MultiRELOAD

PORT SOLUTIONS FOR SUSTAINABLE MOBILITY

European cooperation for the development of innovative inland port solutions for efficient, effective and sustainable multimodality

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Contact

www.multireload.eu

CBoXX – High-Capacity Multimodal Container for LCL & LTL Rail Logistics

Making rail competitive for fragmented freight

THE SOLUTION

What is CBOXX?

CBoXX is a high-capacity, modular rail loading unit designed to enable efficient LCL and LTL freight consolidation on rail, making fragmented cargo economically and operationally viable for multimodal transport with:

- 104 pallets / 34 tonnes capacity
- 4× capacity vs 40' container
- Modular & movable shelves
- Automated horizontal transshipment
- Road–rail seamless transfer
- Sensor-ready (tracking & condition)

WHO BENEFITS FROM THIS?

FREIGHT FORWARDERS & LOGISTICS SERVICE PROVIDERS

"Volume efficiency is a game changer for LTL rail."

- LTL rail consolidation with higher volume efficiency
- Lower cost per pallet and better asset utilisation
- Automation to reduce handling and workforce costs

SHIPPERS (FMCG, MANUFACTURING, CHEMICALS)

- CO_2 reduction and improved sustainability performance
- High cargo protection with monitoring and vibration reduction
- Customisable layouts for specific cargo types

TERMINALS, INLAND PORTS & FREIGHT VILLAGES

- Higher handling productivity per train through consolidated LTL units
- Faster, automated handling and transshipment
- Improved security through isolated cargo spots

RAIL & MULTIMODAL ECOSYSTEM ACTORS

- Enables modal shift from road to rail
- Supports new rail LTL services beyond FTL
- High relevance for TEN-T corridors

CargoBeamer MultiRELOAD
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Multimodal Transport of Bulk Goods Using Pallet - Wide Containers

Making inland waterways accessible, flexible and reliable for bulk logistics of all sizes

THE SOLUTION

The innovative solution proves that bulk goods can be efficiently transported via inland waterways using pallet-wide bulk containers, enabling multimodal, weather-independent and flexible logistics services for smaller and fragmented cargo volumes.

Key solution elements:

- Use of pallet-wide bulk containers instead of conventional bulk-only vessels
- Top loading via manholes and gravity discharge at destination
- Combination of containerised bulk cargo and traditional bulk on the same vessel
- Seamless integration of road–IWT–road transport
- Demonstrated on a real corridor: Vienna – Port of Lom – Sofia

The demonstrator achieved ~97% container utilisation, validated customs procedures, and proved operational feasibility under real market conditions

WHO BENEFITS FROM THIS?

SHIPPERS (AGRICULTURE, FOOD, RAW MATERIALS)

- Access to inland waterways for smaller shipment sizes
- Reliable, weather-independent transport
- Ability to combine different bulk cargo flows

LOGISTICS SERVICE PROVIDERS & FORWARDERS

- New multimodal bulk services beyond full bulk
- Better use of inland waterway capacity
- Flexibility comparable to road transport

INLAND PORTS & TERMINAL OPERATORS

- Increased cargo diversity (bulk + containerised)
- Stronger role as multimodal hubs
- Improved utilisation of existing infrastructure

PUBLIC AUTHORITIES & CORRIDOR MANAGERS

- Supports modal shift from road to IWT
- Enables SME participation in sustainable logistics
- Scalable along TEN-T corridors

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Smart Rail Cargo Flow Monitoring for Inland Terminals

Automated rail handling through precise load position detection

THE SOLUTION

What is Smart Rail Cargo Flow Monitoring?
A camera-based digital solution that automatically detects train length, wagon positions and cargo handling activities at the rail gate, feeding this information into a Digital Twin to optimise rail operations in inland terminals.

Key solution elements

- Camera sensors installed at rail gates and buffers
- Automated detection of:
  - train length
  - wagon and buffer positions
  - loading / unloading events
- Real-time data integration into a Digital Twin
- Seamless connection with terminal IT and operational systems
- Automated support for documentation and planning

WHO BENEFITS FROM THIS?

TERMINAL OPERATORS

- Faster rail handling with fewer crane repositioning movements
- Reduced idle time and increased throughput
- Lower energy use and operating costs

PORT & INLAND TERMINAL AUTHORITIES

- Improved real-time visibility of rail flows
- Better coordination between rail, road and maritime operations
- Data-driven planning and decision-making

RAIL OPERATORS & LOGISTICS SERVICE PROVIDERS

- More predictable rail operations
- Reduced delays at terminals
- Improved service reliability for multimodal customers

WORKFORCE & SAFETY

- Reduced manual intervention in hazardous areas
- Safer and more controlled handling processes

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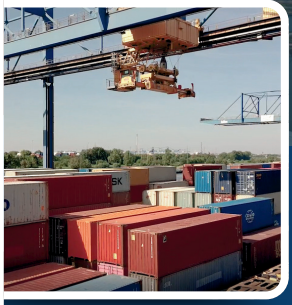
Predictive Maintenance for Port Handling Equipment

Increasing reliability, safety and efficiency of multimodal terminals



THE SOLUTION

What is Predictive Maintenance?
A cloud-based, sensor-driven system that continuously monitors port handling equipment (cranes, reach stackers) to anticipate failures before they occur.

Key features

- Sensor-based condition monitoring (stress, usage, energy)
- AI-based failure prediction and maintenance planning
- Remote monitoring without heavy on-site IT
- Adaptation of crane operation to wind conditions
- Integration with existing terminal and crane management systems

WHO BENEFITS FROM THIS?

TERMINAL & CRANE OPERATORS

- Fewer unexpected breakdowns
- Higher equipment availability
- Lower repair and emergency maintenance costs

PORT & INLAND TERMINAL AUTHORITIES

- More reliable and predictable operations
- Improved safety and asset management
- Support for energy-efficiency and decarbonisation goals

LOGISTICS OPERATORS & RAIL USERS

- Reduced handling delays
- More stable multimodal connections
- Improved service reliability

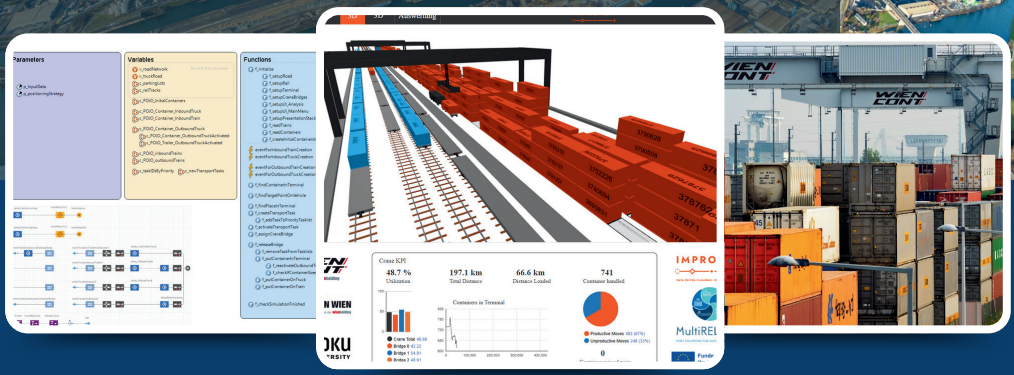
MAINTENANCE & TECHNOLOGY PROVIDERS

- Data-driven maintenance planning
- New digital service and subscription models

duisport MultiRELOAD PORT SOLUTIONS FOR SUSTAINABLE MOBILITY

Predictive Container Positioning in Terminal

Reducing unproductive moves through AI-driven planning and simulation



THE SOLUTION

What is Predictive Container Positioning in Terminal?

A simulation- and AI-based digital solution that predicts the optimal container positions in the terminal yard by analysing historical and operational data, reducing unnecessary moves and improving planning decisions.

Key solution elements

- AI models analysing historical container flows and handling patterns
- Predictive algorithms recommending optimal container placement
- Digital simulation of yard operations and scenarios
- Virtual testing of strategies without impacting daily operations
- Integration with terminal planning and operating systems

WHO BENEFITS FROM THIS?

TERMINAL OPERATORS

- Fewer unproductive container moves
- Shorter handling times and smoother operations
- Increased effective terminal capacity

PORT & TERMINAL AUTHORITIES

- Improved operational planning and foresight
- Better use of existing infrastructure
- Data-driven decisions for terminal expansion and investment

LOGISTICS OPERATORS & RAIL USERS

- Faster turnaround times
- More reliable terminal services
- Reduced congestion-related delays

WORKFORCE

- Less reactive firefighting
- Better decision support for planners and operators

BOKU UNIVERSITY

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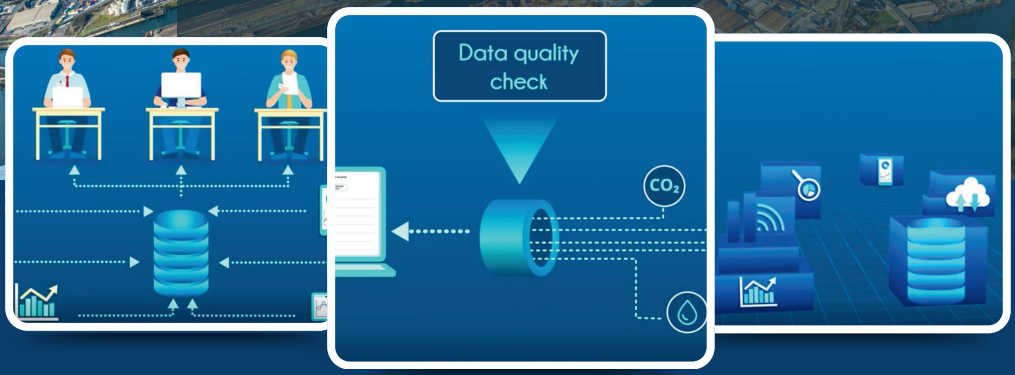
Multimodal Node Digital Twin

A unified digital view for smarter, more resilient multimodal ports



THE SOLUTION

What is the Multimodal Node Digital Twin?

A modular Digital Twin platform that acts as a central visualisation and decision-support toolfor ports and multimodal nodes, integrating operational, environmental and energy data in real time and historically.

Key solution elements

- Centralised data repository collecting information from:
- sensors
- Port and terminal systems
- Environmental and energy sources
- Digital representation of the port (map & dashboards)
- AI-based analytics, simulations and predictions
- Real-time alerts and decision-support notifications
- Modular, scalable architecture based on Big Data technologies

WHO BENEFITS FROM THIS?

PORT AUTHORITIES

- Real-time situational awareness across all port activities
- Early detection of disruptions and performance issues
- Data-driven decision-making and coordination

TERMINAL OPERATORS & INFRASTRUCTURE MANAGERS

- Better alignment with port-wide operational priorities
- Improved planning through shared visibility
- Integration with existing operational systems

LOGISTICS & TRANSPORT OPERATORS

- More predictable port operations
- Improved coordination between rail, road and inland waterways
- Reduced uncertainty in multimodal chains

PUBLIC AUTHORITIES & REGULATORS

- Better monitoring of environmental and energy KPIs
- Support for safety, compliance and sustainability objectives

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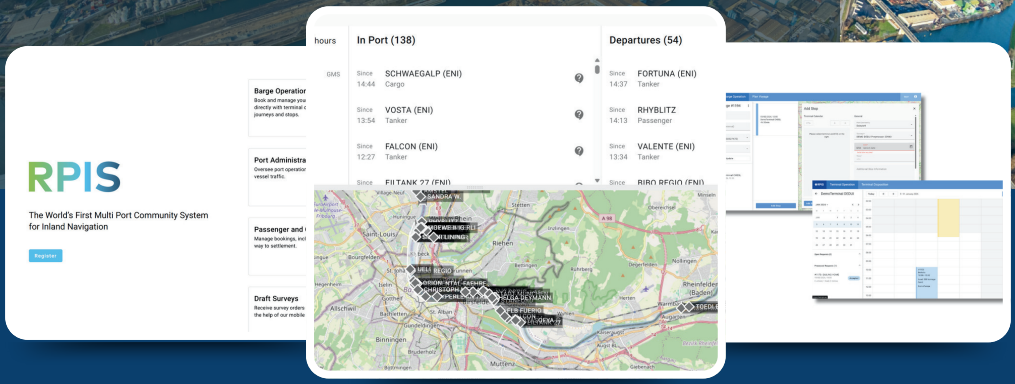
Multimodal Corridor Digital Management Service

Connecting ports, terminals and operators along European hinterland corridors



THE SOLUTION

What is the Multimodal Corridor Digital Management Service?

A corridor-level digital platform that connects ports, inland terminals, inland waterways, rail and road operators to provide end-to-end visibility, coordination and process automation across the European hinterland. Based on the RiverPorts Planning and Information System (RPIS), the solution enables:

Key solution elements

- Real-time data exchange across modes and borders
- Slot booking and planning for barges, terminals and ports
- Digital pre-notification of arrivals, cargo and documents
- Integration with customs and port community systems
- Open APIs aligned with EU PCS and eFTI principles
- Modular, neutral and scalable corridor architecture

WHO BENEFITS FROM THIS?

PORT AUTHORITIES & CORRIDOR MANAGERS

- Corridor-wide visibility of traffic, capacity and utilisation
- Improved coordination between ports and hinterland nodes
- Stronger role of inland ports within TEN-T corridors

LOGISTICS SERVICE PROVIDERS & FORWARDERS

- Real-time visibility of cargo and transport status
- Easier booking and planning across modes
- Reduced delays and operational uncertainty

BARGE, RAIL & TERMINAL OPERATORS

- Better anticipation of arrivals and workloads
- Improved slot utilisation and resource planning
- Reduced manual communication and paperwork

CUSTOMS & PUBLIC AUTHORITIES

- Earlier access to digital documents and cargo data
- More efficient and predictable administrative processes
- Improved compliance and monitoring capabilities

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