Tersus GNSS
Oscar GNSS Receiver

Overview

The Oscar GNSS Receiver is a new generation GNSS RTK system. It 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 on Ultimate and Advanced versions. With an internal high-performance multi-constellation and multi-frequency GNSS board, the Oscar 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.

The Oscar GNSS Receiver has three versions: Ultimate, Advanced and Basic. It provides selectivity for the requirement from different users.

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(Optional for Oscar Basic and Advanced)
- ✓ Supports 576 channels
- ✓ 410-470MHz UHF radio, 4G network, Wi-Fi, Bluetooth, NFC
- ✓ Tilt compensation without calibration, immune to magnetic disturbances(1)
- ✓ 16GB/8GB internal storage(1)
- ✓ 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, support BDS-3; Galileo E1, E5a, E5b; QZSS L1 C/A, L2C, L5; SBAS(2) supports WAAS, EGNOS, GAGAN, SDCM, MSAS	
Channels:	576
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
Observation Accuracy (zenith direction):	
- C/A Code:	10cm
- P Code:	10cm
- Carrier Phase:	1mm
Tilt compensationaccuracy (No tilt angle limit):	
	≤2cm(within 60°)(1)
Timing Accuracy (RMS):	20ns
Velocity Accuracy (RMS):	0.03m/s
Time To First Fix (TTFF):	
- ColdStart:	<35s
- WarmStart:	<10s
Re-acquisition:	<1s

System & Data

Operating System:	Linux
Storage:	Built-in 16GB/8GB(1)
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

Software Support

Tersus Nuwa
MicroSurvey FieldGenius

Communication

Cellular:	4G LTE/WCDMA/GSM
Cellular Bands (5):	
	FDD LTE 1,3,7,8,20,28A | 2,4,5,12,13 TDD LTE 38,40,41 | WCDMA 1,8 | 2,5 GSM3,8 |
Network Protocols:	Ntrip Client, Ntrip Server, TCP,
	Tersus Caster Service (TCS)
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

Technical Specifications

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: 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℃ ~ +45℃
Battery Working Time:	up to 8 hours(6)

Physical

Display:	1.54'' OLED (1)
Dimension:	157x157x103mm(7)
Weight:	≈ 1.2kg (without battery) ≈ 1.4kg (with a battery)(7)
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) Details refer to performance comparison table.
(2) SBAS optional for Oscar Advanced and Basic.
(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 for Oscar Ultimate is 99.99%, for Advanced and Basic is 99.9%. May be affected by atmospheric conditions, signal multipath, and satellite geometry.
(5) Depending on version. In order Europe | American version.
(6) Oscar uses one battery at a time, the other is a substitute. Each battery lasts up to 8 hours when Oscar 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.
(7) The actual size/weight may vary depending on the manufacturing process and measurement method.
(8) Smart antenna: A compact and high precision product with and robust positioning accuracy.

Technical Specifications

Oscar Version	Ultimate	Advanced	Basic
Picture			
Channels	576	576	576
GPS	L1 C/A, L2C, L2P, L5	L1C/A, L2C, L2P, L5	L1 C/A, L2C, L2P, L5
GLONASS	L1 C/A, L2 C/A	L1C/A, L2C/A	L1 C/A, L2 C/A
BeiDou	B1, B2, B3 (BDS-3)	B1, B2, B3(BDS-3)	B1, B2, B3 (BDS-3)
Galileo	E1, E5a, E5b	E1, E5a, E5b	E1, E5a, E5b
QZSS	L1 C/A, L2C, L5	L1C/A, L2C, L5	L1 C/A, L2C, L5
SBAS(2)	WAAS, EGNOS, GAGAN, SDCM, MSAS	WAAS, EGNOS, GAGAN, SDCM, MSAS	WAAS, EGNOS, GAGAN, SDCM, MSAS
GNSS antenna(8)	Integrated	Integrated	Integrated
Buttons	FN, ON/OFF	FN, ON/OFF	FN, ON/OFF
Display	1.54''OLED	1.54''OLED	×
LED indicators	Satellite, Tilt, Correction data, Power	Satellite, Static, Correction data, Power	Satellite, Static, Correction data, Power, Bluetooth, Solution status
Bluetooth	✓	✓	✓
NFC	✓	✓	✓
UHF radio	✓	✓	✓
4G	✓	✓	✓
Tilt compensation (IMU)	✓	✘	✘
Electronic bubble	✓	✓	✓
Memory	16GB	8GB	8GB
USB OTG	✓	✓	✓
Battery capacity	7.4V 6400mAh x2	7.4V 6400mAh x2	7.4V 6400mAh x2
Smart battery with power display	✓	✓	✓
Warranty period	TWO Years	TWO Years	ONE Year

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