α-GEO



Matrix III

Long-range laser+AR

Laser survey | AR | Camera | IMU | IP67 | 64GB

Innovation Breakthrough!
Brand-New Matrix III
Ushers in a New Era of 100-Meter Laser Measurement

With the rapid advancement of technology, laser measurement has reached a groundbreaking milestone! ALPHAGEO Matrix III, equipped with a high-performance laser module, redefines industry standards with exceptional stability and precision, delivering a maximum measurement range of 100 meters—effortlessly meeting long-distance ranging demands in complex environments.

• Extended Range: Shattering traditional limitations, it effectively covers distances up to 100 meters.

• High Precision: Incorporating advanced algorithms and optical design, it achieves centimeter-level accuracy, ensuring reliable data output.

• Superior Environmental Adaptability: With strong anti-interference capabilities, it maintains stable performance even in low-light conditions and under temperature variations.



Right to the point with AR real scene stakeout

• When the stakeout points are marked directly on the ground, surveyors can easily find the exact location of the stakeout points.
• By following the arrows on the real-life map, you can stake out points in one go, without having to move the pole back and forth, making the stakeout work more accurate and efficient.



Dual-Dimensional Empowerment! Matrix III Features 5MP HD Auxiliary Camera for Laser-Assisted Coordinate Positioning

The Matrix III laser module innovatively integrates a 5MP high-definition auxiliary camera, significantly enhancing measurement reliability in complex environments through multispectral cooperative technology. Equipped with an f/2.08mm large-aperture lens, this auxiliary system can clearly capture target feature points in environments with illumination below 500 Lux, effectively addressing the "blind aiming" challenge inherent in traditional laser measurement.





Super IMU say goodbye to repeated initialization

Matrix III is equipped with a fast initialization, calibration free and immune to magnetic interference inertial Measurement Unit (IMU). All users can use this technology to collect or stakeout topo points up to 120°.

Advanced Multi-Constellation Tracking & PPP Technology



Equipped with a 1408-channel high-performance GNSS board, the Matrix III delivers full signal tracking across all operational satellite constellations, including GPS, GLONASS, BDS, GALILEO, QZSS and IRNSS, ensuring continuous, high-precision spatial positioning even in challenging environments.
At the meantime, Matrix III supports state-of-the-art PPP technologies, such a highlight performance makes Matrix III achieve centimeter-level standalone accuracy with BDS PPP and sub-decimeter precision with Galileo HAS.



Worry-free storage

Built in 64GB memory, which can meet most needs of field work. And the feature of cyclic storage helps receiver to automatically remove the previous observation data while there is not enough space in the memory, with this excellent performance, data storage can last almost 4 years based on 5s sampling interval. And the design of embedded memory chip can ensure the safety of observation data.

GNSS Performance

Signals tracking	GPS: L1C/A, L2C, L2P, L5 GLONASS: L1, L2 BDS: B1, B1C, B2, B2a, B2b, B3 GALILEO: E1, E5a, E5b, E6 QZSS: L1, L2, L5, L6 SBAS: WAAS, EGNOS, MSAS, GAGAN, SDCM
Channels	1408
Cold start	<60s
Hot start	<15s
Positioning output rate	1Hz ~ 50Hz
Signal reacquisition	<1s
RTK initialization time	<5s
Initialization reliability	>99.99%
Time accuracy	20ns

Positioning accuracy [1]

Code differential GNSS positioning	H: 0.25m + 1ppm RMS V: 0.50m + 1ppm RMS
SBAS differential positioning accuracy [2]	Typically < 5m 3DRMS
Static GNSS surveying	H: 2.5mm + 0.5ppm RMS V: 5mm + 0.5ppm RMS
RTK surveying (baseline<30km)	H: 8mm + 1ppm RMS V: 15mm + 1ppm RMS
Network RTK [3]	H: 8mm + 0.5ppm RMS V: 15mm + 0.5ppm RMS
Laser measurement	±2mm±100x10-6xD (D is the measuring distance, unit : mm)
Laser distance	0.05m~100m

Sensor

IMU	Supported, 4D IMU initialization in 3 seconds
Update rate	400Hz
Accuracy	<2.5cm within 120°
Tilt compensation	0 ~ 120°

Camera

Laser assisted	5MP HD camera
AR camera	5MP
FOV	84°

Physical

Materials	Magnesium alloy
Dimensions	129mm×129mm×99mm
Weight	<0.8kg
Operating temperature	-40℃ ~ +75℃
Storage temperature	-55℃ ~ +85℃
Waterproof/Dustproof	IP67 standard, protected from 30min immersion to depth of 1m
Shock	Survive a 2m pole drop onto concrete
Vibration	MIL-STD-810G
Humidity	100% non-condensing

Eletrical

Power supply	9~24V DC external power input to 5-pin LEMO port Supports Type-C fast charging
Battery	Built-in 7000mAh-7.4V Li-ion battery
Battery life	Rover mode: 12hours Base mode: 7hours Static mode: 15hours

Communications

I/O interface	1* USB Type-C port, charging, data download 1* SIM card slot, Nano SIM
Cellular network	Full frequency multi-band 4G modem, supports TDD-LTE /FDD-LTE/WCDMA/CDMA2000
WiFi	802.11 b/g standard, access point & client mode, supports accessing to hotspot for correction transmission
Bluetooth	Bluetooth 5.2 classical/BLE proprietary dual-mode
Differential data format	RTCM2x, RTCM3x, CMR&CMR+, sCMRx
GPS output data format	RINEX, NMEA-0183

Date storage

Memory	64GB, supports cyclic storage, with ability to collect almost 4 years raw observation based on 5s interval

User interaction

Operating system	Linux OS
Buttons	Power key
Indicators	1* Power indicator 1* Bluetooth indicator 1* Satellite indicator 1* Data link indicator
Voice	Intelligent voice prompts
Web UI	Supports Web UI configration

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1*Precision and reliability may be subject to anomalies due to multipath, obstruction, satellite geometry, and atmospheric conditions. the specification stated recommend the use of stable months in an open sky view, EMI and multipath clean environment, optimal GNSS constellation configurations. Baselines longer than 30km require ephemeris and occupations up to 24 hours may be required to achieve the high precision static specification.
2*Depends on SBAS system performance.
3*Network RTK ppm values are referenced to the closest physical base station and depends on network performance.

Where Precision Meets Innovation