CHCNAV

Geospatial

i93

VERSATILE, EFFICIENT AND EASY-TO-USE VISUAL IMU-RTK





Extreme GNSS Performance. Visual Power On Top

The i93 integrates advanced GNSS, AUTO-IMU, and premium dual-camera tech for an enhanced user experience. Its 3D visual stakeout and offset measurement boost construction site efficiency. Powered by CHCNAV's iStar algorithm, its multi-band GNSS and hybrid positioning ensure reliable accuracy in tough environments, making it versatile for all projects. It also supports PointSky, which delivers real-time centimeter-level accuracy via satellite, cellular, or IP without the need for local base stations or VRS. The i93 is the ideal solution for completing tasks faster, more accurately, and more efficiently.



1892-Channel GNSS, iStar Technology And Hybrid Engine

1892 GNSS Channels + iStar Technology + RF-SoC Processor

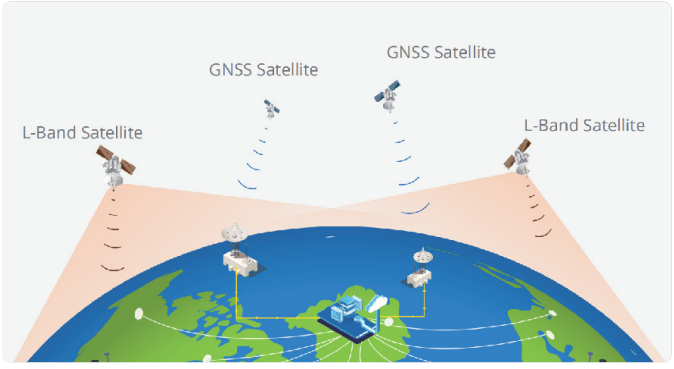
Delivers a 15% boost in survey-grade RTK performance.



Hybrid Engine + Narrowband Interference Mitigation

Enhances GNSS signal tracking and data quality by over 20%, excelling even in the most challenging environments.

PointSky: Untethered Surveying/ No Base Station



The i93 features PointSky, offering real-time centimeter-level accuracy via satellite, cellular, or IP, without the need for local base stations or VRS. This cuts costs and boosts efficiency: eliminate base station procurement, transport, and setup; save 50% on equipment and setup time; and complete large-scale topographic, cadastral, and staking surveys with one receiver and operator.

Visual Survey And 3D Modeling



The i93 GNSS combines IMU and premium global shutter camera with video photogrammetry tech, delivering survey-grade 3D coordinates from real-world video in seconds. It effortlessly surveys hard-to-reach, signal-blocked, and hazardous areas, with dynamic panoramic capture and auto image matching boosting productivity by 60%. High-speed continuous shooting with 85% overlap ensures processing success, offering surveyors the perfect blend of ease, speed, and precision.

Key feature

Visual Surveying
Dual cameras extract survey-grade 3D coordinates improving measurement efficiency.

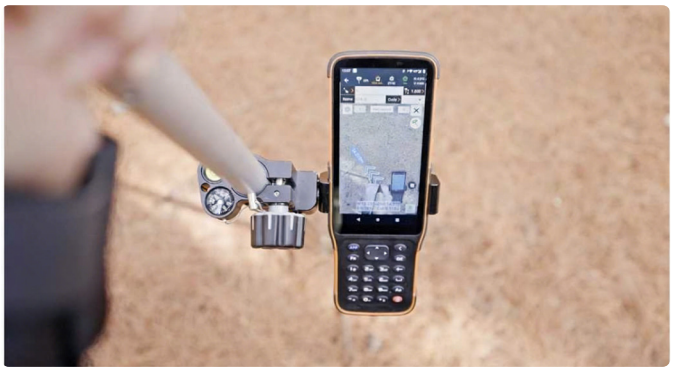
Visual Stakeout
Guidance by a clear, eye-catching directional information.

3D Modeling
Dynamic panoramic video capture.

Dual-Link
L-band geostationary satellite + internet connectivity coverage.

PointSky
Centimeter-level real-time accuracy, paired with a 1-10 minute convergence time.

Visual Navigation And Stakeout



The i93's star-level cameras create an immersive 3D visual stakeout experience, paired with LandStar software's intuitive AR visual guidance. A clear directional arrow, real-time distance, and ground-marked stakeout point enable effortless one-step stakeout at a glance. With support for line and CAD-based map stakeout, it boosts efficiency by up to 50%, making complex tasks easier for all skill levels.

Engineered For Versatile Field Use



The i93 Visual GNSS combines full connectivity for unmatched field performance. It features CHCNAV's 200 Hz AUTO-IMU, Wi-Fi, Bluetooth, and NFC for seamless device pairing, plus 4G and UHF modems to support all RTK survey modes. Smart power management delivers up to 34 hours of network rover operation, eliminating extra battery needs, and the robust magnesium alloy body is shock, dust, and water-resistant to ensure uninterrupted operation in any environment.

Use Cases



Topographic Survey



Boundary Survey



As-built Survey



3D Modeling

SPECIFICATIONS

GNSS Performance [1]

Channels	1892 channels
GPS	L1C/A, L1C, L2C, L5
GLONASS	G1, G2, L1OC*, L2OC*, L3OC*
Galileo	E1C, E5a, E5b, E5AltBoC, E6
BeiDou	B1I, B2I, B3I, B1C, B2a, B2b
QZSS	L1C/A (B), L1C, L2C, L5, L6D/E*
NavIC/ IRNSS	L5
PPP	B2b-PPP, E6B-HAS
SBAS	EGNOS (L1, L5)
L-band	CHCNAV PointSky

GNSS Accuracies [2]

Real time kinematic (RTK)	H: 8 mm + 1 ppm RMS V: 15 mm + 1 ppm RMS Initialization time: <10 s Initialization reliability: > 99.9%
Post-processing kinematic (PPK)	H: 3 mm + 1 ppm RMS V: 5 mm + 1 ppm RMS
PPP	Support PPP-B2b, E6B-HAS H: 10 cm | V: 20 cm
PointSky[3]	H: 3 cm (CEP95) V: 7 cm (CEP95) Standard < 10 min, Specific regions < 3 min, as fast as < 1 min under optimal conditions Uptime During Interruption: 300 s
High-precision static	H: 2.5 mm + 0.1 ppm RMS V: 3.5 mm + 0.4 ppm RMS
Static and rapid static	H: 2.5 mm + 0.5 ppm RMS V: 5 mm + 0.5 ppm RMS
Code differential	H: 0.4 m RMS | V: 0.8 m RMS
Autonomous	H: 1.5 m RMS | V: 2.5 m RMS
Visual survey	Typical 2~4 cm, range 2~15 m
Visual stakeout[4]	H: 8 mm + 1 ppm RMS | V: 15 mm + 1 ppm RMS
Positioning rate[5]	1 Hz, 5 Hz and 10 Hz
Time to first fix[6]	Cold start: < 45 s; Hot start: < 10 s Signal re-acquisition: < 1 s
IMU update rate	200 Hz, AUTO-IMU
Till angle	0-60°
RTK tilt-compensated	Additional horizontal pole-tilt uncertainty typically less than 8 mm + 0.7 mm/° tilt down to 30°

Environments

Temperature	Operating: -40°C to +65°C (-40°F to +149°F) Storage: -40°C to +85°C (-40°F to +185°F)
Humidity	100% non-condensation
Ingress protection	IP68[7] (according to IEC 60529)
Drop	Survive a 2-meter pole-drop
Vibration	MIL-STD-810H
Waterproof and breathable membrane	Prevent water vapor from entering under harsh environments.

Electrical

Power consumption	UHF/4G RTK Rover w/o camera: Typical 2.8 W Visual Stakeout/ Visual Survey: Typical 4 W
Li-ion battery capacity	Operating: -40°C to +65°C (-40°F to +149°F) Storage: -40°C to +85°C (-40°F to +185°F)
Operating time on internal battery[8]	UHF/ 4G RTK Rover w/o camera: up to 34 h Visual Stakeout/Visual Survey: up to 24 h UHF RTK Base: up to 16 h; Static: up to 36 h
External power input	9 V DC to 28 V DC

Hardware

Size (LxWxH)	Φ5.98 in x 3.19 in
Weight	1.15 kg (2.54 lb)
Front panel	1.1'' OLED color display 2 LED, 2 physical buttons
Tilt sensor	Calibration-free IMU for pole-tilt compensation. Immune to magnetic disturbances. E-Bubble leveling.

Cameras

Sensor pixels	Global shutter with 2 MP & 5 MP
Field of view	75°
Video frame rate	25 fps
Image group capture	Method: video photogrammetry. Rate: typically 2 Hz, up to 25 Hz. Max. capture time: 60 s with an image group size of appr. 60 MB.
Illumination	Starlight-grade camera. OmniPixel®-GS technology. Maintain full color at illumination levels as low as 0.01 lux.

Communication

SIM Card Type	Nano-SIM card
Network modem	Integrated 4G modem: TDD-LTE, FDD-LTE, WCDMA, EDGE, GPRS, GSM
Wireless connection	NFC for device touch pairing
Wi-Fi	Wi-Fi IEEE 802.11a/b/g/n/ac, access point mode
Bluetooth®	5.0 and 4.2 +EDR, backward compatible
Ports	1 x 7-pin LEMO port (RS-232) 1 x USB Type-C port (external power, data download, firmware update) 1 x UHF antenna port (TNC female)
Built-in UHF radio	Rx/Tx: 410 - 470 MHz Transmit Power: 0.5 W to 2 W Protocol: CHC, Transparent, TT450, Satel Link rate: 9600 bps to 19200 bps Range: Typical 3 km to 5 km, up to 15 km with optimal conditions
Data formats	RTCM 2.x, RTCM 3.x, CMR input / output HCN, RINEX 2.11, 3.02; NMEA 0183 output NTRIP Client, NTRIP Caster
Data storage	32 GB internal memory. Support 128 GB external expansion

Compliance with Laws and Regulations

International standards	IGS Antenna Calibration, IEC 62133-2:2017+A1, IEC 62368-1:2014, UN Manual Section 38.3

***All specifications are subject to change without notice.**

(1) Compliant, but subject to availability of BDS ICD, GLONASS, Galileo, QZSS and IRNSS commercial service definition. GLONASS L1OC, L2OC, L3OC, and QZSS L6D/E will be provided through future firmware upgrade. (2) Accuracy and reliability are determined under open sky, free of multipath, optimal GNSS geometry and atmospheric condition. Performances assume a minimum of 5 satellites, follow up of recommended general GPS practices. PPP accuracy is subject to the region, environment, and convergence time. High-precision static requires a minimum of 24 hours of long-term observation and precise ephemeris. (3) Supported after the product upgrade in March 2026. Measurement precision, accuracy, reliability and time for initialization are dependent upon various factors including number of satellites, satellite constellation, observation time, atmospheric conditions, multipath, etc. Figures quoted assume normal to favorable conditions. Achievable accuracy and initialization time may vary based on type and capability of receiver and antenna, user's geographic location and atmospheric activity, scintillation levels, GNSS constellation health and availability and level of multipath including obstructions such as large trees and buildings. Please contact CHCNAV for specific regions of use. (4) CHCNAV's VPT™ (Virtual Pole Tip) technology ensures precise alignment of the virtual pole tip with the red point representing the staking out location in the LandStar software within acceptable error margins. (5) Compliant and 10 Hz to be provided through future firmware upgrade. (6) Typical observed values. (7) Splash, water, and dust resistant and were tested under controlled laboratory conditions with a rating of IP68 under IEC standard 60529. (8) Battery life is subject to operating temperature.

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