VAHLE

asean Ports and Logistics 2024

The Cornerstone of Global Economy and Supply Chain Networks

The Zero Emission Terminal – How to connect the green future

Electrification & data communication solutions for port equipment

VAHLE Group – Key Facts

845 employees worldwide

100 %

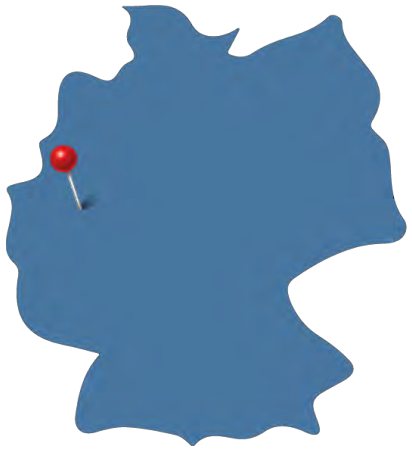
Family owned since 1912

12 VAHLE subsidiaries worldwide and representations in 52 countries

€ 150 mil. in sales

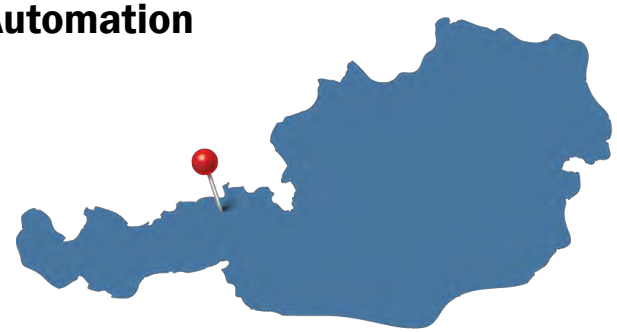
Headquarter
Kamen, Germany

- Engineering
- Production
- Sales



Technology Center Automation
Schwoich, Austria

- Engineering
- Trend Scouting
- Training



From zero emission to green future

Step by step approach

Electrification

- Electrification by **conductor bars** (1000 V, 1000 A with aluminum / stainless steel)
- **Automated power** Connection for block changes
- Automated **seamless switching**

Positioning

- **Absolute, precise positioning system**
- Independent from external influences
- Contactless reading head
- Position **accuracy** up to **± 1 mm**
- **PN / PB / Ethernet** Interfaces for Plug and Play integration

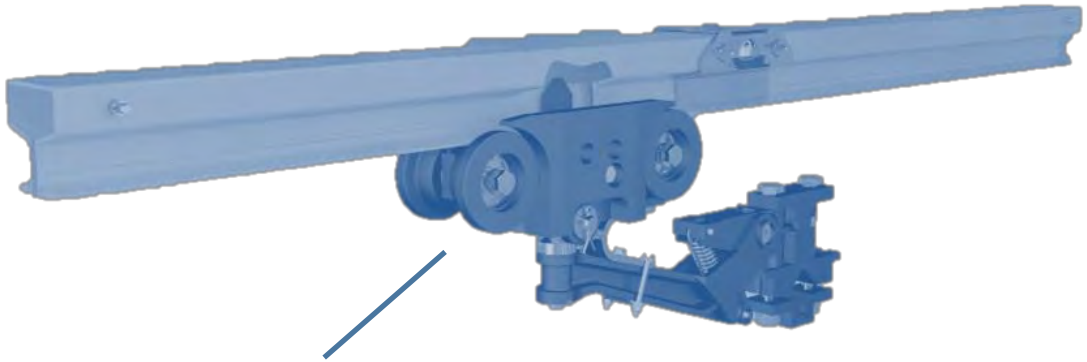
Data communication

- **Highly shielded** data communication
- Up to **600 Mbit/s** net rate
- **Low latency** times
- Interfaces **ready for automation** – Ethernet, Profinet and Profinet Safe

Automation

- **Combination** of electrification, positioning and data communication for remote control
- **Autosteering**
- **Power measurement**
- **Energy optimization**
- **Remote maintenance**

SMGX data communication waveguide
installed at the steel support structure



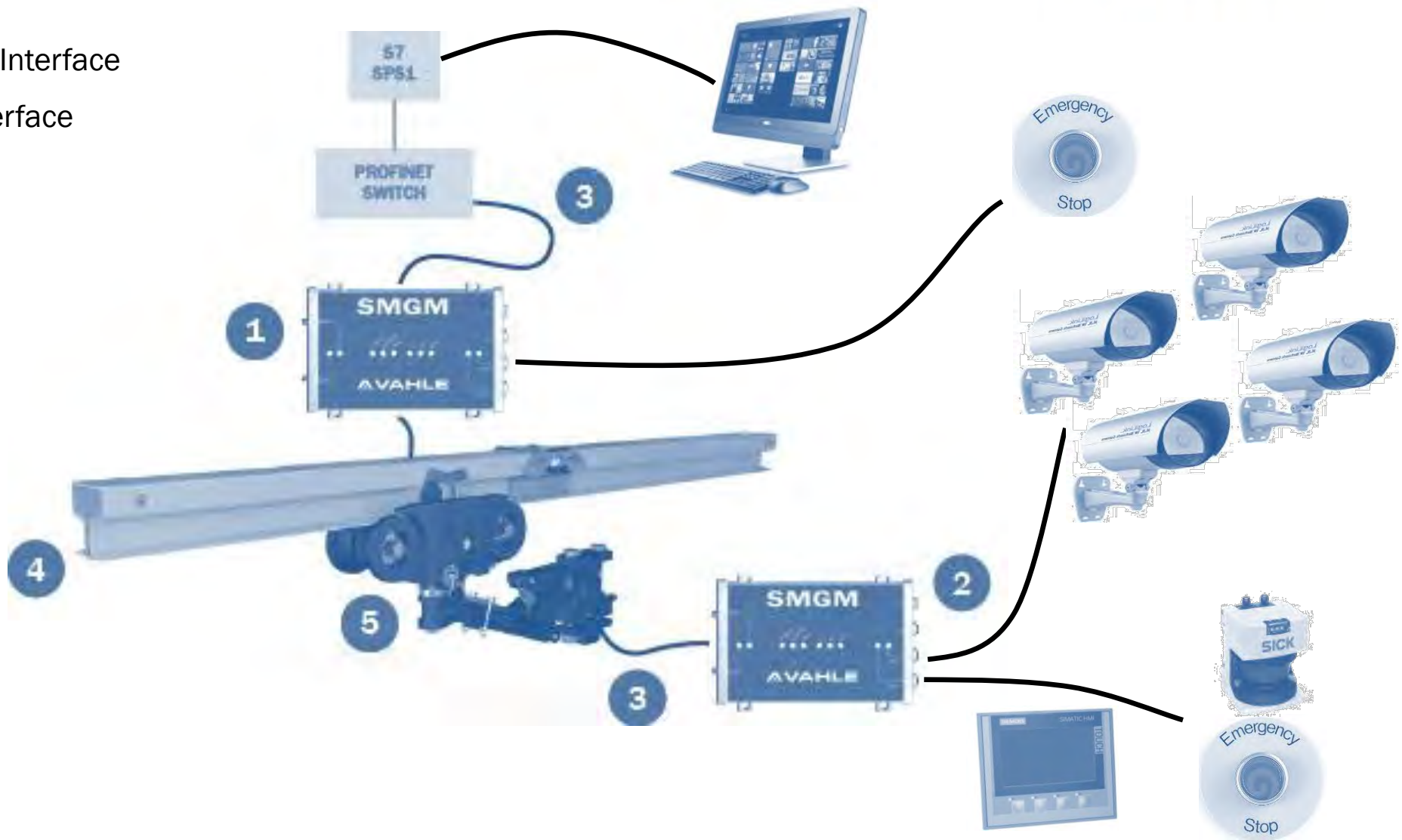
SMGX antenna
installed at the current collector trolley

Characteristics

- EN55022 Class A certified: **no radio frequency device**
- Lowest emission for safe and reliable operation
- Simultaneously video and data transmission with one device
- Coexistent with other radio systems
  - Antenna driving in/out of the rail without influencing the remaining devices
- Frequency band 2,4 or 5 to 5.8 Ghz
- Flexible for different application and travel length

SMGX Data Communication
Overview

1. SMGM Stationary Segment Interface
2. SMGM Mobile Segment Interface
3. SMGM HF Cable
4. SMGX Profile
5. SMGX Mobile Coupler



Sri Lanka, CICT Columbo

Project success stories

2013 - today

12 Ultra post panamax crane

Movable Parts weight: 20KG
compare to festoon system and cable chain
Less noise

No cable for wear

Easy maintenance

SMG data communication system

Hong Kong, Modern Terminals Limited

Project success stories

2011 - 2013

104 RTGs (retrofit & new cranes)

Electrification of 66 container blocks

Hong Kong, Modern Terminals Limited

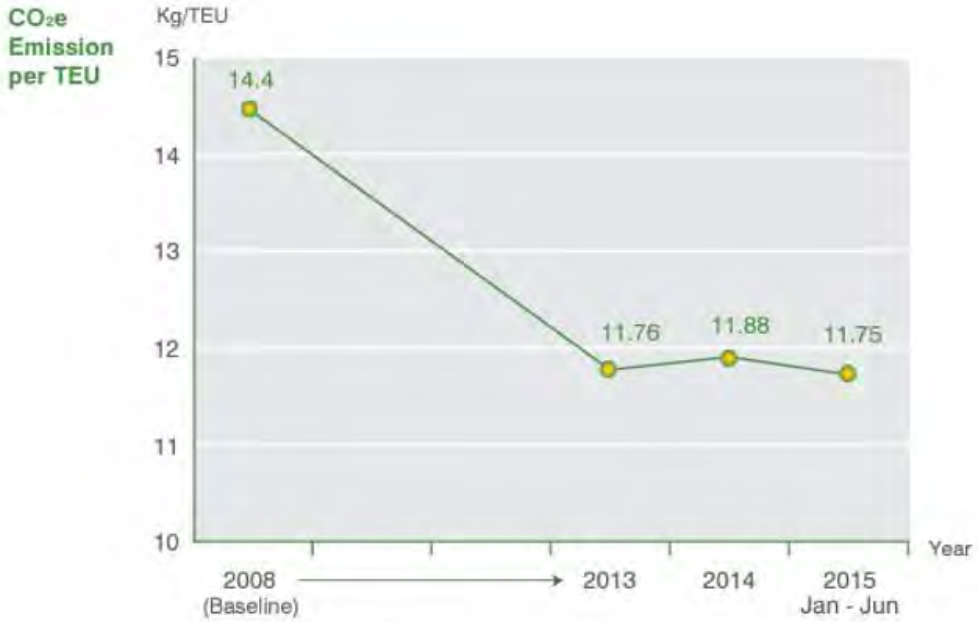
Customer Case study

Electricity-powered Rubber-tyred Gantry Cranes (E-RTGs) Conversion

By the end of June 2015, there were some 200 Rubber-tyred Gantry Cranes (RTGs) across our business units in Hong Kong and mainland China. To reduce associated emissions, the Group has been progressively replacing traditional diesel-fuel powered RTGs with hybrid RTGs and E-RTGs. All of our 94 RTGs in HKBU were converted to E-RTGs with engines compliant with EU Stage IIIA emission standards by the end of 2014; DCB has already been using a full fleet of E-RTGs since it commenced operations in 2007; in TIG P2, E-RTG conversion has taken place in 2008, covering 95% of all RTGs. In 2014, the replacement of eight E-RTGs in HKBU contributed to the reduction of over 850 tonnes of CO_2e emission.

New environmental targets for our operations

Operations	Unit	Baseline year	Reduction target
Container operations	CO_2e kg/ TEU	2008	10 kg/TEU in 2018, 30% reduction from base year
Break-bulk cargo operations	CO_2e kg/ ton	2013	1.7 kg/ton in 2018, 11% reduction from base year



*Only data of container terminal operations is included in the calculation.

Total savings 2011-2018:

298.130.000,00 kg CO^2 *1

Great Britain, HPH UK – Port of Felixstowe

Project success stories

2015 – today

Retrofit

66 ZPMC RTGs

Greenfield

Berth 9: 8 new remote ZPMC eRTGCs

17 new Konecranes aeRTGCs

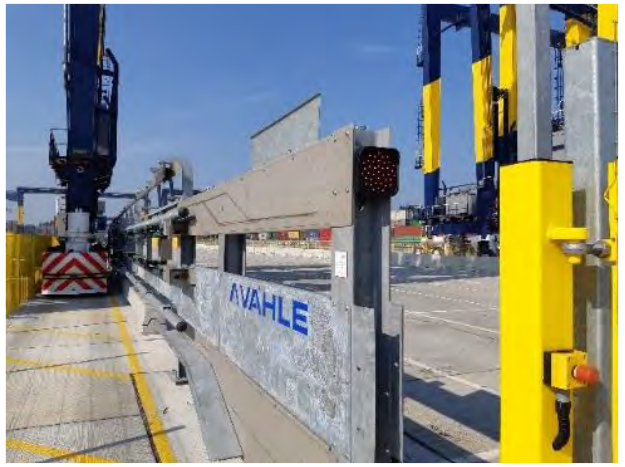
Retrofit

59 blocks (15,322 m)

Greenfield

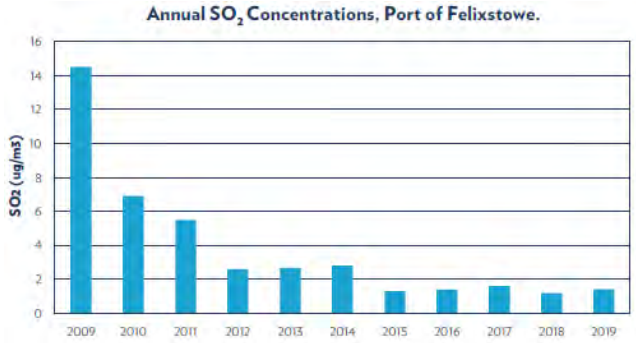
Berth 9: 8 container blocks

Automation with **SMGX data communication** and positioning



Great Britain, HPH UK – Port of Felixstowe

Customer case study



Scope 1 (direct) emissions produced on-site by fossil fuel combustion; mainly by RTG cranes, internal movement vehicles and port vehicles.

Total savings since 2015:

89.620.000,00 $kgCO^2$ *2

Thailand, HPT Laem Chabang – Terminal D

Greenfield Project Success Stories

2017 - today

World's first remote controlled terminal

Remote operation with 28 new AERTGCs

Automation of 20 container blocks in phase 1 – 5,040 m

Phase 2 already in progress

SMGX data communication system

For remote control

USA, Gulftainer Wilmington

Project Success Stories

2021 - today

9 new Konecranes AERTGCs

Automation of 6 container blocks in phase 1 – 1,316 m

Including **SMGX data communication system**

USA, Ports America – Chesapeake, Baltimore

Project Success Stories

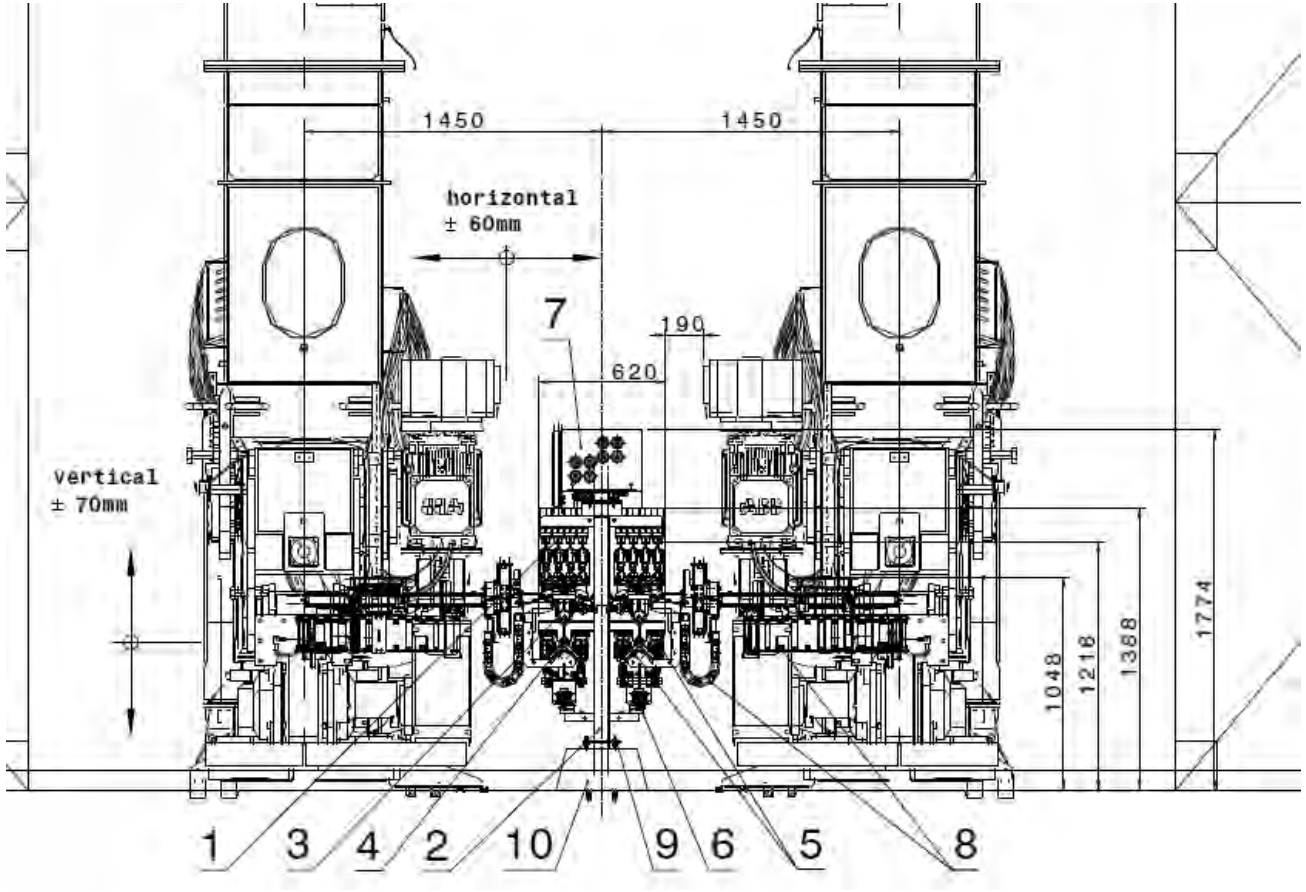
2021 - today

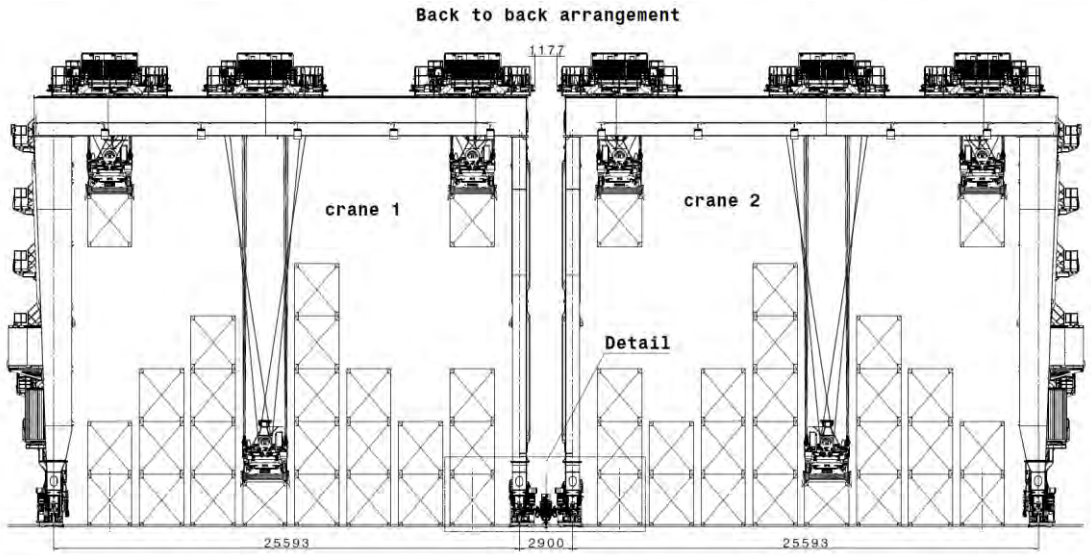
15 new Konecranes AERTGCs

Automation of 4 container blocks
in phase 1 – 1,176 m
Commissioning project ongoing

SMGX data communication system
For remote control

New ASC solution
Busbar with back to back design





Advantage

- reduced weight
- No restriction on acc. And max. speed
- Minimum maintenance work
- Optimized total cost of owner ship
- LV direct feeding

Terminal Automation for Next-Gen Ports

Benefits of VAHLE Electrification & Automation Solutions

ECONOMIC

- Optimized OPEX by reduced fuel cost and idle time
- Reduced dependency on fossil fuel supplies
- Reduced GenSet maintenance cost
- Smart / remote maintenance
- Personnel costs are saved
- Productivity is increased
- Optimized Total Cost of Ownership

ECOLOGIC

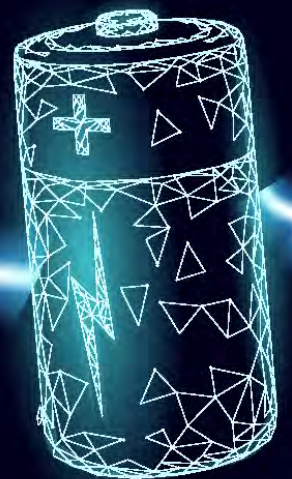
- Reduction of CO_2 emissions and noise pollution
- Sustainable and green – at best with renewables

EFFICIENT

- Flexible yard operation
- Automatic connection system
- Autosteering
- Seamless synchronization
- Human Safety

VAHLE Park & Charge

SAFE | EASY | RELIABLE

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THANK YOU FOR YOUR ATTENTION

Source 1: MTL Sustainability Report 2018-2019

Source 2: PoF Environment Report 2020