



# 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 L1C/A, L2C, L2P, L5
- GLONASS L1C/A, L2C/A
- BeiDou B1, B2, B3
- Galileo E1, E5A, E5B
- QZSS L1C/A, L1C, L2C, L5
- SBAS (EGNOS, WAAS, MSAS, GAGAN) L1C/A

Supports 576 channels

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

Tilt compensation without calibration, immune to magnetic disturbances <sup>(1)</sup>

Various working modes

16GB/8GB internal storage <sup>(1)</sup>

Up to 16 hours working in 4G/3G/2G network and Rover radio mode

IP67-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 L1C/A, L2C, L2P, L5; GLONASS L1C/A, L2C/A; BeiDou B1, B2, B3; Galileo E1, E5A, E5B; QZSS L1C/A, L1C, L2C, L5; SBAS (EGNOS, WAAS, MSAS, GAGAN) L1C/A |
| Channels:                                     | 576   |
| Single Point Positioning Accuracy (RMS):      |   |
| – Horizontal:                                 | 1.5m  |
| – Vertical:                                   | 3.0m  |
| DGPS Positioning Accuracy (RMS):              |   |
| – Horizontal:                                 | 0.4m  |
| – Vertical:                                   | 0.8m  |
| SBAS Differential Positioning Accuracy (RMS): |   |
| – Horizontal:                                 | 0.6m  |
| – Vertical:                                   | 1.2m  |
| 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 <sup>(1)</sup> |
| 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 <sup>(1)</sup> |
| 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 |



Website | [www.tersus-gnss.com](http://www.tersus-gnss.com)  
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# 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<sup>(3)</sup>

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<sup>(2)</sup>

## Physical

Display: 1.54" OLED<sup>(1)</sup>

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: IP67

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.

Website | [www.tersus-gnss.com](http://www.tersus-gnss.com)




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# 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   |
| SBAS                             | L1C/A   | L1C/A   | L1C/A   |
| GNSS Antenna                     | Integrated  | Integrated  | Integrated  |
| Buttons                          | FN, ON/OFF  | FN, ON/OFF  | FN, ON/OFF  |
| Display                          | 1.54" OLED  | 1.54" OLED  | X   |
| 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)          | √   | X   | X   |
| Electronic Bubble                | √   | √   | √   |
| Memory                           | 16GB  | 16GB  | 8GB   |
| USB OTG                          | √   | √   | √   |
| Battery Capacity                 | 6400mAh 7.4V x2   | 6400mAh 7.4V x2   | 6400mAh 7.4V x2   |
| Smart Battery with power display | √   | √   | √   |
| Warranty Period                  | TWO Years   | TWO Years   | ONE Year  |

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