

GEOMATE

SG9

IMU-RTK GNSS RECEIVER



**SURVEYING
& ENGINEERING**

HIGH-PERFORMANCE IMU RTK GNSS RECEIVER

The SG9 GNSS receiver integrates professional IMU-RTK technology to provide a robust and accurate positioning, in any circumstances. It combines state-of-the-art GNSS RTK engine, a hassle-free high-end IMU sensor and advanced GNSS tracking capabilities to dramatically increase RTK availability and reliability.

The SG9 automatic pole-tilt compensation boosts survey and stakeout speed by up to 30%. Construction and land surveying projects are achieved with high productivity and reliability pushing the boundaries of conventional GNSS RTK survey.

FULL GNSS POSITIONING

Combining GPS, Glonass, Galileo and BeiDou constellations

The embedded 1408-channel GNSS technology takes benefit from all GPS, GLONASS, Galileo and BeiDou signals and provides robust RTK position availability and reliability.

EXTENDED CONNECTIVITY

Instant NFC pairing of your controller

The SG9 GNSS combines high-end connectivity modules: Bluetooth, Wi-Fi, NFC, 4G and UHF radio modem. The 4G modem brings ease of use when working within RTK networks. The internal UHF radio modem allows long-distance base-to-rover surveying up to 5 km.

HASSLE-FREE IMU-RTK SURVEYING

Dramatically increase RTK availability

No complicated calibration process, rotation, leveling or accessories are necessary with the i90. Simply rock the range pole a few times to initialize the SG9 internal IMU module and enable GNSS RTK survey in difficult field environment.

HIGH ACCURACY. ALWAYS.

Boost survey and stakeout speed by up to 30%

The SG9 GNSS build-in IMU ensures interference-free and automatic pole-tilt compensation in real-time. 3 cm accuracy is achieved with pole-tilt range of up to 30 degrees.



**IMU-RTK
TECHNOLOGY**



**ENABLE GNSS RTK
ANYTIME, ANYWHERE.**

SPECIFICATIONS

GNSS Performance ⁽¹⁾	
Channels	1408 channels Powered by CHCNAV iStar GNSS tracking technology
GPS	L1 C/A, L2C, L2P, L5
GLONASS	L1, L2, L3
Galileo	E1, E5a, E5b, E6
BeiDou	B1, B2, B3
SBAS	EGNOS, GAGAN, MSAS, WAAS, L1, L5
QZSS	L1, L2, L5, L6

GNSS Accuracies ⁽²⁾	
Real time kinematics (RTK)	Horizontal: 8 mm + 0.5 ppm RMS Vertical: 15 mm + 0.5 ppm RMS Initialization time: <10 s Initialization reliability: >99.9%
Post-processing kinematics (PPK)	Horizontal: 2.5 mm + 1 ppm RMS Vertical: 5 mm + 1 ppm RMS
Post-processing static	Horizontal: 3 mm + 0.1 ppm RMS Vertical: 3.5 mm + 0.4 ppm RMS
Code differential	Horizontal: 0.2 m RMS
Autonomous	Horizontal: 1.5 m RMS Vertical: 3 m RMS
Positioning rate	Up to 10 Hz
Time to first fix ⁽³⁾	Cold start: < 45 s Hot start: < 10 s Signal re-acquisition: < 1 s
RTK tilt -compensated	Additional horizontal pole-tilt uncertainty typically less than 10 mm + 0.7 mm/° tilt

Hardware	
Size (L x W x H)	159 mm x 150 mm x 110 mm (6.3 in x 5.9 in x 4.3 in)
Weight	1.26 kg (2.77 lb)
Environment	Operating: -40°C to +65°C (-40°F to +149°F) Storage: -40°C to +85°C (-40°F to +185°F)
Humidity	100% condensation
Ingress protection	IP67 waterproof and dustproof, protected from temporary immersion to depth of 1 m
Shock	Survive a 2-meter pole drop
Tilt sensor	Calibration-free IMU for pole-tilt compensation. Immune to magnetic disturbances. E-Bubble leveling
Front panel	4 LED indicates 1.46" OLED Display

Certification	
FCC Part 15 (class B Device), FCC Part 22, 24, 90; CE Mark; NGS Antenna Calibration; MIL STD 810G, Method 514.7	

Communication	
Network modem	Integrated 4G modem LTE (FDD): B1, B2, B3, B4, B5, B7, B8, B20 DC-HSPA+/HSPA+/HSPA/UMTS: B1, B2, B5, B8 EDGE/GPRS/GSM 850/900/1800/1900 MHz
Wi-Fi	802.11 b/g/n, access point mode
Bluetooth®	V 4.1
Ports	1 x 7-pin LEMO port (external power, RS-232) 1 x USB Type-C port (data download, firmware update) 1 x UHF antenna port (TNC female)
UHF radio	Standard Internal Rx/Tx: 410 - 470 MHz Transmit Power: 0.5 W to 2 W Protocol: CHC, Transparent, TT450, 3AS Link rate: 9,600 bps to 19,200 bps Range: Typical 3 km to 5 km
Data formats	RTCM 2.x, RTCM 3.x, CMR input / output HCN, HRC, RINEX 2.11, 3.02 NMEA0183 output NTRIP Client, NTRIP Caster
Data storage	32 GB internal memory, Support for removable external USB/Micro SD to USB Type-C card reader for data storage and download

Electrical	
Power consumption	5 W (depending on user settings)
Li-ion battery capacity	2 x 3,400 mAh, 7.4 V
Operating time on internal battery ⁽⁴⁾	UHF receive/transmit (0.5 W): 6 h to 9 h Cellular receive only: Up to 9 h Static: Up to 12 h
External power input	9 V DC to 28 V DC



*All specifications are subject to change without notice.
(1) Compliant, but subject to availability of BDS ICD and Galileo commercial service definition. BDS B3 and Galileo E6 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) Typical observed values. (4) Battery life is subject to operating temperature.

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WWW.GEOMATE.SG | SALES@GEOMATE.COM

Geomate Positioning Pte. Ltd.

71 Lorong 23 Geylang #07-09
Work + Store (71G) Singapore 388386
+65 9130 7218
sales@geomate.sg
www.geomate.sg

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