

# OPERATION & MAINTENANCE MANUAL

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Read this manual carefully before use - v. 24/10/2024

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# GPSY OPERATION & MAINTENANCE MANUAL

## MATERIAL



## BODY

The mark's body is composed of a fiberglass waterproof structure including motors, batteries, and electronics.

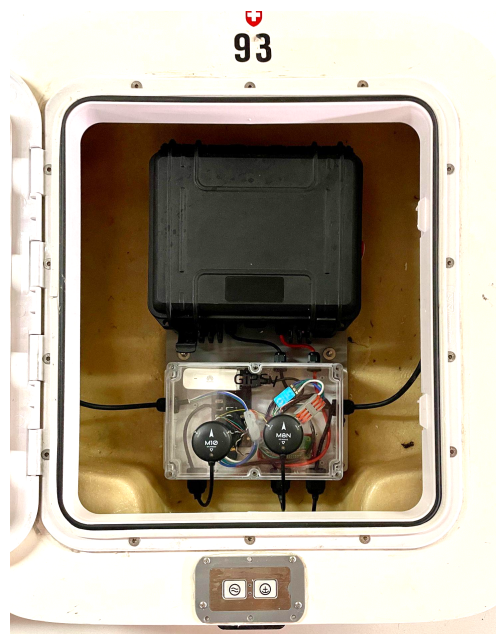
The body can be used in stand-alone mode or combined with an inflatable part. Two electric motors are lowered into the water thanks to a mechanical spring system. The engine arm can be pushed forward, rotated down, and lowered on its pin. The body has an opening for the batteries on the top part. It also has two buttons for manual use of the buoy.

The front part of the body is where the serial number is displayed.

Battery box

Dongle

Free and Fix buttons



Switch on/off

GPS Antennas

## INFLATABLE

The inflatable is the visible part of the mark. It allows for towing and easy grab from the water for big displacements. Its shape is self-stabilizing. The inflatable must be inflated and deflated in soft places. It is advisable not to fold it on hard ground. The inflatable has separate air chambers.

## ADAPTOR

The body is connected to the inflatable part through two transversal tubes.

## BATTERY AND CHARGER

Batteries are made of Ion-Lithium material, 36 Ah or 70 Ah. Storage temperature between 5°C and 35°C. The batteries should not be removed from the box and the charging cable should reach them directly.

Always turn off the mark before unplugging the batteries.

The batteries are equipped with a Battery Management System (BSM), able to control the charging phase and monitor, in real-time, the behavior of the batteries during usage. Never leave the buoy charging unattended.

Charging is done by plugging the XT60 connector (yellow connector). The charger will display a red light during charging and a green light when the battery is fully charged.

Effetto Venturi will provide the Material Safety Data Sheet MSDS.



## WIND SENSOR

The wind sensor Calypso Mini will automatically connect to the closest buoy via Bluetooth. It is normally offered with custom support, and it comes with a wireless charger.

It must be mounted with the little hole or arrow pointing precisely at the front of the buoy.



The wind sensor can last 150 hours without being charged. The charging starts when the Calypso is put upside-down on its wireless charge pad (to be placed with labels on the bottom part) and a small red light on the platform becomes blue.

More information on Calypso wind sensors at [calypsoinstruments.com](http://calypsoinstruments.com).

Separate apps can be downloaded for free to use the instrument when not with the buoy, or simply check its battery status, or upload firmware upgrades.

All apps here: [apps.apple.com](https://apps.apple.com) or [play.google.com](https://play.google.com)

## GETTING STARTED

### PREPARING THE MARK

#### BUOY MOUNTING:

1. Inflate the inflatable part
2. Connect the body to the tubes with the central screw pointing up and by securing the two parts with a knob or self-locking nut and a washer
3. Place the whole structure on the inflatable and tighten the stripes.





#### GETTING READY:

1. Charge the batteries
2. Place the body on land, flat and far from big metal constructions
3. Turn the mark ON through the switch on the side, and don't move it
4. Wait for 3-4 minutes: the antenna will first show a blinking blue LED while looking for a satellite connection, once the connection is established, the LED will turn green
5. Calibration: applicable just every couple of weeks or when using the mark in a new location. Place the mark on the flat ground far from metal constructions, the front part pointing exactly North. Press the free button for over 12 seconds, till the buoy restarts and connects to the satellites
6. Check for LTE connectivity: the USB dongle should display a solid blue LED (Huawei) or a solid green LED (Brovi)
7. Close the inspection door
8. Check the functioning of the motors by pressing the left button for at least 3 seconds until the lights become solid (fix mode). Check if all motors are running by moving the mark from its position. ATTENTION: don't let the thrusters run outside the water for more than 10 seconds as they are made to be water-cooled. Release the motors by pressing the free button for over 4 seconds till the thrusters stop.

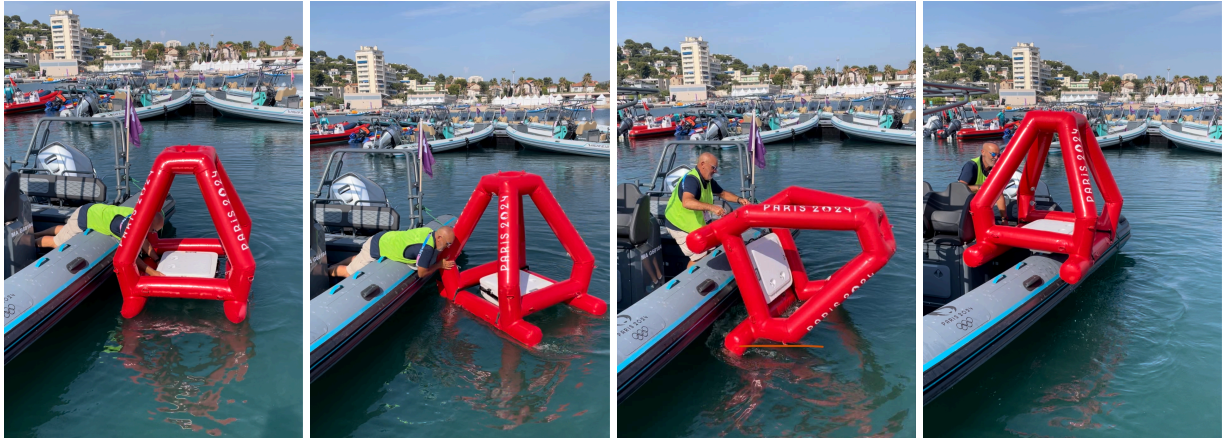
## BUOY'S HANDLING ON THE WATER

The buoy can be quickly transported to the desired area with a boat.

It should be put on a boat in the upside position.

Once in the desired location, the buoy should be placed on the water from the upwind side. The motors have to be lowered down **ONLY AFTER** placing it on the water. The fix button can then be pressed to lock its position.

When a buoy has to be taken on board, set it on free first by pushing the wave button for over 4 seconds till the motors stop. Take the engine's legs up **FIRST** then take the buoy onboard by sliding it on its hulls.



## MANUAL CONTROL

Anchor button: press and hold for 3 seconds then release to fix the mark on the actual spot (anchor down).

Wave button: press and hold for 3 seconds then release to free the mark (anchor up).

## REMOTE CONTROL

### OPENING THE WEB INTERFACE

Once the mark is switched on for the first time in the day, open the web interface with your credentials on [control.effettoventuri.eu](https://control.effettoventuri.eu). You can also use a demo version with the username *demo* and password *demo1*.

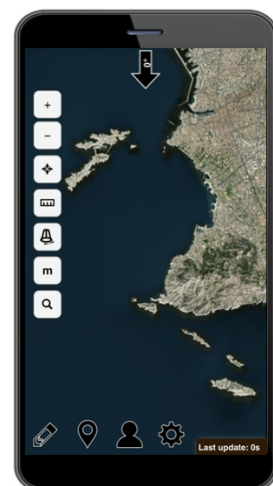
### MAIN SCREEN DESCRIPTION

The main screen is composed by:

- A map in the background that supports touch interactions
- Left and bottom Menus
- Wind arrow
- Info on page refresh

#### Left menu

- In/out zoom buttons
- A crosshair symbol to display your own position
- A ruler symbol to measure the distance and angle between objects
  - A link to rotate the regatta course
- Switch between meters and nautical miles
- Search button



## Bottom menu

- Drawing button
- Pin insertion
- Profile
- Setting (units)

- Last update

(normally refreshes every 5 seconds. If your phone loses connection, you'll see a red background)

## BUOY MENU

### MAIN BUOY MENU:

By clicking on a buoy, a menu will appear:

- Buoy name (it can be changed)
- Stepped thrusters
- Displace through dragging (showing a preview of distance and angle)
- Displace through steps: upwind-downwind-sideways



- Battery level

- Info menu
- Fixed mark
- Displace through angle and distance from other objects or itself
- Displace through coordinates

If the mark is powered on in free mode (no clickable. To unlock the options click first on

anchor), the options to move it won't be the "Fix" button to fix the buoy on its position.

A buoy in a fixed position can be moved in 4 ways: Drag, Distance/angle, Offset, Coordinates.

1. Drag: allows you to drag the mark to the desired position on the map. A preview position will appear in green on the map. While dragging it, info on the distance and angle relative to the map orientation compared to the last position will be shown. Once the position is ok, select the button "Apply". The mark will start heading to the green preview. If you change your mind before clicking on "Apply" click on "Cancel" to go back to the buoy's menu. The drag function is useful especially when pre-set courses are present (see "Drawing Courses").



2. Distance/angle: the mark can be placed at a certain distance and angle (compared to the map orientation) with

respect to a selected item in the reference menu. The item can be the mark itself, another mark, or a pin (a point in the map defined by the user, see "Placing a pin"). Select "Apply" to confirm.



- Offset: displace a mark through a quick input towards the desired direction. By selecting the number of meters, you can click as many times as you want to keep moving the mark on the map. Select "Apply" to confirm.



- Coordinates: give a manual GPS position to the mark. Choose the format in the settings menu (down).



## INFO MENU:

The “info menu” contains less frequently needed information, such as:

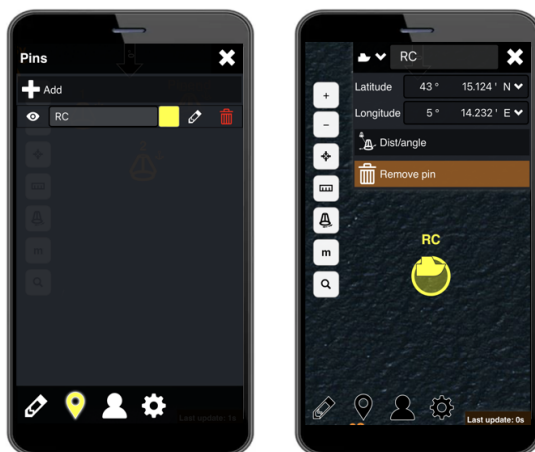


- The serial number of a buoy
- The actual position (or the last one registered, before disconnecting)
- The distance from the goal: this information can be useful if a new goal is given, to understand if the distance decreases properly and estimate the time needed to reach the goal
- The wind direction and speed, if a wind sensor is connected
- A calibrate button that can be used as an alternative to the free button: if the buoy is in a “fixed” position, the button is locked and to launch a calibration the buoy needs to be in “free” mode
- The trace button is useful to check the history of the commands on the map and on a timeline, showing the distance of the buoy from its goals.

## PLACING A PIN

Pins are useful tools to be used as fixed references. They can be created by clicking on the pin symbol in the lower menu.

Click on the plus button “add new Pin”, and a menu will appear on the top right of your page. Give your pin a name and select a symbol from the dropdown menu. By default, the pin will be placed in the middle of the map. It can be moved by dragging, by changing its coordinates or by selecting another object of reference and imposing a distance and an angle (relative to the “north” of the map given).





## ORIENTING THE MAP AND THE MARKS

It is often convenient, especially in sailing, to orientate the map in order to have it aligned with the wind direction.



The map can be oriented: click on the black arrow, write the number corresponding to the wind direction in degrees compared to North, and click on "Orient map" to validate. The orientation of the map is always displayed on the arrow.

To rotate the whole set of marks that are currently in FIX position within 10 km from the rotation point, you can select a rotation point in the drop-down menu under: "Rotate fix marks around", and when exiting the menu the program will ask you a confirmation for rotating the whole set of marks.

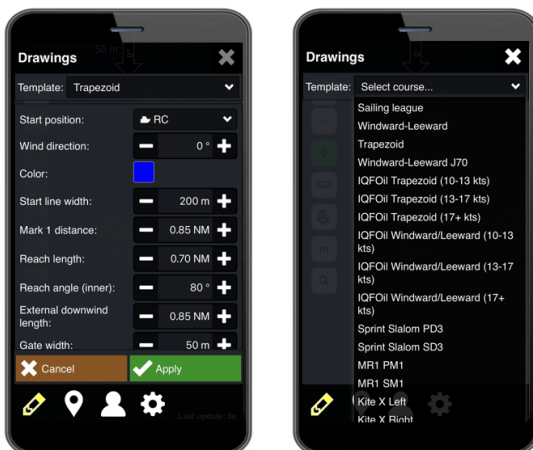
## DRAWING COURSES

Different courses (pre-set courses or freely drawn courses) can be created on the map and saved for the future. The drawings (together with the pins) are displayed also on other devices with the same user account. To see changes from another user, simply refresh the web page.

Click on the pen symbol on the bottom left menu, and click on the plus button "add course" for templates or "add drawing" for brand new ones.

### ADD COURSE

Course templates are designed and used for precise courses. Wind direction, starting point as Race Committee (drop-down menu), lengths, and angles can be customized.



Once the drawing is set, buoys can be dragged and placed on the points.

When some changes are made (by clicking again on drawings and the selected course) the choice is whether to move also the buoys attached: toggle the “move attached marks”.



## ADD DRAWING

The default option to create a free drawing course is “line” and a drawing with straight lines can be realized by tapping on the map. After clicking on “finish” you can adjust the position of the points connecting the lines, by simply dragging them. The distances and relative angles are always shown (the angles are the ones between two lines).



The drop-down menu offers more styles as well, such as polygons or circles and more colors. You can name each drawing differently. Use the delete button to delete the drawing.

You can draw as many courses as you want and choose which ones to display by clicking on the pen icon and the eye symbol next to each drawing.

## ROTATING AND MOVING A DRAWING

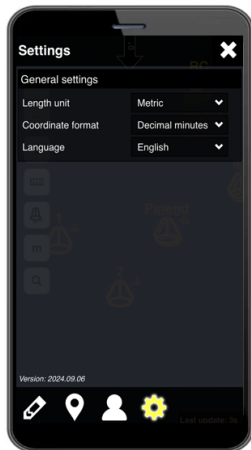
It happens often that the wind changes direction and it's useful to keep the same course with a different orientation. This can be done by changing orientation around a mark, yourself, or a pin previously created, such as a Race Committee boat on the starting line.

Click on the pen icon on the bottom left of the screen, and select the rotation symbol next to the course to be rotated. Once the menu for the rotation of the drawing appears, select the anchor point in the dropdown menu, then apply the angle desired, and click on “finish”. At this point, the drawing will rotate.

On the edit menu of the drawing, it is also possible to move the drawing maintaining its geometry. Select “move” and then

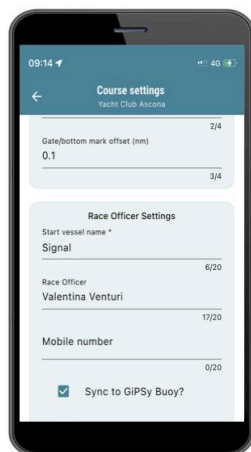
## UNITS

In the setting button, on the bottom menu, you can select the units to be used: nautical miles or meters. You can also choose the type of GPS coordinates to use.



## SYNCHRONIZATION TO BUOYZONE

It is possible to import pins from BuoyZone. First of all create a course in Buoyzone advanced setting for the desired course and tick “Sync to GiPSy Buoy”.



In GiPSy's web application go to the login Symbol and insert the course number: be aware that spaces are not allowed.



Once the importation is done PINS are visible and they can be used as reference to attach the buoys positions.



Pins from Buoyzone can be refreshed or hidden in the PIN menu.

## MARKS MAINTENANCE

### CLEANING

Rinse the mark after every use in salty water, especially propellers and pins where the motor leg pivots, after turning the mark off. Turn the propellers manually while rinsing and check for any anomalous friction during rotation. Every 5 uses, let the motors spin in fresh water for at least 15 seconds.

### INFLATABLE

The inflatables shall not be deflated and folded on the hard ground/asphalt as they can be damaged. During the deflating procedure, they should be on a carpet or similar soft ground.

If you notice that one air chamber is losing pressure quicker than others check for small holes, apply adhesive Dacron on it or a piece of spare material with glue for rubber boats.

### ENGINE ARMS

The elastic pieces holding the engine's arms can be released during long pauses. Replace them with elastic material of the same size and length if they lose elasticity. Rinse carefully the arms at each use and check the screws holding the

thrusters.

## TROUBLESHOOTING

### BAD CALIBRATION

A mark rotates in 5-10 m diameter circles: the mark needs calibration or was calibrated near a metal construction (see the getting started section for calibration). Recalibrate possibly on land or in urgent cases on the water by keeping the mark as firm as possible pointing north.

### OBSTRUCTED MOTORS

A mark rotates on itself or its distance to the goal increases: check the engines for obstructions, after putting it in a free position. If there is an obstruction, turn the mark off and remove it carefully. Check for the good rotation of the propeller and if something is creating friction, stop using the mark and call the Company.

### LOSS OF CONNECTION

1. The buoy lost connection but can still be used in manual mode (the push buttons are working): check for the light on the dongle (normally visible next to the antenna). It might be that the connection is bad, try and reboot the buoy.
2. The buoy lost connection and cannot be used in manual mode (the push buttons are not working): call the Company.

ENJOY YOUR GIPSY BUOY!