

CHCNAV

# i90 PRO

IMU-RTK GNSS  
RECEIVER



SURVEYING &  
ENGINEERING

# HIGH-PERFORMANCE IMU RTK GNSS RECEIVER

The i90 Pro GNSS receiver combines the latest CHCNAV's IMU-RTK technology and the compatibility with L-Band corrections services to extend RTK positioning, in any location. It integrates a state-of-the-art GNSS RTK engine, a calibration-free high-end IMU sensor and advanced GNSS tracking capabilities to dramatically increase RTK availability and reliability.

The i90 Pro automatic pole-tilt compensation boosts survey and stakeout speed by up to 30%. Construction and land surveying projects are achieved with high productivity and reliability pushing the boundaries of conventional GNSS RTK survey.

## FULL GNSS POSITIONING

**Combining GPS, Glonass, Galileo and BeiDou constellations.**

The embedded 336-channel GNSS technology takes benefit from all GPS, GLONASS, Galileo and BeiDou signals and provides robust RTK position availability and reliability to any surveying project and positioning application.

## L-BAND PPP CORRECTIONS

**Compatible with L-Band and RTX™ correction signals.**

Connected to 3rd party L-Band corrections services, the i90 Pro GNSS provides accurate, sub-decimeter positioning in virtually all regions where RTK networks, GSM coverage or traditional GNSS base station are not available.

## HASSLE-FREE IMU-RTK SURVEYING

**Dramatically increase RTK availability.**

No complicated calibration process, rotation, leveling or accessories are necessary with the i90. Simply rock the range pole a few times to initialize the i90 Pro internal IMU module and enable GNSS RTK survey in difficult field environment.

## EXTENDED CONNECTIVITY

**Instant NFC pairing of your controller.**

The i90 Pro 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.

## HIGH ACCURACY. ALWAYS

**Boost survey and stakeout speed by 30%.**

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

 FULL GNSS  
L-BAND  
IMU RTK



**ENABLE GNSS RTK  
ANYTIME, ANYWHERE**

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# SPECIFICATIONS

| GNSS Performance <sup>(1)</sup> |                               |
|---------------------------------|-------------------------------|
| Channels                        | 336 channels                  |
| GPS                             | L1C, L1C/A, L2E, L2C, L5      |
| GLONASS                         | L1C/A, L2 C/A, L3 CDMA        |
| Galileo                         | E1, E5a, E5b, E5AltBOC, E6    |
| BeiDou                          | B1, B2, B3                    |
| SBAS                            | L1C/A, L5                     |
| QZSS                            | L1 C/A, L1 SAIF, L2C, L5, LEX |
| IRNSS                           | L5                            |
| L-BAND                          | RTX <sup>®</sup>              |

| GNSS Accuracies <sup>(2)</sup>   |                                                                                                                                   |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Real time kinematics (RTK)       | Horizontal: 8 mm + 1 ppm RMS<br>Vertical: 15 mm + 1 ppm RMS<br>Initialization time: < 10 s<br>Initialization reliability: > 99.9% |
| Post-processing kinematics (PPK) | Horizontal: 2.5 mm + 1 ppm RMS<br>Vertical: 5 mm + 1 ppm RMS                                                                      |
| Post-processing static           | Horizontal: 2.5 mm + 0.5 ppm RMS<br>Vertical: 5 mm + 0.5 ppm RMS                                                                  |
| Code differential                | Horizontal: 0.25 m RMS                                                                                                            |
| Autonomous                       | Horizontal: 1 m RMS<br>Vertical: 1.5 m RMS                                                                                        |
| Positioning rate                 | Up to 50 Hz                                                                                                                       |
| Time to first fix <sup>(3)</sup> | Cold start: < 45 s<br>Hot start: < 10 s<br>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 x W x H)                                                                                                | 159 mm x 150 mm x 110 mm<br>(6.3 in x 5.9 in x 4.3 in)                                                   |
| Weight                                                                                                          | 1.26 kg (2.77 lb)                                                                                        |
| Environment                                                                                                     | Operating: -40 °C to +65 °C<br>(-40 °F to +149 °F)<br>Storage: -40 °C to +85 °C<br>(-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.<br>Immune to magnetic disturbances.<br>EBubble leveling |
| Front panel                                                                                                     | 4 status LED<br>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<br>LTE (FDD): B1,B2,B3,B4,B5,B7,B8,B20<br>DC-HSPA+/HSPA+/HSPA/UMTS:<br>B1, B2, B5, B8<br>EDGE/GPRS/GSM<br>850/900/1800/1900MHz |
| Wi-Fi                  | 802.11 b/g/n, access point mode                                                                                                                    |
| Bluetooth <sup>®</sup> | v4.1                                                                                                                                               |

|              |                                                                                                                                                                                                   |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ports        | 1 x 7-pin LEMO port (external power, RS-232)<br>1 x USB Type-C port (data download, firmware update)<br>1 x UHF antenna port (TNC female)                                                         |
| UHF radio    | Standard Internal Rx/Tx: 410 - 470 MHz<br>Transmit Power: 0.5 W to 2 W<br>Protocol: CHC, Transparent, TT450, SATEL3AS<br>Link rate: 9600 bps to 19200 bps<br>Range: 5 km under optimal conditions |
| Data formats | RTCM 2.x, RTCM 3.x, CMR, CMR+, SCMRX input and output<br>HCN, HRC, RINEX 2.11, 3.02<br>NMEA 0183 output<br>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 <sup>(4)</sup> | UHF receive/transmit (0.5 W): 5 h to 8 h<br>Cellular receive only: up to 9 h<br>Static: up to 10 h |
| External power input                              | 9 V DC to 28 V DC                                                                                  |



\*All 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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