



## Project RPV Maritima: Energy Management for Sustainable Marine Systems

### About Maritimatrix™

Maritimatrix™ is the innovation arm of Masten-Cain Consulting Inc., a woman-owned public benefit S Corporation founded in 2017. Our mission is to design and deliver technologies that promote environmental sustainability and social equity—especially for communities facing industrial and climate-related threats.

### Leadership Team

- **Kathryn Masten, Ph.D.** – CEO and information systems strategist with deep expertise in community informatics and public interest technology.
- **Randy Cain** – CTO and former global Certified Enterprise Architect at Xerox, with a half-century of experience in enterprise IT and systems integration.

### Core Offerings

- Research and development in maritime informatics and sustainable energy systems
- Consulting services for communities impacted by petrochemical expansion and climate change
- Open-source hardware and software platforms for resilient, off-grid automation

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### Product Innovation: Wireless Mesh Network Systems Integration

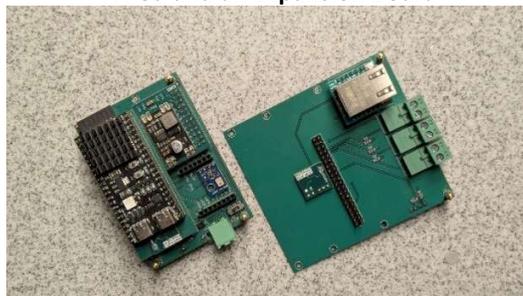
Our flagship hardware product is the **Maritimatrix™ Pod**—a modular microcontroller-based computer built from open-source printed circuit boards (PCBs). Pods can operate independently or as nodes in a wireless mesh network. Each Pod supports a wide variety of expansion boards for seamless integration with third-party devices.

At the heart of this system is **Maritimatrix™ MNOS** (Mesh Network Operating System), our proprietary firmware that enables:

- Reliable, energy-efficient communication across all connected components
- Instant data sharing between sensors, motors, safety systems, and control modules
- Resilient performance in off-grid, mobile, and harsh environments
- Easy updates and feature expansion without hardware replacement

Maritimatrix™ MNOS acts as a “nervous system” for automated platforms, enabling smarter, safer, and more autonomous operation. The architecture is designed to foster a developer ecosystem, allowing third parties to build and contribute their own Pod-compatible expansion boards.

**A Pod and an Expansion Board**



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## 🚢 Demonstration Platform: RPV Maritima

To showcase the capabilities of the Maritimatix™ Pod and the Maritimatix™ MNOS system, we are outfitting the **RPV Maritima**—a 34-foot catamaran powered entirely by renewable energy. This vessel serves as a proof-of-concept for off-grid, sustainable marine automation.

- The transformation of this vessel can be followed on the [RPV Maritima Facebook page](#).
- Maritimatix™ also manages the Facebook group: [Electric Powered Multihull Boat Conversions](#) .

### Design Challenges

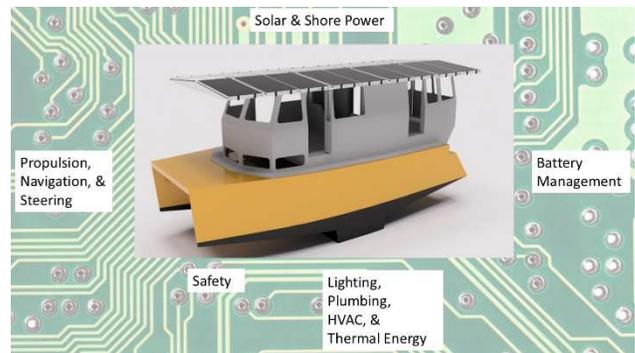
- Operates in wet, corrosive, and constantly shifting conditions
- Must be self-contained, energy-efficient, and environmentally safe
- Requires intuitive controls and reliable performance to meet mission goals

### System Integration via REEMS

The boat's command and control system is called **REEMS** (Renewable Electric Energy Management System). REEMS uses Maritimatix™ Pods and Maritimatix™ MNOS to monitor and optimize energy harvesting, storage, and consumption across all onboard systems, including:

- Battery management
- Solar and shore power
- Propulsion, navigation, and steering
- Safety
- Lighting, plumbing, HVAC, and thermal energy

### Renewable Electric Energy Management System (REEMS)



REEMS uses broker-mediated message passing via a RabbitMQ cluster, leveraging MQTT and AMQP protocols to ensure secure, real-time communication across all subsystems.

Maritimatix.com



RPV Maritima



Electric Powered Multihulls

