

# **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 Seselect
LCD_RS		Command/Data Seselect
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 Seselect 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

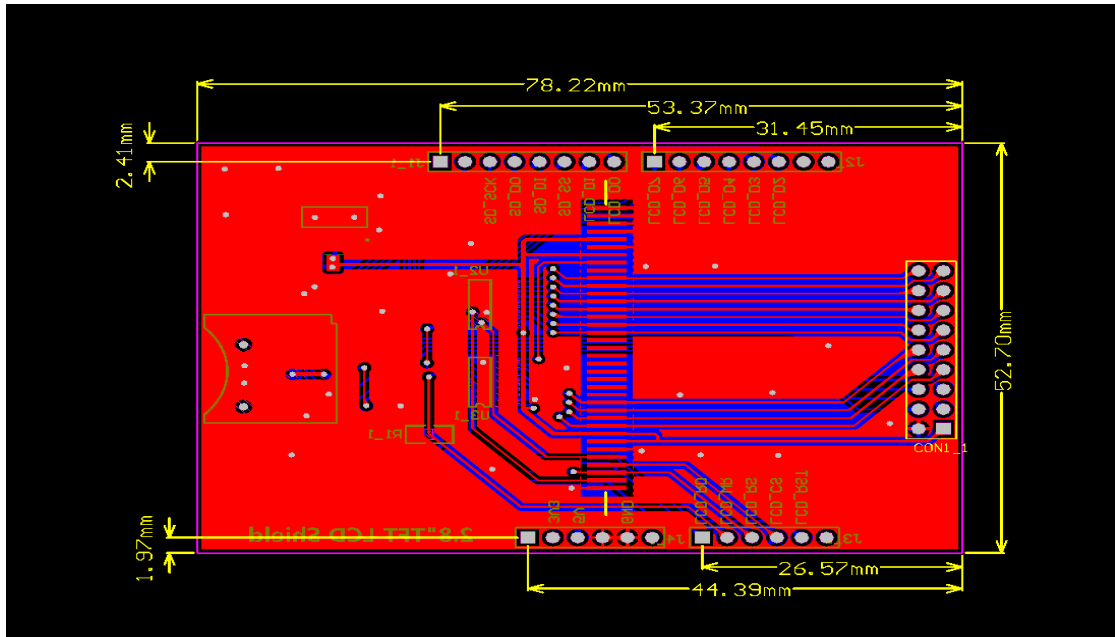


Figure 2. Size Specifications

### 1.3.2. Pins Correspondence

LCD Pins	Arduino UNO&2560 Pins	instruction
LCD_RST	A4	Reset Signal
LCD_CS	A3	Chip Seselect
LCD_RS	A2	Command/Data Seselect
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 Seselect 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

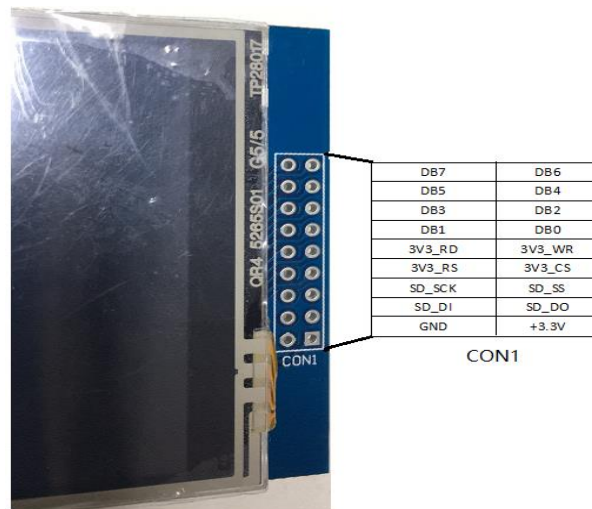


Figure 3. CON1interface

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).

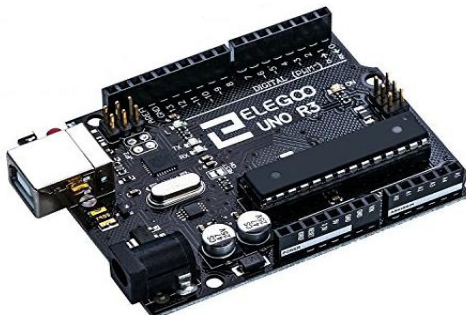


Figure 3. UNO



Figure 4. MEGA2560

- ( 3 ) A Mini USB Cable (Type B)





## 2.2. Software Preparation

Download the Arduino IDE from the official site of Arduino.( [www.arduino.cc](http://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” .

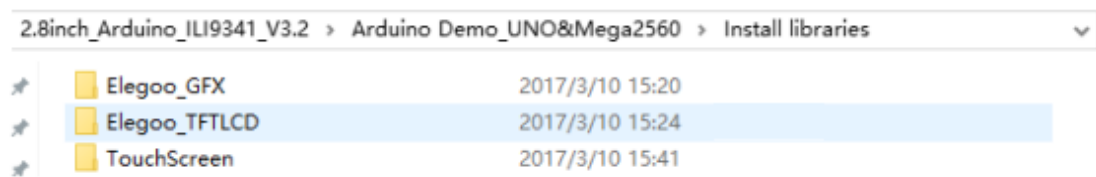


Figure 10

### 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.

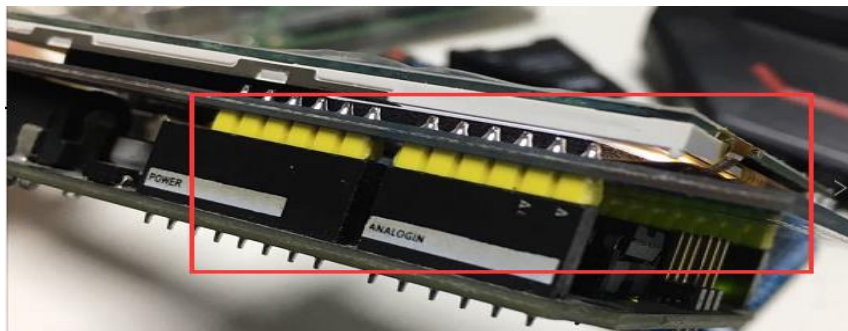


图 11

#### 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)

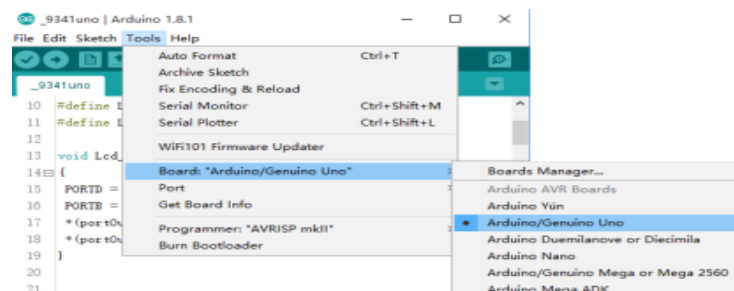


Figure 12

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

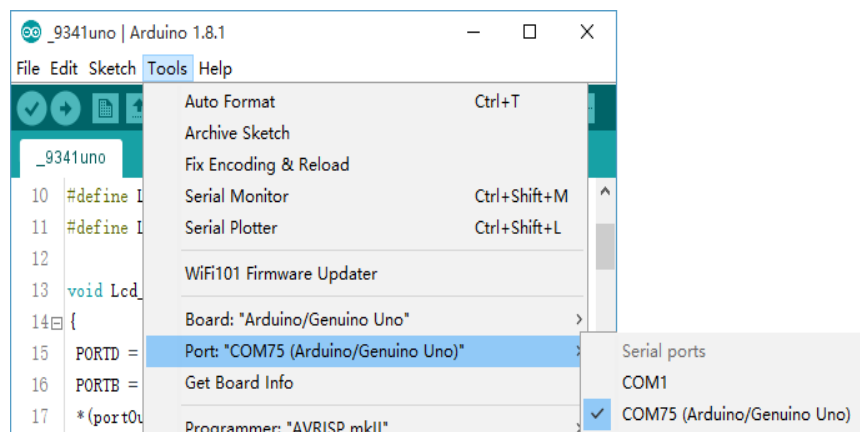


Figure 13


( 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.

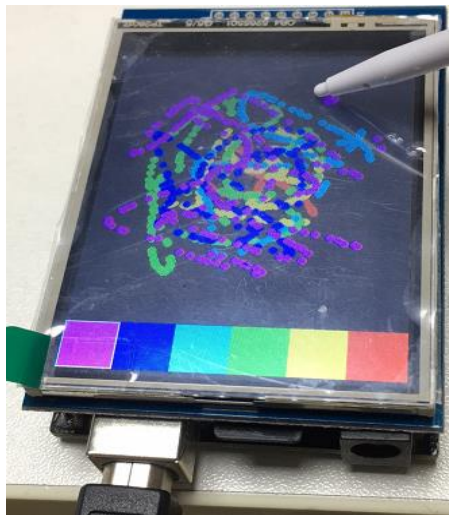


Figure 17

This example output a touch screen 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

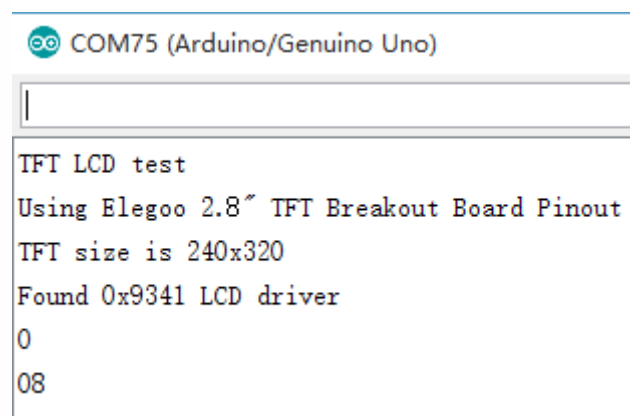


Figure 21

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.

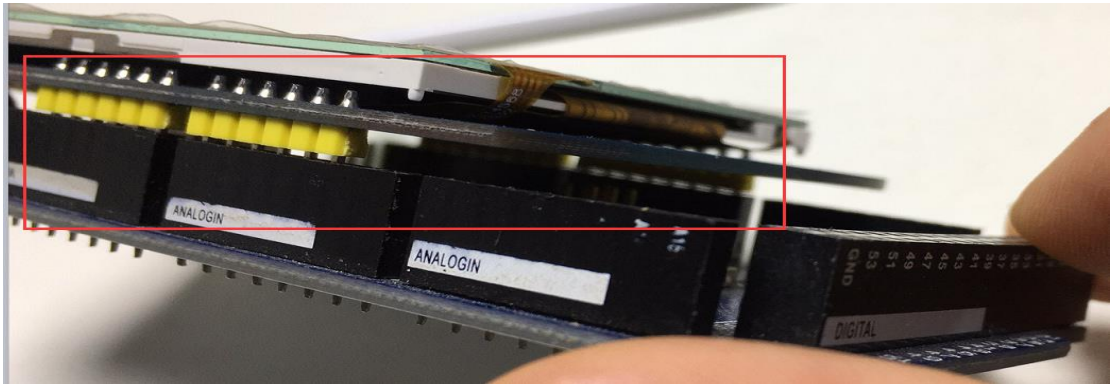


Figure 22



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)

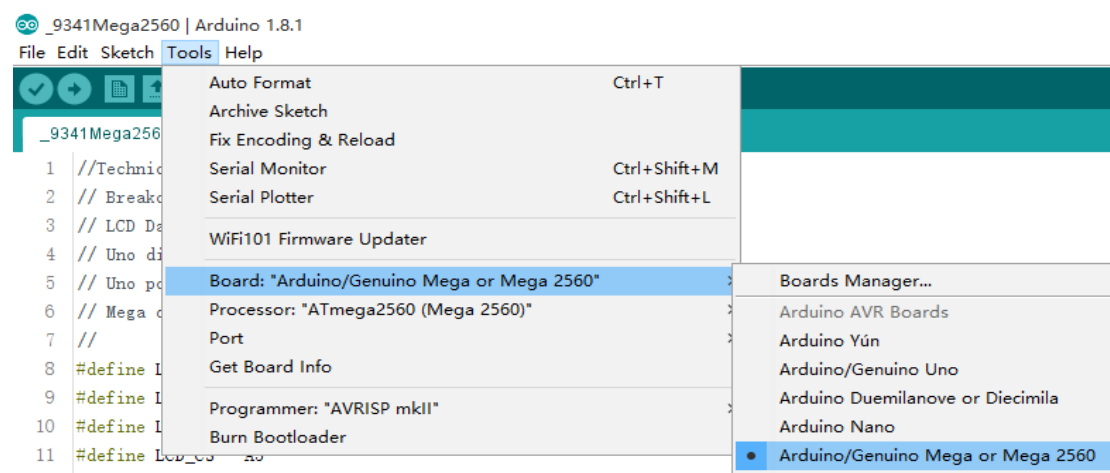


Figure 24

( 5 ) Click "Tools" -- "Processor" -- "ATmega2560 (Mega2560)" (See Figure 25)

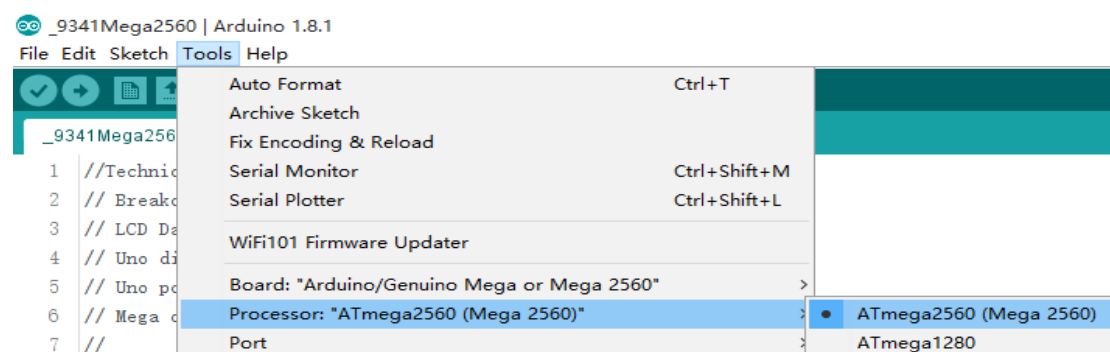


Figure 25

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

Figure 26)

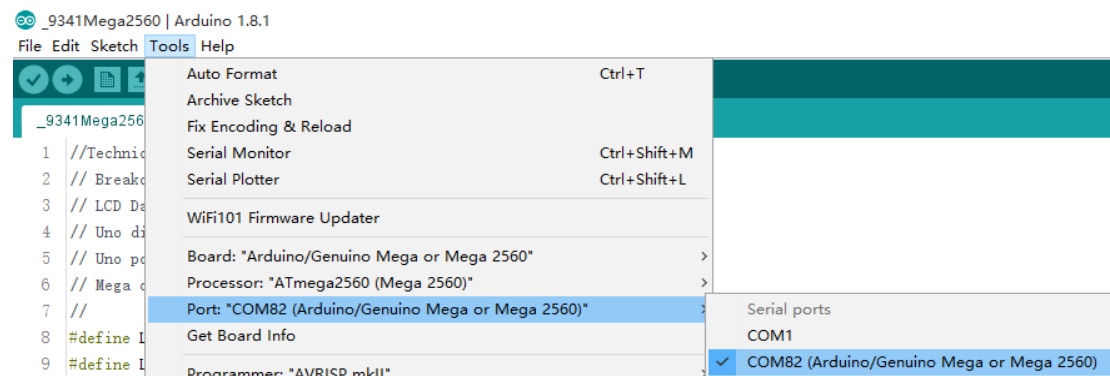


Figure 26


( 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.