



# Oscar GNSS Receiver

## Overview

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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

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Supports multiple constellations & frequencies:

- GPS L1, L2, L5
  - GLONASS L1, L2
  - BeiDou B1, B2, B3
  - Galileo E1, E5a, E5b
  - QZSS L1, L2, L5
  - SBAS (EGNOS, WAAS, MSAS, GAGAN) L1C/A
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Supports 576 channels

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

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Tilt compensation without calibration, immune to magnetic disturbances

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Various working modes

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16GB/8GB internal storage

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

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IP67-rated dust- & waterproof enclosure, for reliability in harsh environmental conditions

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Free subscription of Tersus Caster Service (TCS): transmit the correction data from Oscar Base to Rover

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# Technical Specifications

## Performance

|  |              |
|--|--------------|
| Signal tracking:                                   |              |
| GPS L1, L2, L5; GLONASS L1, L2; BeiDou B1, B2, B3; |              |
| Galileo E1, E5a, E5b; QZSS L1, L2, 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:  | 10cm         |
| – 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, 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:           | 4G LTE/TD-SCDMA/WCDMA/GPRS/GSM                          |
| Network protocols:  | Ntrip Client, Ntrip Server, Tersus Caster Service (TCS) |
| Wi-Fi:              | 802.11b/g <sup>(3)</sup>                                |
| Bluetooth:          | 4.1   |
| USB OTG:            | USB 2.0 x1  |
| Serial ports:       | RS232 x1  |
| COM baud rate:      | up to 921600bps   |
| Internal radio:     |   |
| - RF transmit power | 0.5W/1W/2W  |
| - Frequency         | 410MHz ~ 470MHz   |
| Distance (Typical): | >5km  |
| Radio protocols:    | TrimTalk450, TrimMark 3, South, Transparent, Satel      |

## 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)<br>≈ 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                              | L1, L2, L5  | L1, L2, L5  | L1, L2, L5  |
| GLONASS                          | L1, L2  | L1, L2  | L1, L2  |
| BeiDou                           | B1, B2, B3  | B1, B2, B3  | B1, B2, B3  |
| Galileo                          | E1, E5a, E5b  | E1, E5a, E5b  | E1, E5a, E5b  |
| QZSS                             | L1, L2, L5  | L1, L2, L5  | L1, L2, 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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