

i93 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*
PPP	B2b-PPP
SBAS (EGNOS Support)	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
Post-processing 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 survey	Typical 2~4 cm, range 2~15 m
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 10 mm + 0.7 mm/° tilt

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	IP67 (according to IEC 60529)
Drop	Survive a 2-meter pole-drop
Vibration	Compliant with ISO 9022-36-08 and MIL-STD-810G- 514.6-Cat.24.
Waterproof and breathable membrane	Prevent water vapor from entering under harsh environments

Electrical	
Power consumption	UHF/ 4G RTK Rover w/o camera: Typical 2.8 W Visual Stakeout/Visual Survey: Typical 4 W
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 w/o camera: up to 34 h Visual Stakeout/Visual Survey: up to 24 h UHF RTK Base: up to 16 h Static: up to 36 h
External power input	9 V DC to 28 V DC

Hardware	
Size (D x H)	Φ 152 x 81 mm (Φ 5.98 x 3.19 in)
Weight	1.15 kg (2.54 lb)
Front panel	1.1" OLED Color Display 2 LED, 2 physical buttons
Tilt sensor	Calibration-free IMU for pole-tilt compensation. Immune to magnetic disturbances. E-Bubble leveling.

Cameras	
Sensor pixels	Global shutter with 2 MP & 5 MP
Field of view	75°
Video frame rate	25 fps
Image group capture	Method: video photogrammetry. Rate: typically 2 Hz, up to 25Hz. Max. capture time: 60s with an image group size of appr. 60MB.
Illumination	Starlight-grade camera. OmniPixel [®] -GS technology. Maintain full color at illumination levels as low as 0.01 lux.

Communication	
SIM card type	Nano-SIM card
Network modem	Integrated 4G modem: TDD-LTE, FDD-LTE, WCDMA, EDGE, GPRS, GSM
Wireless connection	NFC for device touch pairing
Wi-Fi	Wi-Fi IEEE 802.11a/b/g/n/ac, access point mode
Bluetooth [®]	5.0 and 4.2 +EDR, backward compatible
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)
Built-in UHF radio	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. Support 128 GB external expansion

Compliance with Laws and Regulations	
International standards	NGS Antenna Calibration, IEC 62133-2:2017+A1, IEC 62368-1:2014, UN Manual Section 38.3



*All specifications are subject to change without notice.
(1) Compliant, but subject to availability of BDS ICD, Galileo and QZSS commercial service definition. Galileo E6 and QZSS L6 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.