BLUENAV

English version

Installation guide

Precision+ GPS

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GPS - INST - Version 1.1 - EN

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1. Introduction

1.1. Overview

The Bluenav Precision+ tri-band GPS is a high-precision positioning module designed to provide centimeter-level accuracy. It enables the integration of ultra-precise motor control with advanced autopilot functionalities, ensuring accurate control of speed, heading, and vessel movement, including in demanding operating conditions. The system incorporates a tri-band GNSS receiver, a high-performance antenna, and an NMEA 2000 interface. This architecture provides positioning accuracy significantly superior to that of standard consumer-grade GPS systems (typically greater than 1 meter). This level of accuracy is required to support Bluenav advanced functionalities, including virtual anchoring and position holding.

1.2. Package contents

- GPS unit with NMEA 2000 connection
- Mounting bracket
- NMEA 2000 drop/backbone cable, length: 5 m
- Installation guide

2. General specifications

2.1. Positioning specifications

- Horizontal position accuracy (95%): < 20 cm
- Supported constellations: GPS / GLONASS / BeiDou / Galileo QZSS / Navic/ SBAS
- Supported GNSS bands: L1, L2, L5 / G1, G2, G3 / E1, E5, E6 / B1, B2, B3
- Update rate: 10 Hz (10 times per second)
- Azimuthal coverage: 360°
- Startup time:
  Cold start: < 35 s / Hot start: < 10 s
  Re-acquisition: 1 s
  HAS convergence time: < 100 s (Europe) / < 300 s (global)

2.2. Mechanicals specifications

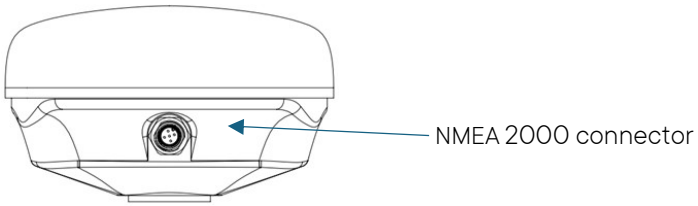
- Material: ABS-type plastic alloy
- Color: White
- Dimensions:
  – GPS diameter: 16 cm
  – Height with/without base: 13 cm / 9.6 cm
  – Base diameter: 70 mm
- Mass : 600 g
- Packaging: L: 24 cm × W: 21.5 cm × H: 16 cm / Weight: 1.2 kg

5. Troubleshooting

- No data: check the NMEA connection / check the NMEA cable power supply / ensure there are no obstructions in any direction (buildings, passing under a bridge). Verify that the GPS is not located in close proximity to a VHF, satellite, or radar antenna.
- Insufficient accuracy : metallic environment, limited sky visibility, close proximity to buildings.
- NMEA 2000 error: check the presence of NMEA 2000 backbone terminators and the condition of the NMEA cable and tee connector

6. Maintenance

- Check the antenna mounting every 6 months
- Inspect the condition of the NMEA 2000 CAN cable
- Clean the installation surfaces and the enclosure using a clean cloth



c) Ensure that the cable is properly seated and that the connector ring is securely tightened.

d) Connect the cable to the NMEA backbone via a tee connection.

Notes:

- The GPS PRECISION+ is designed to be connected or disconnected from the NMEA 2000® network whether or not the network power is active.
- The NMEA cable must be protected from twisting, sharp bends, and exposure to moisture.

4. Commissioning and configuration

4.1. Start Up

At startup, verify that the GPS appears in the MFD sources or in the Bluenav HMI application.

4.2. NMEA PGN Specifications

- List of transmitted PGNs:

1. GNSS Position Data (129029) – 1Hz
2. Position, Rapid Update (129025) – 10Hz
3. COG & SOG, Rapid Update (129026) – 5Hz
4. Product Information (126996)

2.3. Electric specifications

- Power supply:
  - Input voltage: 12 V via NMEA network
  - Input current: I < 150 mA
  - Load equivalence number (LEN): 3 (according to NMEA / 1 LEN = 50 mA)
- Connectivity: NMEA 2000 – M12 male / 5 pin

2.4. Environment specifications

- Protection rating: IP65
- Operating temperature: -10 °C to +50 °C
- Storage temperature: 10 °C to 75 °C
- Vibration: according to IEC 60945
- Electromagnetic emission: IEC 60945
- Electromagnetic immunity: IEC 60945
- Solar radiation: IEC 60945
- Relative humidity: 92% at 40 °C

2.5. Certification

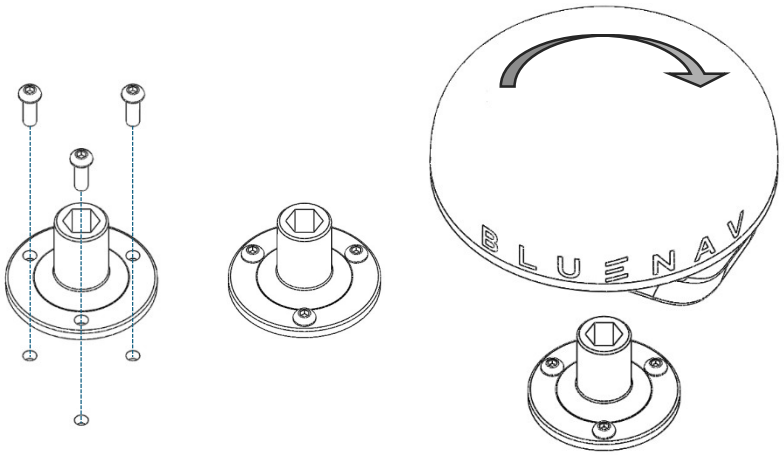
- NMEA 2000 compatible
- Maritime navigation and radiocommunication equipment and systems: according to IEC 60945
- CE marking: Electromagnetic compatibility

3. Physical installation

3.1. GPS Unit mounting

The GPS unit and its integrated antenna must:

- Be perfectly horizontal relative to the ground plane — this ensures the GPS100 antenna has an optimal view of satellites in all directions.
- Be installed at a sufficient height to provide an unobstructed view of the sky up to the horizon over 360°, without obstruction from masts or other antennas — the GPS delivers the most accurate measurements when it can receive signals from as many satellites as possible.
- Be installed as far as possible from VHF, satellite, or radar antennas, and at least 50 cm away from any large metallic surfaces. Radio emissions from these antennas can interfere with the GPS PRECISION+ satellite signal reception.
- Be mounted on a rigid support to minimize vibrations.
- See mounting diagram.



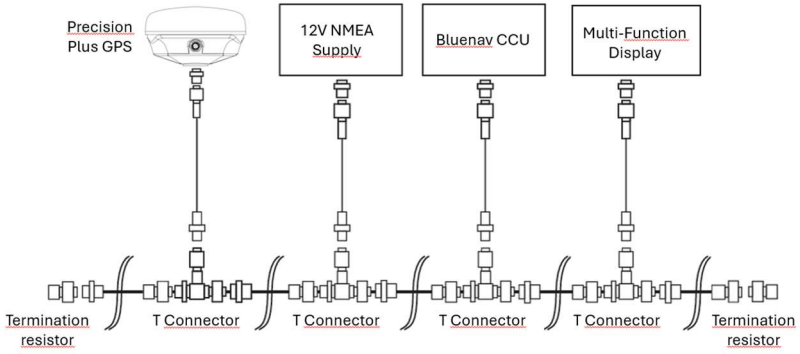
3.2. Connection to NMEA 2000

NMEA 2000, based on a CAN bus, is a communication protocol that allows multiple data and signals to be transmitted over a single cable called the backbone.

Any NMEA 2000 device can be connected to this backbone to expand the network. Power is distributed to the devices via the NMEA 2000 network.

a) Verify that the linear topology of the NMEA backbone complies with the standard, with two 120 Ω terminators placed at the ends of the network.

Note: No resistor is required at the connection point of the GPS PRECISION+.



b) Connect the supplied NMEA drop cable to the male connector of the GPS unit using its female end. It is possible to position the GPS at a greater distance while keeping the total cable length within the standard limits to maintain the bus speed (< 10 m).