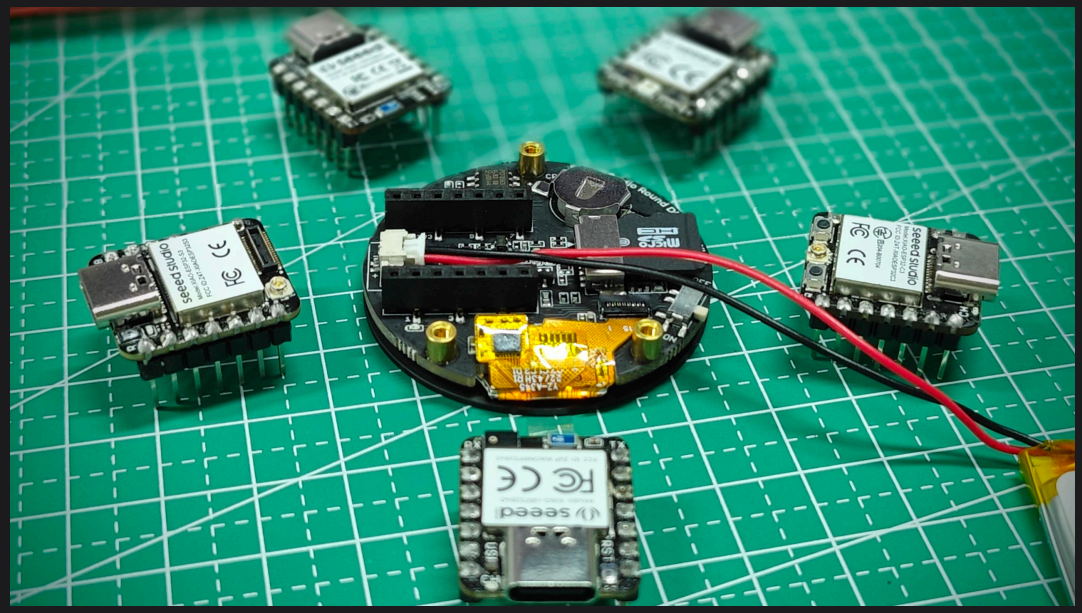
Use of the Seeed Studio Round Display extension



Get One Now

This tutorial will explain in detail how to use the extended functions on the Round Display, including the use of the RTC function, SD card function, and screen function.

Getting Started

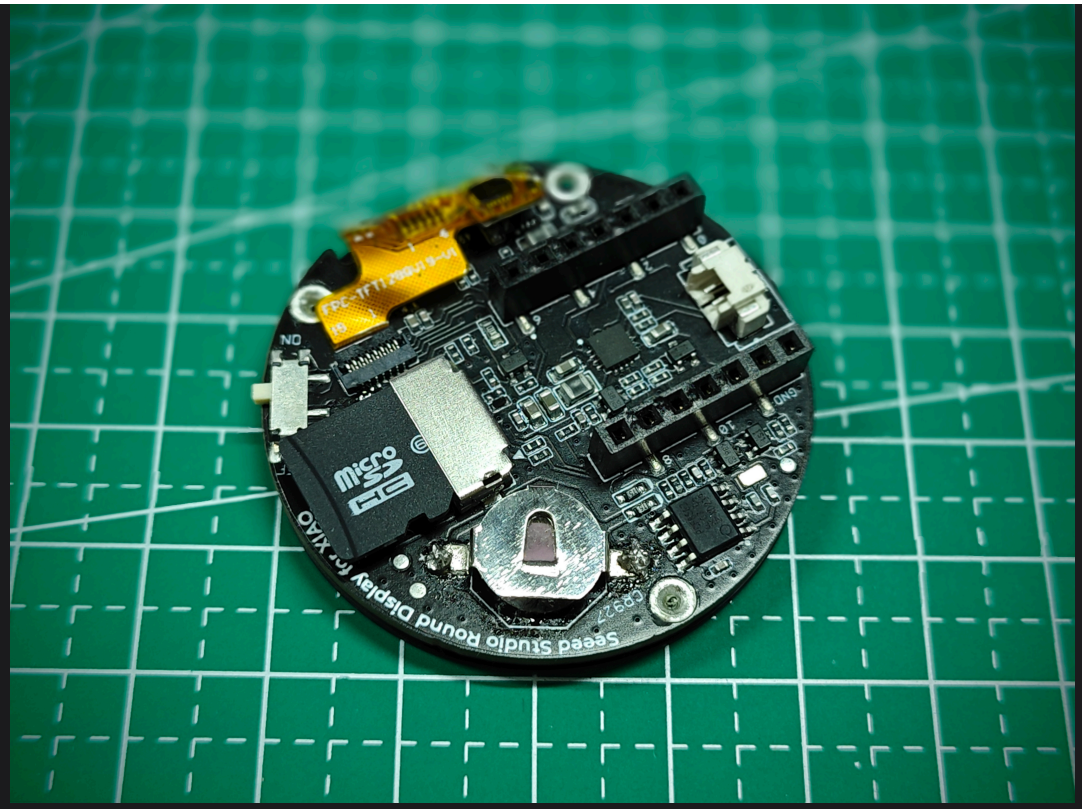
The content of this tutorial supports all XIAO series products. So you can use any XIAO to complete the content of this Wiki.

If you are using Round Display for the first time, you may want to read the prep content we wrote for it earlier and configure the library's environment according to this content to make sure you can use Round Display smoothly.

- **Prep for using Seeed Studio Round Display for XIAO**

Install a microSD card

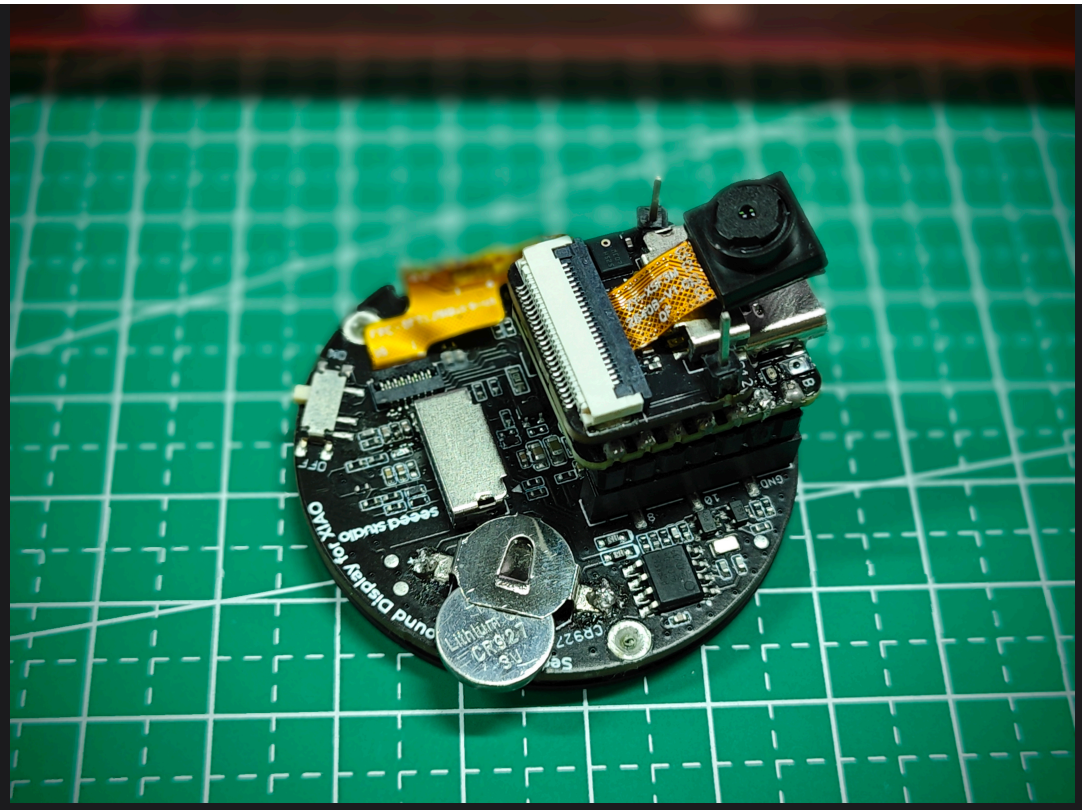
Round Display supports the use of microSD cards with **FAT32** format no larger than **32GB**. When installing a microSD card, the gold finger of the microSD card should be inserted towards the inside of the board.



Install the RTC battery

Round Display supports RTC function, and it has a built-in PCF8563T chip. If you need to use the RTC function, you may need a coin cell battery to keep the RTC working.

We recommend using CR927 series button cell batteries with the positive (flat) terminal facing outward and the negative (slightly protruding surface) facing inward when installed.

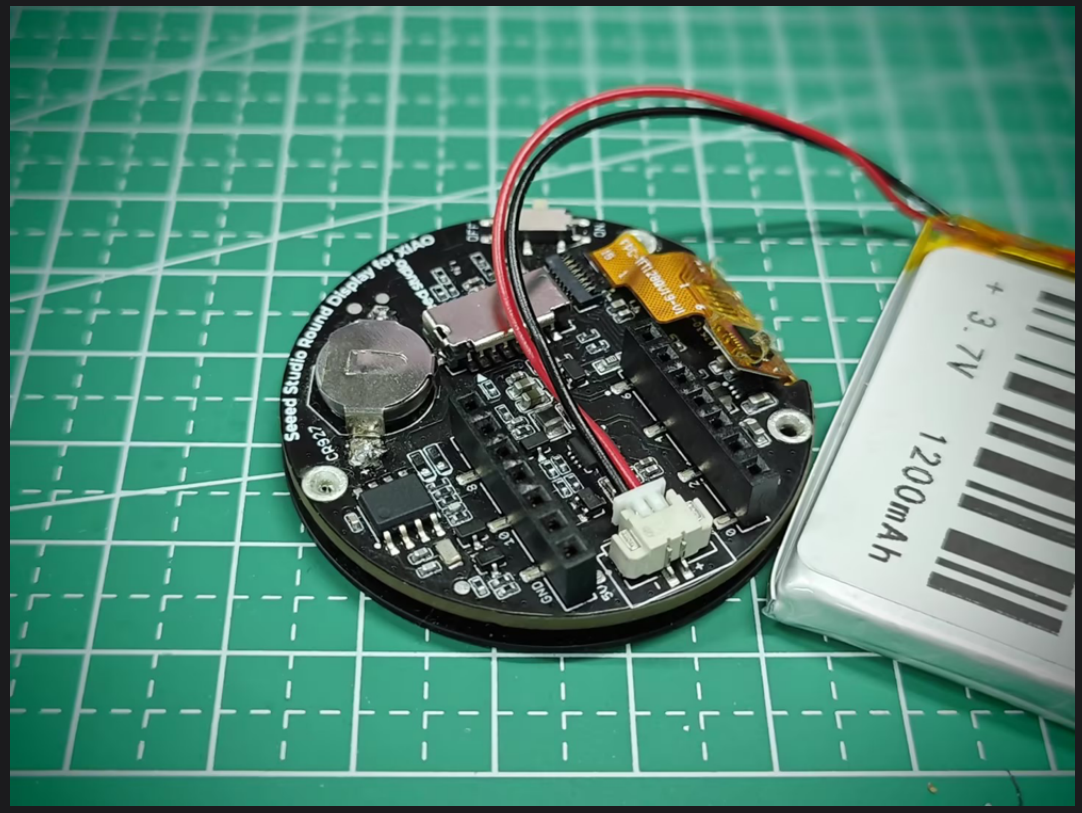


> **NOTE**
>
> The above picture only shows the battery installation direction, not fully installed battery. The correct installation of the battery should be fully inserted into the battery holder.

Install power supply battery

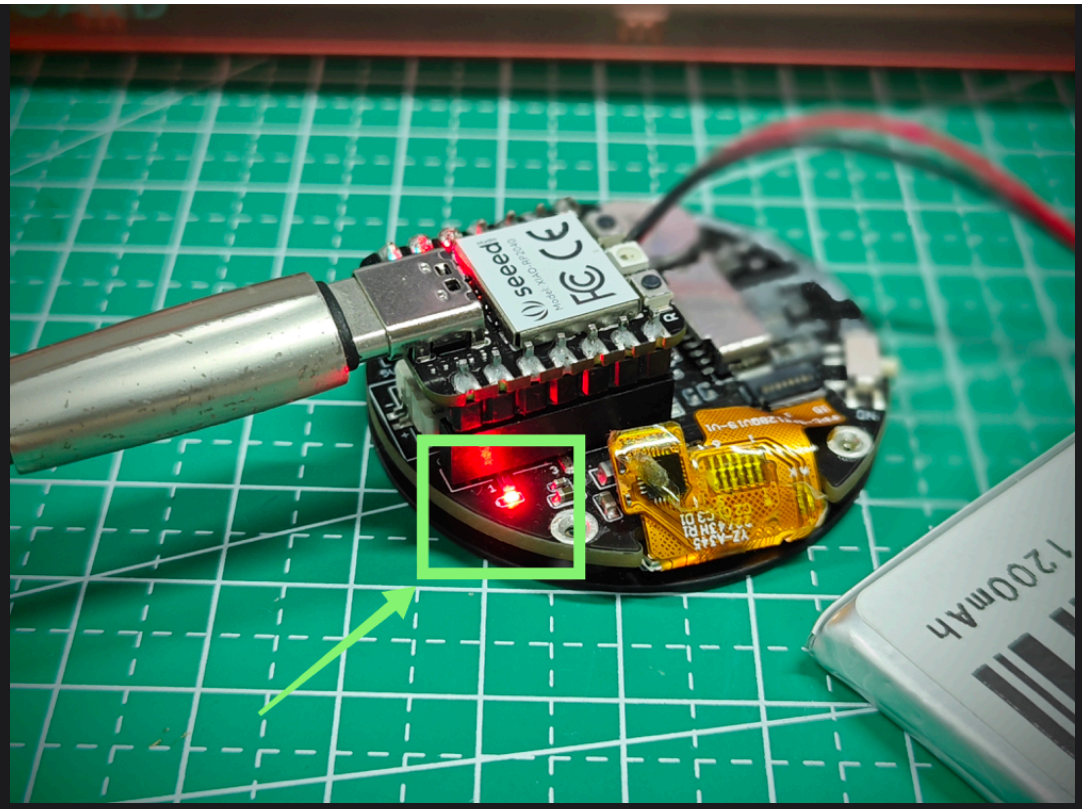
Round Display supports external 3.7V lithium battery. And with a built-in power management chip, the battery can be charged

through XIAO's USB port.



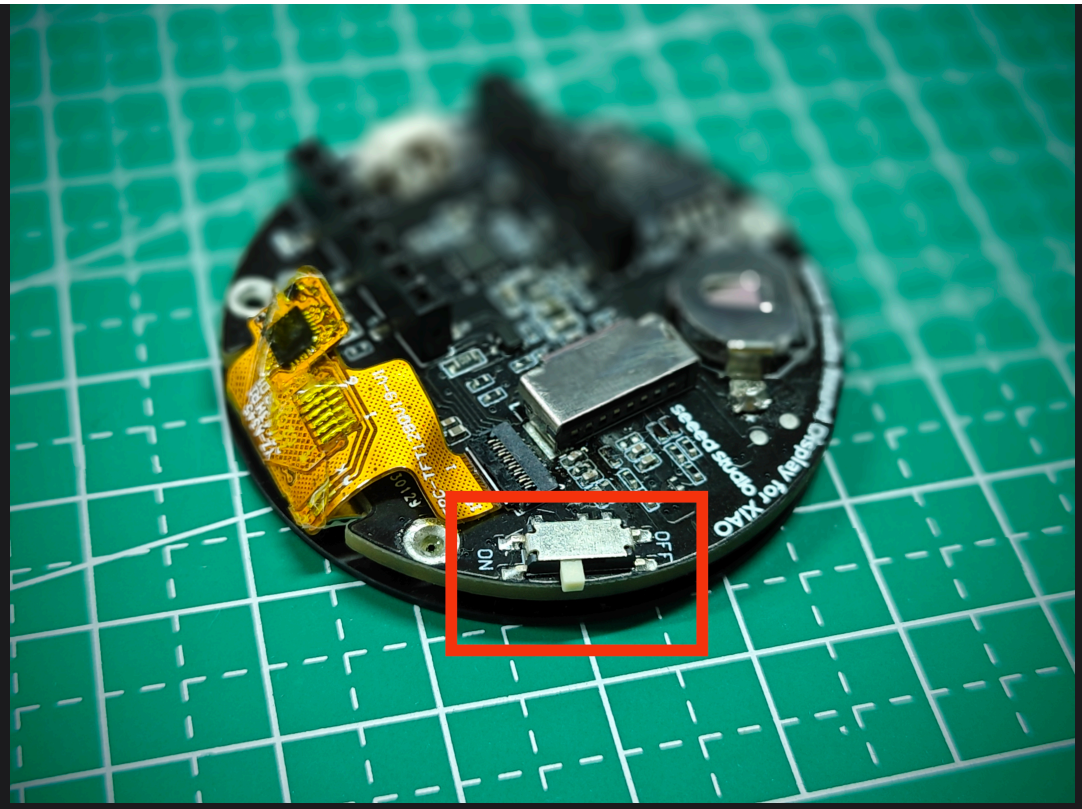
The Round Display also has a charging indicator. It has three states:

1. The indicator light is always on at low brightness when the lithium battery is not connected.
2. Connect the lithium battery and the red light is always on at high brightness when charging the lithium battery.
3. Lithium battery is connected and the light goes off when the battery is fully charged.



Round Display switch

There is also a switch on the Round Display. The switch is used to control the on/off of the display and the power supply to the XIAO. When you flip the switch to OFF, the battery will not power the XIAO and the display screen will turn off. When you turn the switch to ON, the display will light up and the battery will power the XIAO (provided that a power supply battery is installed) to ensure that the program runs.



NOTE

Powering the XIAO in the description here refers to powering the XIAO through the Round Display. If you are powering the XIAO directly, then the switch on the Round Display cannot disconnect the power to the XIAO. If you want to control the whole device through the switch on the Round Display, you need to install the power supply battery on the Round Display.

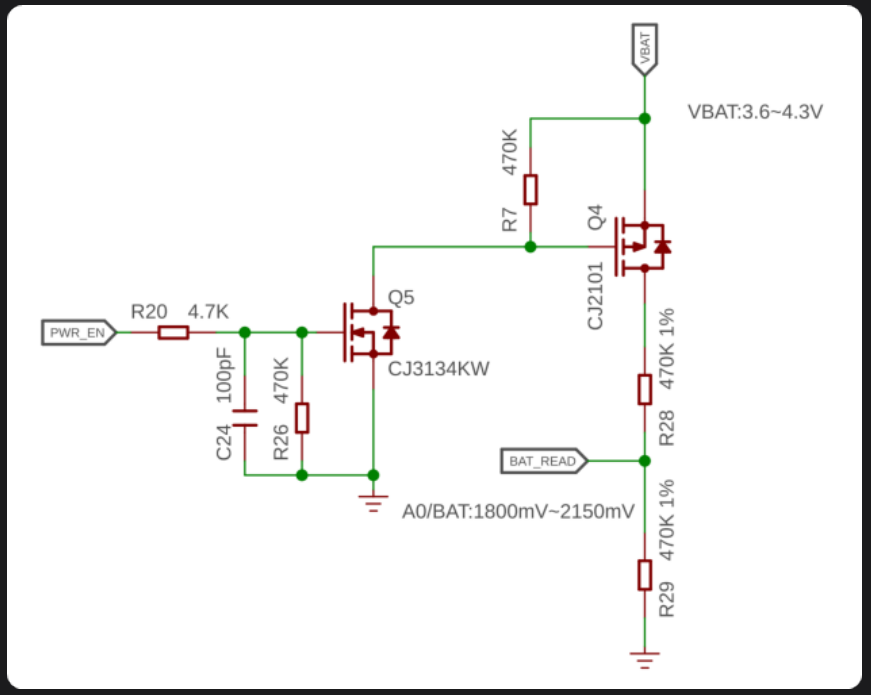
Also note that some XIAOs (such as the XIAO ESP32C3) may require a press of the Reset button on the XIAO to start working

when powering down and powering up again to run a program.

Round Display circuit design

In this section, we will intercept the circuit schematic of the hardware of Round Display and inform users which IO pins on XIAO are used in the hardware of Round Display to avoid conflicts in the use of IO.

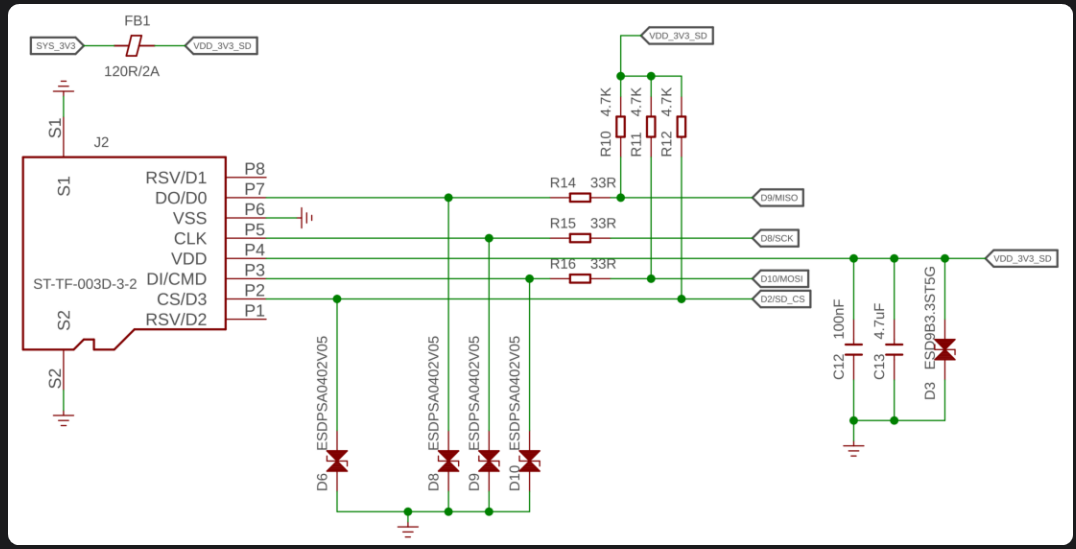
Measure battery voltage pins



For the design of the Round Display, we used the **A0/D0** pins on the XIAO to connect to the circuitry of the on-board battery. The

remaining battery charge can be obtained by reading the analog value of this pin.

SD card circuit pins

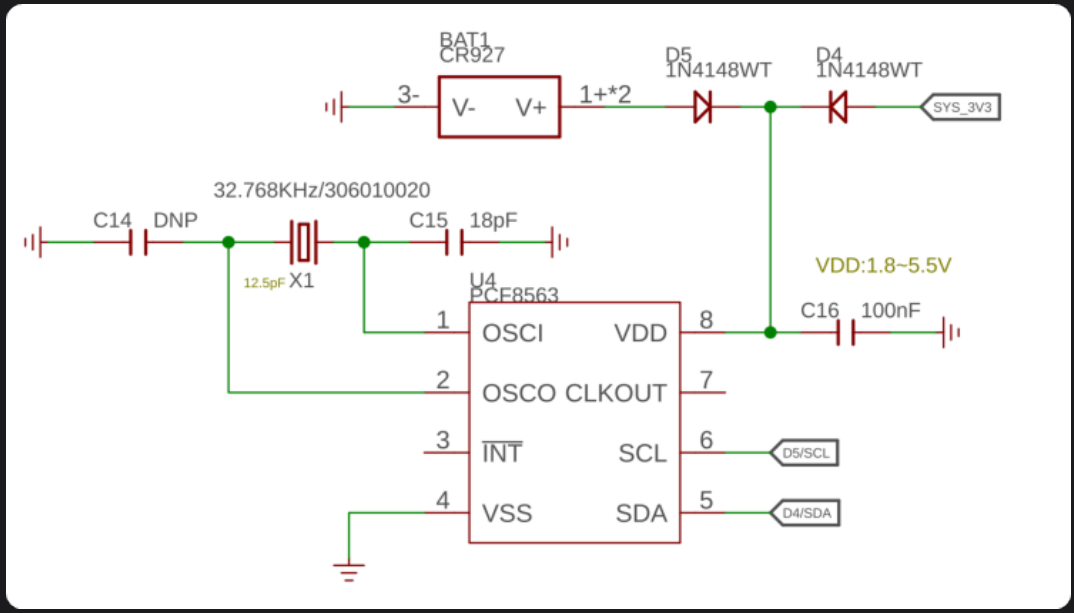


The SD card section uses the four IO ports on the XIAO, which are used as shown in the table below.

XIAO GPIO	microSD Card Slot
D2	CS
D8	SCK
D9	MISO

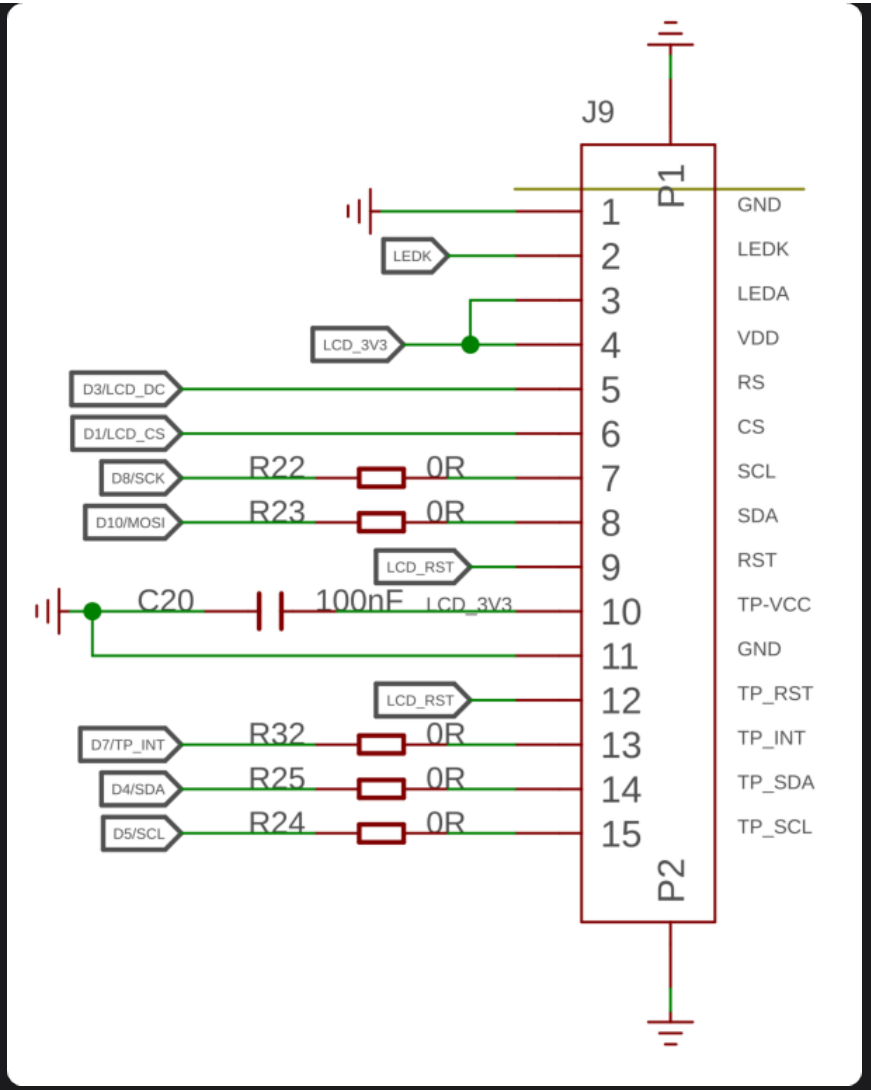
D10	MOSI

RTC circuit pins



The RTC function uses the IIC protocol, so it occupies the **D5 (SCL)** and **D4 (SDA)** pins.

Touch screen circuit pins



The touch screen section uses the four IO ports on the XIAO, which are used as shown in the table below.

XIAO GPIO	Touch screen

D4 (SDA)	Touch Screen IIC
D5 (SCL)	Touch Screen IIC
D3	LCD_DC
D1	LCD_CS
D7	TP_INT
D6	Screen backlight

Round Display library Overview

The vast majority of Round Display's software development is based on XIAO's own hardware support. The graphics are based on the TFT library, the LVGL library, and the Arduino GFX library.

In order to facilitate users to use the functions on Round Display, we wrote a separate library that mainly calls the interfaces of the above libraries to reduce the threshold of independent development by the users themselves when they arrive at a later stage. In this chapter, we will focus on what are the functions of these libraries that I prepared for Round Display and how to use them respectively.

Download the Libraries

lv_xiao_round_screen.h

The `lv_xiao_round_screen.h` file is a header file in the Round Display library, which drives the display and touch functions of the screen.

A macro definition check is made at the beginning of the file and is intended to require that developers using Round Display need to select the graphics library you want to develop when drawing screen patterns. There are two choices, **TFT** and **Arduino GFX**. if you choose the **TFT** library, then it is the one that can support **LVGL**.

```
#if defined(USE_TFT_ESPI_LIBRARY) &&
defined(USE_ARDUINO_GFX_LIBRARY)
#error "More than one graphics library is defined."
#elif defined(USE_TFT_ESPI_LIBRARY)
#include <TFT_eSPI.h>
TFT_eSPI tft = TFT_eSPI(SCREEN_WIDTH,
SCREEN_HEIGHT);
#elif defined(USE_ARDUINO_GFX_LIBRARY)
#include <Arduino_GFX_Library.h>
```

The reason for this design is that certain XIAO has its own advantages in drawing patterns on different graphic libraries. For example if you are using the XIAO nRF52840, then you may be more memory efficient and stable using the Arduino GFX library. For XIAO ESP32S3, a large memory XIAO has an inherent advantage in handling graphics libraries like LVGL, and is also able to draw more complex patterns and UI.

So if you need to draw a pattern using Round Display, don't forget to select the graphics library you want to use and define it at the beginning of your Arduino program.

- If you want to use the TFT library or the LVGL library:

```
#define USE_TFT_ESPI_LIBRARY
```

- If you want to use the Arduino GFX library:

```
#define USE_ARDUINO_GFX_LIBRARY
```

1. `void xiao_disp_init(void)`: This function is used to initialize the display backlight and rotate the display to its initial position, with the device display backplane color being solid black. This function is generally not used alone, and the `lv_xiao_disp_init()` function is used instead when

initialization is needed.

2. `void lv_xiao_disp_init(void)`: Initialize the backlight, and initialize the display driver. Typically used for display initialization.

3. `bool chsc6x_is_pressed(void)`: This function is used to check if the screen is touched, and returns `Ture` if the screen is touched.

4. `void lv_xiao_touch_init(void)`: This function is used to initialize the touch screen and its driver.

5. `void chsc6x_read( lv_indev_drv_t * indev_driver, lv_indev_data_t * data )`: This function is used to get the coordinate points of the touch screen.

lv_hardware_test.h

The `lv_hardware_test.h` file is the header file in the sample **HardwareTest** in the Round Display library. This header file prepares most of the hardware usage functions for Round Display.

If you want to use the functions inside this header file, you can copy the file directly to the same file directory of your Arduino file.

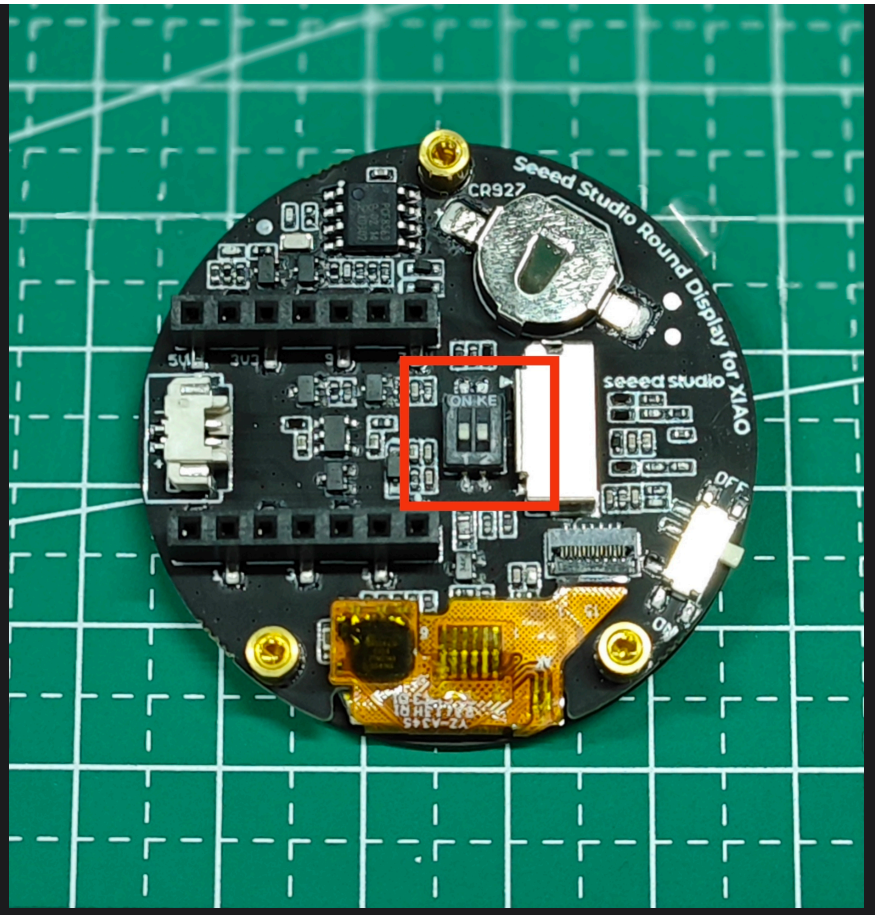
1. `int32_t battery_level_percent(void)` : By calling this function, you can read and calculate the battery charge percentage to display the battery level in the application.

2. `void lv_hardware_test(void)` : This function is used to test all hardware functions, including screen display, screen touch, RTC clock and battery level. You can refer to this function writing method to complete the development of the Round Display function you want.

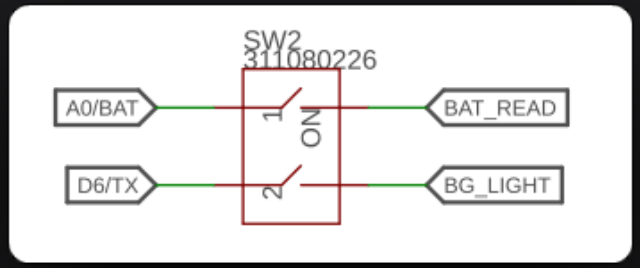
KE Button & GPIO

On the new version of the Round Display, we have designed a KE switch to selectively release certain GPIOs for selective use by the user.

The KE switch is designed in the middle of the microSD card slot and the row of pins that connect to the XIAO.



The circuit design for this switch is shown below.



This means that when the switch is closed **(toggled to the ON side)** then the Round Display's battery voltage reading function and display backlight function become available.

When the switch is disconnected **(toggled to the digital side)**, then pins A0 and D6 on the XIAO are the available states.

Measure battery voltage

Due to the lack of IO pins on the XIAO, the majority of XIAOs are unable to measure battery voltage, although the power management chip is configured on some XIAOs to allow external batteries.

But if you choose to use Round Dislay and power the XIAO through the screen, then measuring the battery voltage will become a reality.

The following is a sample program to measure the battery voltage. The function `battery_level_percent()` is selected from the `lv_hardware_test.h` file.

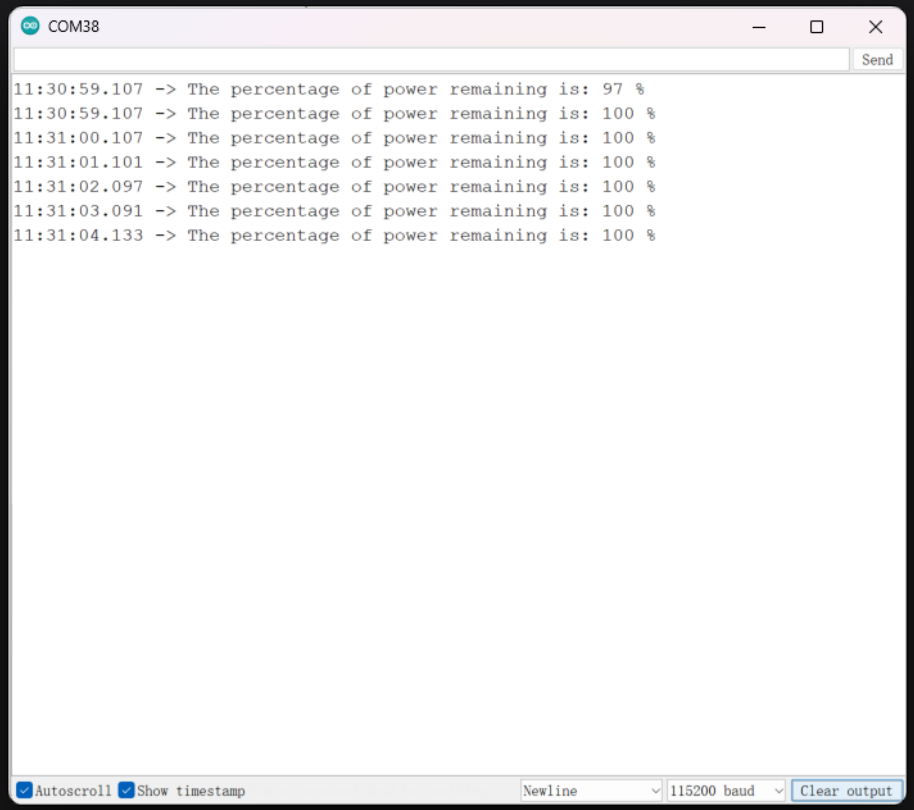
```
#define NUM_ADC_SAMPLE 20           // Sampling
frequency
#define RP2040_VREF 3300            // When you use
the XIAO RP2040, you need to measure the actual
voltage at the 3.3V pin and modify that value.
(unit: mV)
#define BATTERY_DEFICIT_VOL 1850    // Battery
voltage value at loss of charge
#define BATTERY_FULL_VOL 2450       // Battery
voltage value at full charge

int32_t battery_level_percent(void)
{
  int32_t mvolts = 0;
#if defined(CONFIG_IDF_TARGET_ESP32S3) ||
defined(CONFIG_IDF_TARGET_ESP32C3)
  for(int8_t i=0; i<NUM_ADC_SAMPLE; i++){
    mvolts += analogReadMilliVolts(D0);
  }
  mvolts /= NUM_ADC_SAMPLE;
#elif defined(ARDUINO_SEEED_XIAO_NRF52840_SENSE) ||
defined(ARDUINO_SEEED_XIAO_NRF52840)
  analogReference(AR_INTERNAL2V4);  // 0.6V ref
1/4 Gain
  int32_t adc_raw = 0;
  for(int8_t i=0; i<NUM_ADC_SAMPLE; i++){
```

```
    adc_raw += analogRead(D0);
  }
  adc_raw /= NUM_ADC_SAMPLE;
  mvolts = 2400 * adc_raw / (1<<12);
#elif defined(ARDUINO_SEEED_XIAO_RP2040)
  int32_t adc_raw = 0;
  for(int8_t i=0; i<NUM_ADC_SAMPLE; i++){
    adc_raw += analogRead(D0);
  }
  adc_raw /= NUM_ADC_SAMPLE;
  mvolts = RP2040_VREF * adc_raw / (1<<12);
#endif
  int32_t level = (mvolts - BATTERY_DEFICIT_VOL) *
100 / (BATTERY_FULL_VOL-BATTERY_DEFICIT_VOL); //
1850 ~ 2100
  level = (level<0) ? 0 : ((level>100) ? 100 :
level);
  return level;
}

void setup() {
  // put your setup code here, to run once:
  Serial.begin(115200);
  while(!Serial);

  analogReadResolution(12);
}

void loop() {
  // put your main code here, to run repeatedly:
  int32_t batteryVal = battery_level_percent();
```

```
  Serial.print("The percentage of power remaining
is: ");
  Serial.print(batteryVal);
  Serial.print(" %");
  Serial.println();
  delay(1000);
}
```

> **TIP**
>
> This program is not a universal program, and the measured battery percentage may not be accurate. This is because everyone uses different batteries and chips and development boards, so you may need to modify the program according to the actual situation when executing this program. Please refer to the program annotation section of this section for the method of modification.

Select the XIAO board you are using, upload the program, open the serial monitor, and set the baud rate to **115200**. If you have the battery connected and powered on, you should be able to see the battery voltage in the serial monitor.



Program annotation

This code uses an ADC to measure the battery voltage and calculate the battery level percentage. The implementation varies depending on the hardware platform:

- For ESP32-S3 and ESP32-C3 platforms, the `analogReadMilliVolts` function is used to read the analog voltage values, and then the average value of multiple samples is taken to obtain the average battery voltage.
- For Seeeduino XIAO NRF52840 platforms, the `analogReference` function is first used to specify the reference voltage as 2.4V, and then the analogRead function is used to read the analog voltage values, and the average battery voltage is calculated.
- For the Seeeduino XIAO RP2040 platform, the `analogRead` function is used to read the analog voltage values, and the average battery voltage is calculated.

In any case, the average battery voltage is calculated, and then the battery level percentage is calculated using the formula `(mvolts - BATTERY_DEFICIT_VOL) * 100 / (BATTERY_FULL_VOL - BATTERY_DEFICIT_VOL)`, where mvolts is the average battery voltage, `BATTERY_DEFICIT_VOL` is the minimum operating voltage of the battery, and `BATTERY_FULL_VOL` is the maximum voltage of the battery. Finally, the code limits the battery level percentage to ensure that it is between 0 and 100.

In summary, the following parameters determine the accuracy of the voltage measurement when using this program.

```
#define RP2040_VREF 3300            // When you use
the XIAO RP2040, you need to measure the actual
voltage at the 3.3V pin and modify that value.
(unit: mV)
#define BATTERY_DEFICIT_VOL 1850    // Battery
voltage value at loss of charge
#define BATTERY_FULL_VOL 2450       // Battery
voltage value at full charge
```

The first thing you need to do is to get the analog value of the battery you purchased when it is at a loss of charge/full charge.

You can get the analog value of the battery by using this function. You need to get the value once in both full and deficit battery states.

```
int32_t battery_test(void)
{
  int32_t mvolts = 0;
#if defined(CONFIG_IDF_TARGET_ESP32S3) ||
defined(CONFIG_IDF_TARGET_ESP32C3)
  for(int8_t i=0; i<NUM_ADC_SAMPLE; i++){
    mvolts += analogReadMilliVolts(D0);
  }
  mvolts /= NUM_ADC_SAMPLE;
#elif defined(ARDUINO_SEEED_XIAO_NRF52840_SENSE) ||
defined(ARDUINO_SEEED_XIAO_NRF52840)
  analogReference(AR_INTERNAL2V4);  // 0.6V ref
1/4 Gain
```

```
  int32_t adc_raw = 0;
  for(int8_t i=0; i<NUM_ADC_SAMPLE; i++){
    adc_raw += analogRead(D0);
  }
  adc_raw /= NUM_ADC_SAMPLE;
  mvolts = 2400 * adc_raw / (1<<12);
#elif defined(ARDUINO_SEEED_XIAO_RP2040)
  int32_t adc_raw = 0;
  for(int8_t i=0; i<NUM_ADC_SAMPLE; i++){
    adc_raw += analogRead(D0);
  }
  adc_raw /= NUM_ADC_SAMPLE;
  mvolts = RP2040_VREF * adc_raw / (1<<12);
#endif
  return mvolts;
}
```

TIP

The `battery_test()` function is actually the `battery_level_percent()` function with the last two lines of code to calculate the percentage removed.

Then just modify the value of the program corresponding to the value you measured.

If you are using the **XIAO RP2040**, then one additional step you will need to do is to use a voltmeter to measure the actual voltage on the

3.3V pin of the XIAO RP2040. The measured voltage value is converted into **mV** units, and the corresponding program is modified.

For example, here are the actual measurements I took using my XIAO RP2040 and battery.

```
#define RP2040_VREF 3080
#define BATTERY_DEFICIT_VOL 1541
#define BATTERY_FULL_VOL 1791
```

RTC function

RTC function part, we mainly divided into the following four sections to introduce its application.

1. First is for XIAO without network function, you can correct the RTC by manually setting the initial time.
2. Then power the RTC with the help of coin cell battery to get the accurate time continuously.
3. For XIAO with network function, you can use the network function to correct the time.
4. Draw a simple clock dial by combining the RTC function.

Off-line manual calibration of the RTC

The following is a sample program to manually calibrate the RTC time. The settings are placed in the `Setup()` function to ensure that the setup program is executed only once. This procedure is the most efficient way to set the initial RTC time for XIAO without network capability.

```
#include "I2C_BM8563.h"

I2C_BM8563 rtc(I2C_BM8563_DEFAULT_ADDRESS, Wire);

void setup() {
  // Init Serial
  Serial.begin(115200);
  while(!Serial);
  delay(50);

  // Init I2C
  Wire.begin();

  // Init RTC
  rtc.begin();

  // Set RTC Date
  I2C_BM8563_DateTypeDef dateStruct;
  dateStruct.weekDay = 3;
  dateStruct.month = 4;
  dateStruct.date = 26;
```

```
  dateStruct.year = 2023;
  rtc.setDate(&dateStruct);

  // Set RTC Time
  I2C_BM8563_TimeTypeDef timeStruct;
  timeStruct.hours   = 9;
  timeStruct.minutes = 43;
  timeStruct.seconds = 10;
  rtc.setTime(&timeStruct);

  Serial.println("RTC time calibration complete!");
}

void loop() {

}
```

After uploading the program and turning on the serial monitor, the RTC time will start to calibrate. When **RTC time calibration complete!** appears, calibration is complete.

Get RTC time

The following program gets the time of the RTC every second and prints it out in the serial monitor.

TIP

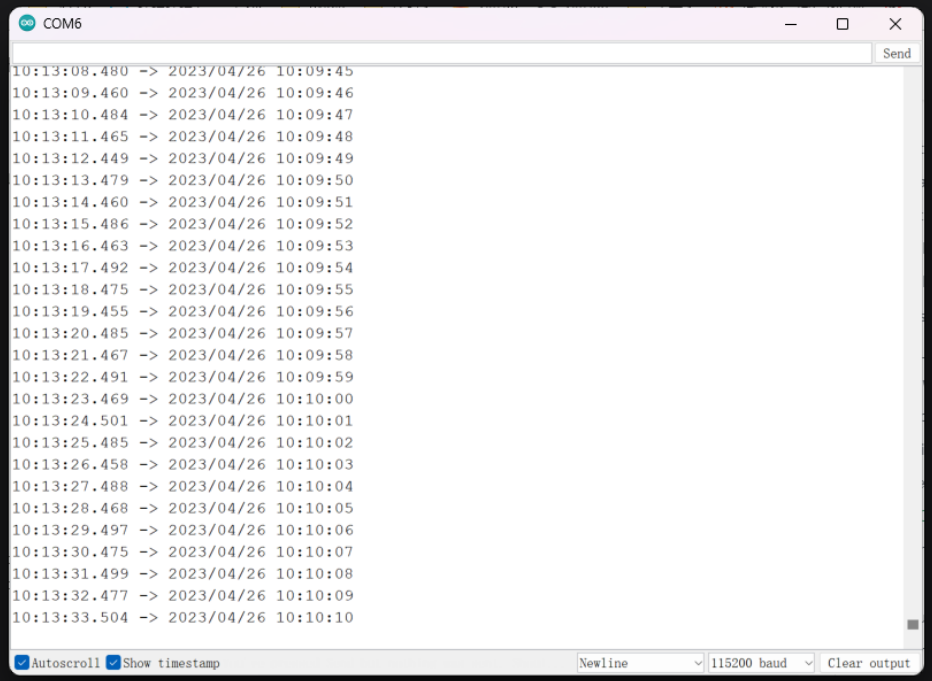
The procedure to obtain the RTC time can be used after the manual calibration procedure above. The time calibration procedure needs to be performed only once and the RTC clock will be able to work continuously under the power of the coin cell battery, after which you only need to use the procedure for obtaining the time to get the exact time.

We do not recommend to use the program to calibrate the time and get the time together, so that when the XIAO is powered up, both will reset once according to the time you configured, then you will never get the accurate time.

```
#include "I2C_BM8563.h"

I2C_BM8563 rtc(I2C_BM8563_DEFAULT_ADDRESS, Wire);

void setup() {
  // Init Serial
  Serial.begin(115200);
  delay(50);

  // Init I2C
  Wire.begin();

  // Init RTC
  rtc.begin();
}
```

```
void loop() {
  I2C_BM8563_DateTypeDef dateStruct;
  I2C_BM8563_TimeTypeDef timeStruct;

  // Get RTC
  rtc.getDate(&dateStruct);
  rtc.getTime(&timeStruct);

  // Print RTC
#if defined(CONFIG_IDF_TARGET_ESP32S3) ||
defined(CONFIG_IDF_TARGET_ESP32C3)
  Serial.printf("%04d/%02d/%02d %02d:%02d:%02d\n",
                dateStruct.year,
                dateStruct.month,
                dateStruct.date,
                timeStruct.hours,
                timeStruct.minutes,
                timeStruct.seconds
                );
#else
  Serial.print(dateStruct.year);
  Serial.print(", ");
  Serial.print(dateStruct.month);
  Serial.print(", ");
  Serial.print(dateStruct.date);
  Serial.print(", ");
  Serial.print(timeStruct.hours);
  Serial.print(", ");
  Serial.print(timeStruct.minutes);
  Serial.print(", ");
  Serial.print(timeStruct.seconds);
```

```
  Serial.println();
#endif

  // Wait
  delay(1000);
}
```



Network calibration RTC time

For XIAO, which has network capabilities, things seem to get a lot easier. With a network, you don't even need to use a coin cell battery to keep the RTC working out of the box, you just need to network the timing every time you power it up.

The following is a sample program for network timing and outputting the RTC time reading on the serial monitor.

> **CAUTION**
>
> This program is only applicable to XIAO ESP32 series. Because only this series has network function.

```
#include "I2C_BM8563.h"
#include <WiFi.h>

I2C_BM8563 rtc(I2C_BM8563_DEFAULT_ADDRESS, Wire);

const char* ntpServer = "time.cloudflare.com";
const char *ssid     = "YOUR_SSID";
const char *password = "YOUR_PASSWORD";

void setup() {
  // Init Serial
  Serial.begin(115200);
  delay(50);

  // Connect to an access point
```

```
  WiFi.begin(ssid, password);
  Serial.print("Connecting to Wi-Fi ");
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }
  Serial.println(" CONNECTED");

  // Set ntp time to local
  configTime(9 * 3600, 0, ntpServer);

  // Init I2C
  Wire.begin();

  // Init RTC
  rtc.begin();

  // Get local time
  struct tm timeInfo;
  if (getLocalTime(&timeInfo)) {
    // Set RTC time
    I2C_BM8563_TimeTypeDef timeStruct;
    timeStruct.hours   = timeInfo.tm_hour;
    timeStruct.minutes = timeInfo.tm_min;
    timeStruct.seconds = timeInfo.tm_sec;
    rtc.setTime(&timeStruct);

    // Set RTC Date
    I2C_BM8563_DateTypeDef dateStruct;
    dateStruct.weekDay = timeInfo.tm_wday;
    dateStruct.month   = timeInfo.tm_mon + 1;
```

```
    dateStruct.date    = timeInfo.tm_mday;
    dateStruct.year    = timeInfo.tm_year + 1900;
    rtc.setDate(&dateStruct);
  }
}

void loop() {
  I2C_BM8563_DateTypeDef dateStruct;
  I2C_BM8563_TimeTypeDef timeStruct;

  // Get RTC
  rtc.getDate(&dateStruct);
  rtc.getTime(&timeStruct);

  // Print RTC
#if defined(CONFIG_IDF_TARGET_ESP32S3) ||
defined(CONFIG_IDF_TARGET_ESP32C3)
    Serial.printf("%04d/%02d/%02d
%02d:%02d:%02d\n",
                  dateStruct.year,
                  dateStruct.month,
                  dateStruct.date,
                  timeStruct.hours,
                  timeStruct.minutes,
                  timeStruct.seconds
                 );
#else
     Serial.print(dateStruct.year);
     Serial.print(", ");
     Serial.print(dateStruct.month);
     Serial.print(", ");
```

```
      Serial.print(dateStruct.date);
      Serial.print(", ");
      Serial.print(timeStruct.hours);
      Serial.print(", ");
      Serial.print(timeStruct.minutes);
      Serial.print(", ");
      Serial.print(timeStruct.seconds);
      Serial.println();
#endif

  // Wait
  delay(1000);
}
```

When you use this program, please fill in the name and password of the network according to your actual situation. After uploading the program, open the serial monitor and set the baud rate to 115200, then you can see the exact time.

Simple dial based on RTC time

The following program is a dial program based on RTC clock drawing.

> ⚠ **CAUTION**

The following program is only compatible with XIAO except for XIAO nRF52840. XIAO nRF52840 currently has problems with TFT compatibility. But you may consider using the Arduino GFX library or LVGL to draw the dials.

```
#include <Arduino.h>
#include <TFT_eSPI.h>
#include <SPI.h>
#include "I2C_BM8563.h"
#include <Wire.h>

#define USE_TFT_ESPI_LIBRARY

#include "lv_xiao_round_screen.h"

I2C_BM8563 rtc(I2C_BM8563_DEFAULT_ADDRESS, Wire);

#if defined(CONFIG_IDF_TARGET_ESP32S3) ||
defined(CONFIG_IDF_TARGET_ESP32C3)
#include "esp_wifi.h"
#include "WiFi.h"

  const char *ntpServer = "time.cloudflare.com";
  const char *ssid     = "YOUR_SSID";
  const char *password = "YOUR_PASSWORD";
#elif defined(ARDUINO_SEEED_XIAO_NRF52840_SENSE) ||
defined(ARDUINO_SEEED_XIAO_NRF52840)
#error "This procedure is not applicable to XIAO nRF5
replace other XIAO and try again."
```

```
#endif


//TFT_eSPI tft = TFT_eSPI();  // Invoke library, pins
User_Setup.h
TFT_eSprite face = TFT_eSprite(&tft);

#define CLOCK_X_POS 0
#define CLOCK_Y_POS 0

#define CLOCK_FG   TFT_SKYBLUE
#define CLOCK_BG   TFT_NAVY
#define SECCOND_FG TFT_RED
#define LABEL_FG   TFT_GOLD

#define CLOCK_R       240.0f / 2.0f // Clock face radi
#define H_HAND_LENGTH CLOCK_R/2.0f
#define M_HAND_LENGTH CLOCK_R/1.4f
#define S_HAND_LENGTH CLOCK_R/1.3f

// Calculate 1 second increment angles. Hours and minu
// change every second so we see smooth sub-pixel move
#define SECOND_ANGLE 360.0 / 60.0
#define MINUTE_ANGLE SECOND_ANGLE / 60.0
#define HOUR_ANGLE   MINUTE_ANGLE / 12.0

// Sprite width and height
#define FACE_W CLOCK_R * 2 + 1
#define FACE_H CLOCK_R * 2 + 1

// Time h:m:s
```

```
uint8_t h = 0, m = 0, s = 0;

float time_secs = h * 3600 + m * 60 + s;

// Time for next tick
uint32_t targetTime = 0;

//
================================================================
// Setup
//
================================================================
void setup() {
  Serial.begin(115200);
  Serial.println("Booting...");

  // Initialise the screen
  tft.init();

  // Ideally set orientation for good viewing angle ra
  // the anti-aliasing effectiveness varies with scree
  // Usually this is when screen ribbon connector is a
  tft.setRotation(0);
  tft.fillScreen(TFT_BLACK);

  // Create the clock face sprite
  //face.setColorDepth(8); // 8 bit will work, but req
of anti-aliasing
  face.createSprite(FACE_W, FACE_H);

  // Draw the whole clock - NTP time not available yet
```

```
  renderFace(time_secs);

#if defined(CONFIG_IDF_TARGET_ESP32S3) ||
defined(CONFIG_IDF_TARGET_ESP32C3)
  WiFi.begin(ssid, password);
  while ( WiFi.status() != WL_CONNECTED )
  {
    delay ( 500 );
    Serial.print ( "." );
  }
  configTime(8 * 3600, 0, ntpServer);
#endif

  Wire.begin();
  rtc.begin();

//  struct tm timeInfo;
  I2C_BM8563_TimeTypeDef timeStruct;
  I2C_BM8563_DateTypeDef dateStruct;

// In case of XIAO ESP32 series, use network timing.
#if defined(CONFIG_IDF_TARGET_ESP32S3) ||
defined(CONFIG_IDF_TARGET_ESP32C3)
  struct tm timeInfo;
  if (getLocalTime(&timeInfo)) {
    timeStruct.hours   = timeInfo.tm_hour;
    timeStruct.minutes = timeInfo.tm_min;
    timeStruct.seconds = timeInfo.tm_sec;
    rtc.setTime(&timeStruct);
  }
#else
```

```
  // Set RTC time, Other XIAOs do not have network fu
manual time alignment.
  // Please note that the setting time should be set 
  timeStruct.hours   = 9;
  timeStruct.minutes = 43;
  timeStruct.seconds = 10;
  rtc.setTime(&timeStruct);
#endif

  targetTime = millis() + 100;
  rtc.getTime(&timeStruct);
  time_secs = timeStruct.hours * 3600 + timeStruct.mi
timeStruct.seconds;
}

//
================================================
// Loop
//
================================================
void loop() {
  // Update time periodically
  if (targetTime < millis()) {

    // Update next tick time in 100 milliseconds for 
    targetTime = millis() + 100;

    // Increment time by 100 milliseconds
    time_secs += 0.100;

    // Midnight roll-over
```

```
    if (time_secs >= (60 * 60 * 24)) time_secs = 0;

    // All graphics are drawn in sprite to stop flicke
    renderFace(time_secs);

    I2C_BM8563_DateTypeDef dateStruct;
    I2C_BM8563_TimeTypeDef timeStruct;

    // Get RTC
    rtc.getTime(&timeStruct);

    // Print RTC
#if defined(CONFIG_IDF_TARGET_ESP32S3) ||
defined(CONFIG_IDF_TARGET_ESP32C3)
    Serial.printf("%02d:%02d:%02d\n",
                  timeStruct.hours,
                  timeStruct.minutes,
                  timeStruct.seconds
                 );
#else
     Serial.print(timeStruct.hours);
     Serial.print(", ");
     Serial.print(timeStruct.minutes);
     Serial.print(", ");
     Serial.print(timeStruct.seconds);
     Serial.println();
#endif
  }
}

//
```

```
//============================================================
// Draw the clock face in the sprite
//
//============================================================
static void renderFace(float t) {
  float h_angle = t * HOUR_ANGLE;
  float m_angle = t * MINUTE_ANGLE;
  float s_angle = t * SECOND_ANGLE;

  // The face is completely redrawn - this can be done
  face.fillSprite(TFT_BLACK);

  // Draw the face circle
  face.fillSmoothCircle( CLOCK_R, CLOCK_R, CLOCK_R, CL

  // Set text datum to middle centre and the colour
  face.setTextDatum(MC_DATUM);

  // The background colour will be read during the cha
  face.setTextColor(CLOCK_FG, CLOCK_BG);

  // Text offset adjustment
  constexpr uint32_t dialOffset = CLOCK_R - 10;

  float xp = 0.0, yp = 0.0; // Use float pixel positio
motion

  // Draw digits around clock perimeter
  for (uint32_t h = 1; h <= 12; h++) {
    getCoord(CLOCK_R, CLOCK_R, &xp, &yp, dialOffset, h
    face.drawNumber(h, xp, 2 + yp);
```

```
  }

  // Add text (could be digital time...)
  face.setTextColor(LABEL_FG, CLOCK_BG);
  face.drawString("TFT_eSPI", CLOCK_R, CLOCK_R * 0.75

  // Draw minute hand
  getCoord(CLOCK_R, CLOCK_R, &xp, &yp, M_HAND_LENGTH,
  face.drawWideLine(CLOCK_R, CLOCK_R, xp, yp, 6.0f, CL
  face.drawWideLine(CLOCK_R, CLOCK_R, xp, yp, 2.0f, CL

  // Draw hour hand
  getCoord(CLOCK_R, CLOCK_R, &xp, &yp, H_HAND_LENGTH,
  face.drawWideLine(CLOCK_R, CLOCK_R, xp, yp, 6.0f, CL
  face.drawWideLine(CLOCK_R, CLOCK_R, xp, yp, 2.0f, CL

  // Draw the central pivot circle
  face.fillSmoothCircle(CLOCK_R, CLOCK_R, 4, CLOCK_FG

  // Draw cecond hand
  getCoord(CLOCK_R, CLOCK_R, &xp, &yp, S_HAND_LENGTH,
  face.drawWedgeLine(CLOCK_R, CLOCK_R, xp, yp, 2.5, 1
  face.pushSprite(0, 0, TFT_TRANSPARENT);
}

//
================================================
// Get coordinates of end of a line, pivot at x,y, len
//
================================================
// Coordinates are returned to caller via the xp and y
```

```
#define DEG2RAD 0.0174532925
void getCoord(int16_t x, int16_t y, float *xp, float *
float a)
{
  float sx1 = cos( (a - 90) * DEG2RAD);
  float sy1 = sin( (a - 90) * DEG2RAD);
  *xp =  sx1 * r + x;
  *yp =  sy1 * r + y;
}
```

The above code you will need to make some minor modifications depending on the type of development board you are using. If you are using an XIAO with networking capabilities, you will need to configure the WiFi name and password. If not, you need to manually adjust the real time.

Upload the program and you will see the dial that automatically goes according to the set time.

SD card function

The Round Display supports the use of microSD cards to read and write data. Before using the microSD card, please format the microSD card to **FAT32** format to make sure it can be recognized

and used properly.

All XIAO series (In addition to the XIAO nRF52840 series)

This section applies to all of XIAO (In addition to the XIAO nRF52840 series), which is a simple program for reading and writing files.

```
#include <SPI.h>
#include <SD.h>
#include <TFT_eSPI.h>

TFT_eSPI tft = TFT_eSPI();

File myFile;

void setup() {
  // Open serial communications and wait for port
to open:
  Serial.begin(115200);
  while(!Serial);

  // Display initialization
  tft.init();

  Serial.print("Initializing SD card...");

  pinMode(D2, OUTPUT);
  if (!SD.begin(D2)) {
```

```
    Serial.println("initialization failed!");
    return;
  }
  Serial.println("initialization done.");

  // open the file. note that only one file can be
open at a time,
  // so you have to close this one before opening
another.
  myFile = SD.open("/test.txt", FILE_WRITE);

  // if the file opened okay, write to it:
  if (myFile) {
    Serial.print("Writing to test.txt...");
    myFile.println("testing 1, 2, 3.");
    // close the file:
    myFile.close();
    Serial.println("done.");
  } else {
    // if the file didn't open, print an error:
    Serial.println("error opening test.txt");
  }

  // re-open the file for reading:
  myFile = SD.open("/test.txt");
  if (myFile) {
    Serial.println("test.txt:");

    // read from the file until there's nothing
else in it:
    while (myFile.available()) {
```

```
      Serial.write(myFile.read());
    }
    // close the file:
    myFile.close();
  } else {
    // if the file didn't open, print an error:
    Serial.println("error opening test.txt");
  }
}

void loop() {
  // nothing happens after setup
}
```

This program will create a new program called **test.txt** on your microSD card and write the contents of **testing 1, 2, 3.**. Finally, it reads the file and prints out the contents of the file through the serial monitor.

> **CAUTION**
>
> You will find that the screen TFT initialization is used in the program for the SD card. Please do not think that this is useless and can be removed, but in fact it is necessary to use the SD card, otherwise you will get an error message that the microSD card failed to mount.

Due to the hardware design, some of the pins are low by default, which will cause the microSD mount program to think there is no pull-up resistor causing the mount to fail. So when using the SD card function with Round Display, please make sure to initialize the screen display before initializing the SD card.

XIAO nRF52840

If you are using the XIAO nRF52840 series then you may need to download the SdFat library separately in order to use the SD card function.

```
#include <SPI.h>
#include "SdFat.h"
#include <TFT_eSPI.h>

TFT_eSPI tft = TFT_eSPI();
SdFat SD;

#define SD_CS_PIN D2
File myFile;

void setup() {
  // Open serial communications and wait for port
to open:
  Serial.begin(9600);
```

```
  while (!Serial) {
    ; // wait for serial port to connect. Needed
for native USB port only
  }

  // Display initialization
  tft.init();

  Serial.print("Initializing SD card...");

  if (!SD.begin(SD_CS_PIN)) {
    Serial.println("initialization failed!");
    return;
  }
  Serial.println("initialization done.");

  // open the file. note that only one file can be
open at a time,
  // so you have to close this one before opening
another.
  myFile = SD.open("/test.txt", FILE_WRITE);

  // if the file opened okay, write to it:
  if (myFile) {
    Serial.print("Writing to test.txt...");
    myFile.println("testing 1, 2, 3.");
    // close the file:
    myFile.close();
    Serial.println("done.");
  } else {
    // if the file didn't open, print an error:
```

```
    Serial.println("error opening test.txt");
  }

  // re-open the file for reading:
  myFile = SD.open("test.txt");
  if (myFile) {
    Serial.println("test.txt:");

    // read from the file until there's nothing
else in it:
    while (myFile.available()) {
      Serial.write(myFile.read());
    }
    // close the file:
    myFile.close();
  } else {
    // if the file didn't open, print an error:
    Serial.println("error opening test.txt");
  }
}

void loop() {
  // nothing happens after setup
}
```

XIAO ESP32S3 & XIAO ESP32S3 Sense & XIAO ESP32C3

Since the ESP32 series has very powerful file system support, we

have written a series of examples for the XIAO ESP32 on how to use the file system and save the microSD card, which you can learn to use in the links below.

- **File System and XIAO ESP32S3 Sense**

The tutorials in this Wiki apply to the XIAO ESP32 series, but since you now want to use the Round Display's SD card slot, and the above tutorial focuses on using the SD card slot on the XIAO ESP32S3 Sense, you will need to modify the initialization of the SD card to the line below.

```
// Display initialization
tft.init();

pinMode(D2, OUTPUT);
SD.begin(D2);
```

> **TIP**
>
> Don't forget that you also need to initialize the TFT screen first to use the SD card function.

Screen function

In the use part of the screen, the two main components are divided into touch and display.

Touch function

Touch function is a special feature of Round Display. You can use the touch function to perform some tap-and-hold display operations.

The following program can be used to output the result of whether the display was touched or not.

```
#define USE_TFT_ESPI_LIBRARY
#include "lv_xiao_round_screen.h"

void setup() {
  // put your setup code here, to run once:
  Serial.begin(115200);
  pinMode(TOUCH_INT, INPUT_PULLUP);
  Wire.begin();
}

void loop() {
  // put your main code here, to run repeatedly:
  if(chsc6x_is_pressed()){
    Serial.println("The display is touched.");
  }
  else
    Serial.println("The display is not touched.");
  delay(50);
```

```
}
```

The following program is a simple example of a touch function combined with a display function. Upload the following program and then tap the screen, a small circle will be drawn at the location where the screen is tapped.

> **CAUTION**
>
> If you are using XIAO nRF52840, then the following program based on TFT library display may not work properly, you need to modify the program to use Arduino GFX library.

```
#include <TFT_eSPI.h>
#include <SPI.h>
#define USE_TFT_ESPI_LIBRARY
#include "lv_xiao_round_screen.h"

lv_coord_t touchX, touchY;

void setup() {
  // put your setup code here, to run once:
  Serial.begin(115200);

  pinMode(TOUCH_INT, INPUT_PULLUP);
  Wire.begin();

  // Initialise the screen
```

```
  tft.init();

  tft.setRotation(0);
  tft.fillScreen(TFT_BLACK);
}

void loop() {
  // put your main code here, to run repeatedly:
  if(chsc6x_is_pressed())
  {
    Serial.println("The display is touched.");
    chsc6x_get_xy(&touchX, &touchY);
    tft.drawCircle(touchX, touchY, 15, TFT_WHITE);
  }

  delay(50);
}
```

Display Functions

About the display part, we mainly introduce the use of LVGL library and TFT library. Due to the space issue, we will go into details on how to draw complex dials using the supported graphics libraries in a new Wiki.

Using LVGL and TFT on the Seeed Studio Round Display for XIAO

Of course, if you just want to implement some simple examples, the graphics library also has a very rich set of examples for your reference use.

- TFT library example
- Arduino GFX library example
- LVGL library example

If you already have these libraries installed, you can easily find the examples inside **File->Example->library name** on the Arduino IDE.

> **TIP**
>
> The examples here are for reference only and not every example will necessarily work. You may need to modify the program to be compatible with the Round Display pinout and hardware definition.

Tech Support & Product Discussion

Q1: Why do I get an error when I use XIAO nRF52840 (Sense)?

When using the content of this tutorial, two different types of problems may occur for the XIAO nRF52840.

1. Compatibility issues between nRF52840 and TFT library.

   If you are using TFT library, compile and upload without any error, very smooth. But when you are displaying it, you find that there is no image. Then you may have encountered a compatibility issue between nRF52840 and TFT library. This means you can only replace XIAO or use Arduino GFX library to finish the image.

2. Compilation error caused by choosing the wrong development board.

If you are having problems with the compilation process. The error message is usually about an SPI error, for example `'SPI_X' was not declared in this scope` . Then it means that you are choosing the wrong type of development board. To use all of this tutorial, you need to use the **non-mbed** version of the XIAO nRF52840. -->

Q2: When uploading a program for XIAO RP2040, an error occurs: unaligned opcodes detected in executable segment?

Please modify the upload options of XIAO RP2040 according to the settings in the image below. All options work fine except the default **Small (-Os) (standard)**.

Q3: Why do I get a pin definition error when I compile a circular screen program for the XIAO SAMD21?

When you encounter this error, please update your **Seeed SAMD** development board on-board package to the latest version.

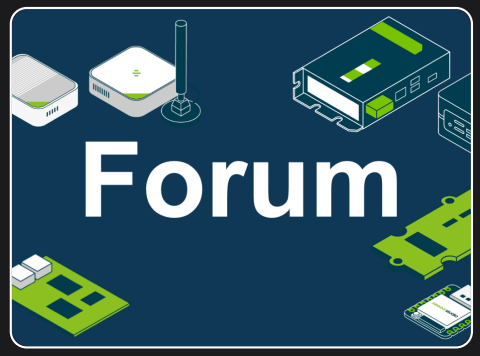
Q4: Why does the screen not display after I upload the program to XIAO ESP32C3?

If there is no problem with the program and it does not show up after uploading it may be that it needs to be reset. Just press the reset button on the XIAO ESP32C3.

Tech Support & Product Discussion

.

Thank you for choosing our products! We are here to provide you with different support to ensure that your experience with our products is as smooth as possible. We offer several communication channels to cater to different preferences and needs.



Edit this page

*Last updated on **Apr 27, 2023** by **MengDu***

4 reactions

😄 1 🎉 1 😕 1 🚀 1 👀 1

25 comments · 50 replies *– powered by giscus* Oldest Newest

tianrking Feb 23

:)

↑ 1 😄 1 👍 1 😄 1 🎉 1 ❤️ 1 🚀 1 6 replies

Show 1 previous reply

TobiasReich Sep 2

Deutsche Antwort folgt.

Sorry, common language is English here so I ask twice. What exactly do you want to achieve? I really love the XIAO ESP32 and they work really well for me - yet you need some technical skills.

--

Was genau möchtest Du denn erreichen. Ich bin auch kein Experte aber die XIAO Dinger sind eigentlich echt gut (wobei sie natürlich nur gewisse technische Voraussetzungen haben)

GitHub-Karl Sep 3

I didn't find a simple guide for installation the ESP32SE sense (cam). I.e.: how will I get the IP-Address of my XIAO. Which of the arduino *.ino are first to be uploaded.

TobiasReich Sep 3

First question, you know that this is not a stand alone ip camera or something similar, right? It is a development board that offers some functionality (like a camera) but not a device you buy, turn on and use as a CCTV or so.

Depending on your setup you might print your IP address to the Serial output.
E.g. something like this `Serial.print(WiFi.localIP());`
If you are the owner of the WiFi network you can also easily look at your router (e.g. enter fritz.box in your browser and have a look). Once it is connected to the network you should see it in the connected WiFi devices.

👍 1

GitHub-Karl Sep 3

Thank you, I knew that I didn't buy a stand-alone-cam. I looked for an instruction for board-installation (with cam). What I found, had confused me. I was able to get connection via the arduino blink-script, Then I didn't get further to install the wifi and didn't

find in which order I have to install other scripts (and which ones).

TobiasReich Sep 3

I guess it might help to get a specific question. You could also find better help in the forum than on github (which is usually more useful for bug reports than support).
Have a look here:
Forum

and ask your question there.
Also there is a tech support option on the website:
Contacts

MatthewJeffson Mar 1

Happy Launch :D

↑ 1  😄 1 0 replies

olaodou Apr 26

good

↑ 1  👍 1 0 replies

robber27199 Jul 24

For Arduino the actual definitions for the 3-in-one LED is actually:
Red LED = LED_BUILTIN or LED_RED
Blue LED = LED_BLUE
Green LED = LED_GREEN

↑ 1

4 replies

MatthewJeffson Jul 24

Hi! May I ask what kind of Arduino board are you referred to?

robber27199 Jul 25

Sorry, this is in relation to the XIAO nRF52840

MatthewJeffson Jul 25 edited

Okay, thanks! The contents have been changed!

MatthewJeffson Jul 25

Hi! Is it ok that I ask a question: Would you be interested in becoming one of our contributor?:D

Piepsakul Jul 27

I'm looking for the correct configuration within ESPhome for the XIAO esp32s3 sense camera.

This is what is not working:

Example configuration entry

esp32_camera:
name: My Camera
external_clock:
pin: GPIO11
frequency: 20MHz
i2c_pins:
sda: GPIO40
scl: GPIO39
data_pins: [GPIO15, GPIO17, GPIO18, GPIO16, GPIO14, GPIO12, GPIO11, GPIO48]
vsync_pin: GPIO38
href_pin: GPIO47
pixel_clock_pin: GPIO13

reset_pin: GPIO48

resolution: 640x480
jpeg_quality: 10

↑ 1 ☺ 3 replies

MatthewJeffson Jul 28

Hi, we are still trying to find people who can help us to support ESPhome for the XIAO esp32s3 sense, which is an assignment under our contributor program.
May I ask would you be interested in it?
Regards!

Piepsakul Aug 2

I'm sorry, but I don't think I'm qualified to do the job.

MatthewJeffson Aug 2

We are looking forward to any contributions(suggesting updates for wiki platform, fixing typos to wiki documents, accepting the assignments)
We will provide our products to our contributors as a token of appreciation.
No matter how. It is good to have a conversation with you.:D

Eee14 Jul 29

I get the following error while compiling:

```
In file included from c:\Users\${UserName}\Documents\Arduino\
                 from c:\Users\${UserName}\Documents\Arduino\
                 from C:\Users\${UserName}\AppData\Local\Temp
```

```
c:\Users\${UserName}\Documents\Arduino\libraries\TFT_eSPI/Use
 #include <User_Setups/Setup66_Seeed_XIAO_RoundDisplay.h>
          ^~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
compilation terminated.

exit status 1

Compilation error: exit status 1
```

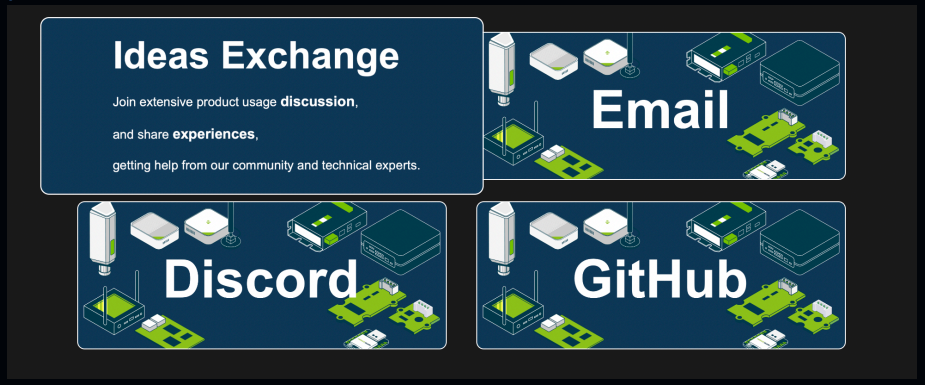
How can I fix this?

↑ 1 

4 replies

MatthewJeffson Jul 30

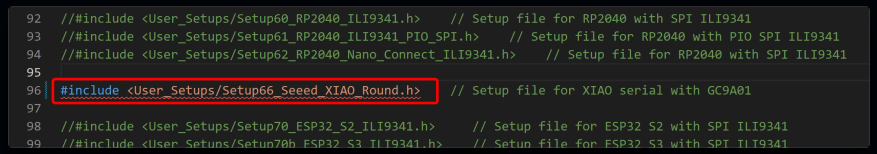
Hi! Thank you for your interests in our products! Would you mind check with our tech support platforms?
https://wiki.seeedstudio.com/Getting_Started/#tech-support--product-discussion



Eee14 Aug 6

Finally! I found the problem!

I was following the text step "#include <User_Setups/Setup66_Seeed_XIAO_Round**Display**.h>", now I follow this image:



change it to "#include <User_Setups/Setup66_Seeed_XIAO_Round.h>" then **Example HardwareTest** works!🤣

MatthewJeffson Aug 6

Haha wow! Glad you working it out and thanks for sharing it! Are you interested being one of our contributor?

Eee14 Aug 6

Thanks, but I'm too busy to help you guys right now.

😄 1

Piepsakul Aug 2

I checked all platforms but there is no simple guide to get the camera working with ESPhome

1 👍 1 2 replies

MatthewJeffson Aug 2

Hi! I really appreciate your efforts! Thanks for checking it.

GitHub-Karl Sep 2

So did I. I didn't find a simple guide. The above didn't help. I.e.: how will I get the IP-Address of my XIAO. Which of the arduino *.ino are first to be uploaded. And so on!

lmanliang Aug 7

I follow the
https://wiki.seeedstudio.com/XIAO_BLE/#battery-charging-current

but

```
xxx.ino:113:11: error: 'P0' was not declared in this scope; d
  113 |   pinMode(P0 .13, OUTPUT);
```

I has try P0.13, P0_13, D14,D22

pin not defined ?

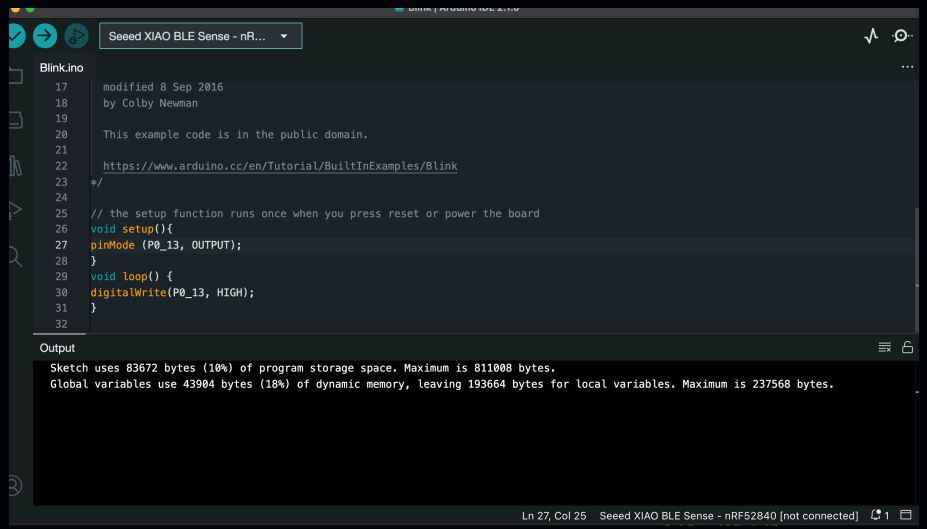
I use the macOS
Seeed XIAO nRF52840 Sense
VID 8x2886

PID 0x8045

↑ 1 

3 replies

MatthewJeffson Aug 7



mine working OK. But thanks to you I found a missing "(" on the wiki and I will change it soon

lmanliang Aug 7

I found difference.
The Speedd nRF52 Boards 1.1.1. not defined the P0_13,
then Seeed nRF52 med-enabled Board has defined.

MatthewJeffson Aug 7

Wow! Thank you for pointing it out! Have you learnt our contributor project? Really looking forward that we can build some together with the products you have.

lmanliang Aug 7

How can get battery volt for now?
this wiki not found this information's.

How can I know the usb cable is plugged in?

I has seem https://forum.seeedstudio.com/t/xiao-nrf52840-how-to-detect-if-usb-c-cable-is-plugged-in/270595

but I'm use Arduino IDE

↑ 1 

9 replies

Show 4 previous replies

lmanliang Aug 26

sorry, tolate seem this.

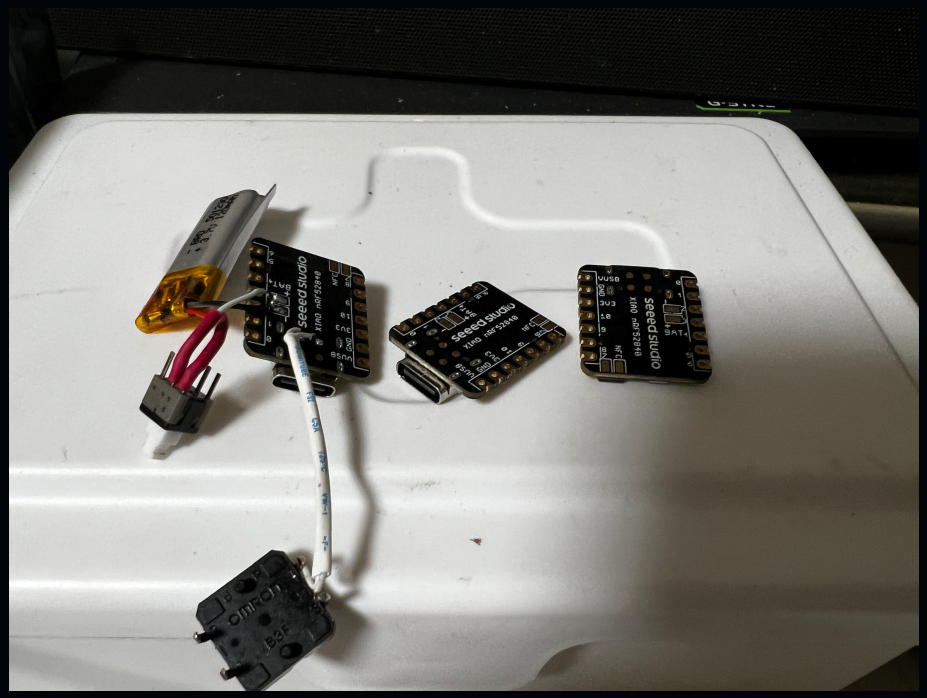
My Device is
I use the macOS
Seeed XIAO nRF52840 Sense
VID 8x2886
PID 0x8045

my application need

check usb cable has plugin, P14 set to High

because
https://wiki.seeedstudio.com/XIAO_BLE/#q3-what-are-the-considerations-when-using-xiao-nrf52840-sense-for-battery-charging

I currently have three 52840s. After connecting the USB, it generates high heat. I suspect this is the reason.



xzxcessarr Aug 28

Hello, if your wanna just plug the usb cable in and detect it is difficult but use the RTOS like the freeRTOS, but you can use the similar way:

1. init the "serial" by the "Serial.begin(9600);" to initize your serial of usb, and set the function "if Serial.available()!=0" for detect whether the serial is available, you can add digitalWrite(P14,HIGH) into it.
2. use the board or other device send a message at the brud rate and your board will detect and execute it

lmanliang Aug 28

Thanks for you recommend.
but I use this create products, the user behavior plugin the usb cable, devices usually not in power off mode, is run something.
so if P_14 to low, I'm plugin the usb, the board maybe burn.
P_14 to HIGH, I can't read batt.

xzxcessarr Aug 29

Hello, from your description, I think you can try freeRTOS, it has component designed for hot plugging

lmanliang Sep 3

sorry, my english is bad.

I just need to know, battery is very low for now,alert user chage.
not need real battery voltage.

P0_31 max is 3.6V,

use P0.14 read battery is work, but LI-PO maybe 4.2v, so if use P0.14, the voltage maybe voltage too high, so brun P0.31.

so why not change mind, I juse need to alter user chage?
so we can on board 3.3v pin connect to A0

and

```
int cg = analogRead(A0);
float batt = ((3.7* cg) / 1024);
```

if batt low to 3.0, alert user , need the chage.

Is this idea correct?
I'm not sure there's a risk

this is output data:
USB cable has plugin, and has LI-PO 3.7V battery
Avometer is 3.3v

```
3.38
3.38
3.38
3.37
3.37
```

but remove USB cable and battery to low, the number maybe is 3.0.

dwj66 Aug 9

the GPIO5 is not able to read the analog signal, which means the ADC2 is disabled, how can I enable ADC2 in arduino IDE?

↑ 1 ☺ 1 reply

xzxcessarr Aug 14

Hi, thanks for feedback, can you tell me which board are you mention?

☺

lmanliang Aug 11

Can give me full version Devicetree overlays and KConfig?
arduino may be can may not meet my needs, I am going to use ncs to re-develop

↑ 1 ☺ 0 replies

TobiasReich Aug 12

I'm experiencing issues with the hardware serial functionality for UART. E.g. when communicating with the Adafruit Soundboard I have a code like that:

```
#include <Adafruit_Soundboard.h>
#include <HardwareSerial.h>

#define SFX_RST 8
```

```
Adafruit_Soundboard sfx = Adafruit_Soundboard(&Serial1, NULL,

void setup() {
  Serial.begin(9600);
  Serial1.begin(9600);

  if (!sfx.reset()) {
    Serial.println("Not found");
    while (!Serial1) { /* wait until it is connected*/ }
  }
  Serial.println("SFX board found");
  uint8_t files = sfx.listFiles();
  Serial.print("Found "); Serial.print(files); Serial.println
}
```

It can't communicate with the device (finding 0 files). However when I'm switching to SoftwareSerial the same code looks fine.
E.g.

```
#include <Adafruit_Soundboard.h>
#include <SoftwareSerial.h>

#define SFX_TX 6
#define SFX_RX 7
#define SFX_RST 8

SoftwareSerial ss = SoftwareSerial(SFX_TX, SFX_RX);   //
Adafruit_Soundboard sfx = Adafruit_Soundboard(&ss, NULL,

void setup() {
Serial.begin(115200);
ss.begin(9600);
if (!sfx.reset()) {
    Serial.println("Not found. Waiting...");
    while (!ss) { /* wait until it is connected*/ }
}
Serial.println("SFX board found");
```

```
uint8_t files = sfx.listFiles();
Serial.print("Found "); Serial.print(files); Serial.print
}
```

Any idea what is going on?

↑ 1 ☺ 0 replies

ab-tools Aug 17

What is exposed via the JST 1.25 connector?

↑ 1 ☺ 1 reply

ab-tools Aug 17

Disregard please, I do understand now that this is the connector for the battery.

☺

ab-tools Aug 17

Is it still possible to use at least some GPIO PINs from the base board while it is connected to this display?

↑ 1 ☺ 6 replies

Show 1 previous reply

ab-tools Aug 18

Hello Matthew, first thanks for your quick reply!

My question was about your round touch screen (Seeedstudio 104030087) in combination with one of your XIAO base board, e. g. the ESP32 one (Seeedstudio 113991114):
It's great to be able to directly connect the base board to the screen, but we would still need some additional IO (including UART).

Is there a way to still use some GPIOs from the ESP32 base board for other things than just the LCD/touch screen connection?

Thanks
Andreas

MatthewJeffson Aug 18

Hi Andreas!
I think that indeed is good question and a great proposal.
Because of size maintenance issue, there might be not two line additional interfaces. I will try to inform this to the product manager and hopefully incorporate it in the next iteration...
Sorry for now there might not be any good ways to manage that.
Regards,
Matthew

ab-tools Aug 18

Hello Matthew

Hello Matthew,

hm, understood, appreciating the quick reply.

We really like your small, round touch screen and would still like to use that for our application.
Do you foresee any problems using your touch screen (Seeedstudio 104030087) with a different base board (but still based on an ESP32 or RP2040, of course)?

E. g. simply a standard ESP32-S3 Dev Board or the "official" Raspberry Pi Pico?

It's clear that it cannot be just hooked up together as simple as when using your base board then, but I would assume that your touch screen should in general work with any base board using an ESP32 or RP2040 chip set, correct?

If so, this would at least allow us to use your round touch screen, even if we are unable to use your base boards due to missing GPIOs.

Best regards
Andreas

MatthewJeffson Aug 18

Hi Andreas,
I'm sorry but it also requires specific libraries for ESP32-S3 Dev Board or the "official" Raspberry Pi Pico, since the IO definitions among them are different. You can change the libraries we provided which might be a solution...
For what's worth, maybe you can leave some gap when you trying to connect with XIAO and the touch screen, then connect a wire

to connect with XIAO and the touch screen, then connect a wire with the exposed pin.
Sorry for the inconvenience.XD
Regards,
Matthew

ab-tools Aug 18

Hello Matthias,

> I'm sorry but it also requires specific libraries for ESP32-S3 Dev Board or the "official" Raspberry Pi Pico, since the IO definitions among them are different.

What do you mean by "IO definitions"?
I would expect that your base board at the end only provides access to a certain subset of IO PINs of the ESP32/RP2040 base MCU. So while the exposed PINs (and especially their order) might be different compared to other boards, when connecting the correct PINs together, it should "just work". Or do I miss something here?

> For what's worth, maybe you can leave some gap when you trying to connect with XIAO and the touch screen, then connect a wire with the exposed pin.

Not sure if I understand your suggestion correctly:
I mean, physically connecting to the PINs is not the problem here - we can just solder some wires on the back side additionally.

But if I understand your "hardware usage" page here https://wiki.seeedstudio.com/seeedstudio_round_display_usage/ correctly, your round display in fact actually uses almost all of the

connected PINs!

Would it then not cause conflicts when we "leave some gap and connect a wire with the exposed pin" additionally to have your touch screen connected?

Best regards and thanks for your support
Andreas

prashik61 Aug 18

Hello,

I am working with the Max30100 sensor and the Xiao ESP32-C3 board. I want to view data on the serial monitor, but nothing is being printed. What should I do? To verify, I tested the code with an ESP32 Dev board, and it successfully printed data on the serial monitor. Now, I'm wondering about the procedure for the Xiao ESP32-C3 board. Do I need any specific drivers for serial communication?

↑ 1

2 replies

domiluci Aug 20

Take a look here: https://forum.seeedstudio.com/t/xiao-esp32c3-wont-program-without-manually-entering-bootloader-mode/269736

domiluci Aug 20

They kind of bailed before finding a solution, but there's a bug with the C3's Serial function relating to DTR/RTS. Not sure if this still applies with Native USB's Serial functionality, or the XIAO C3 (I have yet to test mine), but there's a couple fixes available, albeit hard to find. The one I used involves editing the Arduino ESP32 lib's board file. But I wouldn't do that here unless it's a last resort, despite being safe.

ahsanfi Aug 19

Hello, I'm trying to record audio (.wav) to sd card with XIAO BLE SENSE nRF5840 with seeduino extension, but keep getting failed like this:

Capturing .wav samples
initialization failed!

I think the module cannot detect the sdcard. Any solutions? Thanks

↑ 1 

1 reply

xzxcessarr Aug 24

Hello, from your description, we think you would better to check whether the nRF5840 board or the extension board is well, after we test we find that if using the space of tf card is more than the 16g may the extension board can not read, so we recommand you to check by this list:

1. use the space of the tf card at 16g or below
2. check the nRF5840 board by using the example like the mic-

serial-plotter

3. follow the step 2 if is well, check the i2c interface of extansion board, you can use every I2C sensor to test it

lmanliang Aug 28

I'm so sorry , I need Help to more.

I has try the accelerometer-examples-and-low-power

It's work, but just in Seeed XIAO nRF52840 Sense without the mbeb-enable.

I'm use mbed-enable version is not working.

1. INPUT_PULLDOWN_SENSE is not defined.
2. FlashTransport_QSPI error.

```
/product.ino:32:1: error: 'Adafruit_FlashTransport_QSPI' does
 Adafruit_FlashTransport_QSPI flashTransport;
 ^~~~~~~~~~~~~~~~~~~~~~~~~~~
/product.ino: In function 'void QSPIF_sleep()':
/product.ino:35:3: error: 'flashTransport' was not declared i
   flashTransport.begin();
   ^~~~~~~~~~~~~~
```

can help me ?

↑ 1 

0 replies

73Volvo Sep 4

I've tried for hours to get this running, but it seems like the sample hardware test is too big to run on the XIAO SAMD21 - is there a smaller test I can use on the SAMD21? Is there a larger chip that's required for this screen?

↑ 1

5 replies

xzxcessarr Sep 5

Hello, could you tell us which screen are you mentioned?

73Volvo Sep 5

Oh, sorry. I found this page embedded on the Seeed 1.28" Round Display - https://wiki.seeedstudio.com/get_start_round_display/

73Volvo Sep 5

Still no luck. I've managed to get the screen running with some simple graphics tests, but not the touchscreen.

73Volvo 29 days ago

Here's the thing...

for SAMD21:

TFT_CS = 1
TFT_DC = 3

for ESP32S3:
TFT_CS = D8
TFT_DC = D3

Hope that helps someone else!

73Volvo 29 days ago

Wait, that's not working for the ESP32S3, but it's working for the SAMD21. Looks like there might be some more tinkering to do...

skartha-sei Sep 5

Like many other people, I was struggling to get the Arduino IDE to recognize my Xiao, but then I finally remembered having read that power-only USB-C cables can be the cause of this. And, sure enough, a different USB-C cable did the trick! Time to find some red fingernail polish to mark the data-capable USB-C cable!!!

↑ 1  0 replies

userpc42069 26 days ago

Is there a way I can use this board as a webcam or a wired camera by connecting it to my laptop?

↑ 1 2 replies

xzxcessarr 23 days ago

Hello, could you tell me which board are you mentioned?

userpc42069 21 days ago

Seeed Studio XIAO ESP32S3 sense with the ov2640 camera

BastelBaus 23 days ago

Very nice product and docu. Thanks!

One feature request / proposal would be very helpfull. Sell the XIAO ESP32S3 w/ connector soldered and offer a extention board which fits to the connector and brings most of the PINs to a second small board (same dimensions) on top of the normal board. This could be used by useres who would like to use more of the IOs for other purposes. Could be a quite cheap board and usefull extention and keep the very nice form factor (gets only thicker).

BR,
Bastel Baus

↑ 1 0 replies

KASSIMSAMJI 18 days ago

Hello There

I am trying to compile the TFT_eSPI library with Seeed XIAO BLE nRF5 selected but I end up having bunch of errors

But If I compile it with Seeed XIAO nRF5 selected, TFT works, ArduinoBLE no longer works

Any help is really appreciated

↑ 1 ☺ 0 replies

userpc42069 13 days ago

can i make seed xiao sense board to host its own wifi to transmit video? or make it a static IP?

↑ 1 ☺ 1 reply

TobiasReich 13 days ago

The XIAO ESP32S3 Sense has a camera and wifi.
So you can easily create a tiny "web server" and transmit the video there.
Be aware that the tiny camera - though on paper offers 1600 x 1200 - is not the best quality. But I did something similar and it works perfectly fine.
You might have a look for how things are done at his project for instance:

[https://www.instructables.com/Camera-NanoTank/]