APPLICATION NOTE

4D SYSTEMS

TURNING TECHNOLOGY INTO ART

Application Note: 4D-AN-M5002

Serial - Running BigDemo on a 4D Display interfaced to an Arduino

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Description

This application note is intended to provide users of Arduino boards and beginners, information on how to interface a 4D display module configured using Serial, to run the BigDemo sample sketch using the Arduino. In order to carry out this application note the following items are required:

- Any 4D Systems Workshop 4 supported Display Module
- Arduino Board (Such as Duemilanove, Duo, etc)
- 4D Arduino Adapter Shield and 5 wire F-F Cable
- 4D Programming Cable
- USB cable for Arduino

Content

Application Overview

This application provides a demo for users to see in action every available 4D Serial commands, using the 4D Systems intelligent displays. This has been tested on an Arduino Gizduino ATmega644 connected to a uLCD-32PTU display using a 4D Arduino adapter shield.

By default, this program uses the hardware serial on pins 0 and 1 of the Arduino. Further, this application note is applicable to any 4D-Display, configured using the Serial Environment of Workshop 4, using the SPE application from 4D Systems. The simplicity and ease for Arduino users to drive any 4D Systems display is the goal of this application note.

Setup Procedure

Foremost, the 4D Workshop 4 IDE has to be downloaded and installed. This is available from the 4D Systems website through the following link:

http://www.4dsystems.com.au/prod.php?id=172

Documentation regarding Workshop 4 and its environments, such as Serial, can also be downloaded from this site.

In the same manner, the Arduino IDE would need to be downloaded and installed. Depending on which OS you're using the appropriate links are available from the following page on the Arduino website:

http://arduino.cc/en/main/software

Simulation Procedure

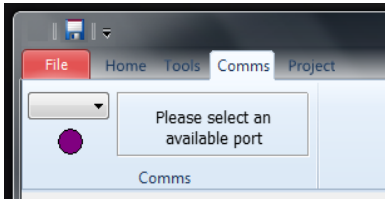
Converting any 4D Display to a Serial display

In this example, the uLCD-32PTU module was used. Any 4D Display that is compatible with Workshop 4 may be used however. The first step is to open a new project in Workshop 4 (WS4).

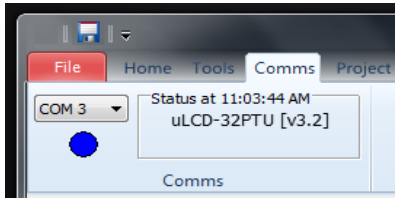
Select the appropriate display you want to use. For this example we used the uLCD-32PTU. Please select the model accordingly to what you have.

Select the serial environment

Connect the display module using a 4D programming cable to the USB port. Click COMMs tab on WS4. Ensure that the "Indicator Dot" is blue otherwise select appropriate COM port (usually COM3 or higher) then click the dot and wait until it is blue indicating that communications with the module was established.

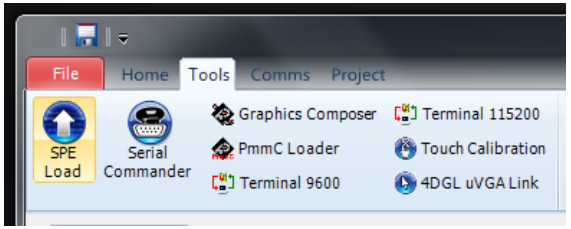


Not Connected



COM connected

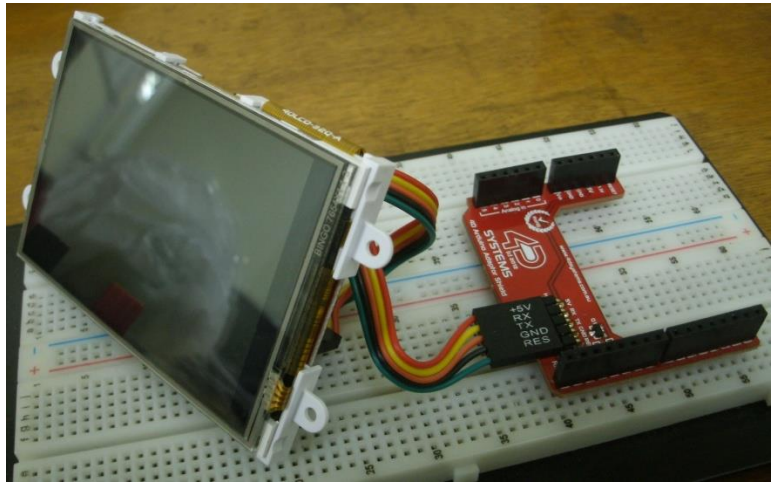
Open Tools menu and click SPE Load. This procedure would load the necessary firmware and configuration to convert the display in Serial (SPE) mode.



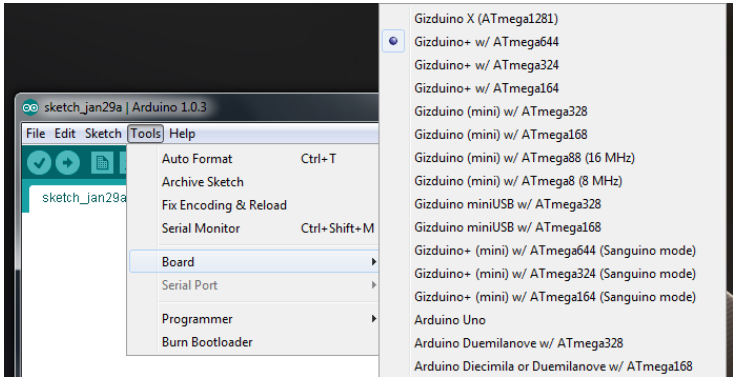
Disconnect the module and programming cable from the PC

Connecting the Display to the Arduino

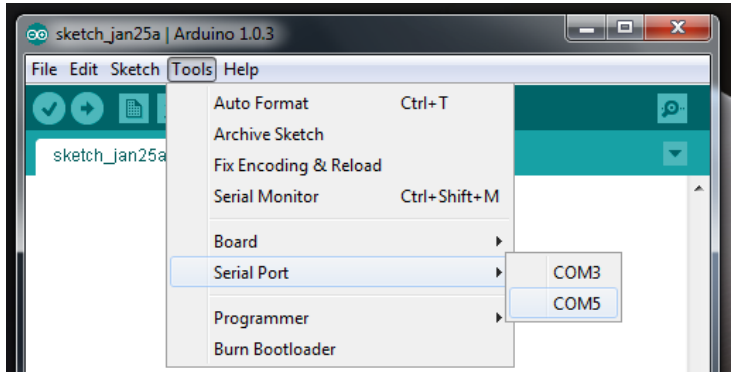
Connect the Display using the 5-pin cable provided, to the 4D Arduino adapter shield. Please take care to connect the 5-pin connector with the proper pin orientation on both the Display side and on the 4D Arduino adapter shield. **Do not connect the shield to the Arduino at this point.**



Open the Arduino IDE and select your Arduino board model. In the "Tools " menu select "Board" submenu and a list will show all available models.



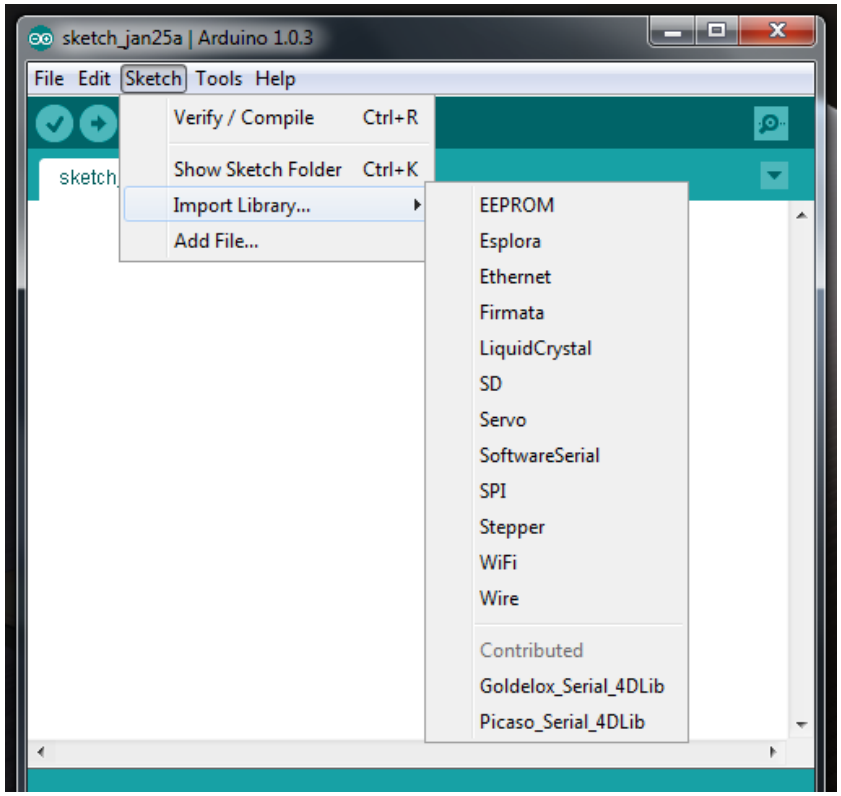
Next, check the serial port connection, to do that, go to the Tools -- Serial submenu. Ensure that the correct COM port is used for the Arduino.



Verify if the Picaso Serial library is installed. Otherwise, go to My Documents or Public Documents and look for the 4D Labs folder. Open the Picasso Serial folder, then open the Arduino folder then right click on the

Picaso_Serial_4DLib folder, copy and paste to your Arduino Library folder (usually located at the ...\My Documents\Arduino\Libraries\ )

For Goldelox displays, copy the Goldelox_Serial_4DLib folder to the Arduino libraries folder. To verify if the 4D library is installed, on the Arduino IDE, open Sketch -- Import Library. Please see below for details:



IMPORTANT: **FAT** format a uSD card and copy the following files to the root directory. Do not use folders, they are needed to finish all test. The **following files are needed on the uSD** to complete all tests and their relative location from **C:\Users\Public\Documents\4D Labs** folder are as follows:

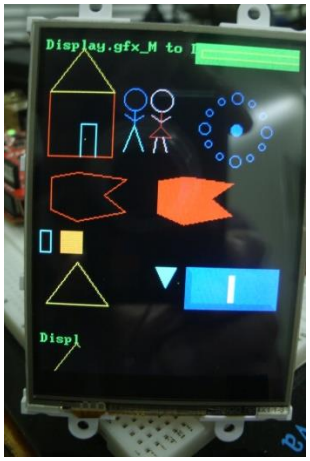
gfx2demo.gci	resources\GC Files
gfx2demo.dat	resources\GC Files
KBFunc.4fn	Picaso ViSi
KBFunc.gci	Picaso ViSi
KBFunc.dat	Picaso ViSi
Space.wav	Picaso ViSi Genie\SoundPlayer.ImgData

Simulating the "BigDemo" Sketch

Open the Arduino IDE and open the BigDemo sketch usually found at:

C:\Users\Public\Documents\4D Labs\Picaso Serial\Arduino\BigDemo

Compile then download to the Arduino board. After the download has successfully completed, attach the 4D Arduino adapter shield to the Arduino board. Insert the uSD card to the display module, press the reset and that's it! Several screens will sequentially appear on the display as the BigDemo sketch runs some of which are as shown below:



Conclusion

The foregoing BigDemo sketch showcases several capabilities of the 4D line of Intelligent Display products when configured as a Serial display bound only by one's creativity and imagination.

Arduino users, whether a novice or expert will experience a guaranteed ease when designing applications based on this system. To complement this, user's are further encouraged to read the Picaso Serial Command Set Reference Manual available on the Workshop 4 product page of the 4D Systems website.

http://www.4dsystems.com.au/prod.php?id=172

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