

# VVM601 ESP32-S3 with Quectel EC200U 4G LTE GPS Module For AI IoT Applications

Product ID: VVM601  
Version: v1.1

## Features:

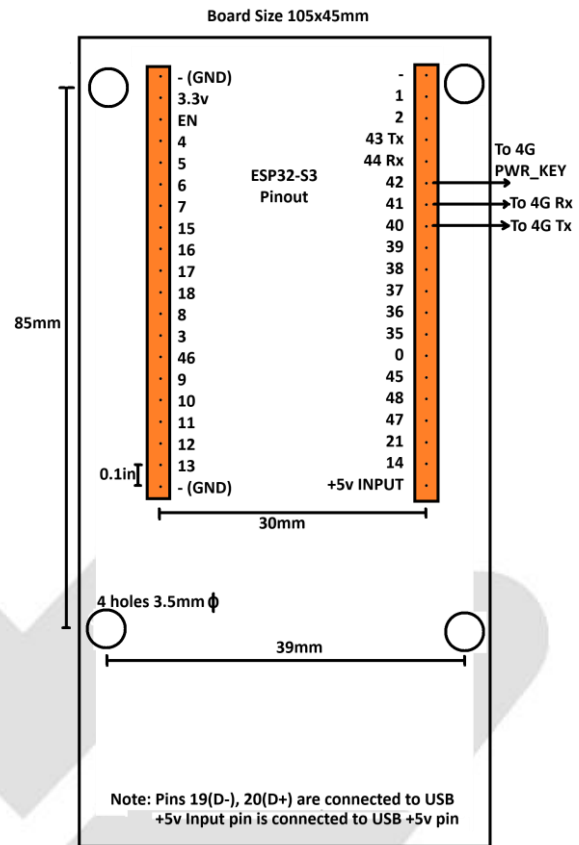
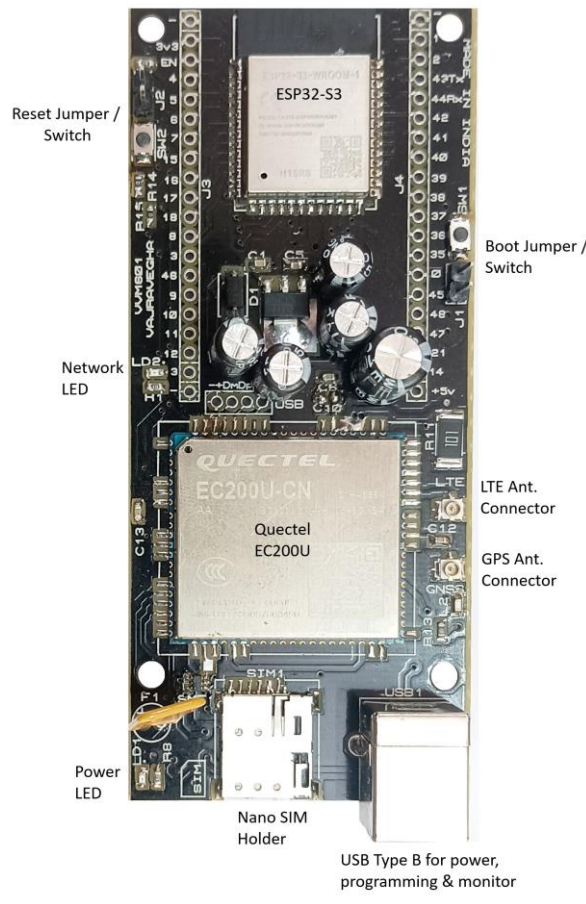
- ESP32-S3-WROOM-1-N16R8 : 2.4GHz Wi-Fi + Bluetooth 5, 240 MHz with 16MB Flash Memory and 8MB PS-RAM, 36 programmable GPIOs, AI acceleration support for vector instructions, full speed USB 2.0, no USB-TTL required.
- Quectel EC200U-CN 4G LTE Cat 1 module with 10Mbps downlink, supports all Indian frequency bands
- Built-in GNSS / GPS
- Single USB Type B connector for power, serial monitoring and programming
- Applications: Artificial Intelligence of Things (AIoT), smart home, smart appliances, smart control panel, POS, data cards, energy control and monitoring, IoT gateways, etc.



## Description:

- VVM601 ESP32-S3 Quectel EC200U 4G LTE Module is a low power embedded module designed for high-speed wireless communication. It integrates the latest LTE module standards and provides a host of features such as advanced modulation and coding technologies, flexible antenna configurations, and high-speed radio transmission. Easy migration from 2G/3G network to 4G network is now made possible using this module. Legacy devices still relying on 2G/3G can be upgraded to 4G networks and made IoT/ Industry 4.0 ready.
- ESP32-S3-WROOM-1-N16R8 SoC with Xtensa dual-core 32-bit LX7 microprocessor (with single precision FPU), up to 240 MHz. 16MB Flash, 8MB PS-RAM, 36 GPIOs. Peripheral support include GPIO, SPI, LCD interface, Camera interface, UART, I2C, I2S, PWM, full speed USB OTG/Serial/JTAG, ADC, timers and watch-dogs.
- The module uses one of the popular 4G LTE chipset EC200U by Quectel. It is Multi-Band LTE-TDD/LTE-FDD/HSPA+ and GSM/GPRS/EDGE module solution in an SMT type which supports LTE CAT1 up to 10Mbps for download data transfer
- EC200U has built-in GNSS function, so no additional GPS modules are required.
- The preconfigured AT commands makes it easier for the user to communicate via MQTT, SMS, Calls etc.
- Indian 4G bands can be used with this module. This means it can be used with Jio, Airtel, Vodafone networks, etc.
- The board supports multiple built-in network protocols like HTTP, HTTPS, FTP, FTPS, MQTT(s), etc. along with SMS and calls.
- The board is powered using a USB Type- B female connector and requires a regulated 5V/2A power source. As ESP32-S3 supports USB 2.0, this port can be used for uploading new code and monitoring. The module can also be powered by 5v input pin, if it's not powered by USB.
- On-board fuse protection, transient voltage protection and EMI suppression. Compact PCB size 105x45mm.

**Applications:** Supports multiple network bands and can be used in a variety of applications including AI and IoT applications, Telematics, Surveillance Devices, PoS, Industrial Routers, Remote Diagnostics, MQTT gateways, etc.



### Operation:

Gently insert a Nano SIM card having valid 4G subscription service in the spring type SIM Card holder. Connect 4G antenna to 4G LTE connector and active GPS antenna to GNSS Connector (if GPS functionality is required). Connect a USB Type A to B cable from the module to a laptop or regulated 5v 2A phone charger. Within 5-10 seconds the Network LED LD2 turns on and starts blinking. Following is the status of this LED:

Flicker slowly (200 ms high/1800 ms low) : Searching for network; Flicker quickly (234 ms high/266 ms low) : Connected to network (idle) ; Flicker rapidly (62 ms high/63 ms low) : Data transfer ongoing.

Default code AT Command tester code is uploaded in the ESP. Open Arduino Serial Monitor or any Serial Port Software like PuTTY, etc., set Baud Rate to 115200 and observe the data log. Enter basic AT commands like AT+CCLK?, AT+CREG?, etc. Check our github page <https://github.com/Vajravegha/VVM601> for sample codes. To upload new code via Arduino, change board settings to **ESP32S3 Dev Module**, ensure **“USB CDC on Boot” is set to Enabled** under Tools, install the relevant libraries and upload the code. Switches and jumpers are provided for reset and boot functionality in-case new code becomes unresponsive.

### NOTES AND PRECAUTIONS:

- Use only a well regulated and stable 5v 2A supply for the USB connector. Exceeding voltage above 5.5v either on the USB or +5v INPUT pin on the PCB can damage the 4G module/ESP32
- Before reprogramming the ESP32, understand the AT Commands properly. Incorrect AT commands sent to the module can corrupt the 4G module memory or change the default configuration settings.
- THIS MODULE IS NOT USED TO MAKE DIRECT CALLS AS SPEAKER AND MICROPHONE IS NOT PRESENT ON THE BOARD. CONTACT US DIRECTLY IN CASE OF CUSTOMISED SOLUTIONS
- For programming under Arduino IDE, ensure **“USB CDC on Boot” is set to Enabled** under Tools
- ESP32-S3 strapping pins are **GPIO 0, 3, 45, 46**. Also this module uses 8MB PSRAM, which is connected to **GPIO 35, 36, 37**. Use these pins with caution. Refer to ESP32-S3 datasheet on Espressif website and Quectel EC200U datasheet for further details