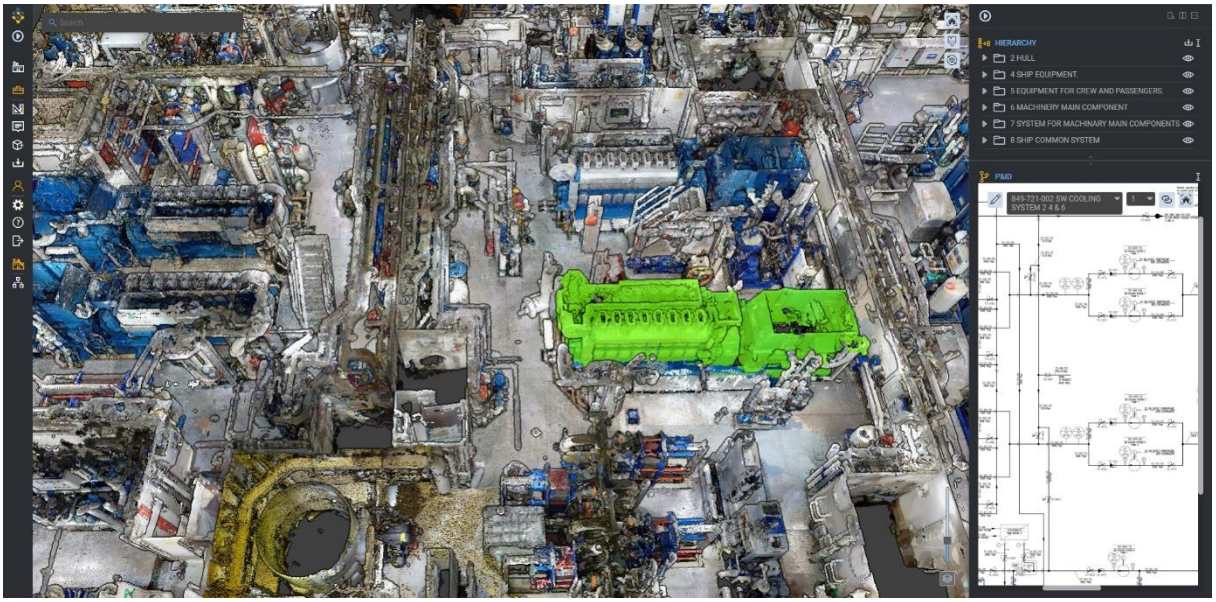
From Ports to Ships:

Bringing Shared Reality to the Maritime Industry



How reality capture and AI-generated 3D digital twins are transforming terminals, shipping and cruise operations

The maritime industry is entering a decisive decade. Decarbonisation targets, rising asset complexity, tighter refit windows, globalised teams and increasing cost pressure are forcing operators to rethink how they design, operate and upgrade their assets.

Ports, terminals, ships and offshore facilities all share the same challenge: **critical decisions are still too often made with incomplete, outdated or fragmented information about real-world assets**.

At Euromaritime, Samp introduces **Shared Reality** to the maritime ecosystem for the first time — an industry-proven, secure and pragmatic approach to immersive digital twins, already deployed at scale in energy, midstream and large industrial infrastructures, and now increasingly adopted by maritime operators.

A Pragmatic Digital Twin Grounded in Reality

Shared Reality is not a traditional CAD-based digital twin. It is a **3D Reality Model**, generated by AI in just hours from reality capture (3D scanning and photogrammetry), that can be progressively enriched with technical or operational information.

Instead of relying on manually designed models that quickly drift away from reality, Shared Reality starts from **what is actually there**, and helps operators or their supply chain connect this digital reality to:

- PFDs, P&IDs and technical drawings
- Equipment metadata and maintenance information
- Documents, procedures or inspection records
- Project and procurement workflows

The result is a **single, immersive and unambiguous reference** for all stakeholders — operators, engineers, shipyards, contractors and suppliers — accessible through a secure web platform.

This approach has proven particularly effective for **complex, long-lifecycle assets**, where discrepancies between technical information and real conditions are a major source of delays, claims and safety risks.

How a Shared Reality Project Typically Works

A typical maritime deployment follows a simple and proven path:

1. **Rapid reality capture** of the asset (terminal, vessel, or selected areas)
2. **Processing into a 3D Reality Model**, streamed securely via the cloud
3. **Controlled access for internal teams and external partners**
4. **Connection to existing data sources** on a need basis (databases, systems)
5. **Progressive enrichment and updates** as projects evolve

Deployment can take **days to weeks**, with immediate operational value — a key difference compared to long digital twin initiatives that delay returns.

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1 - Terminal Operators: Reducing Revamping and Modification Projects Costs

For port and terminal operators, accuracy and coordination are paramount. Interfaces between civil works, piping, loading arms, safety systems and marine operations leave little room for approximation.

A concrete illustration comes from **Elengy**, a leading European LNG terminal operator. By deploying Shared Reality across its facilities, Elengy created a reliable 3D reference of its terminals, directly connected to engineering data and documentation.

This enabled:

- More reliable tendering processes, with less variation orders or claims
- Better preparation of projects with contractors and engineering companies
- Fewer on-site surprises during execution and better management of change

In terminal environments where access windows are constrained and safety is critical, **having a shared and trusted view of reality** significantly reduces execution risk and improves collaboration across all parties. This translates into a **15% cost reduction for contracted work, 2x faster initial engineering studies and 50% less rework on site.**

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2 - Shipping Operators: Reducing Dry-Dock Time Through Better Preparation

For shipping companies, dry-dock periods are among the most critical — and costly — phases in a vessel's lifecycle. Every additional day in dock translates into lost operational availability and increased refit risk.

In 2025, Samp presented at VivaTech a **joint project with CMA CGM**, demonstrating how Shared Reality can be applied at full-ship scale.

In this project:

- The **world's largest LNG-powered container ship** was fully scanned in **two weeks**
- The data was processed by AI into an interactive 3D reality model of the vessel
- Engineering teams, experts and partners could navigate the ship remotely, down to technical systems and confined spaces and connect technical information as needed

The main objective: **shorten dry-dock refit durations through better anticipation and coordination**.

Thanks to Shared Reality, refit preparation can be carried out in much greater detail **before the vessel enters the shipyard**, enabling:

- Earlier identification of access constraints and interferences
- Clearer scopes for contractors and equipment suppliers
- Faster decision-making with remote experts, including while the vessel is at sea

For large container ships, this approach can **reduce dry-dock duration by approximately two days per refit**, while also enabling remote expertise during operations — a decisive advantage for globally operating fleets.

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3 - Cruise Line Operators: Optimising Refits and Calls for Tender at Global Scale

Cruise ships combine some of the most complex technical environments at sea with high-end accommodation spaces, all subject to tight refit schedules and strong brand expectations.

Samp currently works with a **major global cruise line operator**, hosting each class of ship in Shared Reality. Both **technical decks** (engines, systems, utilities) and **accommodation levels** are captured and made accessible to internal teams and selected partners.

This approach delivers measurable benefits:

- **30% reduction in tender cycle time**, thanks to clearer scopes and shared understanding
- Approximately **€100,000 per year per ship** saved in travel and external consultancy costs, by avoiding repeated on-board visits
- Lower bidding risk, fewer clarifications and reduced change orders during execution

By allowing shipyards, designers and contractors to explore ships remotely — yet accurately — and verify or update technical information accordingly, cruise operators can prepare technical and accommodation refits with much greater confidence, while limiting operational disruption and unnecessary travel.

Technology Focus: Understanding Reality Capture

Reality capture is the foundation of Shared Reality. It consists in digitally documenting physical environments to create accurate 3D representations of assets.

Two complementary methods are used :

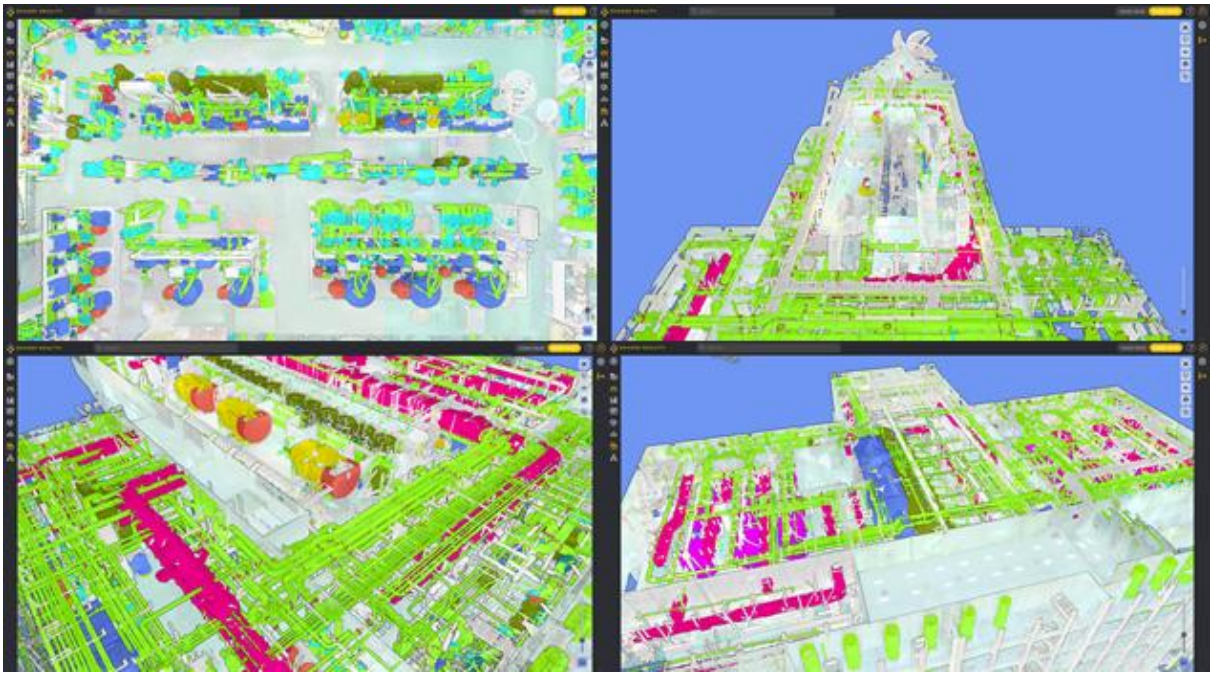
3D Laser Scanning

Modern laser scanning technologies, including SLAM-based scanners, enable fast, precise surveys of complex environments — even in confined or hard-to-reach areas. They deliver millimetric to sub-centimetric accuracy, ideal for technical spaces and machinery.

Photogrammetry

Using high-resolution photographs captured by drones or mobile devices, photogrammetry complements laser scanning for large areas or local updates. Field teams can even update parts of a model themselves using tablets or smartphones.

This combination allows Shared Reality to remain **accurate, up to date and scalable**, without the cost and rigidity of traditional CAD workflows.



A New Reference for Maritime Collaboration

Across terminals, shipping and cruise operations, the same conclusion emerges: **better outcomes start with a better understanding of reality**.

By grounding digital workflows in accurate, shared and up-to-date representations of assets, Shared Reality helps maritime stakeholders:

- Reduce delays and costs in a matter of days, not months or years
- Improve safety and auditability, with a simple solution designed for all users
- Collaborate more effectively across organisations and geographies, with a secured global cloud access

At Euromaritime, Samp invites maritime operators, shipowners, ports and shipyards to explore how Shared Reality can become a **new operational reference**, from quay to engine room, from design office to dry dock.