SPECIFICATIONS

GNSS Features

Channels	1698
GPS	L1C, L1C/A, L2C, L2P(Y), L5
GLONASS	G1, G2, G3
BDS	B1I, B2I, B3I, B1C, B2a, B2b
GALILEOS	E1, E5a, E5b, E6, AltBOC*
SBAS	L1*
IRNSS	L5*
QZSS	L1, L2C, L5*
MSS L-Band	B2b-PPP, E6B HAS
Positioning Output Rate	1Hz~20Hz
Initialization Time	< 10s
Initialization Reliability	> 99.99%

Positioning Precision

Code differential GNSS positioning	Horizontal: 0.25 m + 1 ppm RMS Vertical: 0.50 m + 1 ppm RMS
GNSS Static	Horizontal: 2.5 mm + 0.5 ppm RMS Vertical: 3.5 mm + 0.5 ppm RMS
Static (Long Observation)	Horizontal: 2.5 mm + 0.1 ppm RMS Vertical: 3 mm + 0.4 ppm RMS
Rapid Static	Horizontal: 2.5 mm + 0.5 ppm RMS Vertical: 5 mm + 0.5 ppm RMS
PPK	Horizontal: 3 mm + 1 ppm RMS Vertical: 5 mm + 1 ppm RMS
RTK(UHF)	Horizontal: 8 mm + 1 ppm RMS Vertical: 15 mm + 1 ppm RMS
RTK(NTRIP)	Horizontal: 8 mm + 0.5 ppm RMS Vertical: 15 mm + 0.5 ppm RMS
SBAS Positioning	Typically<5m 3DRMS
RTK Initialization Time	2~8s
IMU Accuracy	8mm+0.7 mm/°tilt
IMU Tilt Angle	Optimal accuracy within 60°
SLAM Accuracy	Relative Accuracy ≤1cm, Absolute Accuracy (RTK) down to 3-5cm, Absolute Accuracy (PPK) down to 2-4cm
Positioning Accuracy while Satellites Unlocked	3-5cm @20m radius (error increases 3cm per 10m additional)
Contactless Measurement Accuracy	5cm @15m range

LiDAR

Range	40m @ 10% reflectivity, 70m @ 80% reflectivity
FOV	H: 360° , V: 59°
Point Frequency	200,000 points per second
Eye Safety Class	Class 1 (IEC 60825 -1: 2014)

Cameras

Camera for SLAM LiDAR Colorization	12 MP x 2 units, left & right
Camera for contactless Visual-LiDAR survey	8MP, frontward
Camera for AR Visual Stakeout	2MP, downward
Eye Safety Class	Class 1 (IEC 60825 -1: 2014)

Hardware Performance

Dimension	134mm ×147mm x 138mm
Weight	1.38kg
Material	Magnesium aluminum alloy shell
Operating Temperature	-20℃~ +55℃
Storage Temperature	-40℃~ +80℃
Humidity	80% Non-condensing
Waterproof/Dustproof	IP64 standard
Battery	Inbuilt 7.4v 5000mAh rechargeable Lithium-ion battery, hot-swappable 7.4v 6,800 mAh handgrip battery, 87.32Wh
Battery Life	Air Meas./ Indoor Mapping/ Point Cloud San: > 3h, GNSS Rover Mode and Static mode: > 24h

Communications

I/O Port	SIM card slot inbuilt (NANO SIM) Type-C interface (charge+OTG+Ethernet) UHF antenna interface
Internal UHF	Inbuilt, Receiving only
Frequency Range	410-470MHz
Communication Protocol	Farlink, Trimtalk, SOUTH
Bluetooth	Bluetooth 5.0, Bluetooth 3.0/4.2 standard, Bluetooth 2.1 + EDR
NFC Communication	Auto paring device and controller by touch
Modem	802.11 b/g/n standard

Data Storage/Transmission

Storage	64GB SSD internal storage Support automatic cycling storage Support external USB storage (OTG) The customizable sample interval is up to 20Hz
Data Transmission	Plug and play mode of USB data transmission Supports FTP/HTTP data download
Data Format	Static data format: STH, Rinex2.01, Rinex3.02, etc. Differential data format: RTCM 2.1, RTCM 2.3, RTCM 3.0, RTCM 3.1, RTCM 3.2 GPS output data format: NMEA 0183, PJK plane coordinate, Binary code Support: VRS, FKP, MAC, fully support NTRIP protocol Post-processing free LAS point cloud output With GEO coordinates

Sensors

Electronic Bubble	Controller software can display electronic bubble, checking leveling status of the carbon pole in real-time
Thermometer	Built-in thermometer sensor, adopting intelligent temperature control technology, monitoring and adjusting the receiver temperature

User Interaction

Operating System	Linux
Buttons	Single button
Indicators	Satellites, data and power indicators
Web Interaction	With access to Web UI via WiFi or USB connection, users can monitor the receiver status and change the configurations
Voice Guidance	Chinese/English/Korean/Spanish/ Portuguese/Russian/Turkish/French/Italian/ Arabic
Secondary Development	Provides secondary development package, and opens the OpenSIC observation data format and interaction interface definition
Cloud Service	The powerful cloud platform provides online services like remote management, firmware updates, online registers, etc.

Software

Mobile App Software	Android with a lifetime license and driver included
Post-processing software	for Windows with a lifetime license - Georeferencing module, colorization module, slice module, profiles and debugging, import and export. - Point Cloud Format: Raw format exportable to .LAS or .LAZ directly or through included software. - Color Point Cloud Supported

*Reserve for future upgrade.

Remarks: *Measurement accuracy and operation range might vary due to atmospheric conditions, signal multipath, obstructions, observation time, temperature, signal geometry and number of tracked satellites. Specifications subject to change without prior notice*

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EVERY POINT MATTERS

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Mixed

ME PLUS

VISUAL-LIDAR RTK

FOR ALL SCENARIOS

Integrates SLAM and RTK, Improving Your Capability

When combing the power of GNSS RTK Positioning and SLAM LiDAR Scanning, surveyors can work in both outdoor and indoor environments, performing contact or non-contact measurements according to their work need, to tackle tasks they couldn't accomplish previously.

Equipped with a professional graphic card by Nvidia and dual 12 MP panoramic cameras by SONY, ME is able to realistically restore scenes. The 8 MP front camera and 2 MP downward camera help surveyor to preform photogrammetry measurement and CAD-AR stakeout efficiently.

GNSS Receiver

1698 channels GNSS Engine, Antenna, IMU sensor, UHF radio, internet module, Bluetooth.

Camera (4 units)

12 MP panoramic camera 2 units, by SONY, for colorization.

8 MP +2 MP for visual positioning.

LiDAR Scanner

Absolute Accuracy<5 cm, relative accuracy <1cm, Scanning Rate 200,000 pts/s, Maximum Detection Range 70 m

Graphic Processor

by NVIDIA, for real-time, true-color image processing

Interface port

connecting telescopic pole or battery handle grip

Uninterruptible Power Supply

The ME can get power from the internal battery, handle battery, and external power supply.

This uninterruptible power supply design eliminates the need for system restarts or reinitialization, ensuring continuity for large-scale, long-duration operations and improving operational efficiency.

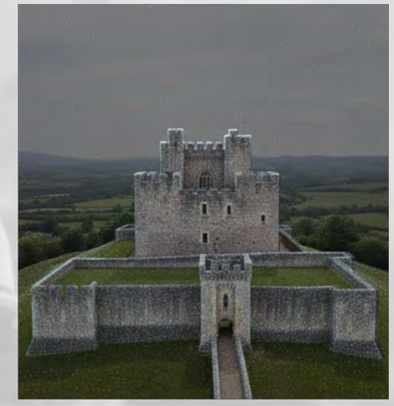
Air Meas., Capture A Lot of Points Contactlessly and Easily

The Air. Meas. function combines laser sensing technology and AI image matching engine. It collects 200,000 points data per second and enable users to collect multiple 3D coordinates by capturing a photo once.

Measuring from a range of 15 meters, while the accuracy remains 5 cm. This data collection method is a ideal solution for many complex environments for example hard-to-reach areas and hazardous areas.

Measuring with Air Meas. function, users don't need to stay steady and aim precisely, don't need to walk in the prescribed manner, don't need to level the range pole.

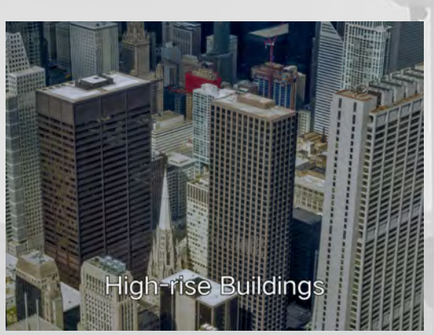
The data collection efficiency of Air Meas. is several times over traditional methods of Laser RTK or Visual Positioning RTK.

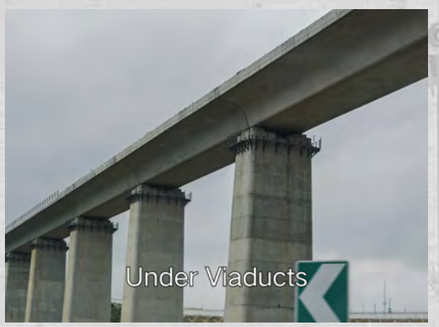


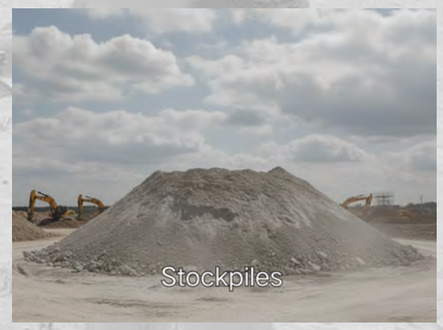
Magicalc, GNSS Positioning Anywhere

ME system is capable to maintain 5 cm accuracy for a few minutes when GNSS satellite signals are out-of-reach, the solution status will change from "fixed" to "Mixed Solution".

This innovative function enables users to seamlessly capture data in areas with limited GNSS signals, such as under overpasses, in tunnels, or in underground garages.







Accurate Earthwork Volume Calculation

The ME system allows users to perform earthwork calculations by capturing 3D point clouds.

The simple and streamlined workflow is very pratical and efficient for excavation, stockpile measurement, mining, constructions.

Field Software for Data Collection

ARC Surv app, Data Collection control software, supports collection control, project management, real-time point cloud browsing and processing, visual positioning, CAD & AR stakeout, other measurement and calculation functions.

Data Collector H9

* 8 Cores, 2.0 GHz CPU
* 7700 mAh high capacity battery
* 6 inches touch screen
* QWERTY full keyboard
* Android 12

Optimized for processing SLAM data and Photogrammetry data.

Office Software for Post-processing

AcuteLas Studio software is designed to process AcuteLas series aerial LiDAR system data and 3D laser scanner data, including the functions one-key trajectory processing and laser scanner/ LiDAR data processing and fusion, point cloud classification, data quality check, quality report output, coordinate system conversion, point cloud classification, topographic survey module, etc.

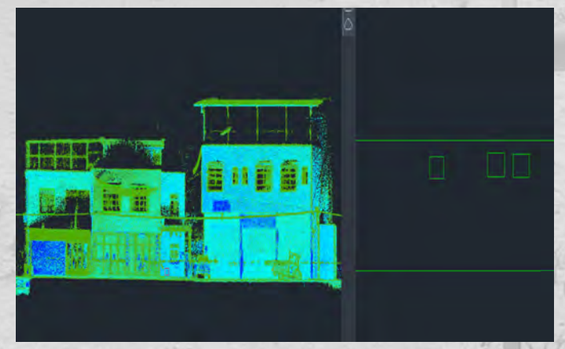
Operating System	Windows 10 IoT Enterprise or higher
Processor	Intel® 13th Gen Core™ i7 processor or better
RAM	32 GB or better
Storage	SSD 1 TB or better

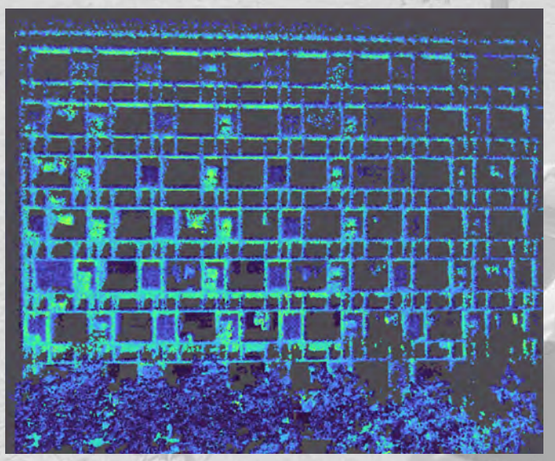
User Case: from a Municipal Surveying Department

User Demand: Working under viaducts, to measure or stake out road center lines and side lines, green belts, manhole covers, etc.

Before: Using both conventional GNSS RTK and total station, procedures are complicated

Now: Taking advantage of the "MagiCalc" function and "Mixed Solution", seamlessly capture data in areas with limited GNSS signals. Using the "AirMeas." and SLAM scanning function, remotely measure the targets that are hard to reach. Remaining a high efficiency in the job.





User Case: from a Real Estate Company

User Demand: Measuring the area of the exterior wall, for building renovation

Before: 1) for small building, using tapes to measure and draw sketch manually. 2) for large buildings, using drones to perform aerial photogrammetry surveying, but ground floor and lower floors are difficult to measure by aerial survey.

Now: Using ME to scan the facade of the building, is much quicker and more precise than traditional methods. ME is able to scan up to eight floors high.

User Case: from City Gas Company and Water Company

User Demand: Coordinate data collection of pipelines, valves, tees, nodes, elbows, household meters, etc.

Before: Using conventional GNSS RTK and total stations

Now: 1) In GNSS signal-obstructed environments and GNSS signal-denied environments, conventional RTK can not get fixed solution but ME system still can keep centi-meter level accuracy by its Mixed Solution. 2) The coordinates of wall-mounted devices and pipes can be obtained in batches through SLAM scanning or AirMeas. function. 3) The real scene can be recorded for future reviewing.

User Case: from a Municipal Gardening Department

User Demand: Classifying the vegetation in the park

Before: Using conventional GNSS RTK, it takes one and half day to measure a park

Now: Using ME to quickly obtain true-color point clouds of various targets in the park, the field work takes only one hour. When going back to office, import point cloud to processing and mapping software, clearly identify the types of vegetation and draw topographic maps based on the positions and boundaries of each vegetation.