# RP2040-LCD-1.28

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**RP2040-LCD-1.28**


(https://www.waveshare.com/rp2040-lcd-1.28.htm)

RP2040
USB Type-C

# Overview

RP2040-LCD-1.28 is a low-cost, high-performance MCU board designed by Waveshare. Although it is tiny, it incorporates a 1.28inch LCD round display, Li-ion battery charger, 6-axis sensor (3-axis accelerometer and 3-axis gyroscope) and so on, adapting all GPIO and Debug headers, which makes it easy for you to develop and integrate it into products quickly.

# Feature

- RP2040 MCU chip designed by Raspberry Pi in the United Kingdom
- Dual-core Arm Cortex M0+ processor, flexible clock running up to 133 MHz
- 264KB of SRAM, and 2MB of onboard Flash memory
- Type-C connector, keeps it up to date, easier to use
- Onboard 1.28-inch 240 x 240 resolution, 65K RGB IPS LCD display for clear color pictures
- Lithium battery recharge/discharge header, suitable for mobile devices
- All GPIOs are adapted through 1.27 pitch female headers (There are 30 pins in total, but some pins have been connected to the internal circuit, you need to pay attention when multiplexing, please refer to the wiki for details)
- USB 1.1 with device and host support
- Low-power sleep and dormant modes
- Drag-and-drop programming using mass storage over USB
- 2 x SPI, 2 x I2C, 2 x UART, 2 x UART, 4 x 12-bit ADC, 16 × controllable PWM channels
- Accurate clock and timer on-chip
- Temperature sensor
- Accelerated floating-point libraries on-chip

- 8 x Programmable I/O (PIO) state machines for custom peripheral support

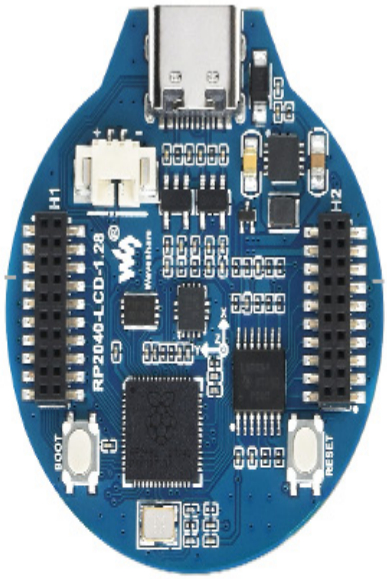
# Specification

| LCD Parameter | | | |
|---|---|---|---|
| Controller | GC9A01A | Resolution | 240 (H) RGB x 240(V) |
| Communication interface | SPI | Display Size | Φ32.4mm |
| Display Panel | IPS | Pixel Size | 0.135 (H) x 0.135 (V) mm |

| IMU Parameter | |
|---|---|
| Sensor | QMI8658C |
| Accelerometer | Resolution: 16 bits<br>Measurement Range (optional): ±2, ±4, ±8, ±16g |

| | |
|---|---|
| Gyroscope | Resolution: 16 bits<br>Measurement Range (optional): ±16, ±32, ±64, ±128, ±256, ±512, ±1024, ±2048°/sec |

# Pinout




| H1 | | | | | H2 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| GP 8 | 1 | | 2 | GP 0 | GND | 20 | | 19 | GND |
| GP 9 | 3 | | 4 | GP 1 | VSYS | 18 | | 17 | ADC_AVDD |
| GP 10 | 5 | | 6 | GP 2 | GP 23 | 16 | | 15 | BOOT |
| GP 11 | 7 | | 8 | GP 3 | GP 22 | 14 | | 13 | RUN |
| GP 12 | 9 | | 10 | GP 4 | GP 21 | 12 | | 11 | GP 29 |
| GP 13 | 11 | | 12 | GP 5 | GP 20 | 10 | | 9 | GP 28 |
| GP 14 | 13 | | 14 | GP 6 | GP 19 | 8 | | 7 | GP 27 |
| GP 15 | 15 | | 16 | GP 7 | GP 18 | 6 | | 5 | GP 26 |
| SWCLK | 17 | | 18 | VSYS | GP 17 | 4 | | 3 | GP 25 |
| SWDIO | 19 | | 20 | GND | GP 16 | 2 | | 1 | GP 24 |

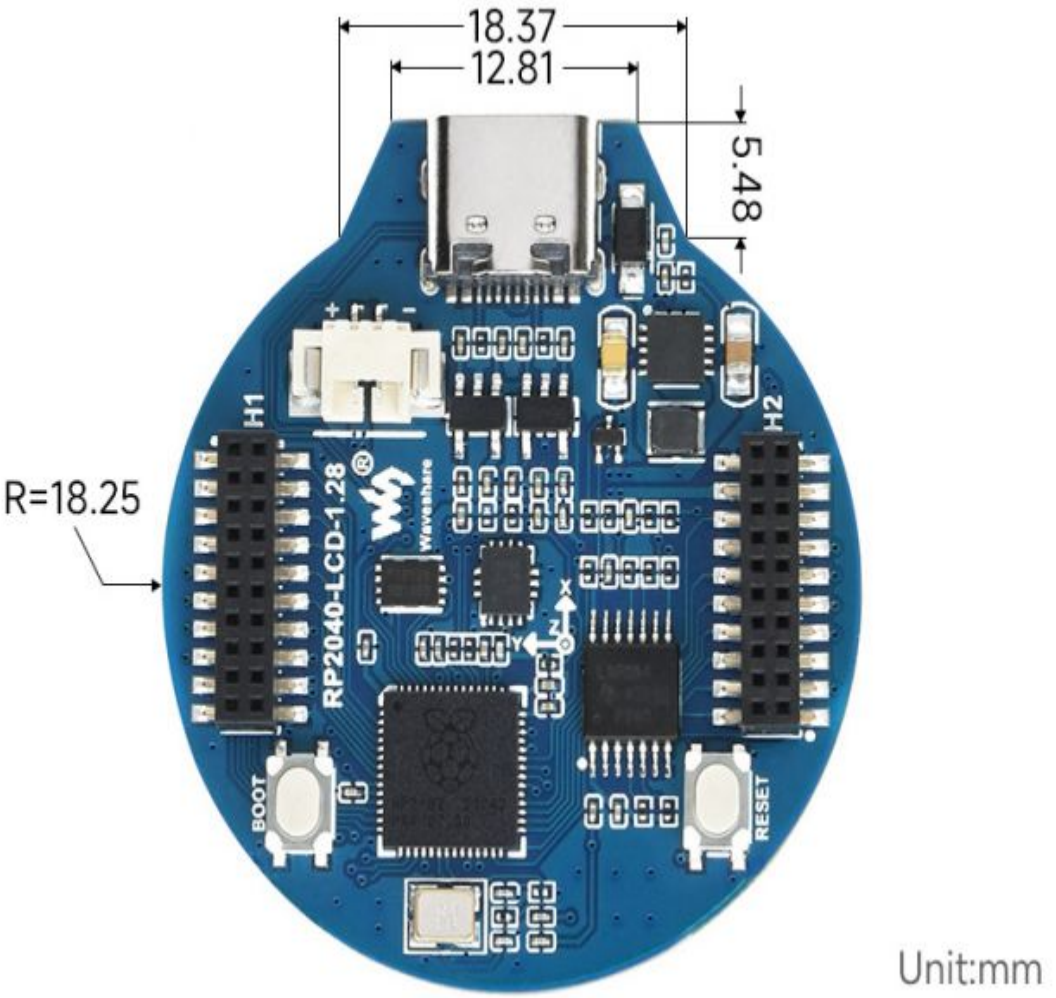
Power Ground Debuging GPIO, PIO, and PWM System Control

| | | |
|---|---|---|
| GP 6 | IMU_SDA | I2C SDA |
| GP 7 | IMU_SCL | I2C SCL |
| GP 8 | LCD_DC | LCD Command/Data Selection |
| GP 9 | LCD_CS | LCD Chip Selection |

| | | |
|---|---|---|
| GP 12 | LCD_RST | LCD Reset |
| GP 23 | IMU_INT1 | QMI8658C INT1 |
| GP 24 | IMU_INT2 | QMI8658C INT2 |
| GP 25 | LCD_BL | LCD Backlight Control |
| GP 29 | BAT_ADC | Battery Voltage |

(/wiki/File:RP2040-LCD-1.28_Spec01.jpg)

# Dimensions




(/wiki/File:RP2040-LCD-1.28_Spec02.jpg)

# Resource

## Demo

- Demo code (https://www.waveshare.com/w/upload/9/9d/RP2040-LCD-1.28.zip)
- Clock project shared by Wienzek Daniel (https://github.com/dawigit/picoclock)

## Drawing

- schematic diagram (https://www.waveshare.com/w/upload/6/60/RP2040-LCD-1.28-sch.pdf)
- 3D drawing (https://www.waveshare.com/w/upload/a/a2/RP2040-LCD-1.28-3D-Drawing.zip)

## Datasheet

- GC9A01A (https://www.waveshare.com/w/upload/5/5e/GC9A01A.pdf)

- QMI8658C (https://www.waveshare.com/w/upload/5/5f/QMI8658C.pdf)

# Official Raspberry Pi Documents

- Raspberry Pi Pico MicroPython Book (https://hackspace.raspberrypi.com/books/micropython-pico)
- Raspberry Pi related books (https://magpi.raspberrypi.com/books)
- Pico datasheet (https://www.waveshare.com/w/upload/1/11/Pico_datasheet.pdf)
- RPI-PICO-R3-PUBLIC-SCHEMATIC (https://www.waveshare.com/w/upload/e/ed/RPI-PICO-R3-PUBLIC-SCHEMATIC.pdf)
- Pico R3 A4 Pinout (https://www.waveshare.com/w/upload/5/52/Pico-R3-A4-Pinout.pdf)
- Getting started with pico (https://www.waveshare.com/w/upload/3/30/Getting_started_with_pico.pdf)
- Pico c sdk (https://www.waveshare.com/w/upload/5/5f/Pico_c_sdk.pdf)
- Pico python sdk.pdf (https://www.waveshare.com/w/upload/b/b0/Pico_python_sdk.pdf)
- Pico datasheet (https://www.waveshare.com/w/upload/4/4a/Pico_datasheet_%282%29.pdf)
- Rp2040 datasheet (https://www.waveshare.com/w/upload/f/fd/Rp2040_datasheet.pdf)
- Hardware design with rp2040 (https://www.waveshare.com/w/upload/9/9d/Hardware_design_with_rp2040.pdf)

# Raspberry Pi Demo

- Raspberry Pi C/C++ (Github) (https://github.com/raspberrypi/pico-examples/)
- Raspberry Pi Micropython (Github) (https://github.com/raspberrypi/pico-micropython-examples)

# Developing Software

- Thonny (https://www.waveshare.com/w/upload/7/73/Thonny-3.3.3.zip)

# Download Firmware

- MicroPython Firmware Download

(/wiki/File:MicroPython_Firmware_Download.gif)

- C_Blink Firmware Download

(/wiki/File:C_Blink_Download.gif)

# Support

### If you require technical support, please go to the Support (https://support.waveshare.com/hc/en-us/requests/new) page and open a ticket.

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