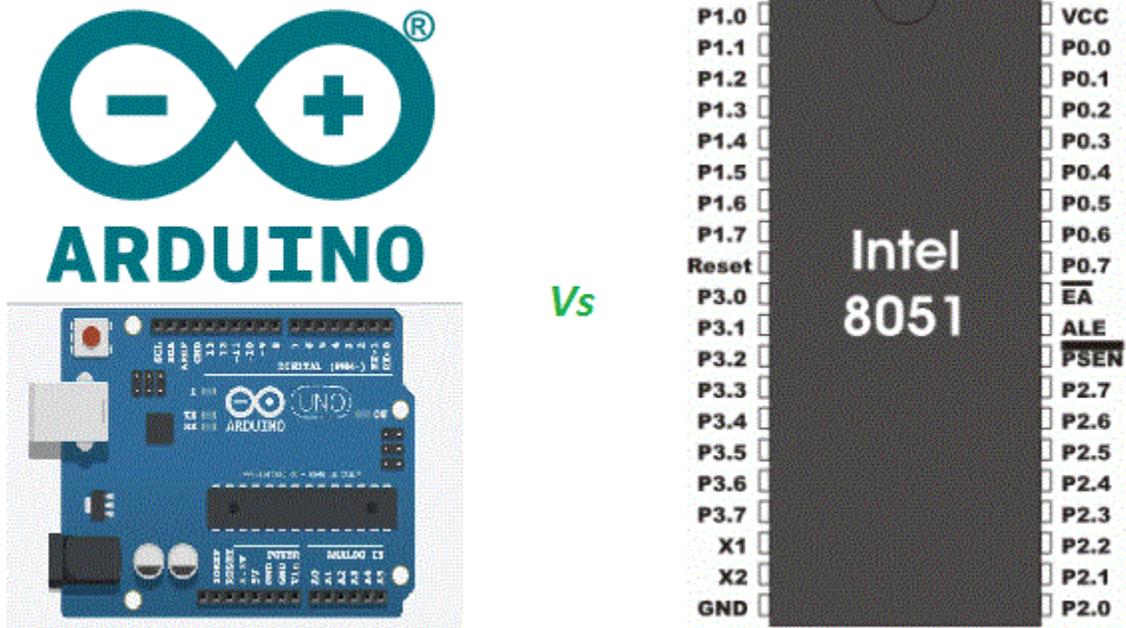


Procedure to Program AT89Sxx Series Micro-controllers using Arduino Uno



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(JCBRO)**

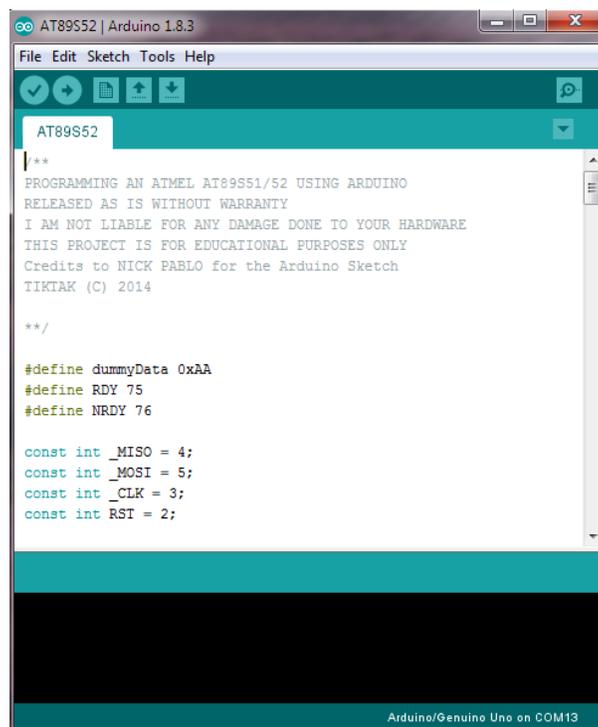
Introduction

8051 series microcontroller is very basic and widely used microcontrollers for teaching purpose in India and other many countries. But sometimes programming a 8051 microcontrollers become night mare for students as it is hard to find a suitable low cost programmer for 8051 microcontrollers. One solution is Philips P89V51RD2 series microcontrollers which can be programmed via normal serial port but the cost of the micro-controllers is high and availability of the same is not very impressive.

Atmel 89SXX series microcontrollers have built in SPI interface to program the microcontroller. This provides very easy interface to program controllers and can also be programmed via atmega series micro-controller programmers using USB-ASP and other ways. In this guide we provide the easy steps to program AT89S51 & AT89S52 microcontrollers using Arduino.

Step 1: Configure Arduino UNO as Programmer

First step is to configure arduino uno as programmer by downloading a firmware on the arduino board using arduino IDE. You can download the arduino firmware program here.



```
AT89S52 | Arduino 1.8.3
File Edit Sketch Tools Help
AT89S52
/**
PROGRAMMING AN ATMEL AT89S51/52 USING ARDUINO
RELEASED AS IS WITHOUT WARRANTY
I AM NOT LIABLE FOR ANY DAMAGE DONE TO YOUR HARDWARE
THIS PROJECT IS FOR EDUCATIONAL PURPOSES ONLY
Credits to NICK PABLO for the Arduino Sketch
TIKTAK (C) 2014
**/

#define dummyData 0xAA
#define RDY 75
#define NRDY 76

const int _MISO = 4;
const int _MOSI = 5;
const int _CLK = 3;
const int RST = 2;

Arduino/Genuino Uno on COM13
```

Fig. 1: Download the Firmware into Arduino Board

Step 2: Connect Basic Circuit Diagram for AT89S51/52

Next, connect basic circuit diagram for microcontroller as shown in figure. You can also connect LEDs to any port, in order to test the circuit after programming. Figure shows the connection diagram for at89s51/52 microcontroller.

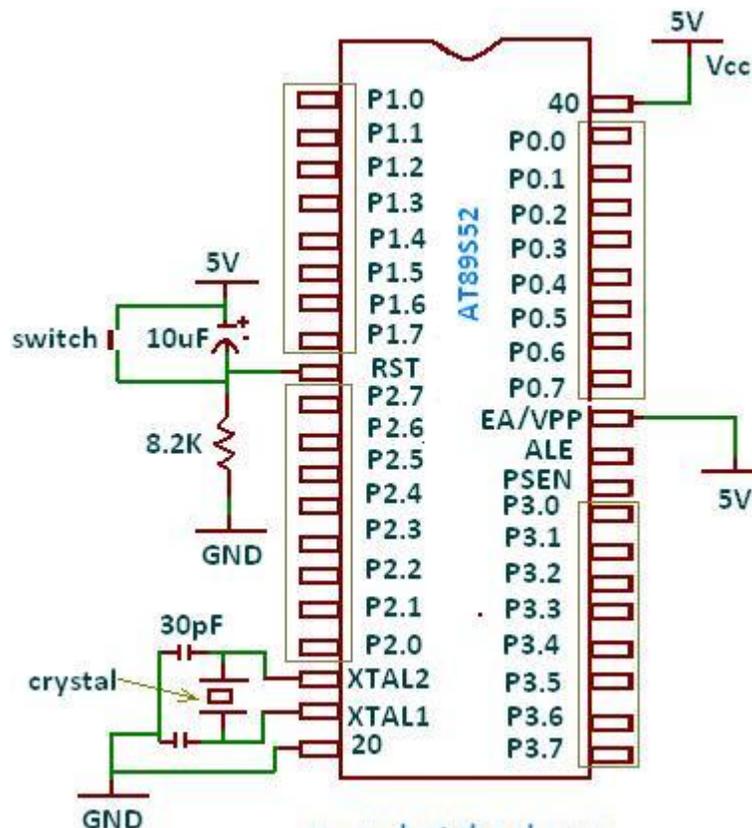


Fig. 2: Basic connection diagram to Microcontroller

Step 3: Connect Arduino with AT89S51/52 Microcontroller

Now, next step is to connect arduino pins to microcontroller as follows:

1. Connect Pin 2 of arduino to RST pin or pin **9** of 89s51/52 microcontroller.
2. Connect Pin 3 of arduino to pin no. **8** of 89s51/52 microcontroller.
3. Connect Pin 4 of arduino to pin no. **7** of 89s51/52 microcontroller.
4. Connect Pin 5 of arduino to pin no. **6** of 89s51/52 microcontroller.

Figure 3 shows the circuit diagram for the same.

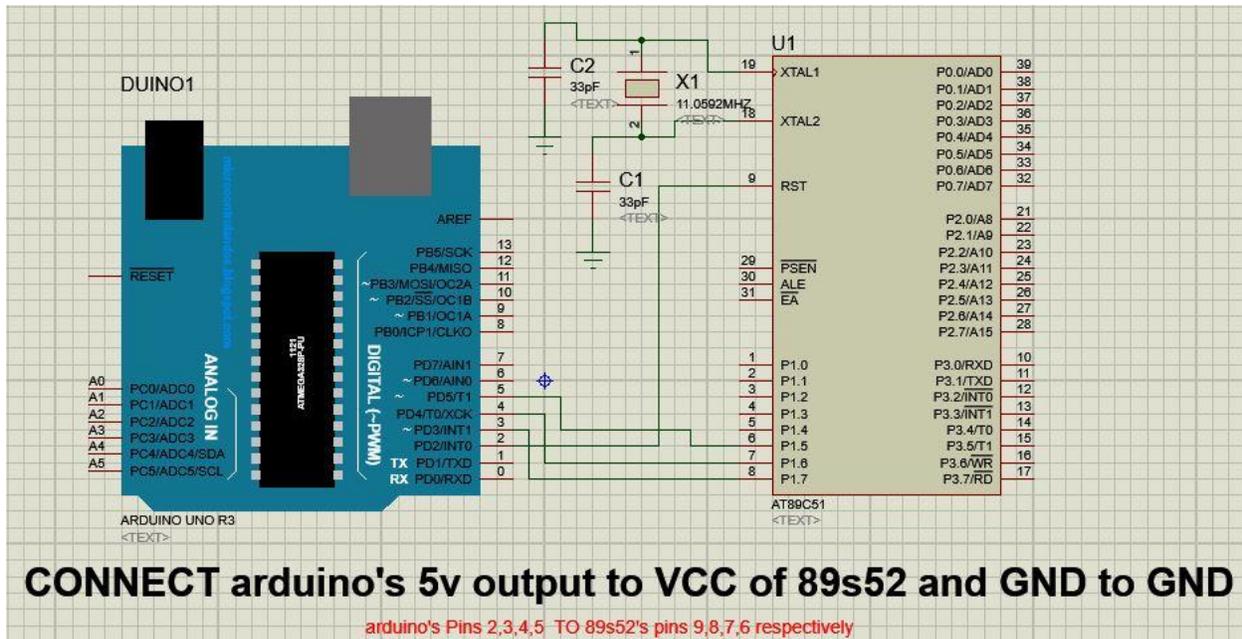


Figure 3: Arduino Board Connections to 89s51/52 microcontroller

Step 4: Program 89s51/52 controller using Programming Software

Now, download the software for programming 89s51/52 microcontroller from here. Make sure your arduino board is connected to the computer. Same can be verified by the COM PORT shown in the space above connect button. Steps for writing the program into 89S51/52 memory is given as follows:

1. First click on **Connect** button.
2. If connection is done then click on **Identify** button. If connections are proper then there will be a message at bottom “**AT89S51/52 Detected**”.
3. Now, select .hex file to be programmed into microcontroller by pressing **Open Hex** button.
4. Now, click **Upload Hex** button to download the program code into microcontroller memory.

(**Note:** if connections are proper and software is not detecting the microcontroller then while holding pressed reset push button, press **Identify**

button again. If this time “AT89S51/52 Detected” message is displayed then keep reset button pressed until complete programming is done.)

Figure 4 shows the picture of the software to be used to program microcontroller.

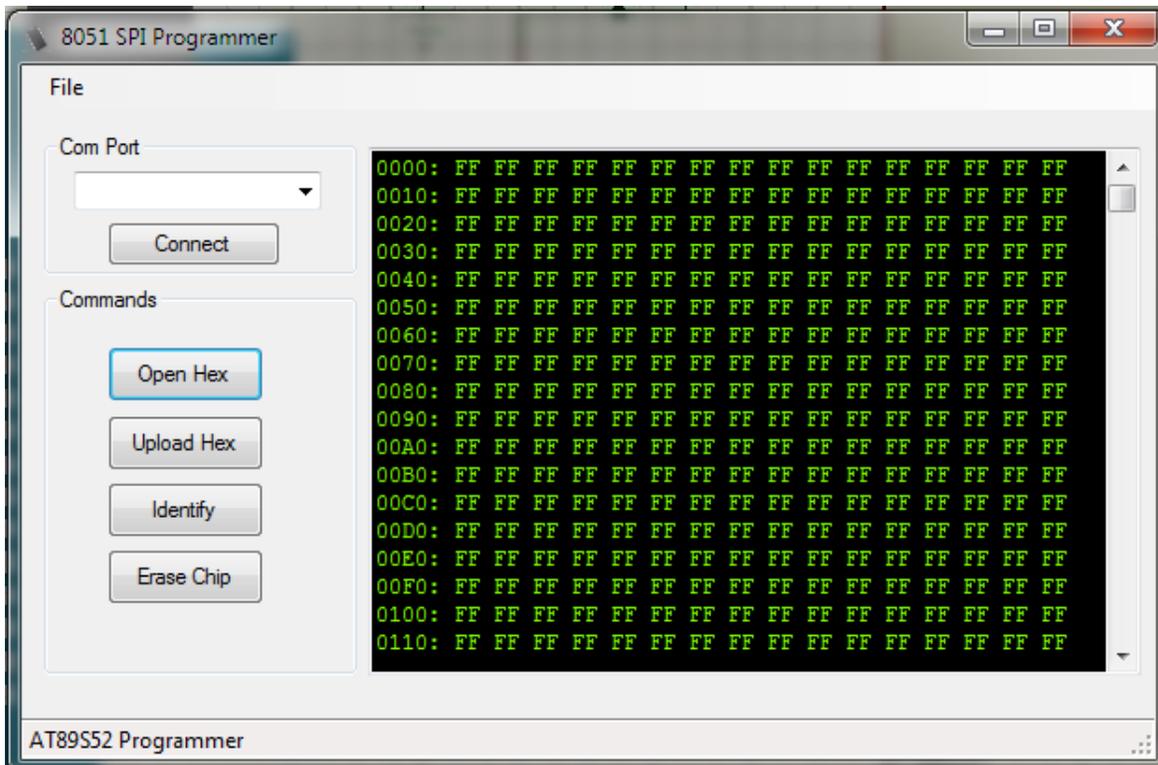


Figure 4: TSOP connection Diagram

In case of any difficulty or suggestion, please feel free to contact us jcbrolabs@gmail.com.