

PIM222A

The PIM222A provides precise GNSS positioning designed to enable autonomy at scale

Proven GNSS precision for ADAS and autonomy

The PIM222A harnesses NovAtel's deep experience delivering precise positioning in the most demanding applications for mass deployment in advanced driver assistance systems and autonomous vehicles.

Automotive quality, easy integration

Built with automotive-qualified hardware in a package that is easy to integrate, the PIM222A leverages SPAN technology from NovAtel to provide accurate position data in urban environments that challenge GNSS availability.

Rich feature array, variable production volumes

The lightweight, power-efficient, solder-down module can be produced in low or high volumes with feature options such as multi-frequency, multi-constellation, RTK and dual-antenna precision, which maximizes slow-speed and initialization performance.



Benefits

- Instant position and attitude — faster IMU calibration
- Maintains accuracy longer into GNSS blackouts
- Tracks and holds more satellites for sustained solutions
- Higher resolution of application dynamics
- Proven precision for automotive applications

Features

- Dual antenna with IMU
- Differential Distance Measurement Instrument (DMI) input via CAN
- High sensitivity
- 50 Hz attitude
- High-volume affordability



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Performance ¹

Signal Tracking (Mode 1)		
Primary RF		
GPS	L1, L2	
Galileo	E1, E5b	
BeiDou	B1I, B2I	
Secondary RF		
GPS	L1	
Galileo	E1	
BeiDou	B1I	
Signal Tracking (Mode 2)		
Primary RF		
GPS	L1, L5	
Galileo	E1, E5a	
BeiDou	B1I, B2a	
Secondary RF		
GPS	L1, L5	
Galileo	E1, E5a	
BeiDou	B1I, B2a	
Horizontal Position Accuracy (RMS)		
Single Point L1	1.5 m	
Single Point L1/L2	1.2 m	
RTK	0.1 m	
RTK (CEP50) ²	1 cm + 1 ppm	
GNSS INS Bridging	30 cm @ 10s outage	
GNSS Outages ³		
INS positioning error ⁴	0.3 m	
INS heading error ⁴	0.5°	
Dead reckoning with DMI ⁵	0.5% at 1 km	
Maximum Data Rate Solutions		
Raw IMU measurements	up to 50 Hz	
Raw GNSS measurements	up to 100 Hz	
	1 Hz	
Time to First Fix		
Cold start ⁶	40 s (typical)	
Hot start ⁷	10 s (typical)	
RTK initialization	15 s	
Boot time	5 s	
Time Accuracy ⁸	20 ns RMS	
Velocity Accuracy	0.04 m/s RMS	
Attitude Accuracy (RMS)		
INS heading	1°	

Physical and Electrical

Dimensions	35 × 42 × 4.2 mm
Weight	12 g
Power	
Input voltage	
VCC	+3.3 VDC ±5%
VBATT for Real Time Clock	+3.0 VDC +5%/-10%
Power Consumption	
Dual frequency GNSS	1.2 W (typ.)
Power down power consumption	0.3 mA
Signals to Module Interfaces	
GNSS RF In	2
UART	Up to 3
USB 2.0 service port (device, 12 Mbit/s) ⁹	1
PPS (Timemark)	1
SPI (for external IMU)	2
CAN Bus	1
External LNA short status	2
Error line	1

Environmental

AEC Automotive Grade	Grade 2
Temperature	
Operating	-40°C to +105°C
Storage	-50°C to +105°C
Humidity	
Operating	MIL-STD-810G (CH1), Method 507.6, Procedure II, 40°C @ 95% RH
Non-operating	MIL-STD-810G (CH1), Method 507.6, Procedure II, 30°C - 60°C @ 95% RH
Random Vibration	
Operating	MIL-STD-810G (CH1), Method 514.7, Category 24, (7.7 g RMS)
Sinusoidal Vibration	
Non-operating)	IEC 60068-2-6 (5.0 g)
Shock	
Operating	MIL STD 810G (CH1), Method 516.7 Procedure I (40 g)
Non-operating	MIL STD 810G (CH1), Method 516.7 Procedure V (75 g)

Bump	
Operating	ISO 9022-31-06 (25 g)
Acceleration	
Operating	MIL-STD-810G (CH1), Method 513.7, Procedure II (4g, 8g)

Features

- RTK correction support for RTCM v3.x MSM
- Navigation output support for NMEA 0183 v4.11 and GNSS+INS binary logs
- Solution integrity flags based Receiver Autonomous Integrity Monitoring (RAIM)
- Dual receiver ALIGN heading solution
- Pulse Per Second (PPS) output
- SPAN GNSS+INS technology internal or external IMU integration
- Differential odometer over CAN bus

