DATASHEET

Bison3 DR+GNSS

Multi-GNSS dead reckoning solution for now and into the future

Key Features

- Multi-constellation GNSS positioning (GPS, GLONASS, BEIDOU, GALILEO, QZSS).
- GNSS-disciplined dead reckoning using the integrated 6-axis IMU onboard
- Instantaneous and reliable positioning in GNSS-challenged environments.
- Robust positioning built on 20-years of navigation, telematics and asset tracking experience.
- Flexible position update rates up to 20Hz
- Suits tight integration with mapping applications.
- Positioning accuracy that surpasses V2X accuracy requirements.
- Surface-mount module form factor 19x19mm.
- Flexible business models including software licensing.

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.

Trimble

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

Receiver Type	Single Frequency L1
Supported Constellations	GPS/GLONASS/BEIDOU/GALILEO/QZSS
Position Update Rate (DR)	5 Hz (Default) with up to 20 Hz option
Horizontal Accuracy (DR)	< 3.0 m (CEP 90%)
Altitude Accuracy (DR)	< 5.0 m (CEP 90%)
Speed Accuracy	0.06 m/s (CEP 90%)
Heading Accuracy	<2 degrees
PPS Accuracy, relative to UTC/GPS-Time	<140 ns (50%)

TTFF

DR-TTFF	<2.5s (Reacquisition)

Protocols

Configurable	NMEA or HIPPO binary
NMEA Messages	GGA, GSA, GSV, RMC, VTG and ZDA
	Supports proprietary NMEA messages

Interfaces

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

Inputs	VIL ≤ 0.8 V, VIH ≥ 2.0 V
Outputs	VOL ≤ 0.4 V, VOH ≥ 2.4 V
UART	115.2K Baud, 8 data bits, None parity, 1 stop bit
	(default, Baud rate and Parity are configurable)
Odometer	0 kHz–2 kHz, distance of 1 cm–1 m per pulse
Forward/Reverse indicator	default

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

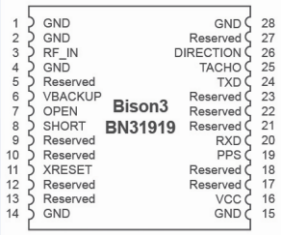
Power Supply

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 µA @ 25 ºC
Antenna Power Supply Voltage	Vcc

Environmental Characteristics

Operating Temperature	-40 ºC to +85 ºC
Storage Temperature	-55 ºC to +105 ºC
Humidity	5% to 95% RH non-condensing @ 60°C
Vibration	5 Hz to 20 Hz: 0.008 g2/Hz
	20 Hz to 100 Hz: 0.05 g2/Hz
	100 Hz to 900 Hz: –3 dB/octave
Module Dimensions	19 mm x 19 mm x 3.05 mm

Pinout Assignments



Accessories

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

Ordering Information

PN #	Constellations	Comments
688167-50	GPS+GLONASS	This version includes a three-axis gyroscope and three axis accelerometer. Can be mounted in any orientation in the vehicle.
688167-51	GPS+Beidou	This version includes a three-axis gyroscope and three axis accelerometer. Can be mounted in any orientation in the vehicle.

Packaging Options

Part Name	Part Number	Packaging options	Ordering Number
Bison3	688167-50	20-piece reel	688167-50-02
		100-piece reel	688167-50-10
		500-piece reel	688167-50-500
Bison3	688167-51	20-piece reel	688167-51-02
		100-piece reel	688167-51-10
		500-piece reel	688167-51-500

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.

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