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JOY-it SBC-LCD84x48 LCD Display Instruction Manual

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JOY-it SBC-LCD84x48 LCD Display

Product Information

Specifications

- Product Name: 84X48 LCD Display
- Model: SBC-LCD84x48
- Manufacturer: Joy-IT powered by SIMAC Electronics GmbH
- Revision: 2
- Logic Level: 3.3V

Product Usage Instructions

Use with an Arduino

Connecting the Display (Rev 1)
Follow the steps below to connect the display to your Arduino:

1. Connect LCD VCC to Arduino 3V3
2. Connect GND to GND

Connecting the Display (Rev 2)
To connect the display following Rev 2 instructions:

1. Connect LCD GND to Arduino GND
2. Connect LIGHT to GND

Code Example for Arduino
Follow these steps to run code examples on Arduino:

1. Install Adafruit PCD8544-Nokia-5110-LCD-library in Arduino IDE
2. Open File > Examples > Adafruit PCD8544 Nokia 5110 LCD Library > pcdtest

Use with a Raspberry Pi

Connecting the Display (Rev 1)
To connect the display to Raspberry Pi following Rev 1 instructions:

1. Connect Pin 1 (3.3 V) to VCC on the display
2. Connect Pin 6 (GND) to GND on the display

Connecting the Display (Rev 2)
To connect the display to Raspberry Pi following Rev 2 instructions:

1. Connect Pin 1 (3.3 V) to VCC on the display
2. Connect Pin 6 (GND) to GND on the display

Code Example for Raspberry Pi
To install libraries for Raspberry Pi, execute the following commands in the console:

1. sudo apt-get install python3-pip
2. sudo apt-get install fonts-dejavu
3. sudo apt-get install python3-pil

Frequently Asked Questions (FAQ)

- **Q: Why is it necessary to use a logic level converter with the display?**
  A: The display operates at a logic level of 3.3V, while Arduino/Raspberry Pi operates at a logic level of 5V, using a logic level converter prevents damage to the display.
- **Q: Can I use other voltage translators instead of KY-051 with the display?**
  A: While we recommend using the KY-051 Voltage Translator from Joy-IT, you may use other compatible voltage translators ensuring they match the required logic levels.

84X48 LCD DISPLAY
SBC-LCD84x48

Joy-IT powered by SIMAC Electronics GmbH – Pascalstr. 8 – 47506 Neukirchen-Vluyn – www.joy-it.net

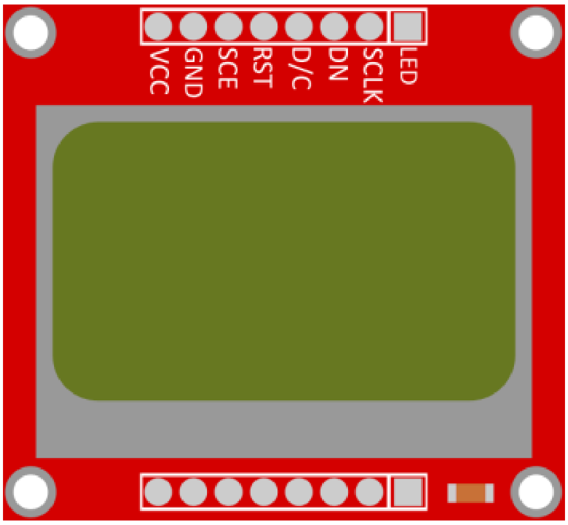
GENERAL INFORMATION

Dear Customer,
thank you for choosing our product. In the following, we will show you what to pay attention to during commissioning and use.
If you encounter any unexpected problems during use, please feel free to contact us.
The display can be used with many common developer boards such as Raspberry Pi or Arduino, for example, to display measured values or measured value graphics directly on the microcontroller or single-board computer.

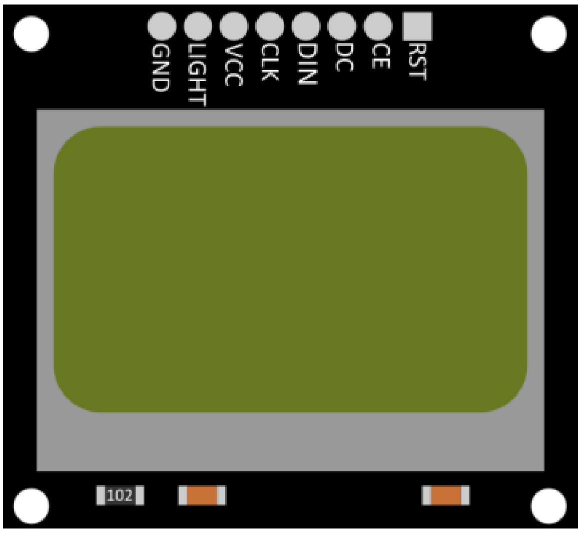
DIFFERENCES BETWEEN THE REVISIONS

This product has a new revision that replaces the previous revision. These changes include the pin out, the LED and the silkscreen.
Below you can see 2 drawings of the different revisions.

Revision 1



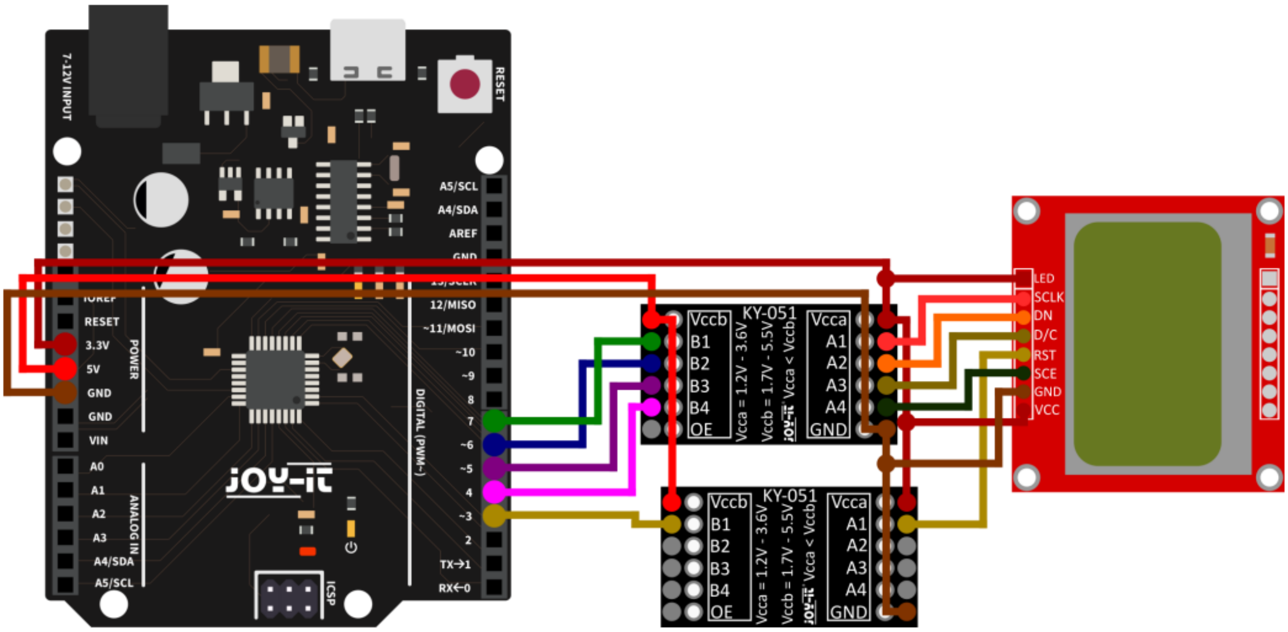
Revision 2



USE WITH AN ARDUINO

Connecting the display (REV 1)
Connect the display as shown in the following picture or table to the pins of the “A-side” of your Voltage Translator and then from the “B-side” of the Voltage Translator to your Arduino.
Here we recommend the KY-051 Voltage Translator from Joy-IT.

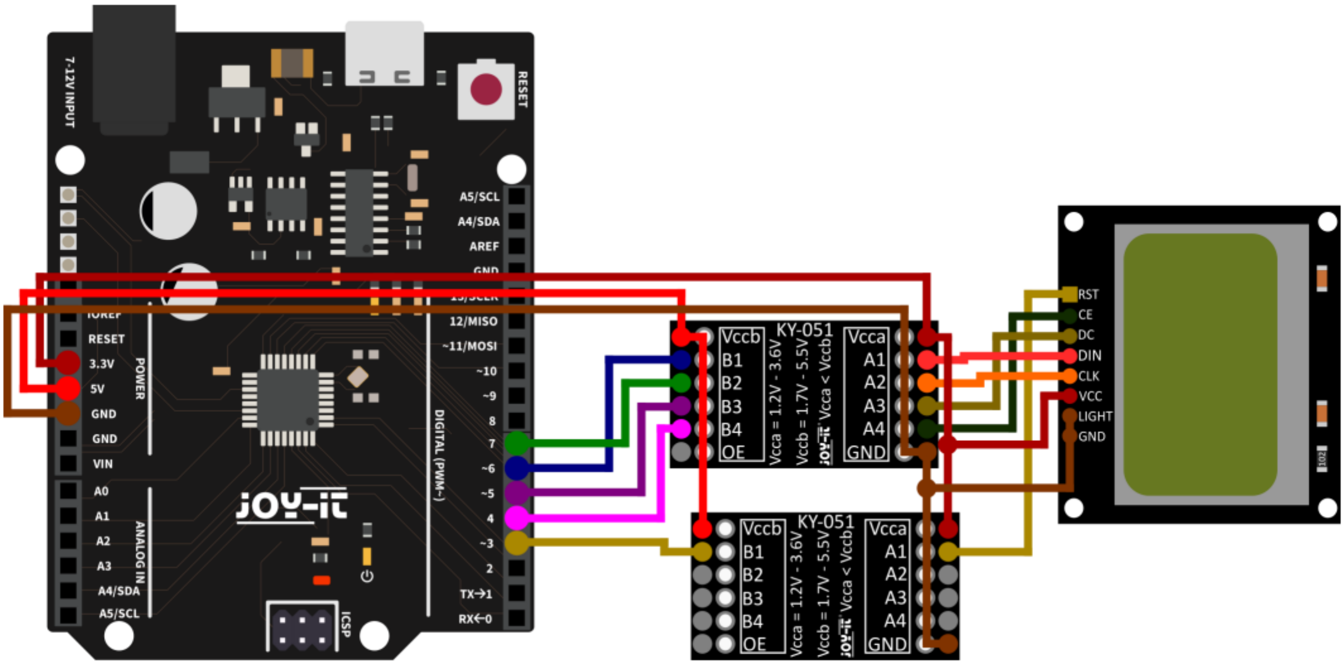
It is necessary to use a logic level converter, because the display has a 3.3 V logic level, while the Arduino has a 5 V logic level. Not doing so may cause damage to the display.



LCD	**Arduino**	**KY-051 (1)**	**KY-051 (2)**
VCC	3V3	Vcca	Vcca
–	5V	Vccb	Vccb
GND	GND	GND	GND
SCE	–	A4	–
–	D4	B4	–
RST	–	–	A1
–	D3	–	B1
D/C	–	A3	–
–	D5	B3	
DN	–	A2	–
–	D6	B2	–
SCLK	–	A1	–
–	D7	B1	–

Connecting the display (REV 2)

Connect the display as shown in the following picture or table to the pins of the “A-side” of your Voltage Translator and then from the “B-side” of the Voltage Translator to your Arduino.
Here we recommend the KY-051 Voltage Translator from Joy-IT.



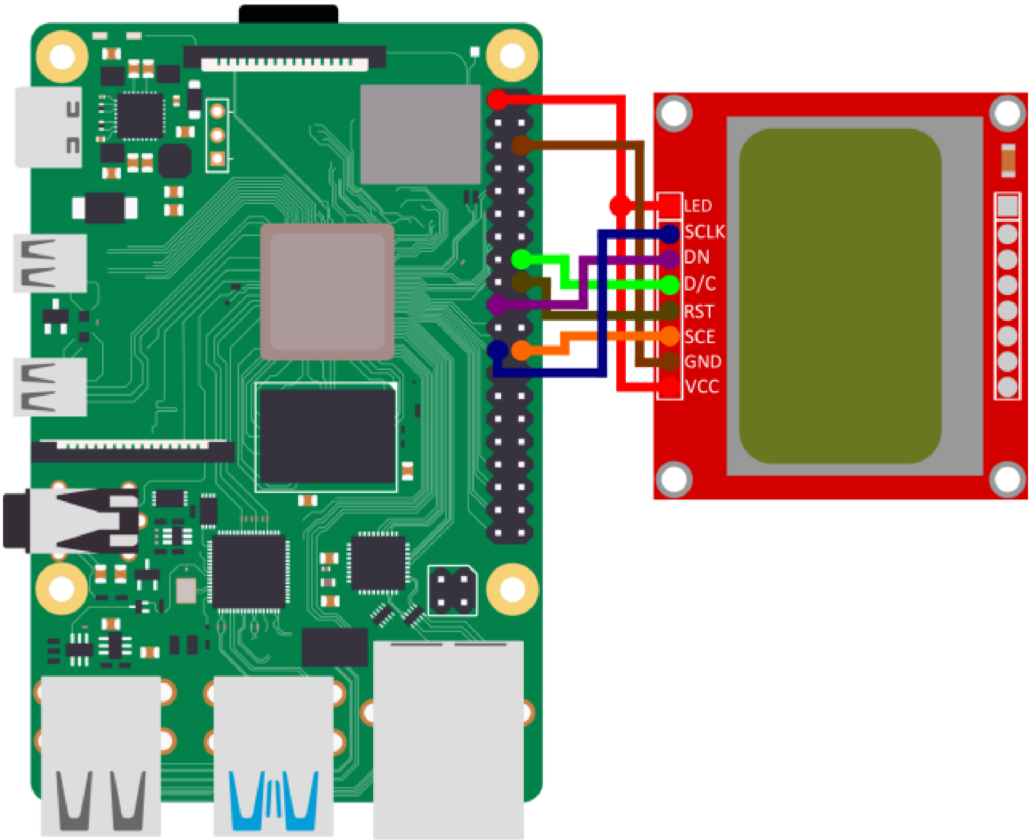
LCD	Arduino	KY-051 (1)	KY-051 (2)
GND	GND	GND	GND
LIGHT	GND	–	–
VCC	3V3	Vcca	Vcca
–	5V	Vccb	Vccb
CLK	–	A2	–
–	D7	B2	–
DIN	–	A1	–
–	D6	B1	–
DC	–	A3	–
–	D5	B3	
CE	–	A4	–
–	D4	B4	–
RST	–	–	A1
–	D3	–	B1

Code example Arduino
This example uses the Adafruit PCD8544-Nokia-5110-LCD-library library, which is released by Adafruit under the BSD license. After installing this library in your Arduino IDE, you can find a code example at File → Examples → Adafruit PCD8544 Nokia 5110 LCD Library → pcdtest. You can upload this code to your Arduino using Upload. Also make sure that the correct settings are made under Tools → Board and Tools → Port.

USE WITH A RASPBERRY PI

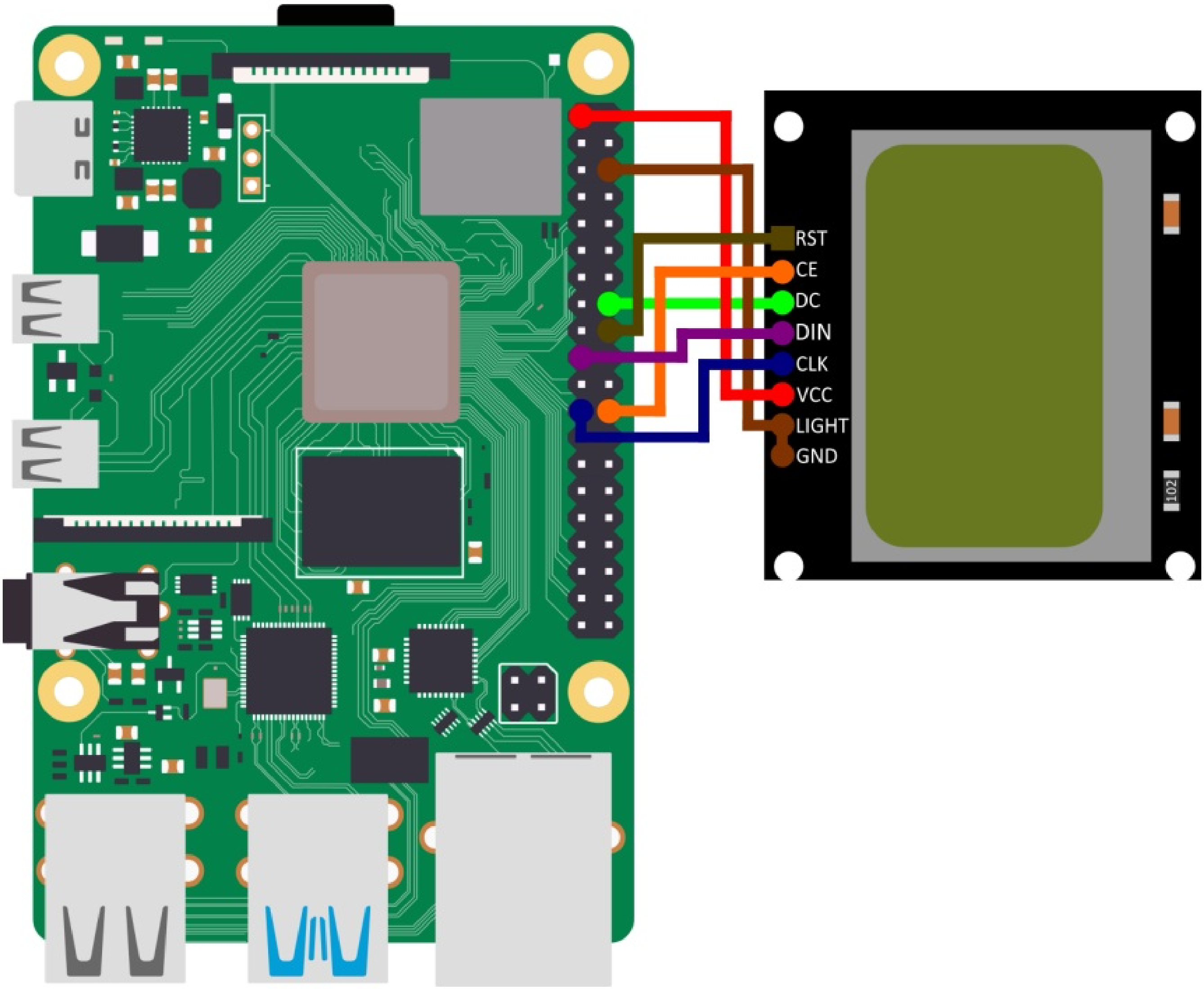
Connecting the display (REV 1)

Connect the display to the pins of your Raspberry Pi as shown in the following picture or table.



Raspberry Pi	84 x 48 LCD
Pin 1 (3.3 V)	8 – LED
Pin 23 (BCM 11 / SCLK)	7 – SCLK
Pin 19 (BCM 10 / MOSI)	6 – DN < MOSI >
Pin 16 (BCM 23)	5 – D/C
Pin 18 (BCM 24)	4 – RST
Pin 24 (BCM 8)	3 – SCE
Pin 6 (GND)	2 – GND
Pin 1 (3.3 V)	1 – VCC

Connecting the display (REV 2)
Connect the display to the pins of your Raspberry Pi as shown in the following picture or table.



Raspberry Pi	84 x 48 LCD
Pin 18 (BCM 24)	8 – RST
Pin 24 (BCM 8 / CE0)	7 – CE
Pin 16 (BCM 23)	6 – DC
Pin 19 (BCM 10 / MOSI)	5 – DIN
Pin 23 (BCM 11 / SCLK)	4 – CLK
Pin 1 (3.3 V)	3 – VCC
Pin 6 (GND)	2 – LIGHT
Pin 6 (GND)	1 – GND

This guide was written under Raspberry Pi OS Bookworm for the Raspberry Pi 4 and 5. It has not been checked with other/newer operating systems or hardware.

Code example Raspberry Pi
Installing the libraries To enable you to use the display as quickly and easily as possible, we are using the Adafruit_CircuitPython_PCD8544 library from Adafruit, which has been published under the MIT license. Open the console and execute the following commands:

- sudo apt-get install python3-pip
- sudo apt-get install fonts-dejavu
- sudo apt-get install python3-pil

To activate the SPI interface, you must first go to raspi-config. To do this, enter the following command:

- sudo raspi-config

Then select the option “3 Interface Options” and go to “I4 SPI” to activate the SPI interface. Confirm your selection by pressing “OK”.
Then enter the following command in the terminal:

- sudo nano /boot/firmware/config.txt

Now add the following line to the end of the file. Then save the file with CTRL+O and close with CTRL+X and Enter:

- dtoverlay=spi0-0cs

Now restart your Raspberry Pi with the following command:
sudo reboot

Now you need to create a virtual environment for this project by entering the following commands:

- mkdir dein_projekt
- cd dein_projekt
- python -m venv –system-site-packages env
- source env/bin/activate

Now install the library used with the following command:

- pip3 install adafruit-circuitpython-pcd8544

Using the sample codes

After completing the installation, you can create the sample file by ente-ring the following command:

- nano Displaytest.py

Now you have to copy the following code into the file. Of course you can modify this example according to your wishes and ideas. You can also download this code example here.

- import time
- import board
- import busio
- import digitalio

- import adafruit_pcd8544
- # SPI-Bus und Steuerpins initialisieren
- spi = busio.SPI(board.SCK, MOSI=board.MOSI)
- dc = digitalio.DigitalInOut(board.D23)
- ce = digitalio.DigitalInOut(board.D8)
- reset = digitalio.DigitalInOut(board.D24)
- display = adafruit_pcd8544.PCD8544(spi, dc, ce, reset)
- display.bias = 4
- display.contrast = 60
- # LED-Hintergrundbeleuchtung einschalten
- # über einen extra GPIO Pin
- backlight = digitalio.DigitalInOut(board.D26)
- backlight.switch_to_output()
- backlight.value = False
- print(“Pixel test”)
- # Löschen Sie die Anzeige. Rufen Sie show immer nach der Änderung von Pixeln auf
- # um die Aktualisierung der Anzeige sichtbar zu machen!
- display.fill(0)
- display.show()
- # Setzt ein Pixel an den Ursprung 0,0.
- display.pixel(0, 0, 1)
- # Setzt ein Pixel in die Mitte des Displays.
- display.pixel(display.width // 2, display.height // 2, 1)
- # Setzen eines Pixels in der gegenüberliegenden Eckposition.
- display.pixel(display.width – 1, display.height – 1, 1)
- display.show()
- time.sleep(2)
- print(“Linien test”)
- # Wir zeichnen von Ecke zu Ecke, wobei wir hier ebenfalls
- # alle Koordinatenpaare definieren
- corners = (
- (0, 0),
- (0, display.height – 1),
- (display.width – 1, 0),
- (display.width – 1, display.height – 1),
-)
- display.fill(0)
- for corner_from in corners:
- for corner_to in corners:
- display.line(corner_from[0], corner_from[1], corner_to[0], corner_to[1], 1)
- display.show()
- time.sleep(2)
- print(“Rechtecks test”)

- display.fill(0)
- w_delta = display.width / 10
- h_delta = display.height / 10
- for i in range(11):
- display.rect(0, 0, int(w_delta * i), int(h_delta * i), 1)
- display.show()
- time.sleep(2)
- print(“Text test”)
- display.fill(0)
- display.text(“Presenting an “, 0, 0, 1)
- display.text(” Examplecode “, 0, 8, 1)
- display.text(“for the SBC- “, 0, 16, 1)
- display.text(“LCD84x48 based”, 0, 24, 1)
- display.text(“on the pcd8455”, 0, 32, 1)
- display.text(“Nokia 5110 LCD”, 0, 40, 1)
- display.show()
- while True:
- display.invert = True
- time.sleep(0.5)
- display.invert = False
- time.sleep(0.5)

Once you have copied the code into your file, you can save it by pressing “CTRL+O” and close it by pressing “CTRL+X”. To ensure that the code example works properly, you must then download and unzip the font file. To do this, execute the following two commands. To ensure that every-thing works, the unzipped font file must be placed in the same folder as the code to be executed.

- wget https://joy-it.net/files/files/Produkte/SBC-LCD84x48/font5x8.zip unzip font5x8.zip

The following command then executes the file with your code and you can end the code with CTRL+C.

- python3 Displaytest.py

ADDITIONAL INFORMATION

Our information and take-back obligations according to the Electrical and Electronic Equipment Act (ElektroG)

Symbol on electrical and electronic equipment:
This crossed-out dustbin means that electrical and electronic appliances do not belong in the household waste. You must return the old appliances to a collection point.
Before handing over waste batteries and accumulators that are not en-closed by waste equipment must be separated from it.

Return options:
As an end user, you can return your old device (which essentially fulfills the same function as the new device purchased from us) free of charge for disposal when you purchase a new device.
Small appliances with no external dimensions greater than 25 cm can be disposed of in normal household quantities independently of the purchase of a new appliance.

Possibility of return at our company location during opening hours:
SIMAC Electronics GmbH, Pascalstr. 8, D-47506 Neukirchen-Vluyn, Germany

Possibility of return in your area:
We will send you a parcel stamp with which you can return the device to us free of charge. Please contact us by email at Service@joy-it.net or by telephone.

Information on packaging:
If you do not have suitable packaging material or do not wish to use your own, please contact us and we will send you suitable packaging.

SUPPORT

If there are still any issues pending or problems arising after your purchase, we will support you by e-mail, telephone and with our ticket support system.
Email: service@joy-it.net
Ticket system: http://support.joy-it.net
Telephone: +49 (0)2845 9360-50 (Mon – Thur: 09:00 – 17:00 o‘clock,
Fri: 09:00 – 14:30 o‘clock)
For further information please visit our website: www.joy-it.net
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www.joy-it.net
SIMAC Electronics GmbH Pascalstr. 8 47506 Neukirchen-Vluyn

Documents / Resources

	JOY-it SBC-LCD84x48 LCD Display [pdf] Instruction Manual SBC-LCD84x48, SBC-LCD84x48 LCD Display, LCD Display, Display

References

- ITnet | Servizi di Colocation e Cloud
- Joy-IT Helpdesk
- For Makers and Professionals | Joy-IT
- Adafruit Industries · GitHub
- Adafruit_CircuitPython_PCD8544/LICENSE at main · adafruit/Adafruit_CircuitPython_PCD8544 · GitHub
- GitHub - adafruit/Adafruit-PCD8544-Nokia-5110-LCD-library: Arduino driver for PC8544, most commonly found in small Nokia 5110's

- Adafruit-PCD8544-Nokia-5110-LCD-library/license.txt at master · adafruit/Adafruit-PCD8544-Nokia-5110-LCD-library · GitHub
- Joy-IT Helpdesk
- For Makers and Professionals | Joy-IT
- User Manual