

# UIMU-LN200

Tactical grade, low noise IMU combines with SPAN GNSS+INS technology from Hexagon | NovAtel to provide 3D position, velocity and attitude solution



## World-leading GNSS+INS technology

SPAN GNSS+INS technology brings together two different but complementary technologies: Global Navigation Satellite Systems (GNSS) positioning and inertial navigation. The absolute accuracy of GNSS positioning and the stability of Inertial Measurement Unit (IMU) gyro and accelerometer measurements are deeply coupled to provide an exceptional 3D navigation solution that is stable and continuously available, even through periods when satellite signals are blocked.

## UIMU-LN200 overview

The UIMU-LN200 contains the Northrop Grumman LN200 IMU. The LN200 is a tactical grade IMU containing closed-loop fiber optic gyros and solid-state silicon accelerometers. The UIMU-LN200 handles the power requirements of the IMU from a 12-28 V power input and provides the IMU data to a SPAN enabled GNSS+INS receiver using a custom NovAtel interface. The GNSS+INS receiver uses IMU measurements to compute a blended GNSS+INS position, velocity and attitude solution at up to 200 Hz. The LN200 is ITAR controlled and requires export approval for customers outside the United States.

## Advantages of UIMU-LN200

Low noise and stable accelerometer and gyro sensor biases make the UIMU-LN200 an ideal choice for airborne mapping applications. IMU mounting is made easy by its small footprint. The UIMU-LN200 is available as a complete assembly, including the IMU and environmentally sealed enclosure. Also, customers who already have the LN200 IMU can purchase the enclosure separately and easily integrate the IMU.

## Improve LN200 accuracy

Receivers from NovAtel provide your choice of accuracy and performance, from decimetre to RTK-level positioning. For more demanding applications, Waypoint Inertial Explorer post-processing software can be used to post-process real-time data on the LN200 and offers the highest level of accuracy with the system.

## Benefits

- Premium performance IMU
- Optimal for aerial, hydrographic survey and industrial applications
- Easy integration with NovAtel's SPAN capable GNSS+INS receivers
- Rugged design ideal for challenging environments
- High sensor dynamic range

## Features

- Closed-loop fiber optic gyros
- Stationary INS alignment capable
- IMU data rate: 200 Hz
- SPAN GNSS+INS capability with configurable application profiles

**SPAN System Performance<sup>1</sup>**

**Horizontal Position Accuracy (RMS)**

Single Point L1/L2	1.2 m
SBAS <sup>2</sup>	60 cm
DGPS	40 cm
TerraStar-L <sup>3,4</sup>	40 cm
TerraStar-C PRO <sup>3,4</sup>	2.5 cm
TerraStar-X <sup>3,4</sup>	2 cm
RTK	1 cm + 1 ppm

**Data Rate**

IMU Raw Data Rate	200 Hz
INS Solution	Up to 200 Hz

**Time Accuracy<sup>5</sup>** 20 ns RMS

**Max Velocity<sup>6</sup>** 515 m/s

**IMU Performance<sup>7</sup>**

**UIMU-LN200**

Gyro input range	±1000 deg/sec
Gyro rate bias	1.0 deg/hr
Gyro rate scale factor	100 ppm
Angular random walk	0.07 deg/√hr

Accelerometer range <sup>8</sup>	±40 g
Accelerometer linearity	150 ppm
Accelerometer scale factor	300 ppm
Accelerometer bias	0.3 mg

**UIMU-LN200-L**

Gyro input range	±1000 deg/sec
Gyro rate bias	1.0 deg/hr
Gyro rate scale factor	100 ppm
Angular random walk	0.07 deg/√hr

Accelerometer range <sup>8</sup>	±40 g
Accelerometer linearity	500 ppm
Accelerometer scale factor	1000 ppm
Accelerometer bias	1.5 mg

**Physical and Electrical**

**Dimensions** 168 x 195 x 146 mm

**Weight** 4.5 kg

**Power**

Power consumption 16 W (typical)  
Input voltage +12 to +28 V

**Connectors**

Power MIL-C-38999-III, 3 pin  
Communication MIL-C-38999-III, 13 pin

**Environmental**

**Temperature**

Operating -30°C to +60°C  
Storage -45°C to +80°C

**Humidity** 95% non-condensing

**MTBF** 20,000 hrs

**Waterproof** IEC 60259 IPX7

**Dust** IEC 60259 IP6X

**Compliance**

FCC, ISED, CE

**Optional Accessories**

- Inertial Explorer post-processing software

**Performance During GNSS Outages<sup>1,9</sup>**

Outage Duration	Positioning Mode	Position Accuracy (M) RMS		Velocity Accuracy (M/S) RMS		Attitude Accuracy (Degrees) RMS		
		Horizontal	Vertical	Horizontal	Vertical	Roll	Pitch	Heading
0 s	RTK <sup>10</sup>	0.02	0.03					
	PPP	0.06	0.15	0.010	0.010	0.008	0.008	0.015
	SP	1.00	0.60					
	Post-Processed <sup>11</sup>	0.01	0.02	0.020	0.010	0.003	0.003	0.006
10 s	RTK <sup>10</sup>	0.12	0.10					
	PPP	0.16	0.22	0.020	0.015	0.011	0.011	0.020
	SP	1.10	0.67					
	Post-Processed <sup>11</sup>	0.01	0.02	0.020	0.010	0.003	0.003	0.006
60 s	RTK <sup>10</sup>	1.77	0.63					
	PPP	1.81	0.75	0.070	0.025	0.014	0.014	0.030
	SP	2.75	1.20					
	Post-Processed <sup>11</sup>	0.09	0.06	0.020	0.010	0.004	0.004	0.006

1. Typical values. Performance specifications subject to GNSS system characteristics, Signal-in-Space (SIS) operational degradation, ionospheric and tropospheric conditions, satellite geometry, baseline length, multipath effects and the presence of intentional or unintentional interference. 2. GPS-only. 3. Requires a subscription to a TerraStar data service. Subscriptions available from NovAtel. 4. Typical value. No almanac or ephemerides and no approximate position or time. 5. Time accuracy does not include biases due to RF or antenna delay. 6. Export licensing restricts operation to a maximum of 515 metres/second. 7. Supplied by IMU manufacturer. 8. GNSS receiver sustains tracking up to 4 g. 9. Steady state and outage performance remains the same for the -L model. 10. 1 ppm should be added to all values to account for additional error due to baseline length. 11. Post-processing results using Inertial Explorer software.

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