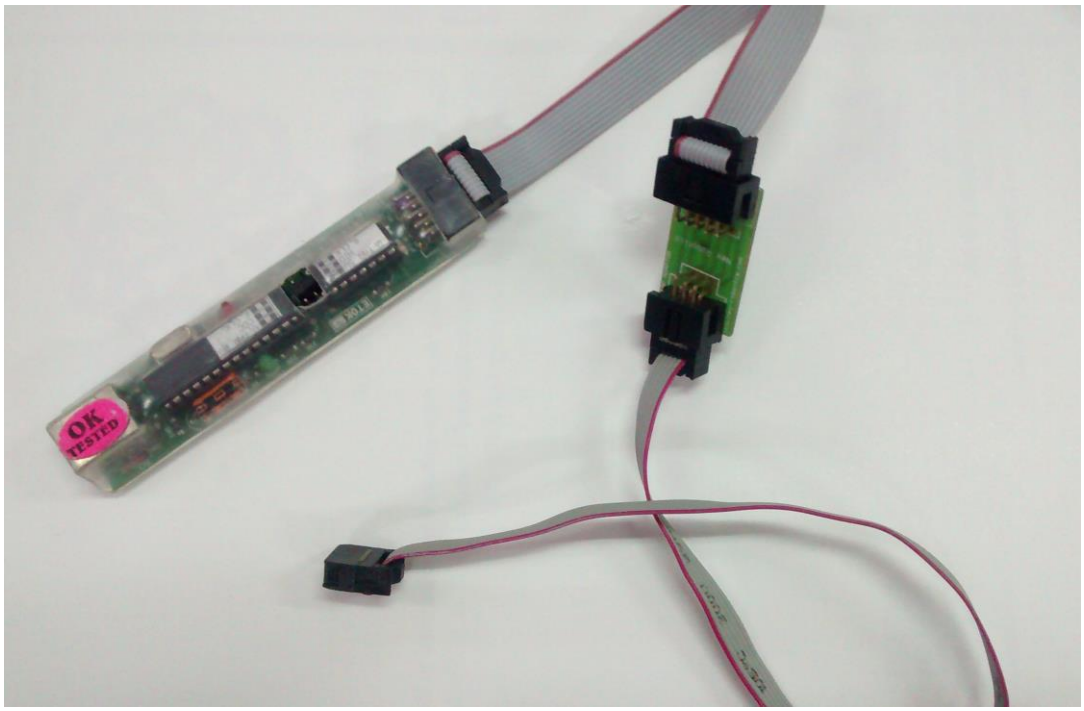
- Locate the ISP connector in the ATmega 2560 microcontroller as shown in the figure:



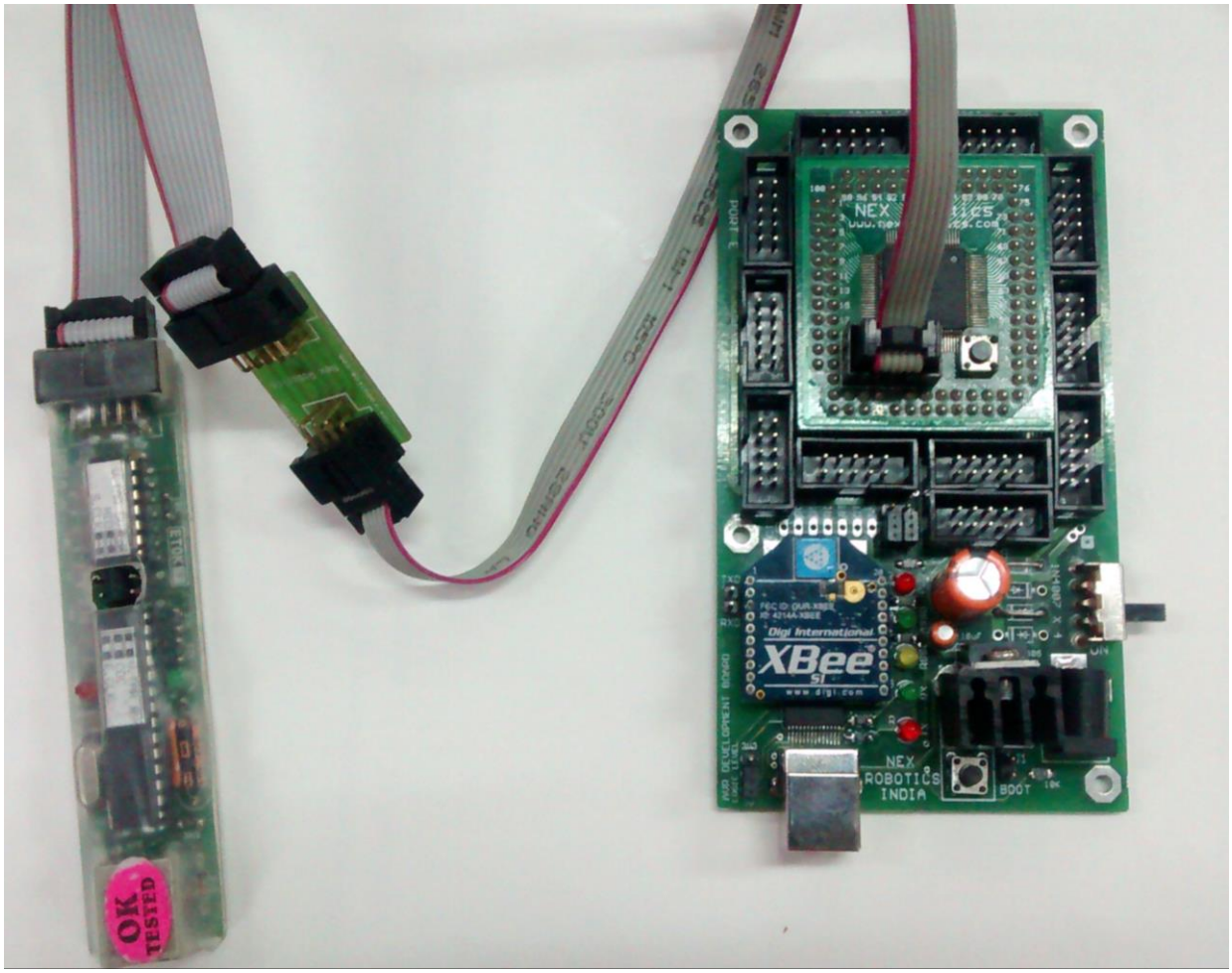
- Ensure that you have the following components in your kit as shown in figure:
  - STK500V2
  - 8 pin connector wire
  - 6 pin connector wire
  - 8-pin to 6-pin converter



- Connect STK500V2 to the converter using 8 pin connector wire and connect the 6-pin connector wire to the other end of the converter as shown below:



- Connect the other end of the 6-pin connector wire to the ISP connector of the ATmega 2560 as shown below:



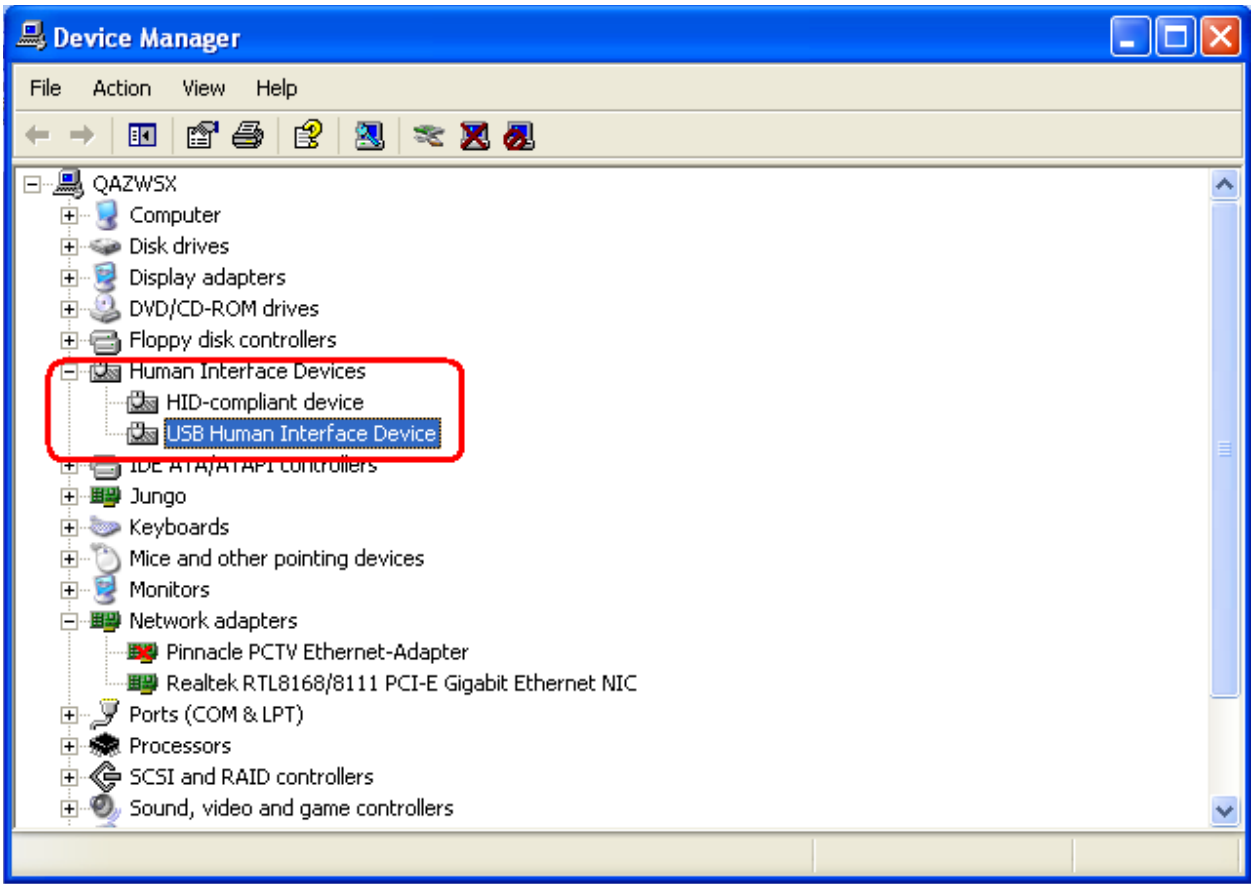
- Connect power supply to the jack of the microcontroller and switch on the microcontroller.
- Connect your USB cable to the STK500V2 and follow the instructions given below to burn hex file to ATmega 2560 using STK500V2.

Installing drivers for HID mode (Works on all windows operating systems)

1. If connected, disconnect programmer from PC and insert HID/CDC jumper. Now reconnect programmer to PC and observe the task bar for “Found New Hardware” message.

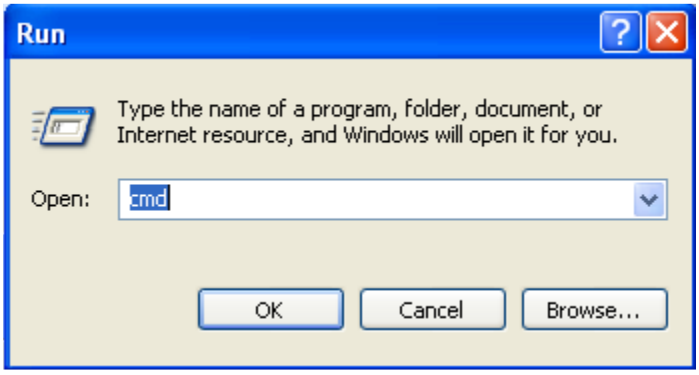
2. HID mode does not require additional drivers. It uses generic windows drivers.

3. Go to Device Manager and observe that new Human Interface Device (HID) is installed. If there are other HID devices connected to PC, you may optionally identify each device by viewing its properties.

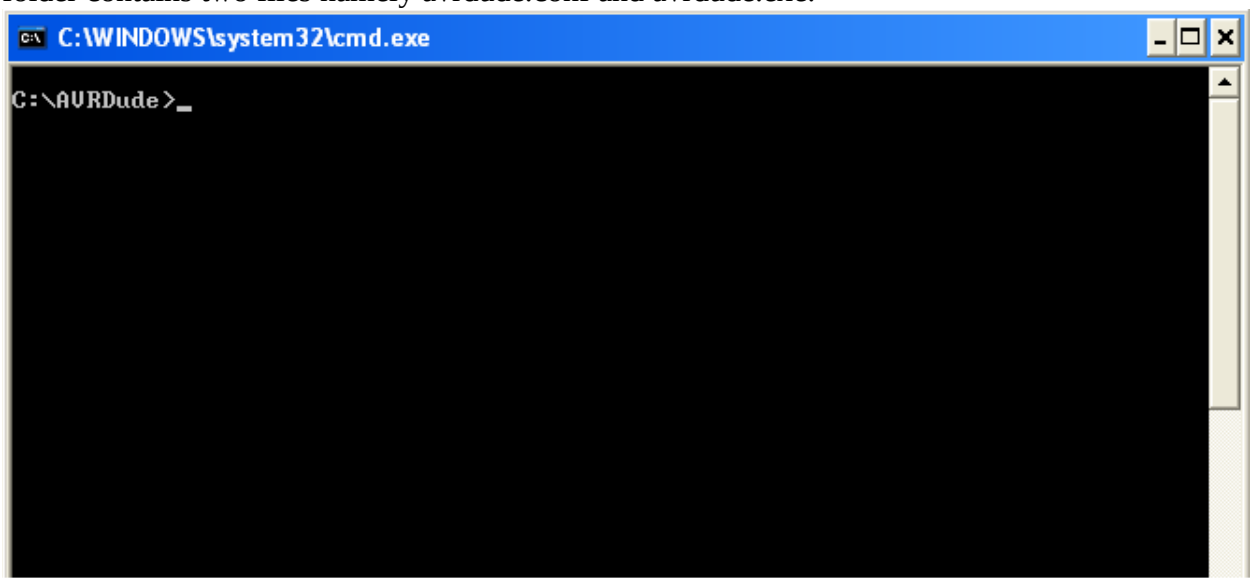


4. Before proceeding ensure that you have AVRDude.exe and AVRDude.conf on your PC.

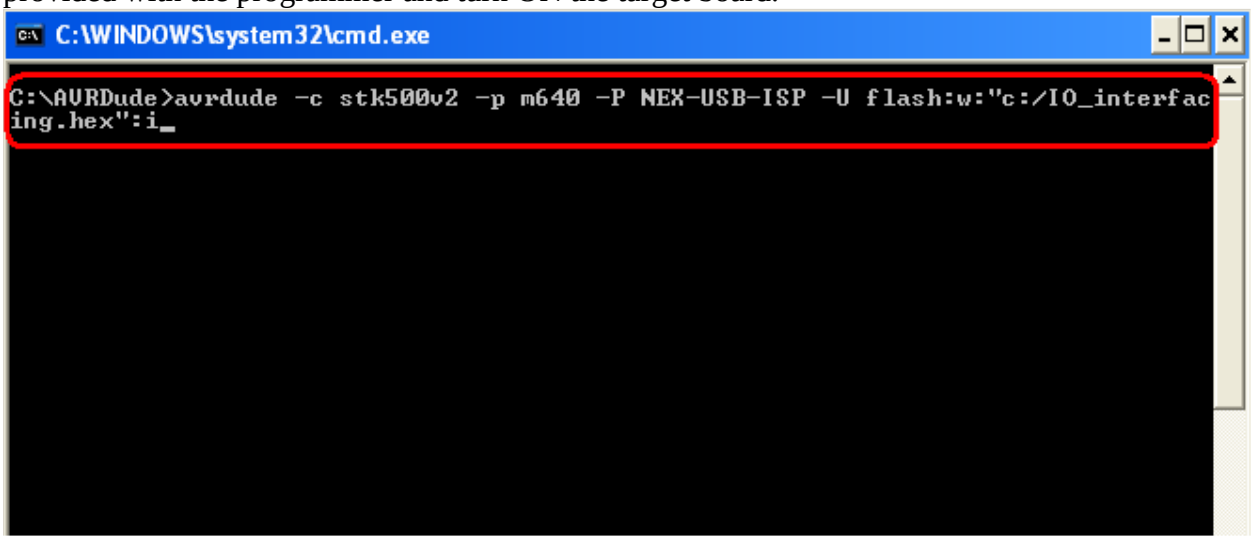
5. Go to Start Menu>Run and type “cmd” to open command prompt.



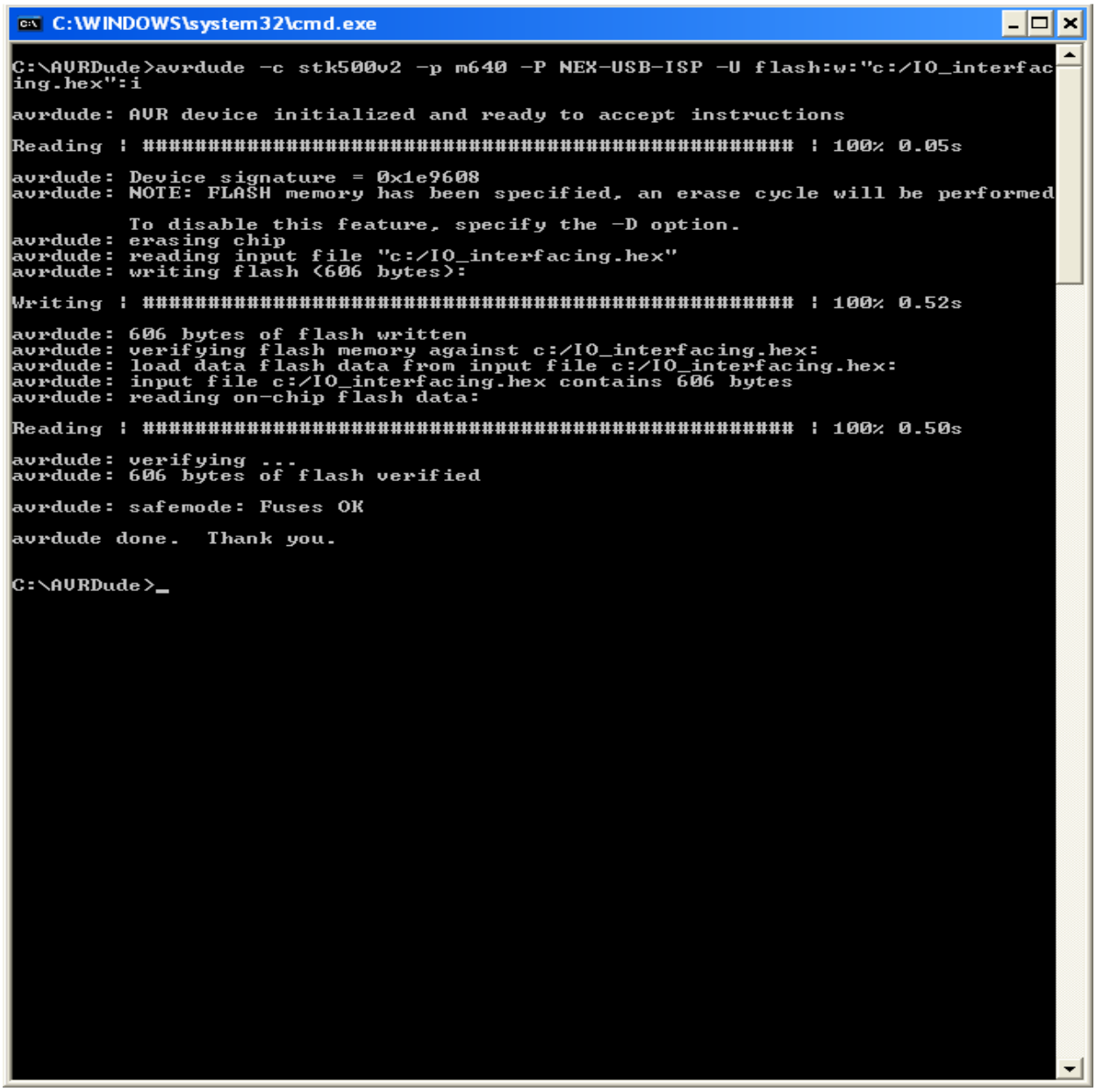
6. On the command prompt, type the path of the folder that contains avrdude.exe and avrdude.conf files. AVRDUDE folder is present inside the folder NEX_AVR_STK500V2 in the google drive link: https://goo.gl/2tn9mg .Copy AVRDUDE folder to your PC in a known location (In the example below: it is copied directly to C drive). Ensure that the AVRDUDE folder contains two files namely avrdude.conf and avrdude.exe.



7. On the command line type the command as shown in the figure below. Here ***-p m640*** refers to the microcontroller part number. As here we are using ATmega 2560 change the part number as ***–p m2560***. The last section after –U in quotes specifies the location of hex file. In the command line edit the part number and hex file location as
required and connect the programmer to the target board using 10 pin FRC cable
provided with the programmer and turn ON the target board.



8. Press enter. You should see the programming status in the command prompt window. If there is any error, recheck ISP connection and command line parameters.



Example Commands:

Eg 1. Transfer a file called example1.hex to a Mega128 device.

avrdude -c stk500v2 -p m128 -P NEX-USB-ISP -U flash:w:example1.hex

Eg 2. Transfer a file called "example1.hex" present on Desktop to a Mega128 device and change hfuse to 0xfe and lfuse to 0xdc.

avrdude -c stk500v2 -p m128 -P NEX-USB-ISP -U flash:w:example1.hex –U hfuse:w:0xfe:m lfuse:w:0xdc:m

Eg 3. Modify the contents of hfuse, lfuse and efuse of Atmega640 microcontroller

avrdude -c stk500v2 -p m640 -P NEX-USB-ISP -U efuse:w:0xf7:m -U hfuse:w:0xd7:m -U lfuse:w:0xff:m

Eg 4. View Avrdude's version number and other details.

avrdude –v

Eg 5. Read the contents of the FLASH memory and store them in a file called test1.hex

avrdude -c stk500v2 -p m128 -P NEX-USB-ISP -U flash:r:"c:\test1.hex":i

Eg 6. Read the contents of the EEPROM memory and store them in a file called test1.eep

avrdude -c stk500v2 -p m128 -P NEX-USB-ISP -U eeprom:r:"c:\test1.eep":i

Eg 7. Read the contents of HFUSE and LFUSE and store them in files hfuse.hex and lfuse.hex

avrdude -c stk500v2 -p m128 -P NEX-USB-ISP -U hfuse:r:"c:\hfuse.hex":i -U lfuse:r:"c:\lfuse.hex":i

Eg 8. Read the contents of HFUSE and LFUSE and EFUSE and store them in files hfuse.txt and lfuse.txt and efuse.txt

avrdude -c stk500v2 -p m640 -P NEX-USB-ISP -U efuse:r:"c:\efuse.txt":h -U hfuse:r:"c:\hfuse.txt":h -U lfuse:r:"c:\lfuse.txt":h

Eg 9. Read device signature bytes and store them in a file called sig.hex

avrdude -c stk500v2 -p m128 -P NEX-USB-ISP –U signature:r:"c:\signature.hex":i

Note: - The signature bytes are fixed for a specific AVR device

Eg 10. Read device lock bytes and store them in a file called lock.hex

avrdude -c stk500v2 -p m128 -P NEX-USB-ISP -U lock:r:"c:\lock.hex":i