CALYPSO instruments

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DAME NOMINATED 2017

CALYPSO
ULTRASONIC Portable Solar
WIND METER AND DATA LOGGER
User manual

English version 2.0
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CE FC 0809

Our awarded Ultrasonic Portable Solar wind meter is an innovative product, bringing top-notch ultrasonic wind measurement technology to the mobile world. Affordable, portable, with no moving parts, IPX8, easy to install, accurate, and open to third-party apps.

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, agricultu- re, aviation, infrastructure and construction.

If you want to know more about our new Ultrasonic Portable Solar wind meter, please keep reading or visit our website at www.calypsoinstruments.com.

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.

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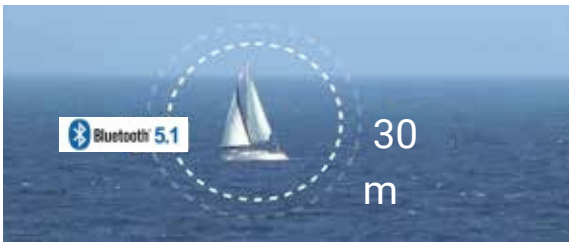
1 Product overview

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.



2 Package content

The package contains the following:

· Ultrasonic Portable Solar Wind Meter

· Serial number reference in the back of the packaging

· User Quick guide on the back of the packaging and some more useful information for the custo-mer.

The packacking has been designed for it to be used as a permanent storage box for your unit. It is recommended to keep the box as a permanent storage solution. It will keep your unit safe from impacts and it contains the serial number.

3 Technical specifications

The Ultrasonic Portable Solar has the following technical specifications:

Dimensions	· Diameter: 70 mm (2.76 in.) · Height: 57 mm (2.24 in)
Weight	·145 grams (5.15 oz.)
Bluetooth	· Version: 5.1 or beyond · Range: up to 30 m or 98 ft. (open space without electromagnetic noise)

The Ultrasonic Portable Solar uses Bluetooth Low Energy technology (BLE).

BLE is the first open wireless communication technology that communicates between mobile devices or computers and other smaller devices such as our new wind meter.

Compared to Classic Bluetooth, BLE provides considerably reduced power consumption and cost while maintaining a similar communication range.

Version
The Ultrasonic Portable Solar uses the latest BLE version which is 5.1. BLE facilitates the reconnection between devices when they leave and re-enter the bluetooth range, among other things.

Compatible devices
You can use our product with the following devices:
· Compatible Bluetooth 5.1 Android devices or beyond
· iPhone 4S or beyond
· iPad 3rd generation or beyond
· Garmin (check compatible devices)

Range
The coverage range is 30 meters when in an open space free of electromagnetic noise.

Battery Power

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

The internal rechargeable battery cannot be repaired; opening the product will permantly damage the sealing and void the warranty. 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. If fully charged, the battery can feed the unit around 30 days in the absence of sun (>30 days on continuous measureing in full darkness).

The useful life of the battery is 2100 full charge/dischage cycles.

Battery life is approximately 30 days in sleep mode without sunlight.

See Chart: page 6.

Please note the solar panel has a protective film which should not be removed.

We highly recommend to charge the unit before using it. Please check section 7 on which we are showing you some different ways to charge the Ultrasonic Portable Solar wind meter.

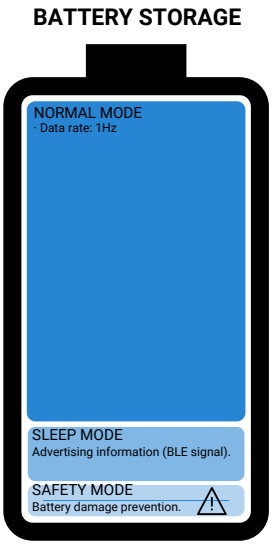
Advanced Power management

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

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.

SLEEP MODE
· Battery voltage: 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

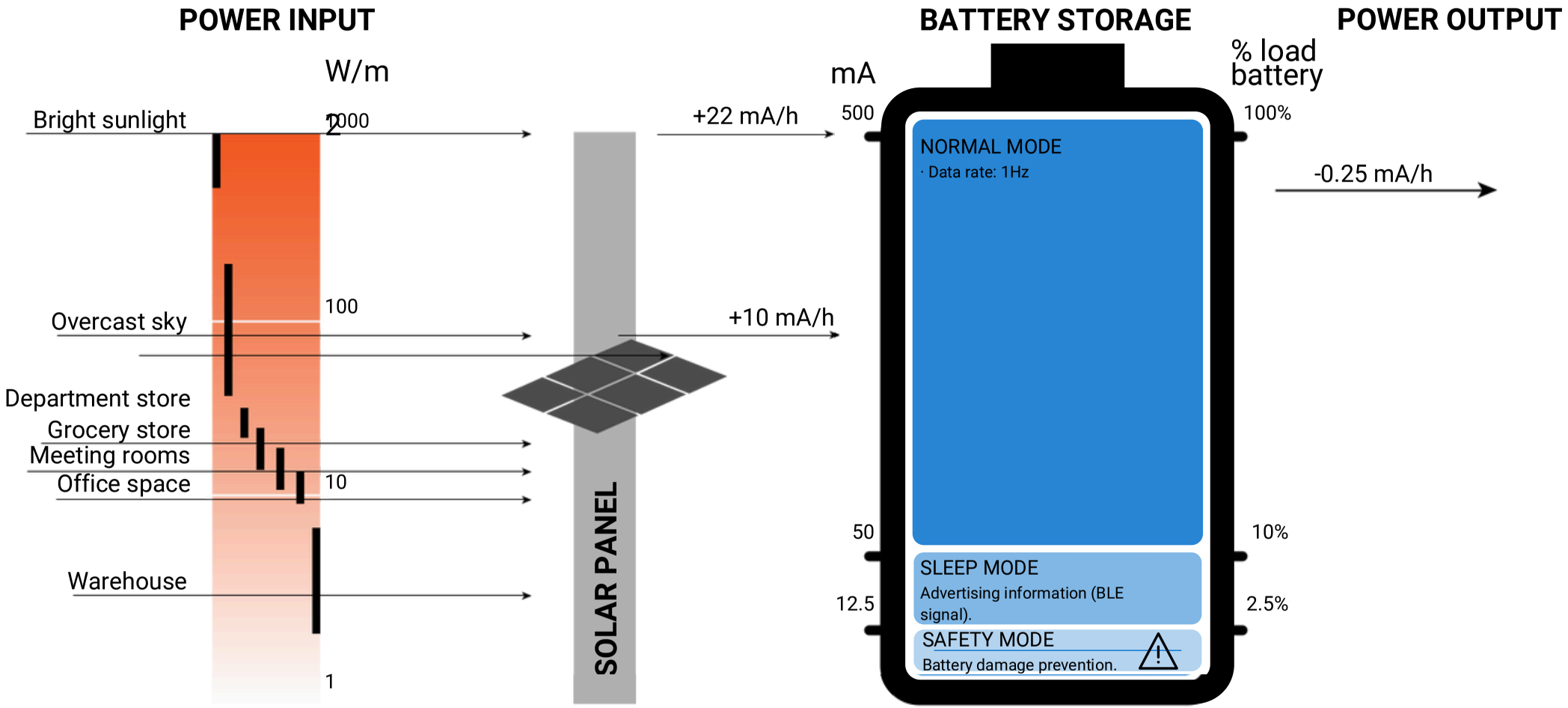
NORMAL MODE
· Battery voltage: 10% - 100%
Every mode changes automatically depending on the voltage of the battery.



Sensors	· Ultrasonic transducers (4x) · Sample rate: 1 Hz

Ultrasonic transducers (4x)
The Ultrasonic Portable Solar has been designed to avoid any mechanical parts to maximize reliability and minimize maintenance.

The transducers communicate between themselves two by two by using ultrasonic range waves. Each pair of transductors calculate the signal delay and obtain information about both, wind direction and wind speed.



Examples:

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.

Wind Information

Wind speed	Range: 1 - 25 m/s (2.24 - 56 mph) Resolution: ±0.1 m/s at 10m/s (±0.22 mph at 22.37 mph)
Wind direction	Range: 0 - 359° Resolution: ± 1°

*For more information about how to get each value, please visit our website and download latest full manual of the Anemotracker App.

Protection Grade

Protection grade	· IPX8 (10 meters, 32.8 feet)

The Ultrasonic Portable Solar has been certified by an approved independent laboratoty as IPX8. In order to get the IPX8 code certificacion, 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 successfull 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, pressu- re increase rate (immersion velocity), water density and temperature, under-water 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.

Mounting Information

Easy mount	· 16 mm or 0.63 in. (M16×2 female thread)

You can mount your Ultrasonic Portable Solar in a simple way as it comes with athreaded lower part (16 mm M16×2 female thread).

Please, visit our website and check available accessories and their possible combinations.

Mast Mount for Ultrasonic Portable Solar

Aluminum & Carbon Fiber Pole
· 33 cm. (13 in.)
· 100 cm. (39.37 in.)

Firmware

Firmware	Upgradable

How can I do that?
Follow the next steps:
1. To check the availability of the new firmware version, please visit our webpage and download the file.

2. Download the Calypso Upgader App available in Google Play or Apple Store.

3. Scan and connect to your device.
Open Calypso Upgrader App. Click on the "Scan and connect" button. Identify and select your Ultrasonic device.

4. Upgrade.
Once it has been connected, click on the "Upgrade" button. You can follow your upgrade status by looking at the bar below the Upgrade button.

The app will automatically disconnect from your device, and it is completely upgraded and ready to be used.

*Tutorial video available at our website and on our Youtube channel.

***Please note that our Ultrasonic Portable Solar with firmware version 0.77 and 0.78 don't need to be updated to the latest version.**

Product Material	Machine-engineered plastic
Quality Control	Every unit is tested and calibrated in production.

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:

· The **Apparent Wind** and **Apparent Wind Angle**

· The **Real Wind** and the **Real Wind Angle** collected by the anemometer and the crossing with the GPS of the connected device.

· All collected data can be stored in the memory of the application, exported and shown on graphs.

*For more information on How to use Anemotracker App, please visit our website and download the latest version of the app user manual.

5. Installation

5.1. Installing the unit

The Ultrasonic Portable Solar has to be oriented to the bow of the boat (in non-sailing scenarios it should be aligned to the natural north or to the target) taking as reference the mark that appears at the top (as shown in the image below).

It comes with a threaded lower part (16 mm M16×2 female thread) that can be adapted to your available accessories.

*Please check our available accesories on our website. Make sure to install the sensor in

a location free from anything that obstructs the flow of
wind to the sensors within a **2 meter radius**, for example, the mast head on a boat.

5.2. Installing the App and testing the unit

Follow the next steps:
1. Make sure your device is BLE compatible*.

· Ultrasonic Portable Solar works with Android 4.3 or 4.4 or iOS devices (4s, iPad2 or beyond).

2. Download and install Anemotracker App on your device from Google Play or Apple Store.

3. Once the App is installed, start it and open the settings menu by sliding the screen to the right.

4. Press the button “Scan” and all Ultrasonic Portable devices within the range should show up at screen.

5. Select your device and connect.
If your device connects with the Ultrasonic Portable correctly, continue with the normal installation.

If not, please read the following lines.

Your device is compatible but you can not connect?
1. Make sure BT (Bluetooth) mode is running on your smartphone, Tablet or PC.

2. Make sure Ultrasonic Portable Solar is not on Off mode. If the device has not been exposed to any source of light for an extended period of time it might be necessary to keep it under direct sunlight for a few hours. A cloudy day will work too.

4. Make sure no other device is linked to your Ultrasonic Portable Solar. Each unit can only be connected to a single device at a time. As soon as it gets disconnec- ted, Ultrasonic Portable is ready to link to any other device with the Anemotracker app installed.

For further information please contact Calypso Technical Support at aftersales@calypsoinstruments.com.

6. Compatible Apps

We constantly work on making the product compatible with a great diversity of applications. You can find a list available on our website in the **Developers section**.

*Please check current compatibility and features on their websites.

Our hardware is open source.
We are a hardware firm but we developed and maintain Anemotracker App to be used with our products. We realize that our users' diverse needs require tailored solutions beyond our imagination and that's why we decided from the beginning to open our hardware to the world.

We encourage third party software and hardware firms to integrate our hardware on their platforms at their will.

Please check the **OEM section** of our website for further details.

We made communication as simple as possible; however, if you need support, do not hesitate to contact us either by email at **sales@calypsoinstruments.com**.

7. FAQ/troubleshooting

For more FAQ'S and troubleshooting, please visit our website at www.calypsoinstruments.com for more details, information and videos.

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

Option 2 : Outdoors Charge

Option 1 : 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.

O**ption 2 : Outdoors Charge**

Sun strenght 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.

8. General information

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

If you have any questions or doubts, please contact us directly. We will be glad to assist you in any time.

Other important aspects

·**Do not attempt to access the transducer area with your fingers.**

·Solar panel comes with a protective film bulit-in. Do not remove the film, as it will damage the cell.

·**Do not attempt any modification to the unit.**

·**Never paint any part of the unit or alter its surface in any way.**

If you have any questions or doubts, please contact us directly. We will be glad to assist you in any time.

Maintenance and repair

The Ultrasonic Portable Solar does not require great maintenance thanks to the lack of moving parts in this new design.

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.

Transducers must be kept clean and aligned. Impacts or incorrect impulsive handling may lead to transducers 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.

Warranty

Warranty is void in case of not following the instructions of use, repair or maintenance without written authorisation.

This product is for leisure purposes exclusively. Any wrongful use given by the user will not incur in any responsibility on part of Calypso Instruments. As well, any harm caused to ULTRASONIC PORTABLE SOLAR by accident will not be covered by the waranty. Using assembly elements different from those delivered with the product will void the warranty. Changes on transducers position/alignment will void any warranty.

For Warranty service, please send your device DIRECTLY to Calypso Instuments if bought from them with a copy of your invoice showing purchase date within the last 2 years and a copy of the Repair Ticket. Contact Calypso Instruments for the Repair Ticket See details below.

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

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