The right one.™

BISON3 DR+GNSS

KEY FEATURES

- **Multi-GNSS capable positioning. (GPS, GLONASS, BEIDOU, GALILEO, QZSS supported)**

- **Instantaneous and accurate positions in deep urban canyons and dense forests.**

- **Continuous position outputs in GNSS denied areas i.e. tunnels, parking garages and on lower bridge decks.**

- **Reliable positioning for vehicle navigation and positioning, mapping applications and tracking of assets.**

- **CANBUS Ready**

- **DR update rate is up to 20Hz.**

- **Full 6 DOF inertial sensors on board**

- **Rate of climb measurement allows for 3D mapping**

- **Any angle mounting**

- **19 mm x 19 mm SMT module**

MULTI-GNSS DEAD RECKONING SOLUTION FOR NOW AND INTO THE FUTURE

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.

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688168-50
S/N:1263013965
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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 an optional accelerometer. 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 and 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 GPS/GLONASS/BEIDOU/GALILEO/QZSS capable
Position Update Rate (DR). . . . . . 5 Hz (Default) with up to 20 Hz option
Horizontal Accuracy (DR). . . . . 3.0 m (CEP 50%)
Altitude Accuracy (DR). . . . . 5 m
Speed Accuracy . . . . 0.5 % of Speed
Heading Accuracy . . . .<2 degrees
PPS Accuracy, relative to UTC/GPS-Time . . . . <140 ns (50%)

TTFF

DR-TTFF . . . .<1 s

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 . . . . $V_{IL} \leq 0.8$ V, $V_{IH} \geq 2.0$ V
Outputs. . . . . $V_{OL} \leq 0.4$ V, $V_{OH} \geq 2.4$ V
UART . . . . 115.2K Baud, 8 data bits, None parity, 1 stop bit (default, Baud rate and Parity are configurable)
Odometer . . . . 0 kHz–3 kHz, distance of 1 cm–1 m per pulse
Forward/Reverse indicator . . . . Optional

ANTENNA INPUT

- Support for active antennas (3.0 V supply, 25 dB LNA gain)
- For passive or 3.3 V antennas, see application notes in Bison3 manual

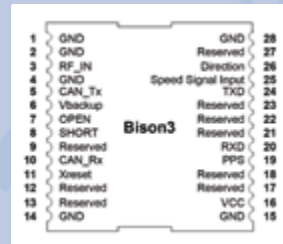## POWER SUPPLY

Main Power Supply Voltage . . . . 3.0 V to 3.6 V (3.3 V typical)
Power Consumption (tracking) . . . . 250 mV @ 3.3 VDC
Backup Power Supply Voltage . . . . 2.5 V to Vcc
Backup Power Consumption (typ) . . . . 70 µA @ 25 °C
Antenna Power Supply Voltage Vcc

ENVIRONMENTAL CHARACTERISTICS

Operating Temperature. . . . . –40 °C to +85 °C
Storage Temperature. . . . . –40 °C to +105 °C
Humidity . . . . 5% to 95% RH non-condensing @ 60°C
Vibration. . . . . 5 Hz to 20 Hz: 0.008 g^2/Hz
20 Hz to 100 Hz: 0.05 g^2/Hz
100 Hz to 900 Hz: –3 dB/octave
Module Dimensions . . . . 19 mm x 19 mm x 3.05 mm

PINOUT ASSIGNMENTS

1	GND	GND	28	
2	GND	Reserved	27	
3	RF_IN	Direction	26	
4	GND	Speed Signal Input	25	
5	CAN_Tx	TXD	24	
6	Vbackup	Reserved	23	
7	OPEN	Reserved	22	
8	SHORT	Reserved	21	
9	Reserved	RXD	20	
10	CAN_Rx	PPS	19	
11	Xreset	Reserved	18	
12	Reserved	Reserved	17	
13	Reserved	VCC	16	
14	GND	GND	15	

ACCESSORIES

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

ORDERING INFORMATION

PIN #	CONSTELLATIONS	COMMENTS
688168-50	GPS+Beidou	This version includes a three axis gyro and three axis accel. Can be mounted in any orientation in the vehicle.
688168-40	GPS+Beidou	This version includes a three axis gyro only and can be mounted in any orientation in the vehicle.
688168-55	GPS+GLONASS	This version includes a three axis gyro and three axis accel. Can be mounted in any orientation in the vehicle.
688168-45	GPS+GLONASS	This version includes a three axis gyro only and can be mounted in any orientation in the vehicle.

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