The Trimble® Bison3 DR+GNSS module (BN31919) combines an integrated AEC-Q100 Global Navigation Satellite System (GNSS) receiver and microprocessor with a MEMS gyroscope and accelerometer to produce an accurate and instantaneous positioning solution. For system integrators, the Bison3 DR+GNSS dramatically improves quality of service (QoS) even under the most challenging of environments like urban canyons or forest destinations. Dead reckoning estimates position based on heading and distance traveled since the last known position. The more accurate the speed, time and heading inputs, the more accurate the dead reckoning solution.

DR coupled with a GNSS receiver helps improve the accuracy. The GNSS receiver can quickly acquire and track multiple constellations at the same time and it’ll use those constellations to continuously calibrate the gyro and speed inputs.

Bison3 uses a three-axis gyro and an optional accelerometer to measure the complete vehicle motion. This allows Bison3 to be mounted in any orientation relative to the vehicle to allow for easy integration with the customer system.

The BN31919’s on-board gyro and accelerometer combined with the ability to accept inputs from a speedometer pulse and a forward/reverse indicator helps produce an optimal dead reckoning solution. The Bison3 also incorporates the ability to read from the CANBUS to get the speed and direction inputs from the vehicle.Trimble’s sophisticated algorithm auto calibrates these sensors and optimally blends the sensor inputs and signals to produce accurate position and velocity outputs in the most hostile environments.

This module uses the latest Trimble patented algorithm for calculating slope (rate of climb) in real-time and while the vehicle is driving. This allows customers to implement 3D maps and track vehicle trajectories through complex intersections and multi-level roads and garages. The Bison3 is backward compatible with the Aardvark (A1919) module so that customers with existing designs that requires GLONASS, Beidou and Galileo capabilities can easily migrate to the next generation platform from Trimble Navigation.
Bison3 DR+GNSS

BISON3 DR+GNSS Module
A SMT module suitable for integration in navigation, telematics and tracking systems. This module includes a multi-constellation single-chip receiver, gyroscope and accelerometer. The module accepts external inputs from speed pulse and forward/reverse indicator. Antenna Open/Short detection and reporting is supported.

Overview
- DR positioning solution with integrated GNSS receiver
- Inertial sensors
- SMT form factor 19 mm x 19 mm x 3.05 mm
- Rate of climb (slope) for 3D mapping
- Supports both NMEA and HIPPO binary protocols
- Automatic calibration of external sensor inputs
- Accepts Map Match Inputs

Performance Characteristics
Fully calibrated and stable system, clear view accuracy

Environment Characteristics

Operating Temperature: -40 ºC to +85 ºC
Storage Temperature: -55 ºC to +105 ºC
Humidity: 5% to 95% RH non-condensing at 60 ºC
Vibration: 5 Hz to 20 Hz: 0.008 g/Hz
<140 ns (Reacquisition)

Backup

• Latitude: < 3.0 m (CEP 90%)
• Heading Accuracy: <2 degrees
• Altitude Accuracy, relative to UTC/GPS-Time: 0.06 m/s (CEP 90%)
• PPS Accuracy (form DR)

TTFF
DR-TTFF: <2.5s (Reacquisition)

Protocols
Configurable NMEA or HIPPO binary

NMEA Messages
GGA, GSA, GSV, GMS, VTG and ZDA

Interfaces
All digital inputs and outputs are 3.3 V Low-Voltage TTL compatible

Input Specifications
VIL ≤ 0.8 V, VIH ≥ 2.0 V

Output Specifications
VOL ≤ 4.0 V, VOH ≥ 2.4 V

UART
115.2K Baud, 8 data bits, None parity, 1 stop bit

Odometer
0 kHz to 2 kHz, distance of 1 cm to 1 m per pulse

Antenna Input
- Support for active antennas (3.0 V supply, 12 dB gain at the module castellation.)
- For passive or 3.3 V antennas, see application notes in Bison3 manual

Power Supply
Main Power Supply Voltage: 3.0 V to 3.6 V (3.3 V typical)
Power Consumption (tracking): 300 mW
Backup Power Supply Voltage: 3.0 V to 3.6 V (3.3 V typical)
Backup Current Consumption (typ): 6 mA @ 25 ºC
Antenna Power Supply Voltage: Vcc

Pinout Assignments

Accessories
- Antenna – Compact, active, magnetic antenna suitable for vehicle installations.

Ordering Information

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<thead>
<tr>
<th>PN #</th>
<th>Constellations</th>
<th>Comments</th>
</tr>
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<tbody>
<tr>
<td>688167-50</td>
<td>GPS+GLONASS</td>
<td>This version includes a three-axis gyroscope and three-axis accelerometer. Can be mounted in any orientation in the vehicle.</td>
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<tr>
<td>688167-51</td>
<td>GPS+Beidou</td>
<td>This version includes a three-axis gyroscope and three-axis accelerometer. Can be mounted in any orientation in the vehicle.</td>
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Packaging Options

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<tbody>
<tr>
<td>Bison3</td>
<td>688167-50</td>
<td>20-piece reel</td>
<td>688167-50-02</td>
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<tr>
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Parts of this product are patent protected.

Trimble has relied on representations made by its suppliers in certifying this product as RoHS compliant.

Specifications subject to change without notice.

Trimble Navigation Limited is not responsible for the operation or failure of operation of GNSS satellites or the availability of GNSS satellite signals.