TERSUS GNSS

LUKA
## GNSS RECEIVER

LIGHTER, SMALLER AND SMARTER

LUKA GNSS RECEIVER

Smaller, lighter, and smarter. The LUKA GNSS receiver Ultimate version is equipped with a high-precision inertial measurement unit (IMU), which enables tilt measurement immune to magnetic disturbances. With calibration-free tilt compensation, the LUKA GNSS receiver offers reliable flexibility and efficiency, and surveyors no longer to keep the leveling pole upright. Additionally, the LUKA GNSS receiver comes with an internal high-performance multi-constellation, multi-frequency GNSS board that provides highly accurate and stable signal detection.
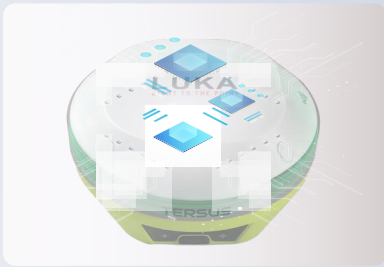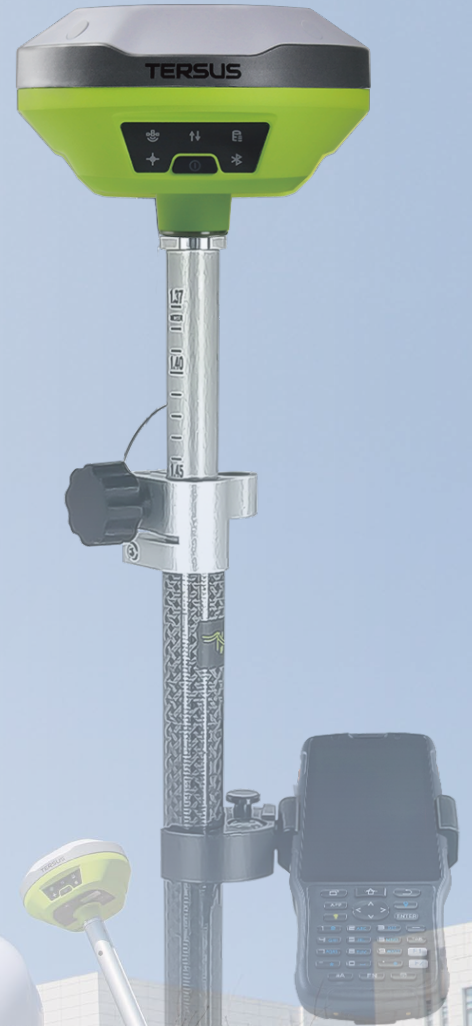
Application Scenario

| Danger Zone | Hidden Point | Underground Utilities | Forest | City Canyon |

Features

Multiple constellations & frequencies: GPS, GLONASS, BeiDou, Galileo, QZSS.

1568 channels for enhanced performance.

High-accuracy tilt compensation without calibration, up to 2cm within 60°, immune to magnetic disturbances.

Smart battery with extended working hours and power level display.

IP68-rated dust- & waterproof enclosure for reliability in harsh environments.

Rich data transmission options: UHF radio, 4G network, Wi-Fi, Bluetooth, NFC.

Flexible and fast charging methods: 15W fast charging; Support power bank charging during Luka operation.

Free Tersus Caster Service (TCS) subscription for correction data transmission.

Performance Comparison

The LUKA GNSS Receiver has four versions: Ultimate, Ultimate w/o UHF, Basic and Basic w/o UHF.
It provides selectivity for the requirement from different users.

Version	LED indicators	UHF radio	Tilt compensation (IMU)	Memory	Warranty period
Ultimate	Satellite, Correction data, Static, Solution, Bluetooth	✓	✓	8GB	ONE Year
Ultimate w/o UHF	Satellite, Correction data, Static, Solution, Bluetooth	—	✓	8GB	ONE Year
Basic	Satellite, Correction data, Static, Solution, Bluetooth	✓	—	8GB	ONE Year
Basic w/o UHF	Satellite, Correction data, Static, Solution, Bluetooth	—	—	8GB	ONE Year

NUWA

Nuwa is a survey application software based on Android OS (Operating System), designed by and all rights reserved to Tersus GNSS Inc. Nuwa is simple, easy to use and has a friendly user interface. It is designed to work with the LUKA GNSS receiver, Oscar GNSS Receiver, and other receivers that support NMEA-0183. Nuwa provides extensive pre-defined coordinate systems that are used worldwide, and various data formats import and export like TXT, CSV, DXF, SHP, RAW, KML/KMZ, LandXML, RW5, HTML, and so on.
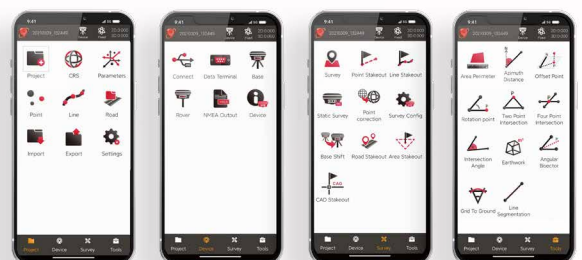
Technical Specifications
LUKA

Performance

Signal Tracking:
GPS L1/L2/L5;
BeiDou B1I/B2I/B3I/B1C/B2a;
GLONASS L1/L2;
Galileo E1/E5a/E5b;
QZSS L1/L2/L5

Channels:	1568

Single Point Positioning Accuracy (RMS):
- Horizontal:	1.5m
- Vertica:	2.5m

DGPS Positioning Accuracy (RMS):
- Horizontal:	0.25m
- Vertica:	0.5m

High-Precision Static (RMS):
- Horizontal:	2.5mm+0.1ppm
- Vertica:	3.5mm+0.4ppm

Static & Fast Static (RMS):
- Horizontal:	2.5mm+0.5ppm
- Vertica:	5mm+0.5ppm

Post Processed Kinematic (RMS):
- Horizontal:	8mm+1ppm
- Vertica:	15mm+1ppm

Real Time Kinematic (RMS):
- Horizontal:	8mm+1ppm
- Vertica:	15mm+1ppm
Initialization (Typical):	4s[1]
Initialization Reliability:	>99.9%[2]

Network Real Time Kinematic (RMS):
- Horizontal:	8mm+0.5ppm
- Vertica:	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

Performance – continued

Tilt compensation accuracy (No tilt angle limit):
	≤2cm(within 60°)[3]
Timing Accuracy (RMS):	20ns
Velocity Accuracy (RMS):	0.03m/s

Software Support

Tersus Nuwa

System & Data

Operating System:	Linux
Storage:	Built-in 8GB
Differential Data Format:	CMR, RTCM 2.x, RTCM 3.x
Data Output:	RINEX, NMEA-0183, Tersus Binary
Data Update Rate:	20Hz

Communication

Cellular:	4G LTE/WCDMA/GSM/EDG
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[3]

RF Transmit Power:	0.5W/1.0W
Frequency Range:	410MHz ~ 470MHz
Operating Mode:	Half-duplex
Channel Spacing:	12.5KHz / 25KHz
Air Baud Rate:	4800 / 9600 / 19200bps
Modulation Type:	GMSK, 4FSK
Radio Protocols:	Transparent, TrimTalk450, TrimMark3, South,Satel

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℃ ~ +45℃
Working Time:	Up to 19 hours[4]

Physical

Dimension:	φ132x68mm
Weight:	≤ 827g[5]
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

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

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