Requirements Specification for EE465 Lab Project 3: SCI

Lab project goal: Use and understand the SCI module of the MC9S08QG8 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:

Note: This is a standalone lab and we will not use the entire breadboard you have been building this semester. DO NOT disconnect your LCD and Keypad circuit, as you may continue to use this on other labs.

Use one of your MC9S08QG8 microcontrollers 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 MC9S08QG8 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).

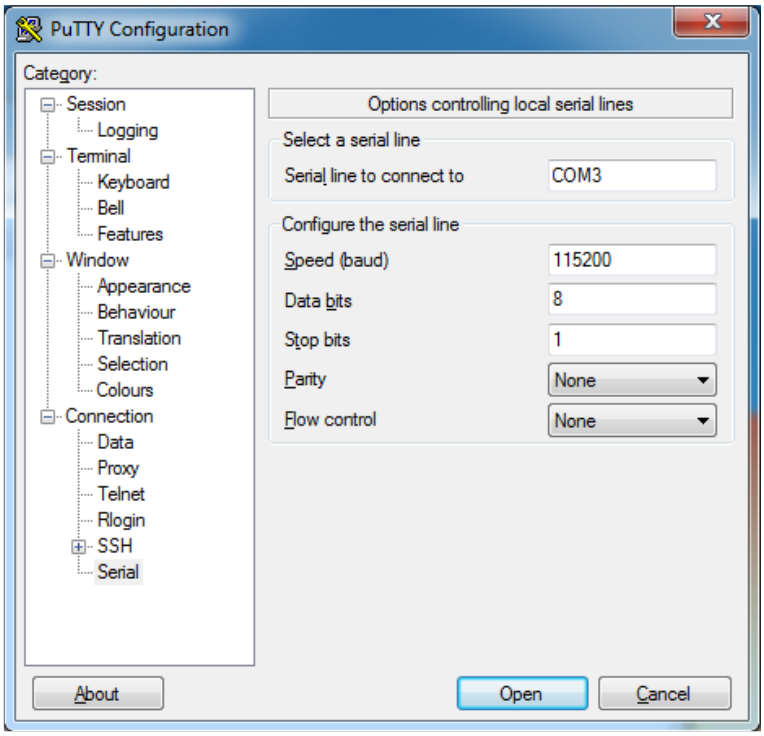
The goal is to use Putty to write a short message (you decide the message) typed on the PC keyboard and store it into the MC9S08QG8 device. You will then use Putty to retrieve that message from the MC9S08QG8 device and display the message on the PC screen.

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**

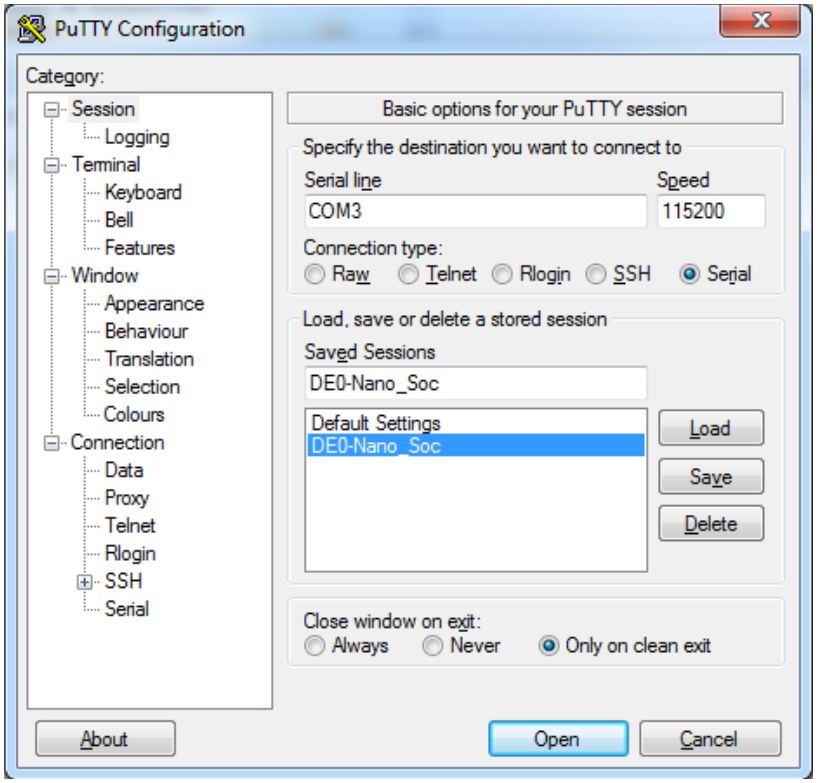
3. Next, select **\Session** in the ***Category*** panel (left side).

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. (this can be hand drawn and scanned in as a pdf to upload with your code.) Your circuit should have the MC9S08QG8 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 storing the following typed characters into your MC9S08QG8 Device and continue doing this until a <cr> is received.

Type a "???you decide???" to read the characters from your MC9S08QG8 Device and continue doing this until a <cr> is received. Display the characters on 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.

Memo Report Date: Tuesday, March 5, 2019 (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: Thursday, February 28, 2019 (by end of lab time).