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, L1P, L1C, L2P, L2C, L5
    - ➢ GLONASS G1, G2, G3, P1, P2
    - ➢ BeiDou B1I, B2I, B3I, B1C, B2A, B2B, ACEBOC
    - ➢ Galileo E1BC, E5a, E5b, E6BC, AltBOC
    - ➢ QZSS L1 C/A, L2C, L5, L1C, LEX
    - ➢ IRNSS L5 (optional)
    - ➢ SBAS support EGNOS, WAAS, MASAS, GAGAN, SDCM (optional)
- ✓ Supports 1000 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

Technical Specifications

Performance

Signal Tracking:

GPS L1 C/A, L1P, L1C, L2P, L2C, L5;

GLONASS G1, G2, G3, P1, P2;

BEIDOU B1I, B2I, B3I, B1C, B2A, B2B, ACEBOC;

Galileo E1BC, E5a, E5b, E6BC, AltBOC;

QZSS L1 C/A, L2C, L5, L1C, LEX;

IRNSS L5 (Optional);

SBAS support EGNOS, WAAS, MASAS, GAGAN, SDCM(Optional)

Channels:	1000

Positioning Accuracy (Autonomous)

no SA:	
- RMS(67%):	1.2m
- 2DRMS(95%):	2.4m
SBAS:	
- RMS(67%):	0.3m
- 2DRMS(95%):	0.6m
TAP (Tersus Advanced Positioning):	
- RMS(67%):	0.04m
- 2DRMS(95%):	0.05m
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:	8mm+1ppm
- Vertical:	15mm+1ppm
Initialization (Typical):	4s[2]
Initialization Reliability:	>99.99%[3]
Observation Accuracy (zenith direction):	
- C/A Code:	10cm
- P Code:	10cm
- Carrier Phase:	1mm
Tilt Compensation Accuracy IMU (No tilt angle limit):	≤2cm(within 60°) [1]

System & Data

Operating System:	Linux
Storage:	Built-in 16GB/8GB [1]
EXPANDABLE	EXT.2X MICROSD CARD; USB DISK
Data Format:	CMR, CMR+ (GPS only), RTCM 2.1, 2.3/3.0, 3.1, 3.2(w/msm), 3.3, 3.4 (2.x/3.x)
Data Output:	RINEX, NMEA-0183(V.3.1.4.1), Tersus binary
Data Update Rate:	20Hz

Software Support

Tersus Nuwa

MicroSurvey FieldGenius

Communication

Cellular

Cellular(REMOVABLE SIMCARD):	4G LTE/WCDMA/GSM
Cellular Bands [4]:	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, Tersus Caster Service (TCS)
Wi-Fi/WLAN:	802.11b/g
Bluetooth:	Bluetooth 2.1+EDR / 4.0 LE

Internal Radio

TNC CONNECTOR	UHF ANTENNA
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):	>10km
Radio Protocols:	TrimTalk450, TrimMark 3, South, Transparent(PCC EOT), Satel

Wired Communication

USB OTG:	USB 2.0 x1
Serial Ports:	RS232 x1
COM Baud Rate:	up to 921600bps

TERSUS GNSS

Technical Specifications - Continued

Timing Accuracy (RMS):	20ns
Velocity Accuracy (RMS):	0.03m/s
Time To First Fix (TTFF):	
- Cold Start :	<35s
- Warm Start:	<10s
Re-acquisition:	<1s
RTK Mode Switchable:	
	Extreme Reliable, Balance, Fast Fix

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
	7.4V 7000mAh x2(Optional)[5]
Battery Working Time:	up to 8 Hours
	>9 Hours(Optional)[5]
AUTOSWAP FROM INTERNAL TO EXTERNAL POWER SUPPLY	
Battery Charging Temperature:	
	+10°C ~ +45°C

Physical

Display:	1.54'' OLED [1]
Dimension:	157x157x103mm[6]
Weight:	≈ 1.2kg (without battery)
	≈ 1.4kg (with a battery)[6]
Operating Temperature:	-40°C ~ +70°C
Storage Temperature:	-55°C ~ +85°C
Relative Humidity:	100% not condensed
Dust- & Waterproof:	IP68
Chemical Resistance:	Cleaning agents, soapy water, industrial alcohol, water vapor, solar(UV)
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 multi-path, and satellite geometry.

(4) Depending on version. In order Europe | American version.

(5) Oscar uses one battery at a time, the other is a substitute. Each 6400mAh 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. Each 7000mAh battery lasts more than 9 hours when Oscar works in 4G/3G/2G network and Rover radio mode. The working time of the battery is related to the working environment, working temperature and battery life.

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

https://www.tersus-gnss.com/product/oscar-receiver-with-options

TERSUS GNSS

Performance Comparison

Oscar Version	Ultimate	Advanced	Basic
Picture			
Channels	1000	1000	1000
GPS	L1 C/A, L1P, L1C, L2P, L2C, L5	L1 C/A, L1P, L1C, L2P, L2C, L5	L1 C/A, L1P, L1C, L2P, L2C, L5
GLONASS	G1, G2, G3, P1, P2	G1, G2, G3, P1, P2	G1, G2, G3, P1, P2
BeiDou	B1I, B2I, B3I, B1C, B2A, B2B, ACEBOC	B1I, B2I, B3I, B1C, B2A, B2B, ACEBOC	B1I, B2I, B3I, B1C, B2A, B2B, ACEBOC
Galileo	E1BC, E5a, E5b, E6BC, AltBOC	E1BC, E5a, E5b, E6BC, AltBOC	E1BC, E5a, E5b, E6BC, AltBOC
QZSS	L1 C/A, L2C, L5, L1C, LEX	L1 C/A, L2C, L5, L1C, LEX	L1 C/A, L2C, L5, L1C, LEX
IRNSS	L5	L5	L5
TAP	✓	✕	✓
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	8GB	8GB
USB OTG	✓	✓	✓
Smart battery with power display	✓	✓	✓
Warranty period	TWO Years	TWO Years	ONE Year

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