

**OPTONAVAL
HVLA
SYSTEM**

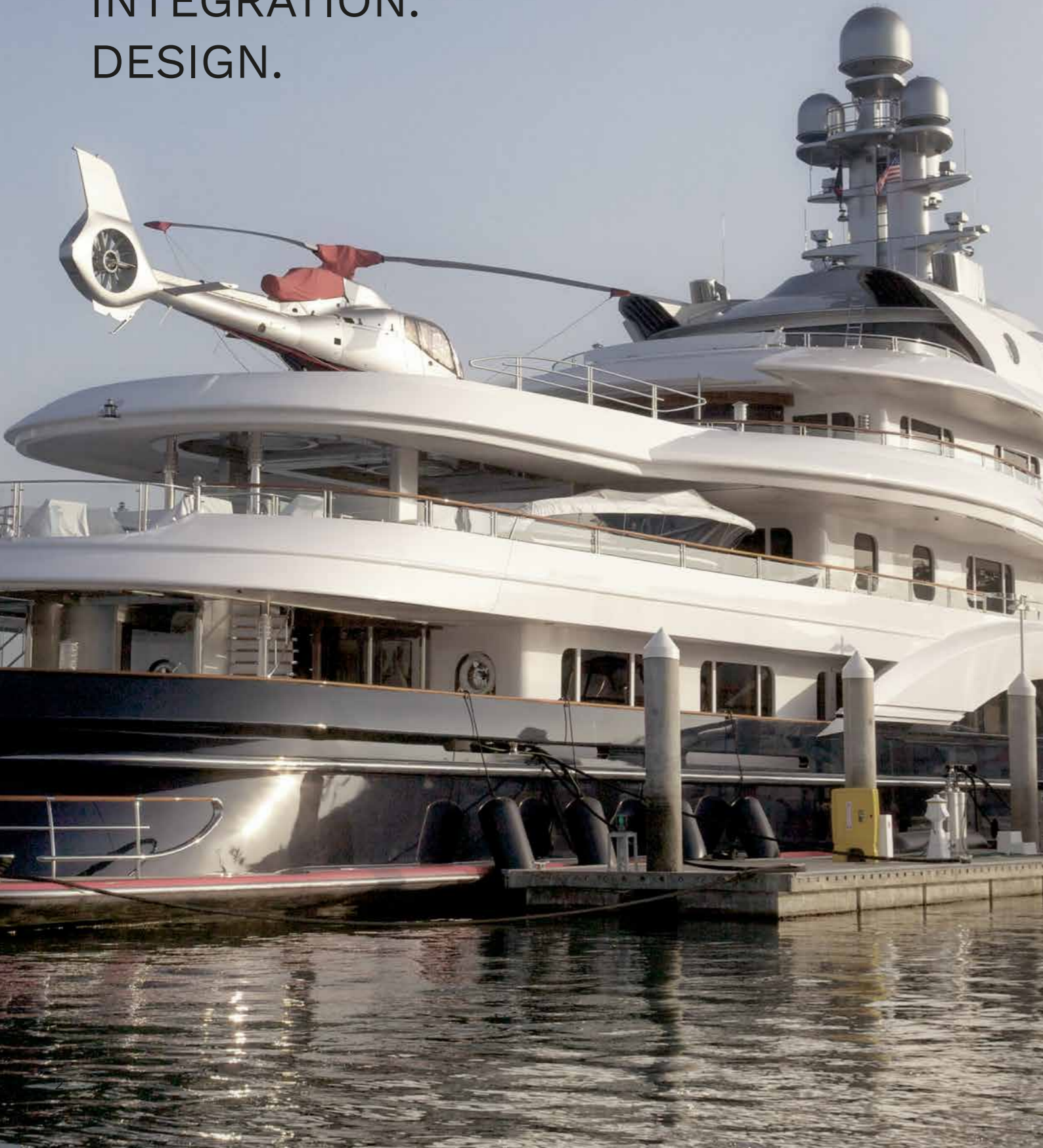
**HELICOPTER
VISUAL LANDING
AID SYSTEM**

**LIGHT.
HELI LANDING.
SURVEILLANCE.**





SYSTEM.
INTEGRATION.
DESIGN.



OPTONAVAL GMBH.

Optonaval GmbH are the leading experts in engineered solutions for special lighting, and discrete surveillance. Their range of competencies assists mega yacht owners and designers to find the most appropriate systems, be it for navigation lighting, retractable cameras or Helicopter Visual Landing Aid Systems (HVALS).

INVOLVING OPTONAVAL THE CUSTOMERS CAN RELY ON

- Perfect combination of proven engineering and cutting-edge technology
- Innovation and customized solutions
- Design in perfection
- Competence in engineering, installation, service and after-sales support



MORE THAN EXPECTED.

ENGINEERING, PRODUCTION, INSTALLATION AND COMMISSIONING FROM ONE HAND.

ACCEPTING OVERALL SYSTEM RESPONSIBILITY.
Optonaval accepts responsibility for their whole package of systems and product installed on board Mega Yachts. Engineering, production, installation and commissioning (EPIC) remain in one hand.

MATCHING QUALITY AND INNOVATION.
Each individual Optonaval product meets the highest demands in quality and function. Built with the latest in LED technology, revolutionary sensor and control systems.

MODERINZATION AND REFITS.
Upgrades of Mega Yachts are facilitated by using Optonaval's modular equipment. Flexibly integrated, design adopted to customer's standards.

DEDICATED TO CUSTOMER SUPPORT.
In case of problems Optonaval experts are available to analyse and solve it. Communication 24/7, prepared to assist on board wherever needed.



HELICOPTER VISUAL LANDING AID SYSTEMS.



Optonaval provides the systems needed for helicopter operations. From early design stage, through project realization until final acceptance Optonaval supports its customers to secure safe helicopter operations within the requested limits and specified regulations. In addition, they design, produce, integrate and maintain Helicopter Visual Landing Aid Systems (HVLAS) tailor-made for Mega Yachts.

OPTONAVAL STANDS FOR

- Safeguarding the integrity of the ship
- Light components just appearing for helicopter operations when needed
- Guidance for certified deck operations according to CAP 437
- Market leading range of products enabling helicopter landing in open sea environment
- Customised project solutions
- Focus on low maintenance and high availability
- A dedicated team with more than 10 years experience in the design of HVLAS

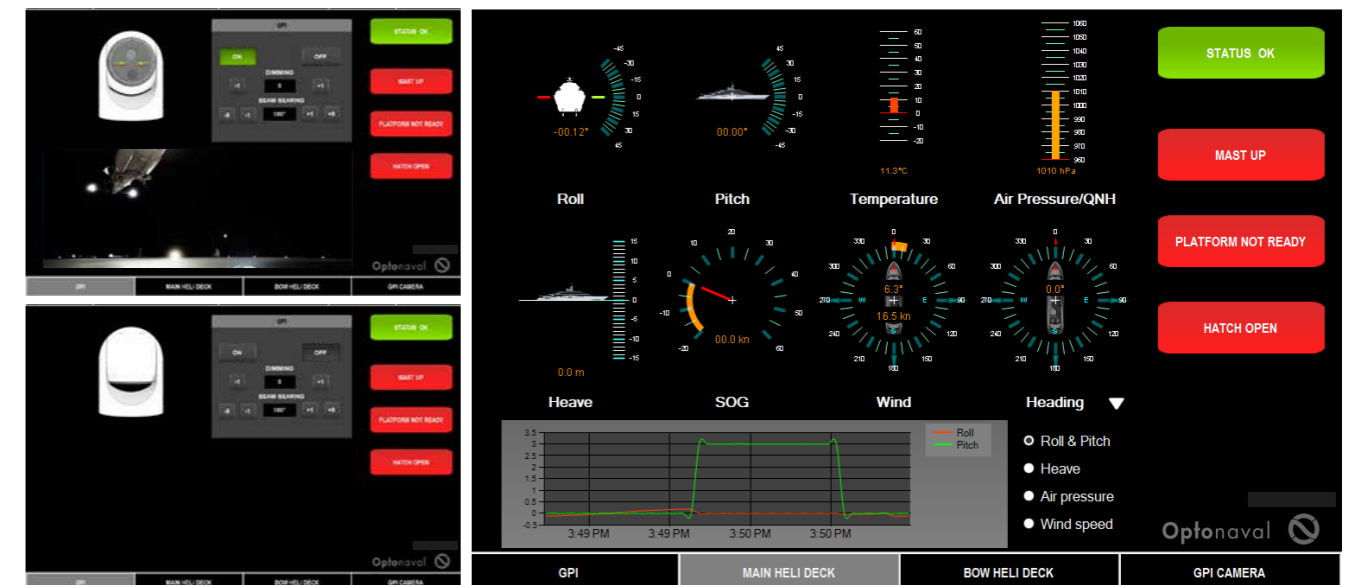


MONITORING HELICOPTER OPERATIONS.



RELIABILITY | SIMPLICITY | SYSTEM INTEGRATION.

- Control and monitoring software developed by in-house staff
- Intuitive graphical user interface, easy to operate, designed by helicopter pilots
- Essential information and warnings always in the foreground
- Safe Helicopter Operation Limits (SHOL) shown for communication with the pilots
- Facilitating easy communication between ship and helicopter
- Assisting in identification of malfunctions and deviation of standard values
- Tracking the maintenance history
- Integration of peripheral helicopter service components
- Interfaced to ship's command system



HELICOPTER VISUAL LANDING AID SYSTEMS.



PRODUCT RANGE

FDO AND BRIDGE CONTROL STATION

GLIDE PATH INDICATOR

HORIZON INDICATING SOLUTIONS

HOMING BEACON / FLASH LIGHT

FLUSH COMBINED DECK EDGE LIGHT /
PERIMETER LIGHTS

DECK LEVEL ADJUSTED DECK EDGE LIGHT

ILLUMINATED AIMING CIRCLE AND "H"

OBSTRUCTION LIGHT, HOMING BEACON

DECK STATUS LIGHT / STOP&GO LIGHT

SERVICE FLOOD LIGHTS

ILLUMINATED WIND SOCK

GPI GLIDE PATH INDICATOR



SAFE GUIDANCE | FULLY REDUNDANT

- Motion-stabilised glide path according to ICAO Annex 14
- Guiding the pilot from up to 5 nm distance, showing the right angle of approach
- Two redundant light projection units
- 180° rotating
- Roll and pitch stabilisation $> \pm 25^\circ$
- Two integrated motion sensors, no interface to gyro necessary
- Design focus on lowest maintenance
- Optional day/night camera, flood light, thermal imaging etc. integrated, motion stabilised and target tracking



ROLL
STABILISATION

PITCH
STABILISATION



CUSTOMIZED FLIGHT DECK LIGHTS 2.0



DESIGNED WITHOUT LIMITS | HAND CRAFTED IN HAMBURG

- Flush deck lights, popping up when needed, CAP 437 compliant
- Using the helicopter deck also for recreational activities
- Aiming circle and H marking lights inserted in teak deck or epoxy layer
- Adjustable, exchangeable, low maintenance
- Even and clearly lighted deck, dazzle-free for the pilot
- Indication lights for various purposes, modular units
- Low maintenance, extremely long-life time due to LED technology



COMBINED DECK EDGE / PERIMETER / FLOOD LIGHT POP UP VERSION



RETRACTABLE



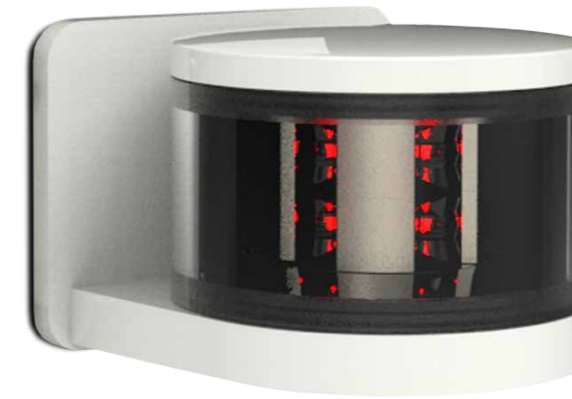
COMBINED DECK EDGE / PERIMETER LIGHT



UNIVERSAL NAVIGATION LIGHT

LONG-LIFE PRODUCTS | ANSWER TO MARKET DEMANDS

- Family of navigation lights, equal common parts, different functions
- Self-monitoring any deterioration, maintenance prior malfunction
- Easy to be installed, shipyard friendly
- Modular design, minimizing spare part storage
- Serviceable by trained crew members
- Perfect marriage of design and technology



SURVEILLANCE. NON-DISTURBING CAMERAS.



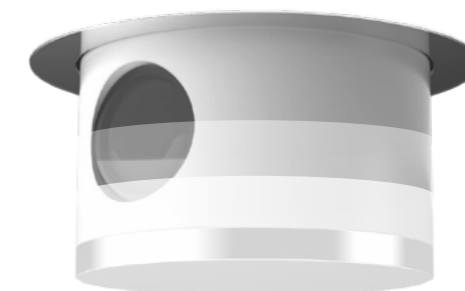
DEVELOPED TO OWNER'S WISH | SIMPLE AND INGENUOUS SOLUTION.

- Optonaval's contribution to passengers' comfort and discretion requirements
- Installed inside or outside
- Unveiled when needed
- Interfaced to CCTV system
- HD-camera in the motion stabilised GPI for tracking floating objects on the sea surface



POSITION **EXTENDED**

POSITION **RETRACTED**



RETRACTABLE



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