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 large capacity batteries are hot swappable. 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

- ✓ Supports 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
- ✓ Supports 576 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:	576
Image Point Measurement Accuracy: Typically 2 cm – 4 cm(2D), within the distance of 2 m to 10 m to the object(1)	
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(2)
Initialization Reliability:	>99.99%(3)
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
Differental 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
Internal Radio	
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
Radio Protocols:	TrimTalk450, TrimMark 3, South, Transparent, Satel
Wired Communication	
USB OTG:	USB 2.0 x1
Serial Ports:	RS232 x1
COM Baud Rate:	up to 921600bps

Electrical

Input Voltage:	9~28V DC
Power Consumption (Typical):	
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℃ ~ +45℃
Battery Working Time:	up to 8 hours(4)
Smart Battery with Power Display:	Support
Electronic Bubble:	Support

Physical

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

Software Support

Tersus Nuwa

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

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