



Service and support.



iGage SG20AR

PALM-SIZE VISUAL IMU-RTK RECEIVER



The SG20AR is an advanced GNSS RTK receiver, designed to deliver exceptional performance in a compact, lightweight solution. Weighing just 1 lb, its palm-size form factor enhances portability, making it ideal for professionals who require mobility in the field.

Even with its exceptionally small size, it performs as well as our full sized rovers and boasts a 10-hour, cameras on, full workday battery life.

This innovative SG20AR receiver integrates GNSS, AUTO-IMU, and dual 2 MP cameras, enabling seamless visual navigation and CAD visual stakeout functionality. With its advanced visual stakeout capabilities, the SG20AR enhances efficiency, streamlining workflows and minimizing field time. Featuring 1608 channels and multi-constellation support, including GPS, GLONASS, Galileo, BeiDou, the SG20AR ensures superior positioning accuracy in even the most challenging environments.

Engineered to withstand harsh conditions with an IP68 rating, it combines durability

with unparalleled precision and reliability and when combined with iGage service and support.

TECHNICAL SPECIFICATIONS

GNSS Performance⁽¹⁾

| | |
|--------------|---|
| Channels | 1608 channels |
| GPS | L1C/A, L2C, L2P(Y), L5 |
| GLONASS | L1, L2, L3* |
| Galileo | E1, E5a, E5b, E6* |
| BeiDou | B1I, B2I, B3I, B1C, B2a, B2b* |
| QZSS | L1C/A, L1C, L2C, L5 |
| NavIC/ IRNSS | L5 |
| PPP | Support PPP-B2b, E6B-HAS H: 10 cm V: 20 cm |
| SBAS | EGNOS (L1, L5*) |

GNSS Accuracies⁽²⁾

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|----------------------------------|---|
| Real time kinematic (RTK) | Horizontal: 8 mm + 1 ppm RMS Vertical: 15 mm + 1 ppm RMS Initialization time: < 10 s Initialization reliability: > 99.9% |
| Post-processing kinematic (PPK) | Horizontal: 3 mm + 1 ppm RMS Vertical: 5 mm + 1 ppm RMS |
| Post-processing static | Horizontal: 2.5 mm + 0.5 ppm RMS 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 ⁽³⁾ | 1 Hz, 5 Hz and 10 Hz |
| Time to first fix ⁽⁴⁾ | Cold start: < 45 s Hot start: < 10 s 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 down to 30° |

Environments

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|------------------------------------|--|
| Temperature | Operating: -40°C to +65°C (-40°F to +149°F) Storage: -40°C to +85°C (-40°F to +185°F) |
| Humidity | 100% non-condensation |
| Ingress protection | IP68 ⁽⁵⁾ (according to IEC 60529) |
| Drop | Survive a 2-meter pole-drop |
| Waterproof and breathable membrane | Prevent water vapor from entering under harsh environments. |

Electrical

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| Charging time | Full charge in 4.5 hours |
| Li-ion battery capacity | Built-in non-removable battery |
| Operating time on internal battery ⁽⁶⁾ | UHF/ 4G RTK Rover w/o camera: up to 17 h Visual Stakeout: up to 10 h Static: up to 22 h |
| External power input | Type-C 5 V / 2 A |

Hardware

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|--------------|---|
| Size (LxWxH) | Φ106 mm x 55.6 mm (Φ 4.17 in x 2.1 in) |
| Weight | 450 g (0.99 lb) |
| Front panel | 2 synchronized LED + 1 Button |
| Tilt sensor | Calibration-free IMU for pole-tilt compensation. Immune to magnetic disturbances. E-Bubble leveling. |

Cameras

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| Sensor pixels | Dual 2 MP cameras |
| Aperture | F2.4 |
| Video frame rate | 30 fps |
| Features | MateSurvey software, support Visual Navigation, Visual Stakeout. |

Communication

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| Wireless connection | NFC for device touch pairing |
| Wi-Fi | Wi-Fi 2.4G 802.11b/g/n; Wi-Fi 5G 802.11ac |
| Bluetooth® | v 4.2, backward compatible |
| Ports | 1 x USB Type-C port (external power, data download, OTG firmware update) 1 x UHF antenna port (SMA female) |
| UHF radio ⁽⁷⁾ | Standard Internal Tx/Rx ⁽⁸⁾ : 410 - 470 MHz Transmit Power: 0.5 W, 1 W Protocol: Transparent, TT450, Satel ⁽⁹⁾ Link rate: 9,600 bps to 19,200 bps Range: Typical 3km, up to 5 km with optimal conditions |
| Data formats | RTCM2x, RTCM3x, CMRinput/output; GCN, RINEX2.11, 3.02; NMEA0183output; NTRIP Client, NTRIP Caster |
| Data storage | 8 GB high-speed memory |

Compliance with Laws and Regulations

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|-------------------------|---|
| International standards | RED 2014/53/EU, IEC 62368-1, FCC PART 15, IEC 62133-2, UN38.3 |
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*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. (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) Compliant and 10 Hz to be provided through future firmware upgrade. (4) Typical observed values. (5) Splash water, and dust resistant and were tested under controlled laboratory conditions with a rating of IP68 under IEC standard 60529. (6) 4900 mAh, 7.2 V internal battery. Battery life is subject to operating temperature. (7) The use of UHF datalink may be subject to local regulations. Users must ensure that the device is not operated without the permission of the local authorities on frequencies or power output other than those specifically reserved and intended for use without required permit. (8) Supported after the product upgrade in April 2025. For details, please kindly contact authorized GEOMATE dealer or regional business team. (9) Compliant and Satel protocol to be provided through future firmware upgrade.



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Designed in Singapore