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XYGStudy SIM7600G-H

XYGStudy SIM7600G-H 4G Communication Module User Manual

Model: SIM7600G-H

1. Introduction and Overview

The XYGStudy SIM7600G-H 4G Communication Module is a versatile, multi-band communication solution compatible with 4G, 3G, and 2G networks. It integrates GNSS positioning capabilities and offers various communication interfaces for broad application in embedded systems and IoT projects.

This module supports a wide range of functionalities including dial-up internet access, telephone calls, SMS, TCP, UDP, MQTT, DTMF, HTTP, and FTP. Its compact design with castellated holes allows for easy integration into devices through direct soldering or via pin headers.



Version Options

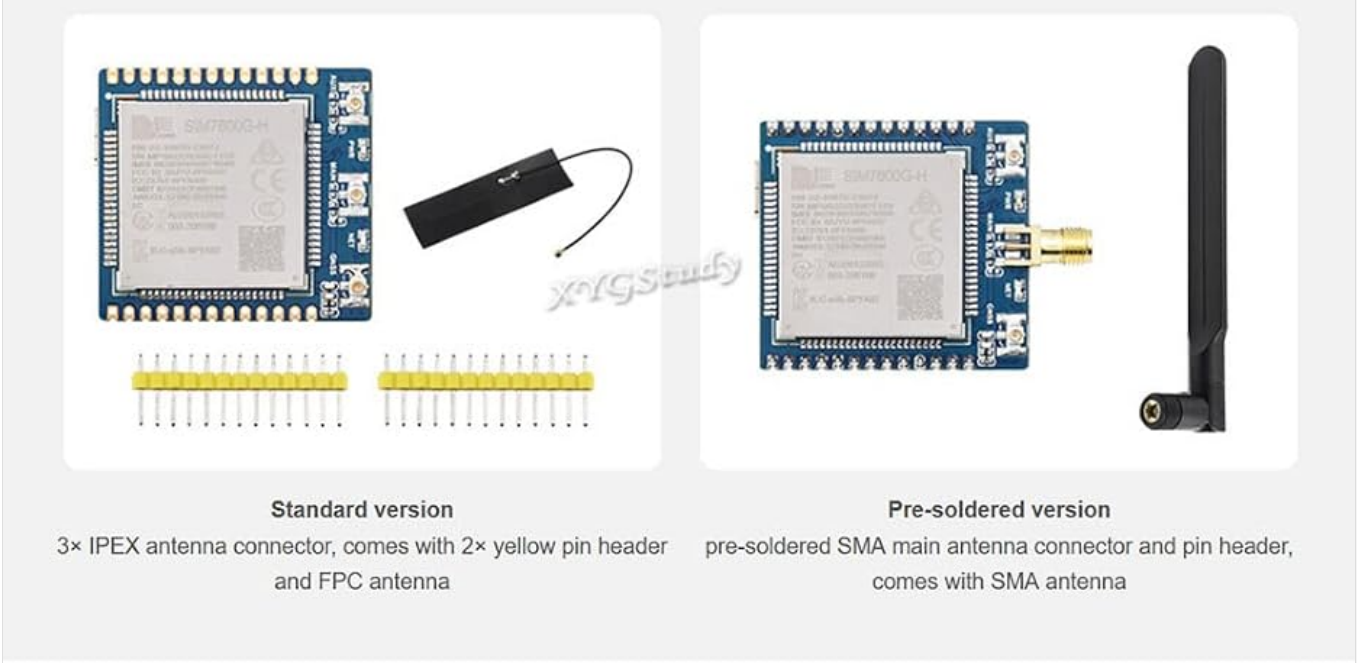


Figure 1: Overview of SIM7600G-H Module capabilities, including multi-band support, GNSS positioning, USB/UART communication, dial-up, cloud platform integration, multi-OS support, and small size for easy integration.

2. Key Features

- **Multi-band Support:** Compatible with 2G/3G/4G networks.
- **Communication Protocols:** Supports dial-up, telephone call, SMS, TCP, UDP, MQTT, DTMF, HTTP, FTP, etc.
- **GNSS Positioning:** Integrated GPS, BeiDou, Glonass, GALILEO, QZSS, and LBS base station positioning.
- **Flexible Interfaces:** Onboard USB and UART interfaces for various applications including internet access, cloud communication, and GNSS.
- **Easy Integration:** Castellated holes with immersion gold design for direct soldering or pin header insertion.

- **Wide Compatibility:** Adaptable with 3.3V/5V MCUs, Raspberry Pi, Jetson Nano, ESP32, Arduino, and STM32.
- **Power Supply Options:** Supports multiple power supply methods, including USB, VIN, and VBAT (3.7V lithium battery).
- **Protection Circuits:** TVS protection for SIM card, power supply isolation between USB port and VIN pin header, and VIN pin power supply anti-reverse protection.
- **LBS Base Station Positioning:** Enhanced location services.
- **Power Management:** Supports 5-26V wide voltage power supply and 3A high current output to prevent module damage during instantaneous power consumption peaks.
- **Nano SIM Card Slot:** Convenient for SIM card installation.



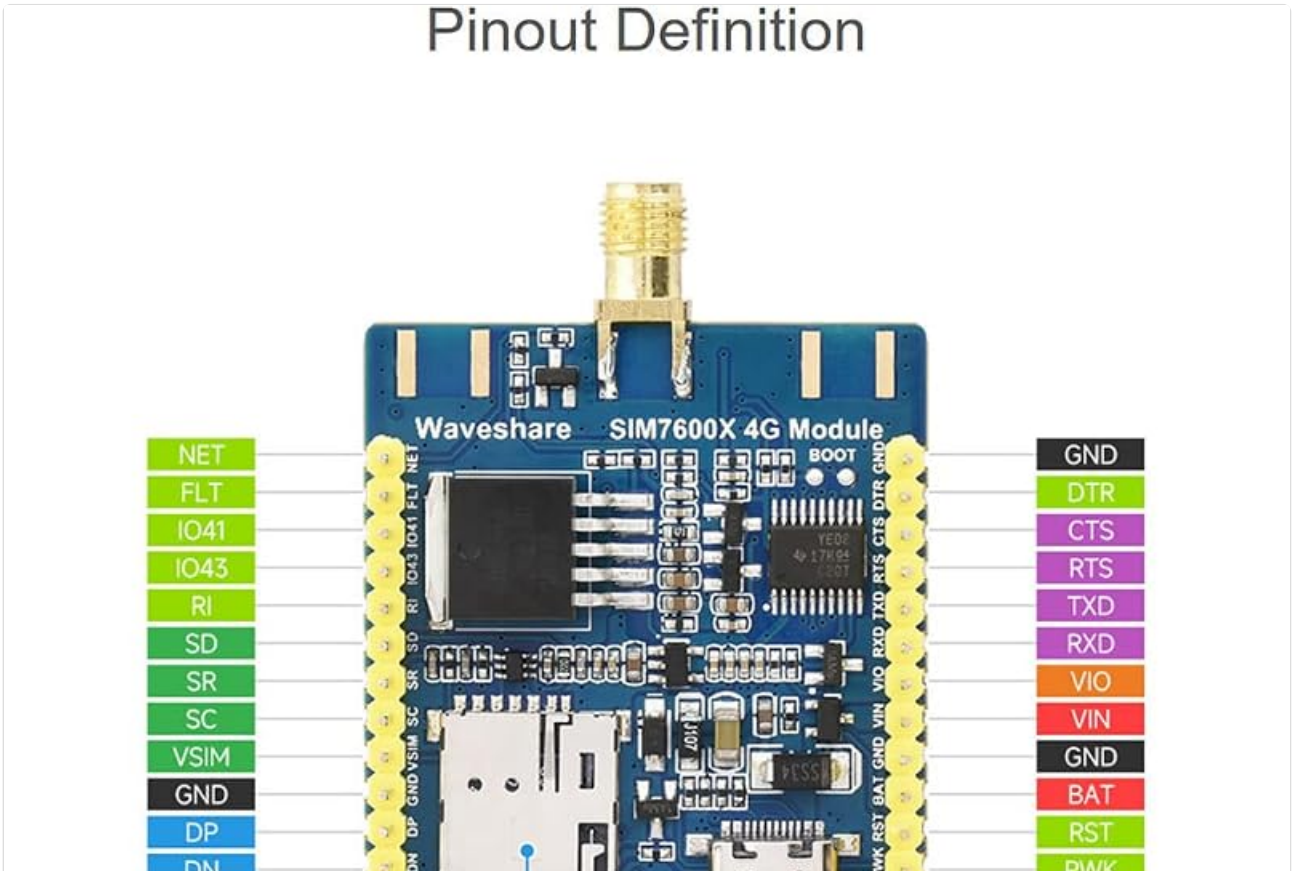
Figure 2: Detailed list of features for the SIM7600G-H module, highlighting connectivity, positioning, and integration capabilities.

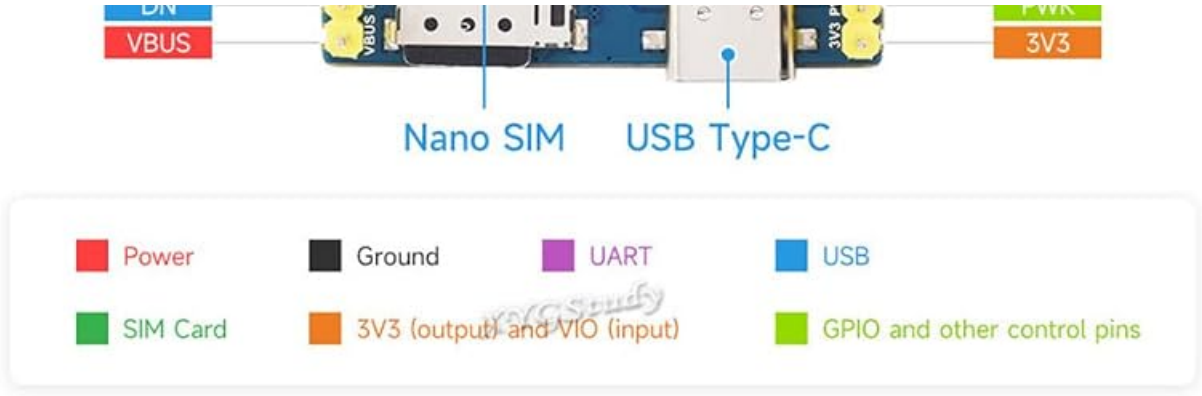
3. Specifications

Category	Specification
Model Name	SIM7600G-H
Connectivity Technology	GPIO, USB

Category	Specification
Operating System Compatibility	Linux (for USB driver), Windows XP/7/8/10/11
Processor Brand	Qualcomm
Compatible Devices	USB devices, UART devices, SIM card devices, GPIO devices, devices with corresponding communication protocols (Raspberry Pi, Jetson Nano, ESP32, Arduino, STM32)
Total USB Ports	1 (USB Type-C)
Built-In Media	4G Module
Network Protocol	TCP/IP/IPV4/IPV6/MQTT/Multi-PDP/FTP/FTPS/HTTP/HTTPS/DNS
SMS Support	MT, MO, CB, Text, PDU
Power Supply	USB port or VBUS-GND pin: 5V power supply; VIN-GND pin: 5V-26V wide voltage power supply; BAT-GND pin: 3.7V lithium battery power supply
Operating Voltage	3.3V by default (configurable as 3.8V-5V via VIO pin by connecting external voltage)
Operating Temperature	-30°C ~ 80°C
Storage Temperature	-45°C ~ 90°C
Dimensions	38.9 x 42.0 mm

Pinout Definition





PIN	DESCRIPTION	PIN	DESCRIPTION
NET	Network Indicator	GND	Power Ground
FLT	Flight mode	DTR	Sleep mode wake up
IO41	Controll GPIO41 high or low level output by AT command	CTS	UART flow control
IO43	Controll GPIO43 high or low level output by AT command	RTS	UART flow control
RI	Voice call wake up	TXD	UART Sending
SD	SIM card data	RXD	UART Receiving
SR	SIM card reset	VIO	VCCIO, default 3.3V when is not connected, configurable as 3.8V-5V via VIO pin by connecting external voltage
SC	SIM card clock	VIN	wide voltage input, 5V~26V
VSIM	SIM card power supply	GND	Power Ground
GND	Power ground	BAT	3.7V Lithium battery power input
DP	USB signal cable Data+	RTS	Module reset pin
DN	USB signal cable Data-	PWK	module power on/off pin
VBUS	USB power supply cable	3V3	power supply output

Figure 3: Comprehensive specifications table for the SIM7600G-H module, detailing network, hardware, and environmental parameters.



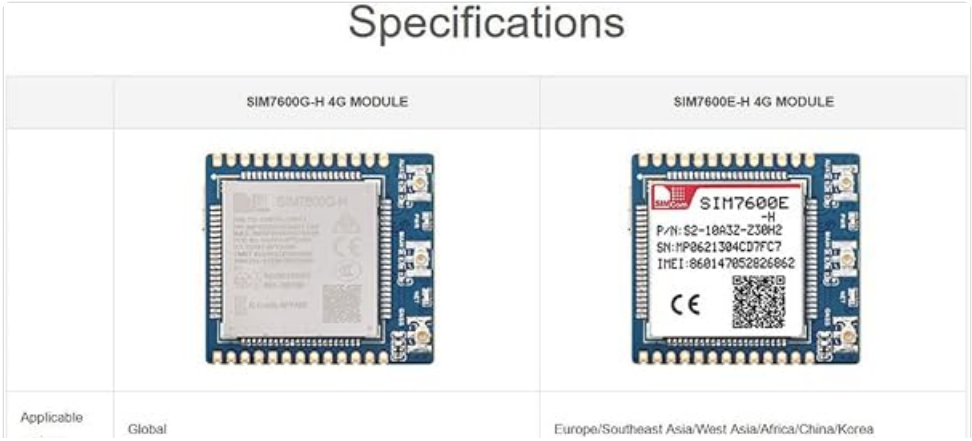
Figure 4: Outline dimensions of the SIM7600G-H module in millimeters, useful for integration planning.

4. Package Content

The SIM7600G-H 4G Communication Module (B) package typically includes the following items:

- SIM7600G-H 4G Module (B) pre-soldered version x1
- 4G antenna x1

Note: For the standard version, the package may include an FPC antenna and 13PIN straight pin headers instead of the pre-soldered module and 4G antenna.



regions		
FREQUENCY BAND		
LTE Cat-4	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B18 /B19/B20/B25/B26/B28/B66 LTE-TDD: B34/B38/B39/B40/B41	LTE-TDD: B38/B40/B41 LTE-FDD: B1/B3/B5/B7/B8/B20
3G	UMTS/HSDPA/HSPA+: B1/B2/B4/B5/B6/B8/B19	UMTS/HSPA+: B2/B5
2G	GSM/GPRS/EDGE: 850/900/1800/1900 MHz	GSM/GPRS/EDGE: 900/1800MHz
GNSS		
Frequency band	GPS/Beidou/GLONASS/GALILEO/QZSS	
Receiver type	C/A Code	
	16-channel	
Sensitivity	-159 dBm (GPS) / -158 dBm (GLONASS) / TBD (BeiDou)	
	Cold starts: -148 dBm	
Time-To-First-Fix (open air)	Cold starts: <35s	
	Hot starts: <1s	
SOFTWARE FEATURES		
Network protocol	TCP/IP/IPV4/IPV6/MQTT/MQTTS/Multi-PDP/FTP/FTPS/HTTP/HTTPS/DNS	
Internet access	PPP/NDIS/RNDIS	
USB driver	Windows XP/7/8/10/11, Linux (driver free on Raspberry Pi Raspbian system)	
SMS	Supported types: MT, MO, CB, Text, PDU	
HARDWARE INTERFACE		
USB interface	Can be used to access PC/Raspberry Pi/Jetson Nano and other hosts for 4G networking, positioning, AT command sending and receiving test, firmware upgrade, etc.	
UART interface	Can be used to access MCU for 4G networking, positioning, AT command sending and receiving test, etc., compatible with 3.3V/5V working level	
SIM card slot	Onboard Nano SIM card slot, adapting related pins, compatible with 1.8V and 3V SIM card	
Antenna connectors	MAIN: 4G main antenna (optional SMA connector or IPEX 1 connector version) AUX: 4G auxiliary antenna (IPEX 1 connector by default, can be mass-customized as SMA connector) GNSS: Positioning antenna (IPEX 1 connector by default, can be mass-customized as SMA connector)	
Other interface	Adapting other common control pins such as GPIO, PWR, RST, FLT	
OTHER		
Power supply	USB port or VBUS - GND pin: 5V power supply	
	VIN - GND pin: 5V~26V wide-range voltage power supply	
	BAT - GND pin: 3.7V lithium battery power supply	
Operating voltage	3.3V by default (configurable as 3.8V-5V via VIO pin by connecting external voltage)	
Operating temperature	-30°C ~ 80°C	
Storage temperature	-45°C ~ 90°C	
Dimensions	38.8 x 42.0mm	

Figure 5: Illustration of the two main versions of the SIM7600X 4G Module: Standard and Pre-soldered, showing their respective components.

5. Setup and Hardware Connection

5.1 Pinout Definition

Understanding the pinout is crucial for correct integration. The module features various pins for power, ground, UART, USB, SIM card, and GPIO control.

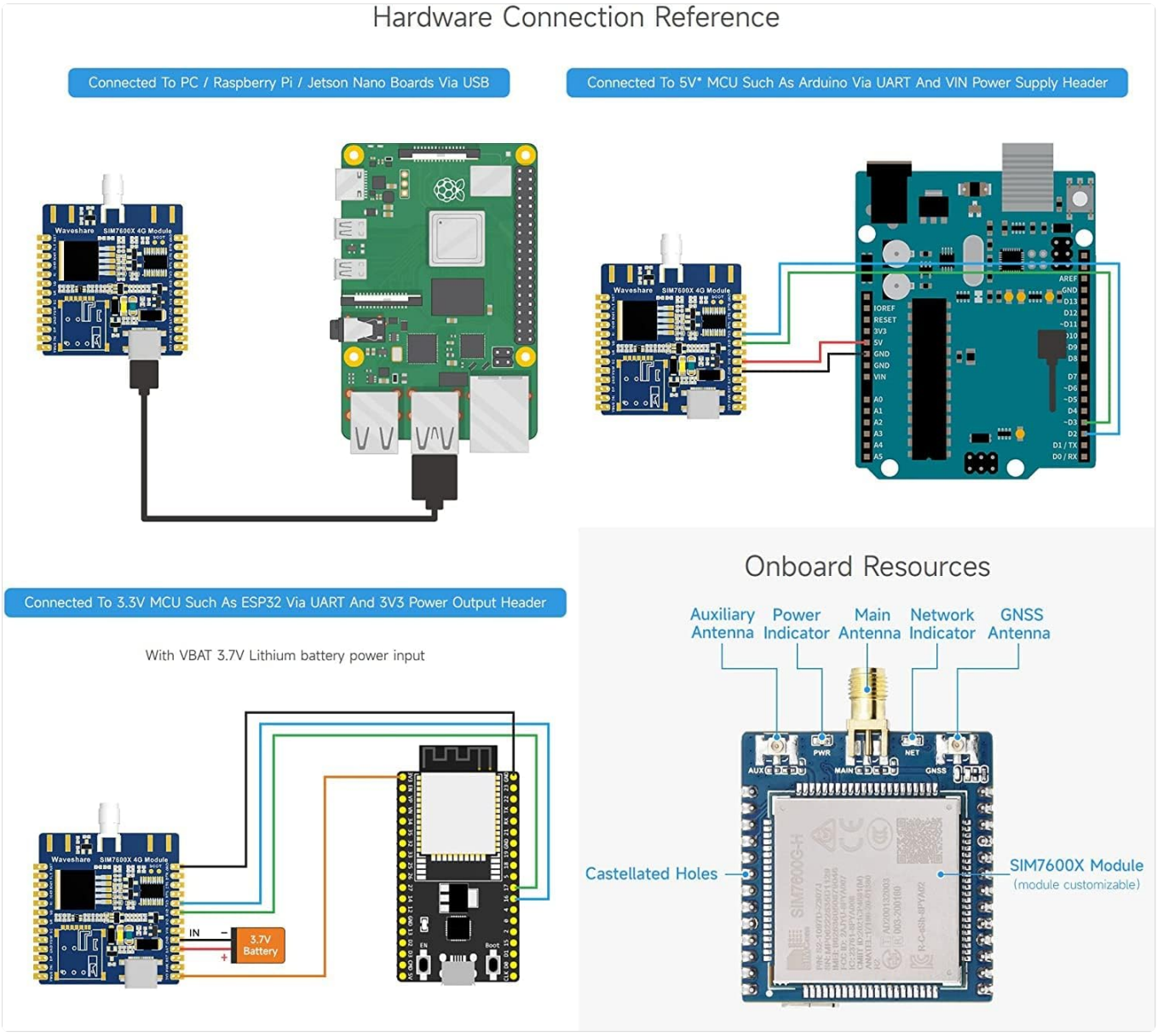


Figure 6: Detailed pinout diagram for the SIM7600X 4G Module, indicating functions for each pin including power, ground, UART, USB, SIM card, and GPIO.

5.2 Hardware Connection Reference

The SIM7600G-H module can be connected to various host devices using its USB or UART interfaces. Ensure proper power supply and signal connections.

- **Connecting to PC / Raspberry Pi / Jetson Nano Boards via USB:** Use the onboard USB Type-C port for data communication and power.
- **Connecting to 5V MCU (e.g., Arduino) via UART:** Connect the module's UART pins (TXD, RXD) to the MCU's

corresponding pins. Ensure VIN power supply header is used for 5V.

- **Connecting to 3.3V MCU (e.g., ESP32) via UART:**Connect UART pins. Use the 3V3 power output header. For portable applications, a 3.7V lithium battery can be connected to the VBAT pins.

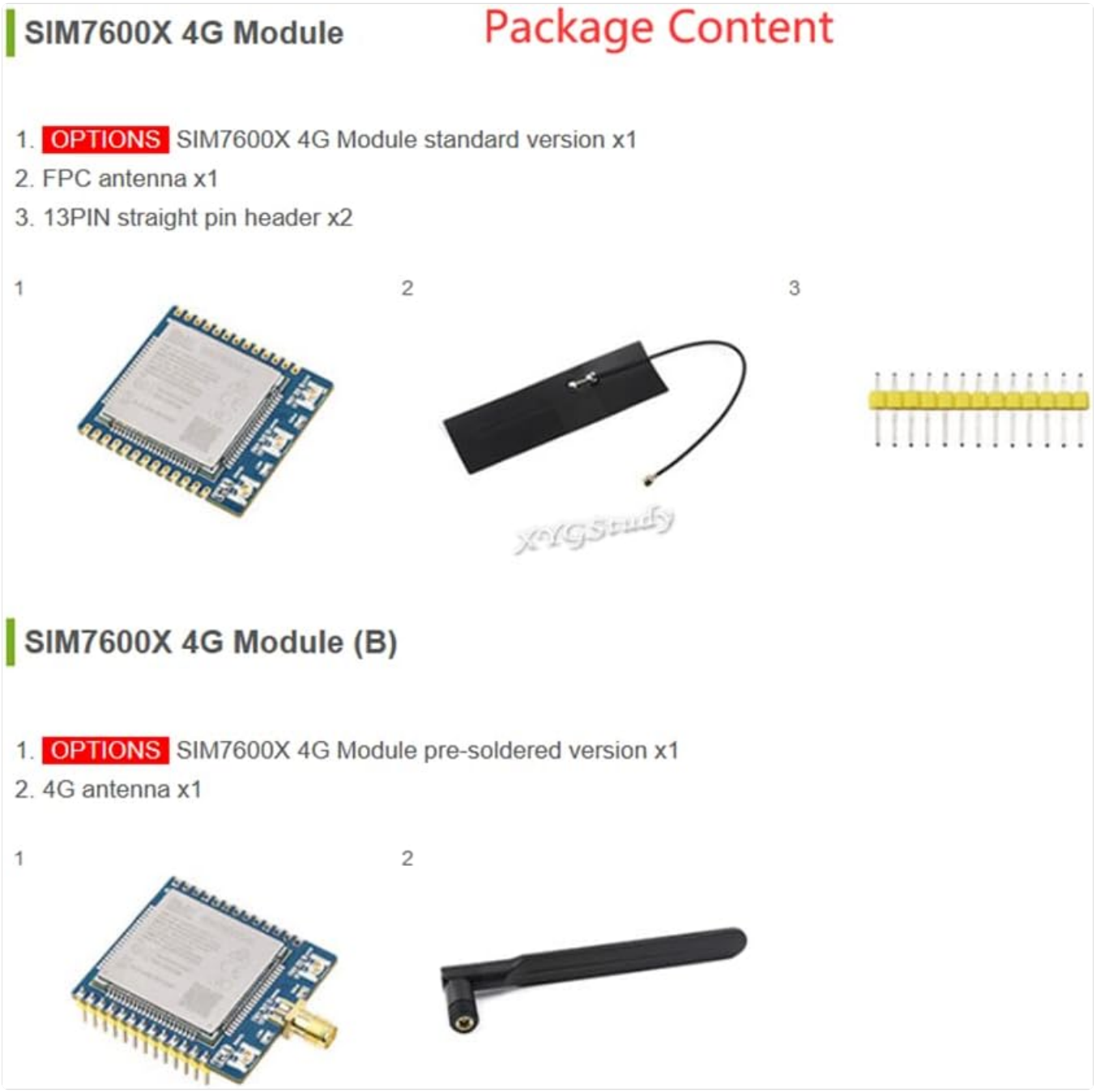


Figure 7: Examples of hardware connections for the SIM7600G-H module with various platforms like Raspberry Pi, Arduino, and ESP32, illustrating USB and UART connections.

5.3 Antenna Connection

Connect the provided 4G antenna to the SMA connector on the module. For GNSS functionality, an external GNSS antenna (not included) may be required and connected to the dedicated GNSS antenna connector.



Figure 8: Visual representation of the module's antenna connections, including the main 4G antenna and optional GNSS antenna port.

6. Operating Instructions

6.1 Dial-up Internet Access

The module supports dial-up internet access on Windows and Linux operating systems. Drivers may be required for your specific OS. Once connected via USB, the module can establish a network connection for internet access.

- **LTE Cat-4:** Up to 50Mbps (Uplink) / Up to 150Mbps (Downlink)
- **3G (HSPA+):** Up to 5.76Mbps (Uplink) / Up to 42Mbps (Downlink)

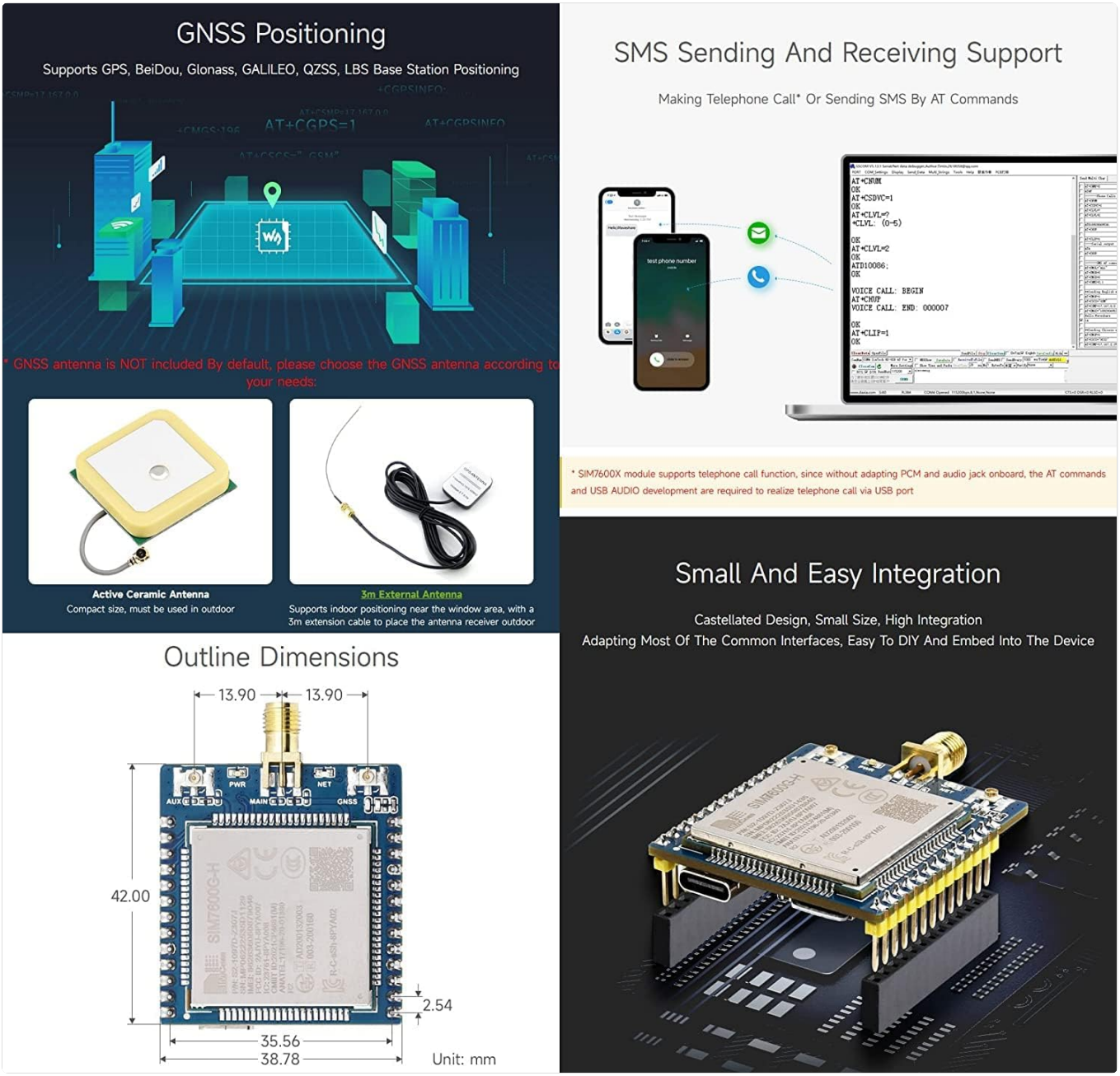


Figure 9: Illustration of the module providing dial-up internet access on a laptop, demonstrating its network capabilities.

6.2 GNSS Positioning

The SIM7600G-H module integrates multiple global navigation satellite systems (GPS, BeiDou, Glonass, GALILEO, QZSS) and LBS base station positioning. For optimal performance, an active ceramic antenna is recommended for outdoor use, while a 3m external antenna can be used for indoor applications near a window.



Figure 10: Visual explanation of the GNSS positioning capabilities, including antenna types and their recommended usage scenarios.

6.3 SMS and Telephone Call

The module supports sending and receiving SMS messages and making telephone calls using AT commands. Note that an audio interface (e.g., PCM and audio jack) and USB audio development may be required for telephone call functionality.



Figure 11: Demonstration of SMS sending and receiving, and telephone call functionality via AT commands.

6.4 Cloud Communication

The module supports various cloud communication protocols, including TCP, UDP, MQTT, HTTP, and FTP, enabling seamless data exchange with cloud platforms.

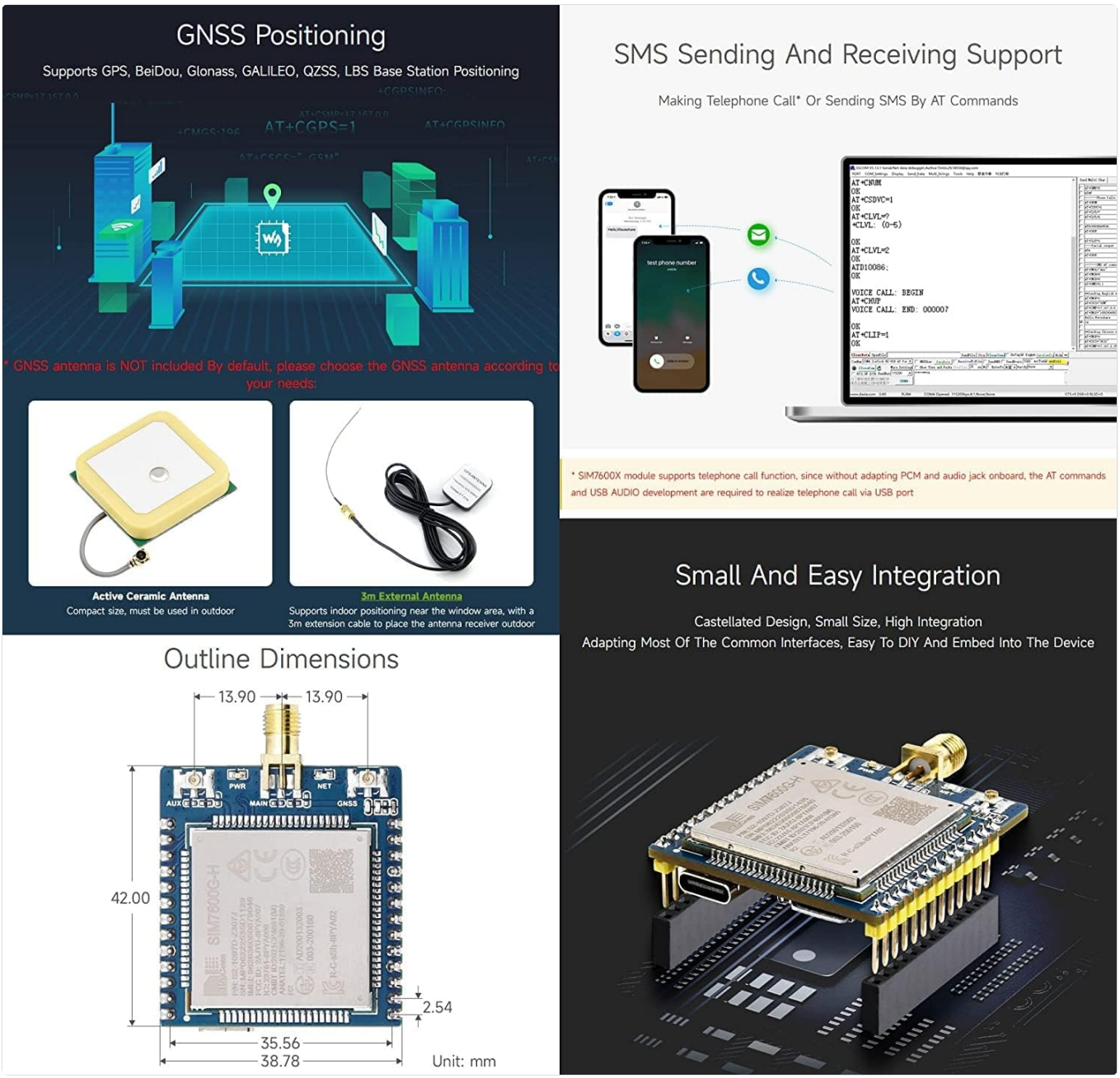


Figure 12: Diagram illustrating the module's support for various cloud communication protocols via USB and UART interfaces.

7. Maintenance

To ensure the longevity and optimal performance of your SIM7600G-H module, consider the following maintenance guidelines:

- **Environmental Conditions:** Operate the module within the specified temperature range (-30°C to 80°C) and avoid extreme humidity or dusty environments.
- **Power Supply:** Always use a stable power supply within the recommended voltage range (5V for USB, 5V-26V for VIN, 3.7V for BAT). Over-voltage can damage the module.
- **Physical Handling:** Handle the module with care to avoid physical damage to components or connectors. Avoid static discharge by using appropriate ESD precautions.
- **Antenna Connection:** Ensure antennas are securely connected. Loose connections can lead to poor signal

quality.

- **Firmware Updates:** Periodically check the manufacturer's website for any available firmware updates to improve performance or address issues.

8. Troubleshooting

If you encounter issues with your SIM7600G-H module, consider the following troubleshooting steps:

- **No Power/Module Not Responding:**
  - Verify power supply connections and voltage levels.
  - Check for proper connection of the USB cable or power pins.
  - Ensure the module's power indicator LED is lit.
- **No Network Connection:**
  - Check if the SIM card is correctly inserted and activated.
  - Ensure the 4G antenna is securely connected.
  - Verify network coverage in your area.
  - Check APN settings if configuring manually.
- **GNSS Not Acquiring Signal:**
  - Ensure an appropriate GNSS antenna is connected (if required).
  - Move the module to an open area with clear sky view.
  - Check antenna connection for looseness or damage.
- **Communication Issues (USB/UART):**
  - Verify driver installation on your host system.
  - Check baud rates and serial port settings for UART communication.
  - Ensure correct TX/RX pin connections.

For further assistance, refer to the official documentation or contact XYGStudy support.

9. Warranty and Support

The XYGStudy SIM7600G-H 4G Communication Module comes with a**1-year warranty** from the date of purchase, covering manufacturing defects.

For technical support, additional resources, or warranty claims, please contact XYGStudy directly. You may reach out via Amazon message for resources or visit the official XYGStudy website for detailed documentation and support channels.

Manufacturer: XYGStudy

Seller: XYGStudy (via Amazon)

For more resources you may need, please contact the seller via Amazon message. They will provide necessary

attachments.

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