CHCNAV

i90

Survey & Engineering
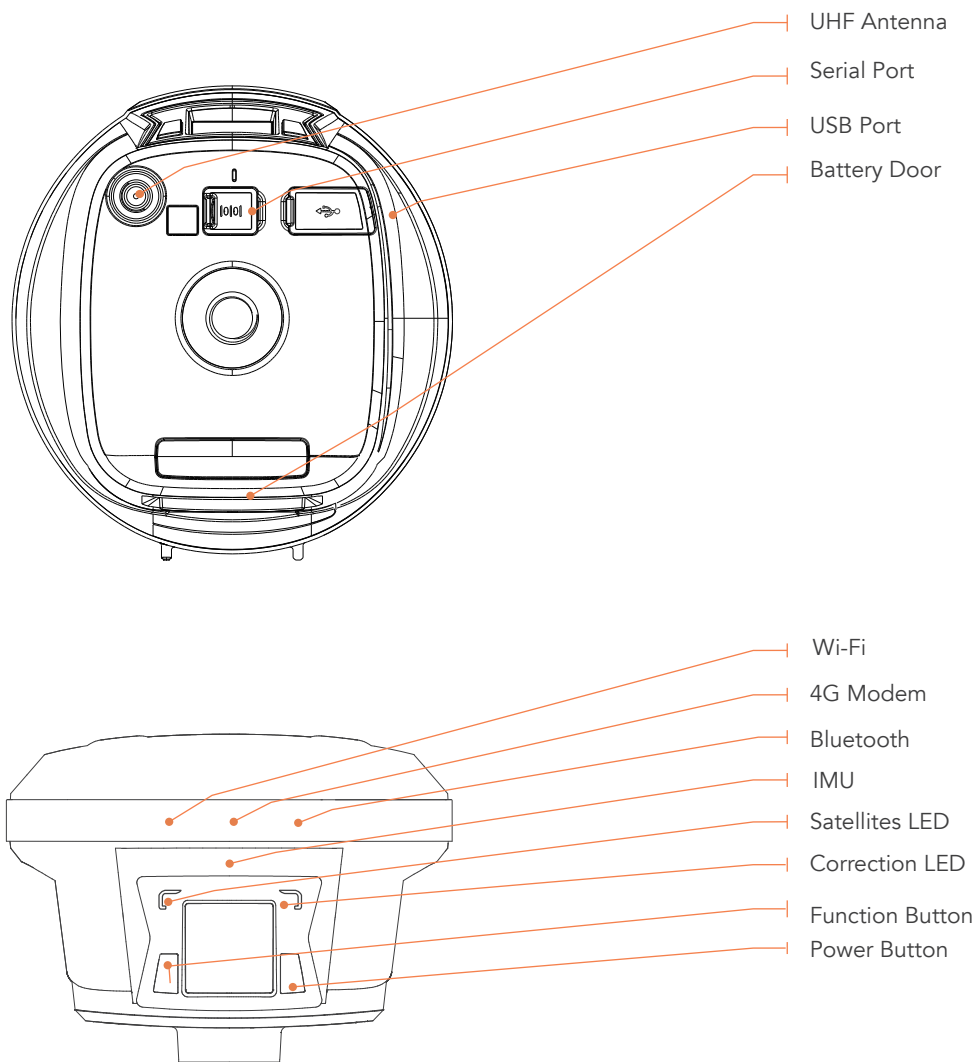
Make your work more efficient

Hardware Description

i90
IMU-RTK GNSS Receiver

The i90 GNSS receiver offers integrated IMU-RTK technology to provide a robust and accurate GNSS positioning, in any circumstances. Unlike the standard MEMS based GNSS receivers, the i90 GNSS IMU-RTK combines state-of-the-art GNSS RTK engine, calibration-free professional IMU sensor and advanced GNSS tracking capabilities to dramatically increase RTK availability and reliability.

The i90 automatic pole-tilt compensation boosts survey and stakeout speed by up to 20%. Construction and land surveying projects are achieved with high productivity and reliability pushing the boundaries of conventional GNSS RTK survey.

UHF Antenna

Serial Port

USB Port

Battery Door

Wi-Fi

4G Modem

Bluetooth

IMU

Satellites LED

Correction LED

Function Button

Power Button

Core Technology

624 channels- Full GNSS

The embedded 624-channel GNSS technology takes benefit from all GPS, GLONASS, Galileo and BeiDou signals and provides robust RTK position availability and reliability.

Extended connectivity

The i90 GNSS combines high-end connectivity modules: Bluetooth, Wi-Fi, NFC, 4G and UHF radio modem. The 4G modem brings ease of use when working within RTK networks. The internal UHF radio modem allows long-distance base-to-rover surveying up to 5 km.
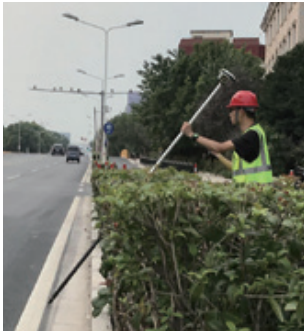

Hassle-free IMU-RTK surveying

No complicated calibration process, rotation, leveling or accessories are necessary with the i90. Just a few meters walk will initialize the i90 internal IMU module and enable RTK survey in difficult field environment.

High accuracy. Always.

The i90 GNSS build-in IMU ensures interference-free automatic pole-tilt compensation in real-time. 3 cm accuracy is achieved with pole-tilt range of up to 30 degrees.

Specifications

GNSS Performance[1]

Channels	624 channels
GPS	L1 C/A, L2C, L2P, L5
GLONASS	L1, L2
Galileo	E1, E5a, E5b
BeiDou	B1, B2, B3
SBAS	L1
QZSS	L1, L2, L5

GNSS Accuracies[2]

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: 2.5 mm + 1 ppm RMS
	Vertical: 5 mm + 1 ppm RMS
Post-processing static	Horizontal: 2.5 mm + 0.5 ppm RMS
	Vertical: 5 mm + 0.5 ppm RMS
Code differential	Horizontal: 0.25 m RMS
Autonomous	Horizontal: 1.5 m RMS
	Vertical: 3 m RMS
Positioning rate	Up to 10 Hz
Time to first fix[3]	Cold start: < 45 s
	Hot start: < 10 s
	Signal re-acquisition: < 1 s
RTK tilt-compensated	Additional horizontal pole-tilt uncertainty typically less than 10 mm + 0.7 mm/° tilt

Hardware

Size (L × W × H)	159 mm x 150 mm x 110 mm (6.3 in × 5.9 in × 4.3 in)
Weight	1.26 kg (2.77 lb)
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%
Ingress protection	IP67 waterproof and dustproof, protected from temporary immersion to depth of 1 m
Shock	Survive a 2-meter pole drop
Tilt sensor	Calibration-free IMU for pole-tilt compensation. Immune to magnetic disturbances. EBubble leveling
Front panel	4 LED indicates 1.46'' OLED Display

Certifications

FCC Part 15 (class B Device), FCC Part 22, 24, 90; CE Mark; NGS Antenna Calibration; MIL STD 810G, Method 514.7;

Communication

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®	v4.1
Ports	1 x 7-pin LEMO port (external power, RS-232)
	1 x USB Type-C port (data download, firmware update)
	1 x UHF antenna port (TNC female)
UHF radio	Standard Internal Rx/Tx: 410 MHz to 470 MHz
	Transmit Power: 0.5 W to 2 W
	Protocol: CHC, Transparent, TT450
	Link rate: 9600 bps to 19200 bps
	Range: Typical 3 km to 5 km
Data formats	RTCM 2.x, RTCM 3.x, CMR input and output
	HCN, HRC, RINEX 2.11, 3.02
	NMEA 0183 output
	NTRIP Client, NTRIP Caster
Data storage	32 GB internal memory

Electrical

Power consumption	5 W (depending on user settings)
Li-ion battery capacity	2 x 3400 mAh, 7.4 V
Operating time on internal battery[4]	UHF receive/transmit (0.5 W): 6 h to 9 h
	Cellular receive only: up to 9 h
	Static: up to 10 h
External power input	9 V DC to 28 V DC

*Specifications are subject to change without notice.

(1) Compliant, but subject to availability of BDS ICD and Galileo commercial service definition. GLONASS L3, BDS B3 and Galileo E6 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) Typical observed values.
(4) Battery life is subject to operating temperature.

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