

SLC1602M Series LCD MODULE USER MANUAL

Please click the following image to buy the sample





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Reference Controller Datasheet

Character LCD Selection Guide

AiP31068L

Test Code



Overview

>> Features

- ♦ I2C interface, only two cables can be directly controlled, easy to access a variety of control boards
- Can display up to 16 x 2 characters, support screen scrolling, cursor movement, and other functions
- The appearance is exquisite and compact, and the workmanship is exquisite and beautiful. Highly integrated
- design, stable performance, fine workmanship, compact body with the dimensions of 87 * 32 * 13 mm.
- Onboard AiP31068L LCD driver chip
- Provide complete supporting information manuals (user manuals/sample demos)

>> Parameters

- Operating voltage: 3.3V/5.0V
- Communication interface: I2C
- Screen type: LCD screen
- Control chip: AiP31068L
- Slave address: 0X7C
- Display dimensions: 64.5 x 16.0 mm
- Product size: 87.0 x 32.0 x 13.0(mm)
- Operating current: 26mA(5V), 13mA (3.3V)

>> Interface Description

Pin	Description
VCC	3.3V/5V power input
GND	Ground
SCL	I2C clock cable
SDA	I2C data cable

>> Communication Protocol



Model No.: SLC1602M





www.surenoo.com





Working with Raspberry Pi

>> Hardware Setting

♦ Enable I2C Interface

Open the Raspberry Pi terminal, enter the following command to enter the configuration interface.

sudo raspi-con Select Interfa	fig cing Options	-> I2C ->ye	es to start	t the i2C	kernel dı	river
Raspberr 1 Change User Passwor 2 Network Options 3 Boot Options 4 Localisation Options 5 Overclock 7 Advanced Options 8 Update 9 About raspi-config	y P1 Software Config d Change password fo Configure network Configure options s Set up language an Configure overcloo Configure advanced Update this tool t Information about	paration Tool (rasp or the current user settings for start-up nd regional setting (ons to peripherals king for your Pi d settings to the latest versi this configuration	i-config)	location		
<selecto< td=""><td></td><td></td><td><finish></finish></td><th></th><th></th><th></th></selecto<>			<finish></finish>			
P2 SSH Enable P3 VNC Enable P4 SPI Enable P6 Serial Enable P7 1-Wire Enable P8 Remote GPIO Enable	/Disable remote comm /Disable graphical r /Disable automatic 1 /Disable shell and k /Disable one-wire in /Disable remote acce	and line access to emote access to yo oading of SPI kern dading of IZC kern ernel messages on terface iss to GPIO pins	<pre>your Pi using St ur Pi using Reall et module at module the serial connect <back></back></pre>	SH		
Would you	like the APM I2C int	terface to be enabl	ed?			
	-	410>				

And then reboot the Raspberry Pi.

sudo reboot



Hardware Connection

When connecting the Raspberry Pi, choose to connect with a 4PIN cable, please refer to the pin correspondence table below.

If you are using a pin header or PH2.0 4PIN interface, you need to connect according to the following table.

Raspberry Pi Pin Connection Correspondence									
	Raspb	erry Pi							
	BCM2835	Board Pin No.							
VCC	3.3V	3.3V							
GND	GND	GND							
SCL	SCL.1	5							
SDA	SDA.1	3							

Take the LCD1602 Module using the PH2.0 4PIN interface as an example, and connect it to the Raspberry Pi according to the above table:

(Please connect according to the pin definition table. The color of the cable in the picture is for reference only, and the actual color shall prevail.)





>> Example Demo

#Download sample demo

cd ~
wget https://www.surenoo.tech/download/SLC1602M_I2C_Code.zip
unzip LCD1602_I2C_Module_code.zip
cd ~/LCD1602_I2C_Module_code/Raspberry
sudo chmod 777 *
cd python/
<pre>sudo python test.py #Display two lines of characters on the LCD</pre>
<pre>sudo python time_test.py #Automatically obtains the local time and displays it on the LCD</pre>

Demo analysis (test.py)

lcd.setCursor(0, 0) #Set the cursor position
#Print the number of seconds since reset:
lcd.printout("Waveshare") #Write characters
lcd.setCursor(0, 1) #Set the cursor position to the zeroth column of the sec
ond row
lcd.printout("Hello, World!")#Write characters



Working with Pico

>> Hardware Connection

Pico Pin Connection Correspondence						
Module Interface	Pico Pin					
VCC	3.3V					
GND	GND					
SCL	GP5					
SDA	GP4					

The physical connection diagram is as follows:





>> Raspberry Pi

Use SSH to log in to the Raspberry Pi terminal or press Ctrl+Alt+T while using the screen to open the terminal.
 Download and decompress the demo to the Pico C/C++ SDK directory, and the users who have not installed SDK can refer to tutorial.

#Pay attention to your own directory, the default installation directory of the SDK
installation tutorial is \sim /pico/, if the user customizes other directories, change
it by yourself
<pre>wget https://www.surenoo.tech/download/SLC1602M_I2C_Code.zip</pre>
unzip LCD1602_I2C_Module_code.zip
cd LCD1602_I2C_Module_code/Pico

micro python

1. Configure settings according to the python environment, using the Raspberry Pi desktop system.

2. Open the Thonny IDE of the Raspberry Pi system, pull the code file into the IDE, and save LCD1602.py to the Pico file system (refer to the Window operation module below), as shown in the figure.







>> Windows

♦ micro python

1. Download and decompress the sample program to the Windows desktop, open the pico corresponding file, refer to the Windows software environment settings.

2. Open the downloaded sample program in Thonnty, as shown in the figure below.

Thonny - C:\Users\oujiewen\Des	ktop\LCD1602_Module_code\LCD1602_Module_code\Pico\LCD1602.py @ 120 : 1	- 🗆 x
File Edit View Run Tools Help		
380 0 · 0 / /	· · · · · · · · · · · · · · · · · · ·	
Files 1	LCD1602.py test.py time_test.py	Assistant
This computer C: \Users \ cujieven \ Desktop \ LCD1602\Pico @ LCD1602.py @ test.py @ time_test.py @ time_test.py @ test.py @ test.py @ test.py @ uart_common.py	<pre>sectory unequety unequety import time from machine import Pin,I2C LCD1602_SDA = Pin(4) LCD1602_SCL = Pin(5) LCD1602_SCL = Pin(5) LCD1602_I2C = I2C(0,sda = LCD1602_SDA,scl = LCD1602_SCL ,freq = 400000) HDEVice I2C Arress LCD_ADDRESS = (0x7c>>1) LCD_ADDRESS = (0x7c>>1) LCD_ENTRYMODESET = 0x04 LCD_ENTRYMODESET = 0x04 LCD_ENTRYMODESET = 0x04 LCD_UNKTIONSET = 0x20 LCD_SETCGRAMADDR = 0x40 LCD_SETCGRAMADDR = 0x40 LCD_SETCGRAMADDR = 0x40 LCD_ENTRYLEFT = 0x02 LCD_ENTRYLEFT = 0x02 LCD_ENTRYLIFTTNCREMENT = 0x00 Shell MicroPython v1.13.1 on 2022-11-00, Raspherry P1 Pices with RP2040 Type "help()" for more information. >>></pre>	
		MicroPython (Raspberry Pi Pico) • COM35



Display

Here you also need to save LCD1602.py to PICO, select LCD1602.py, save it as Raspberry pi pico, and name it LCD1602.py.

	The Save to Racoherny Di Dico	×	
8 -	IR save to naspoelly Preico	~	^
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fro	Raspberry Pi Pico		
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LCD			
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LCD	File pamer ICD1602 pv	OK Cancel	
LCD		Cancer	
LCD	FUNCTIONSET = 0x20	-l	
LCD_	SETCGRAMADDR = 0×40		
LCD_	SETDDRAMADDR = 0×80		
1.00	Contraction of the second s		
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LCD			
LCD			
LCD			
LUD_	ENTRY SHITE DECREMENT = 0X00		
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"hel	p()" for more information.		

Finally, just run the demo under test.py or time_test.py.

Demo analysis: (test.py)





Working with Arduino

>> Hardware Connection

Arduino Pin Connection Correspondence						
Module Interface	Arduino Pin					
VCC	5V/3.3V					
GND	GND					
SCL	SCL					
SDA	SDA					

Connection diagram:



>> Arduino IDE

Download this sample demo in the Resource, enter the Arduino folder, and double-click to open the test.ino file, Arduino IDE will automatically load the driver library under the same folder, select the correct driver board model and its corresponding port number, click the upload button to automatically start compiling and uploading the demo, and the demo will run automatically after the upload is successful.

LCD1602 > Arduino > test			v 0	。 P 在test中證書
名称	修改日期	美型	大小	
e test.ino	2022/12/14 9:07	INO 文件	1 KB 🤜	
Waveshare_LCD1602.cpp	2022/12/13 19:08	C++ Source File	5 KB	
Waveshare_LCD1602.h	2022/12/13 19:08	H文件	3 KB	

This demo has been tested and run on Arduino uno development board and Arduino mega2560 development board.



Working with ESP32

>> Environment Setting

♦ Install the ESP32 Plug-in in the Arduino IDE

1. Open the Arduino IDE, click on the file in the upper left corner, select Preferences:



2. Add the following link in the additional development board manager URL, then click OK.

https://dl.espressif.com/dl/package_esp32_index.json



Surenco[®] Display

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File Edit	Sketch	Tools Help				
8		Select Board			\checkmark	·Q:
	761X Ino	DEV Config cpp DEV Config h	176X.cpp 1.76X.h			
		#Lfndef L76X H				
		#define _L76X_H_				
		#include "DEV Config.h"				
ITA		Minclude (math.h)				
		Preferences	×			
de la						
			Settings Network			
		Sketchbook location:				
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		Editor font size:	14			
		Interface scale:	Automatic 100 %			
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Note: If you already have the ESP8266 board URL, you can separate the URLs with commas like this:

https://dl.espressif.com/dl/package_esp32_index.json, http://arduino.esp8266.com/ stable/package_esp8266com_index.json

Download the packages compressed package and copy the decompressed packages file to the following path:

C:\Users\surenoo\AppData\Local\Arduino15





此电脑 > 本地磁盘	(C:)	3.	用户	\$	surenoo	3	AppData	5	Local	3	Arduino15
------------	------	----	----	----	---------	---	---------	---	-------	---	-----------

名称	修改日期	类型	大小
Cache	2022/8/25 11:13	文件夹	
packages	2022/8/26 16:07	文件夹	
staging	2022/8/26 16:06	文件夹	
🔟 library_index.json	2022/8/26 15:43	JSON 源文件	26,581 KB
library_index.json.sig	2022/8/26 15:43	SIG 文件	1 KB
package_esp32_index.json	2022/8/26 16:36	JSON 源文件	24 KB
package_index.json	2022/8/26 16:36	JSON 源文件	525 KB
package_index.json.sig	2022/8/26 16:36	SIG 文件	1 KB
preferences.txt	2022/8/26 15:08	文本文档	3 KB

Note: Replace the username: surenoo with your own username.

>> Hardware Connection

When connecting to ESP32, choose to connect with a 4PIN cable, please refer to the pin correspondence table below:

If you are using a pin header or PH2.0 4PIN interface, you need to connect according to the following table.

ESP32 Pin Connection Correspondence			
LCD Interface	ESP32 Pin No		
VCC	5V/3.3V		
GND	GND		
SCL	GPIO22		
SDA	GPIO21		

Take the LCD1602 Module using the PH2.0 4PIN interface as an example, and connect it to the ESP32 according to the above table:

(Please connect according to the pin definition table. The color of the wiring in the picture is for reference only, and the actual color shall prevail.)

Connect to ESP32 as shown in the figure below.





>> Use With Arduino IDE

Download this sample demo in the Resource, enter the ESP32 folder, double-click to open the test.ino file, Arduino IDE will automatically load the driver library under the same folder, select the correct driver board model and its corresponding port number, click the upload button to automatically Start compiling and uploading the demo, and the demo will run automatically after the upload is successful.



Working with Jetson Nano

>> Hardware Connection

When connecting Jetson nano, choose to connect with 4PIN cable, please refer to the pin correspondence table below: If you are using a pin header or PH2.0 4PIN interface, you need to connect according to the following table:

Jetson nano Pin Connection Correspondence				
LCD	Jetson nano			
	BCM2835 Pin	Board Pin No.		
VCC	3.3V	3.3V/5V		
GND	GND	GND		
SCL	SCL.1	5		
SDA	SDA.1	3		

Take the LCD1602 Module using the PH2.0 4PIN interface as an example, and connect it to the Jetson nano according to the above table:

(Please connect according to the pin definition table. The color of the wiring in the picture is for reference only, and the actual color shall prevail.)

Connect to Jetson nano as shown below:



Sample Demo

```
cd ~
wget https://www.surenoo.tech/download/SLC1602M_I2C_Code.zip
unzip LCD1602 I2C Module_code.zip
cd ~/LCD1602 I2C Module_code/Jetson\ Nano
sudo chmod 777 *
cd python/
sudo python time_test.py #Automatically obtains the local time and displays it on t
he LCD
```