Tersus GNSS
LUKA-TAP GNSS Receiver

Overview

The LUKA-TAP GNSS Receiver adopts satellite-based precise point positioning service developed by Tersus GNSS, which allows users to achieve centimeter-level high-precision positioning worldwide. With TAP, the GNSS rover receiver will not need to work with the local RTK base station or CORS, but directly receives corrections broadcast by the satellites, such as ephemeris error, satellite clock error, etc.

The LUKA-TAP is small, light, and easy to carry and operate. It supports a calibration-free tilt compensation function immune to magnetic disturbances; a leveling pole is unnecessary. It can provide high accuracy and stable signal detection with an internal high-performance multi-constellation and multi-frequency GNSS board. 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 fieldwork 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.

The LUKA-TAP meets the demand of centimeter-level high-precision positioning in areas without or with poor network coverage, such as oceans, deserts, mountains, high altitudes, etc. It can be widely used in autonomous driving precision agriculture, and disaster monitoring and so on.

Key Features

- ✓ Supports multiple constellations and frequencies
  - GPS L1C/A, L1C, L2C, L2P, L5C
  - GLONASS L1OF, L2OF, L3OC
  - BeiDou B1I, B2I, B3I, B1C, B2a, B2b
  - Galileo E1, E5a, E5b, E5AltBoc, E6
  - QZSS L1C/A, L1C, L2C, L5C
  - SBAS L1C/A, L5
  - IRNSS L5
  - L-Band
- ✓ Supports 1792 channels
- ✓ 410-470MHz UHF radio, 4G network, Wi-Fi, Bluetooth, NFC
- ✓ Tilt compensation without calibration, immune to magnetic disturbances
- ✓ The design is exquisite and compact, making it more convenient to carry and operate
- ✓ 8GB internal storage
- ✓ IP68-rated dust- & waterproof enclosure, for reliability in harsh environmental conditions
- ✓ Free subscription to Tersus Caster Service (TCS): transmit the correction data from LUKA Base to Rover
- ✓ With worldwide coverage, TAP can be used as long as there is a good vision
- ✓ No need to use the network to receive corrections with TAP
- ✓ High signal stability, which guarantees uninterrupted transmission for 24 hours a day

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Technical Specifications

Performance

Signal Tracking:	
GPS	L1 C/A, L1C, L2C, L2P, L5C
BDS	B1I, B2I, B3I, B1C, B2a, B2b
GLONASS	L1OF, L2OF, L3OC
Galileo	E1, E5a, E5b, E5AltBOC, E6
QZSS	L1 C/A, L1C, L2C, L5C
SBAS	L1 C/A, L5
IRNSS	L5
L-Band	
Channels:	1792
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:	2.5mm+1ppm
- Vertical:	5mm+1ppm
Real Time Kinematic (RMS):	
- Horizontal:	8mm+1ppm
- Vertical:	15mm+1ppm
Initialization (Typical):	4s(1)
Initialization Reliability:	>99.9%(2)
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
Time To First Fix (TTFF):	
- Cold Start:	<30s
- Warm Start:	<5s
Re-acquisition:	<1s
Timing Accuracy (RMS):	20ns
Velocity Accuracy (RMS):	0.03m/s
Tilt Compensation Accuracy (No tilt angle limit):	
	≤2cm(within 60°)
TAP Positioning Accuracy(RMS):	
- Horizontal:	15mm
- Vertical:	30mm
TAP Convergence Time:	3 minutes
TAP Coverage:	Global
TAP Signal Stability:	99.99%

System & Data

Operating System:	Linux
Storage:	Built-in 8GB
Differential Data Format:	CMR, RTCM 2.x/3.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 (3):	
	LTE FDD B1, B3, B7, B8, B20, B28 LTE TDD B38, B40 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

Technical Specifications

Internal Radio:	
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:	
TrimTalk450, TrimMark 3, South, Transparent, Satel	
Wired Communication	
USB:	Type-C, OTG

User Interface

Button:	Power Button
LED Indicators:	
Satellite, Correction Data, Static, Solution, Bluetooth	
Voice:	Support
Power Display:	Support

Electrical

External Power Supply :	Support USB (5~20V)
Fast Charging:	Support, 15W max (5V 3A)
Lithium Battery:	Built-in, 7000mAh/7.4V
Charging Time:	3 hours (20%-90%)
Battery Charging Temperature:	+10℃ ~ +45℃
Working Time:	up to 19 hours(4)
Smart Battery with Power Display:	Support
Electronic Bubble:	Support

Physical

Dimension:	ϕ132x68mm
Weight:	≈ 827g(5)
GNSS Antenna:	Integrated
Operating Temperature:	-40℃ ~ +70℃
Storage Temperature:	-55℃ ~ +85℃
Relative Humidity:	100% not condensed
Dust- & Waterproof:	IP68
Pole Drop onto Concrete:	2m
Vibration:	MIL-STD-810G, FIG 514.6C-1
Warranty Period:	One Year

Note:
(1) The initialization time depends on various factors, including the number of satellites, observation time, atmospheric conditions, multi-path, obstructions, satellite geometry, etc.
(2) The initialization reliability may be affected by atmospheric conditions, signal multipath, and satellite geometry.
(3) Optional for LTE FDD B28A.
(4) The working time of the battery is related to the working environment, working temperature and battery life.
(5) The actual size/weight may vary depending on the manufacturing process and measurement method.

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