CHCNAV

i83 Pro

SMART VERSATILE IMU-RTK RECEIVER

SURVEYING & ENGINEERING

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SMART AND VERSATILE IMU-RTK GNSS RECEIVER

The i83 Pro GNSS receiver is a state-of-the-art 336-channel multi-band IMU-RTK GNSS receiver, designed to meet the rigorous demands of surveying, construction, and mapping professionals. With built-in Wi-Fi, Bluetooth, UHF, and a 4G modem, it ensures reliable performance across various scenarios, adapting seamlessly to any job site configuration.

The i83 Pro GNSS features CHCNAV's third-generation GNSS antenna and the advanced iStar algorithm, boosting GNSS signal tracking efficiency by 30%. It integrates a 200 Hz Auto-IMU sensor, enhancing the usability and reliability of GNSS RTK surveys. The i83 Pro offers versatile GNSS functionalities, including optional support for Trimble RTX and OmniSTAR, as well as the Trimble MAXPro Positioning Engine, providing extended capabilities for diverse applications.

SUPERIOR GNSS TECHNOLOGY

Powered by 336-channel GNSS and iStar technology

The i83 Pro GNSS smart antenna delivers centimeter-level precision in seconds, maintaining consistent RTK accuracy even in challenging environments. Its high-gain antenna increases GNSS satellite signal tracking efficiency by up to 30%, ensuring accurate, survey-grade positioning using GPS, GLONASS, BeiDou, Galileo, and QZSS constellations. Integrated iStar technology optimizes GNSS RTK surveying for all applications, guaranteeing superior performance.

ENHANCED AND VERSATILE FUNCTIONALITY

Extended Capabilities for Advanced Surveying

The i83 Pro offers optional advanced features like Trimble RTX and OmniSTAR support, delivering RTK-level accuracy without a base station or VRS network. The optional Trimble MAXPro Positioning Engine ensures exceptional performance in difficult GNSS conditions. Additional features include Fault Detection & Exclusion (FDE) and Receiver Autonomous Integrity Monitoring (RAIM), which enhance position quality by identifying and mitigating satellite measurement issues. The receiver supports flexible data rates, including 20Hz and optional 50Hz outputs for raw observations and positioning results.

COMPREHENSIVE CONNECTIVITY

Smarter Connectivity for Every Surveying Project

The i83 Pro GNSS offers comprehensive connectivity essential for any surveying project. With built-in Wi-Fi, Bluetooth, NFC, 4G, and UHF modems, it supports diverse GNSS surveying modes including RTK Networks NTRIP and UHF base-rover configurations. Continuous GNSS RTK corrections ensure precise positioning, supported by VRS, FKP, and MAC for Network RTK. RTCM State Space Representation (SSR) messages enable for improved positioning accuracy. The high-resolution color display provides a clear view of the i83 Pro GNSS status. Whether used as a UHF base station, for data recording, or as a UHF or 4G network rover, the i83 Pro puts surveyors in full command of their operations.

EFFICIENT IMU-RTK SURVEYING

Efficient IMU-RTK survey made easyAuto-IMU for Enhanced Productivity

The i83 Pro GNSS receiver's built-in AUTO-IMU offers automatic pole tilt compensation, enhancing surveying, engineering, and mapping efficiency by up to 30%. The 200 Hz inertial module achieves real-time, interference-free initialization automatically, ensuring 3-centimeter accuracy over a pole tilt range of up to 60 degrees. This makes measuring and staking out with the i83 Pro fast, easy, and highly productive for engineers, site foremen, and surveyors.

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GNSS IMU-RTK
TECHNOLOGY

ENABLE GNSS RTK ANYTIME, ANYWHERE

SPECIFICATIONS

GNSS Performance [1]

Channels	336 channels
GPS	L1 C/A, L2E, L2C, L5
GLONASS	L1 C/A, L2 C/A, L3 CDMA*
Galileo	E1, E5A, E5B, E5AltBOC, E6*
BeiDou	B1, B2, B3
QZSS	L1 C/A, L1 SAIF,L1C, L2C, L5, LEX*
NavIC/ IRNSS	L5*
SBAS	L1 C/A, L5
MSS L-Band [2]	OmniSTAR*, Trimble RTX*

GNSS Accuracies [3]

Real time kinematics (RTK)	Horizontal: 8 mm + 1 ppm RMS Vertical: 15 mm + 1 ppm RMS Initialization time: <10 s Initialization reliability: >99.9%
Post-processing kinematics (PPK)	Horizontal: 3 mm + 1 ppm RMS Vertical: 5 mm + 1 ppm RMS
High-precision static	Horizontal: 2.5 mm + 0.1 ppm RMS Vertical: 3.5 mm + 0.4 ppm RMS
Static and rapid static	Horizontal: 2.5 mm + 0.5 ppm RMS Vertical: 5 mm + 0.5 ppm RMS
Code differential	Horizontal: 0.4 m RMS Vertical: 0.8 m RMS
Autonomous	Horizontal: 1.5 m RMS Vertical: 2.5 m RMS
Position/ atitude update rate	1 Hz, 5 Hz, 10 Hz, 20 Hz and 50 Hz [4]
Time to first fix [5]	Cold start: < 45 s Hot start: < 10 s Signal re-acquisition: < 1 s
IMU update rate	200 Hz
Tilt angle	0~60°
RTK tilt -compensated	Additional horizontal pole-tilt uncertainty typically less than 8 mm + 0.7 mm/° tilt

Hardware

Size (L x W x H)	Φ 152 mm x 78 mm (Φ 5.98 in × 3.07 in)
Weight	1.15 kg (2.54 lb)
Front panel	1.1" OLED Color Display 2 LED, 2 physical buttons
Temperature	Operating: -40°C to +65°C (-40°F to +149°F) Storage: -40°C to +85°C (-40°F to +185°F)
Humidity	5% to 95% R.H. non-condensing, at +60 °C
Ingress protection	IP68[6] (according to IEC 60529)
Waterproof and breathable membrane	Prevent water vapor from entering the device under harsh environments such as sun exposure and sudden heavy rain
Drop	Survive a 2-meter pole drop
Tilt sensor	Calibration-free IMU for pole-tilt compensation. Immune to magnetic disturbances. E-Bubble leveling

Communication

SIM Card Type	Nano-SIM card
Network modem	Integrated 4G modem. LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/ B18/B19/B20/B25/B26/B28 LTE-TDD: B38/B39/B40/B41 WCDMA: B1/B2/B4/B5/B6/B8/B19 GSM 850/900/1800/1900 MHz
Wi-Fi	802.11g, access point mode
Bluetooth®	v4.2
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	Standard Internal Rx/Tx: 410 - 470 MHz Transmit Power: 0.5 W, 1 W Protocol: CHC, Transparent, TT450, Satel Link rate: 9,600 bps to 19,200 bps Range: Typical 3 km, up to 8 km with optimal conditions
Data formats	RTCM 3.x, CMR, CMR+, SCMR, RTD HCN, HRC, RINEX 2.11, 3.02 NMEA 0183 output NTRIP Client, NTRIP Caster
Network RTK	VRS,FKP, MAC
Data storage	8 GB internal memory

Electrical

Power consumption	Typical less than 4.15 W (depending on user settings)
Li-ion battery capacity	Built-in non-removable battery 9,900 mAh, 7.2 V
Operating time on internal battery [7]	UHF/ 4G RTK Rover: up to 20 h UHF RTK Base: up to 14 h Static: up to 20 h

Compliance with Laws and Regulations

International standards	IEC 62133-2:2017+A1, UN Manual Section 38.3

*Specifications are subject to change without notice.

(1) Compliant, but subject to availability of GLONASS, Galileo, QZSS and IRNSS commercial service definition. GLONASS L3 CDMA, Galileo E6, QZSS LEX and IRNSS L5 will be provided through future firmware upgrade. There is no public GLONASS L3 CDMA or Galileo E6 ICD. The current capability in the receivers is based on publicly available information. As such, CHCNAV cannot guarantee that these receivers will be fully compatible.
(2) Both RTX and OmniSTAR service can be supported by purchasing activation codes. RTX and OmniSTAR accuracies depend on correction service chosen. Trimble CenterPoint RTX provides <4cm horizontal accuracy 95% of the time with initializations of less than 30 minutes. (3) Accuracy and reliability are determined under open sky, free of multipaths, optimal GNSS geometry and atmospheric condition. Performances assume minimum of 5 satellites, follow up of recommended general GPS practices. (4) Standards-compliant with a default output rate of up to 20 Hz. Optional 50 Hz raw observation and positioning result output is available with an activation code purchase. (5) Typical observed values. (6) Splash, water, and dust resistant and were tested under controlled laboratory conditions with a rating of IP68 under IEC standard 60529. (7) Battery life is subject to operating temperature.

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