

CHCNAV

i83

SMART VERSATILE IMU-RTK  
RECEIVER



SURVEYING  
& ENGINEERING

# SMART AND VERSATILE IMU-RTK GNSS RECEIVER

The i83 GNSS receiver is more than a universal 1408-channel multi-band IMU-RTK GNSS receiver, it is the perfect GNSS RTK survey tool that any surveying, construction or mapping professional has come to expect. Built-in connectivity modules such as Wi-Fi, Bluetooth, NFC, UHF and 4G modem can be used reliably, efficiently and conveniently in a variety of application scenarios to meet any job site configuration.

The i83 GNSS features CHCNAV's third-generation GNSS antenna and the latest iStar algorithm to increase all GNSS signals tracking efficiency by 30%. It also integrates a premium calibration-free IMU sensor, which greatly improves the usability and reliability of RTK GNSS surveys. Designed for extended field use and robust performance, the i83 GNSS smart power management technology allows for up to 18 hours of continuous RTK rover operation. The i83 GNSS provides unparalleled productivity for GNSS measurements, stakeout surveys and other typical construction tasks.

## BEYOND GNSS RTK SURVEY

**Powered by 1408-channel GNSS and iStar technology**

The i83 GNSS smart antenna delivers centimeter precision in seconds and maintains reliable fixed RTK accuracy even in typically challenging environments. Its quick-start feature gets you up and running within 30 seconds of powering up the receiver, making point collection faster than ever as you move from place to place. The third-generation high-gain antenna increases GNSS satellite signals tracking efficiency by up to 30% and provides accurate, survey grade positioning when using GPS, Glonass, BeiDou, Galileo and QZSS constellations. The integrated iStar technology ensures optimal GNSS RTK surveying in all GNSS survey applications.

## ENGINEERED FOR FIELD USE

**18 hours on single charge to ensure operation when you need it**

The i83 GNSS ultra-low power SoC (System-on-Chip) electronic design and smart power management dramatically improve GNSS survey time span and eliminate the need for spare or external batteries. Up to 18 hours of autonomous work are achieved when operated as a GNSS RTK network rover and up to 9 hours as a RTK base station. i83 GNSS charges from a power bank or a standard USB-C charger. No matter where or when the GNSS surveys are carried out, the i83 GNSS' magnesium alloy body is shock-, dust- and waterproof to ensure uninterrupted performance, even in the most demanding job site conditions.

## SMARTER CONNECTIVITY THAN EVER

**Unrivaled universal GNSS receiver**

i83 GNSS has all the connectivity features a surveyor needs to complete any GNSS surveying project scenario. Built-in Wi-Fi, Bluetooth, and NFC technologies provide a seamless connection to field data controllers and tablets. Integrated 4G and UHF modems enable any GNSS surveying mode, from RTK Networks NTRIP connections to UHF base-rover configuration. GNSS RTK corrections are accessed or broadcasted continuously for accurate positioning in all circumstances.

The high-resolution color display provides a clear view of the i83 GNSS status. Whether it is set up as a UHF RTK base station, recording raw data for further GNSS post-processing, or simply being used as a UHF or 4G network rover, operators are always in full control of their survey operations.

## GNSS SURVEY TOOL FOR ALL

**Efficient IMU-RTK survey made easy**

The i83 GNSS built-in IMU for automatic pole tilt compensation boosts surveying, engineering and mapping speed and efficiency by up to 30%. Real-time, interference-free initialization of the 200 Hz inertial module is achieved in just 5 seconds and ensures 3-centimeter accuracy over a pole tilt range of up to 30 degrees. Measuring and staking out with the i83 GNSS is fast, easy and highly productive, whether you are engineer, site foreman or surveyor.




GNSS IMU-RTK  
TECHNOLOGY



**ENABLE GNSS RTK  
ANYTIME, ANYWHERE**

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# SPECIFICATIONS

GNSS Performance <sup>(1)</sup>		Communication	
Channels	1408 channels	SIM Card Type	Nano-SIM card
GPS	L1 C/A, L2C, L2P, L5	Network modem	Integrated 4G modem. LTE(FDD): B1,B2,B3,B4,B5,B7,B8,B20 DC-HSPA+/HSPA+/HSPA/UMTS: B1, B2, B5, B8 EDGE/GPRS/GSM 850/900/1800/1900MHz
GLONASS	L1, L2	Wi-Fi	802.11 b/g/n, access point mode
Galileo	E1, E5a, E5b, E6*	Bluetooth®	V 4.2
BeiDou	B1I, B2I, B3I, B1C, B2a, B2b*	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)
SBAS	L1	UHF radio	Standard Internal Rx/Tx: 410 - 470 MHz Transmit Power: 0.5 W to 2 W Protocol: CHC, Transparent, TT450, Satel Link rate: 9,600 bps to 19,200 bps Range: Typical 3 km to 5 km
QZSS	L1, L2, L5, L6*	Data formats	RTCM 2.x, RTCM 3.x, CMR input / output HCN, HRC, RINEX 2.11, 3.02 NMEA 0183 output NTRIP Client, NTRIP Caster
GNSS Accuracies <sup>(2)</sup>		Data storage	8 GB internal memory
Real time kinematics (RTK)	Horizontal: 8 mm + 1 ppm RMS Vertical: 15 mm + 1 ppm RMS Initialization time: <10 s Initialization reliability: >99.9%	Electrical	
Post-processing kinematics (PPK)	Horizontal: 3 mm + 1 ppm RMS Vertical: 5 mm + 1 ppm RMS	Power consumption	Typical 4.5 W (depending on user settings)
Post-processing static	Horizontal: 2.5 mm + 0.5 ppm RMS Vertical: 5 mm + 0.5 ppm RMS	Li-ion battery capacity	Built-in non-removable battery 9,600 mAh, 7.4 V
Code differential	Horizontal: 0.4 m RMS Vertical: 0.8 m RMS	Operating time on internal battery <sup>(5)</sup>	UHF/ 4G RTK Rover: up to 18 h UHF RTK Base: up to 9.5 h Static: up to 18 h
Autonomous	Horizontal: 1.5 m RMS Vertical: 2.5 m RMS	External power input	9 V DC to 28 V DC
Positioning rate <sup>(3)</sup>	1 Hz, 5 Hz and 10 Hz	Certifications	
Time to first fix <sup>(4)</sup>	Cold start: < 45 s Hot start: < 10 s Signal re-acquisition: < 1 s	CE Mark; FCC Part 15 Subpart B Class B; NGS Antenna Calibration; MIL-STD-810H, method 514.8	
IMU update rate	200 Hz	 <p>*All specifications are subject to change without notice. (1) Compliant, but subject to availability of BDS ICD, Galileo and QZSS commercial service definition. BDS B2b, Galileo E6 and QZSS L6 will be provided through future firmware upgrade. (2) 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. (3) Compliant and 10 Hz to be provided through future firmware upgrade. (4) Typical observed values. (5) Battery life is subject to operating temperature.</p>	
Tilt angle	0~60°		
RTK tilt-compensated	Additional horizontal pole-tilt uncertainty typically less than 10 mm + 0.7 mm/° tilt		
Hardware			
Size (L x W x H)	Φ 152 mm x 78 mm (Φ 5.98 in x 3.07 in)		
Weight	1.15 kg (2.54 lb)		
Front panel	1.1" OLED Color Display 2 LED, 2 physical buttons		
Environment	Operating: -40°C to +65°C (-40°F to +149°F) Storage: -40°C to +85°C (-40°F to +185°F)		
Humidity	100% condensation		
Ingress protection	IP67 waterproof and dustproof, protected from temporary immersion to depth of 1 m		
Waterproof and breathable membrane	Prevent water vapor from entering the device under harsh environments such as sun exposure and sudden heavy rain		
Shock	Survive a 2-meter pole drop		
Tilt sensor	Calibration-free IMU for pole-tilt compensation. Immune to magnetic disturbances. E-Bubble leveling		

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