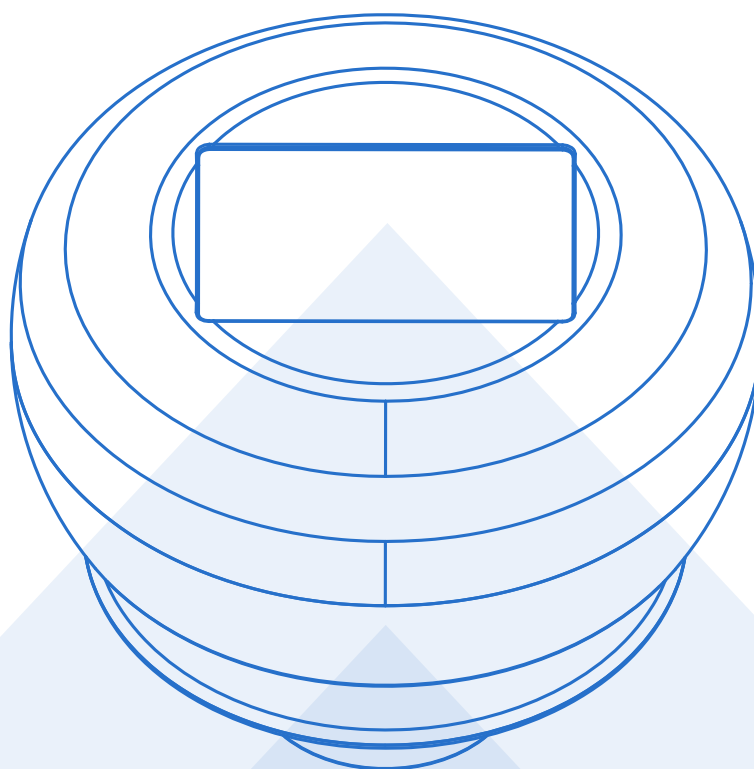


User manual

SOLAR
WIND SENSOR · CMI1006

English version

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CALYPSO
i n s t r u m e n t s

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1 Product Overview

The Ultrasonic Portable Solar Wind Meter is a wireless (BLE) and self-powered (solar) IPX8 pocket-sized ultrasonic anemometer, easy to install, simple to use and compatible with iOS and Android and Garmin.

It brings astonishing technology to a wider range of users, from the sailor to the farmer. It can be used in leisure activities such as nautical, extreme sports, golf, ballistics, archery, drones or in non-leisure applications such as industry, scientific, meteorology, firefighting, energy, agriculture, aviation, infrastructure and construction.

Nominated for the Dame Design Awards 2017

The Dame Awards recognize the best designed products at the Metstrade Show. Its unique relevance in the global marine marketplace emphasizes innovation and environmental impact among others.

2 Package Content

The package contains the following:

- Ultrasonic Portable Solar Wind Meter.
- Wireless charging Qi.
- Serial number on the packaging.
- A user guide at www.calypsoinstruments.com with all useful information for the customer, linked via a QR code on the packaging.

NOTE

It is recommended to keep the box; it contains the serial number.

IMPORTANT NOTE

Before installing the anemometer, especially in challenging locations like the top of a mast, **please thoroughly test the device** to ensure it functions correctly without errors or issues.

We recommend testing the unit in an easily accessible location to confirm its accuracy. Always test it **outside of the packaging**.

3 Technical Specifications

The Ultrasonic Portable Solar has the following technical specifications:

3.1 Weather data

WIND SPEED		WIND DIRECTION	
Range	1 – 25 m/s (1.12 – 56 mph)	Range	0 – 359°
Accuracy	0.1 m/s or 3% at 0–16 m/s (0–35.8 mph)	Accuracy	3° at 1–5 m/s (2.24–11.2 mph)
	5% at 16–25 m/s (1.12–56 mph)		1° at 5–16 m/s (11.2–35.8 mph)
			6° at 16–25 m/s (35.8–56 mph)
Resolution	0.01 m/s (0.0224 mph)	Resolution	±1°

3.2 Power consumption

The Ultrasonic Portable Solar wind instrument counts on an advanced power management system so no external source of energy is required beyond solar light.

The product has a solar panel integrated on the top that feeds an internal, rechargeable battery located in the interior of the product. The battery can handle thousands of charge/- discharge cycles and its capacity and overall characteristics guarantee a superb performance along the life of the product.

Thanks to a laboratory-tested sealing design, the battery is protected against any external agent reaching an IPX8 protection grade rating.

Type	Solar panel, internal battery, automatic power management.
Autonomy (active use without sunlight)	Up to 90 days
Autonomy (standby)	Up to 1 year with no sunlight

NOTE

To check battery level, connect to the AnemoTracker App. The level is shown in the side menu. We highly recommend to charge the unit before using it.

WARNING

Please note the solar panel has a protective film which should not be removed. The internal rechargeable battery cannot be repaired; opening the product will permanently damage the sealing and void the warranty.

Advanced Power management

The Ultrasonic Portable Solar anemometer and wind vane firmware automatically manages power drain, energy storage, and solar production. The firmware sets one of the following battery modes depending on the battery status:

NORMAL MODE

- Battery level: 10% - 100%

SLEEP MODE

- Battery level: 2.5% - 10%
- In sleep mode the device only provides advertising information (BLE signal). It does not send any wind info.
- Needs to be charged.

SAFETY MODE

- Battery level: 0% - 2.5%
- This is a safety mode to prevent permanent battery damage. It does not receive or send any information and it will not be visible via Bluetooth.
- Needs to be charged.

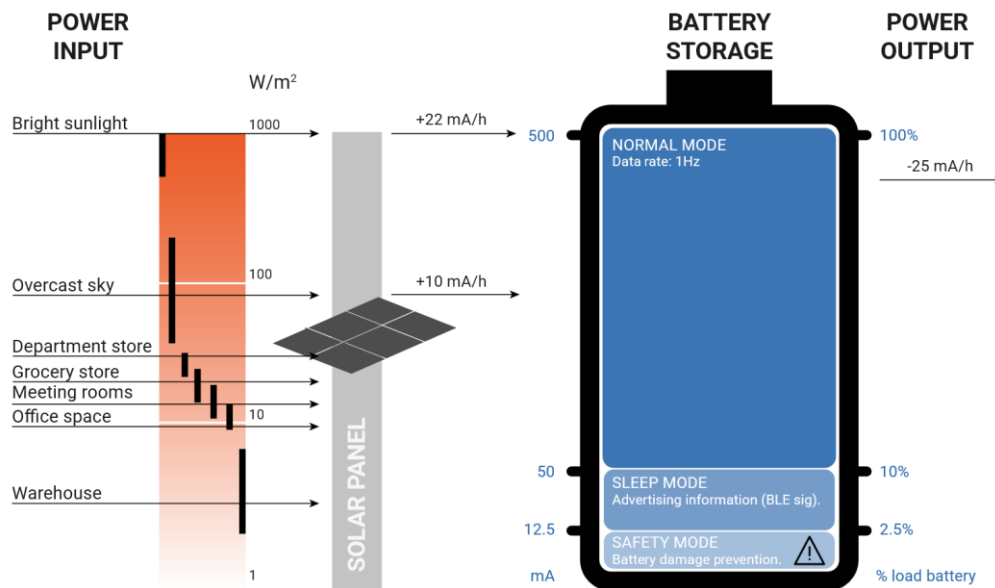
BATTERY STORAGE



Every mode changes automatically depending on the voltage of the battery.

Charging modes

We are showing you some different ways to charge the Ultrasonic Portable Solar wind meter.



EXAMPLE

Let's say your unit is charged up to 33%. 1/3 of a battery of 500mA battery means you have 167 mA in your battery, and you still need 333 mA to reach full charge. On an overcast day, we can estimate a charging rate of 10 mA per hour. If not in use, the solar cell will require 33.3 hours to produce the 333 mA at 10 mA per hour. When in use, the power drain is 0.25 mA per hour. This means that the lling capacity will be 10 - 0.25 mA per hour which equals 9.75 mA per hour. In this scenario, to reach full charge (100%, 500 mA) it would take 34 hours while in use.

3.3 Parameters

Sample rate	1 Hz
Configurable units via AnemoTracker App	
Wind	m/s, km/h, knots, mph



3.4 Data Output: Bluetooth and Firmware

BLUETOOTH		FIRMWARE	
Version	BLE 5.1 or beyond	Upgrade	Via Bluetooth
Range	~30 m in open space (no interference)	Download	AnemoTracker Configure&Update

The Ultrasonic Portable Solar incorporates Bluetooth Low Energy (BLE) technology, providing reduced power consumption while maintaining a similar communication range.

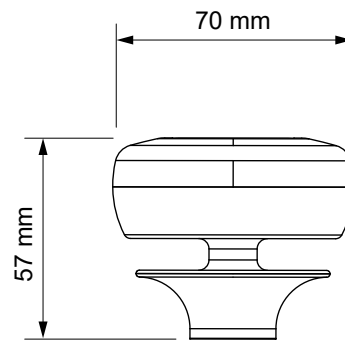
3.5 Sensors

Wind sensors Ultrasonic transducers (4x)

The device has been designed with no moving parts to maximise reliability and minimise maintenance. Transducers communicate in pairs using ultrasonic waves to calculate wind speed and direction.

3.6 Dimensions

Diameter	70 mm (2.76 in.)
Height	57 mm (2.24 in.)
Weight	145 g (5.15 oz.)



3.7 Materials

Main material	Machined engineering plastic (black)
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3.8 Mount

MOUNTING

Thread	M16 Female thread
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ACCESSORIES

Adapter for tripod	CMI1025
Carbon fiber Pole	CMI1008 or CMI1009 33 cm or 1 m
Aluminum Pole	CMI1011 or CMI1012 33 cm or 1 m
Mast mount	CMI1015
GoPro screw	CMI1026

A wide range of accessories can be used with the device, visit our website www.calypsosinstruments.com and check all the accessories available and their possible combination.

3.9 Environmental

The Ultrasonic Portable Solar has been certified by an approved independent laboratory as IPX8. In order to get the IPX8 code certification, ULTRASONIC PORTABLE SOLAR has successfully passed a 30 minutes water immersion test at a depth of 10 meters (1bar) with no water ingress. We have also run more severe tests in house with successful results (even though they are not certified).

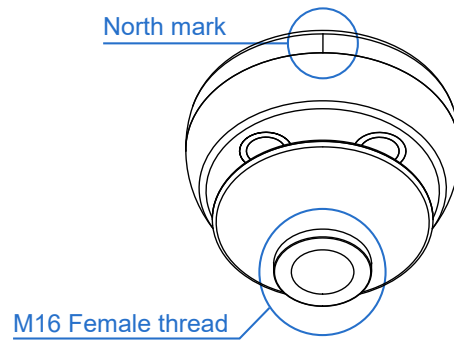
However, reaching IPx8 30 min-10 m does not yield warranty of being waterproof at 10 m. The same rationale applies to swimming watches; a watch needs to be tested at 30- 50 meters depth to be considered water-resistant at a swimming depth of around 1 meter. For going deeper than (snorkeling, diving) watches are individually tested up to 200-500 m.

Several factors might affect Ultrasonic watertightness: rubber seals and plastics wear and tear, drastic temperature changes (hot air then cold water), previous impacts, pressure increase rate (immersion velocity), water density and temperature, underwater speed and acceleration. This is why we do certify that our Ultrasonic is IPX8 30 min-10 m but we cannot guarantee that it is waterproof at 10 m.

IP Protection grade	IPX8
Temperature range	-15 to 60 °C (5 to 140 °F)
Humidity	0 – 100% HR

3.10 Compatible Devices

Android	Bluetooth 5.1 or beyond
iPhone	4S or beyond
iPad	3rd generation or beyond



Visit www.calypsosinstruments.com for the latest compatibility information.

3.11 Calibration

The Ultrasonic Portable Solar has been calibrated with accuracy following the same calibration standards for each unit.

4 Functions

The Ultrasonic Portable Solar will allow you to perform a great diversity of operations adapting to your needs.

It will provide you information about everything that is shown below through the application AnemoTracker App, but the most important aspects that facilitate the unit are the following:

- Apparent Wind and Apparent Wind Angle.
- Real Wind and Real Wind Angle – All collected by the anemometer and the crossing with the GPS of the connected device.
- Data logging – Collected data can be stored in the memory of the application, exported and shown on graphs.

NOTE

For full information on using the AnemoTracker App, visit www.calypsosinstruments.com and download the latest app manual.

5 Installation

5.1 Installing the Unit

Orient the unit towards the bow using the alignment mark on the side of the device (in navigational situations, align it with the bow of the vessel).

Install in a location free from any obstacles within a 2-metre radius that could disturb airflow to the transducers.

For accurate readings, never place any obstacles around the sensors. Ensure the space between the sensors and the base of the unit is clear – objects such as cords can interfere with ultrasonic waves and produce inaccurate wind readings.

5.2 How to Use

Step 1 — Remove the unit from the packaging

- Remove the device from its case and protective element and keep it out throughout the usage cycle.

NOTE

Keeping the device inside its packaging during setup and use will cause erroneous measurements. Always use it **outside of the packaging**

Step 2 — Charge the Ultrasonic device.

- Place the unit on

NOTE

Allow the device to stabilize after charging. Using the unit immediately after charging may affect measurement accuracy. Wait a few minutes before use

Step 3— Install the AnemoTracker App

- Make sure your device has Bluetooth enabled. The device requires BLE 5.1. Compatible: Android 4.3+, iPhone 4S+, iPad 2+.
- Download the AnemoTracker App from Google Play or the Apple Store.
- Open the App, slide right to open settings, and press the Pair Portable button.
- All Ultrasonic Portable devices within range appear. Select the one matching the MAC number on your box.

WARNING

Each unit can only be connected to one device at a time. Disconnect from the current device first to allow pairing with another.

Step 4— Pair your device and use it.

- Once the App is installed start it and click on the three lines on the bottom left-hand corner to open settings
- Press the Pair button. All Ultrasonic Portable units within range appear. If no device is shown, swipe down on "Scanning for wind device" screen.
- Select your device and connect. Select the one matching the MAC number on your box. If your device connects with your Ultrasonic Portable unit correctly, **continue with the normal installation**. If not, please go to section [6 Troubleshooting](#)

Step 4 — Disconnect your device.

- To avoid draining the battery, unpair your device from the App. This will keep your unit off.

6 Troubleshooting

6.1 Troubleshooting Battery

If you don't see your device in the App:

- Make sure your Ultrasonic Portable unit is not in Off mode (unit off when battery is empty).

- There will be no battery level shown when trying to connect to the device in AnemoTracker App. Charge your device.

What to do when your device does not connect via AnemoTracker?

IMPORTANT NOTICE

If your portable solar unit hasn't been exposed to direct sunlight for an extended period or its battery level has dropped below 15%, it will need to be recharged for 72 hours under a 30W, 5500K color temperature LED light.

When you're connected to your Portable Solar in AnemoTracker, the battery level will appear on the main screen and it will always show a battery level. If there is no battery level, then the device is not connected.

This could be due to not having enough battery on your device. This is common if your device has been in storage for an extended period of time.

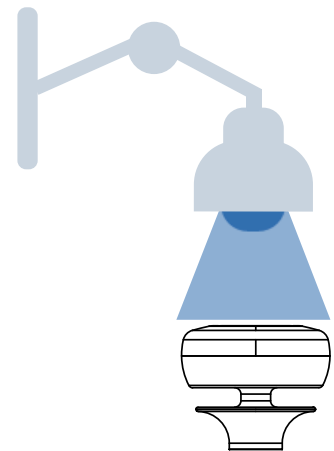
To charge the battery, you can choose between two options:

Option 1: Outdoors Charge

- Sun strength may vary depending on location, weather or season. Given that, if you feel the natural light in your location is not strong enough for your wind meter, we suggest charging with a Led light (30 W Power, 5500 K Color).
 1. Place your Ultrasonic Portable Solar wind meter outdoors between 24 and 72 hours. Do not place in a window as glass will hinder the solar charge.
 2. Last of all, check the battery level in AnemoTracker App.

Option 2: Led Light (30W Power, 5500K Color) charge.

- We recommend you to have a shallow container and a Led Light (30 W Power, 5500 K Color).
 1. Leave the Ultrasonic Portable Solar wind meter in the shallow container (make sure the solar panel points upwards), then place a Led light between 3 and 5 fingers above the Ultrasonic Portable Solar wind meter.
 2. You should leave it to charge between 24 and 72 hours, as the time may vary depending on the battery level you wind meter previously had.
 3. After that, check one more time the battery level in AnemoTracker App.



6.1 Troubleshooting Bluetooth Connection

If your compatible device cannot connect:

- Make sure Bluetooth mode is running on your smartphone, tablet or PC.
- Make sure no other device is already linked to your Ultrasonic Portable unit.
- Make sure you are within BLE range (~30 meters).

WARNING

Each unit can only be connected to one device at a time. Disconnect from the current device first to allow pairing with another.

6.2 Troubleshooting Sensor Accuracy

If data is inaccurate:

- Make sure no debris is around or near the sensors.

You can review [11.1 General Recommendations](#).

If the problem persists, contact: aftersales@calypsoinstruments.com

7 AnemoTracker App

The Ultrasonic Portable unit you have purchased is designed to be used with the AnemoTracker App, which provides apparent and true wind speed and direction, as well as temperature, humidity and pressure data, and allows data logging for future viewing. The app offers a variety of interfaces suited to different use cases.

For more information, download the latest app manual from www.calypsoinstruments.com

8 AnemoTracker Configure & Update App

Keeping your anemometer up to date is essential for ensuring optimal performance and accurate wind data collection.

You can update your anemometer by downloading the AnemoTracker Configurator & Update app (Android and iOS).

Stay up-to-date, get accurate data. Regular updates ensure your anemometer is running the latest firmware, improving both reliability and functionality.

WARNING

Before updating your device, check for a new version. There's no need to update if a new version isn't available.

For more information, download the latest version from www.calypsoinstruments.com

9 Compatible Apps

We constantly work on making the product compatible with a great diversity of Applications.

To see compatible Apps visit the product tab in our website www.calypsoinstruments.com

10 Developers

Our hardware is open source. We welcome third-party software and hardware companies to seamlessly integrate our products into their platforms.

NOTE

For ballistics sector our developers manual is not available

For more information, please contact us through our [web form](#) or at sales@calypsoinstruments.com

11 General Information

11.1 General Recommendations

Install on the masthead, oriented with the North mark towards the bow. Ensure a clear 2-metre radius free from obstacles.

- Do not attempt to access the transducers area with your fingers.
- Do not attempt any modification to the unit.
- Never paint any part of the unit or alter its surface in any way.
- Solar panel comes with a protective film built-in. Do not remove the film, as it will damage the cell.

11.2 Maintenance and Repair

The unit requires minimal maintenance thanks to its design with no moving parts.

- Transducers must be kept clean and aligned.
- Impacts or incorrect handling may cause transducer misalignment.
- The space around the transducers must be empty and clean. Dust, frost, water, etc... will make the unit stop working. Rinse with freshwater and let dry.
- The solar panel can be cleaned with a damp cloth a few days before using it and place it in a light source / solar to get the battery full of charge.
- Before using it, make sure that the device has enough battery to work without problems. You can get that information directly through the application.

11.3 Warranty

This Warranty covers defects from defective parts, materials, and manufacturing if reported within 3 years of purchase date.

Warranty is void in case of non-following the instructions of use, repair or maintenance without written authorisation:

- Any harm caused to device by accident will not be covered by the warranty.
- Using assembly elements different from those delivered with the product will void the warranty.
- Do not attempt to access the transducers area with your fingers.
- Do not attempt any modification to the unit.
- Never paint any part of the unit or alter its surface in any way.

For further information please contact Calypso Technical Support through sales@calypsoinstruments.com or visit www.calypsoinstruments.com.