

PORT TECHNOLOGY

# GREEN AUTOMATED TERMINAL PROCESSES





# PORT AUTOMATION: MAXIMUM EFFICIENCY, ZERO EMISSIONS

Every day, millions of tons of goods are handled in ports around the world, and VAHLE has the right solutions for your terminal to ensure that these processes are safe, efficient, cost-effective and environmentally friendly.

From individual modules to complete systems with conductor systems or cables, VAHLE has the tailor-made solution for every challenge in the port!

More than 100 years of experience and expertise paired with vision and modern technology. Your vision. Our solution.

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RELIABLE AND TOUGH

# EFFICIENCY FOR SHIP-TO-SHORE CRANES

## Seamless port operations

STS cranes are the cornerstone of any container terminal, handling the critical step of cargo handling and loading.

VAHLE ensures a reliable power and data supply for these cranes. Our modular systems offer individual solutions for various requirements. In addition to conventional conductor systems, we also offer advanced power and data rails that are less susceptible to weather conditions and that enable higher speeds. With VAHLE, you can operate your plant efficiently and safely thanks to state-of-the-art technology and remote monitoring.

## Challenges

- Extreme weather conditions
- High loads
- Maintenance-intensive
- 24/7 operation
- Energy efficiency



#### ENERGY TRANSMISSION

### U35: Easy installation

A unipole insulated conductor system for currents up to 1000 A based on an aluminum-stainless steel design. The U35 is even available in a high temperature version, suitable for use in environments with humid and salty air.

#### Highlights

- For operating temperatures from -30 °C to +130 °C
- Heatable to prevent icing up
- UL approval
- Can be combined with SMGX



#### DATA TRANSMISSION

### SMGX: Safe and durable

The SMGX enables interference-free data transmission by communicating in a protected aluminum profile called a slotted waveguide. Any external interference or interference from other communication systems is excluded.

#### Highlights

- No interference with and from other radio/WLAN systems
- High transmission rate up to 1 GBit/s
- Compliant with PROFINET and PROFI-safe
- Fast commissioning (no parameterization)



#### ENERGY TRANSMISSION

### Cable Reels: Reliable and resistant

VAHLE offers motorized cable reels of all sizes for the power supply of crane systems in harbors. The systems have different drive components. Their conductor ring ensures reliable transmission of power, control, data and video signals. Even the integration of fiber optic cables is possible.

#### Highlights

- Suitable for high dynamic applications
- Corrosion protected
- Resistant to aggressive environmental influences
- Travels distances up to 1,000 meters



#### ENERGY TRANSMISSION

### Festoon Systems: Robust and flexible

Large festoon systems are customized to meet specific needs. The scalable systems can accommodate round or flat power and data cables. The use of high-quality materials also ensures high resistance to environmental influences such as salty or humid air.

#### Highlights

- Withstands harsh environments (waste, steel and coal industries, grain handling)
- Low maintenance
- For flat and round cables, shielded cables also possible





ENVIRONMENTALLY FRIENDLY

# FULLY AUTOMATED CONTAINER HANDLING

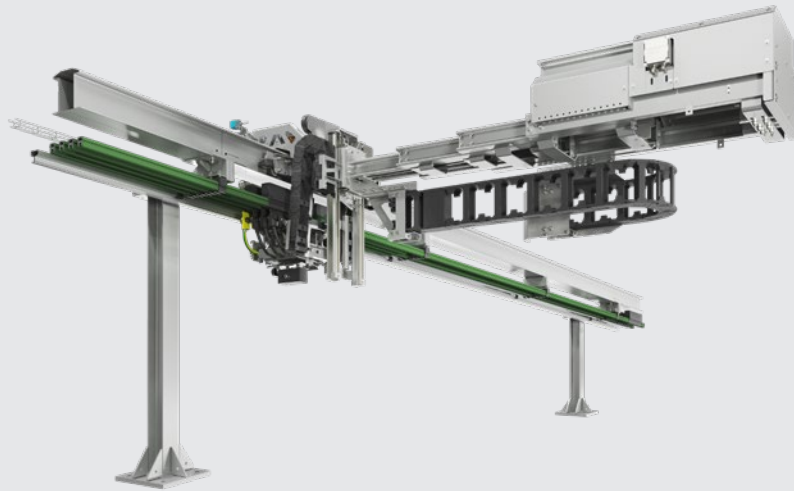
## **Innovate your operations: VAHLEs eRTG Solution!**

Rubber Tyred Gantry Cranes (RTGs) provide rail-free flexibility, moving seamlessly between container aisles. Electrifying RTGs with conductor systems reduces terminal costs and improves sustainability. Manual or automated methods connect telescopic arms to the conductor system for power and data, enabling remote operation and accelerating container handling.

Hybrid RTGs typically use diesel engines for lane changing, but battery-powered alternatives are also available. VAHLE specializes in port technology and presents the eRTG system for terminals, covering power, data and positioning for efficient operation inside and outside the container aisles, ensuring constant control.

### **Challenges**

- Increased container movements
- Reduced emissions
- Higher levels of automation and digitalization
- Minimizing the risk of accidents



## SYSTEM SOLUTIONS

## eRTG SYSTEM: GREEN REVOLUTION IN PORTS

VAHLEs eRTG system is revolutionizing container handling in ports. It electrifies RTGs for efficient and environmentally friendly operation. eRTG optimizes container movement, reducing fuel consumption and emissions compared to traditional diesel-powered systems.

With advanced automation and precise positioning technology, it increases productivity while minimizing maintenance costs. The eRTG ensures seamless integration

with existing port infrastructure, providing a sustainable solution for the evolving needs of the maritime industry.

### Highlights

- Automatic power connection
- Simple installation and commissioning (plug and play)
- Automatic control
- Compact and lightweight design



## ENERGY TRANSMISSION

## Battery packs: Sustainable and revolutionizing

Experience the cutting edge of port operations with VAHLEs eRTG solutions. At the heart of our innovation are state-of-the-art lithium-ion battery packs, carefully selected and implemented in collaboration with leading cell manufacturers. The result is unmatched reliability and performance, setting new standards for port equipment.

### Highlights

- Seamless transition to battery power
- Eliminate the need for generators and diesel tanks to change aisles
- Unmatched flexibility, sustainability, and efficiency



POWERFUL AND RELIABLE

# ENERGY TRANSMISSION AND POSITIONING SYSTEMS FOR RMGs

## Maximize productivity

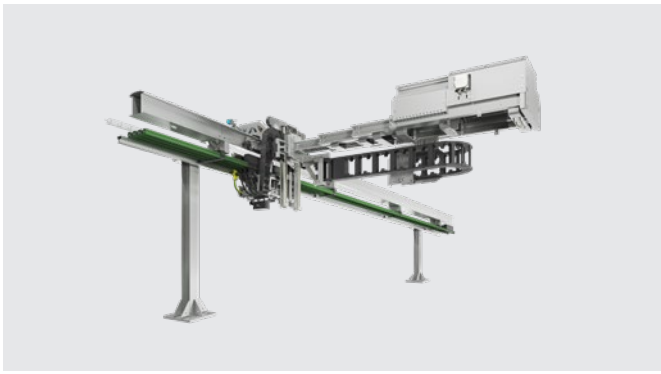
Rail Mounted Gantry Cranes (RMGs) are portal cranes mounted on rails and are commonly used in ports for container handling. They offer high load capacity and flexibility in moving containers over long distances. VAHLE offers a solution for the electrification of RMGs by replacing conventional diesel-driven systems with electrically driven ones.

By integrating VAHLEs electrical power and data transmission systems, RMGs become more environmentally friendly, more efficient and can be seamlessly integrated into existing port infrastructures, leading to a sustainable modernization of port operations.

## Challenges

- Increased container movements
- Reduced emissions
- Higher levels of automation and digitalization
- Minimizing the risk of accidents





## SYSTEM SOLUTIONS

### RMG system: A green revolution

VAHLEs RMG system revolutionizes port container handling with RMGs. It boosts efficiency, reduces emissions, and integrates seamlessly into existing port infrastructure, offering a sustainable solution for maritime container management.

#### Highlights

- Automatic connection to the power supply
- Easy installation and commissioning (plug and play)
- Automatic control
- Compact and lightweight design



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## CABLELESS AND FUTURE-PROOF

# ELIMINATING THE NEED FOR HIGH-MAINTENANCE CABLE SYSTEMS

### Revolutionising container terminals

Container terminals are vital hubs of the global economy, operating around the clock. A reliable energy supply and secure data communication are essential for the safety and efficiency of maritime supply chains.

VAHLE is revolutionising container handling – our system, consisting of data and power transmission, eliminates the need for a festoon, which not only reduces maintenance and service costs, but also results in significant weight savings. Choose VAHLE for efficient, sustainable and future-proof container terminals.

### Challenges

- Cost reduction
- Reduced maintenance
- Zero emissions
- Operational continuity
- Automation expansion
- Space efficiency



EFFICIENT AND ECO-FRIENDLY

# POWERING UP TERMINAL OPERATIONS FOR eTRUCKS

## Efficiency and safety combined: Solutions for AGVs

In the past, terminal vehicles were mostly diesel-powered. However, as part of the transition to green ports, many Automated Guided Vehicles (AGVs) have been and are being converted to battery electric drives. A special infrastructure is required for the energy supply.

VAHLE has developed high-performance battery charging solutions for the efficient and safe energy supply of terminal vehicles. In addition to a wide range of standard solutions, we also manufacture special designs according to individual specifications. We also have the right solution for permanent conductive or inductive power supply.

## Challenges

- Energy efficiency
- Charging infrastructure
- Range optimization
- Continuous operation
- Cost reduction
- Risk minimization





SMART COLLECTOR

# THE VAHLE PREDICTIVE MAINTENANCE TOOL FOR CONDUCTOR SYSTEMS







## UNPLANNED SYSTEM FAILURES HAVE UNWELCOME CONSEQUENCES

In container ports, unforeseen malfunctions can bring operations to a halt, resulting in costly downtime and logistical nightmares.

Enter the Smart Collector: the world's first system designed to revolutionize maintenance and service operations. Using specialized sensors, it collects important motion and heat data and transmits it to the main unit for real-time analysis.

This innovative solution enables proactive monitoring to quickly detect anomalies and prevent potential failures. Don't wait until problems occur - use the power of our Smart Collector to predict and prevent problems in your conductor system. Stay ahead with predictive maintenance. We make your application predictive.

Find out more at: [smartcollector.vahle.de](https://smartcollector.vahle.de)

### Highlights

- Early detection of the smallest changes
- Continuous temperature measurement to protect against hotspots
- Processing and evaluation of the measurement data using the IDAA method (Intelligent Dynamic Anomaly Analysis)
- Simple implementation thanks to plug-and-play
- Uncomplicated installation without structural changes, even in existing systems

### Benefits

- Data analysis for predictive maintenance
- Minimizing unplanned downtimes and increasing process reliability
- Increase overall system productivity
- Optimally plan maintenance cycles
- Reduce inventory and maintenance costs







## OUR MISSION: YOUR SMOOTH OPERATION

# SERVICE AND SUPPORT FROM A SINGLE SOURCE

VAHLE offers a comprehensive range of service and support services from a single source. Our services include project management, installation, supervision and commissioning, maintenance and repair as well as detailed consulting and training. Our goal is to be at your side every step of the way to ensure that your requirements are met and your expectations are exceeded.

## PROJECT MANAGEMENT

## Overall responsibility as general contractor

- Wide range of pre- and after-sales services
- Function as a system supplier or project manager as a general contractor
- Organization of the necessary sub-projects including budgeting and complete cost control
- Proactive communication on progress, schedule and implementation periods
- Certified controlling of the entire project in accordance with ISO 45001

## INSTALLATION AND COMMISSIONING

## Certified specialists on site at your facility

- Installation of VAHLE components, including new systems, extensions or retrofits
- Large service team including external partners
- Electrical connection according to official regulations
- Overall responsibility for installation and commissioning possible
- Handover of the ready-to-use turnkey system
- Certified personnel available for supervision and start-up support

## MAINTENANCE AND REPAIR

## Smooth operation of your system

- One-time or periodic maintenance contracts
- Global repair management of electronic products
- Material thickness measurement of the copper conductors of conductor systems
- Camera inspections for testing enclosed conductor systems
- Level measurement for slotted microwave guide
- Cleaning of conductor systems
- Installation of software updates as part of release management

## TRAININGS

## Professional handling of our products

- Qualification of external persons for maintenance and repair work
- Basic training: Basic training including theoretical and practical test
- Advanced training: Examination to become a supervisor after working on a system five times under supervision
- Application training: teaching of additional knowledge





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