

[Manuals.plus](#) /

› [XYGStudy](#) /

› XYGStudy Pico-UPS-B UPS Module User Manual for Raspberry Pi Pico

## XYGStudy Pico-UPS-B

# XYGStudy Pico-UPS-B Module User Manual

## UNINTERRUPTIBLE POWER SUPPLY FOR RASPBERRY PI PICO

---

### 1. Product Overview

---

The Pico-UPS-B is a dedicated Uninterruptible Power Supply (UPS) module designed for the Raspberry Pi Pico. It integrates a Li-po battery switching charger with power path management and a voltage/current monitoring chip. This design allows for continuous operation of your Raspberry Pi Pico while recharging the connected Li-po battery and enables monitoring of the battery's operational status via the I2C bus. Its stackable design, featuring a male pin header, facilitates the integration of additional modules on top.

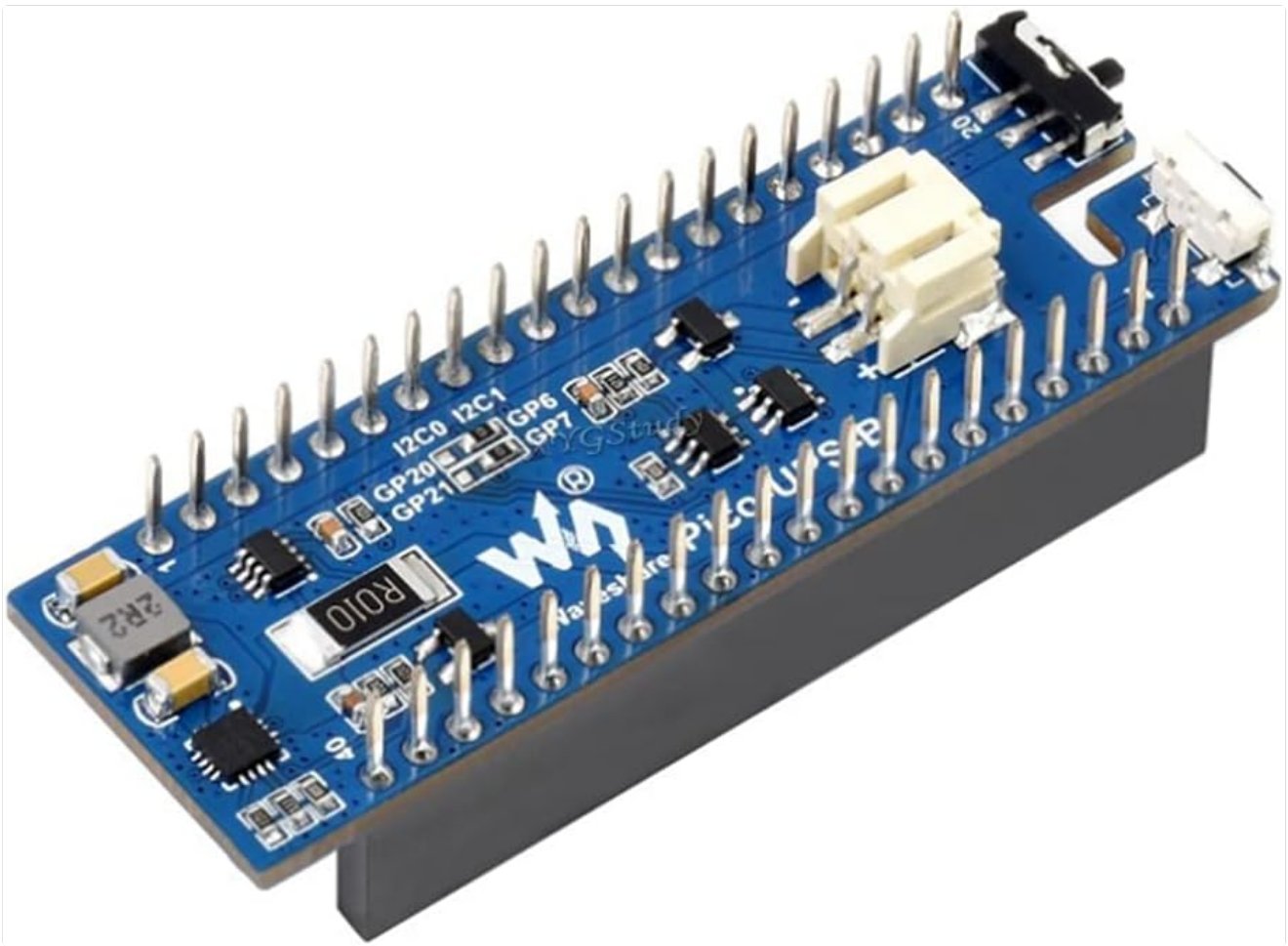


Figure 1: Top view of the Pico-UPS-B module.

## 2. Package Contents

Verify that all items listed below are present in your package:

- Pico-UPS-B Module x1

## 3. Features

- Dedicated UPS module for Raspberry Pi Pico.
- Incorporates Li-po battery switching charger with dynamic power path management for stable power supply.
- I2C bus communication for monitoring battery voltage, current, power, and remaining capacity in real-time.
- Multi-battery protection circuits: over-charge/discharge protection, over-current protection, short circuit protection, and reverse protection.
- Onboard recharging indicator and power indicator for easy battery status checks.
- Standard Raspberry Pi Pico header, supporting Raspberry Pi Pico series boards.
- Stackable design with male pin header for attaching other modules.

# Features At A Glance

The **Pico-UPS-B** is a dedicated **UPS (Uninterruptible Power Supply)** module designed for Raspberry Pi Pico. It incorporates Li-po battery switching charger with power path management, and voltage/current monitoring chip, allows monitoring the battery operating status via I2C bus. What's more, the male pin header make it possible to "stack" other modules on top.

- Standard Raspberry Pi Pico header, supports Raspberry Pi Pico series boards
- Incorporates Li-po battery switching charger with dynamic power path management, more stable power supply
- I2C bus communication, monitoring the battery voltage, current, power, and remaining capacity in real time
- Multi battery protection circuits: over charge/discharge protection, over current protection, short circuit protection, and reverse protection, more safe and stable
- Onboard recharging indicator, power indicator, easy to check the battery status
- Comes with development resources and manual (Raspberry Pi Pico C/C++ and MicroPython examples)

*xygstudy*

## Specifications

<b>RECHARGE VOLTAGE</b>	5V
<b>CONTROL BUS</b>	I2C
<b>BATTERY SUPPORT</b>	600mAh 3.7V Li-po battery
<b>DIMENSIONS</b>	60 × 21mm

Figure 2: Key features of the Pico-UPS-B module.

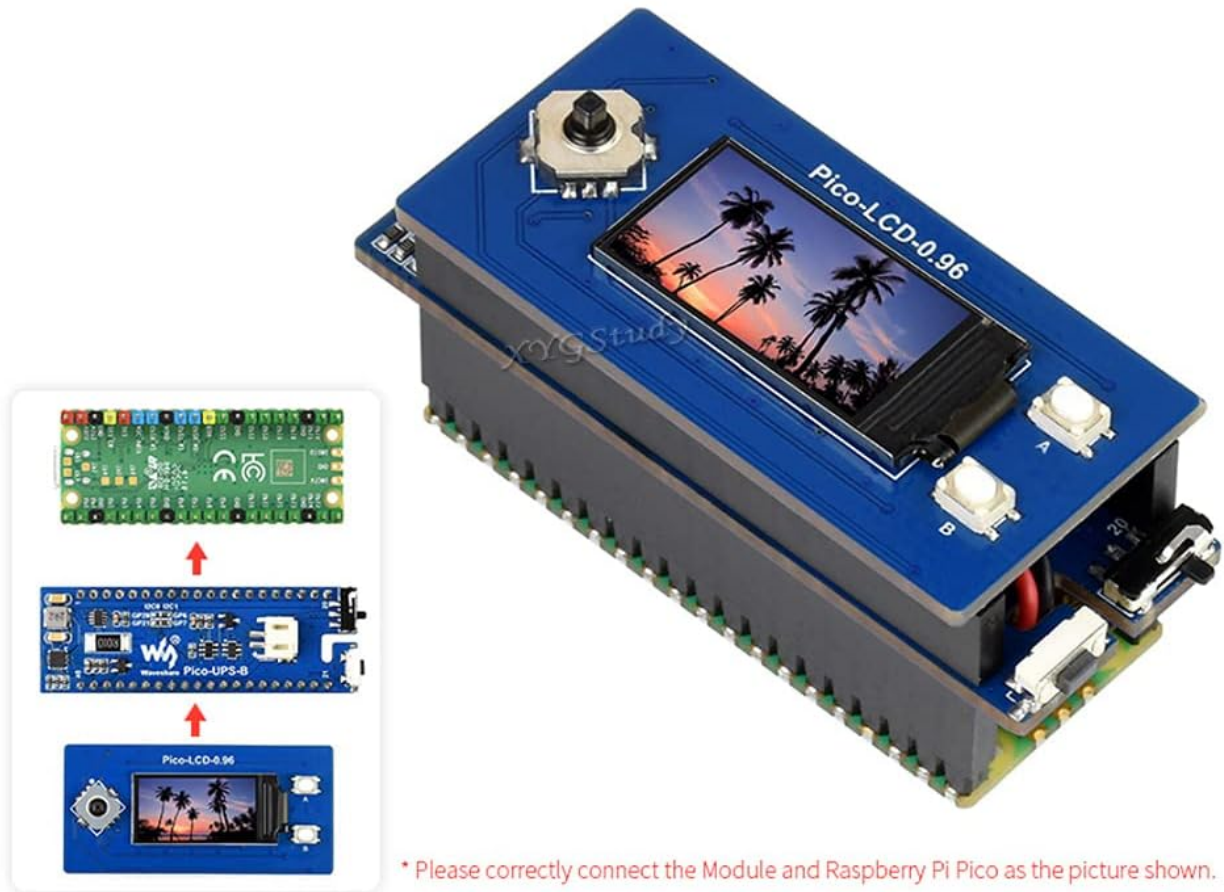
## 4. Setup

Follow these steps to set up your Pico-UPS-B module with a Raspberry Pi Pico:

1. **Attach Raspberry Pi Pico:** Align the female header of the Pico-UPS-B module with the male header of your Raspberry Pi Pico. Gently press them together until securely connected. Ensure all pins are correctly aligned to prevent damage.
2. **Connect Li-po Battery:** Connect a compatible 3.7V Li-po battery to the battery header (JST connector) on the Pico-UPS-B module. Observe polarity.
3. **Power On:** Locate the power switch on the module and slide it to the 'ON' position.
4. **Activate Protection Circuit (if needed):** If replacing the battery or after initial setup, press the small 'Activate' button to ensure the protection circuit is active and the module is ready for operation.

# Raspberry Pi Pico Header Compatibility

Onboard Female Pin Header For Direct Attaching To Raspberry Pi Pico,  
Male Pin Header For Stacking Other Modules



Raspberry Pi Pico and Pico-LCD-0.96 are NOT included.

Figure 3: Raspberry Pi Pico header compatibility and stacking example.



Figure 4: Pico-UPS-B module with connected Li-po battery.

## 5. Operating Instructions

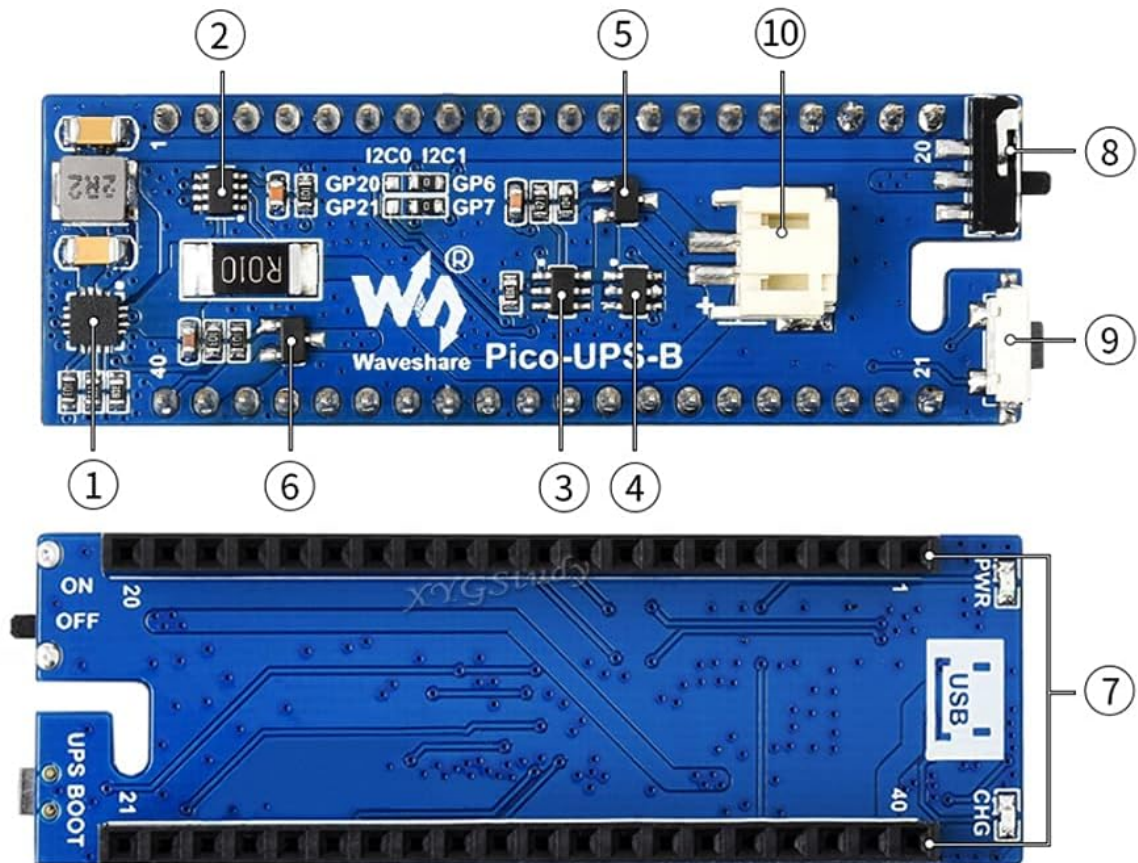
The Pico-UPS-B module provides uninterruptible power to your Raspberry Pi Pico. When external 5V power is supplied via the USB port, the module will power the Pico and simultaneously charge the connected Li-po battery. If the external power is disconnected, the module seamlessly switches to battery power, ensuring continuous operation of your Pico.

- **Charging:** Connect a 5V power source to the USB port on the Pico-UPS-B. The onboard recharging indicator will show the charging status.
- **Battery Monitoring:** Utilize the I2C interface (GP6/SDA, GP7/SCL) on the Raspberry Pi Pico to read real-time battery data, including voltage, current, power, and remaining capacity. Refer to the pinout definition for I2C pin locations.
- **Stacking:** The male pin header allows for additional Raspberry Pi Pico compatible modules to be stacked on top of the Pico-UPS-B, expanding functionality.

## 6. On-Board Components

The following diagram identifies key components on the Pico-UPS-B module:

# What's On Board



- |  |   |
|--|---|
| <ol style="list-style-type: none"><li>1. <b>ETA6003</b><br/>recharger chip</li><li>2. <b>INA219</b><br/>voltage/current monitoring chip</li><li>3. <b>S8261</b><br/>Li-po battery protection chip</li><li>4. <b>FS8205</b><br/>Li-po battery protection MOS</li><li>5. <b>AO3400</b><br/>reverse-proof MOS</li><li>6. <b>SI2305</b><br/>counter current preventing MOS</li></ol> | <ol style="list-style-type: none"><li>7. <b>Raspberry Pi Pico header</b><br/>for direct attaching to Raspberry Pi Pico</li><li>8. <b>Power switch</b></li><li>9. <b>Activate button</b><br/>activate the protection circuit after replacing battery</li><li>10. <b>Battery header</b><br/>for connecting 3.7V Li-po battery</li></ol> |
|--|---|

Figure 5: On-Board Components of Pico-UPS-B.

1. **ETA6003:** Recharger chip.
2. **INA219:** Voltage/current monitoring chip.
3. **S8261:** Li-po battery protection chip.
4. **FS8205:** Li-po battery protection MOS.
5. **AQ3400:** Reverse-proof MOS.
6. **SI2305:** Counter current preventing MOS.
7. **Raspberry Pi Pico Header:** For direct attachment to Raspberry Pi Pico.
8. **Power Switch:** Controls the main power to the module.
9. **Activate Button:** Activates the protection circuit after battery replacement.
10. **Battery Header:** For connecting a 3.7V Li-po battery.

## 7. Pinout Definition

The following table and diagram detail the pin assignments for the Pico-UPS-B module:

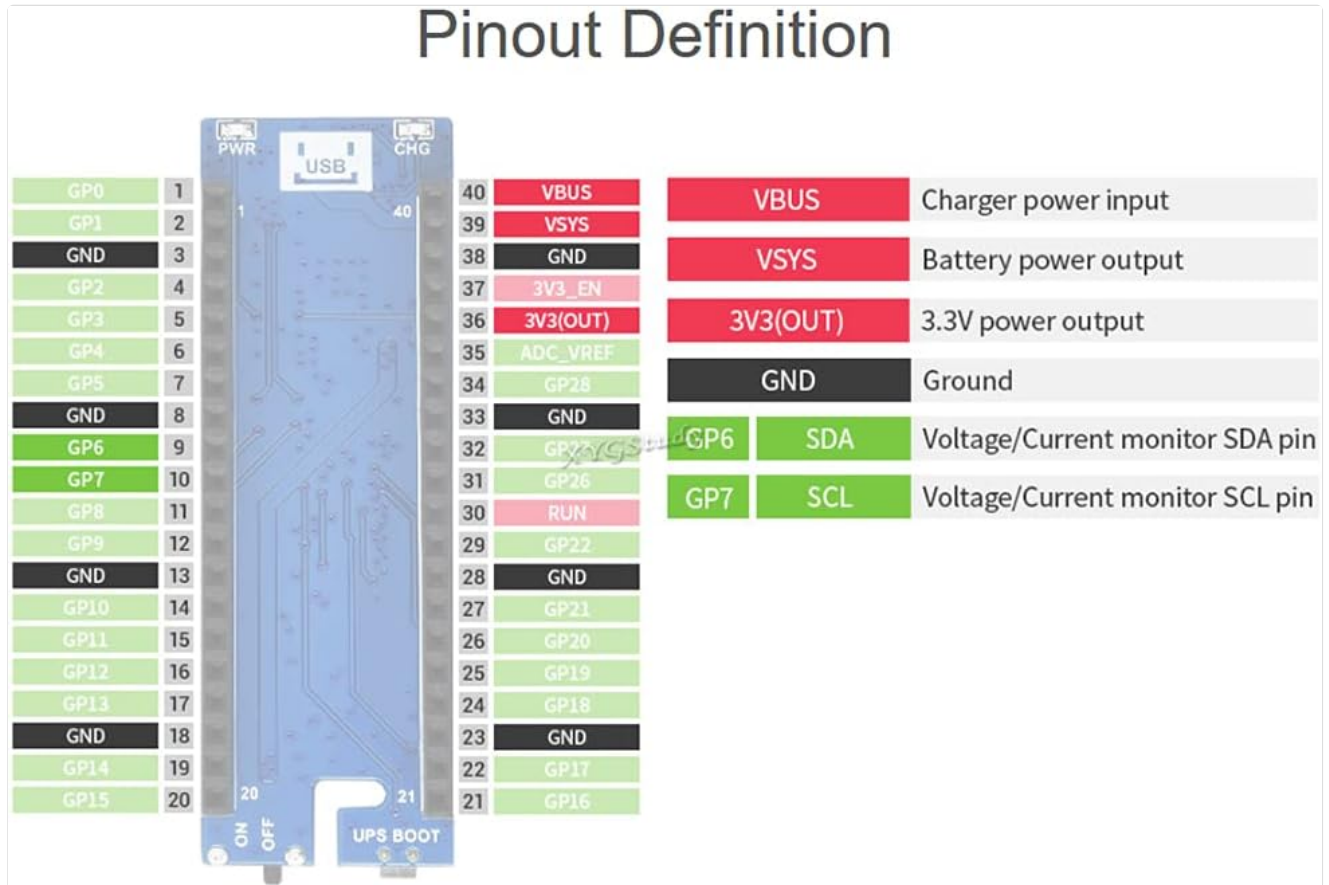


Figure 6: Pico-UPS-B Pinout Definition.

Pin	Function
VBUS	Charger power input (5V)
VSYS	Battery power output
3V3(OUT)	3.3V power output
GND	Ground
GP6 (SDA)	Voltage/Current monitor I2C SDA pin
GP7 (SCL)	Voltage/Current monitor I2C SCL pin

## 8. Specifications

Technical specifications for the Pico-UPS-B module:

# Outline Dimensions

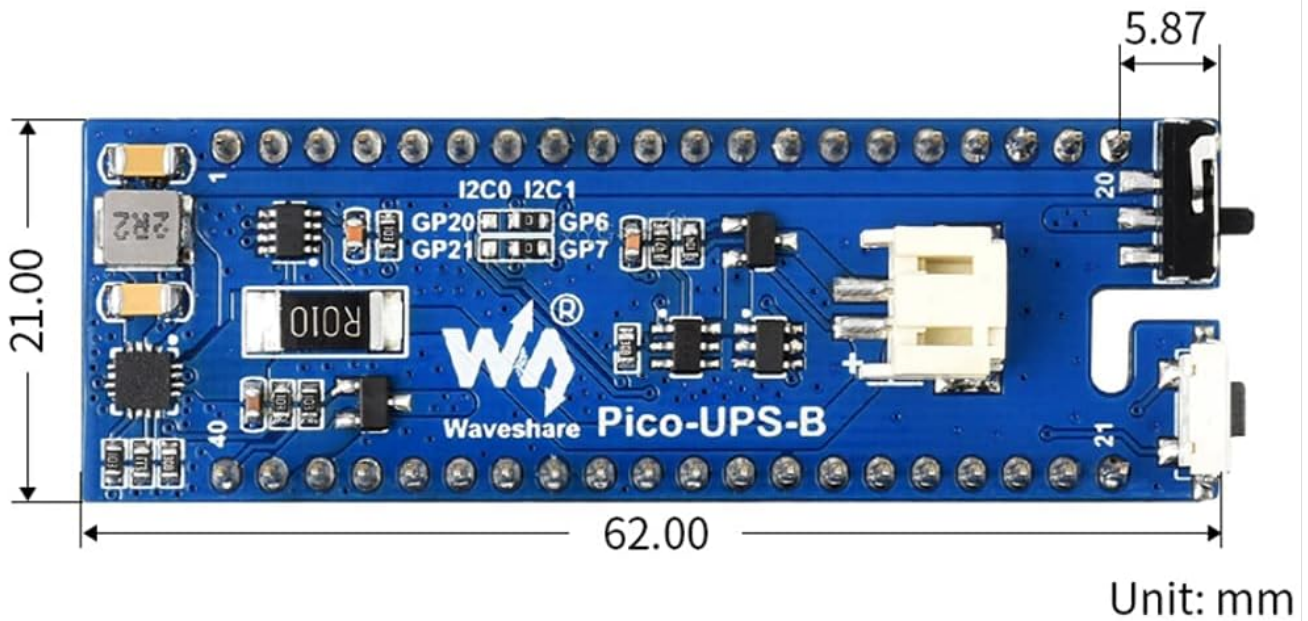


Figure 7: Outline Dimensions of Pico-UPS-B.

Parameter	Value
Recharge Voltage	5V
Control Bus	I2C
Battery Support	600mAh 3.7V Li-po battery (not included)
Dimensions	62.00 × 21.00 mm

## 9. Maintenance

To ensure the longevity and proper functioning of your Pico-UPS-B module:

- **Storage:** Store the module in a dry, cool environment away from direct sunlight and extreme temperatures.
- **Cleaning:** Use a soft, dry cloth to clean the module. Avoid using liquids or solvents.
- **Battery Care:** If using a Li-po battery, follow the manufacturer's guidelines for charging, discharging, and storage to prevent damage and ensure safety. Do not overcharge or deep discharge the battery.
- **Handling:** Handle the module by its edges to avoid touching electronic components, which can be sensitive to static discharge.

## 10. Troubleshooting

If you encounter issues with your Pico-UPS-B module, consider the following:

- **Module Not Powering On:**
  - Ensure the power switch is in the 'ON' position.
  - Verify the Li-po battery is correctly connected and charged.

- Press the 'Activate' button after connecting the battery.

- **Raspberry Pi Pico Not Receiving Power:**

- Check that the Pico is securely seated on the Pico-UPS-B header.
- Confirm the Pico-UPS-B module itself is powered (either via USB or charged battery).

- **Battery Not Charging:**

- Ensure a 5V power source is connected to the USB port.
- Check the USB cable and power adapter for functionality.
- Verify the battery is properly connected to the battery header.

- **I2C Communication Issues:**

- Confirm correct wiring of SDA and SCL pins to the Raspberry Pi Pico.
- Check your software code for correct I2C address and communication protocol.

## 11. Warranty and Support

---

Specific warranty information and detailed support contacts are not provided within this manual. For warranty claims, technical assistance, or further inquiries, please refer to the product packaging or contact the manufacturer, XYGStudy, directly through their official support channels or the platform where the product was purchased.

---