

**CHCNAV**

**i85**

**COMPACT AND EFFICIENT  
LASER IMU RTK GNSS**



**SURVEYING  
& ENGINEERING**

# HIGH-PERFORMANCE GNSS LASER & CAMERA POWER ON TOP

The i85 Laser IMU GNSS is a compact, 800 g receiver designed for demanding fieldwork. Equipped with a 1408-channel GNSS chip and CHCNAV's iStar2.0 engine, it delivers consistent RTK performance, even in challenging conditions. Advanced ionospheric modeling maintains fix reliability during periods of increased solar activity.

The built-in laser module enables fast, accurate 3D point capture in obstructed or hard-to-reach areas. AUTO-IMU eliminates manual centering, allowing immediate measurements with tilt compensation. Combined with a high-speed SoC processor and next-generation IMU, the i85 enhances laser-based surveys.

With up to 20 hours of battery life and features such as AR navigation and visual stakeout, the i85 is built for efficiency across all experience levels.

## WORLD LEADER IN GNSS

### Trusted Precision, Built for the Field

Equipped with CHCNAV's multi-constellation, multi-frequency GNSS chip and proprietary iStar2.0 technology, the i85 delivers consistent, ultra-accurate positioning even in complex environments. It features an enhanced IMU that optimizes heading accuracy, enabling laser measurements accurate to 2 cm at 5 m and 3 cm at 10 m\*. Its reinforced metal chassis and integrated all-in-one design ensure stable laser sensor alignment. Multi-sensor synchronization reduces latency and enhances calculation accuracy. An integrated temperature sensor adjusts measurement algorithms in response to environmental changes, while intelligent gain control adapts to lighting and signal conditions to ensure consistent laser measurement performance.

\*Performance figures based on CHCNAV Lab testing. Actual results may vary.

## SMART AUTO-FOCUS

### Aim and measure instantly

The i85's high-performance embedded processor powers real-time image processing, ensuring clear views with ultra-low latency. It automatically adjusts focus and zoom based on user behavior, and after a brief aiming period, the device assists in capturing point data without requiring manual input. The intelligent autofocus feature streamlines operation and minimizes handling, enabling greater productivity.

## BRIGHT GREEN LASER

### Optimal visibility on all surfaces

The i85 is equipped with an industrial-grade green laser that maintains high visibility across a wide range of surfaces. Resistant to ambient light levels up to 50,000 lux, comparable to direct midday sunlight, the laser remains clearly visible, allowing accurate targeting even under bright outdoor conditions.

## CLEAR LONG-RANGE SHOTS

### No more blurry targets

With the industry's first true 8MP high-definition camera, the i85 offers precise visual targeting over long distances. The integrated camera functions like a high-definition telescope, keeping distant targets crisp and clearly defined even when zoomed in. Users can confidently aim and capture targeted points without interference from visual distortion or blurry images.

## LASER MEASUREMENT WITH EXTENDED RANGE

### Over 50% boost in data collection efficiency

The i85 overcomes GNSS signal limitations in obstructed environments such as under dense foliage or near tall structures through a hybrid GNSS and laser ranging solution. Its integrated high-precision laser enables accurate data collection in areas that are physically difficult or unsafe to access. Data acquisition efficiency improves by more than 50%, reducing collection time from minutes to seconds. Whether surveying across rivers, behind barriers, or near hazardous zones, surveyors can collect data remotely without direct exposure to risk. The i85 enables safe, efficient, and accurate measurement even under the most challenging field conditions.



**POCKET-SIZED  
LASER IMU-RTK  
GNSS RECEIVER**



**LASER SURVEY**

Accurately measure previously inaccessible points.  
Survey-grade laser module for 3D coordinate capture.  
Bright green laser with auto-focus for improved targeting.



**EXTREME GNSS PERFORMANCE**

CHCNAV iStar2.0 hybrid GNSS engine  
1408 channels and integrated SoC processor 96% fix reliability with 20% improved data quality.



**VISUAL NAVIGATION AND STAKEOUT**

GNSS, IMU, and visual sensor fusion  
Powered by a 1.5 GHz processor  
Adaptative Wi-Fi (5.8 GHz)  
VPT™ (Virtual Pole Tip) technology.



**AUTO-IMU**

200 Hz AUTO-IMU with no manual initialization  
Automatic pole tilt compensation  
Maintained 3 cm accuracy over a 60° tilt range  
Reduced field time by up to 30%.

# SPECIFICATIONS

GNSS Performance <sup>(1)</sup>	
Channels	1408 channels with iStar2.0
GPS	L1C/A, L2C, L2P(Y), L5
GLONASS	L1, L2, L3*
Galileo	E1, E5a, E5b, E6*
BeiDou	B1I, B2I, B3I, B1C, B2a, B2b*
QZSS	L1C/A, L1C, L2C, L5
NavIC/ IRNSS	L5
SBAS	L1, L5*

GNSS Accuracies <sup>(2)</sup>	
Real time kinematic (RTK)	H: 8 mm + 1 ppm RMS V: 15 mm + 1 ppm RMS Initialization time: <10 s Initialization reliability: >99.9%
Post-processing kinematic (PPK)	H: 3 mm + 1 ppm RMS V: 5 mm + 1 ppm RMS
PPP	Support B2b-PPP, E6B-HAS H: 10 cm   V: 20 cm
High-precision static	H: 2.5 mm + 0.1 ppm RMS V: 3.5 mm + 0.4 ppm RMS
Static and rapid static	H: 2.5 mm + 0.5 ppm RMS V: 5 mm + 0.5 ppm RMS
Code differential	H: 0.4 m RMS   V: 0.8 m RMS
Autonomous	H: 1.5 m RMS   V: 2.5 m RMS
Visual stakeout <sup>(3)</sup>	H: 8 mm + 1 ppm RMS V: 15 mm + 1 ppm RMS
Laser survey	2 cm within range 5 m 3 cm within range 10m
Positioning rate <sup>(4)</sup>	1 Hz, 5 Hz and 10 Hz
Time to first fix <sup>(5)</sup>	Cold start: < 45 s Hot start: < 10 s Signal re-acquisition: < 1 s
IMU update rate	200 Hz, AUTO-IMU
Tilt angle	0-60°
RTK tilt-compensated	Additional horizontal pole-tilt uncertainty typically less than 8 mm + 0.7 mm/° tilt down to 30°

Environments	
Temperature	Operating: -40°C to +65°C (-40°F to +149°F) Storage: -40°C to +85°C (-40°F to +185°F)
Humidity	100% non-condensation
Ingress protection	IP68 <sup>(6)</sup> (according to IEC 60529)
Drop	Survive a 2-meter pole-drop
Vibration	Compliant with ISO 9022-36-08 and MIL-STD-810H
Waterproof and breathable membrane	Prevent water vapor from entering under harsh environments.

Electrical	
Power consumption	Typical 2.0 W
Quick charge	Full charge in 4.8 hours
Operating time on internal battery <sup>(7)</sup>	UHF RTK Rover w/o camera: up to 20h Laser Survey: up to 15h Visual Stakeout: up to 15h UHF RTK Base: up to 12 h
External power input	5 V / 2 A

Hardware	
Size (LxWxH)	Φ133 mm x 85 mm (Φ 5.24 in x 3.35 in)
Weight	800 g (1.76 lb)
Front panel	4 LED, 2 physical buttons
Tilt sensor	Calibration-free IMU for pole-tilt compensation. Immune to magnetic disturbances.
Laser sensor	Class 3R, Green <sup>(8)</sup>

Cameras	
Sensor pixels	Dual-camera, global shutter with 2 MP & 8 MP.
Field of view	91°
Video frame rate	30fps <sup>(9)</sup>
Features	LandStar software, support Visual Navigation, CAD AR Visual Stakeout, Laser Survey.

Communication	
Wireless connection	NFC for device touch pairing
Wi-Fi	802.11 b/g/n/ac, 5.8 GHz & 2.4 GHz, access point mode
Bluetooth <sup>®</sup>	v 4.2, backward compatible
Ports	1 x USB Type-C port (external power, data download, firmware update) 1 x UHF antenna port (SMA male)
Built-in UHF radio	Standard Internal Tx/Rx: 410 - 470 MHz Transmit Power: 0.5 W, 1 W Protocol: CHC, Transparent, TT450, Satel Link rate: 9600 bps to 19200 bps Range: Typical 3 km, up to 8 km with optimal conditions
Data formats	RTCM 2.x, RTCM 3.x, CMR input / output HCN, RINEX 2.11, 3.02 NMEA 0183 output NTRIP Client, NTRIP Caster
Data storage	8 GB high-speed memory

Compliance with Laws and Regulations	
International standards	IEC 62133-2:2017+A1, IEC 62368-1:2014, UN Manual Section 38.3, IC:32467-A2045, IEC60825-1-2007



- (1) Compliant, but subject to availability of BDS ICD, GLONASS, Galileo, QZSS and IRNSS commercial service definition. GLONASS L3, Galileo E6, Galileo E6 High Accuracy Service (HAS), BDS B2b and SBAS 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. PPP accuracy is subject to the region, environment, and convergence time. High-precision static requires a minimum of 24 hours of long-term observation and precise ephemeris.
- (3) CHCNAV's VPT™ (Virtual Pole Tip) technology ensures precise alignment of the virtual pole tip with the red point representing the staking out location in the LandStar software within acceptable error margins.
- (4) Compliant and 10 Hz to be provided through future firmware upgrade.
- (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) Rechargeable and built-in 7.2 V / 4900 mAh lithium battery. Battery life is subject to operating temperature.
- (8) Avoid Direct Eye Contact with Beam
- (9) Adaptive frame rate, actual frame rate is affected by wireless connection environment.

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WWW.CHCNAV.COM | MARKETING@CHCNAV.COM

CHC Navigation Headquarter  
Shanghai Huace Navigation Technology Ltd.  
577 Songying Road, Qingpu,  
201703 Shanghai, China  
+86 21 54260273

CHC Navigation Europe  
Office Campus, Building A,  
Gubacsi út 6, 1097  
Budapest, HUNGARY  
+36 20 421 6430  
Europe\_office@chcnav.com

CHC Navigation USA LLC  
6380 S. Valley View Blvd, Suite 246,  
Las Vegas, NV 89118, USA  
+1 702 405 6578

CHC Navigation India  
409 Trade Center, Khokhra Circle,  
Maninagar East, Ahmedabad,  
Gujarat, India  
+91 90 99 98 08 02