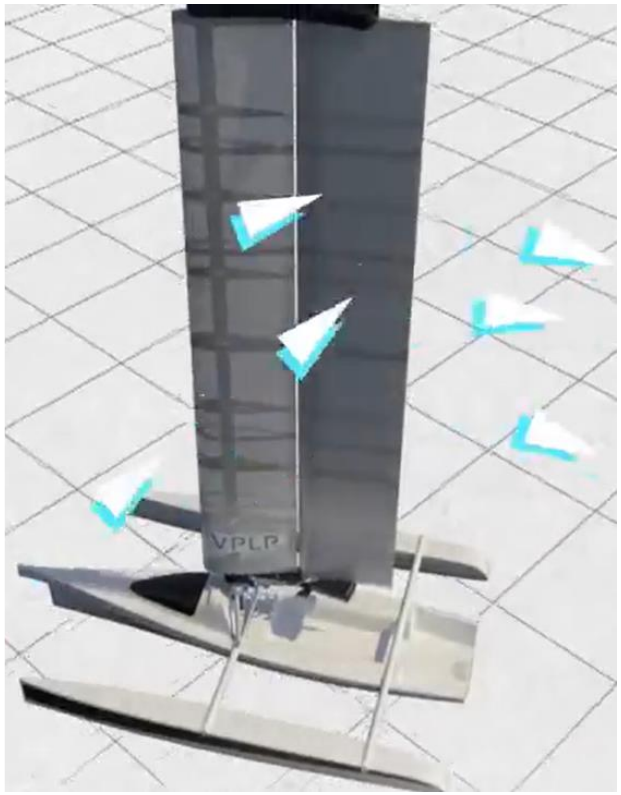
OCEANWINGS OPERATING PRINCIPLES

1. SENSORS ON THE WINGSAILS MEASURE THE WIND

2. A COMPUTER ANALYSES THE DATA

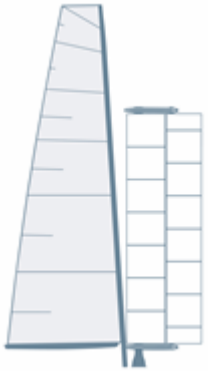
3. MOTORS ADJUST THE WINGSAIL ANGLE OF ATTACK DEPENDING ON THE SHIP'S HEADING



OCEANWINGS
THE MOST CONVENIENT AND PERFORMANT WINGSAIL

AYRO

OCEANWINGS
THE MOST VERSATILE WINGSAIL



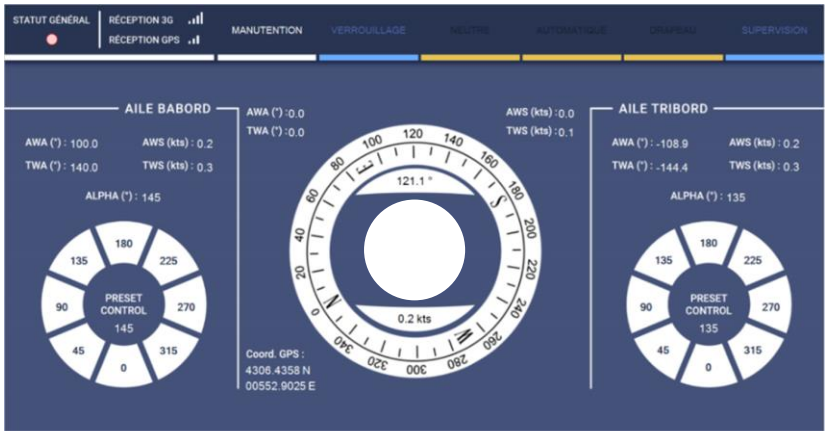
TWICE AS PERFORMANT

AUTOMATED

ADJUSTABLE CAMBER

REEFABLE & FURLABLE

AIUTO
AUTOMATION & CONTROL SOFTWARE



OPERATING WINDOW

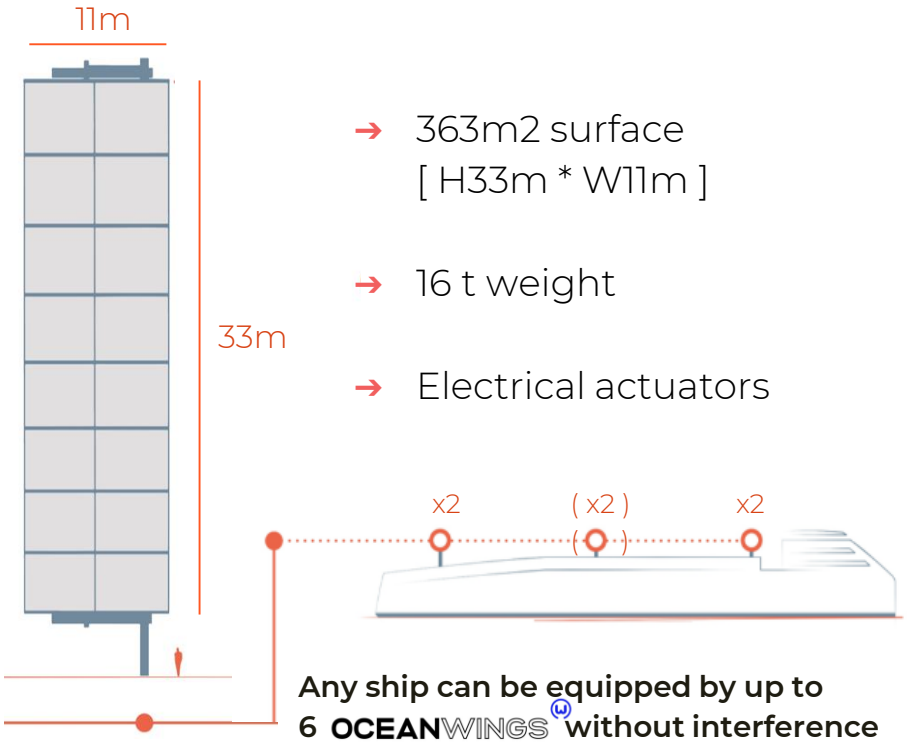
- Applicable Apparent Wind Angle from 5° to downwind
- Oceanwings are reefable and can be used with an Apparent Wind Speed from 0 up to 80 knots
- Can be fully lowered with negligible windage to manage port maneuvers and commercial operations
- Designed to endure wind speeds of up to 140+ knots

SIMPLE RELIABLE SAFE PERFORMANT

PATENTED

OCEANWINGS® INTEGRATION ONBOARD A SHIP

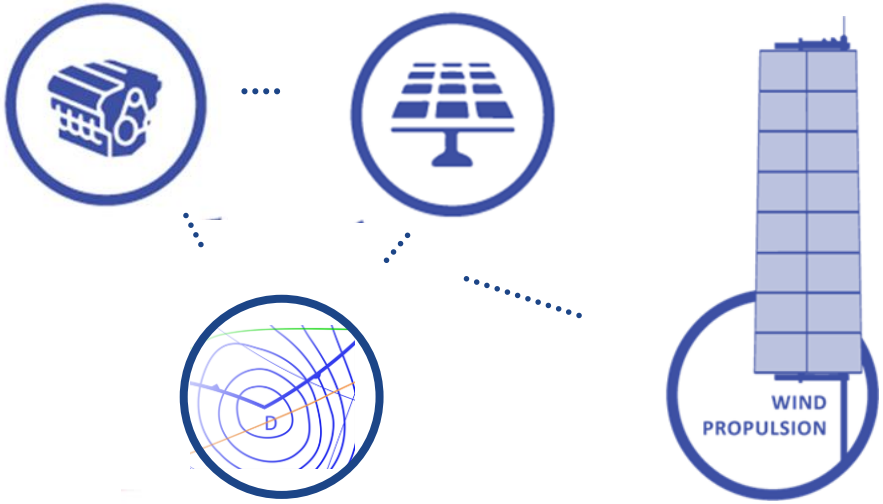
OCEANWINGS® MAIN CHARACTERISTICS



- 363m2 surface
  [H33m * W11m]
- 16 t weight
- Electrical actuators

Any ship can be equipped by up to 6 OCEANWINGS® without interference

INTERFACE WITH ENERGY MANAGEMENT SYSTEM AND ROUTING



The easiest wingsail system to install aboard a ship, comparable to a handling crane setup...

... enhancing the operational efficiency and performance monitoring.

16 MONTHS OF OPERATIONS AT SEA

2010
America's cup Winner

Wingsail designed for BMW Oracle Racing, Winner of the 33th America's Cup in 2010

2016
Prototype

Development in collaboration with Ademe
Extensive testing in 2017

2018-2019
Industrial Demonstrator

2 Oceanwings equip Energy Observer, a Zero CO2 emission ship, sailing successfully for 1 year across the seas

2020 +
Decarbonation of Maritime Transport

Canopee, the first modern wind powered ship dedicated to Ariane 6 transport.
120m long ship equipped with 4 Oceanwings

OCEANWINGS®, FITTING ALL TYPES OF SHIPS

KEY BENEFITS OF USING OCEANWINGS®

COSTS EFFECTIVENESS
- 15-45% fuel savings
- 10-30% opex reduction

REGULATION COMPLIANCE
- IMO* 2030 compliant
- IMO* 2050 compliant with hybrid system

GREEN BRANDING
- Chartering opportunities
- Port state advantages
- Financing facilitator

FUTURE PROOF
- Reduced dependency on fuel price
- Carbon tax avoidance

A SYSTEM WELL ADAPTED TO OPERATIONS

Weather Conditions
Oceanwings have optimal lift-to-drag ratio and can be reefed or lowered

Seafarers
No additional crew nor extensive training

Plug & Play installation
Limited structural reinforcement alike a medium capacity crane

Safety
Fully automated system with integrated safety features

* International Maritime Organization

FROM CUTTING-EDGE SAILING TECHNOLOGY
TO A COMPETITIVE INDUSTRIAL ANSWER
FOR THE INTERNATIONAL SHIPPING INDUSTRY

PHONE
+33 (0)1 42 77 24 00

EMAIL
CONTACT@AYRO.FR

ADDRESS
2 RUE D'HAUTEVILLE, 75010 PARIS, FRANCE