Tersus GNSS
Oscar Trek GNSS Receiver

Overview

The Oscar Trek GNSS Receiver is an innovative integration of visual positioning technology, GNSS, IMU and a camera, enabling you to measure what you see for 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 high-performance 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 14 hours. The rugged housing protects the equipment from challenging environments.

The Oscar Trek-TAP version features visual positioning and the satellite-based precise point positioning service developed by Tersus (TAP). With TAP , the GNSS rover receives corrections directly from satellites, including ephemeris error and satellite clock errors, eliminating the need for a local RTK base station or CORS. Oscar Trek TAP meets the demand of centimeter-level high-precision positioning in areas worldwide without or with poor network coverage, such as oceans, deserts, mountains, high altitudes, etc.

Key Features

- ✓ 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
- ✓ 1792 channels
- ✓ Innovative visual positioning technology for precise measurement
- ✓ Measure what you see, save your time
- ✓ Point Clouds generation and export
- ✓ 410-470MHz UHF radio, 4G network, Wi-Fi, Bluetooth, NFC
- ✓ Tilt compensation without calibration, immune to magnetic disturbances
- ✓ 32GB internal storage
- ✓ Up to 14 hours working in 4G/3G/2G network and Rover radio mode
- ✓ IP68-rated dust- & waterproof enclosure, for reliability in harsh environmental conditions
- ✓ With worldwide coverage, TAP(1) enables centimeter-level high-precision positioning
- ✓ No need to use the network to receive corrections with TAP
- ✓ High stability TAP service, 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
GLONASS	L1OF, L2OF, L3OC
BDS	B1I, B2I, B3I, B1C, B2a, B2b
Galileo	E1, E5a , E5b, E5AltBOC, E6
QZSS	L1 C/A, L1C, L2C, L5C
SBAS	L1 C/A, L5
IRNSS	L5
L-band	
Channels:	1792(1)
Visual Positioning Accuracy: Typically 2 cm – 4 cm(2D), within the distance of 2 m to 10 m to the object(2)	
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(3)
Initialization Reliability:	>99.99%(4)
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):	
- Cold Start:	<35s
- Warm Start:	<10s
Re-acquisition:	<1s
Observation Accuracy (zenith direction):	
- C/A Code:	10cm
- P Code:	10cm
- Carrier Phase:	1mm
TAP(1) Positioning Accuracy (RMS):	
- Horizontal:	15mm
- Vertical:	30mm
TAP Convergence Time:	3 minutes
TAP Coverage:	Global
TAP Signal Stability:	99.99%

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 32GB
Data Format:	CMR, CMR+ (GPS only),RTCM 2.x/3.x
Data Output:	RINEX, NMEA-0183, Tersus binary
Data Update Rate:	20Hz

Technical Specifications

Communication

Cellular:	4G LTE/WCDMA/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
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(5)
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: Radio Transmit Mode (0.5W): Radio Transmit Mode (1W): Radio Transmit Mode (2W):	≈ 5W ≈ 8W ≈ 9W ≈ 11W
Lithium Battery:	7.4V 6400mAh x2(6)
Battery Charging Temperature:	+10°C ~ +45°C
Battery Working Time:	up to 7 hours(6)
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(7)
Weight:	≈ 1.2kg (without battery) ≈ 1.4kg (with a battery) (7)
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

Note:
(1) TAP Service is available exclusively on the Oscar Trek TAP version.
(2) The measurement precision may be subject to anomalies such as multi-path, obstructions, satellite geometry, atmospheric conditions, etc.
(3) The initialization time depends on various factors, including the number of satellites, observation time, atmospheric conditions, multi-path, obstructions, satellite geometry, etc.
(4) The initialization reliability may be affected by atmospheric conditions, signal multipath, and satellite geometry.
(5) The distance depends on the environment and antenna type. In an urban environment, a short rod antenna can reach up to 5km, and a high-gain antenna can exceed 5km. In optimal conditions, the range can exceed 5km. However, in challenging environments such as wooden and suburban areas, the range will be less than 5km.
(6) Oscar Trek uses one battery at a time, the other is a substitute. Each battery lasts up to 7 hours when Trek works in 4G/3G/2G network and Rover radio mode. Two batteries add up to 14 hours of continuous use. The working time of the battery is related to the working environment, working temperature and battery life.
(7) The actual size/weight may vary depending on the manufacturing process and measurement method.

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