

DENSITRON USB KIT



HARDWARE AND SOFTWARE MANUAL

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REVISION RECORD

Rev.	Date	Page	Chapt	Comment	ECR no.
A	24/May/15			New Release	

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1 Introduction

Easy to use Development platform for all Densitron Microcontroller interface displays.

This kit is based on the success of Arduino UNO micro controller platform. This kit will allow our customers, engineers, students... to evaluate and play with Densitron displays.

The kit will be pre-loaded with the required software and all our source codes can be downloaded from our server.

Kit comprises of Arduino UNO R3 controller platform with specific shield board matching display drivers. Will come as a USB powered unit but can also be used as standalone kit with battery power supply. Shield boards will come with some integrated function useful to our customers, for example current measurement circuit, touch functionality, .. etc.

1.1 HARDWARE FEATURES

- USB1.1 and USB2.0 compatible communication interface
- Small board form factor (88mm x 55mm)
- Supports OLED displays
- Onboard switching power supply for OLED
- Current measurement function
- PCT Touch capabilities (DD-PCT-128128FC-6A)
- Hot plug and unplug detection
- Software control for OLED

1.2 SOFTWARE FUNCTIONS

- Picture show from SD card to display BMP format
- Software Development functions
- Picture slide show
- Picture pause (see section)
- Brightness control (see section xx)

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2 PARTS OF SUPPLIED SYSTEM

The supplied system contains the following:

- Arduino UNO R3 base Kit
- Shield Board along with appropriate display
- SD card
- USB cable

3 SYSTEM REQUIREMENTS

Arduino Latest IDE with [link to download area](#).

- Windows PC
- Windows CE **

4 START-UP

Download Arduino IDE from below link:

- [Windows Installer, Windows ZIP file \(for non-administrator install\)](#)
- [Mac OS X](#)
- Linux: [32 bit](#), [64 bit](#)
- [source](#)

Install the driver, follow the instruction as per the above links.

4.1 ASSEMBLY

To assemble the shield board to the Arduino UNO R3 just follow the same number of sockets matching to the pin headers from shield board and match them together. Care should be taken while aligning the two cards together. See picture below on section Arduino kit details.

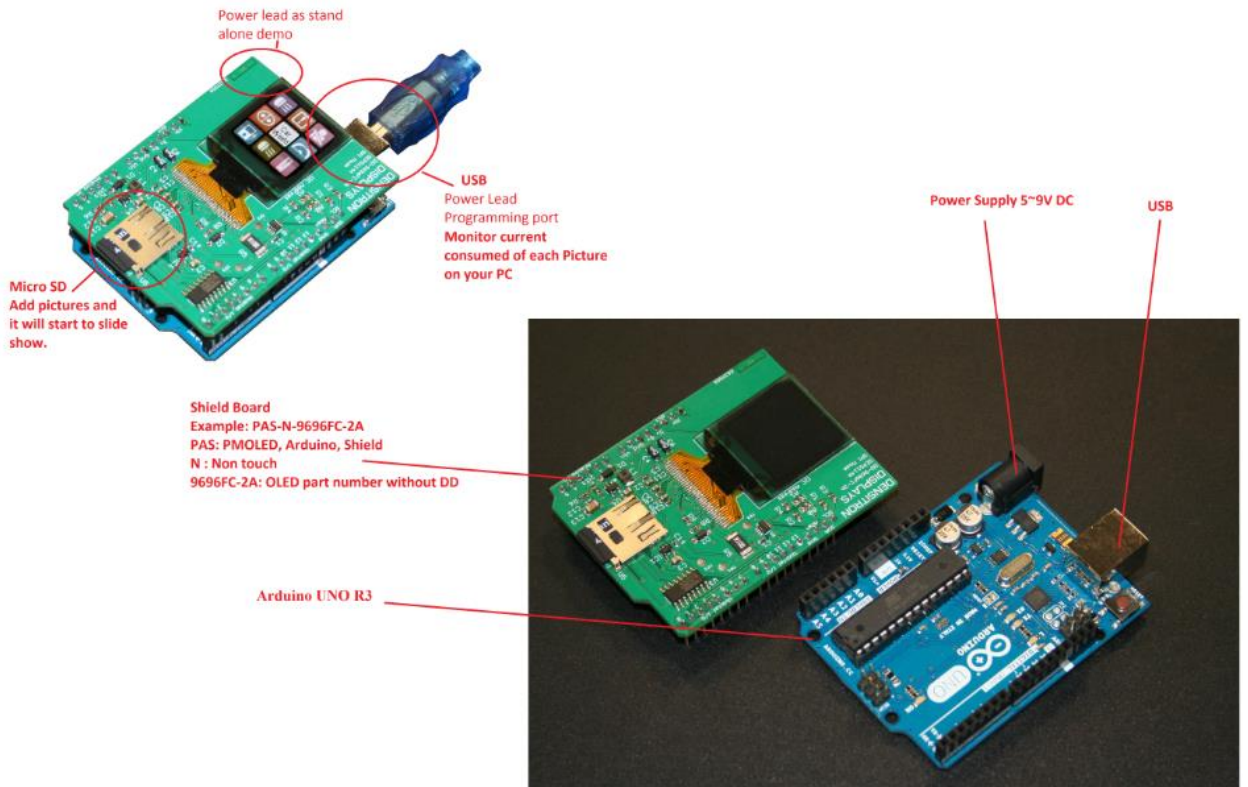
4.2 CONNECTION

After the system is assembled correctly then it can be connected to the PC USB port with the supplier USB A to B cable provided with the kit. Kit is powered by USB port or can also be powered by 9V DC with centre positive. The display should start with picture slide show any trouble with the driver not been installed please refer to Arduino website for trouble shooting.

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4.3 ARDUINO KIT DETAILS:



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5 USING THE DEMO SOFTWARE

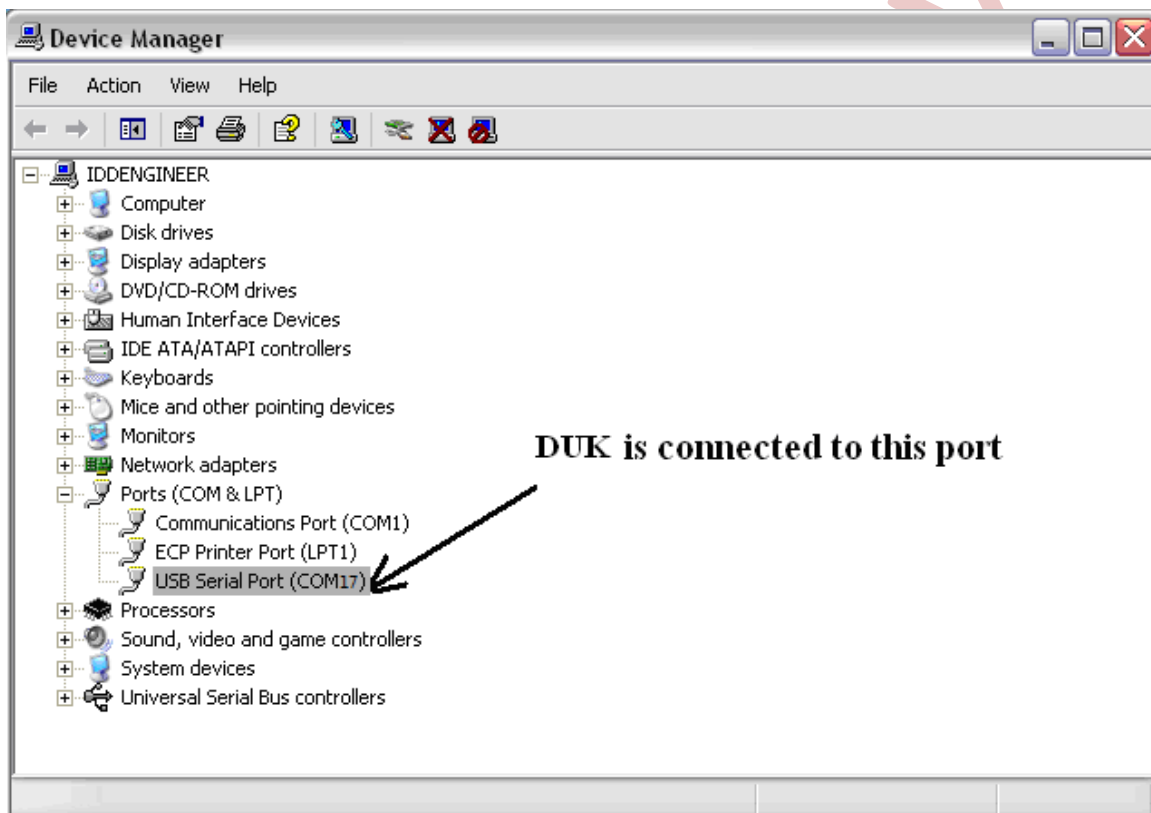
5.1 CONNECTING TO DISPLAY

The demo slide show starts when the USB cable or power supply is plugged in. customers can modify these functions as per their requirement by changing the source code. When the Kit is connected to PC operating system, PC will make a new virtual serial COM port.

Serial port's number can be found by following this instruction below:

For Windows XP: "Start menu =>Control Panel=>System=>Device Manager"

Other versions: "Start menu=>Settings=>Control Panel=>System=>Device Manager"



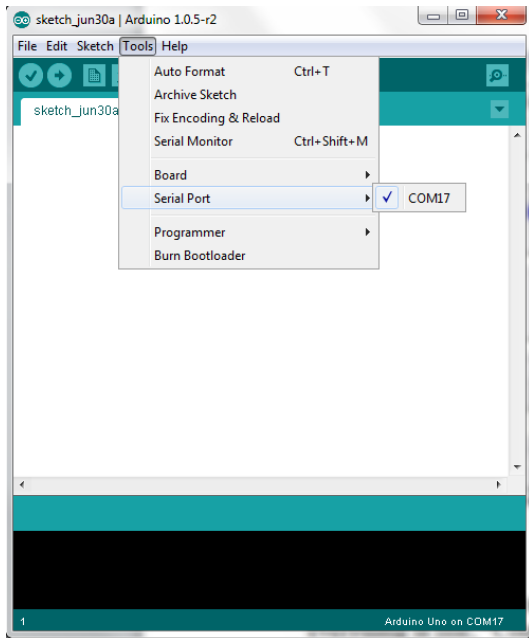
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5.2 ARDUINO SOFTWARE TOOL:

Double click on the Arduino software to get to the Arduino sketch.

Make sure that the right com port is been used see below picture:



Download the following library from Adafruit for the current sensing circuit from INA219. You can find this under the library folder of SD card

https://github.com/adafruit/Adafruit_INA219

Updated libraries will also be found in Densitron website, click link below:

www.densitron.com

Display libraries will be found under the library folder of SD card and also in our website above.

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5.3 SOFTWARE DEVELOPMENT CONTROL

Customer has the complete liberty to change the software provided along with the kit. File used for Arduino kit has been provided along with the SD card. If this soft code is lost please consult Densitron support team or your account manager.

5.3.1 BRIGHTNESS

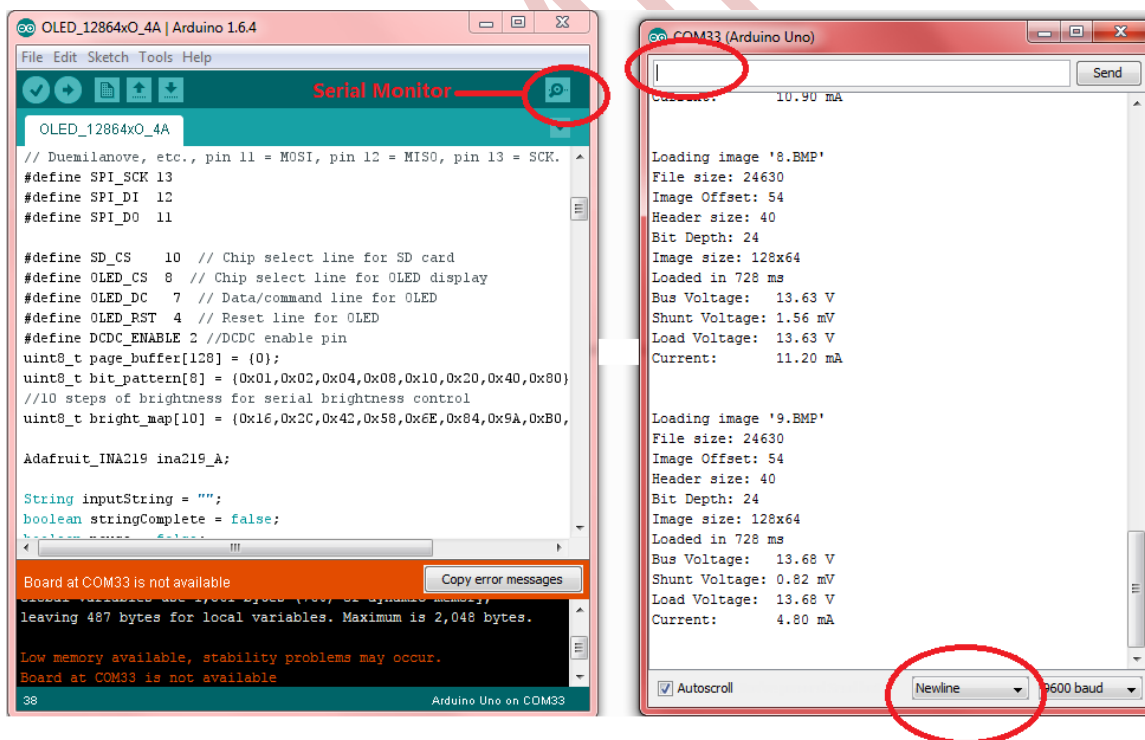
Brightness can be adjusted as follows by connecting the display with the Arduino Latest IDE. This will be found in Arduino download website. We have added a version of the IDE to the SD card attached.

You need to open the software provided in the sd card with extension `***.ino` file after the IDE is installed.

Click serial Monitor on the top right hand corner. You will see the window as shown on the below picture on the right.

Change to newline from the drop down menu.

On the typing area you can change from 0 to 9 to vary the brightness from fully off to full brightness.

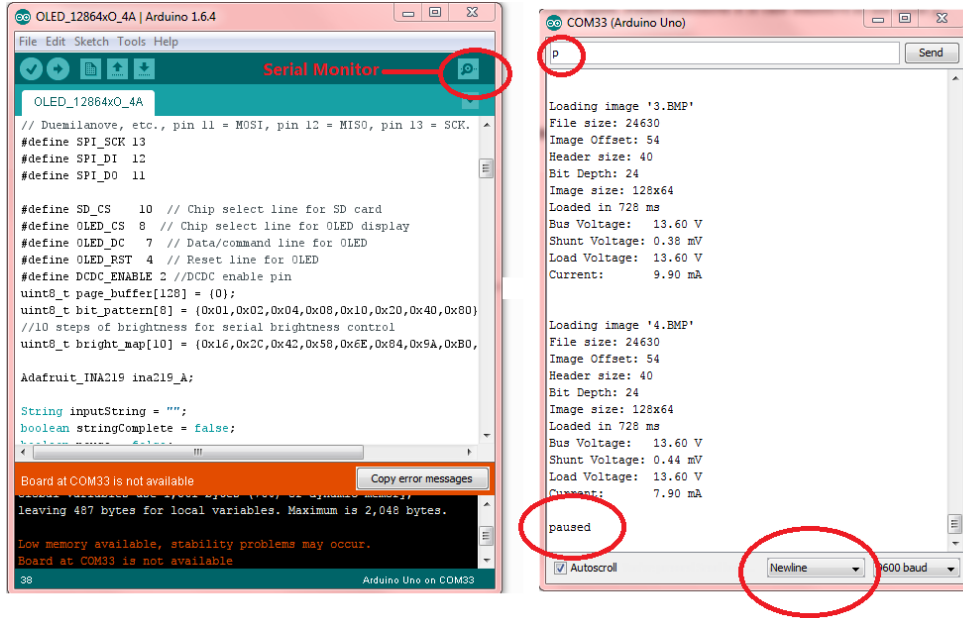


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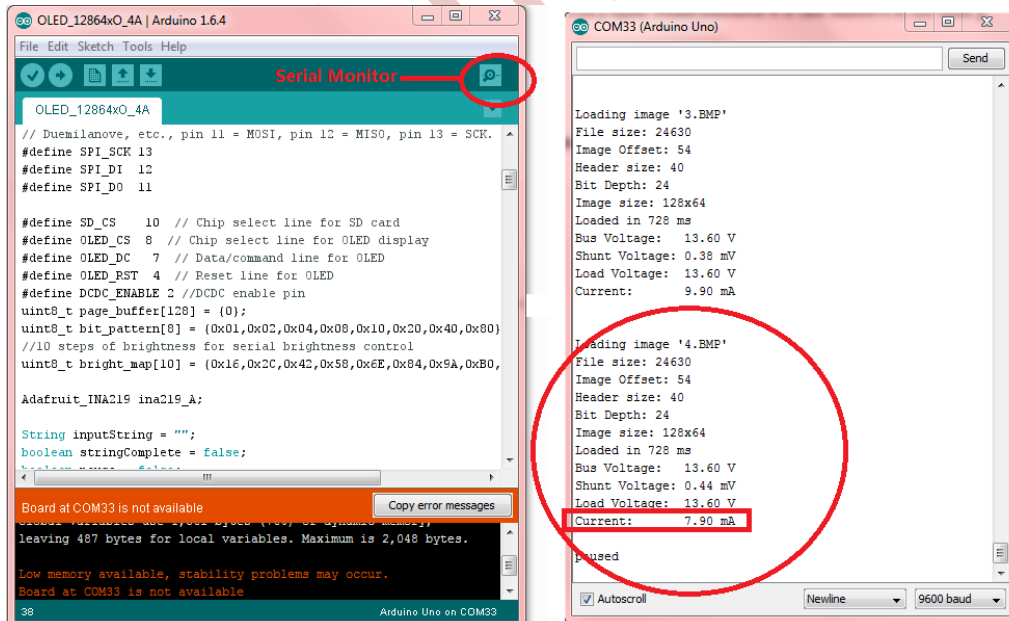
5.3.2 PAUSE FEATURE

Use the same method as section brightness section and instead of number you need to use **p** for Pause and unpause with **p** again. Please remember it is case sensitive so use small **p**.



5.3.3 CURRENT MEASUREMENT

Follow brightness section and open serial monitor. You will find the



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5.3.4 PICTURE MANAGEMENT

As per our code recently added pictures under Images of the SD card root directory will be displayed first and follows the sequence by the dates the files have been added. See link below to loading below.

<https://learn.adafruit.com/adafruit-micro-sd-breakout-board-card-tutorial/library>

5.3.5 ADD PICTURE TO THE SLIDE SHOW:

Add the correct resolution picture to the location specified in the soft code. As default we have specified to root directory of the SD card root images, see below picture. This can be modified on the software to change to a different location on the SD card.

```
images = SD.open("/images/12864/");
```

SD card root/images/xxxxxx/*.BMP

12864 are based on the resolution of the display attached to the kit.

5.3.6 CHANGE OR REMOVE PICTURE FROM THE LIST

A picture can be changed or removed by deleting the picture from the specified location on the SD card.

5.3.7 START/STOP SLIDE SHOW

Tom to provide details

5.3.8 PICTURE SLIDE

Default scroll mode is implemented so all the picture on the specified SD card will be shown. See below code, this can be modified to customers convenience. You can use PC to make a pause read section **PAUSE FEATURE**

5.4 TB card layout

Mainly used when trying to use the TB card as connector board in internal DC/DC on or off. Check with Densitron technical team for TB/card schematic.

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5.5 AVAILABLE TRANSITION CARDS FOR DIFFERENT DISPLAY

Currently three different Transition cards are available for this system. These cards support the following displays:

5.5.1 PM OLED

Display	Display Kits	Transition board	Colour
			Full Colour
			Full Colour
			Full Colour
			Yellow
			Yellow
			Full Colour
			Yellow
			Blue
			Full Colour
			Blue
			White
			Yellow
			Yellow
			Yellow
			Yellow
			Green
			White
			Green
			Blue
			Blue
			White
			Blue
			White
			2 colour
			White/yellow
			White/yellow
			Green/white
			White
			White

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