PORT AUTOMATION

LEADING TO IMPROVED SAFETY, PRODUCTIVITY AND ECO-EFFICIENCY
STEP BY STEP TO AUTOMATION
Are you looking for automation processes in your port? VAHLE provides you with

• smart
• customised
• cost-effective

solutions of Electrification, Data Communication and Positioning Systems for RTGs, ASCs and STS cranes leading to a significant reduction of container handling and turnover time – this is how to optimize your efficiency.
1.0 Electrification
robust and powerful solution by single insulated conductor rails 1000 V, 1250 A with aluminium/stainless steel or copper surface, multiple combinations possible

2.0 Positioning
precise position feedback by durable stainless steel code rail combined with a contactless reading head

3.0 Data Communication
reliable, interference-free and safe data communication for data and video signals up to 100 MBit/s
Today, process data communication is an integral part of the industry 4.0 approach.

The availability of high data rates for machine-to-machine communication and human-machine-interfaces is one crucial aspect. However, data communication is only one step to take. The main goal, using the valuable source of an efficient operator, is still valid. Therefore more steps have to be taken. With an electrified system, e.g. an eRTG, the carbon footprint as well as operational costs can be reduced significantly. To get all locations with one tick in the box will helps to optimise the efficiency. The creation of infrastructure for secured data communication is the third element of VAHLE’s innovative trio for the demand of future.

Electrification + Positioning + Data Communication leading to AUTOMATION

4.0 Automation
by the combination of the elements electrification, positioning and data processes and thus remote operations can be realised
TECHNICAL BENEFITS

• Millimetre precise position feedback with high resolution ± 0.4 mm
• Interface: Profibus or Profinet
• Reliable reading up to a velocity of 750 m/min
• Determination of position values in real time and independent of temperature fluctuations
• Calibration- and adjustment-free system
• Not sensitive to power cuts

Making processes smarter by knowing at all times the exact position on a millimetre basis. The system can be used on STS trolley travel, eRTG crane, RMG and ASC gantry travel. The positioning system is independent of a global positioning system which enables the first steps into Remote Operation/Automation.

Absolute Positioning System supporting AUTOMATION

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CONDUCTOR RAIL
POWER SUPPLY
TECHNICAL BENEFITS

- Bandwidth of 100 Mbit/s (gross rate)
- Low latency fast path communication system
- Stationary mounted compact waveguide and movable antenna
- Leading high frequency shielded radio transmission system
- -> EN55022 Class A device certified - NO RF device
- Transmission of Video and Audio over Ethernet
- Transmission of Profinet and Profinet Safe signals with priority
- Interface: Ethernet 100 Mbit/s
- Interference-free Profinet Safe data transmission for automation

SMGX DATA COMMUNICATION SYSTEM

To handle the global demand of products and goods the shipping lines are still increasing their capacity of cargo container vessels. Cargo container ships average capacity has doubled over recent decades, faster than any other ship type. The on-going development is a challenge for all Terminal Operators. The loading and unloading of vessels must be highly efficient and reliable, to serve both the Port’s customers and to maximise container moves/hour. Improving efficiency by optimising the process and utilising the most valuable resource, the crane operator, where every finger movement gains profit: Remote Operation, Semi- or Full Automation is possible.

SMGX Data Communication leading to AUTOMATION.

SMGX-Profile
HF-transmission medium made out of extruded aluminium

Running surface
for coupler carrier of the actual mobile coupler and a guide, the coupler carrier is guided on the profile with the help of rollers.

Coupler carrier
Multinode connection between mobile antenna installed on the coupler carrier and the stationary interface. Designed for 800 MHz frequency bandwidth.

Slotted Microwave Guide eXtreme
Rugged, reliable and above all proven technology to optimise your Port Operation. U-SMGX is a combination of VAHLE conductor rails with SMGX Data Communication Technology. This combination provides high operational availability with a minimum of maintenance. Predestined for PORT AUTOMATION.

In comparison with conventional festoon systems or cable chains the SMGX/Unipole combination permits a substantially higher trolley speed, up to 600 m/min. and thus faster container loading and unloading.

On new STS Cranes the beneath boom design and construction can be simplified and on existing STS cranes installation is simple. In comparison to the many moving parts of festoon and chain systems the SMGX/Unipole combination uses a contactless design which increases operating reliability, significantly reduces maintenance time and hence lowers the cost of ownership.

**OPERATOR’S BENEFITS**

- High system availability
- Reduced operational costs
- Fast container handling
- High container stacking level
- Space saving solution
- Higher load capacity
- Simplified crane construction
- Reliable system
- Easy installation
- Maintenance friendly system
Transfer funnel at boom hinge

TOTAL COST OF OWNERSHIP ANALYSIS

NEW INSTALLATION COSTS

Conductor System + SMGX

Cable Festoon System

Source: APM Terminals
TECHNICAL BENEFITS

- High trolley speed
- No cable loops, no storage area
- Multipole combinations possible
- Precise positioning
- No signal delay
- Lower weight
- Suitable for harsh environmental conditions
- Not susceptible to wind
- Extremely low maintenance effort
- No additional beam for festoon system

ABSOLUTE POSITIONING SYSTEM

- Transceiver
- PLC
- Ethernet
- VOIP
- SMGX
The combination of Power, Data Communication and Positioning on the STS boom provides major benefits for the AUTOMATION. The positioning system provides permanently redundant position information without the necessity of calibration. Together with the U-SMGX components the effects of downtime by weather conditions can be significantly minimized. Due to the contactless design of the Communication and Positioning Systems, wear parts and maintenance works can be reduced to a minimum.

Knowing each position of the box offers you the opportunity to drive the trolley fully automatic.