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FOSA EC200U C4 P01

FOSA EC200U C4 P01 Development Board User Manual

Model: EC200U C4 P01

1. INTRODUCTION

This manual provides essential instructions for the setup, operation, maintenance, and troubleshooting of the FOSA EC200U C4 P01 Development Board. Designed for professional use, this PCB development board integrates an EC200U LTE Cat 1 telecommunication module with GNSS positioning capabilities, offering a versatile platform for various applications. Please read this manual thoroughly before using the device to ensure proper functionality and safety.

2. PRODUCT OVERVIEW

The FOSA EC200U C4 P01 Development Board is a robust platform featuring the EC200U LTE Cat 1 telecommunication module. It supports multi-mode and multi-band operations, making it suitable for diverse global applications. Key features include:

- **EC200U LTE Cat 1 Module:** Provides reliable telecommunication capabilities.
- **40PIN GPIO Interface:** Compatible with most Raspberry Pi (RPI) HAT expansion boards for extended functionality.
- **GNSS Positioning:** Supports GPS, GLONASS, BDS, Galileo, and QZSS for accurate location services.
- **Onboard SIM/eSIM Slots:** Features Nano SIM and eSIM slots for flexible network connectivity (single mode).
- **MIPI Interface:** Supports MIPI screens and is compatible with RPi peripherals.
- **Camera Interface:** Supports customized SPI cameras up to 0.3MP.
- **LED Indicators:** Five onboard LEDs for monitoring module status.
- **Protocol Support:** Comprehensive support for TCP, UDP, PPP, NITZ, FILE, MQTT, NTP, HTTP, HTTPS, SSL, FTP, FTPS, CMUX, MMS.

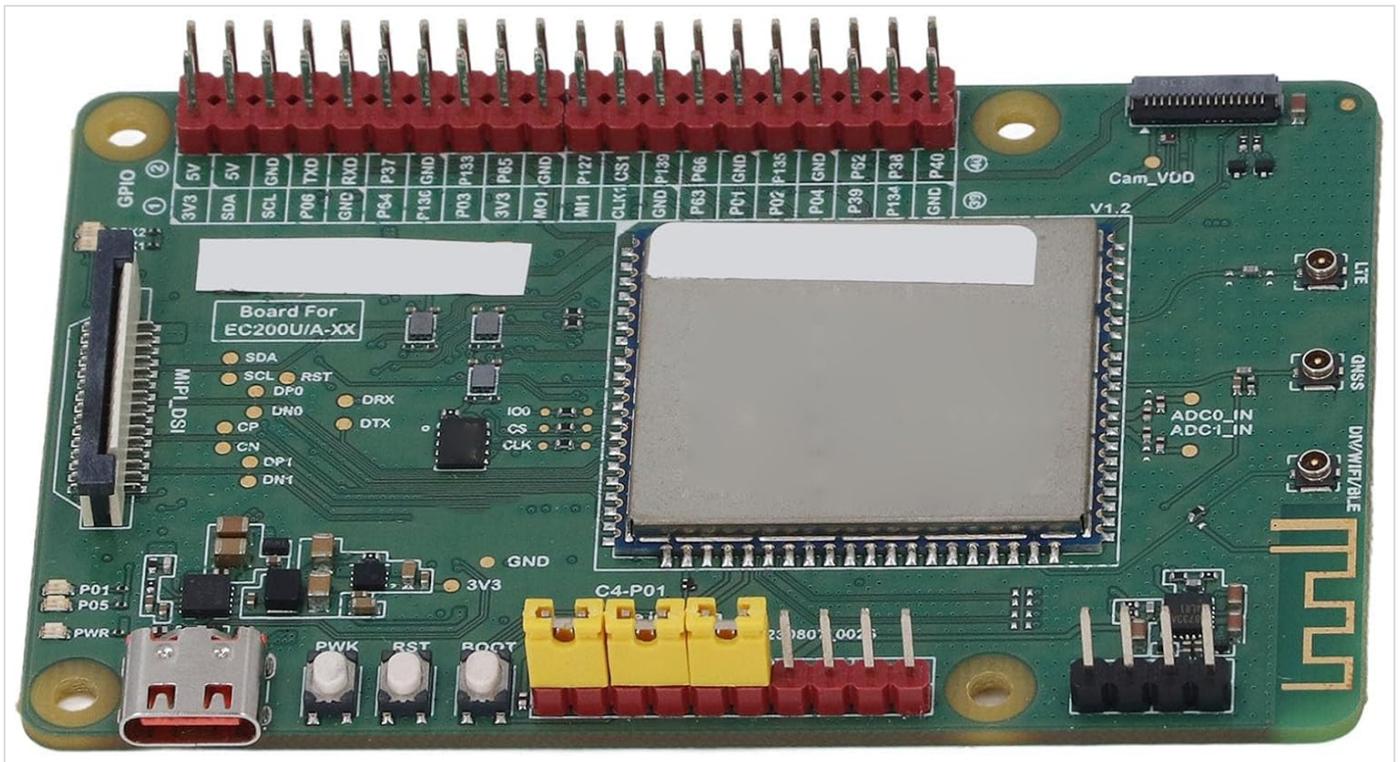
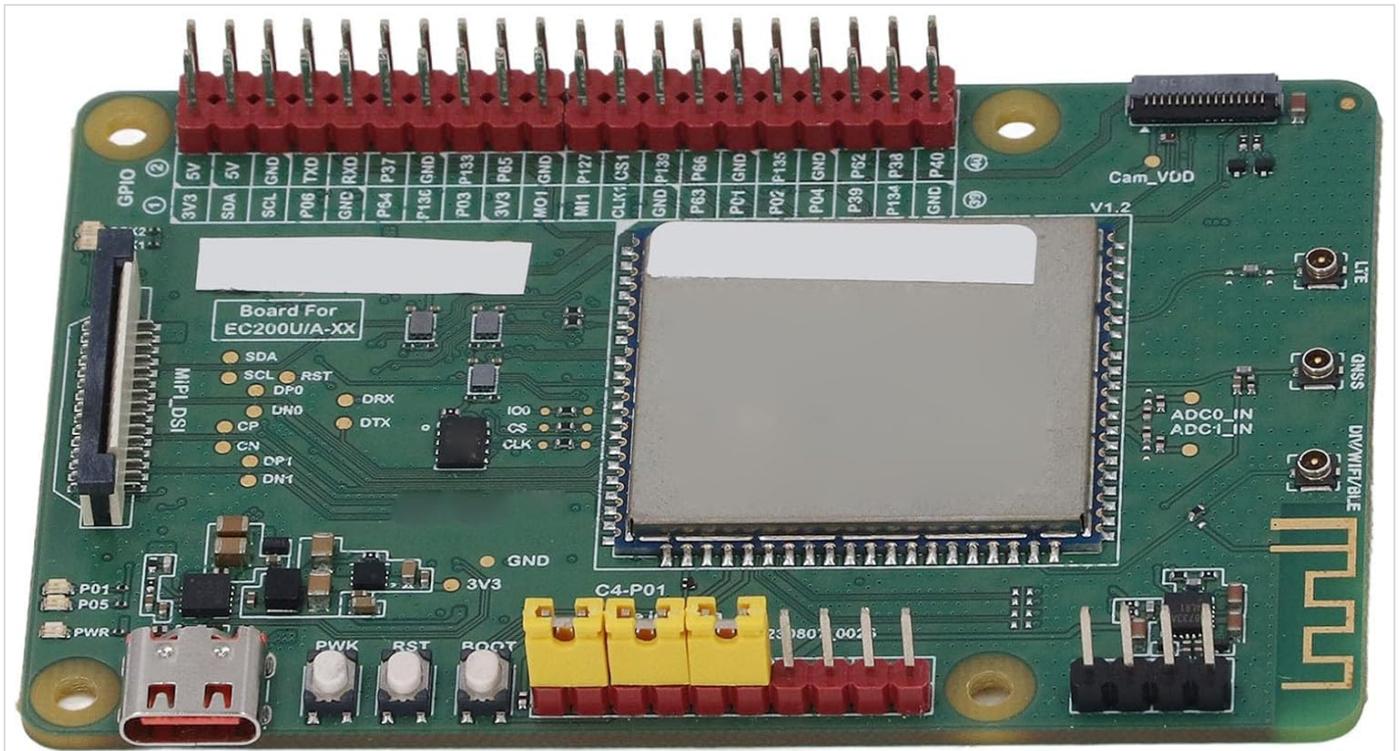


Figure 1: Top-down view of the FOSA EC200U C4 P01 Development Board, highlighting the main components and GPIO header.

3. SETUP

Follow these steps to set up your EC200U C4 P01 Development Board:

3.1. Component Identification



EC200U EU:
 Regions of Application: Europe, Middle East, Africa, Australia, New Zealand, Brazil
 LTE FDD: B1 B3 B5 B7 B8 B20 B28

Figure 2: Detailed view of the board's labeled components, including GPIO, power, and module area.

3.2. SIM Card Installation

1. Locate the Nano SIM and eSIM slots on the board.
2. Carefully insert your Nano SIM card into the designated slot. The board supports single-mode operation for either Nano SIM or eSIM.

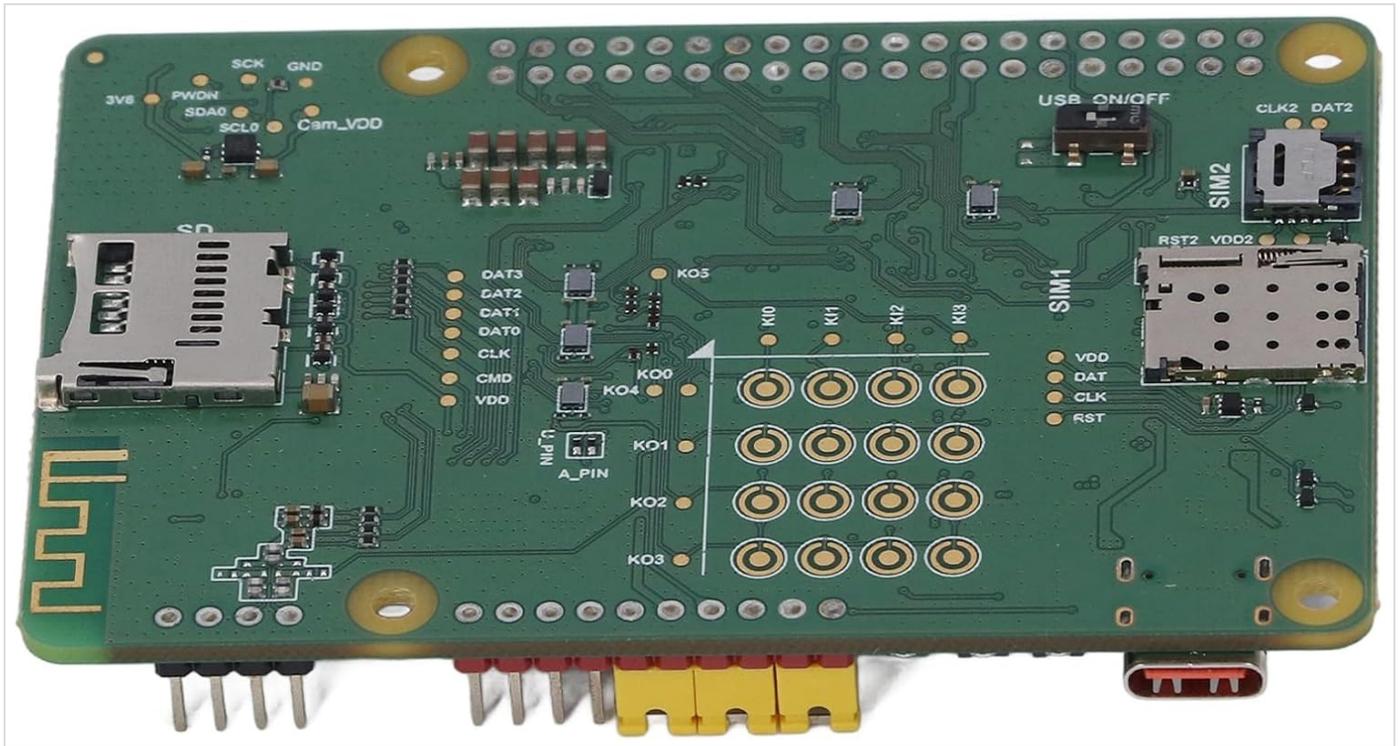


Figure 3: Underside of the board, illustrating the SIM card and SD card slot locations.

3.3. Antenna Connection

1. Connect the LTE Main Antenna to the corresponding connector on the board.
2. If applicable, connect the Diversity Antenna to its designated port.

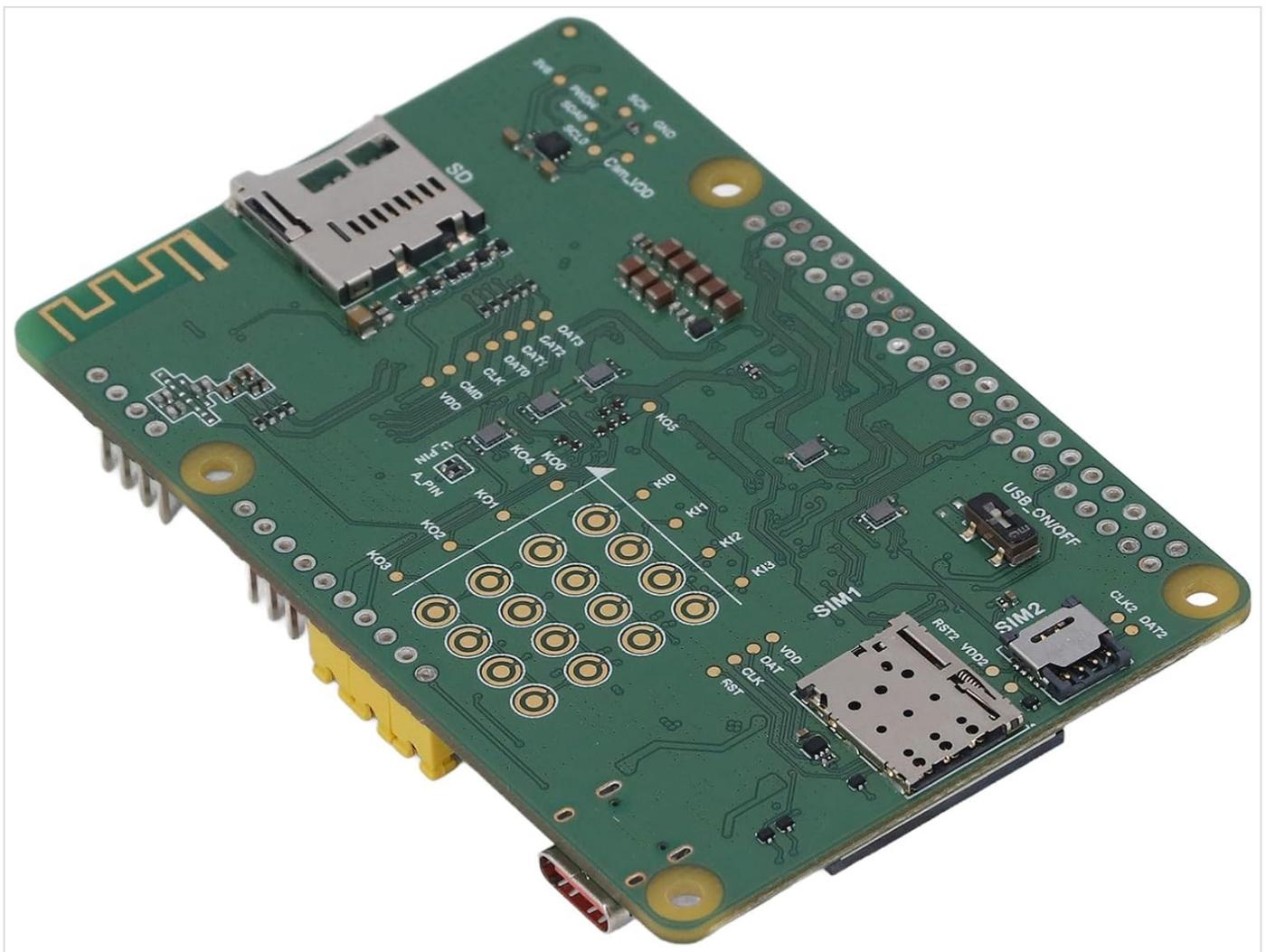


Figure 4: Development board with included accessories, including an antenna and USB cable.

3.4. Power Connection

Connect the development board to a suitable power source using the USB Type-C port. Ensure the power supply meets the board's voltage requirements.

3.5. Initial Power On

Press the **PWK** key to power on the board. Observe the **PWR** indicator LED to confirm power status.

3.6. Software Setup

For development and programming, utilize the provided plug-in tools:

- QPYcom
- Thonny IDE
- VSCode

Refer to the respective tool documentation for installation and usage instructions.

4. OPERATING INSTRUCTIONS

This section outlines the basic operation of the EC200U C4 P01 Development Board.

4.1. Telecommunication Protocols

The board supports a wide range of telecommunication protocols. Depending on your application, configure the module

using the appropriate AT commands or software libraries for:

- TCP, UDP, PPP, NITZ, FILE
- MQTT, NTP, HTTP, HTTPS, SSL
- FTP, FTPS, CMUX, MMS

4.2. GNSS Positioning

To utilize GNSS positioning, ensure the GNSS antenna is properly connected. The module can acquire location data from GPS, GLONASS, BDS, Galileo, and QZSS satellite systems. Access positioning data through the module's serial interface or relevant APIs in your application.

4.3. LED Indicators

The onboard LEDs provide visual feedback on the module's status:

- **P01:** Module Pin 1 status (Default is EC200A XX PWM0).
- **P05:** NET_MODE Indicator.
- **SCK1:** SIM1 Detection Indicator (on when SIM1 card is inserted).
- **SCK2:** SIM2 Detection Indicator (on when SIM2 card is inserted).
- **PWR:** Power Indicator.

4.4. Key Switches

The board includes several key switches for control:

- **PWK:** Power On/Off switch.
- **RST:** Reset button.
- **BOOT:** Force Download mode.
- **USB ON OFF:** USB Detection Switch.

5. MAINTENANCE

To ensure the longevity and optimal performance of your FOSA EC200U C4 P01 Development Board, observe the following maintenance guidelines:

- **Handling:** Always handle the board by its edges to avoid touching components, especially the sensitive module area. Electrostatic discharge (ESD) can damage electronic components; use appropriate ESD precautions.
- **Cleaning:** Keep the board clean and free from dust and debris. Use a soft, dry brush or compressed air for cleaning. Avoid using liquids or abrasive cleaners.
- **Environment:** Operate and store the board in a dry, temperature-controlled environment, away from direct sunlight, extreme temperatures, and high humidity.
- **Connections:** Periodically check all connections (antennas, cables, HATs) to ensure they are secure and free from damage.

6. TROUBLESHOOTING

This section addresses common issues you might encounter with the EC200U C4 P01 Development Board.

6.1. No Power Indicator (PWR LED Off)

- **Check Power Source:** Ensure the USB Type-C cable is securely connected to a functional power source.
- **Verify Cable:** Try a different USB Type-C cable to rule out a faulty cable.

- **Press PWK:** Confirm that the PWK (Power) button has been pressed to initiate power-on.

6.2. No Network Connectivity

- **SIM Card:** Ensure the Nano SIM or eSIM is correctly inserted and activated with a valid data plan. Check the SCK1/SCK2 LEDs.
- **Antenna:** Verify that the LTE Main Antenna is securely connected.
- **Network Coverage:** Confirm that you are in an area with adequate LTE Cat 1 network coverage.
- **Module Status:** Check the P05 (NET_MODE) LED for network activity indication.

6.3. GNSS Not Acquiring Position

- **GNSS Antenna:** Ensure the GNSS antenna is properly connected and has a clear view of the sky.
- **Environment:** GNSS performance can be affected by indoor environments, tall buildings, or heavy foliage. Move to an open outdoor area.

6.4. Software Communication Issues

- **USB Connection:** Ensure the USB cable is connected and the USB ON OFF switch is in the correct position for detection.
- **Driver Installation:** Verify that necessary USB drivers for the module are installed on your computer.
- **IDE/Tool Configuration:** Check the serial port settings and module configuration within QPYcom, Thonny IDE, or VSCode.

7. SPECIFICATIONS

Detailed technical specifications for the FOSA EC200U C4 P01 Development Board:

Feature	Detail
Model Number	EC200U C4 P01
LTE TDD Bands	B38, B40, B41
GSM Bands	B2, B3, B5, B8
GNSS Support	GPS, GLONASS, BDS, Galileo, QZSS
Bluetooth Version	4.2 (BR EDR)
Wi-Fi Fidelity Scan	2.4 GHz 11b (Rx)
LTE FDD Data Rate	10 Mbps downlink; 5 Mbps uplink
LTE TDD Data Rate	8.96 Mbps downlink; 3.1 Mbps uplink
GSM Data Rate	85.6 Kbps downlink; 85.6 Kbps uplink
NB IoT Support	Not Supported
Cat M Support	Not Supported
Supported Protocols	TCP, UDP, PPP, NITZ, FILE, MQTT, NTP, HTTP, HTTPS, SSL, FTP, FTPS, CMUX, MMS
SIM Card Type	Nano SIM and eSIM (Single Mode)
GPIO Interface	40PIN, RPi HAT compatible
MIPI Interface	Yes, RPi peripheral compatible

