

# MATRIX X

Move the Laser. Not the Workflow.

The Industry's First Automatic  
Laser GNSS Receiver



Automatic Laser



5MP  
Auxiliary Camera



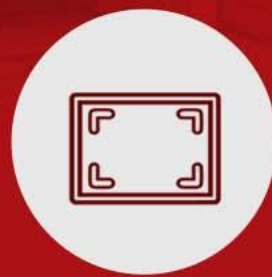
120° Calibration  
-Free Super IMU



AR Intelligent  
Stakeout Function



Cyclic Storage

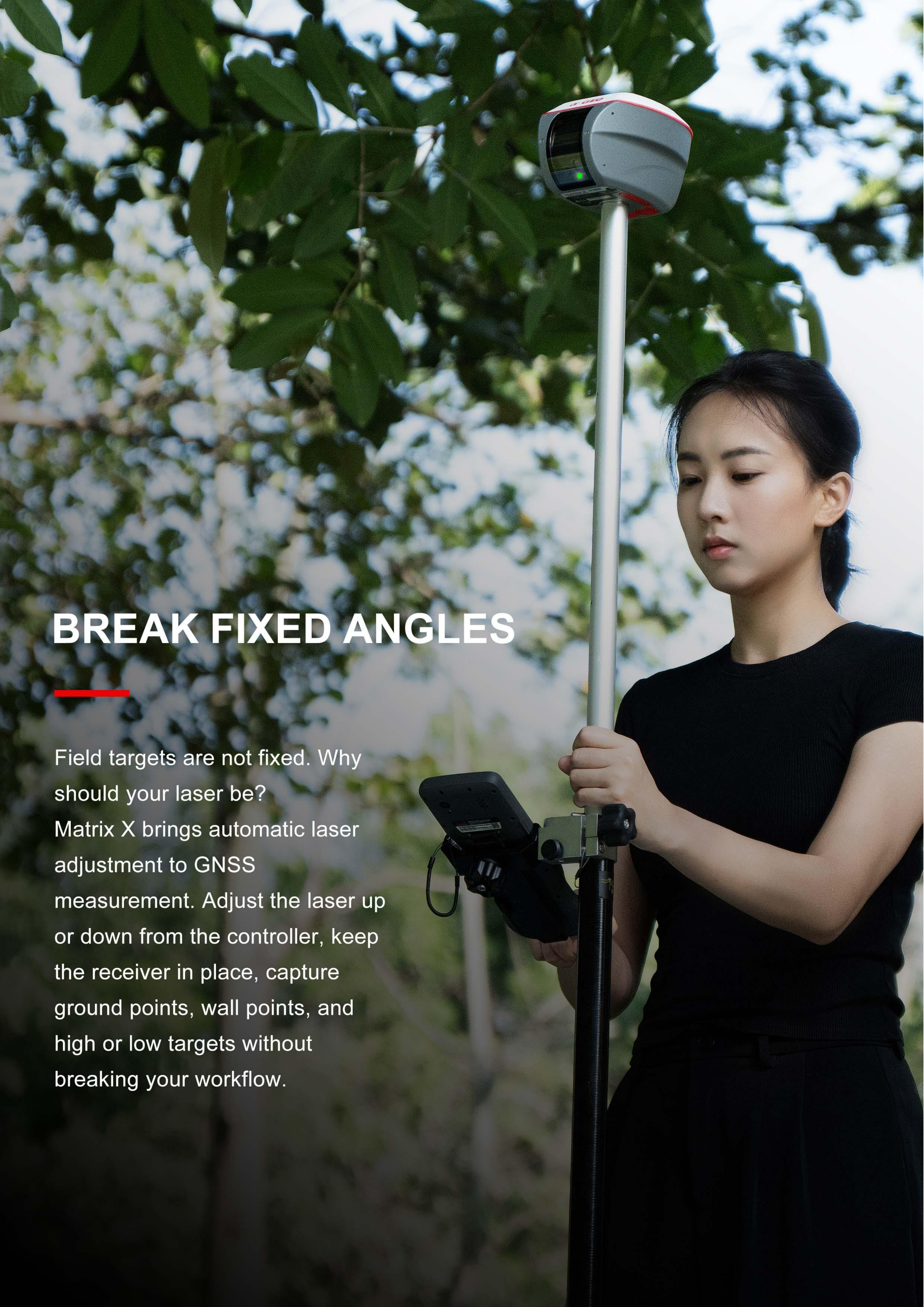


1.47" HD  
On-Board Display



1408-Channel





# BREAK FIXED ANGLES

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Field targets are not fixed. Why should your laser be?

Matrix X brings automatic laser adjustment to GNSS measurement. Adjust the laser up or down from the controller, keep the receiver in place, capture ground points, wall points, and high or low targets without breaking your workflow.

# THE RIGHT ANGLE FOR EVERY POINT

## 75° Automatic Laser Tilt Range

When the target changes, conventional laser measurement often forces surveyors to move the pole or tilt it excessively.

Matrix X lets the laser move instead. With a 75° automatic laser tilt range, users can adjust the laser angle while keeping the receiver and pole in place—making point collection smoother, steadier, and more controlled.



### Collect Points Continuously

Move from ground points to wall points and roofline targets without physically approaching every point.

### Balance Ease and Accuracy

Adjust the laser to a suitable angle, helping keep the pole stable, the sky view open, and the laser distance under control.

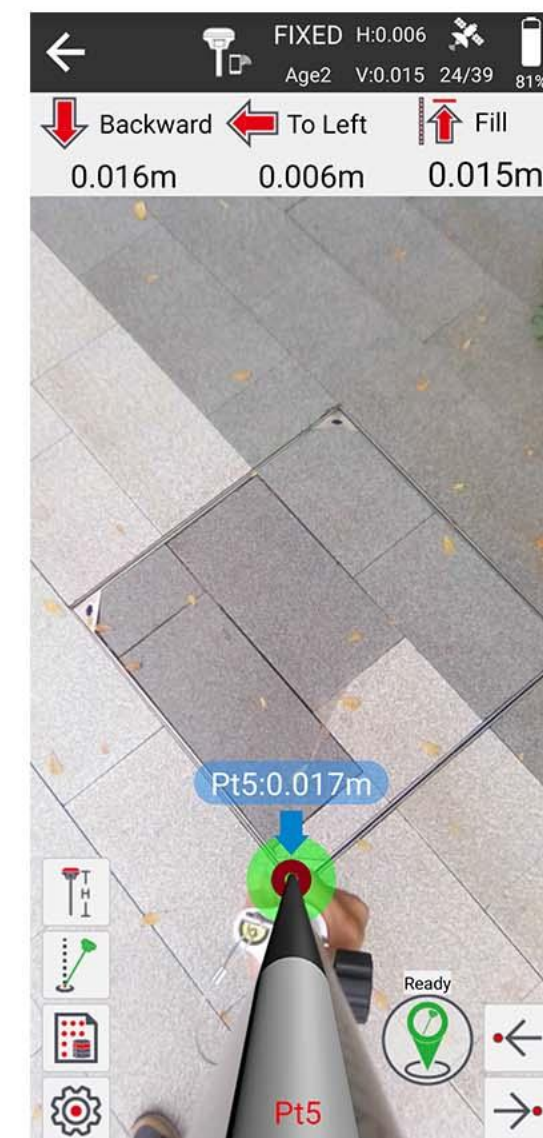
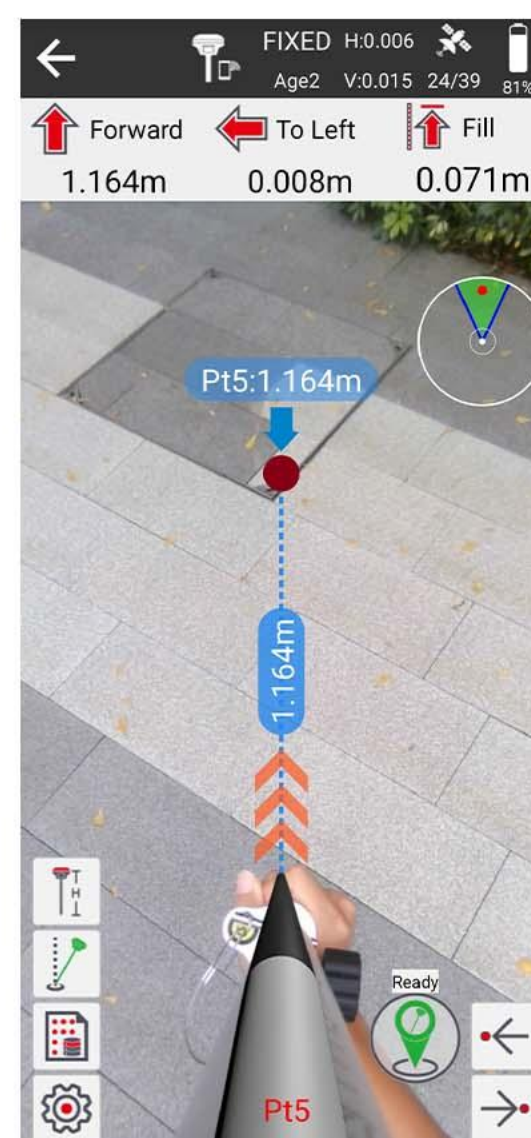
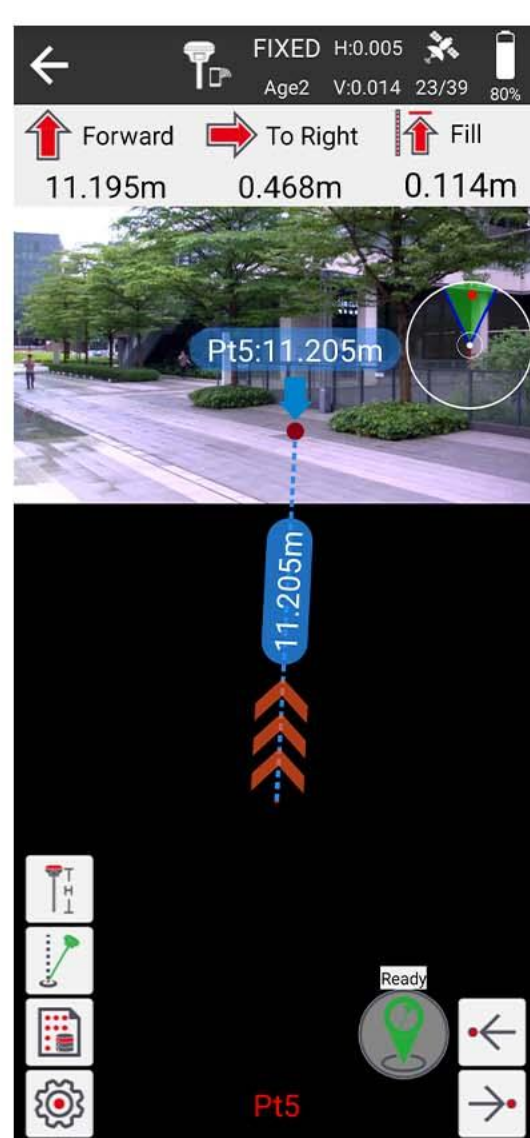
### Control from the Controller

Set the angle or drag the control bar directly in the field software, with the 5MP camera assisting target aiming on screen.

# A Smoother Workflow from Measure to Stakeout —AR Stakeout

## AR Intelligent Stakeout Function

It overlays design points on real scenes for quick target positioning, eliminating repeated pole adjustments to deliver intuitive, efficient stakeout.



## 1.47" HD On-Board Display

1.47" HD built-in screen stays readable in bright sunlight without external controllers, showing satellite and device status in real time for easy on-site inspection.

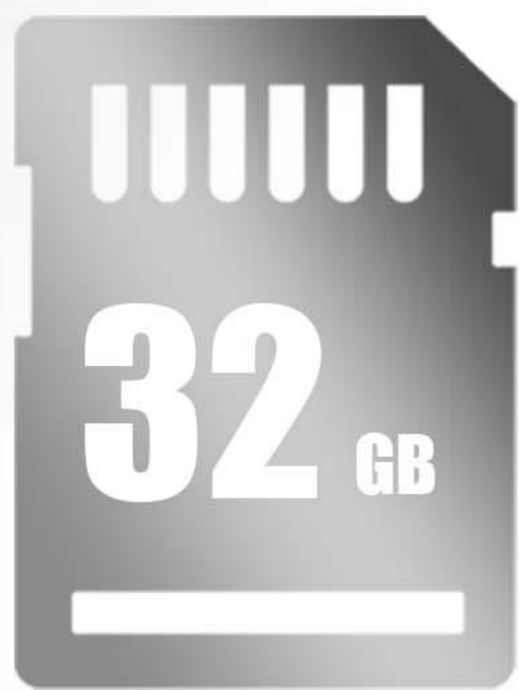
Break free from fixed-angle  
laser constraints and reimagine  
your survey workflow



# 1408-Channel GNSS Positioning

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Track all satellite constellations, improves resistance to interference in forests and high-rise areas, fast RTK fix.



## 32GB Cyclic Storage

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Built-in 32GB local storage with cyclic overwriting. It stores nearly 4 years of data at 5s sampling interval, cutting frequent exports and manual maintenance to securely retain survey data.

## Wide-Tilt Super IMU

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Supports 120° wide tilt, ultra-fast startup and calibration-free measurement. It maintains high precision with tilted poles, cutting repeated leveling and speeding up field work.



# Specifications >>>

| GNSS Performance                                    |                                                              |
|-----------------------------------------------------|--------------------------------------------------------------|
| Signals tracking                                    | GPS: L1C/A, L2C, L2P, L5                                     |
|                                                     | GLONASS: G1, G2, G3                                          |
|                                                     | BDS: B1, B1C, B2, B2a, B2b, B3                               |
|                                                     | GALILEO: E1, E5a, E5b, E5AltBoC, E6                          |
|                                                     | QZSS: L1, L2, L5, L6                                         |
|                                                     | NavIC (IRNSS): L5                                            |
|                                                     | SBAS: L1, L5                                                 |
|                                                     | 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 <sup>1</sup>                   |                                                              |
| Code differential GNSS positioning                  | H: 0.25m + 1ppm RMS                                          |
|                                                     | V: 0.50m + 1ppm RMS                                          |
| SBAS differential positioning accuracy <sup>2</sup> | Typically < 5m 3D RMS                                        |
| 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 <sup>3</sup>                            | H: 8mm + 0.5ppm RMS                                          |
|                                                     | V: 15mm + 0.5ppm RMS                                         |
| AR stakeout                                         | H: 8mm + 1ppm RMS                                            |
|                                                     | V: 15mm + 1ppm RMS                                           |
| Laser measurement                                   | 1cm+5mm/m                                                    |
| Laser distance                                      | 0.05m~120m (indoor),                                         |
|                                                     | 0.05m~100m(outdoor overcast sky)                             |
|                                                     | 0.05m~40m(under strong light)                                |
| Laser tilt range                                    | +30°~-45°                                                    |
| 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                                                |
| FOV                                                 | 73°                                                          |
| AR stakeout                                         | 5MP HD camera                                                |
| FOV                                                 | 73°                                                          |
| Physical                                            |                                                              |
| Materials                                           | Magnesium alloy                                              |
| Dimensions                                          | 128mm × 128mm × 90mm                                         |
| Weight                                              | 1.3kg                                                        |
| 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                                          |

| Electrical                  |                                                                                                            |
|-----------------------------|------------------------------------------------------------------------------------------------------------|
| Power supply                | 9~24V DC external power input to 5-pin LEMO port.                                                          |
|                             | Supports Type-C fast charging                                                                              |
| Battery                     | Built-in 7000mAh-7.2V Li-ion battery                                                                       |
| Battery life                | Rover mode: 12 hours                                                                                       |
|                             | Base mode: 7 hours                                                                                         |
|                             | Static mode: 15 hours                                                                                      |
| 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 Frequency band | 1.5W Tx & Rx                                                                                               |
|                             | 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                               |
|                             | 802.11 b/g standard, access point & client mode, supports accessing to hotspot for correction transmission |
| WiFi                        | Bluetooth 5.2 classical/BLE proprietary dual-mode                                                          |
| 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                      | 32GB, 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, 2 select keys                                                                                   |
| Display                     | 1.47-inch LCD display, resolution: 320 × 172                                                               |
| Voice                       | Intelligent voice prompts                                                                                  |
| Web ul                      | Supports Web UI configurations                                                                             |



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1\*Precision and reliability may be subject to anomalies due to multipath, obstruction, satellite geometry and atmospheric conditions. The stated specifications recommend working in open-sky areas free of EMI and multipath interference with optimal GNSS constellation configurations. For baselines over 30 km, ephemeris data and up to 24 hours of observation duration are required to meet high-precision static survey standards.  
2\*Performance subject to SBAS system conditions.  
3\*Network RTK ppm accuracy figures are based on the nearest physical base station and rely on network stability.

***α*-GEO**