TERSUS

OSCAR

GNSS RTK Receiver
with Calibration-Free Tilt Compensation

Oscar
GNSS Receiver
ExtremeRTK™

Speed Up Your Work

Empowered by a high precision inertial measurement unit (IMU) on Ultimate version, Oscar GNSS receiver from Tersus is a new generation of tilt survey GNSS receiver. This kind of calibration-free tilt compensation is immune to magnetic disturbances. Oscar gives a surveyor unprecedented flexibility and efficiency — holding the survey pole upright is no longer necessary. 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 built-in high-performance antenna can speed up the time to first fix (TTFF) and improve anti-jamming performance. With a Nano-SIM card inserted in Oscar, it can access Internet, transmit and receive correction data through 4G/WiFi network. The built-in UHF radio module supports long distance communication. The built-in large capacity battery is detachable and can display power level. Two batteries support up to 16 hours of fieldwork in 4G/3G/2G network and Rover radio mode. Oscar can be easily configured with 1.54 inch interactive screen on Ultimate and Advanced versions. The rugged housing protects the equipment from challenging environments.

Customers also have an easy backup from Tersus Caster Server (TCS), so that a GNSS BASE station can be quickly set up to broadcast correction stream via mobile networks instead of radio. Natively supported by FieldGenius and Nuwa App, Oscar can be configured to different work modes to suit various daily jobs. Also pillared by the prompt technical supports from Tersus' global partner network, Oscar GNSS receiver is a surveyor's capable and reliable workmate.

**Oscar
GNSS Receiver**

Unprecedented
Flexibility and efficiency

Danger Zone

Hidden Point

Underground
Utilities

Forest

City Canyon

Features

Supports multiple constellations & frequencies: GPS, GLONASS, BeiDou, Galileo, QZSS, SBAS	IP68-rated dust- & waterproof enclosure, for reliability in harsh environmental conditions
576 Supports 576 channels	16GB/8GB internal storage
Tilt compensation without calibration, immune to magnetic disturbances	410-470MHz UHF radio, 4G network, Wi-Fi, Bluetooth, NFC
Smart battery displays power level, two batteries supports up to 16 hours working in 4G/3G/2G network and Rover radio mode	Free subscription of Tersus Caster Service (TCS): transmit the correction data from Oscar Base to Rover via internal 4G network or controller network

Version Comparison

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

Version	Display	LED Indicators	IMU (Tilt Compensation)	Memory	Warranty Period
	1.54" OLED	Satellite, Tilt, Correction Data, Power	✓	16GB	TWO Years
	1.54" OLED	Satellite, Static, Correction Data, Power	—	8GB	TWO Years
	—	Satellite, Static, Correction Data, Power, Bluetooth, Solution Status	—	8GB	ONE Year

Common Specifications

Supports 576 channels

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

Integrated GNSS Antenna

FN, ON/OFF buttons

Bluetooth; NFC; UHF Radio; 4G

Electronic Bubble

USB OTG

2x 6400mAh Battery Capacity

Smart Battery with power display

Technical Specifications
Oscar

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[1] 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[2]
Initialization Reliability:	>99.99%[3]

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

Time To First Fix (TTFF):
– Cold Start:	<35s
– Warm Start:	<10s
Reacquisition:	<1s

Performance – continued

Tilt compensation accuracy (No tilt angle limit):	≤2cm (within 60°)
Timing Accuracy (RMS):	20ns
Velocity Accuracy (RMS):	0.03m/s

System & Data

Operating system:	Linux
Storage:	built-in 16GB/8GB[4]
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

Physical

Display:	1.54'' OLED[4]
Dimension:	157x157x103mm[5]
Weight:	≈ 1.2kg (without battery)
	≈ 1.4kg (with a battery)[5]
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

Electrical

Input voltage:	9~28V DC

Power consumption (typical):
Network or Radio receive mode:	≈ 5W
Radio transmit mode (0.5W):	≈ 8 W
Radio transmit mode (1W):	≈ 9 W
Radio transmit mode (2W):	≈ 11 W
Lithium battery:	7.4V 6400mAh x2[6]

Electrical – continued

Battery Charging Temperature:	+10°C ~ +45°C
Battery Working Time:	up to 8 hours[6]

Communication

Cellular
Cellular:	4G LTE/WCDMA/GSM

Cellular Bands[7]:
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
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

Software Support

Tersus Nuwa

MicroSurvey FieldGenius

Note:
(1) SBAS optional for Oscar Advanced and Basic.
(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) Details refer to performance comparison table.
(5) The actual size/weight may vary depending on the manufacturing process and measurement method.
(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) Depending on version. In order Europe | American version.

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