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Adafruit ADA1115

Adafruit Blue&White 16x2 LCD+Keypad Kit for Raspberry Pi

MODELS: ADA1115 / 100263

1. Introduction

The Adafruit Blue&White 16x2 LCD+Keypad Kit is designed to provide an efficient display and input solution for Raspberry Pi projects. This kit allows control of a 16x2 character LCD, backlight, and five keypad buttons using only the two I2C pins (SDA/SCL) on the Raspberry Pi, significantly minimizing GPIO usage. It is an ideal component for building standalone projects that require a user interface without the need for a bulky computer.

2. Product Overview

This kit offers a streamlined method to integrate a 16x2 character LCD and a 5-button keypad with your Raspberry Pi. It utilizes the I2C interface, requiring only two pins from the Raspberry Pi's GPIO, leaving other pins available for additional sensors or components. The keypad includes four directional buttons (Up, Down, Left, Right) and a central Select button for basic user interaction. The board features an updated design with buttons positioned on the right side for improved mechanical stability.



Image 1: The Adafruit 16x2 LCD+Keypad Kit for Raspberry Pi, featuring a blue and white LCD screen and five tactile

buttons. The screen displays 'Adafruit LCD Plate w/Keypad!'.

3. Kit Contents

The Adafruit Blue&White 16x2 LCD+Keypad Kit typically includes the following components:

- High-quality Printed Circuit Board (PCB)
- 16x2 Blue & White Character LCD
- All necessary electronic components for assembly (e.g., buttons, headers, resistors, I2C expander chip)

4. Setup Instructions

4.1. Assembly (Soldering Required)

This kit requires soldering to assemble the various components onto the PCB. Basic soldering skills are necessary. Ensure all components are correctly oriented before soldering. Refer to Adafruit's official assembly guide for detailed, step-by-step instructions and component placement diagrams. Incorrect soldering can lead to malfunction.

4.2. Wiring to Raspberry Pi

The LCD+Keypad Kit connects to the Raspberry Pi via the I2C interface. This requires connecting the SDA and SCL pins, along with power (5V) and ground (GND). The kit is designed to plug directly onto the Raspberry Pi's GPIO header, aligning with the I2C pins.

- Connect the kit to the Raspberry Pi's GPIO header, ensuring proper alignment with the I2C pins.
- The board uses I2C 7-bit address **0x20**.

4.3. Software Configuration

To operate the LCD and read keypad inputs, your Raspberry Pi requires specific software libraries and configuration. This typically involves:

1. Enabling the I2C interface on your Raspberry Pi (e.g., `viaraspi-config`).
2. Installing necessary Python libraries (e.g., `Adafruit_Python_CharLCD`).
3. Writing or adapting code to initialize the LCD, display text, and read button presses.

For detailed software setup and example code, please refer to the official Adafruit learning guides and documentation specific to this LCD+Keypad kit.

5. Operating Instructions

Once assembled and configured with the appropriate software, the LCD+Keypad kit functions as an input/output device for your Raspberry Pi project.

- **LCD Display:** Your custom code will send text and commands to the LCD to display information. The 16x2 format means it can show 16 characters per line across two lines.
- **Keypad Input:** The five buttons (Up, Down, Left, Right, Select) can be read by your software to trigger actions or navigate menus within your application. Each button press corresponds to a specific digital input that your program can detect.
- **Backlight Control:** The backlight can typically be controlled via software to adjust brightness or turn on/off, enhancing readability in various lighting conditions.

The specific functionality and interaction will depend entirely on the software you develop or utilize for your project.

6. Maintenance

To ensure the longevity and proper functioning of your Adafruit LCD+Keypad Kit, consider the following maintenance guidelines:

- **Cleaning:** Keep the LCD screen and PCB free from dust and debris. Use a soft, dry cloth for cleaning. Avoid abrasive materials or harsh chemicals.
- **Handling:** Handle the board by its edges to avoid touching components, especially the LCD screen. Static electricity can damage electronic components.
- **Environment:** Operate and store the kit in a dry environment, away from extreme temperatures, humidity, and direct sunlight.
- **Connections:** Periodically check all soldered connections for integrity, especially if the device is subject to vibration or frequent movement.

7. Troubleshooting

If you encounter issues with your LCD+Keypad Kit, consider the following troubleshooting steps:

- **LCD Not Displaying:**
 - Verify all soldered connections are solid and correct.
 - Check wiring to the Raspberry Pi, ensuring SDA, SCL, 5V, and GND are correctly connected.
 - Confirm the I2C interface is enabled on your Raspberry Pi.
 - Ensure the correct I2C address (0x20) is used in your software.
 - Adjust the contrast potentiometer on the board.
 - Check for power supply issues to the Raspberry Pi and the kit.
- **Keypad Buttons Not Responding:**
 - Inspect soldering for the buttons and the I2C expander chip.
 - Verify your software code is correctly reading inputs from the I2C expander.
- **Intermittent Issues:**
 - Check for loose connections or cold solder joints.
 - Ensure adequate power supply to prevent brownouts.

For further assistance, consult the comprehensive guides and community forums available on the official Adafruit website.

8. Specifications




Brand	Adafruit
Item Model Number	100263 (also referred to as ADA1115)
Display Type	16x2 Character LCD (Blue & White)




Standing Screen Display Size	2.2 Inches
Connectivity Technology	I2C (SDA/SCL)
I2C Address	0x20 (7-bit)
Keypad	5-button (Up, Down, Left, Right, Select)
Item Weight	2.4 ounces
Package Dimensions	4.6 x 4.4 x 1.2 inches
UPC	701851953612, 720825758299

9. Warranty and Support

Specific warranty information for the Adafruit Blue&White 16x2 LCD+Keypad Kit is not provided within this manual. For details regarding product warranty, returns, or technical support, please refer to the official Adafruit website or contact their customer service directly. Adafruit provides extensive online learning resources, tutorials, and community forums that can assist with setup, programming, and troubleshooting.

Related Documents - ADA1115

	<p>Adafruit FT232H with SPI & I2C Devices Guide</p> <p>A guide to using the Adafruit FT232H breakout board to add SPI and I2C communication capabilities to your computer, with instructions for wiring and software setup for various Adafruit breakout boards.</p>
	<p>Adafruit PiTFT 3.5" Touch Screen for Raspberry Pi - Installation and Usage Guide</p> <p>Comprehensive guide to the Adafruit PiTFT 3.5" Touch Screen for Raspberry Pi. This 480x320 resolution display with resistive touch connects via SPI to Raspberry Pi models A, B, and B+. Covers easy installation, configuration, touchscreen calibration, image/video playback, Pygame integration, and troubleshooting. Enhance your Raspberry Pi projects with this interactive display.</p>
	<p>An Introduction to RP2040 PIO with CircuitPython Adafruit Learning Guide</p> <p>Learn how to use Programmable I/O (PIO) on the Raspberry Pi RP2040 microcontroller with CircuitPython. This guide covers setup, basic examples like LED control, blinking, and driving NeoPixels.</p>

 <p>CYBERDECK Bonnet and HAT for Raspberry Pi 400</p>	<p>CYBERDECK Bonnet and HAT for Raspberry Pi 400 - Adafruit</p> <p>Discover the CYBERDECK Bonnet and HAT from Adafruit, designed to enhance your Raspberry Pi 400 experience. This guide details its features, pinouts, connectivity options like STEMMA QT and JST PH, and recommended display add-ons, along with schematic and layout information.</p>
 <p>Retro Gaming with Raspberry Pi</p>	<p>Retro Gaming with Raspberry Pi: Build Your Own Arcade Console</p> <p>Explore how to build a retro gaming console using a Raspberry Pi and popular emulation software like RetroPie. This guide from Adafruit covers hardware setup, software installation, and customization for an authentic DIY arcade experience.</p>
 <p>NeoPIO: Drive Multiple NeoPixel LED Strands with Raspberry Pi Pico</p>	<p>NeoPIO: Drive Multiple NeoPixel LED Strands with Raspberry Pi Pico</p> <p>A comprehensive guide detailing how to use the Raspberry Pi Pico's Programmable I/O (PIO) module in conjunction with CircuitPython and a 74HC595 shift register to efficiently control numerous NeoPixel LED strands. Learn about setup, wiring, code, and performance benefits.</p>