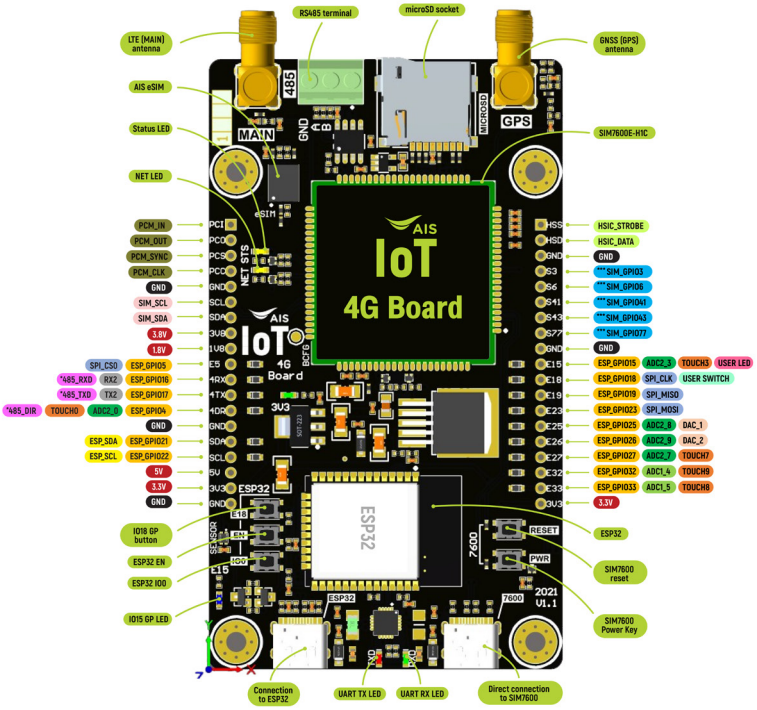
Introduction

AIS 4G Board is a compact circuit board built for use in IoT development via 4G network using a market-leading microcontroller module from Espressif, model "ESP32-WROOM-32" and 4G communication module from SIMCom, model "SIM7600E-H1C", which supports LTE Cat 4 signals.

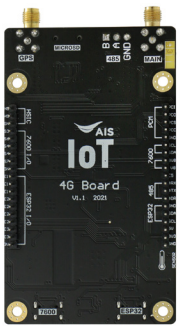
This board has been designed and manufactured as a 4-Layer PCB according to engineering standards specified by IPC and includes built-in circuit protection in the form of transient-voltage-suppression of each I/O pins. The board itself has many incredible and useful functions. For example, there are two USB Type-C connectors: one for direct connection to SIM7600E-H1C, and the other for ESP32-WROOM-32 via the FTDI chip, which acts as a USB-to-Serial converter that is stable and supports all operating systems.

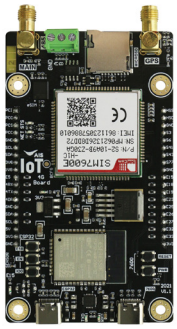
There is an on-board temperature and humidity sensor, an RS485 port, GPS for location tracking, and also several LED indicators. AIS eSIM is pre-installed onto the board so no additional SIM installation is required, while a MicroSD card slot is provided for data logging purposes. And the most unique thing about this product is its ability to promptly connect to the Microsoft Azure cloud services.

AIS 4G Board V 1.1 Pinout Diagram



Distributed by : AIS Designed by : G-LAB Manufactured by : GRAVITECH Certified by : ***Logic 1.8V เท่านั้น





Features

- Compact 4-Layer PCB Design
- Strong AIS LTE Cat 4 network
- Wi-Fi and Bluetooth supported
- GNSS (GPS), eSIM (pre-installed), and microSD socket
- RS485/I2C/SPI/I2S/UART support
- On-board Switches and LED Indicators
- 1 x Programmable LED, 1 x Programmable Switch
- On-board sensors (temperature and humidity)
- Transient-voltage-suppression on I/O pins
- Drivers for all operating systems

Applications

- Portable data collector
- Sensor IoT node
- 4G communication device
- Temperature & humidity alert response
- Industrial control system
- Smart farm device
- Wireless communications equipment

Technical Specifications

Microcontroller Unit:

Brand: Espressif

Model: ESP32-WROOM-32

CPU and Memory Specification

- Xtensa® dual-core 32-bit LX6 microprocessors (up to 600 DMIPS)
- ROM: 448 KB
- SRAM: 520 KB
- SRAM in RTC: 16 KB
- Clock Frequency: Up to 240 MHz

WIFI 802.11 b/g/n

- 802.11 n @ 2.4 GHz, up to 150 Mbps

Bluetooth v4.2 BR/EDR and BLE specifications

Module Certification

- RF Certification: FCC/CE-RED/IC/ TELEC/KCC/SRRC/NCC
- Wi-Fi Certification: Wi-Fi Alliance
- Bluetooth Certification: BQB
- Green Certification: RoHS/REACH

Peripheral Input/Output

- 15 x GPIO
- 7 x ADC, 2 x DAC
- 1 x UART, 1 x SPI, 1 x I2C

Cellular Communication:

Brand: SIMCom

Model: SIM7600E-H1C

Network Technology

- LTE Cat 4 (AIS 4G)

Frequency Bands

- LTE-FDD: B1/B3/B5/B7/B8/B20
- LTE-TDD: B38/B40/B41
- WCDMA: B1/B5/B8
- GSM: B3/B8

Data Transmission

- LTE (Mbps): 150(Downlink) / 50(Uplink)
- HSPA+ (Mbps): 42(Downlink) / 5.76(Uplink)
- WCDMA (Kbps): 384(Downlink) / 384(Uplink)
- GPRS/EDGE (Kbps): 236.8(Downlink) / 236.8(Uplink)

Software Features

- Protocol: TCP/IP/IPV4/IPV6/Multi-PDP/FTP/FTPS/ HTTP/HTTPS/DNS
- Android RIL: Android 5.0/6.0/7.0/8.0/9.0
- USB Driver: Microsoft Windows 7/8/10, Linux/ Android
- Firmware Upgrade: USB

Module Certification

- E-RED / RoHS / REACH

Interfaces

- 1 x HSIC, 1 x PCM, 1 x I^2C
- 5 x GPIO
- SIM socket (1.8V/3.0V)
- MicroSD socket (up to 32 GB)

Sensor(s):

Brand: Sensirion

Model: SHT40-AD1B-R3

Temperature & Humidity Sensor

- Operating Range: 0 to 100 %RH, -40 to +125 °C
- Temperature Accuracy: up to ±0.1 °C
- Relative Humidity Accuracy: up to ±1.5 %RH
- Output Type: Digital
- Interface Type: I2C

On-board Switches & LED Indicators:

- User Programmable

Supply Rating:

- USB Type-C (5V/1A)

Power Consumption:

- Normal Mode: 240-350 mA
- Low Power Mode: 5-6 mA

Operating Conditions:

- Applicable Temperature Range: 0-70 °C
- Applicable Humidity Range: 0-90 %RH

Antennas:

- LTE/GSM/UMTS (Main) antenna
- GNSS (GPS) antenna

Dimensions:

- 57.92mm x 107.1mm x 19.54mm

Weight:

- 42 grams