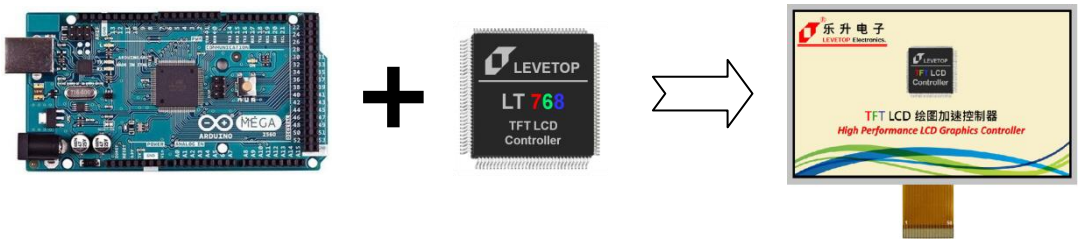
LT768x Library for Arduino IDE

Arduino is an open source platform based on Atmel AVR single chip. It provides simple I/O and supports easy-to-use software to help users develop projects. Arduino Mega2560 is a microcontroller board based on ATmega2560. It has 54 digital input/output pins (of which 15 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button.



To help Arduino users develop projects with the TFT display using LT768x (LT7681/LT7683/LT7686) controller, Levetop provides a complete library for Arduino platform. This manual is to illustrate how users can setup and apply such library in their projects, based on Arduino Mega2560 board. For more information about LT768x controller, please refer to LT768x datasheet and the application note.

1. Connect Arduino MEGA2560 to LT768x – SPI interface

	Arduino MEGA2560	LT768x (LT7681/LT7683/LT7686)
MOSI	PB2(Pin51)	DB6
MISO	PB3(Pin50)	DB5
SCK	PB1(Pin52)	DB7
SS	PB0(Pin53)	DB4
RESET	PA0(Pin22) (Optional)	RST#

2. Connect Arduino MEGA2560 to LT768x – IIC interface

	Arduino MEGA2560	LT768x (LT7681/LT7683/LT7686)
SDA	PD1(Pin20)	DB6
SCL	PD0(Pin21)	DB7
RESET	PA0(Pin22) (Optional)	RST#

3. Add Arduino_LT768 Library

(1) Install Arduino IDE (**I**ntegrated **D**evelopment **E**nvironment)： Users can download the software through www.arduino.cc/en/Main/Software

(2) Download LT768x Library, LT768x_Arduino_200319.zip through www.levetop.tw/en/download2-TFT.html, and unpack it to an appropriate directory.

(3) Add LT768x Library to Arduino IDE： Copy the six directories named [LT768], [LT768_Basic], [LT768_Demo], [LT768_KEY], [LT768_LCD], and [LT768_Lib] located in the unpacked LT768x_Arduino_200319 directory, and paste them to the Arduino IDE directory named “libraries”. (e.g. C:\Program Files (x86)\Arduino\libraries)

4. Add SPI and Wire Libraries

(1) Using SPI interface: Please download the latest SPI library through Menu>Sketch>Include Library>Manage Libraries…
Please open LT768_LCD.h, and set the macro definition of Arduino_SPI to 1, and that of Arduino IIC to 0

(2) Using I2C interface: Please download the latest Wire library through Menu>Sketch>Include Library>Manage Libraries…
Please open LT768_LCD.h, and set the macro definition of Arduino_SPI to 0, and that of Arduino IIC to 1

5. Call Functions

(1) Users may apply the methods provided by each library. Please refer to Lib_List.pdf

(2) To call a function, the coding format is as Library.Method(Parameters). Followings are some examples:

```
LT768_KEY.KEY_Init();
LT768_LCD.Parallel_Init();
LT768_Lib.LT768_Init();
LT768_Demo.StartUp_picture();
LT768.Display_ON();
LT768_KEY.Waiting_Key();
LT768_Demo.Main_GUI();
```

Please refer to LT768x application note for further explanation about the functions listed in the libraries.

6. Power Supply for Arduino MEGA2560 and LT768x

When using Arduino MEGA2560 + LT768x board, Arduino MEGA2560 and LT768x should be supplied by the same power source in order to guarantee that both devices are power-on at the same time. Please note that the supply voltage to Arduino MEGA2560 is 5V; and the supply voltage to LT768x is 3.3V。

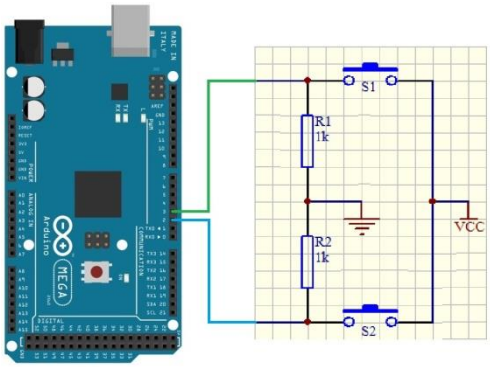
7. Example: Arduino_LT768_Basic

(1) Users may find a simple sample code called Arduino_LT768_Basic in the unpacked LT768x_Arduino_200319 directory. It is designed to repeatedly display Red, Green, Blue colors and a 1024*600 picture stored in the SPI Flash (starting address: 0).

(2) This sample code only uses [LT768_Basic] library. Please make sure that this directory is copied to the Arduino IDE installation path as mentioned in Section 3.

8. Example: Arduino_LT768_DEMO

(1) Users may also find another demo program called Arduino_LT768_DEMO in the unpacked LT768x_Arduino_200319 directory. The demo program applies [LT768_Demo] library, therefore users need to copy the library to the Arduino IDE installation path as mentioned in Section 3. This program requires two buttons to perform related functions. Please refer to the below figure.



(2) After power-on, the LCD will display a startup picture. Press either button (S1 & S2) to enter the selection menu. Users may then select desired demo function by pressing either button (S1 & S2). Pressing any of the buttons for more than 0.5 seconds will start the demonstration of the selected function. During the demonstration, users may press either button to stop the demonstration and go back to the selection menu.

TFT Controller – LT768x Series

Part No.	Resolution	Colors	Panel Type	MCU IF				Embed Font	Graphics Engine				Scroll & Rotation	Text & Graphic Cursor	PWM / GPIO	Package
				Parallel	4w-SPI	3w-SPI	IIC		Geo-metric	BTE	Alpha-Blending	PIP				
LT7681	640*480	16.7M	RGB	8/16bits	v	v	v	128Mb	v	v	v	v	v	v	2 / 28	128-LQFP
LT7683	1024*768	16.7M	RGB	8/16bits	v	v	v	128Mb	v	v	v	v	v	v	2 / 28	128-LQFP
LT7686	1280*1024	16.7M	RGB	8/16bits	v	v	v	128Mb	v	v	v	v	v	v	2 / 28	128-LQFP
LT7680A	1280*1024	262K	RGB	--	v	v		64Mb	v	v	v	v	v	v	2 / 2	68-QFN
LT7680B	480*320	262K	RGB	--	v	v		64Mb	v	v	v	v	v	v	2 / 2	68-QFN