

VAHLE SMGX

RELIABLE WIRELESS DATA COMMUNICATION

Significant effort has been dedicated by VAHLE during recent years, to the development of reliable wireless data communication for remote operation and automation of port equipment. Introduction of the VAHLE SMG (Slotted Microwave Guide) allows operators to rethink electrification and data communications for automatic stacking cranes (ASC), rail mounted gantry (RMG) cranes and ship-to-shore (STS) cranes.

In the case of ASC and RMG cranes, VAHLE's wireless data communication solution (Net 300 Mbit/s) brings back an old fashioned type of technology for crane electrification – conductor systems. The use of the SMGX, conductor bars and VAHLE positioning system will allow manufacturers to make their cranes lighter in weight, reflecting positively on the cost of the machine's production and offering a crane that will consume less kWh per year: a win-win situation for OEMs and the end users, terminal operators.

VAHLE SYSTEM BENEFITS

The following explains how the combination of VAHLE conductor systems and SMGX 'safe' data transmission becomes a decisive factor for the rethinking of ASC and RMG operations; reducing the weight of the crane by removing medium voltage cable reels and cable, platform and access stairs.

- Increase gantry speed of the cranes; bars can work up to 600m/min without any concern or restrictions.
- Use of low voltage (LV) instead of medium voltage (MV) as main crane power; this will allow OEMs to remove MV transformers from cranes and replace MV protection (switchgear) with a simple LV protection.
- In the absence of MV transformers and protection, OEMs will be able to re-design the E-Room, making it smaller and leaner.

Summarizing, by using the VAHLE System of conductor system and SMG data communication, the ASC/RMG will be much lighter (by an estimated 10t) and faster and therefore perform better than conventional machines. Also cheaper to operate and maintain, a 10t lighter crane will save approximately 23,000 kWh/year (this value will depend on the different crane OEMs).

There are also benefits from a civil point of view. Working with a back to back configuration, the space required between ASCs or RMGs will be reduced compared to that necessary for machines using cable reel technology, thus creating more space for containers or a more efficient configuration of the port.

REDUCING MAINTENANCE COSTS

With regard to maintenance, costs will be reduced on a large scale, considering that power cables are critical as one of

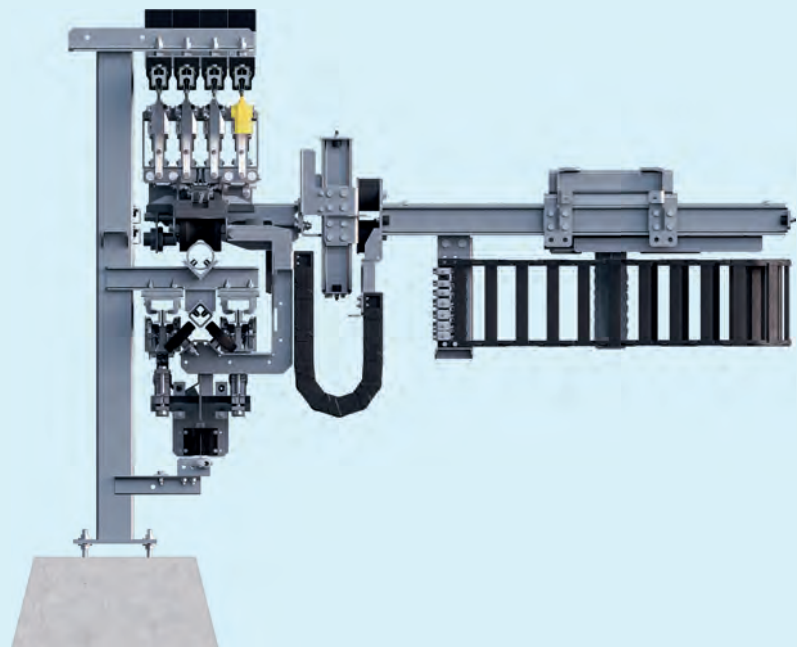
the main elements subjected to wear and tear on port gantry applications. We are comparing MV cable costs against sets of brushes, time to replace and stock cost of the material on site.

Also, very important to mention, dealing with low voltages considerably reduces safety risks for maintenance personnel in comparison to medium voltage.

SUMMARY

The system of VAHLE energy transmission via conductors will significantly change the crane landscape in terminal operations. VAHLE is confident that the SMGX 'safe data transmission' will transform the design of cranes and container ports around the world. This will be done with a focus on the needs of the customer.

This is the next step in port automation. VAHLE SMGX technology is already been used for remote operation of electric





RTG in different ports with excellent performance. This is a very reliable way to send data communication without the use of fibre optics, bringing flexibility to ERTG operations.

Working under a band of 5Ghz offers 300Mbits/s net with a latency for video data under 5ms and PLC data of 3ms. The system allows both up and down stream communication. Adequate for ethernet interface protocols Profinet and PROFI-safe (PROFI-safe SIL3) and due to the slotted guide, the VAHLE system can coexist without interference from other wireless system signals in the terminal. Compared

to other systems like WIFI or RCOAX, the VAHLE SMGX offers high availability permitted for EMC without the need for frequency management.

All of the above will make remote operation of ERTGs possible, with three cranes per block and with 100Mbit/s net rate of communication per crane feasible. It will become possible to add a second system to the same steel structure if necessary, offering an extra 300Mbit/s for catering for more machines per block. Automation of stacking cranes and crane gantries with integrated video monitoring will be feasible

In order to offer a complete support to OEMs and terminal operators, VAHLE will also assist with voltage drop calculations and design of auxiliary substations, low voltage and high voltage power links and position optimization; using a containerized sub-station solution to reduce the space impact in the yard.

ENQUIRIES

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