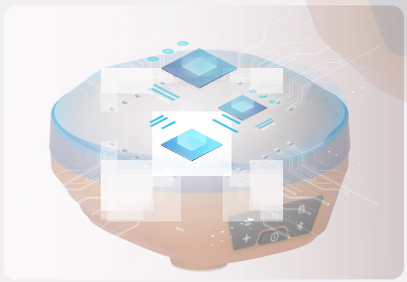
kinematic
the rtk factory

K1 GNSS Receiver

LIGHTER, SMALLER AND SMARTER

K1 GNSS Receiver

The K1 GNSS Receiver is a new generation GNSS RTK system, which 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. The K1 GNSS Receiver 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.



K1 GNSS Receiver

Application Scenario

Danger Zone

Hidden Point

Underground Utilities

Forest

City Canyon

Features

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

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.

Up to 19 hours working
in 4G/3G/2G network and Rover radio mode.

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

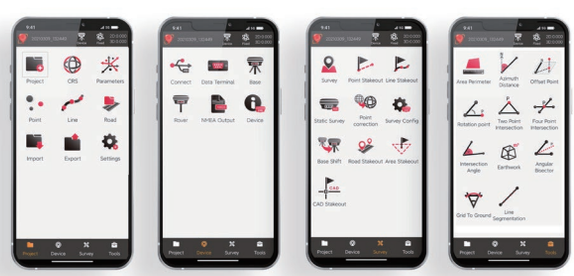
TC80 Controller

A rugged, multifunctional wireless data controller with a 5.5" sunlight-readable HD touchscreen for surveying and construction applications.

- Powerful platform for data collection
- Handling challenging environments
- Premium design for better fieldwork
- Ultra-long battery Life

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

K1 GNSS Receiver

Performance

Signal Tracking:
GPS L1/L2/L5;
BeiDou B1I/B2I/B3I/B1C/B2a;
GLONASS L1/L2;
Galileo E1/E5a/E5b;
QZSS L1/L2/L5
SBAS supports WAAS, EGNOS, GAGAN, SDCM, MSAS

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:	2.5mm+1ppm
- Vertica:	5mm+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
Re-acquisition:	<1s

Performance Continued

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

Communication

Cellular:	4G LTE/WCDMA/GSM/EDG
Cellular Bands(3):	LTE FDD B1,B3,B7,B8,B20, B28A 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
Internal Radio	
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:	TrimTalk450, TrimMark3, South,Transparent, Satel
Wired Communication	
USB:	Type-C, OTG

System & Data

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

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)
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)

Physical

Dimension:	ϕ132x68mm
Weight:	≈ 827g(5)
Operating Temperature:	-40°C ~ +70°C
Storage Temperature:	-55°C ~ +85°C
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) Optional for LTE FDD B28A.
(4) The working time of the battery is related to the working environment, working temperature and battery life. Up to 19 hours working in static mode.
(5) The actual size/weight may vary depending on the manufacturing process and measurement method.