APPLANIX POSITION AND ORIENTATION SYSTEMS FOR LAND VEHICLES (POS LV)

POS LV powers any application where vehicle positioning and orientation is required.

applanix™
A TRIMBLE COMPANY

capture everything. precisely.

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Why Applanix?

Worldwide availability of high-accuracy systems

Only Applanix offers highly accurate positioning and orientation solutions with the latest commercial technology available worldwide

Applanix offers a complete portfolio of products and solutions to support all land applications

Applanix leads the industry in robust, reliable, and repeatable positioning and motion compensation solutions for land applications. Our technology easily integrates with today's leading sensors, making them the right solution for any application:

- Positioning data for vehicle navigation systems
- Autonomous vehicle navigation sub-systems
- Machine control positioning and orientation for construction and industrial vehicle operations
- Robotic Guidance
- Generating data on high-performance vehicle movement
- Pavement Analysis
- Asset Management
  - o Road sign/traffic signal inventory etc.
  - o Hydro/utility pole maintenance scheduling
  - o Tree inventory and assessment
- GIS Data Capture
  - o Road corridor map data obscured by bridges, tunnels, urban canyons
  - o Indoor Mapping – Trimble's Indoor Mobile Mapping Solution

Increased productivity

Directly georeferencing sensor data from a moving vehicle using Applanix technology *saves time and money*… while delivering highly accurate results. Applanix improves productivity with:

- High reliability in all environments
- Immunity to GNSS outages
- Robust centimetric positioning
- Post-processing capabilities
- Faster, simpler, less costly deployment
- Streamlined data workflows
- Upgradeable systems – protecting your investment

The Applanix Customer Care Team – experienced, highly qualified experts ensure your success

When you purchase an Applanix solution for land, you're buying into the wealth of knowledge and expertise that has gone into the development of that solution. Our experienced team of survey engineers, geospatial experts, and quality assurance personnel means you get the highest quality solution and the highest level of performance – whatever the time of day and wherever you are in the world. *Please feel free to contact any of our customer support staff at support@applanix.com*

APPLANIX TECHNOLOGY FOR LAND VEHICLES GIVES YOU THE ADVANTAGE: LOWER COSTS OF DEPLOYMENT, FASTER TIMES-TO-COMPLETION AND IMPROVED QUALITY OF DATA.

POS LV™

Maximize your ROI with POS LV

POS LV is a compact, fully integrated, turnkey position and orientation system, utilizing integrated inertial technology to generate stable, reliable and repeatable positioning solutions for land-based vehicle applications.

Designed to operate under the most difficult GPS conditions found in urban and suburban environments, POS LV enables accurate positioning for roadgeometry, pavement inspection, GIS database and asset management, road surveying, and vehicle dynamics, and more.

POS LV Benefits

- Available worldwide
- Generates continuous, accurate, position and orientation information under all GPS conditions
- Produces precise, high-rate, low-latency, real-time data
- Operates at normal highway traffic speeds for cost-effective data capture
- Allows quick operational capability, with installation, calibration and training completed in as little as three days
- Includes an automatic redundant data logging capability
- Uses the latest survey-grade GPS technology for improved positioning performance
- Requires less space in the survey vehicle, using a small, lightweight POS Computer System (PCS)

"We consider Applanix to be the market leader. Their technology is just very, very precise. It gives us a fantastic estimation of where our vehicle is."

— Sebastian Thrun, Google and Research Professor at Stanford University

COMPONENTS EXPLAINED

The Inertial Measurement Unit (IMU) contains three accelerometers and three gyroscopes that measure the acceleration and angular velocities necessary for computing all aspects of vehicle motion. The IMU is the heart of the POS LV system as it generates continuous, accurate position and orientation information and a true representation of vehicle motion in all three axes.

POS Computer System (PCS): Ruggedized, power efficient, and light-weight, the POS LV Computer System is the central processing computer that houses the GNSS receivers, USB logging drive, data processing, and power distribution units for all components of the POS LV. It enables raw GPS data from as few as one satellite to be processed directly into the system to compute accurate positional information in areas of intermittent or no GPS reception.

GNSS Receivers: Embedded GPS receivers provide heading data to supplement the inertial data.

DMI: The Distance Measuring Indicator (DMI), a standard POS LV feature, is a wheel-mounted rotary shaft encoder that measures precise linear distance traveled and helps constrain GNSS outage drift

GPS Antennas and GAMS: Two GPS antennas generate raw observables data. GAMS (GNSS Azimuth Measurement Subsystem) integrates the IMU with the 2-antenna heading measurement system. By utilizing a carrier-phase differential GNSS algorithm to measure the relative position vector between the two antennas, GAMS continuously calibrates the IMU and ensures that azimuth does not drift (as long as there is GNSS coverage).

POSPac™ Mobile Mapping Suite (MMS) is Applanix' next generation, industry-leading software for Direct Georeferencing of mobile mapping sensors using GNSS and inertial technology. Compatible with a variety of mapping sensors, this smart software solution achieves both maximum accuracy and maximum efficiency for Direct Georeferencing.

Mining Vehicle Automation

Applanix POS LV enables vehicle automation for mining activities. With dirty, dangerous mining activities in remote locations running 24 hours a day, vehicle automation radically reduces overall cost and improves mining productivity. By reducing reliance on shift personnel, vehicle automation with the POS LV enables you to increase vehicle utilization, reduce labour costs, and eliminate much inefficiency in a mining operation. Whether you are looking to fully automate your operations or achieve driver assistance, the Applanix POS LV delivers the performance required.

Autonomous Vehicles

Top Finishers at DARPA's autonomous vehicles grand challenge… Chose Applanix.

The Applanix POS LV system was an integral component of the top finishing teams including the top two finishers: Carnegie Mellon and Stanford University. In all, Applanix POS LV was chosen by:

- 10 of the 36 cars that reached the qualifying round
- 5 of the 11 teams in the Urban Challenge Race
- 3 of the six vehicles to finish the course
- the top 2 finishers

APPLANIX & CLEARPATH ROBOTICS: MINING VEHICLE AUTOMATION

"Clearpath Robotics is establishing itself as a clear leader in the development of autonomous vehicles. Their robotics expertise is unique, and we are very pleased to be working closely with them as they grow and bring autonomous vehicles to industry. The initial work we did together on autonomous vehicles for mining operations was a great success."

—Louis Nastro, Director of Land Products

"Applanix' position and orientation technology is robust and accurate, making it essential for enabling autonomous vehicles to navigate themselves through difficult industrial environments. Applanix offers OEM components for tight integration and complete turnkey systems – all with ROS (Robot Operating System) compatibility – and this makes them an excellent partner for Clearpath as we move forward in autonomous vehicle development."

—Matt Rendall, CEO of Clearpath.

POSPAC™ MMS (MOBILE MAPPING SUITE) FOR LAND APPLICATIONS IS YOUR KEY TO POWERFUL, CONSISTENT, RELIABLE, AND ACCURATE DATA…EVERY TIME.

POSPac Mobile Mapping Suite is Applanix' next generation, industry-leading software for Direct Georeferencing of mobile mapping sensors using GNSS and inertial technology. Optimized for all environments and platforms (air, land, and marine), and compatible with a variety of mapping sensors, this smart software solution achieves both maximum accuracy and maximum efficiency for Direct Georeferencing.

Benefits

- Increases Your Scope: Higher accuracy missions can now be done at a lower cost over larger areas in less time.
- Increases Your Accuracy
- Increases Your Productivity: The Applanix POSPac MMS software allows you to reduce deployment costs, extend distances and areas for mapping, reduce re-work and production costs through rigorous quality checks
- Increases Your Profit

Applanix SmartBase™ and IN-Fusion™ Technology Deliver High Accuracy, Productivity

The combination of the Applanix SmartBase and the Applanix IN-Fusion technologies provides important new benefits over standard GNSS Kinematic Ambiguity Resolution (KAR). Because there is no need to set up dedicated stations close to the project area, and because the time spent in the office post-processing results is less, the overall expenditure associated with high-accuracy surveying is significantly reduced. The robustness of the solution however is increased, ensuring the data is captured first time, every time. Up to 50 reference stations may be processed at a time, with a minimum of four required for accuracy and robustness.

Rigorous Quality Assurance and Control

Included in SmartBase is the ability to perform a quality check on the reference station data. Using rigorous GNSS surveying adjustment

PRECISION AGRICULTURE

VEHICLE AUTOMATION

COUNTIES POWER USES POS LV IN THE DOUBLE AWARD WINNING "PAL-GPR SYSTEM" – A WORLD-FIRST SOLUTION FOR LOCATING AND MAPPING UNDERGROUND UTILITIES.

Whenever vehicle position and orientation matters.

The Challenge

Counties Power of New Zealand identified a strong need to create a sub-surface map of existing utility infrastructure ahead of new construction. Locating and identifying services is important to all underground construction teams. Without this, drilling activities could cause serious damage to critical infrastructure and lead to costly and time-consuming repairs.

The Solution

The PAL-GPR (Precision All Terrain Location – Ground Penetrating Radar) System is a fast, accurate and precise all-terrain location system which advances use of GPR technology . It uses the Applanix POS LV for locating and mapping underground utilities and sets new standards in safety and asset protection.

COUNTIESPOWER

"The very strong POS-LV system from Applanix allowed Counties Power to build a precision location sensing sub-system that leveraged differential GPS and Trimble's VRS technology. This sub-system delivers accurate location information even when the data collection unit is at unusual attitudes or under conditions of short GPS signal loss. It also recovers quickly from loss of signal, reducing downtime. We chose Applanix for their unique blend of features and accuracy."

—Gaz Maroof-Program Manager Subsurface Imaging

LAND AIRBORNE MARINE

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