

3.2IN TFT LCD TOUCH SHIELD

Introduction



HY-TFT320 is a [3.2 inch TFT LCD](#) Screen module, 320*240 (resolution), 65K color, 34pins interface , not just a LCD breakout, but include the Touch screen, SD card. So it's a powerful extension module for your project.

This Screen includes a controller SSD1289, it's 16bit data interface, easy to drive by many MCU like STM32 ,AVR and 8051.HY-TFT320 is designed with a touch controller in it . The touch IC is XPT2046 , and touch interface is included in the 34 pins breakout. Another useful extension in this module is the SD Card socket. It uses the SPI mode to operate the SD card, the SPI interface included in the 40pins breakout.

Application Ideas

- Digital Photo Frame (DPF)
- Video terminals
- Instrumentation
- GPS
- Game consoles
- Video phones and Portable VCD, DVD

Specification:

- 3.2" Color TFT LCD
- 320 x 240 Resolution
- 65,536 Colors (16 Bit)
- Powerful 16 Bit Microcontroller(SSD1289)
- Built-in video RAM buffer
- Integrated Resistive Touchscreen
- Integrated SD card
- 5V Operating Voltage
- LED Backlight

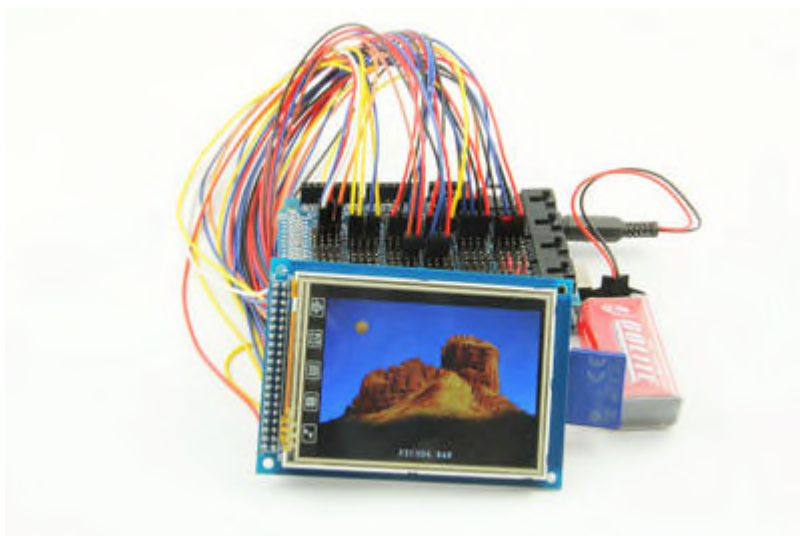
pin definition

		LCD1			
LCD CS	1	LCD_CS	RS	2	LCD RS
LCD WR	3	WR/CLK	RD	4	LCD RD
LCD RST	5	RST	DB1	6	DB1
DB2	7	DB2	DB3	8	DB3
DB4	9	DB4	DB5	10	DB5
DB6	11	DB6	DB7	12	DB7
DB8	13	DB8	DB10	14	DB10
DB11	15	DB11	DB12	16	DB12
DB13	17	DB13	DB14	18	DB14
DB15	19	DB15	DB16	20	DB16
DB17	21	DB17	GND	22	SD_CS
BL_CTR	23	BL	VDD3.3	24	VCC
VCC	25	VDD3.3	GND	26	GND
GND	27	GND	BL_VDD	28	BL_VDD
SPI_MISO	29	MISO	MOSI	30	SPI_MOSI
T_PEN	31	T_PEN	MO	32	FLASH_CS
T_CS	33	T_CS	CLK	34	SPI_CLK

TFT_LCD

Example connections with Arduino board:

Display:



The [UTFT library](#) is required to be installed to get this screen model display. This library is especially designed for 3.2" TFT LCD screen using 16 bit mode. The library requires the following connections.

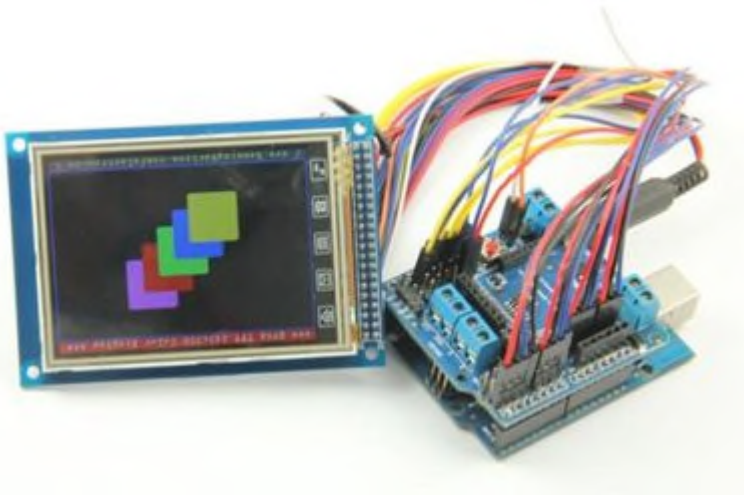
- Connect HY-TFT320 to **Arduino Mega2560**

```

BL CTR(pin23) -> 3.3V
VCC -> 3.3V
RD(pin4) -> 3.3V
GND -> GND
DB1~DB8 -> pin D37~D30
DB10~DB17 -> pin D22~D29
RS(pin2) -> D38
WR(pin3) -> D39
LCD_CS(pin1) -> D40
RSET(pin5)-> D41

```

- Connect HY-TFT320 to **Arduino UNO**



```

BL CTR(pin23)-> 3.3V
VCC -> 3.3V
RD(pin4) -> 3.3V
GND -> GND
DB1~DB6 -> D8~D13
DB7->A0
DB8->A1
DB10~DB17 -> D0~D7
RSET(pin5)->A2
LCD_CS(pin1)->A3
WR(pin3)->A4
RS(pin2)->A5

```

Note: The TFT controller model needs to be declared in the initializing statement. ITDB02 myGLCD(38,39,40,41) needs to be modified as myGLCD(38,39,40,41,ITDB32S) when using Arduino Mega2560. ITDB02 myGLCD(19,18,17,16,ITDB32S) needs to be commented when using Arduino UNO. Otherwise it just show a blank screen. In practice, RS, WR, CS, RSET can be connected to any free pin. But the pin number must be in accord with myGLCD(RS,WR,CS,RST).

Touch Screen:

The LCD has a 3.2" 4-wire resistive touch screen lying over it. [The Touch library](#) needs to be installed to get it works. This library is designed for 2.4" TFT, 3.2" TFT LCD screen module.

- Interface the touchscreen to **Arduino Mega2560**:

Default pin number in example code:

```
DCLK(pin34) -> D6
T_CS(pin33) -> D5
MOSI(pin30) -> D4
MISO(pin29) -> D3
T_PEN(pin31) -> D2
```

Note: TCLK, TCS, TDIN, TDOUT, IRQ also can be connected to any free pin. But the pin number must be in accord with the touch screen initializing statement `myTouch(DCLK,CS,IN,OUT,IRQ)`.

Calibrate the touch screen: The default setting is accurate for 2.4" TFT module, but you need to calibrate when using 3.2" TFT module. A program to calibrate the touch screen is included in the example. If your touch screen is inaccurate, you need to run `touch_calibration`. Follow the on-screen instruction to calibrate the touch screen. Better not use your finger to calibrate it, use your accessory touch pen to pressure the front sight with strength. Then record the calibration parameters and apply them in `ITDB02_Touch.cpp` in your touch screen library.

SD Card:

There is built-in SD card slot in the shield, so we can use it to upload images. But the images need to be converted RAW format first. SD libraries [tinyFAT](#) and [tinyFAT_16](#) need to be preinstalled for displaying the image.

Note: The library only supports FAT16 formatted SD card up to 2GB, so you need to format your SD card to FAT16. 4GB FAT16 formatted SD card is tested not working. Long file names are not supported. Keep your file names compliant with 8.3 standard.

Interface SD card to **Arduino mega**:

```
SCK(pin34) -> D52
SD_CS(pin22) -> D53
MISO(pin29) -> D50
MOSI(pin30) -> D51
```

Touch Screen and SD Card share the MOSI and MISO, and they are controlled through T_CS and SD_CS separately.

When T_CS is enabled, Touch Screen works ; when SD_CS is enabled, SD Card works.