TRIMBLE AP+ 30 LAND

NEXT GENERATION EMBEDDED GNSS-INERTIAL SOLUTION FOR ROBUST MOBILE MAPPING AND POSITIONING

The Trimble AP+ Land GNSS-inertial OEM system is comprised of next-generation compact, low-power hardware, with dual embedded survey-grade GNSS chipsets, an onboard inertial measurement unit (IMU), an external IMU, and the all-new Applanix IN-Fusion+™ GNSS-aided inertial firmware featuring Trimble ProPoint™ GNSS Technology.

INTEGRATE ONCE, USE MANY

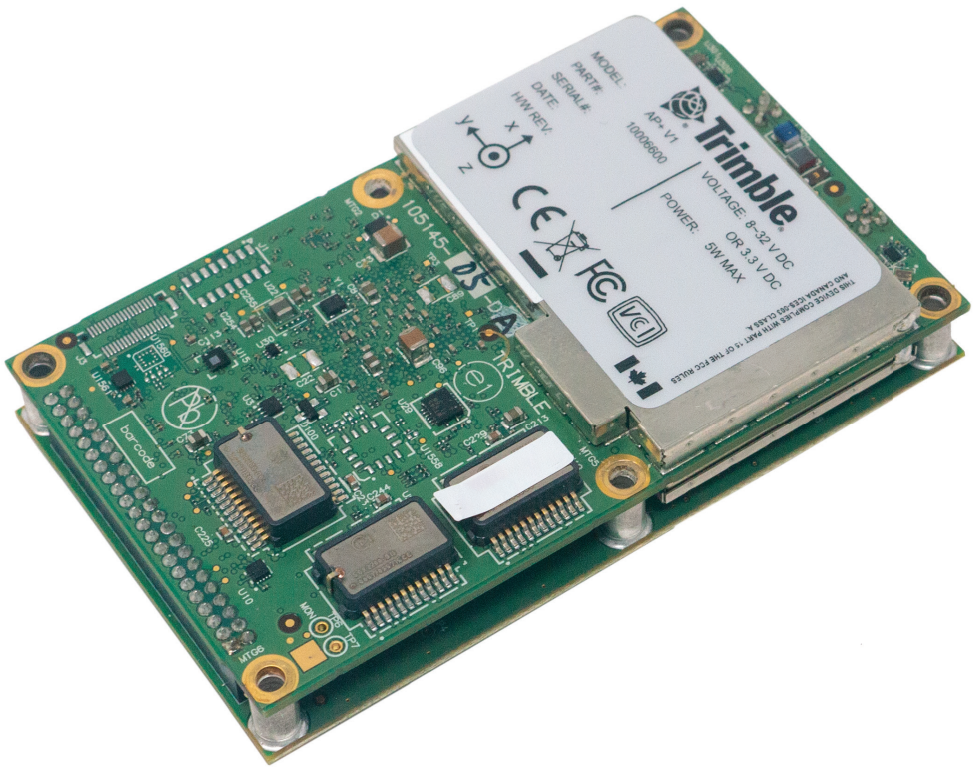
The "Integrate once, use many" concept means a single hardware platform can be used to build a complete range of mapping systems. This consistency saves costs associated with design and integration.

THE BEST SOLUTION JUST GOT BETTER

The Trimble AP+ Land OEM solution is fully supported by the industry-leading Applanix POSPac® MMS post-processing software, featuring Post-processed Trimble CenterPoint® RTX™ for centimeter position accuracy without base stations, making it the ultimate solution for integrators wishing to produce a highly efficient mobile mapping system. For LiDAR integrators, the Trimble AP+ Land OEM is fully compatible with the POSPac MMS LiDAR QC Tools, which performs LiDAR to IMU boresighting and trajectory adjustment using the LiDAR point cloud.

Key Features

- "Integrate once, use many" concept means a single platform can be used to build a complete range of mapping systems, using the same design, which saves costs
- Reduced SWaP
  - 54% smaller footprint
  - 64% lighter
  - 75% less power
- Next generation, survey-grade GNSS receiver
- Two antenna heading support
- Next generation Applanix In-Fusion+™ GNSS-aided inertial firmware featuring Trimble ProPoint™ GNSS Technology
- Completely configurable



AP+ 30 LAND

TECHNICAL SPECIFICATIONS

System Summary

- Applanix IN-Fusion+™ GNSS-inertial integration firmware featuring Trimble ProPoint™ GNSS Technology
- Onboard IMU with solid-state MEMS inertial sensors and Applanix SmartCal™ compensation technology
- High performance external IMU
- Advanced Trimble Maxwell™ Custom GNSS survey technology with 2 x 336 tracking channels
- Dual Antenna, GAMS (GNSS Azimuth Measurement System) included
- Primary Antenna
  - GPS: L1 C/A, L2C, L2E, L5
  - GLONASS: L1 C/A, L2 C/A, L3 CDMA[4]
  - BeiDou: B1, B1C, B2, B2A, B3[6]
  - Galileo[5]: E1, E5A, E5B, E5AltBOC, E6[4]
  - IRNSS: L5
  - QZSS: L1 C/A, L1 SAIF,L1C, L2C, L5, LEX
  - SBAS: L1 C/A, L5
  - MSS L-Band: OmniSTAR, Trimble RTX
- Secondary Antenna:
  - GPS: L1 C/A, L2C, L2E, L5
  - GLONASS: L1 C/A, L2 C/A, L3 CDMA[4]
  - BeiDou: B1, B1C, B2, B2A, B3[6]
  - Galileo[5]: E1, E5A, E5B, E5AltBOC, E6[4]
  - IRNSS: L5
  - QZSS: L1 C/A, L1 SAIF,L1C, L2C, L5, LEX
  - SBAS: L1 C/A, L5
- High-precision multiple correlator for GNSS pseudorange measurements
- Unfiltered, unsmoothed pseudorange measurements data with low noise, low multipath error, low time domain and high dynamic response
- Very low noise GNSS carrier phase measurements with <1 mm precision in a 1 Hz bandwidth
- Proven Trimble low elevation tracking technology
- Real-time GNSS L1, SBAS positioning mode
- Real-time 100 Hz position, attitude output, dual IMU 200 Hz data rate logging
- Navigation output format: ASCII (NMEA-0183), binary (Trimble GSOF)
- RTK license support for Reference Inputs CMR, CMR+, sCMRx, RTCM 2.1, 2.2, 3.0, 3.1, 3.2, sold separately
- Supported by POSPac MMS (sold separately)
- No export permit required
- Support for optional Distance Measurement Indicator (DMI) input (sold separately)
- Support for optional GNSS Azimuth Measurement System (GAMS™)

LAN INPUT/OUTPUT

All Ethernet functions are supported through dedicated IP address (static or DNS) simultaneously including web-based control GUI access and real-time data streaming

TCP/IP and UDP	ASCII and binary data streaming (time tag, PPS sync, status, position, attitude, velocity, track and speed, dynamics, performance metrics, GNSS data), configuration messages
HTTP	Web-based control software (GUI) for easy system configuration and low rate display. Support for all common browsers (IE, Safari, Mozilla, Google Chrome, Firefox)

SERIAL INPUT/OUTPUT

RS232 ports (baud rates up to 460,800)	ASCII and Binary data streaming (time tag, PPS sync, status, position, attitude, velocity, track and speed, dynamics, performance metrics, GNSS data), reference input (CMR, CMR+, sCMRx, RTCM), configuration messages
USB 2.0 Device Configuration	ASCII and Binary data streaming (time tag, PPS sync, status, position, attitude, velocity, track and speed, dynamics, performance metrics, GNSS data), configuration messages

OTHER INPUT/OUTPUT

PPS (pulse-per-second)	Time synchronization
Event Input (2)	Two time marks for external events, TTL 3.3V, 50 Hz max rate
Digital I/O (3)	LED drivers with dedicated functionalities for system integrators
DMI Input	Quadrature pulse with reference voltage
External IMU Interface	Dedicated signals for external IMU support

LOGGING

Internal Logging	6 GB flash memory
External Logging	USB 2.0 host configuration support for removable USB device
Parameters	Time tag, status, position, attitude, velocity, track and speed, dynamics, performance metrics, raw IMU data (200 Hz), raw GNSS data (5 Hz)

PERFORMANCE SPECIFICATIONS

Absolute Accuracy Specifications[1,8] (RMS)

	With GNSS		GNSS Outage, 60 seconds or 1km[9]	
AP+ Land	RTK	Post-Processed[3]	RTK	Post-Processed[3]
Position (m)	0.02 H 0.03 V	0.02 H 0.03 V	0.69 H 0.35 V	0.24 H 0.13 V
Roll & Pitch (deg)	0.01	0.01	0.02	0.02
True Heading[2] (deg)	0.05	0.025	0.07	0.03

PHYSICAL CHARACTERISTICS

Size[7]	100x60x21 mm
Weight[7]	100 g
Power[7]	7W max, 8-34V DC or 3.3V DC
Connectors	Samtec LSHM-140-03.0-L-DV-A-N
Antenna Port	2 x MMCX receptacle Output Voltage: Primary 7.5 VDC Secondary 5 VDC Maximum Current: 400 mA Minimum Input Signal Strength: 32 dB (>35 dB recommended)

ENVIRONMENTAL CHARACTERISTICS

Temperature	-40°C to +75°C (Operational) -55°C to +85°C (Storage)
GNSS Operating Limit	515 m/sec, 18,000 m

ADDITIONAL ACCESSORIES

Evaluation Kit	Includes development board, power supply, and short antenna cables (sold separately)
DMI	External wheel-mounted DMI and cable
GNSS Antennas	Survey-grade GNSS antennas and cables

INERTIAL MEASUREMENT UNITS (IMUS)

Type	Range	Temp °C (Operational)	Power	Size (L x W x H) mm	Weight (kg)
Internal Onboard IMU-79	+/-6 g[10] +/-350 dps	-40 to +75	n/a	n/a	n/a
External IMU-82	+/-10 g +/-490 dps	-40 to +85	4.75 to 36 V DC 4W max	61 x 68 x 65	0.33

1 Typical performance. Actual results are dependent upon satellite configuration, atmospheric conditions and other environmental effects.
2 Using GAMS option and two meter antenna baseline
3 POSPac MMS, Single Base station or SmartBase.
4 There is no official GLONASS L3CDMA or Galileo E6 ICD. The current tracking capability is based on publicly available information. Full receiver compatibility cannot be guaranteed.
5 Developed under a License of the European Union and the European Space Agency.
6 The hardware of this product is designed for BeiDou B3 compatibility (trial version) and its firmware will be enhanced to fully support such new signal as soon as officially published ICD becomes available.
7 Does not include external IMU.
8 Performance based upon external IMU.
9 With DMI, DMI sold separately
10 Sensor bandwidth (-3dB amplitude) ~50Hz

Specifications subject to change without notice.

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