

**GEOMATE**

High-Tech Precision. High-Touch Service.



# **GEOMATE SG6L**

POCKET LASER IMU-RTK RECEIVER



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The GeoMate SG6L Pocket Laser GNSS Receiver is the latest cutting-edge GNSS surveying receiver designed in Singapore, featuring advanced GNSS, IMU, laser and dual-camera technology. The SG6L boasts an impressive 1892-channel GNSS SoC module, ensuring precise positioning even in challenging environments. Equipped with state-of-the-art laser detection technology, the SG6L harnesses the power of high-quality dual cameras assistance and laser measurement while maintaining its compact and portable design.

The SG6L GNSS provides surveying professionals and construction operators with powerful capabilities, including visual stakeout, visual surveying, and laser measurement, enabling efficient, real-time data collection and stakeout. Designed as a pocket-sized laser GNSS RTK, the SG6L is compact, rugged, and durable. Crafted with meticulous manufacturing in Singapore, the SG6L is backed by GeoMate's commitment to quality and precision, making it a reliable partner for executing any surveying task and an ideal tool for surveyors striving for excellence in their projects.

## TECHNICAL SPECIFICATIONS

### GNSS Performance<sup>(1)</sup>

|              |                                 |
|--------------|---------------------------------|
| Channels     | 1892 channels                   |
| GPS          | L1C/A, L2C, L2P(Y), L5          |
| GLONASS      | G1, G2, L1OC*, L2OC*, L3OC*     |
| Galileo      | E1C, E5a, E5b, E5AltBoC, E6     |
| BeiDou       | B1I, B2I, B3I, B1C, B2a, B2b    |
| QZSS         | L1C/A (B), L1C, L2C, L5, L6D/E* |
| NavIC/ IRNSS | L5                              |
| PPP          | B2b-PPP, E6B-HAS                |
| SBAS         | EGNOS (L1, L5)                  |
| L-band       | PointSky                        |

### GNSS Accuracies<sup>(2)</sup>

|                                  |   |
|----------------------------------|---|
| Real time kinematic (RTK)        | Horizontal: 8 mm + 1 ppm RMS<br>Vertical: 15 mm + 1 ppm RMS<br>Initialization time: < 10 s<br>Initialization reliability: > 99.9%   |
| Post-processing kinematic (PPK)  | Horizontal: 3 mm + 1 ppm RMS<br>Vertical: 5 mm + 1 ppm RMS  |
| PointSky <sup>(3)</sup>          | H: 2.5 cm (CEP95)<br>V: 5 cm RMS<br>Standard < 5min, Specific regions < 1min(CEP95)<br>Re-Convergence time: < 1 min<br>Coverage: Network broadcast covers the global, while satellite broadcast covers Asia, Eastern Europe, Eastern Africa, Australia, and the Americas. |
| PPP                              | Support PPP-B2b, E6B-HAS<br>H: 10 cm   V: 20 cm   |
| Post-processing static           | Horizontal: 2.5 mm + 0.5 ppm RMS<br>Vertical: 5 mm + 0.5 ppm RMS  |
| Code differential                | Horizontal: 0.4 m RMS    Vertical: 0.8 m RMS  |
| Autonomous                       | Horizontal: 1.5 m RMS    Vertical: 2.5 m RMS  |
| Visual stakeout                  | H: 8 mm + 1 ppm RMS; V: 15 mm + 1 ppm RMS   |
| Positioning rate <sup>(4)</sup>  | 1 Hz, 5 Hz and 10 Hz  |
| Time to first fix <sup>(5)</sup> | Cold start: < 45 s    Hot start: < 10 s<br>Signal re-acquisition: < 1 s   |
| IMU update rate                  | 200 Hz  |
| Tilt angle                       | 0-60°   |
| RTK tilt-compensated             | Additional horizontal pole-tilt uncertainty typically less than 8 mm + 0.7 mm/° tilt  |

### Laser Sensor<sup>(6)</sup>

|                            |   |
|----------------------------|---|
| High-accuracy Laser survey | 2 cm within range 5 m; 3 cm within range 10 m |
| Rapid Laser survey         | 3 cm within range 5 m; 5 cm within range 10 m |
| Laser Range                | Up to 50 m                                    |
| Range Accuracy             | 2 mm  |
| Laser Type                 | Class 3R, Green <sup>(7)</sup>                |

### Environments

|                                    |  |
|------------------------------------|--|
| Temperature                        | Operating: - 40°C to + 65°C (- 40°F to + 149°F)<br>Storage: - 40°C to + 85°C (- 40°F to + 185°F) |
| Humidity                           | 100% non-condensation  |
| Ingress protection                 | IP68 <sup>(8)</sup> (according to IEC 60529)   |
| Drop                               | Survive a 2-meter pole-drop  |
| Waterproof and breathable membrane | Prevent water vapor from entering under harsh environments.                                      |

### Communication

|                        |   |
|------------------------|---|
| Wireless connection    | NFC   |
| Wi-Fi                  | Wi-Fi IEEE 802.11 g/ac, access point mode   |
| Bluetooth®             | v 4.2, backward compatible  |
| Ports                  | 1 x USB Type-C port (power supply, data transmission, firmware update)<br>1 x UHF antenna port (SMA male)   |
| LongRun <sup>(9)</sup> | The new-generation UHF radio data transmission mode of GeoMate enables GNSS RTK Base all-day operation and long-distance range.   |
| UHF radio              | Standard Internal Tx/Rx: 410 - 470 MHz<br>Transmit Power: 0.5 W, 1 W<br>Protocol: LongRun, Transparent, TT450, Satel <sup>(10)</sup><br>Link rate: 9600 bps to 19200 bps<br>Range: Typical 6 km, optimal up to 15 km with LongRun. Typical 3 km, optimal up to 8 km with other protocols. |
| Data formats           | RTCM 2.x, RTCM 3.x, CMR input / output<br>RINEX 2.11, 3.02; NMEA 0183 output<br>NTRIP Client, NTRIP Caster  |
| Data storage           | 8 GB high-speed memory  |

### Hardware

|              |  |
|--------------|--|
| Size (LxWxH) | Φ133 mm x 90 mm (Φ 5.24 in x 3.54 in)  |
| Weight       | 800 g (1.76 lb)  |
| Front panel  | 4 LED, 2 physical buttons  |
| Tilt sensor  | Calibration-free IMU for pole-tilt compensation.<br>Immune to magnetic disturbances.<br>E-Bubble leveling. |

### Cameras

|                  |  |
|------------------|--|
| Sensor pixels    | Global shutter with 2 MP & 8 MP  |
| Field of view    | 91°  |
| Video frame rate | 30 fps   |
| Features         | MateSurvey software, support Visual Navigation, Visual Stakeout, Laser Survey. |

### Electrical

|  |   |
|--|---|
| Power consumption                                  | UHF/ 4G RTK Rover w/o camera: Typical 2.4 W   |
| Li-ion battery capacity                            | Built-in non-removable battery  |
| Operating time on internal battery <sup>(11)</sup> | UHF/ 4G RTK Rover w/o camera: up to 20 h<br>Visual Stakeout/Laser Survey: up to 15 h<br>UHF RTK Base: up to 7.5 h (LongRun), up to 12 h (other protocols); Static: up to 20 h |
| External power input                               | 5 V / 2 A   |

### Compliance with Laws and Regulations

|                         |   |
|-------------------------|---|
| International standards | RED 2014/53/EU, IEC 62368-1, FCC PART 15, IEC 62133-2, UN38.3 |
|-------------------------|---|

\*All specifications are subject to change without notice.

(1) Compliant, but subject to availability of BDS ICD, GLONASS, Galileo, QZSS and IRNSS commercial service definition. GLONASS L1OC, L2OC, L3OC, and QZSS L6D/E will be provided through future firmware upgrade.

(2) Accuracy and reliability are determined under open sky, free of multipaths, optimal GNSS geometry and atmospheric condition. Performances assume minimum of 5 satellites, follow up of recommended general GPS practices. (3) RMS performance based on repeatable in field measurements. Achievable accuracy and initialization time may vary based on type and capability of receiver, antenna and environment.

(4) Compliant and 10 Hz to be provided through future firmware upgrade. (5) Typical observed values. (6) Data sourced from GeoMate Lab. Actual results may vary depending on testing environment and conditions.

(7) Avoid Direct Eye Contact with Beam. (8) Splash, water, and dust resistant and were tested under controlled laboratory conditions with a rating of IP68 under IEC standard 60529. (9) All test values above are from GeoMate internal labs under typical conditions. Actual results may vary due to product differences, software versions, usage, and environmental factors. (10) Compliant and Satel protocol to be provided through future firmware upgrade. (11) 4900 mAh, 7.2 V internal battery. Battery life is subject to operating temperature.



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DESIGNED IN SINGAPORE



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