

CHCNAV

i85

COMPACT EFFICIENT
POCKET-SIZED LASER IMU-RTK



SURVEYING
& ENGINEERING

EXTREME GNSS PERFORMANCE LASER & CAMERA POWER ON TOP

The i85 Laser IMU GNSS combines cutting-edge technology in a lightweight 800 g design built for daily fieldwork. Powered by a 1408-channel GNSS chip and CHCNAV's iStar2.0 engine, it delivers reliable RTK performance even in harsh conditions—thanks to advanced ionospheric modeling for high fix integrity under intense solar activity.

With AUTO-IMU, there's no need for manual centering—just pick it up and measure. The built-in laser module enables fast, accurate 3D point coordinate capture in obstructed, hard-to-reach, or unsafe areas. Enhanced by high computing power SoC and next-gen IMU, the i85 brings new efficiency to photogrammetric surveys. Up to 21 hours of battery life, plus integrated AR navigation and stakeout, help slash operator workload—no matter their experience level.

WORLD'S GNSS SALES CHAMPION

Trusted quality, lasting precision

The i85 features an upgraded IMU system that enhances heading accuracy, ensuring laser measurement precision of 2 cm at 5 m and 3 cm at 10 m*. Powered by CHCNAV's full-constellation, full-frequency GNSS chip and proprietary StellaFusion™ 4.0 technology, it delivers consistent, high-precision positioning even in complex environments. Its new-generation laser system adopts an all-in-one design with a reinforced metal frame to maintain sensor alignment and minimize installation errors. Optimized multi-sensor synchronization significantly reduces latency, improving overall computational accuracy. Built for reliability, the i85 also features a temperature sensor that automatically adjusts measurement algorithms, while intelligent gain control adapts to changes in surface lighting and signal quality—ensuring precise, dependable laser measurements wherever the job takes you.

SMART AUTO-FOCUS

Aim and measure instantly

Powered by an embedded high-performance processor, the i85 performs real-time local image processing, ensuring high-quality visuals with ultra-low latency. It intelligently adjusts zoom and focus based on user behavior, and after just a few seconds of aiming, the system automatically assists in capturing data. No more fumbling with manual operation—what you need is handled for you, seamlessly and effortlessly.

BRIGHT GREEN LASER

Never lose your target

The i85 features an industrial-grade green laser that delivers exceptional reflectivity across a wide range of surfaces. With resistance to ambient light levels up to 50,000 lux—equivalent to direct midday sunlight—the laser point remains vividly visible, like the morning star against the bright sky.

CLEAR LONG-RANGE SHOTS

No more hazy targets

The i85 debuts the industry's first true 8MP HD camera, effectively equipping the receiver with a high-definition telescope. Even when zooming in, distant targets remain crisp and sharply defined—say goodbye to blurry, foggy video feeds. Distance is no longer a barrier to precision aiming—bring your target into clear view and measure exactly what you intend to.

LASER MEASUREMENT WITH EXTENDED RANGE

Over 50% boost in data collection efficiency

In environments where traditional GNSS receivers fail—such as beneath dense canopies or beside high-rise buildings—the i85 overcomes signal challenges with an advanced GNSS + laser ranging hybrid solution. By integrating a high-precision, industry-grade laser module, it enables accurate coordinate acquisition even in obstructed or hard-to-reach areas, boosting overall efficiency by up to 50%. Whether it's across rivers, behind fences, or through restricted zones, the laser easily bypasses physical barriers, saving you from time-consuming detours. Data collection that once took three minutes can now be completed in under 30 seconds. And with remote, non-contact laser measurement, users can safely gather data from hazardous areas without ever stepping into danger. With the i85, obstacles vanish, efficiency accelerates, and safety stays by your side.



LASER SURVEY

Accurate measurement of previously inaccessible points, Premium laser detector for survey-grade 3D coordinates, Bright green laser and auto-focusing for easier aiming.



EXTREME GNSS PERFORMANCE

CHCNAV iStar2.0, Hybrid GNSS Engine and StellaFusion™ 4.0, 1408-channel and integrated SoC, 96% reliable fix rate, 20% data quality improved.



VISUAL NAVIGATION AND STAKEOUT

Deep fusion of GNSS, IMU, and Visual, Advanced 1.5 GHz CPU, Adaptive 5.8 GHz Wi-Fi, Unique VPT™ (Virtual Pole Tip) technology.



AUTO-IMU

200 Hz AUTO-IMU eliminates manual initialization, Automatic pole tilt compensation, 3 cm accuracy over a 60° tilt range, Saves up to 30% of time.

SPECIFICATIONS

GNSS Performance ⁽¹⁾

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 ⁽²⁾

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 ⁽³⁾	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 ⁽⁴⁾	1 Hz, 5 Hz and 10 Hz
Time to first fix ⁽⁵⁾	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 ⁽⁶⁾ (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 ⁽⁷⁾	UHF/ 4G RTK Rover w/o camera: up to 20h, Laser Survey: up to 16h Visual Stakeout: up to 16h 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 × 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 ⁽⁸⁾

Cameras

Sensor pixels	Dual-camera, global shutter with 2 MP & 8 MP.
Field of view	91°
Video frame rate	30fps ⁽⁹⁾
Features	LandStar software, support Visual Navigation, CAR 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®	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
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(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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