# Elegoo 2.8 inches Touch Screen User Manual

## ---Arduino version

# Preface

2.8 inches Touch Screen User Manual (Arduino version) is for Arduino UNO board and Mega 2560 board or boards compatible with UNO. Other core boards that provide 3-5V voltage and should be connected with wires when using are not discussed in this manual.

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# 1.Product introduction

## 1.1. Features

( 1 ) Compatible with Arduino UNO and Mega2560, and can be connected directly by inserting the pin into the interface without wire.

( 2) Compatible with all kinds of 5V or 3V MCU with 5V-3.3V change-over circuit.

( 3 ) 320X240 HD resolution, can be used as a touch screen.

( 4 ) Adopting 8-bit parallel bus, quicker and smoother refresh than SPI.

( 5 ) Offer support with Arduino libraries, simplify program development.

( 6 ) With Micro-SD card circuit, easy to expand the scope of the test.

## 1.2. Module Specifications

### 1.2.1. Basic Specifications

| Item | Description |
|---|---|
| Display Type | 2.8 inch a-si TFT LCD Module |
| Glass Type | TFT |
| Display Resolution | 240XRGBX320 Pixels |
| Back light | 4 chip HighLight white LEDs |
| Control IC | ILI9341 |
| Interface | 8 Bit parallel interface |
| PCB Module size | 78.22mmX52.7mm |
| LCD Area(WxHxT) | 50mmX69.2mmX2.5mm |
| Active Area(WxH) | 43.2mmX57.6mm |
| Module weight | TDB |

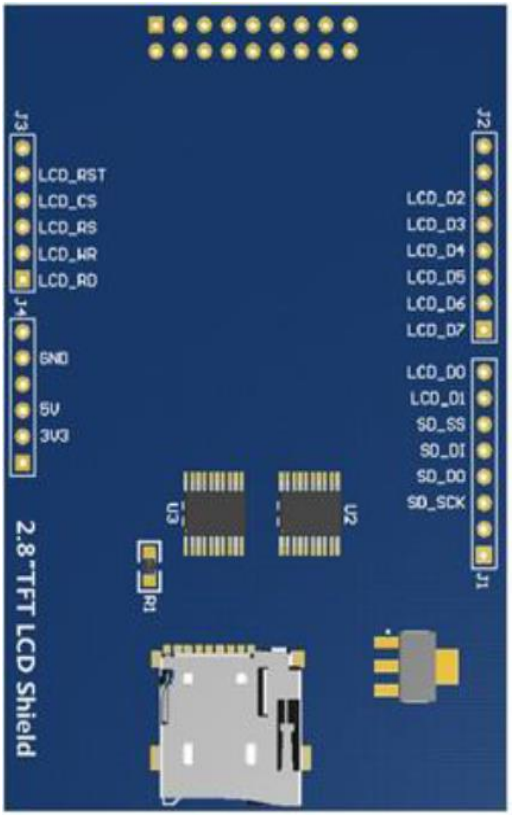
Table 1. Basic Specifications

## 1.2.2. Electronic Specifications

| Specification | | Min | Type | Max | Unit |
|---|---|---|---|---|---|
| Power Voltage(VDD/VCC) | | 3.3 | 5 | 5.5 | VDC |
| IO Pins Voltage | MCU Voltage = 3.3V | 3 | 3.3 | 3.6 | V |
| | MCU Voltage = 5V | 4.5 | 5 | 5.5 | |
| BackLight Voltage | | 2.8 | 3.2 | 3.3 | V |
| Current Consumption | | - | 120 | - | mA |

Table 2. Electronic Specifications

## 1.3. Interface Definition




| LCD Pins | instruction |
|---|---|
| LCD_RST | Reset Signal |
| LCD_CS | Chip Sellect |
| LCD_RS | Command/Data Sellect |
| LCD_WR | Write Signal |
| LCD_RD | Read Signal |
| GND | Power GND |
| 5V | Power VCC |
| 3V3 | No Connected |
| LCD_D0 | LCD Data Bit0 |
| LCD_D1 | LCD Data Bit1 |
| LCD_D2 | LCD Data Bit2 |
| LCD_D3 | LCD Data Bit3 |
| LCD_D4 | LCD Data Bit4 |
| LCD_D5 | LCD Data Bit5 |
| LCD_D6 | LCD Data Bit6 |
| LCD_D7 | LCD Data Bit7 |
| SD_SS | SD-card Chip Sellect Signal |
| SD_DI | SD-card SPI Bus MOSI Signal |
| SD_DO | SD-card SPI Bus MISO Signal |
| SD_SCK | SD-card SPI Bus SCLK Signal |

Figure 1. Interface Definition

## 1.3.1. Size Specifications

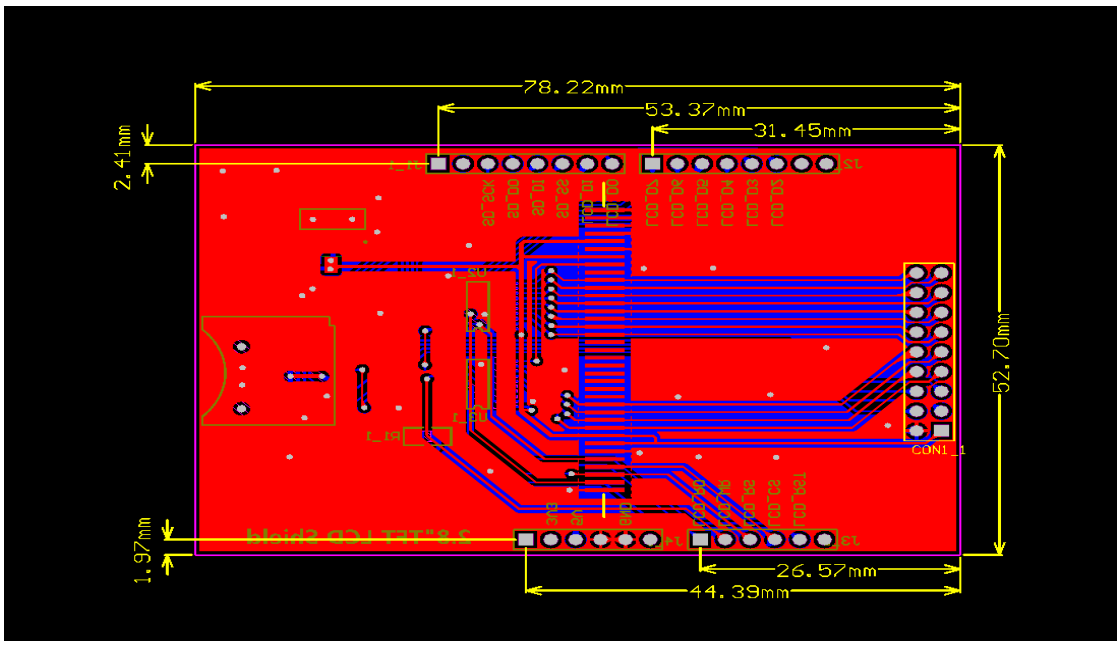



Figure 2. Size Specifications

## 1.3.2. Pins Correspondence

| LCD Pins | Arduino UNO&2560 Pins | instruction |
|---|---|---|
| LCD_RST | A4 | Reset Signal |
| LCD_CS | A3 | Chip Sellect |
| LCD_RS | A2 | Command/Data Sellect |
| LCD_WR | A1 | Write Signal |
| LCD_RD | A0 | Read Signal |
| GND | GND | Power GND |
| 5V | 5V | Power VCC |
| 3V3 | 3.3V/NC | No Connected |
| LCD_D0 | 8 | LCD Data Bit0 |
| LCD_D1 | 9 | LCD Data Bit1 |
| LCD_D2 | 2 | LCD Data Bit2 |
| LCD_D3 | 3 | LCD Data Bit3 |
| LCD_D4 | 4 | LCD Data Bit4 |
| LCD_D5 | 5 | LCD Data Bit5 |
| LCD_D6 | 6 | LCD Data Bit6 |
| LCD_D7 | 7 | LCD Data Bit7 |
| SD_SS | 10 | SD-card Chip Sellect signal |
| SD_DI | 11 | SD-card SPI Bus MOSI Signal |
| SD_DO | 12 | SD-card SPI Bus MISO Signal |
| SD_SCK | 13 | SD-card SPI Bus SCLK Signal |

Table 3. Pins Correspondence between LCD and Arduino

### 1.3.3. CON1 interface

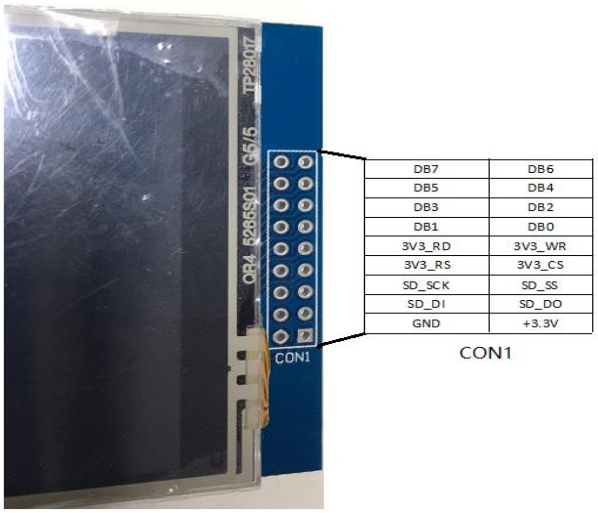



Figure 3. CON1interface

Note: Only SD_DO, SD_DI, SD_SS, SD_SCK and Arduino are on, and the rest are independent of Arduino's IO.

# 2. Preparation

## 2.1. Hardware Preparation

( 1 ) A PC or a laptop

( 2 ) A Arduino UNO board (Figure 3) or a Arduino MEGA2560 board (Figure 4).

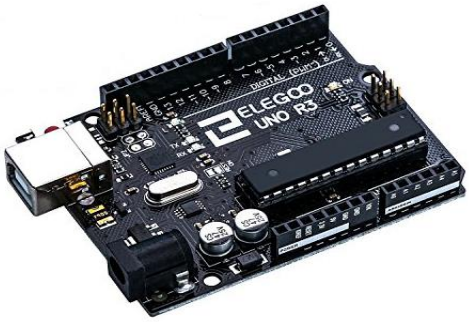



Figure 3. UNO

Figure 4. MEGA2560

( 3 ) A Mini USB Cable (Type B)

Figure 6.  Mini USB Cable (Type B)

( 4 ) A 2.8 inches Touch Screen.

Figure 7. 2.8 inches Touch Screen.

( 5 ) A micro SD card, any storage capacity is ok.

Figure 8. Micro SD card

## 2.2. Software Preparation

Download the Arduino IDE from the official site of Arduino. (www.arduino.cc). Install the IDE with default setting, you can select the installing path during the installation. Open the IDE like figure 9.

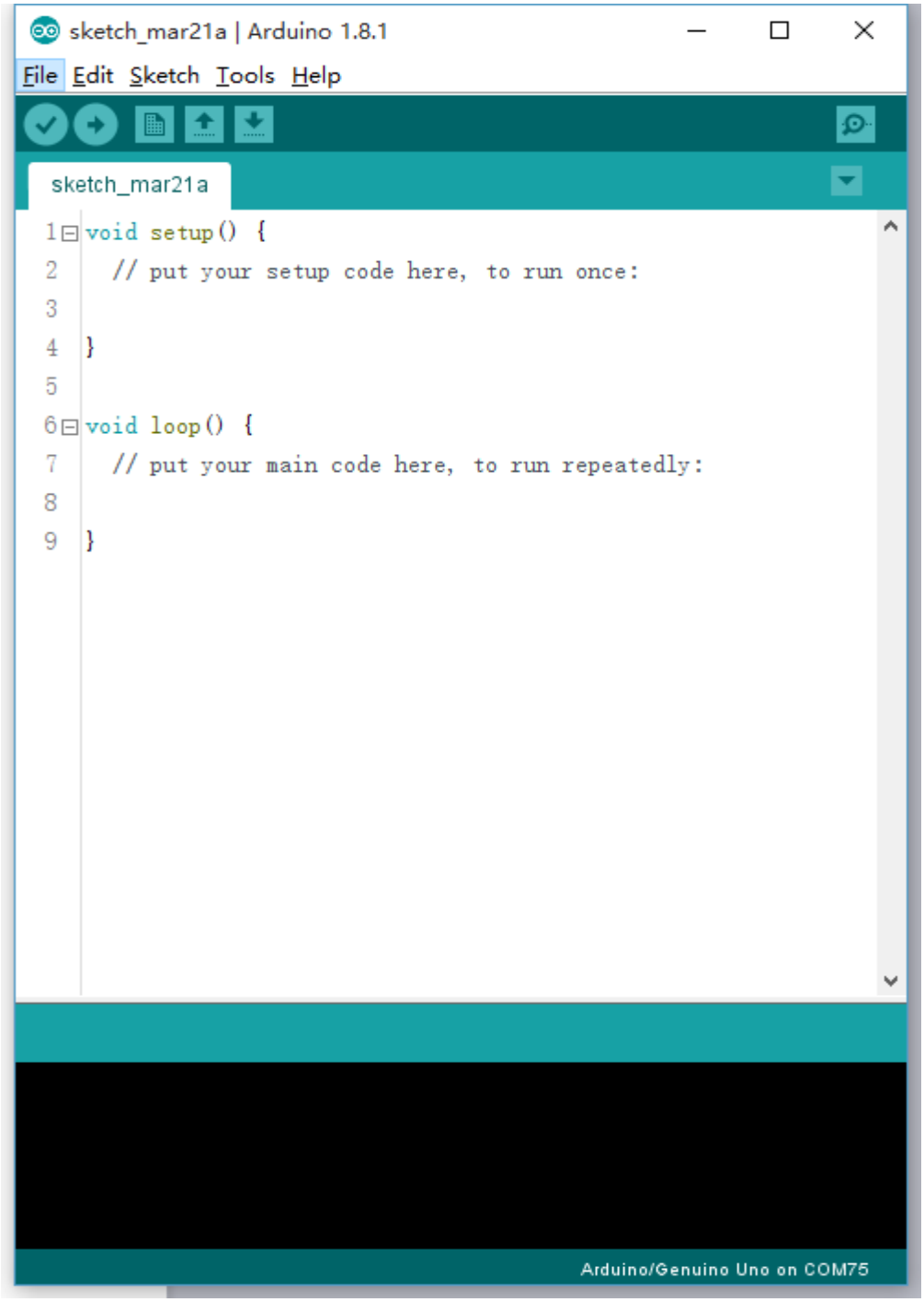



Figure 9. Arduino IDE

# 3. Instruction

## 3.1. Import Libraries.

Copy the libraries from "..\Arduino Demo_UNO&Mega2560\Install libraries" (figure 10) to the Arduino IDE installing path: "..\Arduino\libraries".

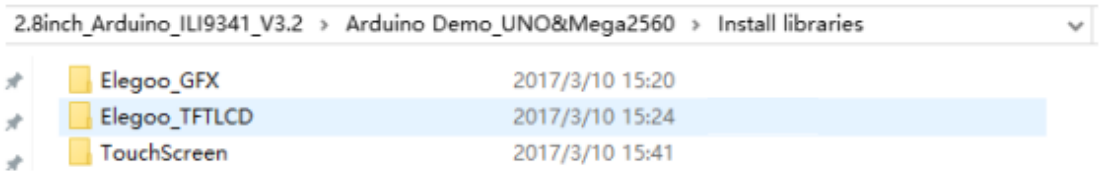



Figure 10

## 3.2. Working with UNO

Connect 2.8 inches touch screen with Arduino UNO board(see Figure 11) , then connect the UNO board with the PC or laptop with USB cable.

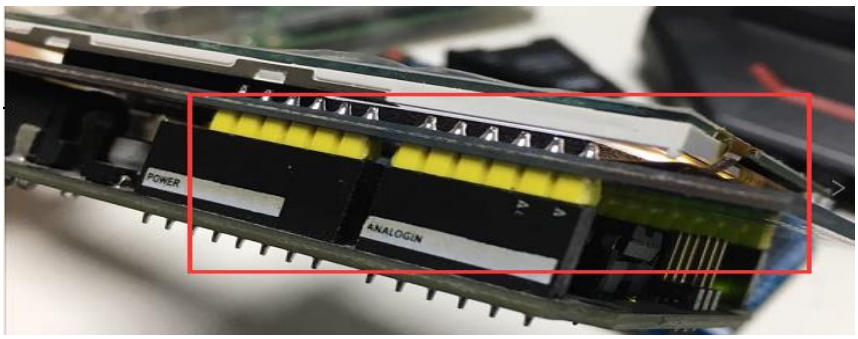



图 11

### 3.2.1. Example 1

（1）Open ..\2.8inch_Arduino_ILI9341_V3.2\Arduino Demo_UNO&Mega2560\Example01-Simple test\Simple test for

UNO_9341uno_9341uno.ino ;

( 2 ) Click “Tool” -- “Board” -- “Arduino/Genuino Uno” (See Figure 12)

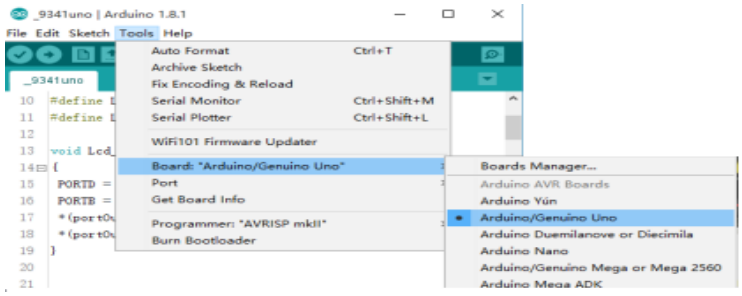



Figure 12

( 3 ) Click “Tool” -- “Port” -- “COMxx( Arduino/Genuino Uno )” (See Figure 13)

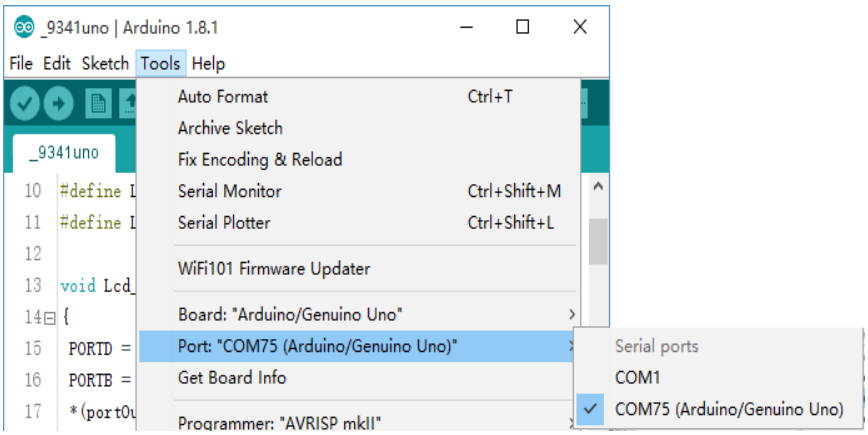



Figure 13

( 4 ) Click the “upload” button , and wait for the completion of the programming. (See Figure 14)

Figure 14

Example 1 is the most basic example program which can run without relying on any library. The result of example 1 is that the whole screen is filled with red, green, blue, white and black in turn and then filled randomly. If this example works fine, the hardware of 2.8 inches touch screen is fine.

### 3.2.2. Example 2

（1）Open ..\2.8inch_Arduino_ILI9341_V3.2\Arduino Demo_UNO&Mega2560\Example02-DisplayString\DisplayString\DisplayString.ino ；

（2）-（4）Same as 3.2.1, In Figure 15 is the result of example 2.

Figure 15

This example display the simplest alphabetic string and numbers, realizing Vector font scaling which allows you to display any English letter of any font size.

## 3.2.3. Example 3

( 1 ) Open ..\2.8inch_Arduino_ILI9341_V3.2\Arduino Demo_UNO&Mega2560\Example03-graphicstest\graphicstest\graphicstest.ino

( 2 ) - ( 4 ) Same as 3.2.1, In Figure 16 is the result.

Figure 16

This example demonstrate various GUI Figure Function and realize screen rotation.

## 3.2.4. Example 4

（1）Open ..\2.8inch_Arduino_ILI9341_V3.2\Arduino Demo_UNO&Mega2560\Example04-Touch\tftpaint\tftpaint.ino；

（2）-（4）Same as 3.2.1, In Figure 17 is the result.

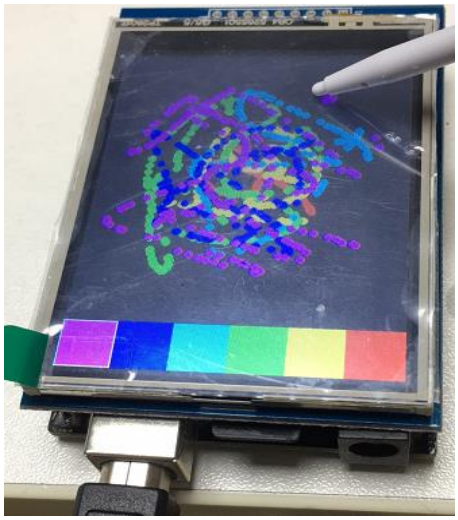


Figure 17

This example output a touch scren drawing board.

## 3.2.5. Example 5

（1）Open ..\2.8inch_Arduino_ILI9341_V3.2\Arduino Demo_UNO&Mega2560\Example05-ShowBMP\ShowBMP\ShowBMP.ino；

（2）Take out the SD card and put it in to a card reader, connect to the PC or laptop with a USB cable.(See Figure 18). Open “Computer”, right click to format the driver of SD card and the copy the picture

from ..\2.8inch_Arduino_ILI9341_V3.2\Arduino Demo_UNO&Mega2560\Example05-ShowBMP\PIC to the root directory of the SD card.

Figure 18

（3）-（5）Same as （2）-（4）in 3.2.1, In Figure 19 is the result.

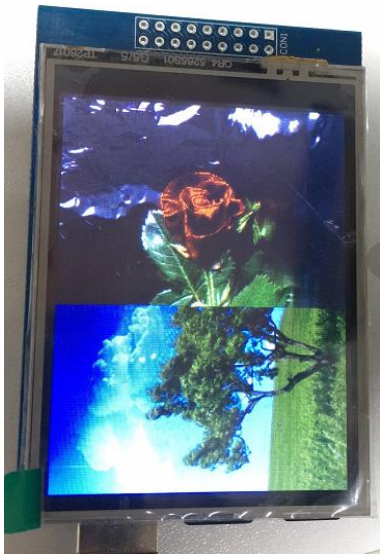


Figure 19

This example shows a program of digital photo frame, realizing the function of decoding and displaying BMP photo from the SD card.

## 3.2.6. Example 6

（1）Open ..\2.8inch_Arduino_ILI9341_V3.2\Arduino Demo_UNO&Mega2560\Example06-Phonecal\phonecal\phonecal.ino；

（2）-（4）Same as 3.2.1, In Figure 20 is the result in the 2.8 inches touch screen. In Figure 21 is the result in the computer.

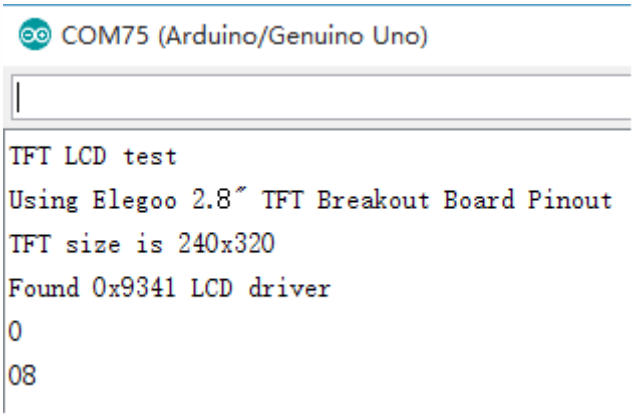



Figure 20 Figure 21

This example realize the function of a number pad, showing the character clicked by the touch pen.

## 3.2.7. Example 7

There are 6 test example in ..\2.8inch_Arduino_ILI9341_V3.2\Arduino Demo_UNO&Mega2560\SDCard Exten Example. Please try these example by referring to the steps in 3.2.1.

## 3.3. Working with MEGA2560

Connect 2.8 inches touch screen with Arduino MEGA2560 board(see Figure 22) , then connect the MEGA2560 board with the PC or laptop with USB cable.

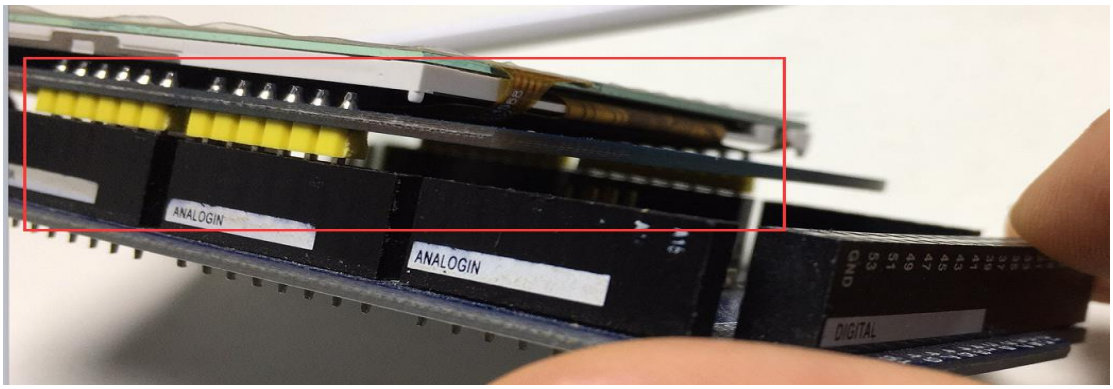



Figure 22

Figure 23

### 3.3.1. Example 1

( 1 ) Open ..\2.8inch_Arduino_ILI9341_V3.2\Arduino Demo_UNO&Mega2560\Example01-Simple test\Simple test for Mega2560_9341Mega2560_9341Mega2560.ino ;

( 2 ) Click "Tool" -- "Board" -- "Arduino/Genuino Mega or Mega 2560" (See Figure 24)

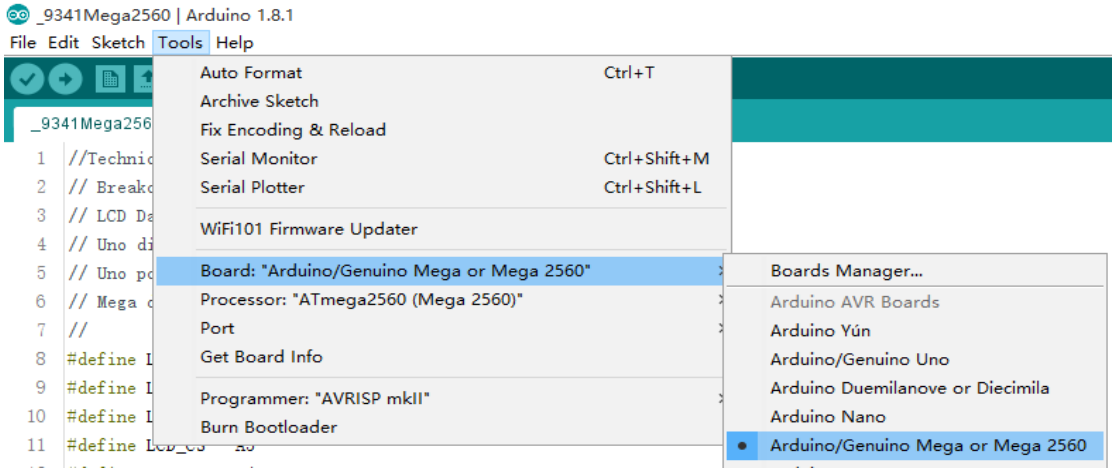



Figure 24

( 5 ) Click "Tools" -- "Processor" -- "ATMega2560( Mega2560 )" (See Figure 25)

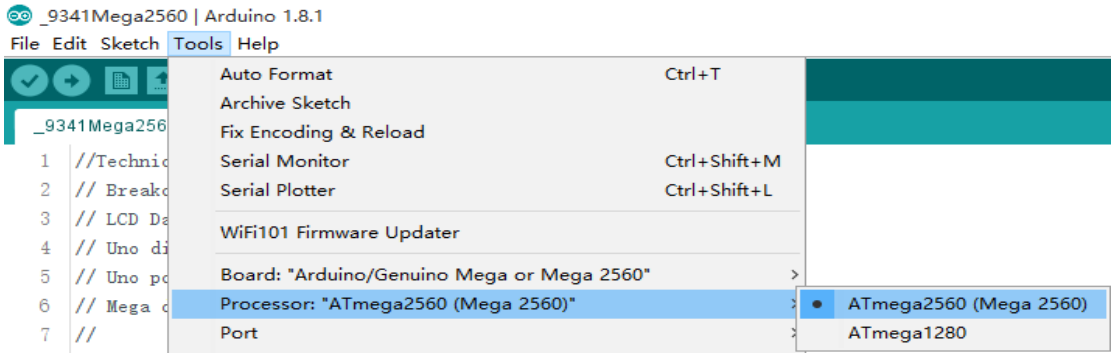



Figure 25

( 4 ) Click "Tools" -- "Port" -- "COMxx ( Arduino/Genuino Mega 2560 ) " (See

Figure 26)

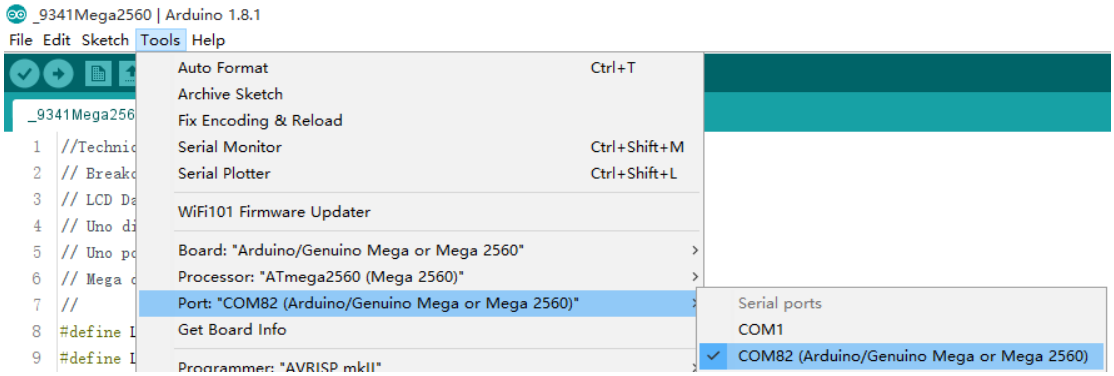



Figure 26

( 5 ) Click the "upload" button , and wait for the completion of the programming. (See Figure 27)

Figure 27

This is the most basic example program which can run without relying on any library. The result of example 1 is that the whole screen is filled with red, green, blue, white and black in turn and then filled randomly. If this example works fine, the hardware of 2.8 inches touch screen is fine.

### 3.3.2. Other Example

Please try other example by referring to the steps in 3.3.1. Example05-ShowBMP and SDCard Exten Example can not work on MEGA2560, because SPI IO of MEGA2560 is different from that of UNO. So example need to read the SD card can not work on MEGA 2560.

The result of the examples are the same as that on UNO.