

# Tersus GNSS

## Oscar Trek GNSS Receiver

### Overview

The Oscar Trek GNSS Receiver is the latest high-precision GNSS RTK system, which is an innovative integration of visual positioning technology, GNSS, IMU and a camera. It enables you to measure what you see to achieve high-precision, high-efficiency and multi-point measurement.

It also supports calibration-free tilt compensation function which is immune to magnetic disturbances, leveling pole is not required. Easy configuration with 1.54 inch interactive screen. With an internal multi-constellation and multi-frequency GNSS board, the Oscar Trek 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 large capacity battery is detachable, two batteries support up to 16 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.

### Key Features

- ✓ Multiple constellations and frequencies
  - GPS L1 C/A, L2C, L2P, L5
  - GLONASS L1 C/A, L2 C/A
  - BeiDou B1, B2, B3, support BDS-3
  - Galileo E1, E5a, E5b
  - QZSS L1 C/A, L2C, L5
  - SBAS supports WAAS, EGNOS, GAGAN, SDCM, MSAS
- ✓ 1792 channels
- ✓ Innovative visual positioning technology for precise measurements
- ✓ Measure what you see, save your time
- ✓ 410-470MHz UHF radio, 4G network, Wi-Fi, Bluetooth, NFC
- ✓ Tilt compensation without calibration, immune to magnetic disturbances
- ✓ 16GB internal storage
- ✓ Up to 16 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 Oscar Base to Rover



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### Technical Specifications

#### Performance

Signal Tracking:	
GPS	L1 C/A, L2C, L2P, L5
GLONAS	L1 C/A, L2 C/A
BDS	B1, B2, B3, Supports BDS-3
Galileo	E1, E5a, E5b
QZSS	L1 C/A, L2C, L5
SBAS	Supports WAAS, EGNOS, GAGAN, SDCM, MSAS
Channels:	1792
Image Point Measurement Accuracy: Typically 2 cm – 4 cm(2D), within the distance of 2 m to 10 m to the object <sup>(1)</sup>	
Tilt Compensation Accuracy (No tilt angle limit ): ≤2cm(within 60°)	
Single Point Positioning Accuracy (RMS):	
- Horizontal:	1.5m
- Vertical :	3.0m
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 <sup>(2)</sup>
Initialization Reliability:	>99.99% <sup>(3)</sup>
Network Real Time Kinematic (RMS):	
- Horizontal:	8mm+0.5ppm
- Vertical:	15mm+0.5ppm

Timing Accuracy (RMS):	20ns
Velocity Accuracy (RMS):	0.03m/s
Time To First Fix (TTFF):	
- ColdStart:	<35s
- WarmStart:	<10s
Re-acquisition:	<1s
Observation Accuracy (zenith direction):	
- C/A Code:	10cm
- P Code:	10cm
- Carrier Phase:	1mm

#### Camera

Active Pixels:	2.3MP
Frame Rate:	120fps
Focal Length:	3.24mm
View Angle:	D:88.2° V:80.2° H:51°
TV Distortion:	<0.1%

#### System & Data

Operating System:	Linux
Storage:	Built-in 16GB
Differential Data Format:	CMR, CMR+ (GPS only), RTCM 2.3, RTCM3.0, RTCM3.1, RTCM3.2
Data Output:	RINEX, NMEA-0183, Tersus binary
Data Update Rate:	20Hz

#### Communication

Cellular:	4G LTE/UMTS/GSM
Cellular Bands:	
	FDD LTE 1,2,3,4,5,7,8,12,13,18,19,20,25,26,28 TDD LTE 38,39,40,41 UMTS 1,2,4,5,6,8,19 GSM 2,3,5,8
Network Protocols:	Ntrip Client, Ntrip Server, TCP, Tersus Caster Service (TCS)
NFC:	Support

# Technical Specifications

Wi-Fi:	802.11b/g
Bluetooth:	4.1
<b>Internal Radio</b>	
RF Transmit Power:	0.5W/1W/2W
Frequency Range:	410MHz ~ 470MHz
Operating Mode:	Half-duplex
Channel Spacing:	12.5KHz / 25KHz
Modulation Type:	GMSK, 4FSK
Air Baud Rate:	4800 / 9600 / 19200bps
Distance (Typical):	>5km <sup>(4)</sup>
Radio Protocols:	TrimTalk450, TrimMark 3, South, Transparent, Satel
<b>Wired Communication</b>	
USB OTG:	USB 2.0 x1
Serial Ports:	RS232 x1
COM Baud Rate:	up to 921600bps

## Electrical

Input Voltage:	9~28V DC
<b>Power Consumption (Typical):</b>	
Network or Radio Receive Mode:	≈ 5W
Radio Transmit Mode (0.5W):	≈ 8W
Radio Transmit Mode (1W):	≈ 9W
Radio Transmit Mode (2W):	≈ 11W
Lithium Battery:	7.4V 7000mAh x2
Battery Charging Temperature:	+10°C ~ +45°C
Battery Working Time:	up to 8 hours <sup>(5)</sup>
Smart Battery with Power Display:	Support
Electronic Bubble:	Support

### Note:

- (1) The measurement precision may be subject to anomalies such as multi-path, obstructions, satellite geometry , atmospheric conditions, etc.
- (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 distance depends on the environment and antenna type. In an urban environment, a short rod antenna can reach up to 5 km, and a high-gain antenna can exceed 5km. In optimal conditions, the range can exceed 5 km. However, in challenging environments such as wooded and suburban areas, the range will be less than 5 km.
- (5) Oscar Trek uses one battery at a time, the other is a substitute. Each battery lasts up to 8 hours when Trek works in 4G/3G/2G network and Rover radio mode. Two batteries add up to 16 hours of continuous use.
- The working time of the battery is related to the working environment, working temperature and battery life.
- (6) The actual size/weight may vary depending on the manufacturing process and measurement method.

## Physical

Display:	1.54" OLED
Buttons:	FN, ON/OFF
LED indicators:	Satellite, Tilt, Correction data, Power
Dimension:	157x157x103mm <sup>(6)</sup>
Weight:	≈ 1.2kg (without battery) ≈ 1.4kg (with a battery) <sup>(5)</sup>
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

## Software Support

Tersus Nuwa