

# 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.



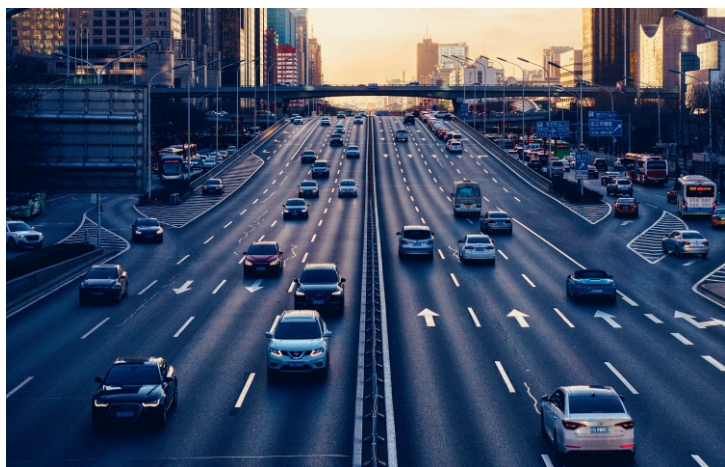


## Measuring as sharp as eyes

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.

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, it can provide real-time images to determine whether the laser spot has been aimed at the measured point or object.



## 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 aiming at the measured point and maintain a certain safe distance from these dangerous locations.

## 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, they 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



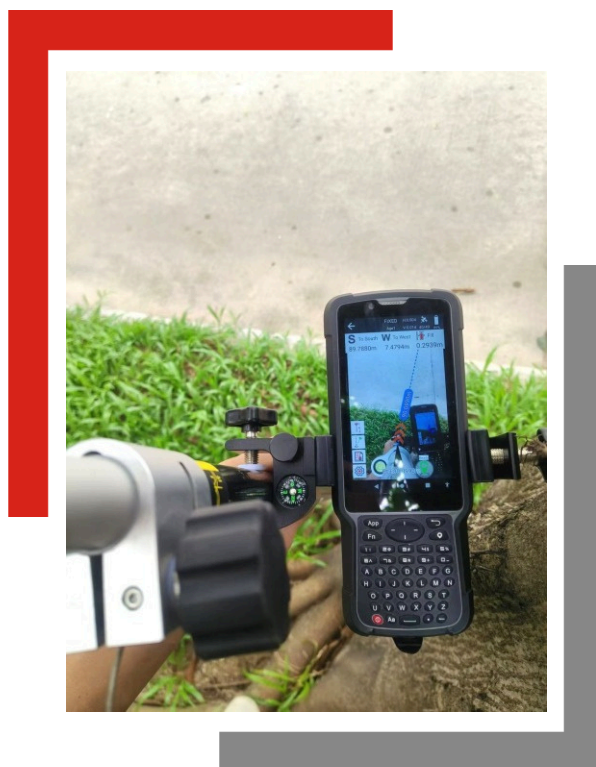
Precise Positioning



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 overcome the difficulty of aiming under sunlight, making field measurement operations faster and more efficient.



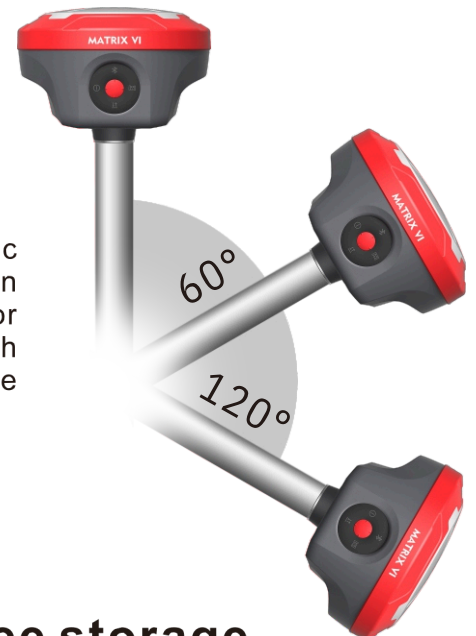
## Goes with powerful GNSS performance

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, which improves the fixed rate and speed, so that you don't need to wait for a long time to get fixed solution as used to be.

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 besides the high buildings, the accuracy can be ensured.

## Super IMU, say goodbye to repeated initialization

Based on a fast initialization, calibration free and immune to magnetic interference IMU sensor, 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, moreover, the tilt angle can be up to 120°.



## 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, that 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

| <b>GNSS Performance</b>                             |  |
|---|--|
| 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   |
| <b>Positioning accuracy<sup>1</sup></b>             |  |
| Code differential GNSS positioning                  | H: 0.25m + 1ppm RMS<br>V: 0.50m + 1ppm RMS                   |
| SBAS differential positioning accuracy <sup>2</sup> | Typically < 5m 3DRMS   |
| Static GNSS surveying                               | H: 2.5mm + 0.5ppm RMS<br>V: 5mm + 0.5ppm RMS                 |
| RTK surveying (baseline<30km)                       | H: 8mm + 1ppm RMS<br>V: 15mm + 1ppm RMS                      |
| Network RTK <sup>3</sup>                            | H: 8mm + 0.5ppm RMS<br>V: 15mm + 0.5ppm RMS                  |
| Laser measurement                                   | ±1cmm + 5mm/m  |
| <b>Sensor</b>                                       |  |
| IMU   | Supported, 4D IMU initialization in 3 seconds                |
| Update rate   | 400Hz  |
| Accuracy  | <2.5cm within 120°   |
| Tilt compensation                                   | 0 ~ 120°   |
| <b>Camera</b>                                       |  |
| Visual camera                                       | Global shutter with 2MP                                      |
| AR camera   | 5MP  |
| FOV   | 84°  |
| <b>Physical</b>                                     |  |
| Materials   | Magnesium alloy  |
| Dimensions  | 129mm×129mm×99mm   |
| Weight  | <0.8kg   |
| Operating temperature                               | -40°C ~ +75°C  |
| Storage temperature                                 | -55°C ~ +85°C  |
| 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  |

| <b>Electrical</b>        |   |
|--------------------------|---|
| Power supply             | 9~24V DC external power input to 5-pin LEMO port<br>Supports Type-C fast charging   |
| Battery                  | Built-in 7000mAh-7.4V Li-ion battery  |
| Battery life             | Rover mode: 12hours   |
|                          | Base mode: 7hours<br>Static mode: 15hours   |
| <b>Communications</b>    |   |
| I/O interface            | 1* 5-pin LEMO port, power supply, RS232, external radio communication port<br>1* USB Type-C port, charging, data download<br>1* SIM card slot, Nano SIM<br>1* UHF antenna interface |
| Internal UHF             | 1.5W receiver and transmitter   |
| Frequency band           | 410MHz~470MHz, supports frequency modification  |
| Protocols                | Trimtalk450S, Alphataik15, 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  |
| <b>Data storage</b>      |   |
| Memory                   | 64GB, supports cyclic storage, with ability to collect almost 4 years raw observation based on 5s interval  |
| <b>User interaction</b>  |   |
| Operating system         | Linux OS  |
| Buttons                  | Power key   |
|                          | 1* Power indicator  |
| Indicators               | 1* Bluetooth indicator  |
|                          | 1* Satellite indicator  |
|                          | 1* Data link indicator  |
| Voice                    | Intelligent voice prompts   |
| Web UI                   | Supports Web UI configuration   |

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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