Tersus
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 harsh 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 (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

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Performance

Signal tracking: GPS L1 C/A, L2C, L2P, L5; GLONASS L1 C/A, L2 C/A; BeiDou B1, B2, B3 (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)	
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:	8mm+1ppm
- Vertical:	15mm+1ppm
Real Time Kinematic (RMS):	
- Horizontal:	5mm+0.5ppm
- Vertical:	10mm+0.8ppm
Network Real Time Kinematic (RMS):	
- Horizontal:	8mm+0.5ppm
- Vertical:	15mm+0.5ppm
Observation Accuracy (zenith direction):	
- C/A Code:	15cm
- P Code:	20cm
- Carrier Phase:	1mm
Time To First Fix (TTFF):	
- Cold start:	<35s
- Warm start:	<10s
- Re-acquisition:	<1s

System & Data

Operating system:	Linux 4.1.15
Storage:	built-in 16GB/8GB (1)
Data format:	CMR, CMR+ (GPS only), RTCM 2.x/3.x
Data output:	RINEX, NMEA-0183, Tersus binary
Data update rate:	20Hz
Processor:	IMAX6ULL
RAM:	512M

Software Support

Tersus Nuwa

MicroSurvey FieldGenius

Communication

Cellular	
Cellular:	4G LTE/TD-SCDMA/WCDMA/GPRS/GSM
Cellular bands (EU version):	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, Tersus Caster Service (TCS)
Wi-Fi:	802.11b/g (2)
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

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Technical Specifications

Tilt compensation accuracy (no tilt angle limitation):	
≤2cm (1) (within 60°)	
Timing Accuracy (RMS):	20ns
Velocity Accuracy (RMS):	0.03m/s
Initialization (typical):	<10s
Initialization Reliability:	>99.99%(3)

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)
Charging time:	3 hours

Physical

Display:	1.54" OLED (1)
Dimension:	157x157x103mm
Weight:	≈ 1.2kg (without battery)
	≈ 1.4kg (with a battery)
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

Note:

(1) Details refer to performance comparison table.

(2) Hardware of Wi-Fi module is ready, the function will be supported by firmware update.

(3) The initialization reliability for Oscar Ultimate is 99.99%, for Advanced and Basic is 99.9%.

(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.

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Performance Comparison

Oscar Version	Ultimate	Advanced	Basic
Picture			
Channels	576/864	576/864	576/864
GPS	L1 C/A, L2C, L2P, L5	L1 C/A, L2C, L2P, L5	L1 C/A, L2C, L2P, L5
GLONASS	L1 C/A, L2 C/A	L1 C/A, L2 C/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	L1 C/A, L2C, L5	L1 C/A, L2C, L5
SBAS	OPTIONAL	OPTIONAL	OPTIONAL
IRNSS	OPTIONAL	OPTIONAL	OPTIONAL
GNSS antenna	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	16GB	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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Website | www.tersus-gnss.com
Sales Inquiry | sales@tersus-gnss.com
Technical Support | support@tersus-gnss.com