α-GEO

MATRIX VI

VISION+AR+LASER

Matrix VI is a brand new functional GNSS receiver merges Visual Positioning, AR real-scene stakeout and Laser measurement technologies, once breaking through the limitations of GNSS products, offering surveyors more convenience and productive solutions.

www.alphageo-info.com

Measuring as sharp as eyes

Matrix VI, a survey-grade GNSS receiver merges Visual Positioning technology, built-in core algorithms of photogrammetry, offering productive solutions for professional or amateur surveyors to measure points which previously could not be measured with a regular GNSS RTK easily.

The surveyors can quickly capture the site with a set of images or a video, and measure the points coordinate from them, no matter in the field or later in office.

F2.8
Aperture

6mm
Focal length

2~4 cm 95% (2σ)
Photogrammetry accuracy

The side camera is not just for photogrammetry, it is also an assistant for laser measurement. When using laser measurement, the laser spot cannot be clearly seen whether it is on the measured point in the strong light conditions. The camera, as the eye of the instrument, can provide real-time images to determine whether the laser spot has been aimed at the measured point or object.

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 point in one go, without having to move the pole back and forth, making the stakeout work more accurate and efficient.

5MP HD Camera

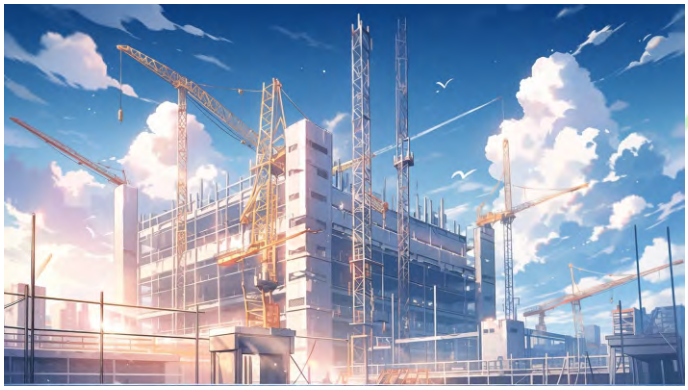
Precise Positioning

Fast Stakeout

Intuitive Guidance

Laser surveying opens a new mode of measurement

The world's exclusive patented laser coordinate measurement quick calibration technology can easily achieve centimeter-level measurement accuracy, making measurement more accurate and user-friendly, besides the camera used in the equipment overcomes the difficulty of aiming under sunlight, making field measurement operations faster and more efficient.



With the same power, the brightness of green laser is usually higher than that of red laser, therefore, the laser spot is more eye-catching and easier to be seen in the field work.

Shorter wavelength (520nm±20nm) of green laser makes the range longer and the accuracy higher.

The green laser output power is 2mW~3mW, which complies with the Class3A laser safety regulations.

Safer measurement

With the laser measurement, Matrix VI is able to minimize the risks or avoid dangers during surveying along the side or central areas on the road with heavy traffic, high voltage tower and transformer, with the laser aims at the measured point and maintain a certain safe distance from these dangerous locations.

When there is a need to measure the coastal waterline, surveyors cannot measure directly along the waterline, so they need to keep a certain safe distance from the waterline, to avoid the risk of being stuck in the mud of waterline, ensuring the safety of the surveyors.

Super IMU, say goodbye to repeated initialization

The IMU is a signification module for GNSS RTK receiver. Based on a fast initialization, calibration free and immune to magnetic interference IMU module, measuring with Matrix VI, surveyors can flexibly capture points coordinate no matter leveling the receiver or inclining the pole, they can gain reliable results, in this way, each measurement will be faster and more efficient.

Utilizing the combination of sensors and GNSS positioning data to achieve high-precision altitude measurement and dead recknoing, all users can use this technology to collect or stakeout topo points up to 120°.

Goes with powerful GNSS performance

Empowered by powerful signals tracking algorithm, and with the 1408 channels of GNSS engine, Matrix VI is able to track enormous signals of all running satellite constellations including GPS, GLONASS, BDS, GALILEO, QZSS, SBAS and IRNSS, which improves the fixed rate and speed, so that you don't need to wait for a long time to get the fixed solution as used to be.

Such an excellent engine algorithm and calculating capability, with the built-in proprietary narrowband interference mitigation technology, that is more than enough to let you easily navigate in complex environments, such as in the thick forest or beside the high buildings, the accuracy can be ensured.

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.

Specifications

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	±1cmm + 5mm/m
Sensor	
IMU	Supported, 4D IMU initialization in 3 seconds
Update rate	400Hz
Accuracy	<2.5cm within 120°
Tilt compensation	0 ~ 120°
Camera	
Visual camera	Global shutter with 2MP
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* 5-pin LEMO port, power supply, RS232, external radio communication port 1* USB Type-C port, charging, data download 1* SIM card slot, Nano SIM 1* UHF antenna interface
Internal UHF	1.5W receiver and transmitter
Frequency band	410MHz~470MHz, supports frequency modification
Protocols	Trimtalk450S, Alphatalk15, South, Satel, PCC-EOT
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
Data 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

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.

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