

# UNISTELLAR

## TECHNICAL GUIDE ODYSSEY SERIE

ODYSSEY | ODYSSEY PRO



## 1 DISCOVER THE ODYSSEY

- Box content
- Odyssey specifications
- More specifications

## 2 HOW TO USE YOUR TELESCOPE

- Download and install the Unistellar application
- Telescope installation

### 1 Thermalization

### 2 Use condition

### 3 Environment : Sky, Wind and Temperature

- LED indicator
- Charging the battery

## 3 TECHNOLOGIES & SCIENCES

- Unistellar Technologies
  - Dynamic Signal Amplification
  - Deep Dark Technology
  - Amplified Resolution
  - Smart Start Finder
  - GotoSun and Sun Tracking Technology (for the Smart Solar Filter)
  - Stellar Autofocus (for Odyssey)
  - Nikon High Precision Optics (for Odyssey)
- Science
  - Scientific campaigns
  - Planetary Defense
  - Asteroid occultation
  - Cataclysmic event
  - Exoplanets
  - Comets

## 4 MAINTENANCE AND STORAGE

- Unable to connect
- Can not take pictures / How to save image
- Add a filter

# 1 DISCOVER THE ODYSSEY

## ○ Box content



\* NOT INCLUDED FOR OTHER COUNTRIES

# 1 DISCOVER THE ODYSSEY

## Odyssey specifications



**Dimensions:** 431x204x134 mm

**Weight:** 4 kg

- 1 64Go SD Card
- 2 USB-A & USB-C ports
- 3 Button & LED Status
- 4 Battery
- 5 Primary mirror
- 6 Secondary mirror
- 7 Dust Cap
- 8 Nikon Eyepiece Technology (Odyssey Pro only)

### Optics

**Architecture:** Optical digital hybrid

**Coated Surface primary mirror 5 :** 82mm diameter

**Coated Surface secondary mirror 6 :** 24mm diameter

**Focal length:** 320mm

**Focus:** Automatic

**FOV:** 45 x 34 arcmin (0.75 x 0.56 degrees)

### Battery 4

**Type:** Li-ion (3 x 18650)

**Voltage:** 3.7V

**Removable:** Yes

**Autonomy:** 5h

**Charger:** 5 V, 2.4A

**Charging time:** 100% in 4h

## More specifications



**Dimensions:** 420x170 mm (with screws)

**Weight:** 2.5kg

### Tripod

Before mounting the telescope, always check that the bubble gauge on the tripod head is level. If the bubble is not centred, please extend or retract the tripod legs until you find the perfect configuration. Your observations may be slightly off centre if your tripod is not properly levelled.

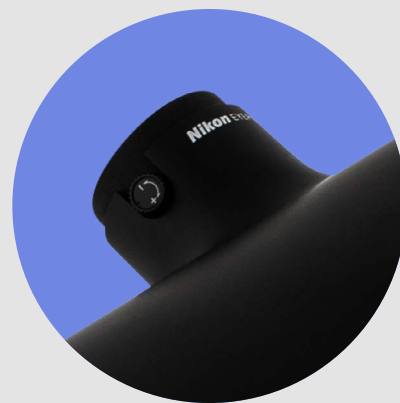
**IMPORTANT:** Tighten the screws on your tripod, but don't over-tighten them, this could damage them and make the tripod unstable.

**WARNING:** The tripod must not be used for any other purposes than for holding your telescope.

## Nikon Eyepiece Technology

For Odyssey Pro

The OLED screen features extremely high contrast and deep blacks, as well as an optical configuration designed to diffuse the sensor view. The end result is a stunning visual quality for your dark sky observations. By turning the side dial, you can adjust the diopter and sharpen the image to suit your eyesight.



## 2 HOW TO USE YOUR TELESCOPE

### Download and install the Unistellar Application

To control your telescope, you will need to connect it over WiFi to a compatible smartphone or tablet which has the Unistellar application installed.

The Unistellar app is available on the following link: [unistellar.help/app](https://unistellar.help/app) or on the Google® Play Store and the Apple® App Store (on smartphones or tablets) by searching Unistellar.

**WARNING: Unistellar app is not supported by the following devices**

- Android 10 and older
- iOS 15 and older
- FireOS, Kindle, or Huawei Harmony OS

The App version 3.0 (or higher) is required to use your telescope.

Click or scan the QR code to watch a video tutorial



## WiFi, Bluetooth and Connexion

In order to connect your Smartphone to the telescope, please be sure that your device's Bluetooth and WiFi functions are activated. Your device will then automatically detect and connect to the telescope network using WiFi. Open the main page of the application for your first connection.

## App permissions

When launching the app for the first time, you will get a prompt asking you to give the app access to your location, and photos on your device (tablet or smartphone). *The app needs to get these permissions in order to get a correct sky mapping and to get access to the images produced by your observations.*

If you do so while being connected to the telescope's Wi-Fi you will also receive an additional prompt about allowing the app to connect to devices on your local network. Because you are connected to the Odyssey, the local network is the Odyssey's network, selecting "Allow" will prevent you from being unable to connect to it at a later stage.

Prompts should occur in this order (while connected to the telescope) :

- ① Geolocation → Allow while using the app
- ② Science push notification → OK and Allow (you may get prompted twice)
- ③ Unistellar would like to access your Photos → Allow Access to all Photos

The last prompt about Photos may only occur the first time you try to access the image gallery, we recommend to activate it from the start by tapping on the last (rightmost) icon at the bottom of your screen.

## Telescope installation

Before first use, please follow the instructions on the Quick Start Guide included in the box.

### ① Thermalization

Thermalization is the process of balancing the temperature of your telescope's components and its surrounding environment. The telescope performs at its best when its mirror reaches ambient temperature.

If there is a temperature difference between the outside and the room where your telescope is stored, place it outside for 15 to 30 minutes before your observation, for optimal performance.

### ② Use condition

- Charge your telescope fully before use
- Do not point directly to the sun
- Observe under a clear sky without clouds or wind
- Adjust the tripod as explained in the quick start guide
- Take off the dust cap
- Do not forget to perform a Sensor calibration for optimal observations

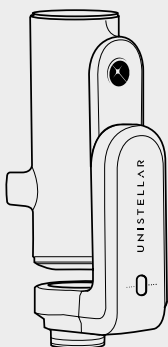
### ③ Environment : Sky, Wind and Temperature

If the sky is cloudy, you will not be able to observe with your telescope. The telescope is highly sensitive to wind because it causes vibrations that can interfere with the Dynamic Signal Amplification. We recommend using your telescope within the following temperature range:

**Temperature range operation & storage:** -15°C/5°F to 35°C/95°F

**Temperature range charge:** 10°C/40°F to 35°C/95°F

## LED indicator



**ON / OFF**  
Color on both side



**Operation**  
A red mode will also be available on the App settings



**GoTo / Park**  
Central button fading 2 secondes



**Telescope charged & plugged**  
1 LED = 25% charged  
2 LED = 50% charged  
3 LED = 75% charged  
4 LED = 100% charged



**Upload**  
1 LED = 25% uploaded  
2 LED = 50% uploaded  
3 LED = 75% uploaded  
4 LED = 100% uploaded



**Errors**  
Central Button is Magenta; please contact the support at [support@unistellaroptycs.com](mailto:support@unistellaroptycs.com)



**Errors**  
Central Button is White; please contact the support at [support@unistellaroptycs.com](mailto:support@unistellaroptycs.com)



**Upload Failed**  
Central button orange for 1 min



- **Long press on the central button:** the telescope turns OFF
- **Press the central button once briefly:** the LEDs on the right light up to indicate the percentage of battery remaining.
- **Press the central button 10 times briefly:** reset factory (the WiFi password and the autofocus will be reset)
- **Press the central button 3 times :** The telescope will park automatically

## Charging the battery

To charge the battery, please use the supplied USB-C power unit and adaptors to connect your telescope to an electrical outlet. A power bank may also be used to charge your telescope. We recommend a USB- 5V power bank and a maximum current of 2.4A.

For quicker charges, Odyssey is compatible with higher rated fast chargers (not included in the package).



**We do not recommend draining the battery below 20%. Storing your telescope with a charge of 40% to 60% is essential for maximizing your battery life. To avoid draining your battery completely, we recommend charging your battery at least every 3 months or remove the battery from the telescope.**

To increase your battery life, avoid using your telescope at low temperatures (10°F / 40°C) or above 35°F / 95°C, as this may cause damage. Very cold environments may increase battery consumption.

3

## TECHNOLOGIES & SCIENCES

### Unistellar Technologies

When you turn on the Dynamic Signal Amplification on the app, the system will use its low-light sensor to accumulate light continuously through a series of short exposures.

The resulting image is projected as the accumulation occurs, which means that once you start Dynamic Signal Amplification, not only will you see something, but the object will keep on improving with time.

Depending on the observation conditions (light pollution, moon phase, weather, etc...) and the objects you are pointing at, it can take from a few seconds to several tens of seconds for you to start seeing the beautiful colors and shapes of galaxies and nebulae, usually invisible directly through the eyepiece of a regular or even a high-end telescope.



#### Dynamic Signal Amplification

Dynamic Signal Amplification is a revolutionary technology invented by UNISTELLAR. The telescope amplifies the incoming light signal from the sky from the very first moments of observation. The onboard computer continuously stacks and live-processes short exposures of the objects at which they are aimed. The telescope captures short exposures processed live by exclusive algorithms, designed and developed by our researchers. By analyzing large amounts of data, these algorithms have learned to recognize the behavior of the light signal emitted by celestial objects. Only the most relevant signal is preserved in the final image.



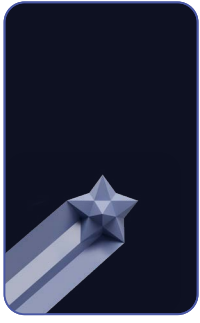
#### Deep Dark Technology

Deep Dark Technology is UNISTELLAR's proprietary state-of-the-art automated noise and light pollution-filtering model. It autonomously filters out the impact of city lights that otherwise inhibits digital sensors from picking up the signal of sky objects. Thanks to the tens of thousands of sky observations by our user community, our exclusive image processing algorithms have learned to automatically distinguish between noise and light pollution on one hand, and the light signal coming from celestial bodies on the other. Our algorithms analyze each part of the image and determine the image component associated with light pollution. This component is then removed, revealing the desired celestial object and the myriad of stars surrounding it.



#### Amplified Resolution

Amplified Resolution, the proprietary technology that boosts image resolution in UNISTELLAR telescopes, brings immediate sharpness to the image. Capturing the faint light of celestial objects requires highly sensitive sensors with relatively large pixels. This increased sensitivity comes at the expense of resolution, which explains the low resolution of astronomical images in comparison to conventional photography standards. The Amplified Resolution technology is based on the latest image processing algorithm techniques to enhance image resolution. Our algorithms distinguish photographic noise from the signal of celestial objects. They can remove this noise while enhancing the signal, fully exploiting its information and producing a denoised image that is rich in detail and remarkably sharp.



## Smart Start Finder

Smart Star Finder uses a cutting-edge UNISTELLAR technology that enables our telescopes to autonomously target any desired celestial object from the moment the telescope is turned on. Select a celestial object in the UNISTELLAR app, and let the telescope point and track, even when few stars are visible in the sky. Once turned on, the telescope's onboard computer connects to your smartphone's GPS to locate itself on the Earth's surface. It then begins to compare the celestial objects in its field of view with its database containing the positions of tens of millions of stars. The telescope can even detect the presence of stars that are invisible to the naked eye. Embedded intelligence allows it to accurately locate its current observation on the sky map and to navigate toward the objects selected by the user in the application. Once the telescope is pointed at an object, it automatically tracks it across the sky as the earth rotates. Note that Smart Star Finder imposes no limitations on the observer regarding the objects they can observe. They are free to point the telescope in any direction using the application's navigation to explore the night sky as they wish.



## Stellar Autofocus (for Odyssey)

A major innovation in the automatic focusing of Odyssey telescopes is Stellar Autofocus, which ensures perfect sharpness throughout the observation. Stellar Autofocus is a specific autofocus mode developed by UNISTELLAR for astronomical observation. The autofocus systems that we are familiar with only work in daylight—on landscapes or portraits—whereas sky images are primarily composed of blackness and points of light (stars). It was therefore necessary to develop a novel focusing algorithm and pair it with a small module comprised of a micromotor and a digital sensor. The algorithm engages the module's motorization to adjust its settings autonomously until the stars appear as small as possible—and thus perfectly sharp. The focus is impeccable, fast, and robust, under any observation conditions.



## **Nikon** High Precision Optics (for Odyssey)

Nikon High Precision Optics is a technological innovation that is revolutionizing the world of telescopes. Odyssey are the first mirror telescope that does not require manual adjustments. This innovation was achieved through a close collaboration between the research teams at Nikon and UNISTELLAR. Nikon High Precision Optics uses a high-tech process to seal the mirrors in the optical tube. This technology guarantees that the mirrors and the optical tube will always be perfectly aligned, regardless of temperature changes or vibrations the telescope experiences while being transported.

## Science

### Scientific campaigns

Subscribe to our citizen science [emails](#) or join our Slack group to interact with our community on scientific observations. You will soon become a citizen astronomer and contribute to scientific discoveries.

### Planetary Defense

Our planet is not free from danger. Our solar system is home to other celestial bodies such as asteroids and artificial objects. Asteroids sometimes cross the Earth's orbit. Some of these near-Earth asteroids are "potentially hazardous asteroids," meaning they could crash into the Earth. The Planetary Defense program aims to locate, track, and characterize these near-Earth objects (NEOs) in our solar system. Each month, Unistellar scientists suggest different targets to observe with your telescope.

### Asteroid occultation

Asteroid occultation detection entails observing an asteroid pass between a bright star and your location on Earth. The telescope's recording of the star's blinking provides valuable data that astronomers can use to learn more about an asteroid's trajectory, size, shape, and composition. When launching an observation campaign, scientists invite telescope users to join their search by activating "Occultation Mode" on their devices. Observe the sky with your telescope, send this data to scientists, and help keep the world informed about and aware of asteroids. You will then receive the results of your occultation. No matter where you live in the world, there is probably an occultation that you can observe.

### Cataclysmic event

Cosmic cataclysms are mysterious and fleeting explosions that may be observable in the night sky for anywhere from a few seconds to weeks, or even years. For example, supernovae and gamma-ray bursts are high-powered cosmic explosions that we know of, but there are many other exotic happenings in the night sky yet to be



studied and understood. In such explosions, there is a temporary but drastic increase in brightness that Citizen Astronomers can observe to help astronomers understand these cataclysmic events.

## Exoplanets

An extrasolar planet – better known as an exoplanet – is a distant planet orbiting a star other than our Sun. As exoplanets orbit their parent star, they may pass – or transit – in front of that star as seen from Earth. As it transits, the exoplanet blocks out a fraction of the star’s light. This small change in the star’s light can be observed by space scientists and Unistellar Citizen Astronomers to detect exoplanets. So far, space scientists have discovered and confirmed over 5,000 exoplanets, and with their Unistellar telescopes, Citizen Astronomers can confirm even more of these alien worlds!

## Comets

A comet is a small Solar System body made of ices and dust. When a comet gets close enough to the Sun on its orbit, ices on the surface will turn to gas. This phenomenon gives rise to the beautiful tails comets are known for.

Comets may break into multiple pieces, visit us only once every century, or even leave our Solar System. Although comets are hard to predict, Citizen Astronomers can observe their close approaches and monitor their activity to help space scientists understand cometary behavior and structure.

4

## MAINTENANCE AND STORAGE

It’s recommended to store the Odyssey or the Odyssey Pro in the original packaging, battery charged with the cap on the top of the tube. Keep your telescope away from light and moisture. Dismantling your telescope without authorization from Unistellar will void the warranty.

### Unable to connect

Please note that if your device is not connected to the telescope during the first opening of the app, the second prompt will not appear until you connect it to the telescope.

### Can not take image / How to save image

Unistellar’s App would like to access your Photos → **The first prompt will request the access to all photos**

If you are not connected to the telescope, the second prompt will not appear.

The last prompt, about Photos, may only occur the first time you try to access the image gallery, so we recommend activating it from the start by tapping on the last (rightmost) icon at the bottom of your screen.

### Add a filter

Please keep in mind that using filters troubles the focus. Adding a filter to your camera is at your own risk. In case of damage, or in case you used a filter and your unit will not be covered by the warranty.

Point to another part of the sky with the joystick and try again.

Center manually the object before starting the Dynamic Signal Amplification.

*Check our latest help articles on our help center: [help.unistellar.com](https://help.unistellar.com)*