

Serial Port Interfacing In Java

Introduction:

This is software designed in java. It can be also termed as a serial port emulator. This software is of size less than 500kB. This controls the serial port of the computer. This can control the USB port also if it is we use a serial to USB converter. The output of the computer is RS232 which is not compatible with the requirements of the commonly used Microcontroller AT89C51. So we use a RS232 to TTL converter MAX232. Thus the serial data communication can be done. A simple example circuit for testing and understanding the serial emulator is also provided with the article.

Software:

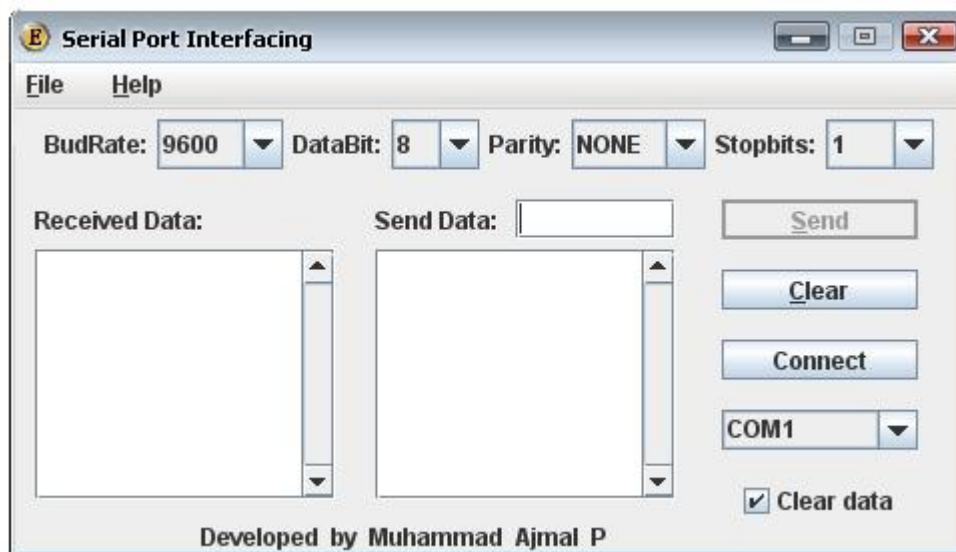
The software is designed in java. Java is platform independent language. So this software can be used in any Operating System if the corresponding Java Runtime is installed under that Operating System.

The software includes 9 class files and a package for controlling serial port. The main class file is "SIJJ.class". This file creates the window for controlling the serial port. The software allows to set the bud rate, data bit etc. The com port is to be selected first for the proper working. After setting the com port click the "connect" button to communicate with the hardware. The software is handshake with the hardware by the code 255(FFH). So first set the value 255 in port P1. This will do the handshaking.

The "MenubarCreator.java" file creates the menu bar and adds it to the window. The next is the "TrayCreator.java" file. This creates an icon in the try so that the program stays in tray until you exit it [The close button will not exit the program].



The file “SendData.java” is the important file which includes the code for controlling the serial port. This file uses the package “gnu.io.*;” which includes the class files for controlling the serial port. Here the code at the end of the SendData.java file is the standard code for initializing the serial port. The “getPortIds()” method returns the available ports. The “SimpleWrite()” method sends the data to the hardware via the corresponding serial port. The method “public void recValue(int temprecval)” is called whenever a serial data is received by the corresponding port. So that the work to be done, when data received should be included inside this function.



Circuit:

The circuit is designed around the Microcontroller AT89C51 [Inside Hardware folder]. Here the port P1 is the input port and the port P0 is the output port. The output is indicated using the LEDs [LED1 – LED8]. The microcontroller is synchronized with the software at a speed of 9.6kbps. For this the crystal of value 11.592MHz is used. This is the value which can be set by both the AT89C51 and software easily and accurately. The circuit is provided with a +5V by the

transformer T1 via the regulator IC 7805. The transformer is 0-6V. You can use 6-0-6 transformer also.

Max232:

The Microcontroller has TTL I/O and the computer has the RS232 I/O. The TTL logic works with 0V as low and +5V as high. Whereas in RS232 a high is represented by -3 - -25V and the low is represented by +3 - +25V, making -3 - +3 undefined. So the computer cannot be directly interfaced with the hardware. Thus we use the IC MAX232 which is a RS232 to TTL converter to solve this problem.

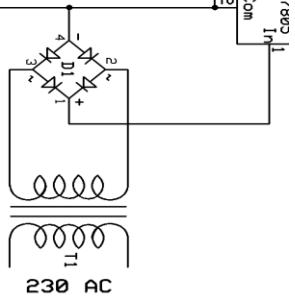
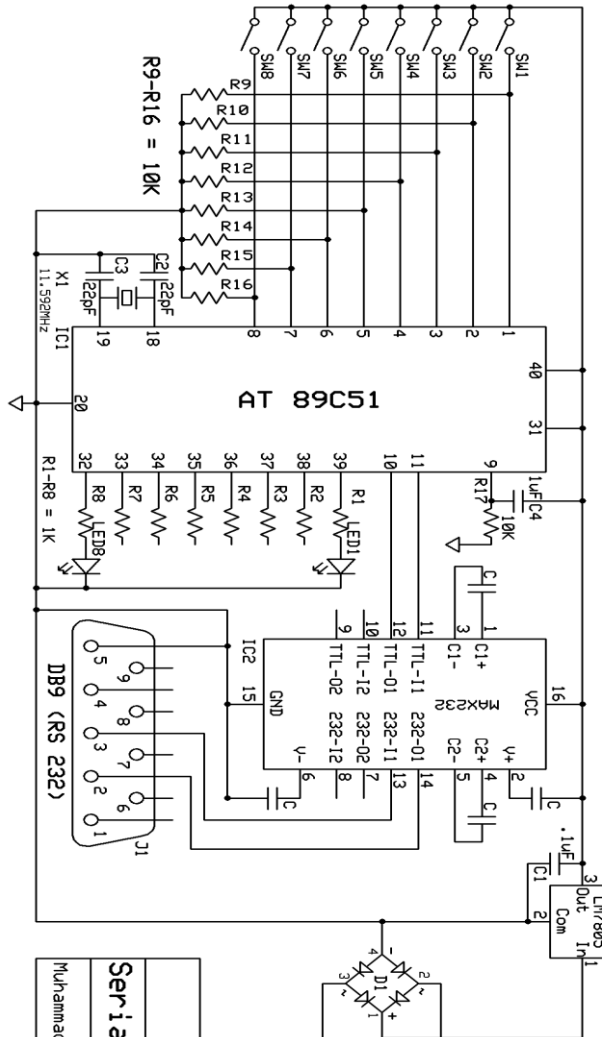
Program:

The program for the microcontroller is written in assembly language. It is a simple program to test and study the working of the serial port and serial interfacing in microcontroller. The program has the only code for sending serial data and displaying the received signal. The program is code in serial interrupt mode.

Caution:

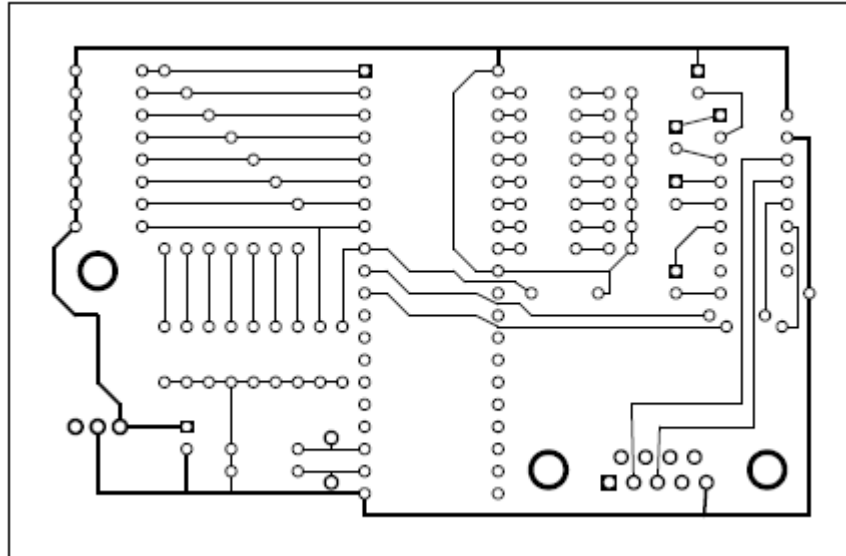
The file includes the serial port driver file "rxtxSerial.dll" and the class files in directory "gnu/io/". These are files downloaded from the Internet [It was downloaded many months before. I never remember the download link.]. I don't know that can these files can be provided to public.

Circuit:



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