

Requirements Specification for EE465 Lab Project 4: SCI

Lab project goal: Use and understand the SCI module of the MSP430 by using Putty to interface to the lab computer via the 9-pin serial COM port located on the back of the computer.

Requirements for lab project completion:

Use your MSP430FR2355 microcontroller on your breadboard with the MAX3222CPN Multichannel RS232 Driver/Receiver along with required capacitors and interface it to the DB9 9-pin Female Adapter RS-232 Serial Port Interface Breakout board. All of these parts should be in your parts kit. (The serial port lines we will be using are Pin 2-RXD, Pin 3-TXD and Pin 5-GND.)

Interface your MSP430FR2355 to the lab PC using the RS232 (SCI) port on the computer and the DB-9 9-pin Female Adapter RS-232 Serial Interface Breakout board. You will need an RS232 9 Pin cable from the lab. Is it a straight thru cable or do two of the pins need to be crossed (null modem cable)? Draw a sketch to help you decide. (TXD to RXD and RXD to TXD).

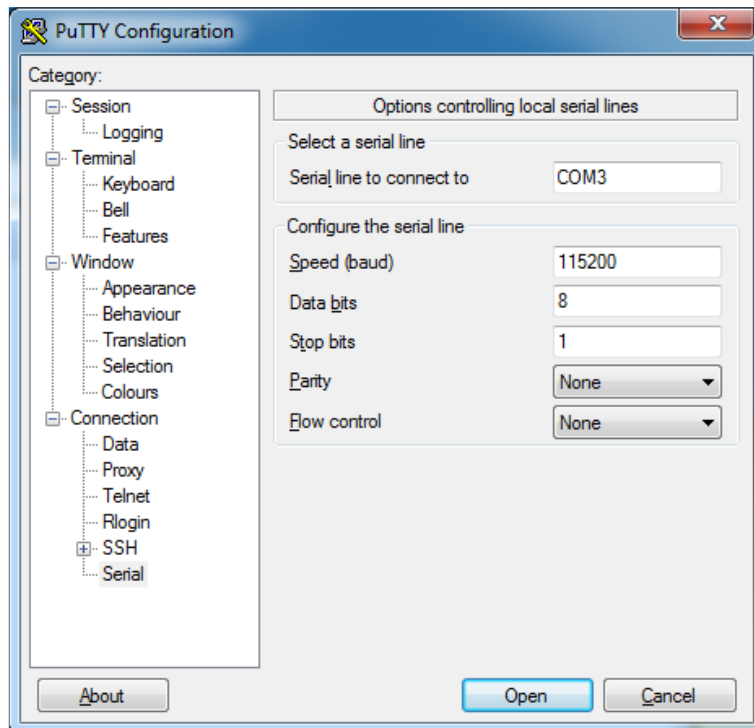
The goal is to use Putty to write a short message (you decide the message) typed on the PC keyboard and store it onto the LCD in your system. You will then use Putty to echo any key typed on your keypad to both the LCD screen and the PC screen.

Putty.exe is used as the UART terminal window and can be found in MSU box folder or at:

<http://the.earth.li/~sgtatham/putty/latest/x86/putty.exe>

<http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html>

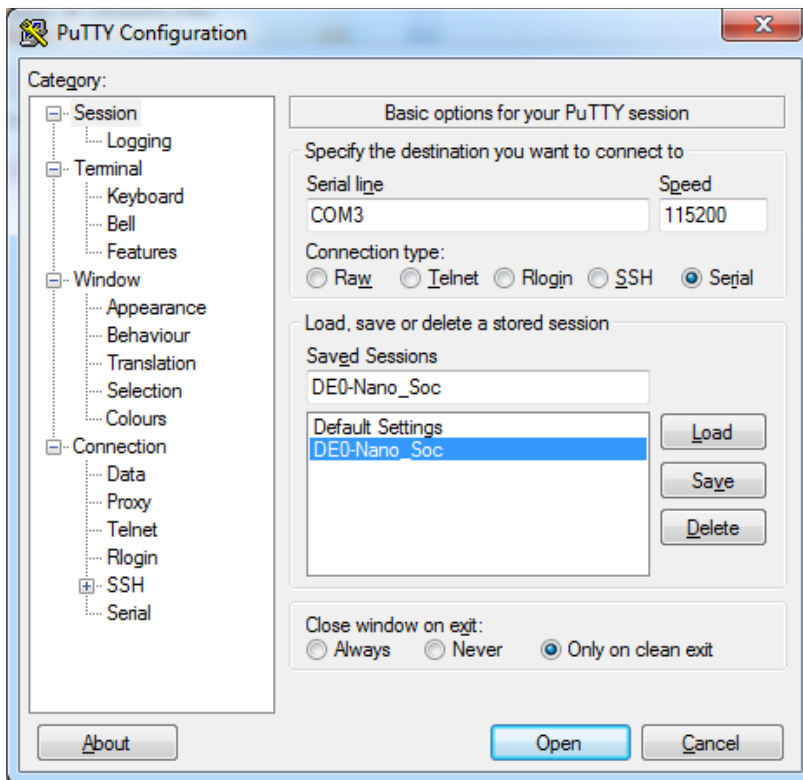
If Putty is not on your computer, please download it for use in this lab.



PuTTY

PuTTY is an open source terminal emulator that will be used to communicate with the Demo board. The serial settings to configure Putty are shown in the figure above (your COM port number might be different) where you have selected the following:

1. **Determine your COM port number** assigned to the USB serial port (This can be found on a Windows 7 machine at: Start -> Computer -> Systems Properties tab -> Device Manager -> Ports)
2. **Configure the Serial settings** by selecting **\Connection\Serial** in the **Category** panel (panel on left side).
 - a. COM Port = Assigned by Windows.
 - b. Speed (baud) = **9600**
 - c. Data bits = **8**
 - d. Stop bits = **1**
 - e. Parity = **None**
 - f. Flow control = **None**
3. Next, select **\Session** in the **Category** panel (left side).
 - a. Make sure that the *Connection type* is **Serial**.
 - b. **Open the terminal window** by clicking the Open button at the bottom. If PuTTY only beeps rather than opening a terminal window, you are probably trying to open the terminal window in the serial configuration setting window (\Connection\Serial) rather than being in the \Sessions window. Hit return if you don't see the login prompt.
 - c. **Save the configuration settings** in the Session window by clicking the Save button after entering an appropriate session name. See the figure below right that shows a saved session call DE0-Nano_Soc.



Generate a schematic for the circuit you designed and upload a pdf with your memo report.) Your circuit should have the MSP430 microcontroller, the MAX3222 Multichannel RS232 Driver/Receiver and the 9 Pin RS232 connector breakout board. Make sure your schematic shows the specific connection to the computer. Each lab **team** must build a hardware circuit and receive a **team** sign off for this lab.

When a “???you decide???” is typed in Putty your program should begin writing characters to the LCD and continue doing this until a <cr> is received.

When a keypad character is typed on your system, display the key on your LCD and echo the key to the PC screen.

For the RS232 interface use a baud rate of 9600, no parity, 8 bit.

Your project grade will be based on the memo report that you hand in during this or subsequent lab sessions and your demonstration of your code written for this lab.

Your **Memo Report** must include:

- a. A memo report summarizing the methods you used to solve the problem. Your memo report should include a flow chart for your program.
- b. Each student should upload their commented code to the appropriate “Dropbox” for this lab on D2L
- c. Upload a PDF of your schematic for this lab as part of your memo report.

Memo Report Date: Tuesday, March 12, 2020 (by Midnight)

Code Demonstration:

- c. A sign-off from the instructor or a TA indicating that your program performed as required and the required circuit modifications were completed. Each lab **team** must build a hardware circuit and receive a **team** sign off for this lab. A sign-off sheet will be kept by the instructor and TA indicating completion of the lab.

Demo Due Date: Tuesday, March 10, 2020 (by end of lab time).