# 1. Introduction to Testing Platform

Development board: Arduino UNO/MEGA2560

MCU: AVR\_ATmega328P/AVR\_ATmega2560

Frequency: 16MHz/16MHz

# 2. Pin connection instructions

The display module is connected to the microcontroller using a DuPont cable, with

specific instructions as follows:



Picture1. Module front pin diagram

Ard	Arduino UNO microcontroller test program wiring instructions						
Number	Module Pin	Corresponding to UNO development board wiring pin	Remarks				
1	GND	GND	LCD Power ground				
2	VCC	5V/3.3V	LCD power positive(It is recommended to connect to 5V. When connected to 3.3V, the backlight brightness will be slightly dim)				
3	SCL	13	LCD SPI bus clock signal				
4	SDA	11	LCD SPI bus write data signal				
5	RES	A4	LCD reset control signal, Low level reset				
6	DC	A3	LCD command / data selection control signal				
7	CS	A2	LCD selection control signal, Low level active				
8	BLK	AO	LCD backlight control signal (If you need control, please connect the pins. If you don't need control, you can skip it)				

	Arduino MEGA2560 microcontroller test program wiring instructions									
Numb	oer	Module Pin	Corresponding to MEGA2560 development board wiring pin	Remarks						
1		GND	GND	LCD Power ground						
2		VCC	5V/3.3V	LCD power positive(It is recommended to connect to 5V. When connected to 3.3V, the backlight brightness will be slightly dim)						
3		SCL	52	LCD SPI bus clock signal						
4		SDA	51	LCD SPI bus write data signal						

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5	RES	A4	LCD reset control signal, Low level reset
6	DC	A3	LCD command / data selection control signal High level: data, low level:
7	CS	A2	LCD selection control signal, Low level active
8	BLK	AO	LCD backlight control signal (If you need control, please connect the pins. If you don't need control, you can skip it)

# 3. Demo Function Description

This testing program program includes two MCU programs, Arduino UNO and Mega2560. Each MCU program includes software spi and hardware spi function programs, which are located in **Demo\_Arduino** directory, as shown in the following figure:



### Description of sample program content

- A. Example\_01\_Simple\_Test is a screen swiping test that does not rely on the library;
- B. Example\_02\_clear\_Screen is a simple screen brushing test that cycles the

screen in the order of black, white, red, green, and blue colors;

- C. Example\_03\_ colligate\_ Test is a comprehensive test that displays graphics, lines, and counts program runtime;
- D. Example\_04\_ display\_ Graphics is a graphical display test that displays various graphics;
- E. Example\_05\_ display\_ Scroll is a scrolling test that displays text scrolling;
- F. Example\_ 06\_ display\_ String is a text display test that displays different sizes of Chinese and English;
- G. Example\_07\_display\_clock tests for simulate testing for a circular clock dial, displaying clock operation;

## 4. Demo Usage Instructions

#### ♦ Installing development tool software

Download the installation package from the Arduino official website.

Download address: https://www.arduino.cc/en/software

Download the corresponding installation package according to your PC system,

as shown in the following figure (the version in the picture may not be the latest version, and the download interface may not be the latest):



After the download is completed, unzip and click Install.

### ♦ Installing software library

After the development environment is set up, the software library used by the

sample program needs to be copied to the project library directory so that the sample program can be called. The software library is located in the **Demo\_Arduino\Install libraries** directory, as shown in the following figure:

🕞 🕞 🗢 📙 « Demo_Arduino 🕨 Install libraries )	► <b>↓</b> 損	题案 Install librarie	es 👂
文件(F) 编辑(E) 查看(V) 工具(T) 帮助(H)			
组织▼ 包含到库中▼ 共享▼ 新建文件夹		-	0
▲ 名称 ^	修改日期	类型	大/
LCDWIKI_GUI	2023/9/12 10	:09 文件夹	
LCDWIKI_SPI	2023/9/12 10	:09 文件夹	
			•

Among them:

LCDWIKI\_GUI is a graphical library for the application layer;

LCDWIKI\_ SPI is the SPI driver for the underlying display screen;

LCDWIKI\_ TOUCH is a touch screen driver;

The default path for the engineering library directory is C: Users\Administrator

\Documents\Arduino\libraries. You can also change the project library directory:

open the Arduino IDE software, click File ->Preferences, and reset the Sketchbook

**location** in the pop-up interface, as shown in the following figure:

💿 clear_Screen   Arduino 1.8.19	Preferences
<u>File</u> Edit <u>Sketch</u> <u>T</u> ools <u>H</u> elp	Settings Network
New Ctrl+N Open Ctrl+O Open Recent	Sketchbook location:     Erowse       C:\Users\Administrator\Documents\Arduino     Erowse       Editor language:     English (English)
Examples TH Close Ctrl+W Save Ctrl+S Save As Ctrl+Shift+P Page Setup Ctrl+Shift+P Print Ctrl+P	Editor font size: 16 Interface scale: Automatic 100 + (requires restart of Arduino) Theme: Default theme - (requires restart of Arduino) Show verbose output during: Compilation Vupload Compiler varnings: None -
Preferences Ctrl+Comma Quit Ctrl+Q	Display line numbers       Enable Code Folding         V Verify code after upload       Use external editor         Check for updates on startup       V Save when verifying or uploading
//Arduino Mega2560 10 9	Use accessibility features Additional Boards Manager URLs: s://espressif.github.io/arduino-esp32/package_esp32_index.json Wore preferences can be edited directly in the file C:\Users\Administrator\AppData\Local\Arduino15\preferences.txt (edit only when Arduino is not running)

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Copy the software library to the project library directory, as shown in the following figure:

00-	<mark>▶ 《 文档</mark> ▶ Arduino ▶ libraries ▶	▼ 🍫 搜索 lit	braries	Q
文件(F) 维	扁辑(E) 查看(V) 工具(T) 帮助(H)			
组织▼	共享▼新建文件夹		•	0
	文档库 libraries		排列方式:	文件夹 ▼
	名称	修改日期	类型	*
	📙 ILI9341_T4-main	2022/11/23 11:25	文件夹	
	📙 LCDWIKI_ESP32_SPI	2023/3/7 17:59	文件夹	E
A	👃 LCDWIKI_GUI	2023/9/12 9:48	文件夹	
3	🐌 LCDWIKI_SPI	2023/9/12 9:48	文件夹	
4 -	< III			•
	41 个对象			

### ♦ Compile and Run Programs

A. Connect the display module to the UNO or Mega2560 development board, and

then power up the development board.

B. Open any example (using clear\_screen as an example), as shown in the following figure:

C V C Momo_Arduino > Demo_MSP0964_U	JNO_Hardware_SPI	• Example_02_clear_	screen 🕨 clear_Screen
文件(F) 编辑(E) 查看(V) 工具(T) 帮助(H)			
组织▼ 包含到库中▼ 共享▼ 新建文件夹			
▲ 名称	修改日期	类型	大小
😂 🔤 clear_Screen.ino	2023/9/12 10:55	Arduino file	3 KB

C. After opening the sample project, select the UNO or Mega2560 device, as shown in the following figure:

#### Select UNO:

💿 clear_Screen   Ard	luino 1.8.19		
File Edit Sketch To	ols Help		「」 编辑 保
Clear_Screen	Auto Format Archive Sketch Fix Encoding & Reload	Ctrl+T	
// IMPORTANT // CONFIGURE	Manage Libraries Serial Monitor Serial Plotter	Ctrl+Shift+I Ctrl+Shift+M Ctrl+Shift+L	BOARD.
//when using //the SDA pi	Teensy 4 Security WiFi101 / WiFiNINA Firmware Updater		rdware spi lines to the LCD,
//if you don	Board: "Arduino Uno"	1	Boards Manager he pin c
//other pins //pin usage	Port Get Board Info	,	Arduino AVR Boards     Arduino Yún       ESP32 Arduino     Image: Comparison of the second s
// //Arduino Un //Arduino Me	Programmer Burn Bootloader	j	Teensyduino     Arduino Duemilanove or Diecimila       12     5     57/3.3       50     5     57/3.3       Arduino Mega or Mega 2560
//Remember to	set the pins to suit your disp	play module	Arduino Mega ADK

#### Select Mega2560:

💿 clear_Screen   Ard	luino 1.8.19				v v	↓ 选择 ▼	百度网
File Edit Sketch To	ols Help				F2	编辑	保存
Clear_Screen	Auto Format Archive Sketch Fix Encoding & Beload	Ctrl+T		<u>ي</u>			
// IMPORTANT // CONFIGURE	Manage Libraries Serial Monitor	Ctrl+Shift+I Ctrl+Shift+M	BOARD.	<b>^</b>	Ľ		
//This progr	Teensy 4 Security WiFi101 / WiFiNINA Firmware Updater	Cur+shirt+L	lack, white, red, green dware spi lines to t	h,blue.			
//if you don	Board: "Arduino Mega or Mega 2560"		Boards Manager	e pin c			
//other pins //pin usage //	Processor: "ATmega2560 (Mega 2560)" Port Get Board Info		Arduino AVR Boards ESP32 Arduino Teensyduino	Arduino Y Arduino U Arduino E	′ún Jno Juemilanov	e or Dieci	mila
//Arduino Un //Arduino Me	Programmer Burn Bootloader		50 5 5V/3.3V	Arduino M Arduino M	Nano Mega or Me	ega 2560	
//Remember to /*********	set the pins to suit your disp **********	lay module!	de ske ske ske ske ske ske ske ske ske sk	Arduino L	eonardo		

## D. Set the port. If you choose Mega2560, you also need to set the processor based

on the development board used, as shown in the following figure:

💿 clear_Screen   Ardı	uino 1.8.19					
File Edit Sketch Too	ols Help					
	Auto Format	Ctrl+T				Ø.
	Archive Sketch					-
clear_Screen	Fix Encoding & Reload					
// IMPORTANT	Manage Libraries	Ctrl+Shift+I	L			
// CONFIGURE	Serial Monitor	Ctrl+Shift+M	BOARD.			
//This progr	Serial Plotter	Ctrl+Shift+L	lack,w	hite,	red, green,	,blue.
	Teensy 4 Security					
//when using	WiFi101 / WiFiNINA Firmware Updater		dware	spi l	ines to th	he LCD,
//the SDA pi			an't b	e mod	lified.	
//if you don	Board: "Arduno Mega or Mega 2560"	•	t to 3	.3V a	nd set the	e pin c
//other pins	Processor: "ATmega2560 (Mega 2560)"		ATn	nega25	60 (Mega 25)	60)
//pin usage	Port: "COM49"	8	ATn	nega12	80	
11	Get Board Info		/MISO	LED	VCC	GND
//Arduino Un	D		12	5	5V/3.3V	GND
//Arduino Me	Programmer	,	50	5	5V/3.3V	GND
	Burn Bootloader					

E. Click the upload button to compile and download the program, as shown in the

following figure:

😊 clear_Screen   Arduino 1	.8.19								
<u>Eile Edit Sketch T</u> ools <u>H</u> elp									
clear_Screen									
// IMPORTANT: LCDWI	KI_S	PI LIBR	ARY MUS	T BE SPECI	FICAL	LY			
// CONFIGURED FOR E	ITHE	R THE T	FT SHIE	LD OR THE	BREAK	OUT BOARD.			
//This program is a	//This program is a demo of clearing screen to display black,white,red,green,blue.								blue.
//when using the BR	EAKO	UT BOAR	D only	and using	these	hardware	spi l	ines to th	ie LCD,
//the SDA pin and S	СК р	in is d	efined	by the sys	tem a	nd can't b	e mod	ified.	
//if you don't need	to	control	the LE	D pin,you	can s	et it to 3	.3V a	nd set the	e pin c
//other pins can be	def	ined by	yousel	f,for exam	ple				
//pin usage as foll	OW:								
11	CS	DC/RS	RESET	SDI/MOSI	SCK	SDO/MISO	LED	VCC	GND
//Arduino Uno	10	9	8	11	13	12	5	5V/3.3V	GND
//Arduino Mega2560	10	9	8	51	52	50	5	5V/3.3V	GND
//Remember to set t	he p	ins to	suit yo	ur display	modu	le!			
/*****	****	******	******	******	****	*****	****	*****	******
* @attention									
*									-

F. If the following prompt appears, it indicates that the program has been compiled

and downloaded successfully, and has already been run:

🙁 clear_Screen   Arduino 1.8.19				
<u>File Edit Sketch Tools H</u> elp				
			ø	
clear_Screen				
•	111		4	
Done uploading.				
Reading   ###################################	######################################	####################   1	00% 1.43s	*
avraude done. Thank you.				4
1			Arduino Uno on COM49	9

G. If the display module displays content, it indicates that the program has run successfully.