CHCNAV

i83

SMART VERSATILE IMU-RTK RECEIVER

SURVEYING
& ENGINEERING

CHCNAV

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 34 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 centimetre 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

34 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 34 hours of autonomous work are achieved when operated as a GNSS RTK network rover and up to 16 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

Unrivalled 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 colour 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 initialisation of the 200 Hz inertial module is achieved in just 5 seconds and ensures 3-centimetre 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.

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GNSS IMU-RTK
TECHNOLOGY

ENABLE GNSS RTK ANYTIME, ANYWHERE

SPECIFICATIONS

GNSS Performance (1)	
Channels	1408 channels
GPS	L1C, A, L2C, L2P(Y), L5
GLONASS	L1, L2, L3*
Galileo	E1, E5a, E5b, E6*
BeiDou	B1I, B2I, B3I, B1C, B2a, B2b
QZSS	L1, L2, L5, L6*
NavIC/ IRNSS	L5*
PPP	B2b-PPP
SBAS	L1, L5

GNSS Accuracies (2)	
Real time kinematics (RTK)	Horizontal: 8 mm + 1 ppm RMS Vertical: 15 mm + 1 ppm RMS Initialisation time: <10 s Initialisation 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
Positioning rate (3)	1 Hz, 5 Hz and 10 Hz
Time to first fix (4)	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
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 vapour 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 levelling

Communication	
SIM Card Type	Nano-SIM card
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 850/900/1800/1900 MHz
Wi-Fi	802.11 b/g/n, access point mode
Bluetooth®	V 4.2
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)
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, up to 15 km with optimal conditions
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
Data storage	8 GB internal memory

Electrical	
Power consumption	Typical 2.8 W (depending on user settings)
Li-ion battery capacity	Built-in non-removable battery 9,600 mAh, 7.4 V
Operating time on internal battery (5)	UHF/ 4G RTK Rover: up to 34 h UHF RTK Base: up to 16 h Static: up to 36 h
External power input	9 V DC to 28 V DC

Certifications
CE Mark; FCC Part 15 Subpart B Class B; NGS Antenna Calibration; MIL-STD-810H, method 514.8

*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 L3, Galileo E6, QZSS L6 and IRNSS L5 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.