

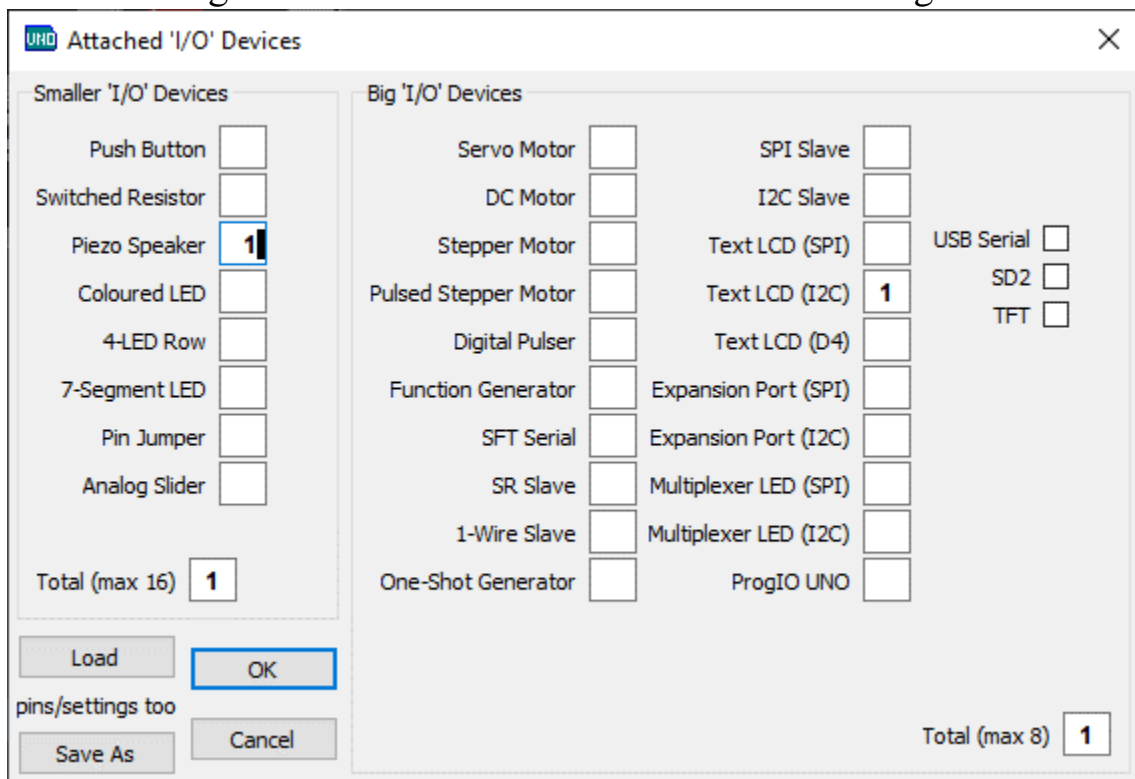
## CS 341 – Lab 5 (virtual)

### Using an LCD Display and Speaker

# Instructions

The goal in this lab is to output some text on a (liquid-crystal display)[LCD](#) and a [piezo speaker](#). The LCD display we use for the in-person class actually has a piezo speaker built into it, so instructions can be sent in the same format (<name of lcd object>.write(0xFF);). In the virtual Arduino software we don't have that luxury.

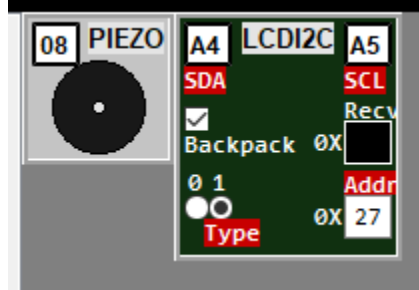
1. If you haven't already downloaded UnoArduSim (instructions for this are in lab 6) then do that first
2. Go to Configure > 'I/O' Devices and select the following:



Note: you can also select “USB Serial” if you want to use the Serial Monitor

3. Click OK. You should only see the piezo speaker and the LCD (and maybe the Serial Monitor)

4. Next you should retrieve the code from [GitHub](#) if you haven't already. Make sure you get the file named "Lab5Virtual\_Starter.ino"
5. Follow the To Do in the code
6. Configure the hardware like so:



Note: in this picture I am using pin 8 to communicate with the Piezo Speaker, and bus address 0x27 to communicate with the LCD

7. Double click on the LCD to open up a window for it. You must select the size you want to see the text on. Try out a couple different layouts.
8. When you click run you should see text show up on the LCD, and you should hear sound (it's quite low quality) through your computer's speakers

## Lab Report

Because we had to cancel this in person version of this lab, the online version of this lab will be due May 6<sup>th</sup>. You can submit your lab report by email to [jack.davis001@umb.edu](mailto:jack.davis001@umb.edu). Please CC all group members so that my replies reach everyone.