

Tersus GNSS LUKA GNSS Receiver

Overview

The LUKA GNSS Receiver is a new generation GNSS RTK system, which is small and light, easy to carry and operate. It supports calibration-free tilt compensation function which is immune to magnetic disturbances, leveling pole is not required. With an internal high-performance multi-constellation and multi-frequency GNSS board, the LUKA GNSS Receiver can provide high accuracy and stable signal detection. The high-performance antenna can speed up the time to first fix (TTFF) and improve anti-jamming performance. The built-in 7000mAh large capacity battery supports up to 19 hours of field work in 4G/3G/2G network and Rover radio mode. The built-in UHF radio module supports long distance communication. The rugged housing protects the equipment from challenging environments.

There are four versions of the LUKA GNSS Receiver, which can provide selectivity for the requirement from different users.

Key Features

- ✓ Supports multiple constellations and frequencies
 - GPS L1/L2/L5
 - GLONASS L1/L2
 - BeiDou B1I/B2I/B3I/B1C/B2a
 - Galileo E1/E5a/E5b
 - QZSS L1/L2/L5
- ✓ Supports 1568 channels
- ✓ 410-470MHz UHF radio⁽¹⁾, 4G network, Wi-Fi, Bluetooth, NFC
- ✓ Tilt compensation without calibration, immune to magnetic disturbances⁽¹⁾
- ✓ The whole design is exquisite and compact, which is more convenient to carry and operate
- ✓ 8GB internal storage
- ✓ Up to 19 hours working in 4G/3G/2G network and Rover radio mode
- ✓ IP68-rated dust- & waterproof enclosure, for reliability in harsh environmental conditions
- ✓ Free subscription of Tersus Caster Service (TCS): transmit the correction data from Luka Base to Rover



Tersus GNSS

LUKA GNSS Receiver

Technical Specifications

Performance

Signal Tracking:	
GPS L1/L2/L5; GLONASS L1/L2;	BeiDou B1I/B2I/B3I/B1C/B2a; Galileo E1/E5a/E5b; QZSS L1/L2/L5
Channels:	1568
Single Point Positioning Accuracy (RMS):	
- Horizontal:	1.5m
- Vertical :	2.5m
DGPS Positioning Accuracy (RMS):	
- Horizontal:	0.25m
- Vertical:	0.5m
High-Precision Static (RMS):	
- Horizontal:	2.5mm+0.1ppm
- Vertical:	3.5mm+0.4ppm
Static & Fast Static (RMS):	
- Horizontal:	2.5mm+0.5ppm
- Vertical:	5mm+0.5ppm
Post Processed Kinematic (RMS):	
- Horizontal:	8mm+1ppm
- Vertical:	15mm+1ppm
Real Time Kinematic (RMS):	
- Horizontal:	8mm+1ppm
- Vertical:	15mm+1ppm
Initialization (Typical):	4s ⁽²⁾
Initialization Reliability:	>99.9% ⁽³⁾
Network Real Time Kinematic (RMS):	
- Horizontal:	8mm+0.5ppm
- Vertical:	15mm+0.5ppm
Observation Accuracy (zenith direction):	
- C/A Code:	10cm
- P Code:	10cm
- Carrier Phase:	1mm
Timing Accuracy (RMS):	20ns
Velocity Accuracy (RMS):	0.03m/s
Tilt compensation accuracy (No tilt angle limit):	
	≤2cm(within 60°) ⁽¹⁾

Time To First Fix (TTFF):	
- Cold Start:	<30s
- Warm Start:	<5s
Re-acquisition:	<1s

System & Data

Operating System:	Linux
Storage:	Built-in 8GB
Differential Data Format:	CMR, RTCM 2.3, RTCM3.x
Data Output:	RINEX, NMEA-0183, Tersus Binary
Data Update Rate:	20Hz

Software Support

Tersus Nuwa

Communication

Cellular:	4G LTE/WCDMA/GSM/EDGE
Cellular Bands:	LTE FDD B1,B3,B7,B8,B20, B28A LTE TDD B38,B40,B41 WCDMA B1,B8 GSM/EDGE B3,B8
Network Protocols:	Ntrip Client, Ntrip Server, TCP Tersus Caster Service (TCS)
Wi-Fi:	802.11b/g/n
Bluetooth:	4.1
Internal Radio⁽¹⁾	
RF Transmit Power:	0.5W/1.0W
Frequency Range:	410MHz ~ 470MHz
Operating Mode:	Half-duplex
Channel Spacing:	12.5KHz / 25KHz
Modulation Type:	GMSK, 4FSK
Air Baud Rate:	4800 / 9600 / 19200bps
Radio Protocols:	Transparent, TrimTalk450, TrimMark3, South,Satel

Technical Specifications

Wired Communication

USB: Type-C, OTG

User Interface

Button: Power Button

LED Indicators:
Satellite, Correction data, Static, Solution, Bluetooth

Voice: Support in Nuwa App

Power Display: Support

Electrical

External Power Supply: Support USB (5~20V)

Fast Charging: Support, 15W max(5V 3A)

Battery: Built-in, 7000mAh/7.4V

Charing Time: 3 hours (20%~90%)

Battery Charging Temperature: +10°C ~ +45°C

Working Time: Up to 19 hours⁽⁴⁾

Note:

(1) IMU and built-in radio are optional, details refer to performance comparison table.

(2) The initialization time depends on various factors, including the number of satellites, observation time, atmospheric conditions, multi-path, obstructions, satellite geometry, etc.

(3) The initialization reliability may be affected by atmospheric conditions, signal multipath, and satellite geometry.

(4) The working time of the battery is related to the working environment, working temperature and battery life. Up to 19 hours working in 4G/3G/2G network and Rover radio mode.

(5) The actual size/weight may vary depending on the manufacturing process and measurement method.

Physical

Dimension: $\phi 132 \times 68 \text{mm}$

Weight: $\approx 827 \text{g}$ ⁽⁵⁾

Operating Temperature: $-40^\circ\text{C} \sim +70^\circ\text{C}$

Storage Temperature: $-55^\circ\text{C} \sim +85^\circ\text{C}$

Relative Humidity: 100% not condensed

Dust- & Waterproof: IP68

Pole Drop onto Concrete: 2m

Vibration: MIL-STD-810G, FIG 514.6C-1

Performance Comparison



PN	Version	Configuration
628xxxxxxxxx	Ultimate	IMU+UHF+4G
629xxxxxxxxx	Ultimate w/o UHF	IMU+4G
630xxxxxxxxx	Basic	UHF+4G
631xxxxxxxxx	Basic w/o UHF	4G

Version	Ultimate	Ultimate w/o UHF	Basic	Basic w/o UHF
Channels	1568	1568	1568	1568
GPS	L1/L2/L5	L1/L2/L5	L1/L2/L5	L1/L2/L5
GLONASS	L1/L2	L1/L2	L1/L2	L1/L2
BeiDou	B11/B21/B31/B1C/B2a	B11/B21/B31/B1C/B2a	B11/B21/B31/B1C/B2a	B11/B21/B31/B1C/B2a
Galileo	E1/E5a/E5b	E1/E5a/E5b	E1/E5a/E5b	E1/E5a/E5b
QZSS	L1/L2/L5	L1/L2/L5	L1/L2/L5	L1/L2/L5
GNSS Antenna	Integrated	Integrated	Integrated	Integrated
Button	Power Button	Power Button	Power Button	Power Button
LED indicators	Satellite, Correction data, Static, Solution, Bluetooth	Satellite, Correction data, Static, Solution, Bluetooth	Satellite, Correction data, Static, Solution, Bluetooth	Satellite, Correction data, Static, Solution, Bluetooth
Bluetooth	✓	✓	✓	✓
NFC	✓	✓	✓	✓
4G	✓	✓	✓	✓
UHF radio	✓	✗	✓	✗
Tilt compensation (IMU)	✓	✓	✗	✗
Electronic bubble	✓	✓	✓	✓
Memory	8GB	8GB	8GB	8GB
USB OTG	✓	✓	✓	✓
Battery capacity	7.4V 7000mAh	7.4V 7000mAh	7.4V 7000mAh	7.4V 7000mAh
Smart battery with power display	✓	✓	✓	✓
Warranty period	ONE Year	ONE Year	ONE Year	ONE Year

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