RinoNav

DIOS

REDEFINED VISION+GNSS: PRECISION STAKEOUT

The DIOS receiver integrates a dual-camera visual measurement system with high-precision GNSS technology, significantly enhancing measurement flexibility and efficiency in complex environments. Its 3D layout functionality enables rapid and precise identification of target points. The device features a high-performance UHF radio module (TX/RX) and a 60° wide-angle IMU, allowing centimeter-level measurements without the need for precise alignment, making it suitable for any measurement scenario.

Visual Measurement Technology

This technology overcomes the constraints of complex terrains by quickly and accurately extracting coordinates of obstructed points through images or video.

Multi-System and Multi-Band Support

Equipped with 1,408 GNSS tracking channels, the receiver simultaneously processes signals from GPS, BDS, GLONASS, Galileo, QZSS, NavIC, SBAS, and L-Band, ensuring high precision and stability to meet a variety of positioning needs.

Tx/Rx UHF Modem and 4G Modem

The DIOS employs an innovative "4G+UHF" dual-channel communication architecture, combining an global 4G network module (supporting LTE Cat4 multi-band) with a high-performance Tx/Rx UHF modem (410-470MHz), ensuring seamless transmission of GNSS correction data in complex environments.

CAD AR Stakeout System

The DIOS utilizes CAD AR tools to overlay BIM/CAD drawings with real-world scenes. Automatically matching design coordinates with on-site locations, it enhances the efficiency of complex construction tasks, simplifying and accelerating various layout processes.

60° Wide-Angle Measurement Technology

This technology revolutionizes traditional workflows by eliminating the need for leveling. Accurate measurements can be obtained in standing or mobile conditions without requiring the alignment rod to remain vertical. Focused on tip positioning, it is particularly effective for complex terrains, significantly improving efficiency. It adapts effortlessly to challenging environments such as building corners and slopes, breaking free from traditional surveying limitations. Measurements remain precise even with minor rod movement, as long as the tip remains stationary.

Product Specification

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GNSS Performance

Satellites tracking	GPS	L1C/A/L1C/L2P (Y)/L2C/L5
	BDS	B1I/B2I/B3I/B1C/B2a/B2b
	GLONASS	L1/L2/L3
	GALILEO	E1/E5a/E5b/E6
	NavIC	L5
	QZSS	L1/L2/L5
	SBAS	WAAS, GAGAN, MSAS, EGNOS, SDCM, BDS
	L-Band	B2b PPP (Only for the Asian-Pacific region), HAS [1]
Channels		1408
Cold start		< 30 seconds
Warm start		< 20 seconds
Hot start		< 5 seconds
RTK signal initialization		< 5 seconds
Initialization reliability		> 99.9%
Update rate		20 Hz
High precision static		■ H: 2.5 mm + 0.1 ppm RMS ■ V: 3.5 mm + 0.4 ppm RMS
Static and Fast Static		■ H: 2.5 mm + 0.5 ppm RMS ■ V: 5 mm + 0.5 ppm RMS
RTK		■ H: 8 mm + 1 ppm RMS ■ V: 15 mm + 1 ppm RMS
Standard point positioning		■ H: 1.5 m RMS ■ V: 2.5 m RMS
Code differential		■ H: 0.4 m RMS ■ V: 0.8 m RMS
SBAS		■ H: 0.3 m RMS ■ V: 0.6 m RMS
Correction data		RTCM V3.X, RTCM2, CMR
Data output		GGA, ZDA, GSA, GSV, GST, VTG, RMC, GLL, Binary

Power Supply

Battery	Rechargeable Built-in Lithium-ion battery x 1 3.6V ~ 13400 mAh
Voltage	Type-C PD 12V/1.5 A
Working time	13 hours as visual survey/visual stakeout
Charging time	Typically 5.5 hours

1: It will be supported through future firmware update.

2: It varies with the obstacle, terrain and protocols.

3. It is only available for radio protocol "Satel".

System

Operation system	Linux
Internal memory	8 GB
Bluetooth	BT 5.0 BR + EDR, BLE
Wi-Fi	802.11 b/g/n/ac
TNC	Connect internal radio with antenna
Type-C port	Charge and data transmission
Web UI	View status, update firmware, set up working mode, download data, etc.
Intelligent voice	Broadcast working mode and status
MEMS	MEMS (Fast initialization, dynamic tilt survey up to 60°)

Physical

Dimension	Φ134mm x 74mm
Weight	890g
Operating temperature	-30°C ~ +65°C
Storage temperature	-40°C ~ +80°C
Water / dust proof	IP67
Shock	■ Withstand topple over from a 2 m survey pole onto hard surfaces ■ Survive a 1.2 m free drop
Vibration	Vibration resistant
Humidity	Up to 100%
Indicators	Satellites, datalink, battery
Button	Power button, short press to voice broadcast working mode and status
Certificate	FCC, CE, NGS, IGS

Internal Radio

Type	TX and RX
Emitting power	1W/2 W
Operation range	3-5 km typically, up to 15km with optical conditions [2]
Frequency range	410 - 470 MHz
Channel spacing	6.25 kHz [3]/12.5KHz / 25KHz
Protocol	TRIMTALK, TRIMMK3, SOUTH, TRANSEOT, GEOTALK, GEOMK3, SATEL, HITARGET, HZSZ, PCCEOT, PCCEOT_SATEL, PCCFST, PCCFST_ADL, SATEL_ADL

Visual Configuration

Pixel	2MP
Frame	Image:30Hz (Visual stakeout), Image:5Hz/Video:30Hz (Visual survey)
FOV	72° (Visual stakeout), 88° (Visual survey)