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 & frequencies:
- GPS L1 C/A, L2C, L2P, L5
- GLONASS L1 C/A, L2 C/A
- BeiDou B1, B2, B3
- Galileo E1, E5a, E5b
- QZSS L1 C/A, L1C, L2C, L5

Supports 576 channels

410-470MHz UHF radio, 4G network, Wi-Fi, Bluetooth, NFC

Tilt compensation without calibration, immune to magnetic disturbances [1]

Various working modes

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, L2C, L2P, L5; GLONASS L1 C/A, L2 C/A;
  BeiDou B1, B2, B3; Galileo E1, E5a, E5b;
  QZSS L1 C/A, L1C, L2C, L5

Channels:	576

Single Point Positioning Accuracy (RMS):
– Horizontal:	1.5m
– Vertical:	3.0m

DGPS Positioning Accuracy (RMS):
– Horizontal:	0.4m
– Vertical:	0.8m

High-Precision Static (RMS):
– Horizontal:	3mm+0.1ppm
– Vertical:	3.5mm+0.4ppm

Static & Fast Static (RMS):
– Horizontal:	3mm+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

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

Reacquisition:	<1s

Performance – continued

Tilt Compensation Accuracy (within 30°)	≤2cm [1]
Timing Accuracy (RMS):	20ns
Velocity Accuracy (RMS):	0.03m/s
Initialization (typical):	<10s
Initialization Reliability:	>99.9%

System & Data

Operating system:	Linux
Storage:	built-in 16GB/8GB [1]
Data format:	CMR, RTCM 2.X/3.X
Data output:	RINEX, NMEA-0183, Tersus Binary
Data update rate:	20Hz

Software Support

Tersus Nuwa

MicroSurvey FieldGenius

Technical Specifications
- Continued

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 [3]
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

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[2]

Physical

Display:	1.54'' OLED [1]
Dimension:	157x157x103mm
Weight:	≈ 1.2kg (without battery)
	≈ 1.4kg (with a battery)
Operating temperature:	-40°C ~ +75°C
Storage temperature:	-55°C ~ +85°C
Relative humidity:	100% not condensed
Dust- & Waterproof:	IP68
Pole drop onto concrete:	2m

Note: (1) Details refer to performance comparison table.
(2) 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.
(3) Hardware of Wi-Fi module is ready, the function will be supported by firmware update.

Performance Comparison

Oscar Version	Ultimate	Advanced	Basic
Picture			
Channels	576	576	576
GPS	L1C/A, L2C, L2P, L5	L1C/A, L2C, L2P, L5	L1C/A, L2C, L2P, L5
GLONASS	L1C/A, L2C/A	L1C/A, L2C/A	L1C/A, L2C/A
BeiDou	B1, B2, B3	B1, B2, B3	B1, B2, B3
Galileo	E1, E5a, E5b	E1, E5a, E5b	E1, E5a, E5b
QZSS	L1C/A, L1C, L2C, L5	L1C/A, L1C, L2C, L5	L1C/A, L1C, L2C, L5
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