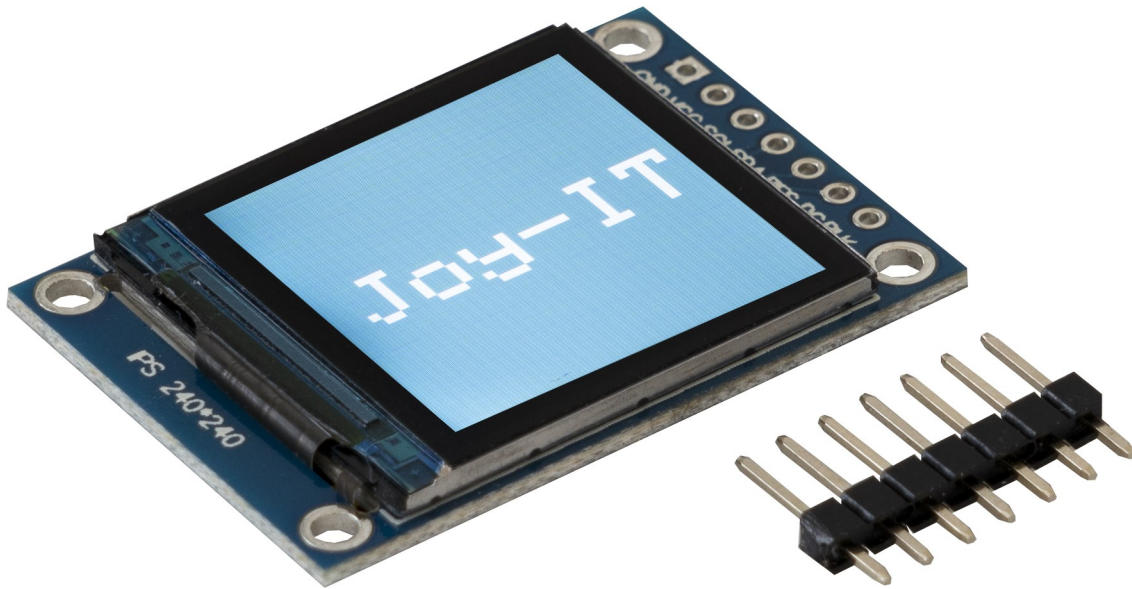


1,3 " HD-IPS-TFT-LCD DISPLAY

SBC-LCD01



1. GENERAL INFORMATION

Dear customer,

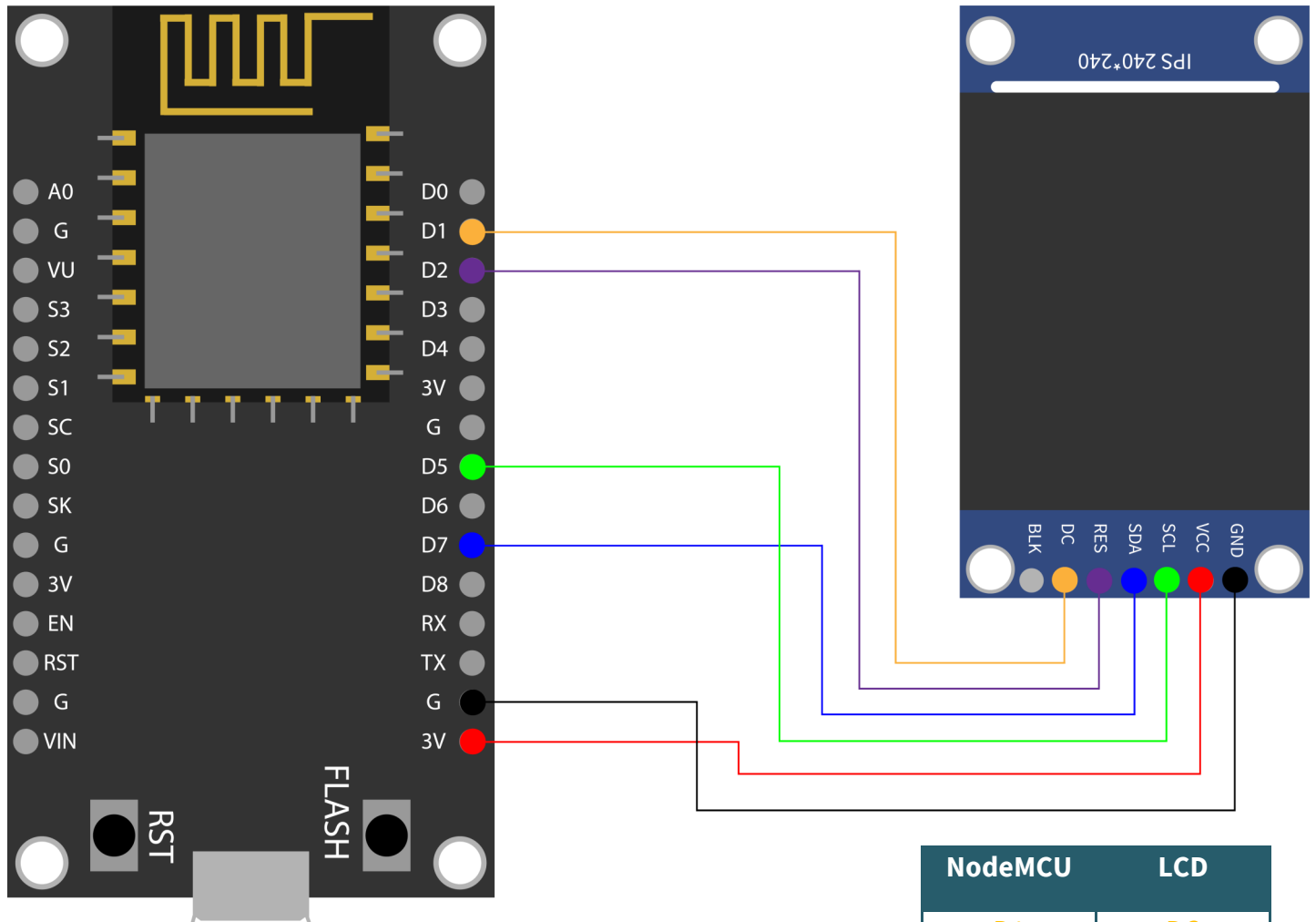
thank you for choosing our product. In the following, we will show you how to use this device.

Should you encounter any unexpected problems during use, please do not hesitate to contact us.

Note that before you can use the display, you must solder the pin header!

2. USAGE WITH THE NODEMCU

1. Connection



2. Code example

The SBC-LCD01 has a logic level of 3.3V, making a NodeMCU recommended for this application. To use a NodeMCU with the Arduino IDE, you must first add the board. To do this click on **File** → **Preferences**. There you add the following link **Additional board administrator URLs**.

http://arduino.esp8266.com/stable/package_esp8266com_index.json

NodeMCU	LCD
D1 (GPIO 5)	DC
D2 (GPIO 4)	RES
D5 (SCLK)	SCL
D7 (MOSI)	SDA
G	GND
3V	VCC

Now you can download the library in the Arduino IDE. There you go to the **library manager**, which you can find under **Sketch** → **Include library ...** → **Manage libraries ...**. There you install **Adafruit ST7735** and **ST7789 Library** and the **Adafruit GFX Library** using the search bar. Now you can download a sample code [here](#), where an image is displayed on the screen.

Make sure that you select the NodeMCU as **board** also under **Tools**, as well as the correct **port**.

Please note, if you want to upload the code, you have to keep the flash button pressed!

```
#include <Adafruit_GFX.h>
#include <Adafruit_ST7789.h>
#include <SPI.h>

#define CS    -1 // Declaration of Chip Select
#define DC     5 // Declaration of Data / Command Pin
#define RST    4 // Declaration of RESET Pin

// Initialize display
Adafruit_ST7789 lcd = Adafruit_ST7789(CS, DC, RST);

void setup(void) {

  lcd.init(240, 240, SPI_MODE2);
  lcd.setRotation(1);

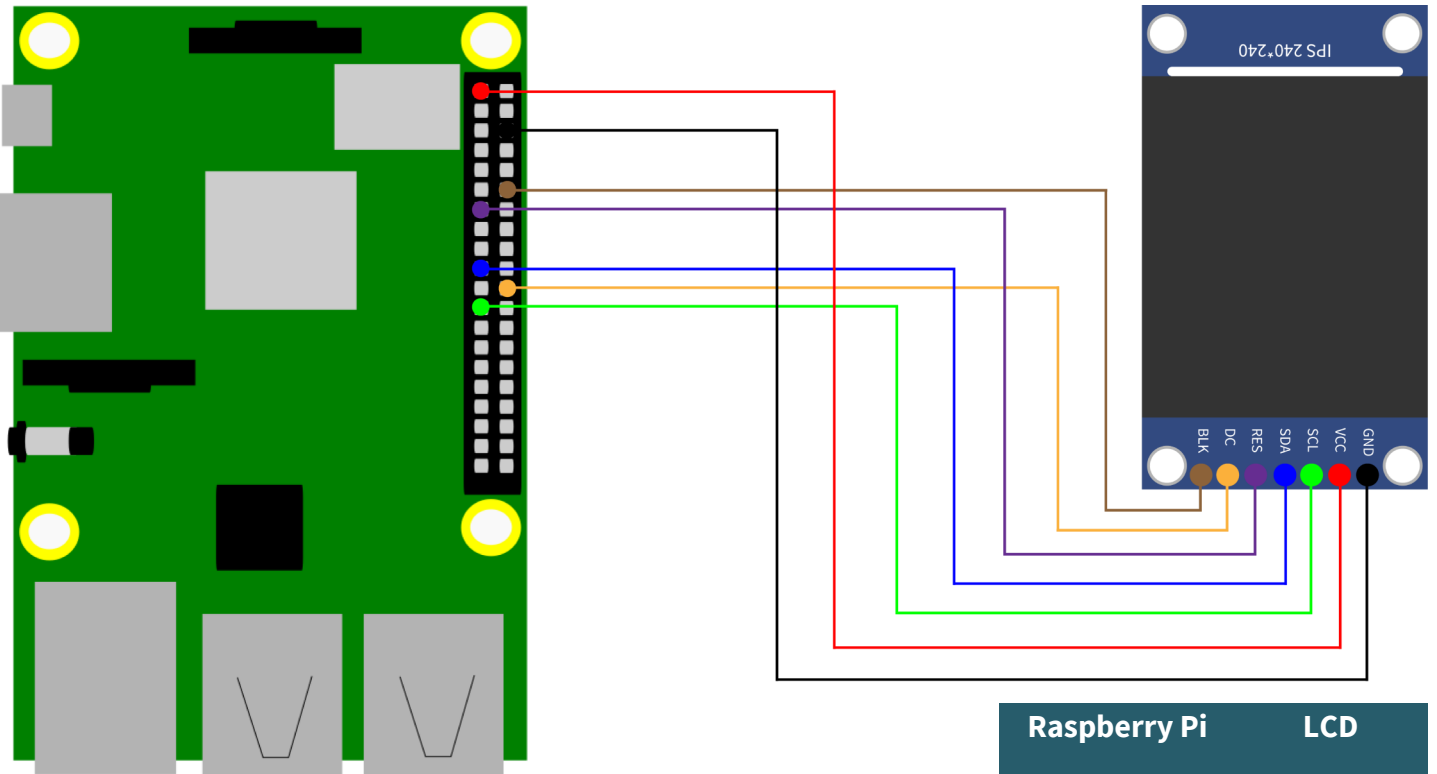
  delay(500);

  // fill Display with a colour and a String
  lcd.fillScreen(0x22ED);
  lcd.setCursor(20, 100);
  lcd.setTextColor(ST77XX_WHITE);
  lcd.setTextSize(6);
  lcd.print("Joy-IT");
}

void loop() {
  // empty
}
```

3. USAGE WITH THE RASPBERRY PI

1. Connection



Raspberry Pi	LCD
Pin 22 (GPIO 25)	DC
Pin 13 (GPIO 27)	RES
Pin 23 (SCLK)	SCL
Pin 19 (MOSI)	SDA
GND	GND
3,3 V	VCC
Pin 12 (GPIO 18)	BLK

2. Code example with SPI

We offer you two sample codes for the Raspberry Pi. One is a control via SPI and the other one via a frame buffer. In this part the operation via SPI is explained.

First enter the following command to enable SPI on your Raspberry Pi.

```
sudo raspi-config
```

There you activate SPI under **5 Interfacing Options** → **P4 SPI**. Then run the following command to restart the Raspberry Pi to put the changes into effect.

```
sudo reboot
```

For this code example we use the library [RPI ST7789](#), which was published under the [MIT Lizenz](#). To do this, insert the following commands one after the other to successfully install the library.

```
sudo apt-get update
sudo apt-get install python3-rpi.gpio python3-spidev python3-pip python3-pil
python3-numpy
git clone https://github.com/rusconi/Rpi-ST7789.git
cd Rpi-ST7789
sudo python3 setup.py install
```

Now you have successfully downloaded the library. You can download the sample code [here](#) or use the following command to download it directly to your Raspberry Pi.

```
wget https://joy-it.net/files/files/Produkte/SBC-LCD01/SBC-LCD01-Python.zip
```

You must download this file to have the image file on your Raspberry Pi. Now you can execute the following commands to project the image file on your LCD.

```
unzip SBC-LCD01-Python
cd SBC-LCD01-Python
sudo python3 image.py Joy-IT-240x240.png
```

In the following you will additionally find our code:

```
import sys
from PIL import Image
import ST7789 as ST7789

# Save image from argument
picRAW = sys.argv[1]
# Declare display
lcd = ST7789.ST7789( port= 0,
                    cs = ST7789.BG_SPI_CS_FRONT,
                    dc = 25, rst = 27, backlight = 18,
                    mode = 3, spi_speed_hz = 8000000)

lcd.begin()
# Open image
pic = Image.open(picRAW)
# Fit image to screen
pic = pic.resize((lcd.width, lcd.height))
# Show image on display
lcd.display(pic)
```

3. Use with a Framebuffer

We explain here how to set up the framebuffer [fbcp-ili9341](#) to use it with this LCD screen. This library was published under the [MIT-Lizenz](#).

You must first deactivate SPI, if you have activated it earlier. Therefore, go back to the configuration of the Raspberry Pi.

```
sudo raspi-config
```

There you deactivate SPI under **5 Interfacing Options** → **P4 SPI**. Now you have to edit the *config.txt* and comment out a command. You open the *config.txt* with :

```
sudo nano /boot/config.txt
```

There you remove the hash at **hdmi_force_hotplug=1**. You can save with CTRL + O and leave the editor with CTRL + X. Now you must restart the Raspberry Pi with the following command.

```
sudo reboot
```

Now you can install fbcp-ili9341 by executing the following commands one after the other:

```
sudo apt-get install cmake
cd ~
git clone https://github.com/juj/fbcp-ili9341.git
cd fbcp-ili9341
mkdir build
```

You must edit the *display.h* before continuing with the setup. Therefore, open the *display.h* with the following command:

```
sudo nano display.h
```

There you exchange **line 83 #define DISPLAY_SPI_DRIVE_SETTINGS (0)** with **#define DISPLAY_SPI_DRIVE_SETTINGS (1 | BCM2835_SPI0_CS_CPOL | BCM2835_SPI0_CS_CPHA)**

```
#ifndef DISPLAY_SPI_DRIVE_SETTINGS
#define DISPLAY_SPI_DRIVE_SETTINGS (1 | BCM2835_SPI0_CS_CPOL | BCM2835_SPI0_CS_CPHA)
#endif
```

You save again with CTRL + O and leave the editor with CTRL + X. You can now continue with the setup by executing the following commands one after the other.

```
cd build
cmake -DST7789VW=ON -DGPIOTFT_DATA_CONTROL=25 -DGPIOTFT_RESET_PIN=27 -DGPIOTFT_BACKLIGHT=18 -DSPI_BUS_CLOCK_DIVISOR=8 -DBACKLIGHT_CONTROL=ON ..
make -j
sudo ./fbcp-ili9341
```

Now you will see your desktop on your 1.3" display.

4. FURTHER INFORMATION

Our information and redemption obligation according to the Electrical and Electronic Equipment Act (ElektroG)



Symbol on electrical and electronic products :

This crossed-out bin means that electrical and electronic products do not belong into the household waste. You must hand over your old appliance to a registration office. Before you can hand over the old appliance, you must remove used batteries and accumulators which are not enclosed by the device.

Return options :

As the end user, you can hand over with the purchase of a new device your old appliance (which has essentially the same functions as the new one) free of charge for disposal. Small devices which do not have outer dimensions greater than 25 cm can be submitted independently of the purchase of a new product in normal household quantities.

Possibility of restitution at our company location during our opening hours:

Simac GmbH, Pascalstr. 8, D-47506 Neukirchen-Vluyn

Possibility of restitution nearby :

We send you a parcel stamp with which you can send us your old appliance free of charge. For this possibility, you must contact us via e-mail at service@joy-it.net or via telephone.

Information about packaging:

Please package your old appliance safe during transport. Should you not have a suitable packaging material or you do not want to use your own material, you can contact us and we will send you an appropriate package.

5. SUPPORT

If any questions remain open or problems arise after your purchase, we are available by email, telephone and ticket support system to answer these.

E-Mail: service@joy-it.net

Ticket-System: <http://support.joy-it.net>

Telephone: +49 (0)2845 98469 – 66 (10 - 17 o'clock)

For more information visit our website:

www.joy-it.net