

# arLCD Quick start guide.

The arLCD should be ready to use right out of the box. Go through these steps to prepare your computer.

## Step 1 – Install the drivers.

Make sure you have the latest Arduino IDE installed and became familiar with the Arduino IDE. The Arduino IDE can be downloaded from the Arduino homepage

[www.arduino.cc](http://www.arduino.cc)

It is outside the scope of this guide to the usage of the entire Arduino IDE. Typically Arduino files are installed by copying the files into a directory **C:\\Arduino**. We will assume that for this install.

Before connecting your arLCD go to

<http://www.earthlcd.com/Downloads/>

Click on **arLCD**, then **Software**. Download the latest zip files.

**arLCD\_Library\_{date}.zip**

**arLCD\_Firmware\_2pxx.hex or zip**

**arLCD\_Fileystem\_{date}.zip**

**ezLCD-3xx Font Converter Setup.zip**

**ezLCD-3xx-Firmware-Loader.zip**

**You may optionally also want to download the ezLCD3xx User Manual.**

[http://www.earthlcd.com/Downloads/3xx\\_Documentation](http://www.earthlcd.com/Downloads/3xx_Documentation)

[ezLCD3xx\\_manual\\_April2013.pdf](#) (Date may change)

Unzip the files to a known location on your computer.

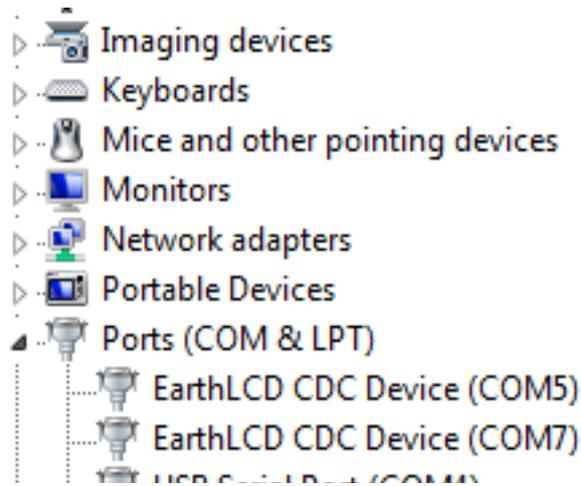
Plug in the arLCD into a free usb port and wait a few seconds.

Windows will recognize the new hardware and show the “new hardware found” guide. The arLCD has a built in 4Mbyte Flashdrive which will be installed automatically using a built-in Windows driver and show up in “**my computer**” as a new drive named “**ARLCD**”. When Windows asks for a driver for the “**EarthLCD CDC Device**” choose manual install and select the new drive named “**ARLCD**” as the drive and path for the required files. The “**ARLCD**” only requires an installation file called “EarthLCD.inf” to install. You should find it in the root of the new flashdrive.

Windows may warn you about the driver not being digitally signed, just click ok and wait until the install process had finished. The “EarthLCD.cat” file should also be present which designates a digitally signed driver for the “EarthLCD.inf” file. The driver should now be installed and ready to use. In most cases a reboot isn’t necessary but it’s recommended.

## Step 2 – Locate ARLCD in system

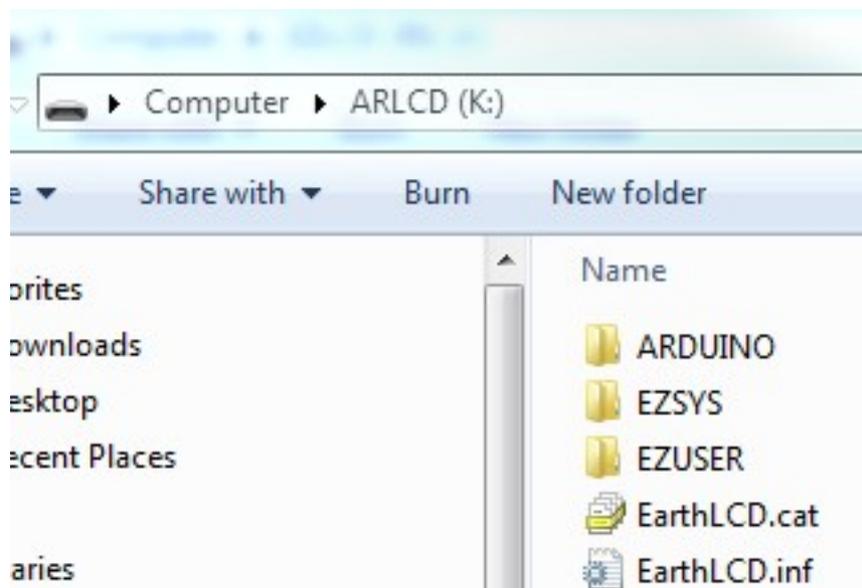
After you have plugged in the ARLCD and successfully installed the driver, a COM port will be available. This COM port will be shown in the Device Manager. Under Ports you will see various devices such as:



In this case I have 2 EarthLCDs connected. COM5 is connected to an ezLCD-301 and COM7 is connected to an ARLCD. The simplest way to find out which is which is to unplug the ARLCD and see which one goes away and returns when reconnected to the USB. Each time you connect the display it will use the same COM port unless you plug in 2 at same time.

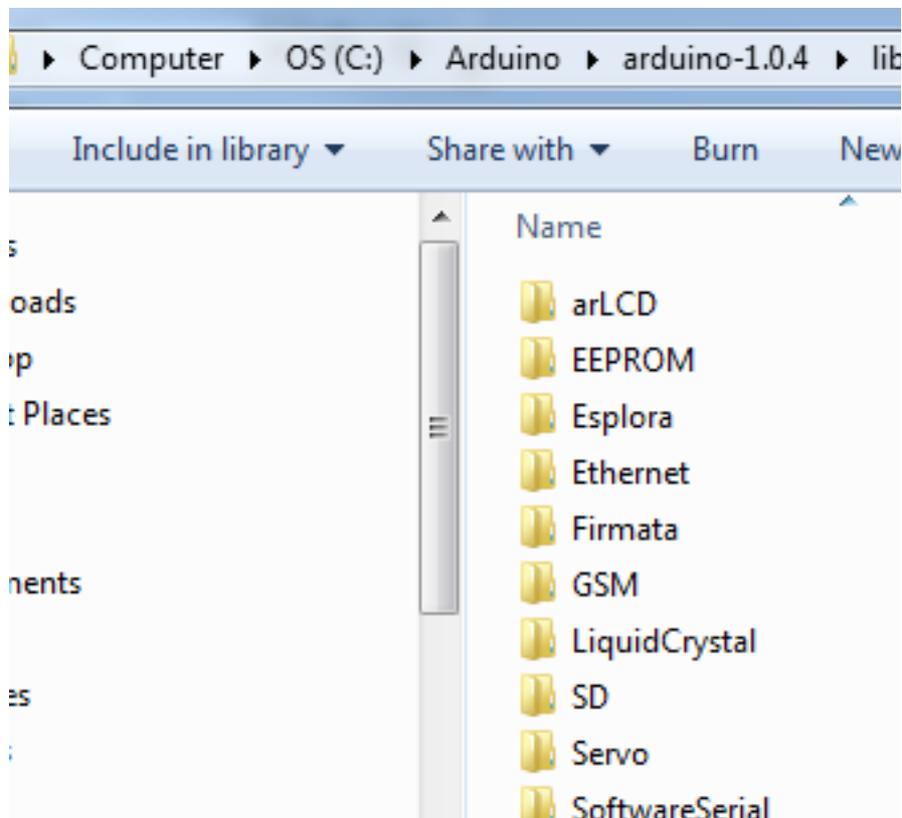
### Step 3 – Update the filesystem.

In order to get the most out of your arLCD it's recommended to update the filesystem to the latest version. You may have already downloaded the latest filesystem in step 1. Open the zip file named **“arLCD\_Fileystem\_{date}.zip”**. Select all files and select copy (can be done using the Ctrl+a & Ctrl+c keyboard shortcuts). Go to **“my computer”**, click and open the drive named **“ARLCD”** select paste ( keyboard shortcut is Ctrl+v ) when Windows asks to overwrite existing files click yes. Restart the arLCD by pressing the RESET button on the back and you are ready for the next step. It should look something like this.



Step 4 – Install the arLCD library and example files for the Arduino IDE.

The arLCD comes with a library to be used with the Arduino IDE, this makes programming the arLCD very ez. In the file named **arLCD\_Library\_{date}.zip** that you downloaded earlier you will find a folder named **ezLCD**. This folder contains the library and example files to be used with the Arduino IDE. Locate the folder of the Arduino IDE on your computer and copy the **ezLCD** folder to the **libraries** folder.



Step 5 – Loading an example sketch into your arLCD

Before you can communicate with your arLCD the startup.ezm file must be setup correctly. If a startup.ezm is in the EZUSER\MACROS\ then it will be used. If not it will use the startup.ezm in the EZSYS\MACROS\ directory.

Check the following lines are present in the startup.ezm:

```
print "Arduino Mode CMD 38400 Baud"  
cfgio 3 serial2_rx 38400 n81  
cfgio 4 serial2_tx 38400 n81  
cmd serial2  
'setup usb bridge to program arduino  
CFGIO 2 serial1_tx 57600 n81  
CFGIO 6 serial1_rx 57600 n81  
CFGIO 7 USB_DTR  
bridge USBserial1  
'extra options
```

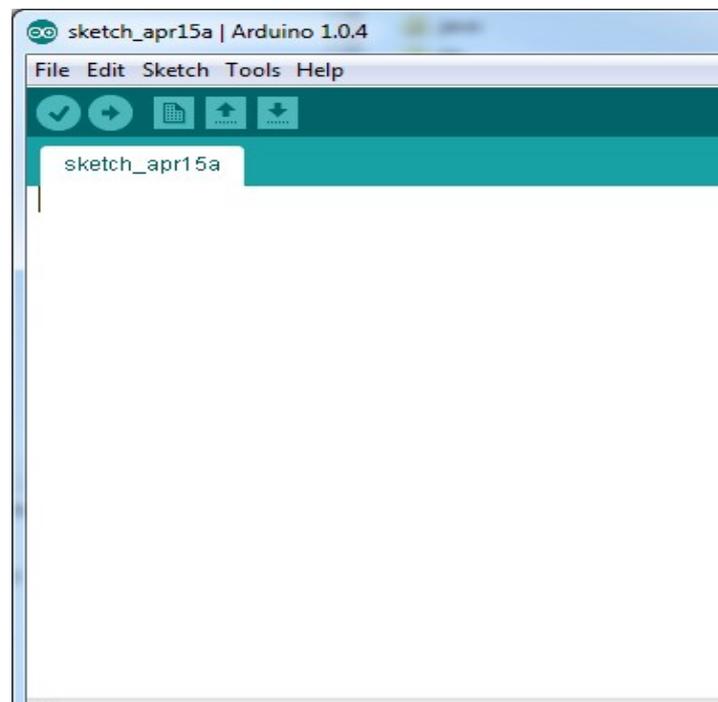
### **cfgio 9 touch\_int low quiet**

If you had to change anything, press the reset button on the back of the display to restart the arLCD.

Note: The arLCD uses the GPU to program the Arduino through the USB. Serial1 on the arLCD is connected to the bootloader of the Atmel CPU and programs the device automatically. The bridge command above is used to make this connection. See the ezLCD-3xx manual for more information.

[ezLCD3xx\\_manual\\_April2013.pdf](#)

Now you are ready to talk to your arLCD. Open the Arduino IDE on your computer by clicking on the “**Arduino.exe**” file.



You are almost ready to load the sketch onto your arLCD. You just need to make sure your Arduino IDE is set to the correct type of hardware and COM port. From the Arduino IDE toolbar select

**Tools -> Board -> Arduino Uno.**

This is compatible with the arLCD.

Now from step 2 you should have determined the COM port.

**Tools -> Serial Port -> COM7 (This will vary with your computer)**

Now from toolbar select **/File/Examples/ezLCD/arLCDTEST**

From the toolbar select **Examples-> ezLCD-> arLCDTEST** This will select the test example sketch. Now compile and upload the arLCDTEST example to the arLCD by using the Toolbar **File-> Upload**. You can press the button with a right arrow on it too. The example should take a few seconds to compile and be downloaded into the arLCD. You should see a test screen with various buttons. One of the options is upgrade ezLCD. Use this sketch to load the latest firmware into the ezLCD. This sketch requires at least firmware V2.04 to run properly. The sketch is used with the ezLCD-3xx Firmware Loader program you downloaded earlier to install the latest firmware.

If you want to upgrade your firmware and its older than V2.04 see Appendix A for the manual way to upgrade.

If you do not see the test screen then go back through the steps and watch for error messages indicating something didn't go well.

Now that you are up and running you can try selecting some of the other 25+ examples from the library and explore how they work. Make some code changes and see how it effects the display. Don't be afraid to try things. If you don't understand lines in the sketch, make some changes and see what happens.

Remember to select each sketch from the File menu.

**File / Examples / ezLCD / selected *sketch***

and then upload

**File / Upload**

for each sketch you want to try. You can modify and re-upload it as many times as you want. If you want to save it, we recommend you save it with another name you can remember so you can go back and look at the original.

On RESET the ezLCD GPU will check the touchscreen to see if during reset the user wants to bypass the normal startup.ezm. The user can supply alternative startup files or none at all.

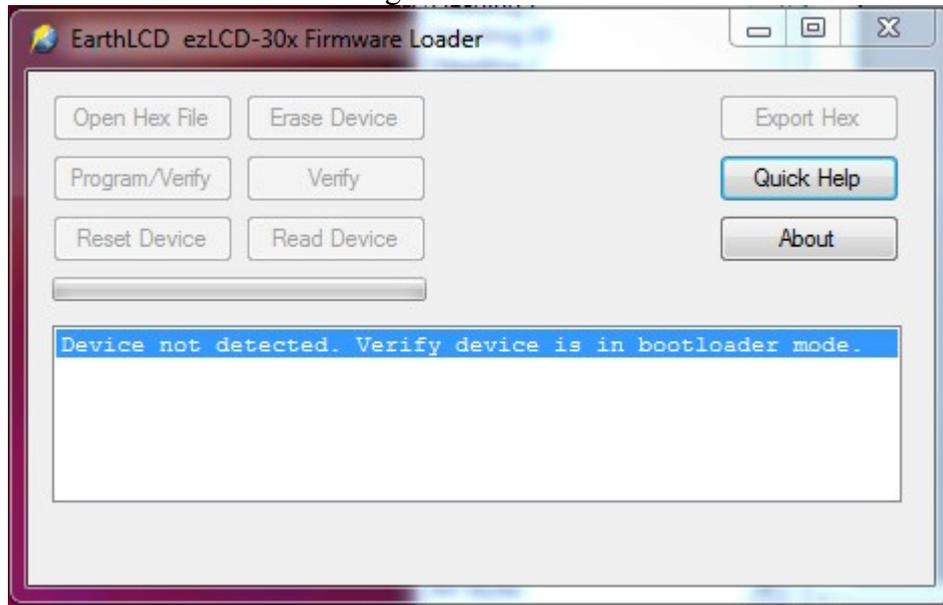
Note: Without one startup the COM ports are not setup and communication with the Arduino can not happen. The startup.ezm files are changed by direct access to the flash drive on your PC.

The normal STARTUP.ezm is used without touching the screen. The Upper left is STARTUP1.ezm, upper right is STARTUP2.ezm. Lower right is STARTUP3.ezm and lower left is STARTUP4.ezm. STARTUP5.ezm is executed if the screen is pressed but outside the 50 x 50 pixel corners. If the startup file is not found, it is simply skipped. The unit is only shipped with STARTUP.ezm.

## Appendix A: Upgrading the arLCD Firmware

A Windows PC is required to upgrade the firmware on an arLCD. There are two parts to upgrading the arLCD firmware.

- 1) Putting the arLCD in firmware upgrade mode.
- 2) Run the Firmware Loader to load the firmware from your PC to the arLCD using the USB port. Before starting an upgrade be sure you have downloaded the ezLCD3xx Firmware Loader and installed it. You should see it waiting for the arLCD to attach.



- 3) The latest firmware can be found at [http://www.earthlcd.com/Downloads/arLCD\\_Software](http://www.earthlcd.com/Downloads/arLCD_Software)

**IMPORTANT:** Never use any upgrade firmware that is not designed for the display you have. Only arLCD firmware should be installed. Using the wrong firmware could make your unit inoperable and leave no way to install the correct firmware.

Before upgrading your arLCD firmware you should backup any macros you have created by copying them from the arLCD flash drive to your computer.

**NOTE:** Once you put the arLCD in firmware upgrade mode it cannot come out of this state until new firmware is programmed using the provided program even if you unplug it or reset!

Step 1. Put the arLCD in Firmware Upgrade Mode. Type in the following command line: "Upgrade ezLCD". The command must be typed exactly and is case sensitive.

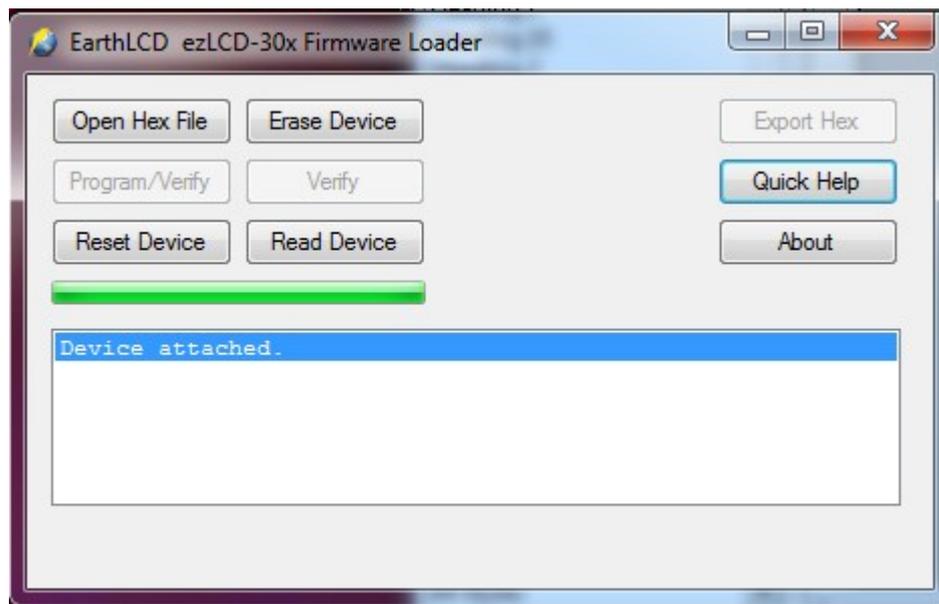
You should receive the message:

Upgrade Firmware Enabled.

If you can not get into Upgrade mode using the serial port, you can short the two vias on the bottom center of the arLCD marked BOOT and GND and press and release reset.

Step 2. Close your terminal program.

Step 3. Run the ezLCD-3xx Firmware Loader program (should already be running).



Step 5. The ezLCD-3xx Firmware Loader program will beep and the text box should display Device attached.

Step 6. Click Open Hex File in the ezLCD-3xx Firmware Loader program.

Step 7. Navigate to your arLCD firmware hex file and click on it.

Step 8. Click Program/Verify in the ezLCD-3xx Firmware Loader program. The ezLCD-3xx Firmware Loader text box should display several status messages followed by Erase/Program/Verify completed Successfully.

Step 9. Click Reset Device in the ezLCD-3xx Firmware Loader program. The arLCD should sign back on with the firmware version you loaded displayed in the bottom left corner of the arLCD splash screen.

If you get the 'FSINIT FAILED' instead of the splash screen you will need to reformat the ezLCD flash drive. Format the ezLCD, using quick format by right clicking the drive in file manager and selecting the button "Restore Device Defaults".

Step 10. Load the new file system if you re-formatted or downloaded a new file system from the EarthLCD website.

Step 11. Reconnect your terminal program and enjoy your firmware upgrade.