HiLetgo GY-NEO6MV2

HiLetgo GY-NEO6MV2 NEO-6M GPS Flight Controller Module User Manual

Model: GY-NEO6MV2 (3-01-1087)

1. INTRODUCTION

This manual provides essential information for the proper setup, operation, and maintenance of your HiLetgo GY-NEO6MV2 NEO-6M GPS Flight Controller Module. Please read this guide thoroughly before using the module to ensure optimal performance and longevity.

The GY-NEO6MV2 module is a compact GPS receiver featuring the u-blox NEO-6M chipset, designed for applications requiring precise positioning data. It includes a ceramic antenna and built-in EEPROM for saving configuration data, making it suitable for various projects, including those involving Arduino and APM 2.5 flight controllers.

2. SAFETY INFORMATION

- **Power Supply:** Ensure the module is powered within its specified voltage range of 3V to 5V. Exceeding this range can cause permanent damage.
- **Static Discharge:** Handle the module with care to prevent electrostatic discharge, which can damage sensitive electronic components.
- **Connections:** Double-check all wiring connections before applying power to avoid short circuits or incorrect polarity.
- **Environment:** Operate the module in a dry environment, away from moisture, extreme temperatures, and strong electromagnetic interference.

3. PRODUCT OVERVIEW

The HiLetgo GY-NEO6MV2 module consists of a main PCB with the u-blox NEO-6M GPS receiver and a separate ceramic patch antenna connected via a U.FL connector.

3.1 Key Features

- Integrated ceramic antenna for superior signal reception.

- Built-in EEPROM to save configuration parameters.
- Data backup battery (MS621FE model).
- LED signal indicator for satellite lock status.
- RS232 TTL interface for communication.
- Compatible with various flight control modules, including APM2 and APM2.5.

3.2 Module Components and Pinout

The module features standard pin headers for power and data communication.

- **VCC:** Power input (3V-5V).
- **RX:** Receiver pin (connects to host TX).
- **TX:** Transmitter pin (connects to host RX).
- **GND:** Ground connection.

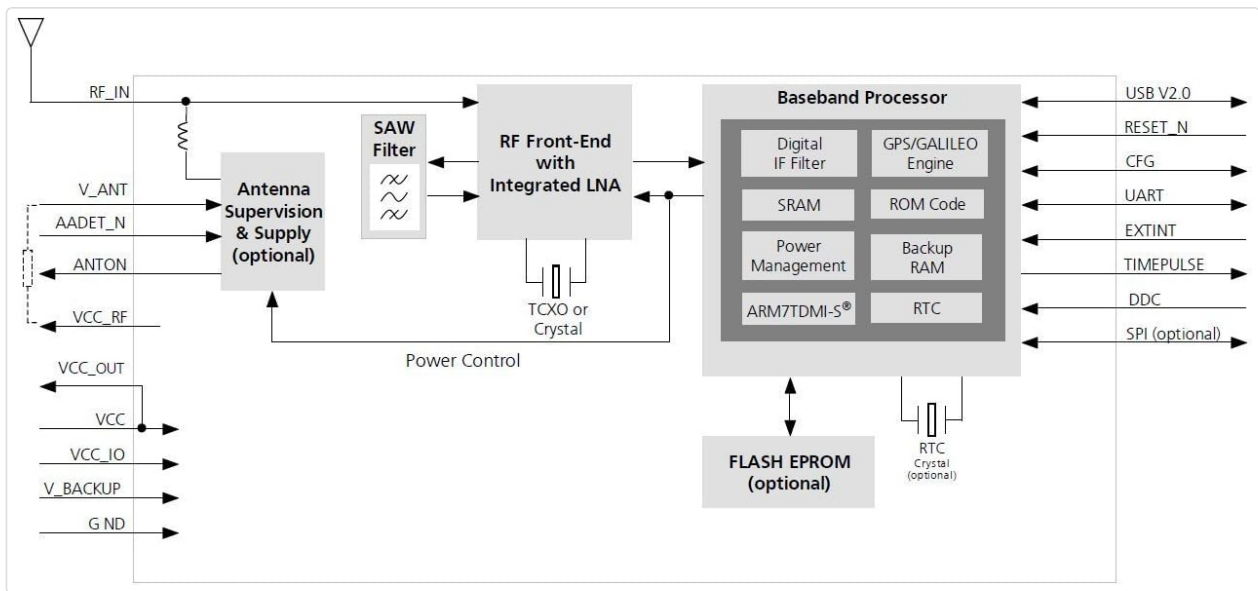Figure 1: HiLetgo GY-NEO6MV2 GPS module with attached ceramic antenna.

Figure 2: Back view of the module, showing mounting holes and solder pads.

Figure 3: Internal block diagram illustrating the components of the u-blox NEO-6M GPS receiver.

4. SETUP

4.1 Initial Connection

1. Connect the ceramic antenna to the U.FL connector on the GPS module. Ensure a secure connection.

2. Connect the module to your microcontroller (e.g., Arduino, Raspberry Pi) or a USB-to-TTL serial adapter using the following pin assignments:

   - Module VCC to 3.3V or 5V power supply.
   - Module GND to Ground.
   - Module TX to Host RX (e.g., Arduino Pin 0).
   - Module RX to Host TX (e.g., Arduino Pin 1).

3. Ensure your host device's serial port is configured to the default baud rate of 9600 bps.

4.2 Satellite Acquisition

Upon initial power-up, the module will attempt to acquire satellite signals. This process, known as a 'cold start', may take several minutes (typically 5-10 minutes) if the module has not been used recently or has been moved a significant distance. Place the antenna in an open area with a clear view of the sky for best results.
The onboard LED indicator will flash once a satellite lock is achieved, indicating valid GPS data is being received.

4.3 Example Arduino Code (for testing)

The following code snippet demonstrates basic communication with the GPS module using an Arduino UNO R4 WiFi. This code reads raw NMEA data from the GPS module and prints it to the Serial Monitor.

```
// Simple Arduino UNO R4 WiFi code to test GY-NEO6MV2 (NEO-6M) GPS module
// Connect: GPS TX -> Arduino Pin 0 (RX)
// GPS RX -> Arduino Pin 1 (TX)
// GPS VCC -> 3.3V or 5V
// GPS GND -> GND

#include <SoftwareSerial.h>

SoftwareSerial gpsSerial(0, 1); // RX, TX pins

void setup() {
  Serial.begin(9600); // For Serial Monitor
  gpsSerial.begin(9600); // GPS default baud rate
  Serial.println("GPS Test Starting...");
}

void loop() {
  if (gpsSerial.available()) {
    char c = gpsSerial.read();
    Serial.write(c); // Print raw NMEA data to Serial Monitor
  }
}
```

5. OPERATING INSTRUCTIONS

5.1 Data Output

The GY-NEO6MV2 module outputs GPS data in standard NMEA 0183 format via its serial (TTL) interface. This data includes information such as latitude, longitude, altitude, speed, time, and satellite status.

5.2 LED Indicator

The onboard LED provides visual feedback on the module's status:

- **Solid ON:** Module is powered, but no satellite lock.
- **Flashing:** Module has achieved a 3D satellite fix and is outputting valid positioning data.

5.3 Configuration and EEPROM

The module's built-in EEPROM allows you to save custom configuration settings, such as baud rate, NMEA sentence output, and update rates. These settings will persist even after power cycling. The u-blox u-center software (available from u-blox) can be used on a PC to configure the module via a USB-to-TTL adapter.

6. MAINTENANCE

6.1 Backup Battery

The module includes a small backup battery (MS621FE) which helps maintain the internal RTC (Real-Time Clock) and ephemeris data. This allows for faster 'hot starts' or 'warm starts' after a brief power loss, as the module retains some satellite information. This battery is typically maintenance-free but may require replacement if the module consistently experiences slow satellite acquisition times after short power cycles.

6.2 Cleaning

Keep the module and antenna free from dust and debris. Use a soft, dry cloth for cleaning. Avoid using liquids or solvents.

7. TROUBLESHOOTING

- **No Satellite Lock (LED not flashing):**
  - Ensure the antenna is securely connected and placed in an open area with a clear view of the sky.
  - Allow sufficient time (up to 10-15 minutes) for the initial cold start.
  - Verify power supply is stable and within 3V-5V.

- **No Data Output:**
  - Check all wiring connections (VCC, GND, TX, RX) for correctness.
  - Confirm the host device's serial port baud rate matches the module's default (9600 bps) or configured baud rate.
  - Ensure the module has achieved a satellite lock (LED flashing).

- **Inaccurate Coordinates:**
  - Ensure the antenna has a clear, unobstructed view of the sky. Obstacles like buildings or dense foliage can degrade accuracy.
  - Allow the module to operate for a longer period to improve accuracy as it receives more satellite data.

- **Module Not Functioning / Appears Dead:**
  - Inspect for any visible damage or poor solder joints. In rare cases, a reflow of components might be necessary if manufacturing defects are suspected (this typically requires specialized equipment and expertise).
  - Verify the power supply is providing adequate current.

8. SPECIFICATIONS

Feature	Specification
Model	GY-NEO6MV2
GPS Chipset	u-blox NEO-6M
Operating Voltage	3V - 5V DC

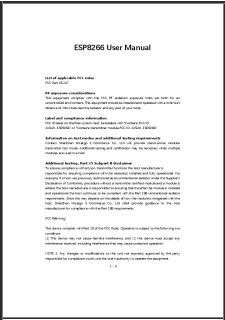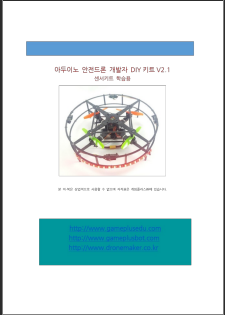| Interface	RS232 TTL
Default Baud Rate	9600 bps
Antenna Type	Ceramic Patch Antenna
Backup Battery	MS621FE
EEPROM	Built-in, for configuration data storage
Dimensions (Module)	Approximately 3.78 x 1.18 x 0.79 inches (Package Dimensions)
Weight	Approximately 0.704 ounces

9. WARRANTY AND SUPPORT

For technical support or if you encounter any issues with your HiLetgo GY-NEO6MV2 module, please contact HiLetgo customer support. You can typically find support information on the official HiLetgo website or through the retailer where the product was purchased.
Email: support@hiletgo.com
Please have your product model number (GY-NEO6MV2) and any relevant purchase details ready when contacting support.

Related Documents - GY-NEO6MV2

ESP8266 User Manual	**ESP8266 User Manual** User manual for the ESP8266 module, detailing its features, parameters, and pin descriptions. Includes FCC compliance information and RF exposure considerations.
JVC 4K MEMORY CARD CAMERA RECORDER GY-HM250U/GY-HM250E GY-HM180U/GY-HM180E GY-HM170U/GY-HM170E INSTRUCTIONS	**JVC GY-HM250/GY-HM180/GY-HM170 4K Camcorder User Manual** This comprehensive user manual provides detailed instructions for operating the JVC GY-HM250, GY-HM180, and GY-HM170 series 4K memory card camera recorders. It covers essential safety precautions, setup procedures, shooting techniques, playback options, and advanced network and system settings for professional video production.
아두이노 안전드론 개발자 DIY 키트 V2.1 센서기반 학습용	**DIY V2.1** ( ) DIY V2.1 . , , .

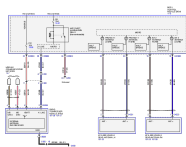|	
	[Granwin GY-BT2 Bluetooth Module Manual](#) This manual provides detailed information on the Granwin GY-BT2 Bluetooth module, including its features, electrical parameters, application areas, and integration instructions for host product manufacturers. It covers specifications such as Bluetooth version, MCU features, power consumption, and antenna details, along with FCC compliance information.
	[JVC Camcorder Web API Reference](#) Comprehensive technical reference for the JVC Camcorder Web API (Version 1.08), detailing commands for controlling JVC camcorders via network, including streaming, PTZ, and system settings.
	[Vehicle Keyless Entry and Alarm System Wiring Diagram](#) Detailed wiring diagram illustrating the connections for the Body Control Module (BCM), Radio Transceiver Module (RTM), internal RKE receiver, and rear antennas in a vehicle's keyless entry and anti-theft system. It outlines connections originating from the BCM.