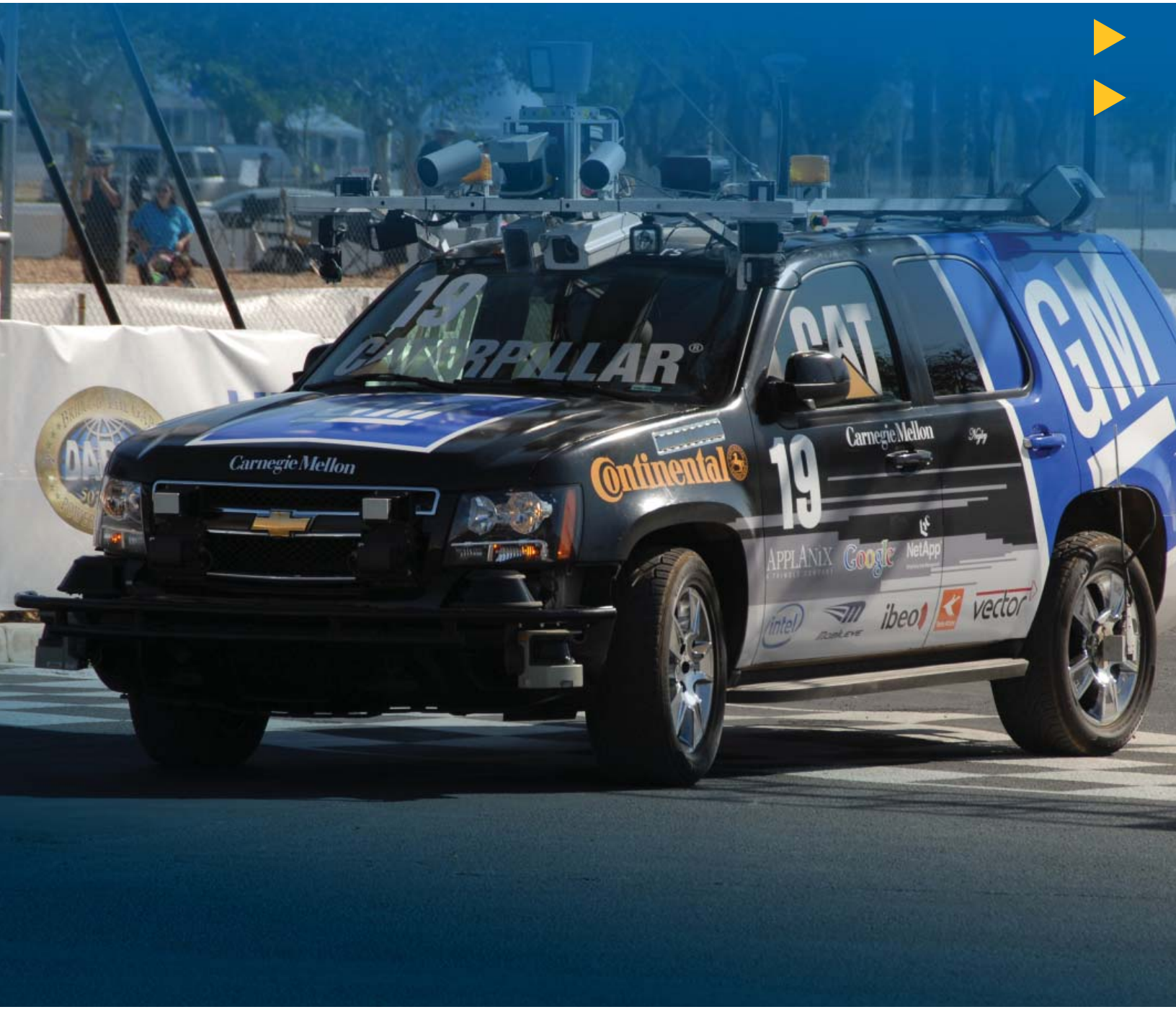
PRECISION GNSS + INERTIAL

Precise Positioning Solutions for Land Applications



Trimble

Precise Positioning Solutions for

	MODULES & ENCLOSURES					
	BD910	**BD930**	**BD982**	**BX982**	**BD935-INS**	**BX935-INS**
Size (mm) Weight (g)	41 x 41 x 7 19 g	51 x 41 x 7 30 g	100 x 84.9 x 11.6 92 g	261 x 140 x 55 1600 g	67 x 60 x 15 60 g	149 x 93 x 43 660 g
Orientation Accuracy (°)[1,3] Real Time:	Position Only	Position Only	R / P: 0.2° HDG: 0.1°	R / P: 0.2° HDG: 0.1°	R / P: 0.1° HDG: 0.5°	R / P: 0.1° HDG: 0.5°
Orientation Accuracy[1,3] Post Processed:	–	–	–	–	–	–
GNSS Frequencies	L1	L1 / L2 / L5	L1 / L2 / L5	L1 / L2 / L5	L1 / L2 / L5	L1 / L2 / L5
GNSS Constellations	GPS + GLONASS + Galileo + BeiDou + QZSS					
IMU	–	–	–	–	Internal	Internal
Dual Antenna Operation	–	–	✓	✓	–	–
DMI Option	–	–	–	–	–	–
Calibrated IMU	–	–	–	–	–	–
POSPac Support	–	–	–	–	–	–

[1] In degrees °; R = Roll; P = Pitch; HDG = Heading (with 2m Antenna base line and Zepyhr 2 Antennas)
[2] POS Computer System / Board Stack only
[3] Typical survey mission profile, max RMS error. Heading error will increase for single antenna systems in low speed applications and when stationary.

Trimble is a leading provider of precise positioning solutions that offer high-accuracy orientation and continuous mobile positioning for applications such as autonomous vehicles and field robotics. System integrators and OEMs select our products for their reliability and robustness in GNSS-challenged environments.

AUTONOMOUS ROAD VEHICLES / ADAS TESTING

Automotive manufacturers and suppliers require robust position and orientation systems for autonomous road vehicles and Advanced Driver Assistance Systems development. Trimble provides different levels of products to these markets. High-accuracy systems such as the POS LV 610 are used as a precise reference system, while the POS LV 125 or POS LV 220 is aimed at mid-range systems in autonomous vehicles that are employed for Pose estimation. Trimble is also committed to developing low-cost, high-volume solutions like the BD935-INS for the system integrators and OEMs.

Land Applications

			TURNKEY SYSTEMS				
APX-15	AP15	AP20	LVX	LV125	LV220	LV420	LV620
67 x 60 x 15 60 g	130 x 100 x 59 280 g²	130 x 100 x 59 280 g²	149 x 93 x 43 600 g	164 x 160 x 66 1300 g	167 x 185 x 68 2400 g²	167 x 185 x 68 2400 g²	167 x 185 x 68 2400 g²
R / P: 0.03° HDG: 0.18°	R / P: 0.03° HDG: 0.09°	R / P: 0.02° HDG: 0.05°	R / P: 0.03° HDG: 0.18°	R / P: 0.03° HDG: 0.09°	R / P: 0.02° HDG: 0.05°	R / P: 0.015° HDG: 0.02°	R / P: 0.005° HDG: 0.02°
R/P: 0.025° HDG: 0.080°	R/P: 0.025° HDG: 0.060°	R/P: 0.020° HDG: 0.025°	R/P: 0.025° HDG: 0.08°	R/P: 0.025° HDG: 0.060°	R/P: 0.020° HDG: 0.025°	R/P: 0.008° HDG: 0.020°	R/P: 0.0025° HDG: 0.015°
L1 / L2 / L5	L1 / L2 / L5	L1 / L2 / L5	L1 / L2 / L5	L1 / L2 / L5	L1 / L2 / L5	L1 / L2 / L5	L1 / L2 / L5
			GPS + GLONASS + Galileo + BeiDou + QZSS				
Internal	External	External	Internal	Internal	External	External	External
–	✓	✓	–	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓

Specifications are subject to change without notification.
Typical performance. Actual results are dependent upon satellite configuration, atmospheric conditions and other environmental effects.

FIELD ROBOTICS

This market encompasses autonomous or remotely operated vehicles that are not typically used on standard roads, but in buildings or on work sites. Field robotics cover many different applications and its users vary greatly in their requirements, resources and capabilities. Trimble provides a range of products from individual OEM pieces to off-the-shelf complete solutions.

Trimble enables vehicle automation for mining, and ports and harbors automation. With autonomous hauling and asset tracking, the mining industry radically reduces overall cost and improves mining productivity. GNSS modules provide precise positioning for mobile asset tracking that aids in managing equipment availability. The POS LV can fully automate or provide driver assistance in hauling operations. This ability enables increased utilization, reduces labor costs and eliminates much inefficiency in mining operations.

Ports and harbors benefit from automation for RTGs and reach stackers and thereby significantly reduce cost. Automation requires precise positioning for management logistics software that can track and position equipment for loading, unloading and stacking. The ability to program and automate these cranes, improve safety and efficiency of container operation in the ports.

There are other small robotics that can be found in industrial, civilian and military applications. These applications encompass a wide range of uses that need to eliminate a direct human operator as it is non-economical, inconvenient, dangerous, or impossible to have a human operator present. The applications may only require continuous mobile positioning for operation or a set of sensors to observe the environment. The robotic vehicle can behave autonomously or send information to a human operator.

PRECISION GNSS + INERTIAL FOR LAND AUTONOMOUS VEHICLES AND ROBOTICS

Trimble's product portfolio for autonomous vehicles and field robotics benefit from the latest in precision GNSS + Inertial positioning technology. Centimeter-level accuracy enables vehicles to be programmed for a predetermined route, while precision orientation is used for stabilization, pointing and georeferencing of on-board sensors. Trimble offers integrated GNSS precise positioning and communications solutions in a highly compact form-factor. Leverage different communications technologies like Wi-Fi, Bluetooth or GSM for data transfer in unique work scenarios like network based RTK or DGPS applications.

Mobile Mapping produces geographical and dimensional information about physical objects and their environments through the recording, measuring and interpreting of data collected from moving platforms. Direct Georeferencing sensor data is the heart of any mobile mapping system. Trimble Applanix offers industry-leading, post-processing software POSPac™ MMS for land applications that provides a powerful, consistent and reliable tool for your georeferencing data.

Unmanned ground vehicles demand accuracy and reliability while OEMs and systems integrators require ease of integration to reduce development time and cost. Trimble's hardware and software systems are designed specifically for rugged dependability and ease of integration. The product portfolio offers a host of easy to use features and access to powerful cloud based technologies. Achieve real time accuracy and precise positioning for your navigation, guidance, control and mobile mapping applications.

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