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Interfacing GY-GPSV3-NEO-M8N GPS Module with Arduino



Introduction

The NEO-M8N is a GPS module that can be plugged into your Arduino board. It uses satellites to find your location and then sends that information to your Arduino. This lets you add location features to your projects, like a GPS tracker or a robot that navigates based on its position.

This model is newer than the NEO-6M provides more stability and still keeps that same compact form factor. This model also comes with 2 LED indicator, Red LED is for indicating whether the module is turning ON or OFF and Green LED for indicating whether the module already connected to GPS.

Key Advantages of the Neo-M8N GPS Module Over the Neo-6M:

- **Improved Accuracy:** The Neo-M8N offers a higher accuracy of 2 meters compared to the Neo-6M's 2.5 meters.
- **Faster Update Rate:** The Neo-M8N boasts a faster update rate of 10 Hz, allowing for more frequent position updates than the Neo-6M's 1 Hz.
- **Lower Power Consumption:** The Neo-M8N is designed to be more power-efficient, making it suitable for battery-powered applications.
- **Multiple Constellation Support:** The Neo-M8N can track GPS, GLONASS, Galileo, and BeiDou satellites, providing better coverage and performance in various locations.
- **Newer Technology:** As a more recent product, the Neo-M8N may benefit from advancements in GPS technology and offer additional features or capabilities.



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Specifications

Model	Ublox NEO-M8N		
Receiver Type	72-channel Ublox M8 engine		
Input Supply Voltage (VDC)	3~5 V		
Main Chip	Ublox NEO-M8N		
Sensitivity (dBm)	156 dBm		
Position Accuracy (Meter)	2 - 2.5m		
Acceleration (g)	≤ 4 g		
Navigation Update Rate	5 - 10 Hz		
Operating Temperature Range (°C)	-45 to 105 °C		
Tracking Sensitivity (dBm)	165 – 167 dBm		
Co-Ordinate System	WGS-84		
Capture Time	0.1s Average		
Average Cold Start Time (s)	≤ 29 s		
Warm / Hot Start Time (s)	1 s		
Boot Time (s)	15 s		
Maximum Altitude (m)	50,000 m		
Dimensior	ns (mm)		
Antenna	26 x 26 x 9* mm		
Module	26 x 36 x 4 mm		
Weight (gm):	17g		

Objective

Interfacing the GPS Module with the Arduino (or with any compatible microcontroller) and getting the GPS data.

List of items needed

- 1. NEO-M8N GPS Module
- 2. Arduino UNO (any compatible MCUs)
- 3. Jumper Wires
- 4. Breadboard



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Procedures

A. Installing the Arduino library.

 Launch Arduino IDE, navigate to the toolbar and select the Sketch > Include Library > Manage Libraries....

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				Manage Libraries	Ctrl+Shift+I
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2 #ir 3⊡/*	Show Sketch Folder	Ctrl+K		EEPROM	
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2. Once Library Manager window appeared, search for 'TinyGPSPlus' and click on Install.

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TinyGPSMinus by Eric Andrechek A smaller and simpler TinyGPS fork with fewer features. The idea is to only get the raw data needed and avoid unneeded parsing, especially if GPS data is being fed into APRS. <u>More info</u>	
TinyGPSPlus by Mikal Hart TinyGPSPlus provides object-oriented parsing of GPS (NMEA) sentences NMEA is the standard format GPS devices use to report location, time, altitude, etc. TinyGPSPlus is a compact, resilient library that parses the most common NMEA 'sentences' used: GGA and RMC. It can also be customized to extract data from *any* compliant sentence. More info	
Tinyurorius-coroz	
by Mikal Hart	~
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1 ATmega328PB on COM7	



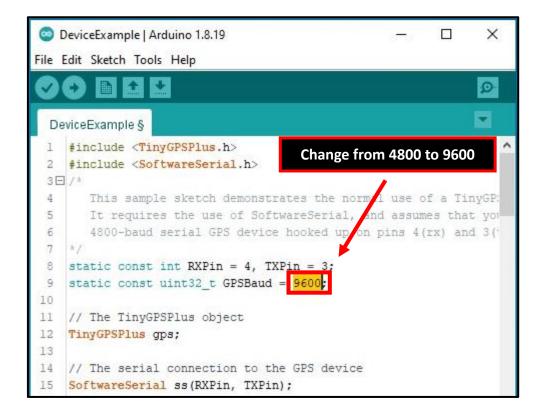
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3. Once library downloaded & installed open the code sample code provided. From toolbar, **Examples > TinyGPSPlus > DeviceExample**.

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Save	Ctrl+S	Adafruit GFX Library	>	
Save As	Ctrl+Shift+S	Adafruit Motor Shield library	>	
Page Setup	Ctrl+Shift+P	Adafruit PN532	>	
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		ESP Async WebServer	>	
		hd44780	>	
		Keyboard	>	BasicExample
		NewPing	2	DeviceExample
		Rtc by Makuna	2	FullExample
		RTCDS1307	2	KitchenSink
1		Servo	>	SatElevTracker
		SIM808	2	SatelliteTracker
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- 4. The code will utilize the **Digital Pin 3 and 4** to receive and send data between both Arduino and the GPS Module.
- 5. **Change** the GPS baud rate from **4800** to **9600**. By default, the **NEO-M8N** GPS Module run at **9600** bps from factory.



6. Once code correctly configured **Upload** the code to **Arduino UNO** board.

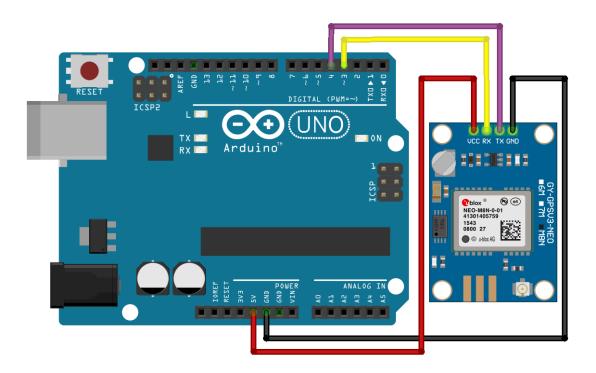




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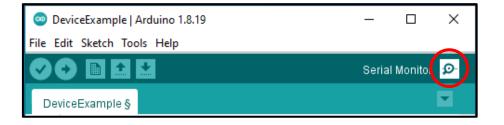
B. Wiring Setup.

Arduino UNO R3		GY-GPSV3-NEO-M8N		
5V	VCC			
GND	GND			
D4 (as Receiver)	-		ТХ	
D3 (as Transmitter)		-	RX	



C. Check the Result.

1. After code uploaded & both boards (*Arduino UNO and GPS Module*) connected, open the **Serial Monitor** to check the acquired GPS data.





2. Make sure to set the **Serial Baud Rate** same as in the code which is **115200 baud**. (*Do not get confused with GPS Baud Rate this is for displaying data from Arduino*)

(Arduino UNO -> GPS NEO-M8N = 9600 bps) (Arduino UNO -> Serial Monitor = 115200 bps)

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GPS Location Fixed

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Troubleshooting (What to do if module is not working properly?)

- 1. Check the wiring, make sure the Receiver, Rx and Transmitter, Tx connection is correct.
- 2. Make sure the Baud rate is correct. (9600 bps for NEO-M8N and 6M)
- 3. Check the Antenna U.FL connector, make sure the connection is solid.
- 4. **Test** the GPS on the **open space area (outdoor)**. GPS Signal might be **weaker** when tested **Indoor**. (Alternatively, user can upgrade their antenna)
- 5. **Power** the Arduino or GPS Module with a Sufficient Power Adapter / Supply or Battery (5v).
- 6. Let the module powered by Arduino for a few minutes if module isn't used for a long period of times. This module equipped with a small battery to act as capacitor to store configuration data. (normally that battery discharged let it charge first)
- 7. Test and Debug the Module with manufacturer provided program U-Center.