

[Manuals.plus](#) /

› [hobbyant](#) /

› hobbyant BE-180 GPS Module Instruction Manual

hobbyant BE-180

hobbyant BE-180 GPS Module Instruction Manual

Model: BE-180

1. PRODUCT OVERVIEW

The hobbyant BE-180 is a compact GPS module designed for precise positioning and navigation applications. It features TTL level output and an integrated GNSS ceramic antenna, making it suitable for integration with various development platforms such as Arduino, Raspberry Pi, and Pixhawk flight controllers. This module supports multiple satellite systems including GPS, BDS, GALILEO, SBAS, and QZSS for enhanced accuracy and reliability.

Its small size and low power consumption make it ideal for projects requiring accurate location data in a compact form factor.

2. PACKAGE CONTENTS

Verify that all items listed below are included in your package:

- BE-180 GPS Module x 1
- Connection Cables x 3
- Adhesive Pad x 1

With Cable and Adhesive



Image: The BE-180 GPS module, three connection cables, and an adhesive pad are included in the package.

3. SPECIFICATIONS

Table 1: BE-180 GPS Module Specifications

Parameter	Value
Operating Mode	GPS+BDS+GALILEO+SBAS+QZSS
Sensitivity (Tracking)	-166dBm
Sensitivity (Reacquisition)	-160dBm
Sensitivity (Cold Start)	-148dBm
Sensitivity (Hot Start)	-160dBm
Start Time (Cold)	27s

Parameter	Value
Start Time (Hot)	1s
Start Time (Assist)	1s
Horizontal Accuracy	1.5m CEP 2D RMS (SBAS assistance for open sky)
Speed Accuracy	0.05m/s
Dynamic Heading Accuracy	0.3 degrees
1PPS Time Accuracy	RMS 30ns, 99% 60ns
Baud Rate	4800bps - 921600bps (Default: 38400bps)
Output Level	TTL Level
Output Protocol	NMEA, U-B-X
NMEA Sentences	RMC, VTG, GGA, GSA, GSV, GLL
Update Frequency	0.25Hz - 18Hz (Default: 1Hz)
Second Pulse (PPS)	Settable 0.25Hz~10MHz (Default: 1s period, 100ms high level)
Module Size	18 × 18 × 6.2 mm
Module Weight	4.9g
Operating Limits (Altitude)	80,000m
Operating Limits (Speed)	<500m/s
Operating Limits (Acceleration)	<4g
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +105°C
Input Voltage	DC 3.6V - 5.5V (Standard: 5.0V)
Current Consumption	Normal 50mA/5.0V

Pin Description:



PIN	Name	I/O	Description
1	GND	G	Ground
2	TX	O	Serial Data Output.
3	RX	I	Serial Data Input.
4	VCC	I	DC 3.6V - 5.5V supply input,Typical: 5.0V

Indicator light:

- 1. The blue light, the TX light, and the blue light flashes when power on, indicating that there is data output.
- 2. The red light, the PPS light, does not light up if it is not positioned; after 3D positioning, it starts to flash.

Image: Dimensions of the BE-180 GPS Module.

4. PIN DESCRIPTION

The BE-180 GPS module features a 4-pin interface for power and serial communication. Refer to the diagram and table below for pin assignments.

GPS Module and USB to TTL Serial Module Connection:



GPS Module and MCU Connection:

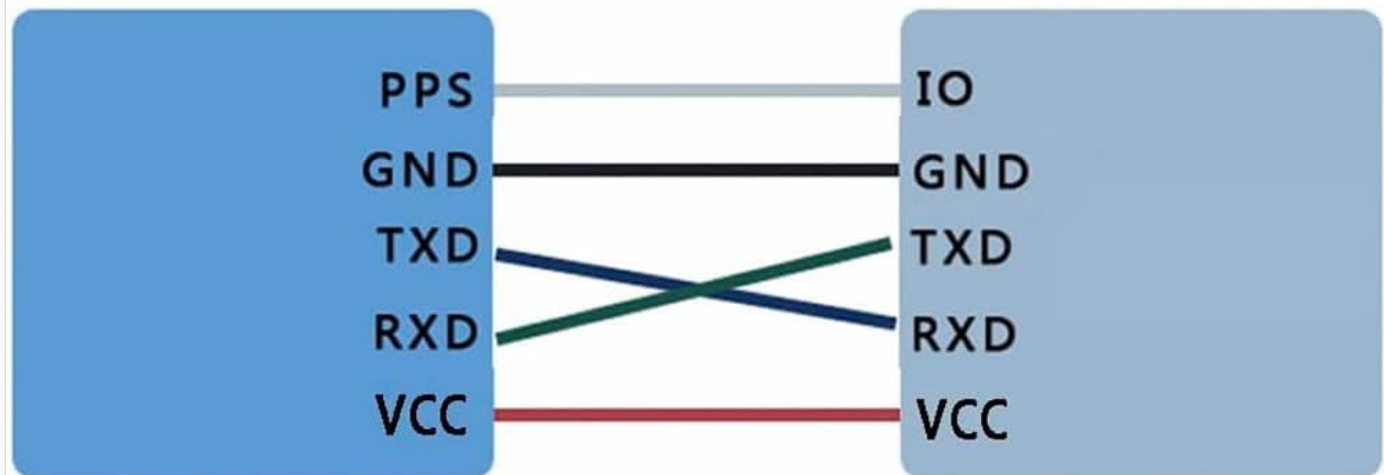


Image: Pinout of the BE-180 GPS Module.

Table 2: BE-180 Pin Assignments

PIN	Name	I/O	Description
1	GND	G	Ground connection.
2	TX	O	Serial Data Output (from GPS module).
3	RX	I	Serial Data Input (to GPS module).
4	VCC	I	Power supply input (DC 3.6V - 5.5V, typical 5.0V).

5. INDICATOR LIGHTS

The BE-180 module includes two indicator LEDs:

- **TX LED (Blue):** This LED flashes when the module is actively outputting serial data.
- **PPS LED (Red):** This LED indicates the GPS fix status.

- If the GPS is *not* fixed, the PPS LED will remain off.
- Once the GPS achieves a 3D fix, the PPS LED will begin to flash, indicating a valid position lock.



Dimensions:

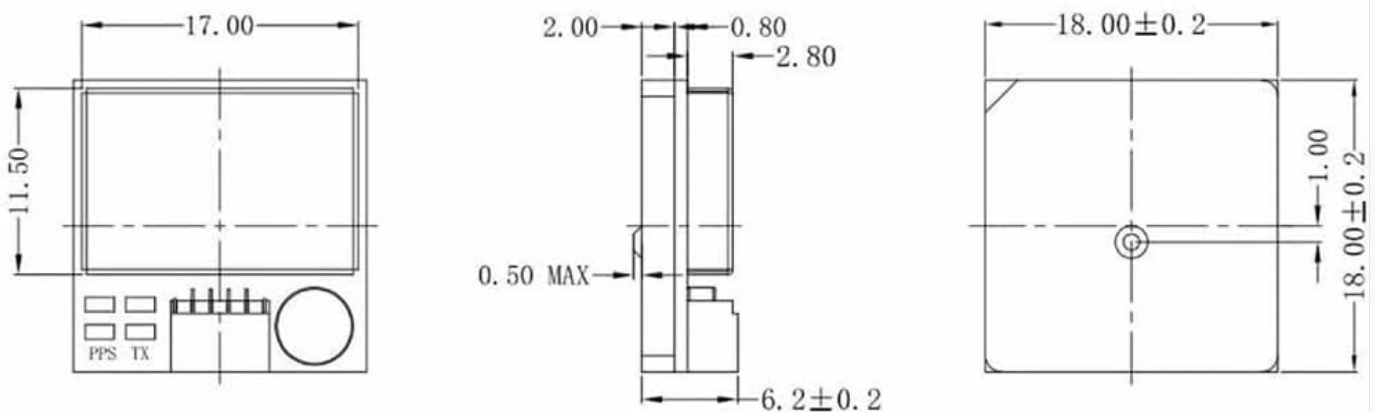


Image: Top and bottom views of the BE-180 GPS Module, highlighting the TX and PPS LEDs.

6. SETUP AND CONNECTION

The BE-180 GPS module can be connected to various microcontrollers or USB-to-TTL serial adapters. Ensure correct pin connections to avoid damage.

6.1. Connection to USB to TTL Serial Module

To connect the GPS module to a computer via a USB to TTL serial module for configuration or data monitoring, follow these connections:

- **GPS Module GND** to **USB-TTL GND**
- **GPS Module TX** to **USB-TTL RXD**
- **GPS Module RX** to **USB-TTL TXD**
- **GPS Module VCC** to **USB-TTL VCC** (ensure 5V supply)

6.2. Connection to Microcontroller (e.g., Arduino, Raspberry Pi, Pixhawk)

When connecting to a microcontroller, ensure the power supply matches the module's requirements (3.6V-5.5V, typical 5V). The PPS pin can be connected to an interrupt-capable pin on your microcontroller for precise timing applications.

- **GPS Module GND** to **MCU GND**
- **GPS Module TX** to **MCU RXD**
- **GPS Module RX** to **MCU TXD**
- **GPS Module VCC** to **MCU VCC** (5V)
- **GPS Module PPS** to **MCU IO** (optional, for 1PPS signal)

Note: Always double-check the voltage levels of your microcontroller's serial ports to ensure compatibility with the 5V TTL level of the GPS module. Use level shifters if necessary.

7. OPERATING INSTRUCTIONS

Once connected and powered, the BE-180 GPS module will automatically begin searching for satellite signals. The initial acquisition time (cold start) can take up to 27 seconds in open sky conditions. Subsequent hot starts are much faster, typically 1 second.

7.1. Data Output

The module outputs NMEA 0183 sentences (RMC, VTG, GGA, GSA, GSV, GLL) and U-B-X protocol data via its TX pin. The default baud rate is 38400bps, but it can be configured from 4800bps to 921600bps using appropriate commands (refer to the U-B-X protocol specification for details).

7.2. GPS Fix Indication

Monitor the red PPS LED. A steady off state indicates no GPS fix. Once the LED starts flashing, a 3D position fix has been achieved, and accurate location data is available.

7.3. Applications

The BE-180 GPS module is suitable for a wide range of applications including:

- Vehicle tracking and monitoring
- Bus station management systems
- Car and marine navigation systems
- Notebook navigation
- Drone and UAV flight controllers (e.g., Pixhawk)
- DIY electronics projects (e.g., Arduino, Raspberry Pi)

8. MAINTENANCE

The BE-180 GPS module is a robust electronic component designed for long-term operation. Minimal maintenance is required.

- **Environmental Protection:** Ensure the module is protected from extreme moisture, dust, and physical impact. While it operates across a wide temperature range (-40°C to +85°C), prolonged exposure to the upper or lower limits may affect performance or lifespan.
- **Cleaning:** If necessary, gently clean the module with a dry, soft cloth. Avoid using liquids or abrasive materials.
- **Antenna Placement:** For optimal performance, ensure the ceramic antenna has a clear, unobstructed view of the sky. Avoid placing it near metal objects or other electronic components that could interfere with GPS signals.

9. TROUBLESHOOTING

If you encounter issues with your BE-180 GPS module, consider the following troubleshooting steps:

- **No Data Output (TX LED off):**

- Verify power supply (VCC and GND) is correctly connected and within the 3.6V-5.5V range.
- Check serial connection: Ensure TX of GPS is connected to RX of your receiving device, and RX of GPS to TX of your device.
- Confirm baud rate settings on your receiving device match the module's default (38400bps) or configured rate.

- **No GPS Fix (PPS LED off):**

- Ensure the module has a clear view of the sky. Indoor environments or areas with heavy obstruction (tall buildings, dense foliage) can prevent satellite acquisition.
- Allow sufficient time for a cold start (up to 27 seconds).
- Check for potential electromagnetic interference from nearby electronics.

- **Inaccurate Position Data:**

- Ensure the module has a strong signal (check satellite count in NMEA GSV sentences).
- Verify the antenna is not obstructed or damaged.
- Consider environmental factors like multipath interference in urban canyons.

10. WARRANTY AND SUPPORT

For warranty information and technical support, please refer to the official hobbyant website or contact your retailer. Keep your purchase receipt for warranty claims.

For further technical documentation, including detailed U-B-X protocol specifications and advanced configuration guides, please visit the manufacturer's support page.

© 2023 hobbyant. All rights reserved.

ASK A QUESTION ABOUT THIS MANUAL

Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page's manual context to help answer it.

Name

Anonymous

Email

you@example.com

After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. [Privacy details](#).

Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

Submit question