

CANmod.GPS



General Information

- **Functionality:** This configurable device outputs GNSS/IMU data via CAN bus and/or USB.
- **Included in the Package:** CANmod.gps module, u-blox GPS antenna, and USB dust cover (mini USB adapter not included).
- **Firmware:** Free firmware updates available via USB to add new features.
- **Configuration:** Utilizes configuration files based on the widely used open source JSON schema concept, similar to the CANedge.
- **Software:** Comes with a free, open-source editor tool for device configuration (available in both offline and online versions).
- **Safety:** Certified for CE, FCC, IC, and RoHS compliance (refer to documentation for certificates).
- **Warranty:** 1-year warranty provided.
- **Support:** Free, fast, and high-quality support included.
- **Origin:** Manufactured in Denmark.

Sensor (GNSS/IMU)

- **Module:** Professional-grade u-blox NEO-M8U sensor (72 channels) with integrated gyroscope and accelerometer.

- GNSS Support: Compatible with GPS (USA), Galileo (Europe), BeiDou (China), and GLONASS (Russia), including combinations.
- Geofencing: Supports 0 to 4 configurable circular geofences, with status updates sent through CAN bus.
- Sensor Fusion (UDR): Improved position accuracy using sensor fusion (UDR) with GNSS and 3D IMU (for automotive use only).
- Acquisition Times: Cold start: 26 seconds; Aided start: 3 seconds; Reacquisition: 1 second.
- Sensitivity: Tracking/Navigation: 160 dBm; Cold start: 148 dBm; Hot start: 157 dBm.
- Battery Backup: Enables 'aided starts' (3 seconds) between power cycles.
- Accuracy:
 - Position: 2.5 m CEP (Circular Error Probable)
 - Heading: 1° (50% at 30 m/s)
 - Velocity: 0.05 m/s (50% at 30 m/s)

Data Parameters

- CAN Signals: Communicates several GNSS/IMU signals (see documentation or DBC file for complete list).
- GNSS Data Broadcasted (1 Hz):
 - Position: Longitude and latitude
 - Time: Precise GNSS epoch timestamp
 - Status: Fix type (NO/UDR/2D/3D/GNSS+UDR) and satellite count
 - Speed: Meters per second
 - Altitude: Meters above sea level
 - Attitude/Orientation: Roll, pitch, heading
 - Odometer: Distance traveled (since power on and total)
 - Geofences: Status updates

3D IMU Data (100 Hz):

Gyroscope: Angular rate (X, Y, Z)

Accelerometer: Acceleration (X, Y, Z)

CAN Bus Interface

- Channels: 1 CAN channel
- Modes: Data can be broadcast on the CAN bus or provided on request.
- Standard: ISO 11898, supporting up to 1 Mbit/s.
- Identifiers: Compliant with CAN 2.0A (11-Bit ID) and 2.0B (29-Bit ID).
- Termination: Can be toggled via a switch below the DB9 connector.

- Retransmission: Frames that lose arbitration or are disturbed by errors are retransmitted.
- Transceiver Protections:
 - $\pm 25\text{kV}$ HBM ESD
 - $\pm 12\text{kV}$ IEC ESD
 - $\pm 14\text{V}$ bus fault, short circuit
 - Common mode input voltage: $\pm 12\text{V}$
 - TXD dominant timeout (prevents network blocking in failure events)

Configuration Options

- Bit Rate: Select standard rates (5K to 1M) or specify custom bit-timing.
- Enable/Disable: Each CAN message can be individually enabled or disabled.
- Identifier Customization: Configure CAN IDs for all messages (11-bit or 29-bit).
- Push/Poll Mode: Configure trigger modes for each message (push or poll).
- Frequency: Prescale message frequencies to lower rates as needed.
- IMU Correction: Optionally compensate module orientation within IMU configuration.

Electrical Specifications

- Input Supply: +5V to +26V DC via DB9 connector (power on pin 1 or 9); USB power also supported for firmware/config or real-time data streaming.
- Power Consumption: Extremely low, less than 1W (minimizes battery drainage risks).
- Protection: Reverse voltage protection on CAN supply; transient voltage protection on supply lines.

Mechanical Details

- Enclosure & Weight: Compact aluminum enclosure (65 x 48 x 24 mm, excluding flanges & connectors), weighing 70 grams.
- Connector: 1 standard D-sub 9 (DB9) connector.
- Pin-Out: See product manual for details.
- USB: Standard mini USB connector for configuration, firmware updates, and data streaming (USB cable not included).
- LED Indicators: Four external LEDs indicate Power, CAN bus, Memory, and GNSS status.
- Operating Temperature: -25°C to $+70^{\circ}\text{C}$ (for componentry).
- IP Rating: IP40.

- Mounting: Module can be mounted using rugged double-sided tape, zip-ties, or a mounting bracket.
- GPS Antenna: Included; comes with SMA plug, 3-meter cable, and magnetic base.