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 GIOVE-B, GIOVE-A E1, E5a, E5b
  - QZSS L1 C/A, L2C, L5
  - SBAS (EGNOS, WAAS, MSAS, GAGAN) L1 C/A (Optional)
  - IRNSS (Optional)
✓ Supports 576/864(optional) 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; GLONASS L1 C/A, L2 C/A; BDS B1, B2, B3, support BDS-3; Galileo GIOVE-B, GIOVE-A E1, E5a, E5b; QZSS L1 C/A, L2C, L5; SBAS (EGNOS, WAAS, MSAS, GAGAN) L1 C/A(Option); IRNSS(Optional)	
Channels:	576/864(option)

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:	5mm+0.5ppm
- Vertical:	10mm+0.8ppm
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

Tilt compensationaccuracy (No tilt angle limit):	
	≤2cm(within 60°)[1]

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

System & Data

Operating System:	Linux 4.1.15
Storage:	Built-in 16GB/8GB[1]
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
Processor:	IMAX6ULL
RAM:	512M

Software Support

Tersus Nuwa
MicroSurvey FieldGenius

Communication

Cellular:	4G LTE/TD-SCDMA/WCDMA/GPRS/GSM
Cellular Bands:	
	LTE FDD B1/B2/B3/B4/B5/B8/B20 WCDMA B1/B2/B5/B8 GSM/GPRS 1900/1800/900/850MHz
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

Technical Specifications

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
Radio Receiving Sensitivity:	-115dBm@BER 10*3 9600
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 6400mAh x2[4]
Battery Charging Temperature:	+10℃ ~ +45℃
Charging Time:	3 hours
Battery Working Time:	up to 8 hours[4]

Physical

Display:	1.54'' OLED [1]
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

Note:
(1) Details refer to performance comparison table.
(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 for Oscar Ultimate is 99.99%, for Advanced and Basic is 99.9%. May be affected by atmospheric conditions, signal multipath, and satellite geometry.
(4) 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.
(5) The actual size/weight may vary depending on the manufacturing process and measurement method.

Performance Comparison

Oscar Version	Ultimate	Advanced	Basic
Picture			
Channels	576/864	576/864	576/864
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	GIOVE-B, GIOVE-A E1, E5a, E5b	GIOVE-B, GIOVE-A E1, E5a, E5b	GIOVE-B, GIOVE-A E1, E5a, E5b
QZSS	L1 C/A, L2C, L5	L1C/A, L2C, L5	L1 C/A, L2C, L5
SBAS	Optional	Optional	Optional
IRNSS	Optional	Optional	Optional
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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