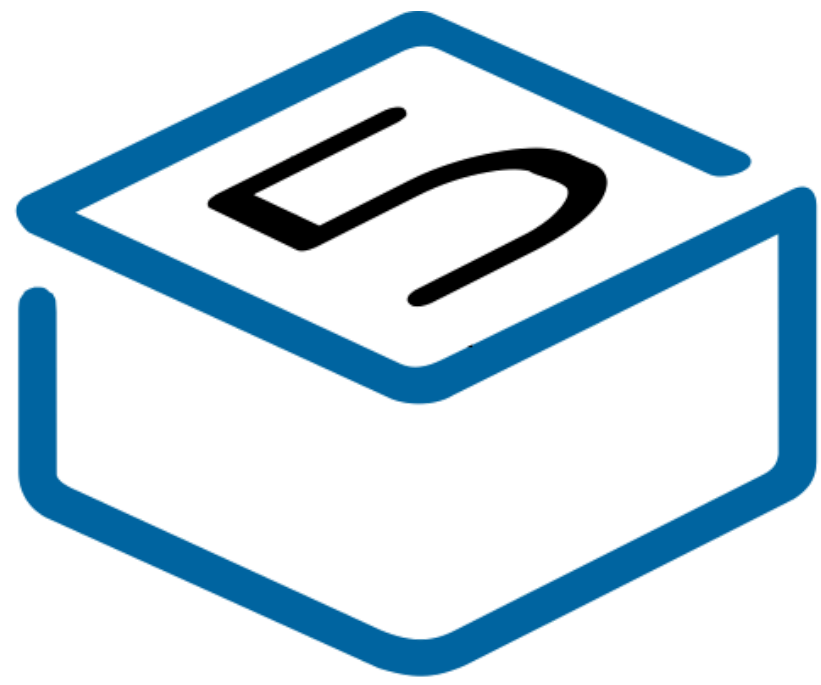
M5STACK

Cardputer



M5STACK

2024

CONTENTS

1.OUTLINE 3

1.1. **M5STACK Cardputer**.....3

2. SPECIFICATIONS.....4

3. QUICK START.....5

3.1. SCAN WIFI.....5

3.2 SCAN BLE Device.....5

1. OUTLINE

M5STACK Cardputer is a card-sized portable computer that is perfect for engineers. At the heart of Cardputer is the ESP32-S3FN8, a mini development board based on the ESP32-S3FN8 chip. Cardputer features a powerful dual-core processor, supports Wi-Fi functionality and integrates various peripherals and sensors, making it ideal for rapid functional verification, industrial control and home automation systems.

The 56-key keyboard and 1.14" TFT screen allow users to easily enter and view information. The on-board SPM1423 digital MEMS microphone and built-in speaker enable voice operations such as recording, wake-up and audio playback. The infrared emitter allows infrared control interaction with external devices such as TVs or air conditioners. And Cardputer offers a HY2.0-4P interface for expanding I2C sensors such as temperature and humidity sensors, light sensors and pressure sensors, which allows users to add different functional modules according to their needs and unleash their creativity. Cardputer also includes a Micro SD card slot for expanding storage space. Users can store program code, data files, images, audio and other resources on the Micro SD card.

The device is powered by an internal 120mAh+1400mAh (in the base) lithium battery solution, eliminating concerns about battery life. In addition, Cardputer has built-in battery charging and voltage regulation circuits that automatically adjust voltage and current to protect the battery and the device. The base of the Cardputer incorporates a magnet, allowing it to be attached to metal surfaces such as fridges or whiteboards. What’s more, Cardputer's structure is compatible with Lego hole extensions, allowing users to create even more interesting designs using Lego bricks.

1.1. M5STACK Cardputer

1. Communication Capabilities:
   - Main Controller: ESP32-S3FN8
   - Wireless Communication: WiFi (WIFI), OTG\CDC functionality
   - Infrared Emission: Infrared emitter for IR control
   - Expansion Interface: HY2.0-4P interface, can connect and expand I2C sensors
2. Processor and Performance:
   - Processor Model: Xtensa LX7 (ESP32-S3FN8)
   - Storage Capacity: 8M-FLASH
   - Processor Clock Speed: Xtensa® dual-core 32-bit LX7 microprocessor, up to 240 MHz
3. Memory:
   - Micro SD Card Expansion: Supported, for expanding storage space
4. GPIO Pins and Programmable Interfaces:
   - Grove Port: Can connect and expand I2C sensors

2. SPECIFICATIONS

Parameters & Specifications	Value
MCU	ESP32-S3FN8@Xtensa® dual-core 32-bit LX7, 240MHz
Communication Capabilities	WiFi, OTG\CDC function, Infrared transmitter, I2C sensor expansion
Storage Capacity	Micro SD card slot for expanding storage space
Flash Storage Capacity	8MB-FLASH
PSRAM Storage Capacity	N/A
Battery Capacity	120mAh + 1400mAh (in the base)
Screen	1.14-inch TFT screen, 240*135px
Audio	SPM1423 digital MEMS microphone, base speaker, IR transmitter
Buttons	56-key keyboard, G0 button on StampS3
Expansion Ports	Grove port for connecting and expanding I2C sensors
Dimensions	84 * 54 * 19.7mm
Operating Temperature	0°C to 40°C

3. QUICK START

3.1. Print WiFi information

1. Open the Arduino IDE
(refer to https://docs.m5stack.com/en/arduino/arduino_ide View the installation development board and software tutorial)
2. Select the M5Cardputer board and upload the code
3. The screen displays the scanned WiFi and the intensity information

cardputer_wifi_display

```ino
#include <M5Cardputer.h>
#include <WiFi.h>

void setup() {
    auto cfg = M5.config();
    M5Cardputer.begin(cfg);
    M5Cardputer.Display.setRotation(1);
    M5Cardputer.Display.setTextColor(GREEN);
//    M5Cardputer.Display.setTextDatum(middle_center);
    M5Cardputer.Display.setTextFont(&fonts::DejaVu9);
    M5Cardputer.Display.setTextSize(1);

    scanAndDisplayWiFiNetworks();
}

void loop() {
    M5Cardputer.update();
    // Additional logic can be added if needed
}

void scanAndDisplayWiFiNetworks() {
    int networksFound = WiFi.scanNetworks();

    if (networksFound == 0) {
        M5Cardputer.Display.setCursor(10, 10);
        M5Cardputer.Display.println("No WiFi networks found.");
    } else {
        M5Cardputer.Display.setCursor(10, 10);
        M5Cardputer.Display.println("WiFi Networks:");

        for (int i = 0; i < networksFound; ++i) {
            M5Cardputer.Display.print("SSID: ");
            M5Cardputer.Display.println(WiFi.SSID(i));
            M5Cardputer.Display.print("Signal Strength: ");
            M5Cardputer.Display.println(WiFi.RSSI(i));
            M5Cardputer.Display.println();
        }
    }
}
```

3. QUICK START

3.1. Print BLE information

1. Open the Arduino IDE
(refer to https://docs.m5stack.com/en/arduino/arduino_ide View the installation development board and software tutorial)
2. Select the M5Cardputer board and upload the code
3. The screen displays the scanned BLE device

cardputer_ble_displya | Arduino 1.8.19

File Edit Sketch Tools Help

cardputer_ble_displya

```
#include <M5Cardputer.h>
#include <BLEDevice.h>
#include <BLEUtils.h>
#include <BLEScan.h>

void setup() {
    auto cfg = M5.config();
    M5Cardputer.begin(cfg);
    M5Cardputer.Display.setRotation(1);
    M5Cardputer.Display.setTextColor(GREEN);
    M5Cardputer.Display.setTextFont(&fonts::DejaVu9);
    M5Cardputer.Display.setTextSize(1);

    scanAndDisplayBluetoothDevices();
}

void loop() {
    M5Cardputer.update();
    // Additional logic can be added if needed
}

void scanAndDisplayBluetoothDevices() {
    BLEDevice::init("");
    BLEScan* pBLEScan = BLEDevice::getScan();

    BLEScanResults foundDevices = pBLEScan->start(5);  // Scanning for 5 seconds, adjust as needed

    int devicesFound = foundDevices.getCount();  // Get the count of found devices

    if (devicesFound == 0) {
        M5Cardputer.Display.setCursor(10, 10);
        M5Cardputer.Display.println("No Bluetooth devices found.");
    } else {
        M5Cardputer.Display.setCursor(10, 10);
        M5Cardputer.Display.println("Bluetooth Devices:");

        for (int i = 0; i < devicesFound; ++i) {
            BLEAdvertisedDevice device = foundDevices.getDevice(i);
            M5Cardputer.Display.print("Name: ");
            if (device.getName().length() > 0) {
                M5Cardputer.Display.println(device.getName().c_str());
            } else {
                M5Cardputer.Display.println("Unknown");
            }
            M5Cardputer.Display.print("Address: ");
            M5Cardputer.Display.println(device.getAddress().toString().c_str());
            M5Cardputer.Display.println();
        }
    }
}
```

FCC Warning

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.

-Increase the separation between the equipment and receiver.

-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-Consult the dealer or an experienced radio/TV technician for help.

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.