

User Manual

Maris Habitats

Modular Marine Habitat & Environmental Monitoring System

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Introduction to Maris Habitats

Maris Habitats is a modular artificial reef system designed to support marine habitat formation and collect environmental data in underwater environments. The system combines physical reef blocks with a removable smartlogger. The reef blocks create cavities, rough surfaces, and sheltered spaces that may support the attachment and growth of marine organisms over time.

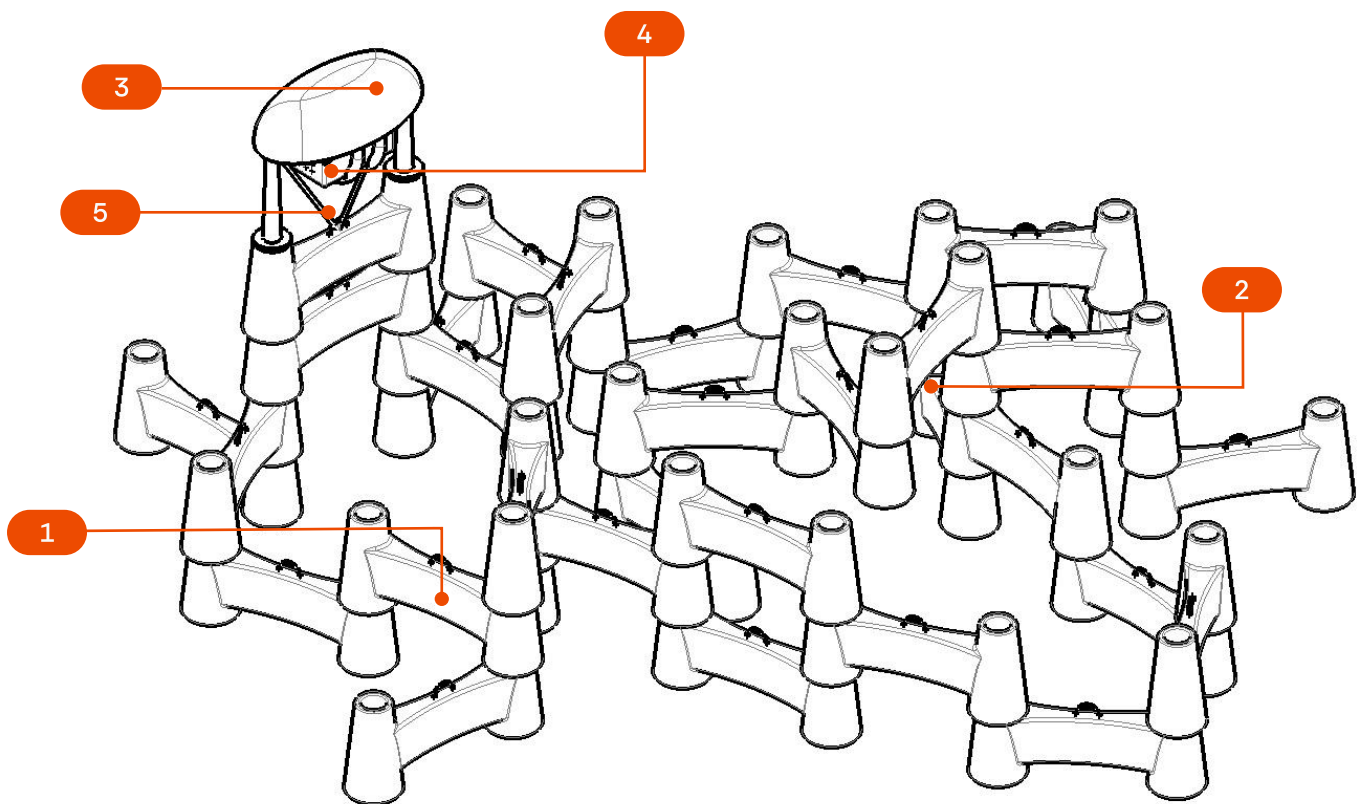
The smartlogger collects environmental data from the surrounding water, helping users monitor local site conditions and observe environmental changes. Maris is intended for marine restoration projects, research institutions, coastal municipalities, environmental organisations, port authorities, aquaculture operators, and marine infrastructure companies.



Product Overview

Maris Habitats consists of modular reef blocks and an optional removable smart module. The reef blocks can be combined in different configurations depending on the installation site and project size. The smart module is used only in selected modules and can be removed for maintenance, battery replacement, and data retrieval.

1. Modular reef block
2. Cavities and sheltered areas
3. Smart Module
4. Smartlogger
5. Smartlogger attachment



List of Components

Reef Structure

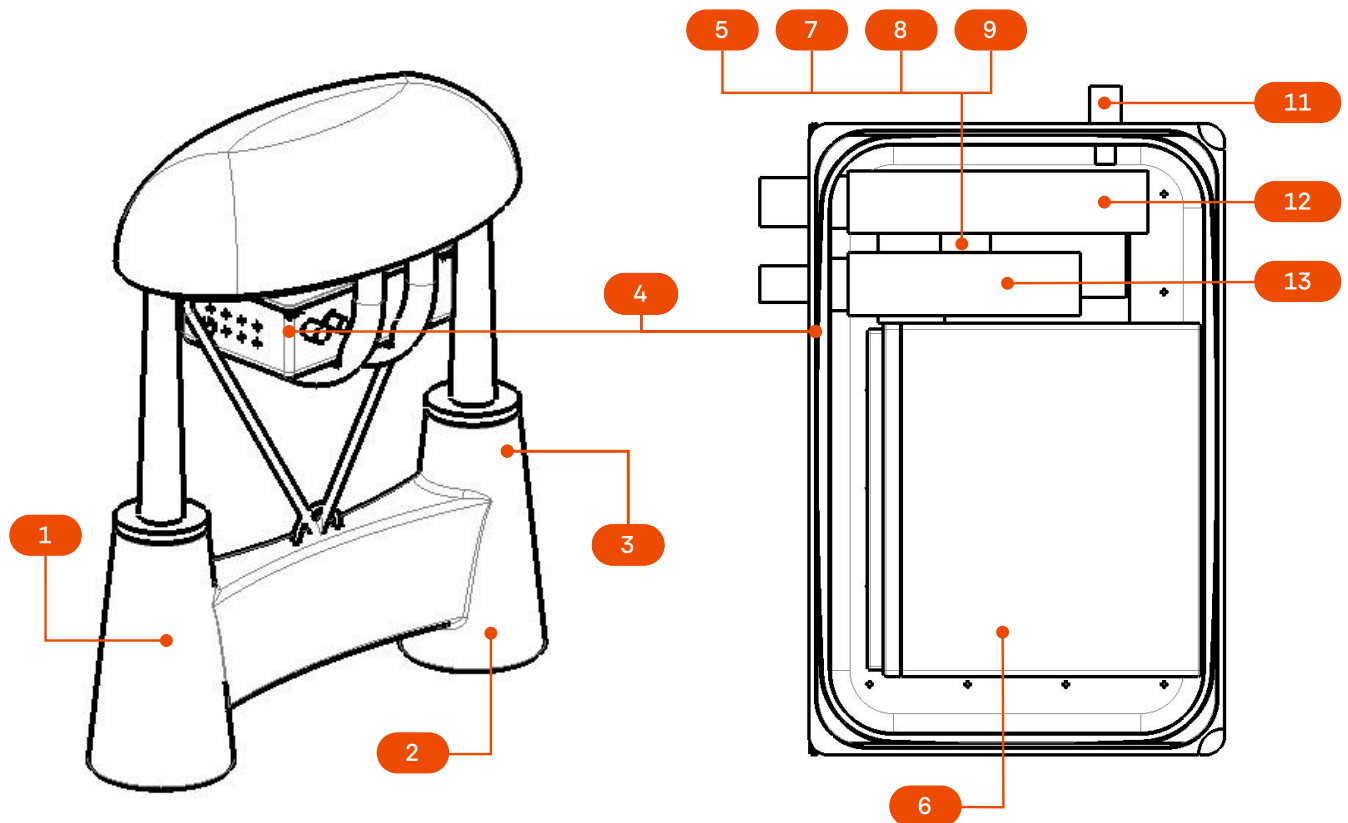
1. Modular reef block
2. Basalt fiber-reinforced concrete structure
3. Cavities and surface texture

Smart module

4. Waterproof housing of the smartlogger
5. Microcontroller
6. LiFePO4 battery
7. SD card module
8. pH surveyor
9. I²C level converter

Sensors

11. Temperature & pressure sensor
12. pH sensor
13. Conductivity sensor



Functioning of the Reef Structure

The modular reef blocks are placed on the seabed to create a stable artificial habitat structure.

The shape of the modules creates sheltered spaces where small marine organisms and fish may find protection.

The rough and textured surfaces allow algae, microorganisms, corals, and other marine life to attach and grow over time.

Multiple blocks can be combined horizontally or vertically to create larger habitat formations.

The system can be adapted to different project sizes, from small pilot installations to larger restoration or monitoring areas.



Functioning of the Smartlogger

The smartlogger collects environmental data from selected locations around the reef structure.

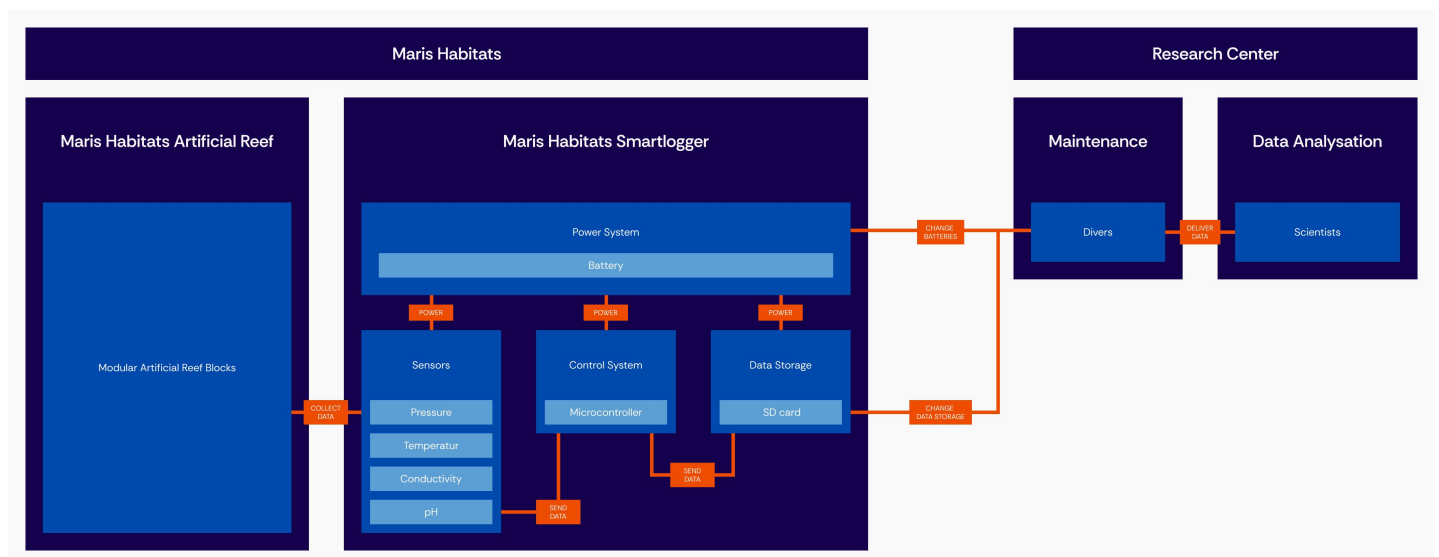
At predefined time intervals, the system activates the sensors and records measurements from the surrounding water.

The collected data is stored locally on an SD card. This avoids the need for continuous underwater communication and reduces power consumption.

After each measurement cycle, the system returns to a low-power state to extend battery life.

During scheduled maintenance, the smartlogger can be removed so the data can be retrieved, the battery replaced, and the sensors inspected.

- Sensors measure water conditions
- Microcontroller processes the readings
- Data is saved locally
- System returns to low-power mode
- Data is retrieved during maintenance



Guide to Deployment

Maris Habitats should be deployed by trained professionals, divers, or marine installation partners. Site conditions, permits, environmental assessments, and safety requirements must be reviewed before installation.

1. Inspect all reef blocks and sensor components before transport.
2. Confirm the selected deployment site and seabed conditions.
3. Transport the reef blocks and smart module to the installation area.
4. Place the reef blocks on the seabed according to the planned configuration.
5. Make sure the structure is stable and correctly positioned.
6. Install the smart module in the selected reef block.
7. Check that the sensor probes of the smartlogger are exposed to the surrounding water.
8. Confirm that the housing of the smartlogger is sealed before leaving the system underwater.

Packaging and Transport

Maris Habitats components must be protected during transport to avoid damage before deployment.

The reef block should be packed securely to prevent cracks, edge damage, or surface breakage. The smartblock and electronic components should be transported separately in a protective waterproof case.

Before deployment, all components must be checked for visible damage. Electronic components should remain dry and protected until installation.

Handling instructions:

- Do not drop or drag the reef blocks
- Keep the smartlogger dry before deployment
- Protect sensor probes from impact
- Store electronic components in a sealed container
- Inspect all parts before installation

Warranty Conditions

This product includes a limited warranty from the date of purchase or project delivery. The warranty applies only when the product is transported, deployed, maintained, and used according to the provided instructions.

What the warranty covers:

- Defects in materials or workmanship
- Malfunctions of electronic components under normal operating conditions
- Manufacturing defects in the smartlogger or housing
- Sensor or data logging issues not caused by misuse or improper handling

What the warranty does not cover:

- Damage caused by improper deployment or unauthorized modification
- Damage caused by extreme weather, storms, currents, or accidental impact
- Water damage caused by incorrect sealing after maintenance
- Normal wear, marine growth, biofouling, or corrosion over time
- Damage caused by use outside specified environmental limits

Warranty claim process:

1. Contact the Maris Habitats support team.
2. Provide proof of purchase/project delivery.
3. Describe the issue and include photos if possible.
4. The support team will assess the claim.
5. If approved, the defective component may be repaired or replaced.

Frequently Asked Questions

Q: What is Maris Habitats used for?

A: Maris Habitats is used to create modular underwater habitat structures and collect environmental data around reef installations.

Q: Does the system restore marine ecosystems immediately?

A: No. The system provides physical habitat support and monitoring. Marine colonisation and ecological development happen gradually over time.

Q: Does every reef block contain sensors?

A: No. The smartlogger is optional and is usually placed only in selected blocks to collect representative data from the site.

Q: What data does the system collect?

A: The final system is intended to collect data such as temperature, pressure/depth, pH, and conductivity.

Q: Does the system transmit data in real time?

A: No. The system stores data locally on an SD card. Data is retrieved during scheduled maintenance.

Q: How often does the system need maintenance?

A: Maintenance depends on the deployment site, battery life, sensor condition, and project requirements. A scheduled inspection is recommended at least once per year.

Q: Can the smartlogger be removed?

A: Yes. The smartlogger is designed to be removable so that data retrieval, battery replacement, inspection, and repairs can be done without removing the full reef structure.

Q: Who should install Maris Habitats?

A: The system should be deployed by trained professionals, divers, or marine installation partners.

Let's stay in touch

Join us in **rebuilding life beneath the surface.**

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Report: Maris Habitats Report

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