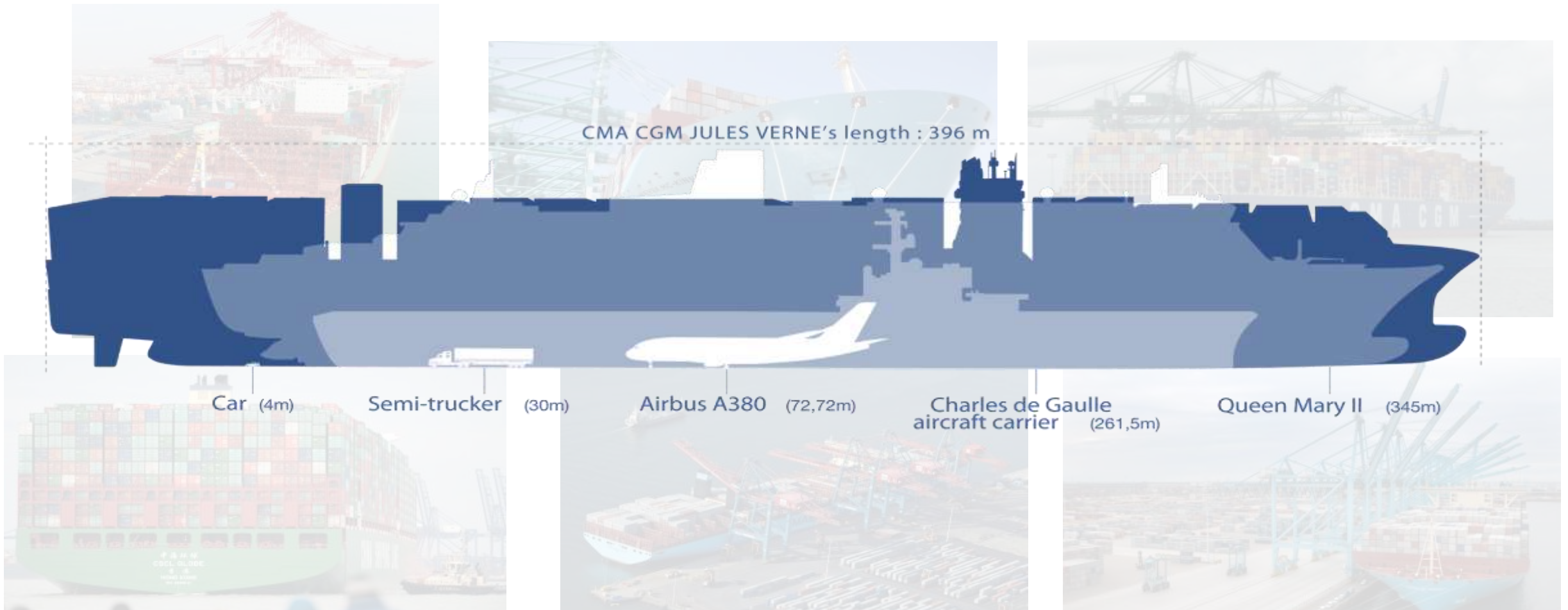


18th Intermodal Africa 2017

Integrated solutions for increased efficiency in ports operation

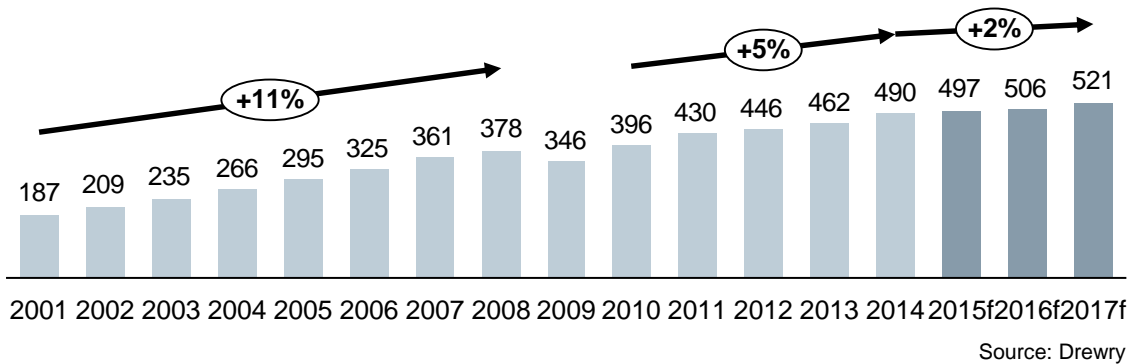
What do the names “Emma”, “Jules Verne”,
“Globe” or “Oscar” have in common?



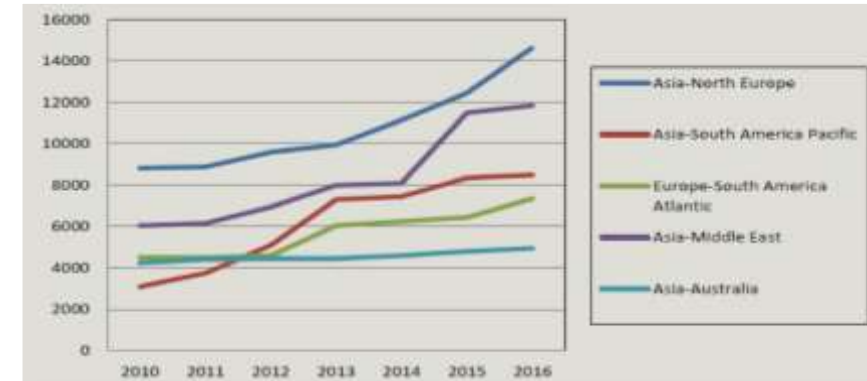
Bigger ships are being used to due lower cost per transported container

Global Container Shipping Environment and Developments

Global port throughput into slow growth phase [MTEU]



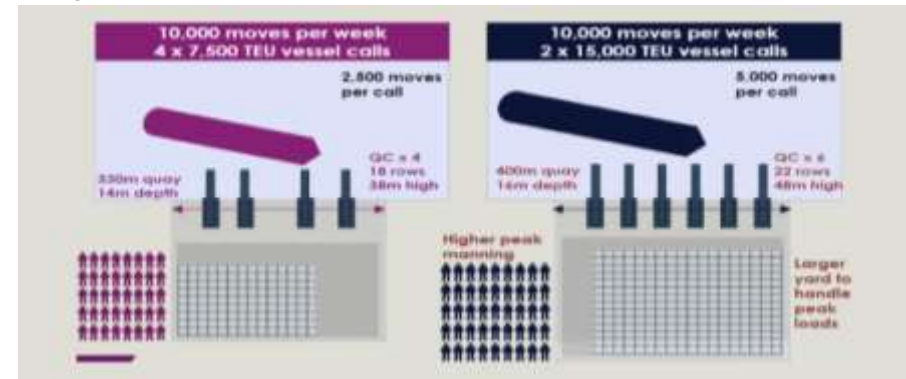
Container ship size per key trade lane [TEU]



Increasing nr. of cranes per ship to increase berth productivity



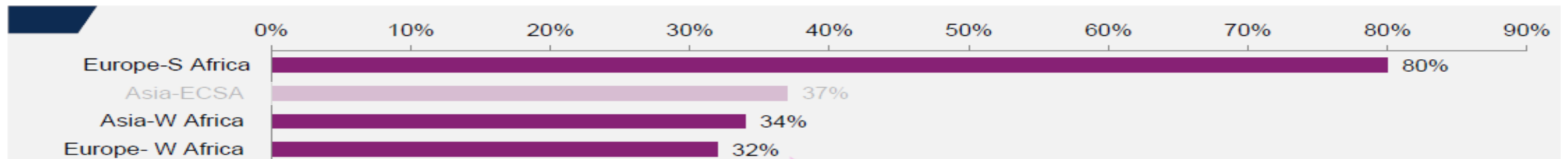
Increasing nr. of cranes per ship to increase berth productivity



Africa is experiencing the biggest relative increase

Vessel cascading

Increase in average ship size: 1Q 2013 - 1Q 2015



Source: Drewry Maritime Research

- Vessel cascading affects all terminals in the World
- Africa is experiencing the biggest relative increase
- Bigger Ships = Bigger Cranes !!



This trend has significant influence on the world's Cranes business



- 1959 hoist 25t; outreach 25m

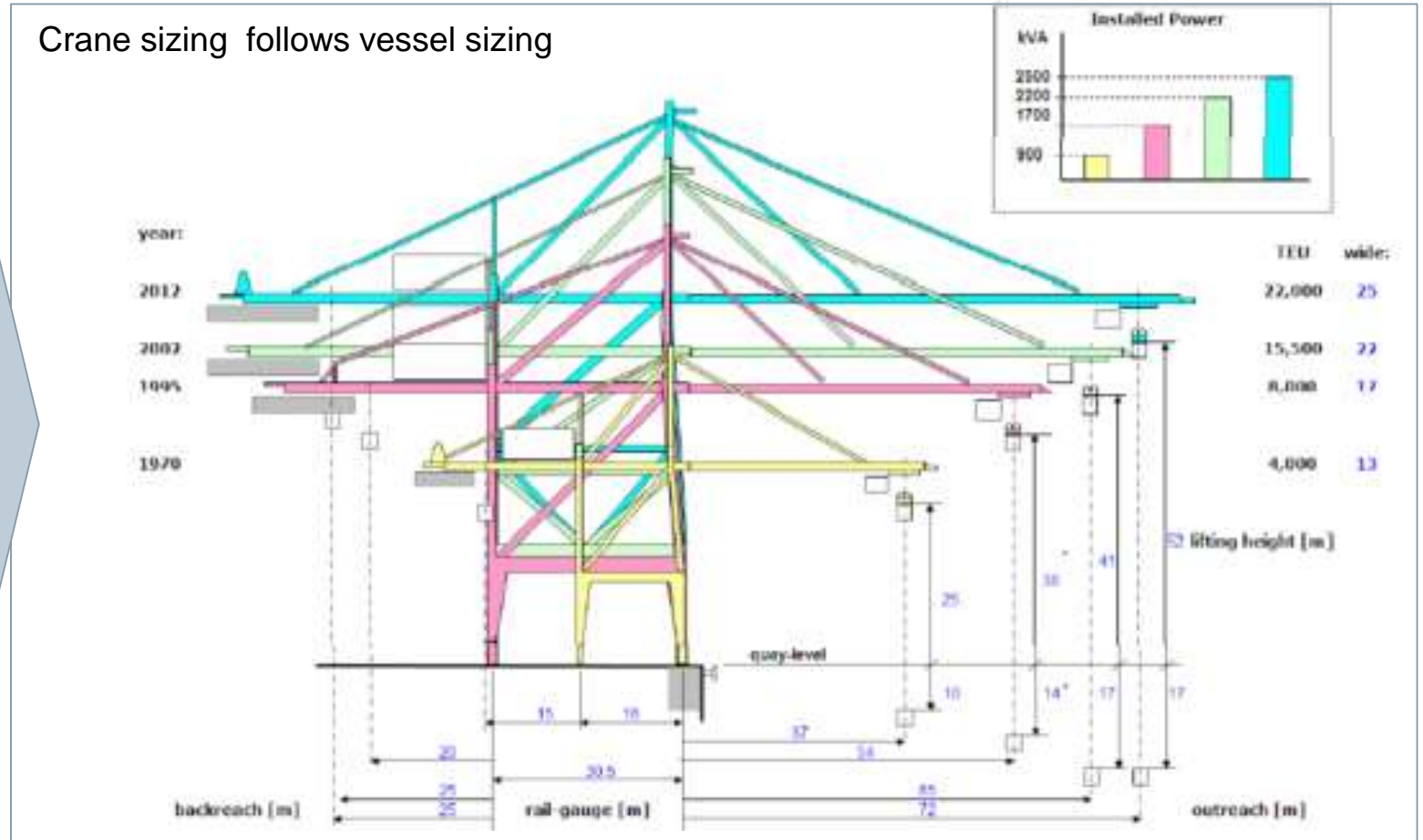


- 2014 hoist 80t; outreach 72m



Source: APMT

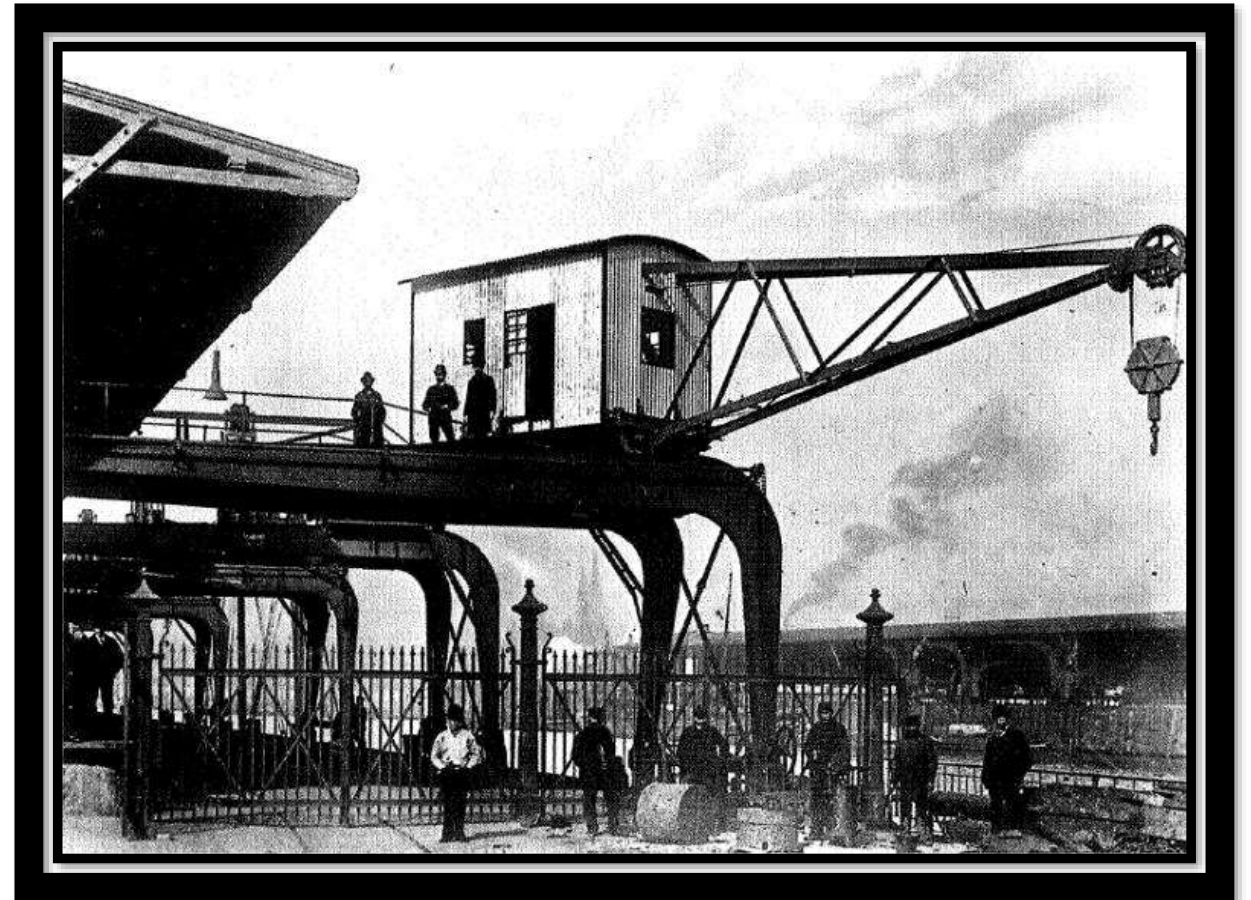
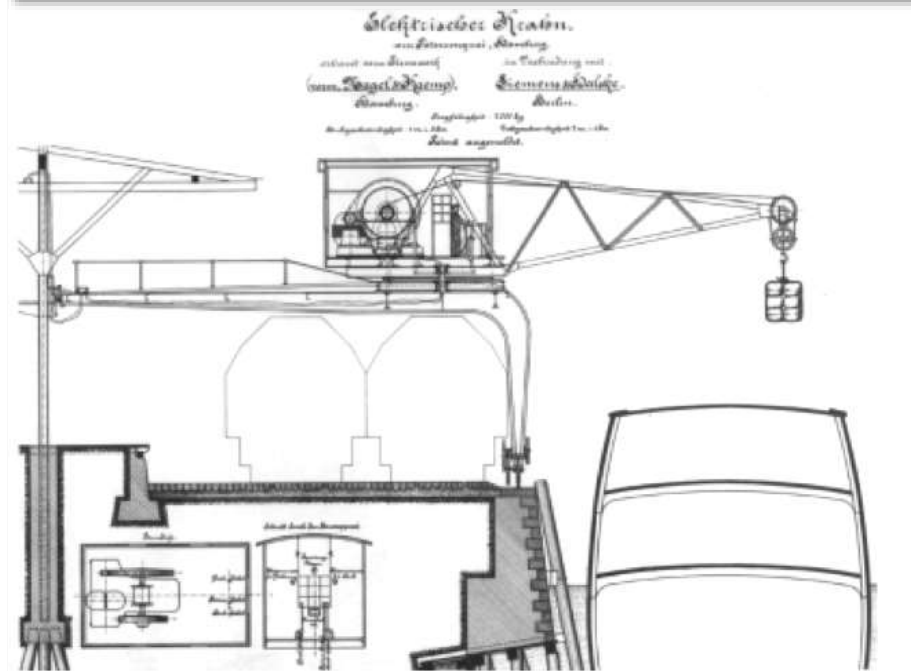
Crane sizing follows vessel sizing



Terminals from all over the world need bigger cranes to handle bigger ships

History of Siemens in electrical cranes dates back to 1891

- 26. 9.1890 Erste Anfrage von Eisenwerk vorm. Nagel & Kaemp in Hamburg-Uhlenhorst wegen elektr. Ausrüstung von Hafenkränen.
- 14.11.1890 S&H reichen Nagel & Kaemp eine überschlägige Kostenberechnung für den elektr. Betrieb von 30 Kränen ein.
- 9. 2.1891 S&H erklären sich auf Anfrage (vom 7.2.) bereit, zu der von der Hafenbehörde gewünschten probeweisen Aufstellung eines elektr. Kranes am Petersenkai, die Dynamomaschine mit Zubehör **auf eigene Kosten zu liefern** und sind mit der Bedingung einverstanden, dass **bei befriedigender Leistung der Ankauf** erfolgt.



Milestones of a 170-year history

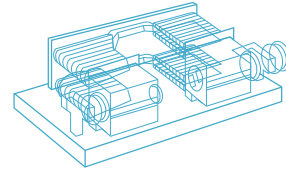
1816 – 1892

Company founder, visionary and inventor



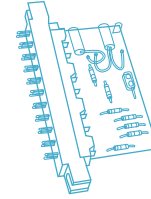
1866

The dynamo makes electricity part of everyday life



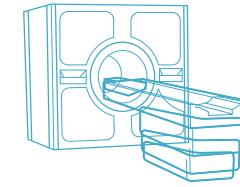
1959

SIMATIC makes Siemens a leader in automation technology



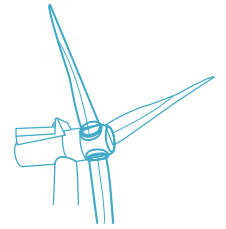
1983

First magnetic resonance imaging scanner goes into operation



2012

Test operation of the world's largest rotor for offshore wind turbines

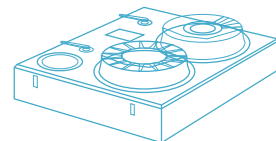


Werner von Siemens

Siemens innovations over the past 170 years

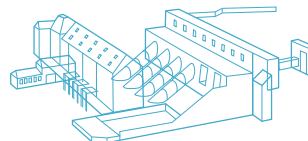
1847

Pointer telegraph lays the foundation of Siemens as a global company



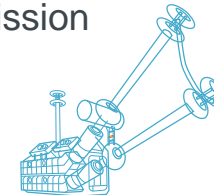
1925

Siemens electrifies the Irish Free State with a hydroelectric power plant



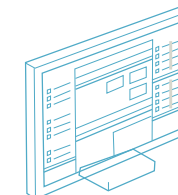
1975

Breakthrough of high-voltage direct current (HVDC) transmission



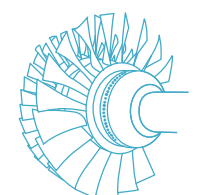
2010

TIA Portal takes automation a stage further



2016

World's most efficient combined cycle power plant



Automation solutions for Cranes



Ship to shore



Stacking



Intermodal



Bulk handling



Coil handling



Shipbuilding

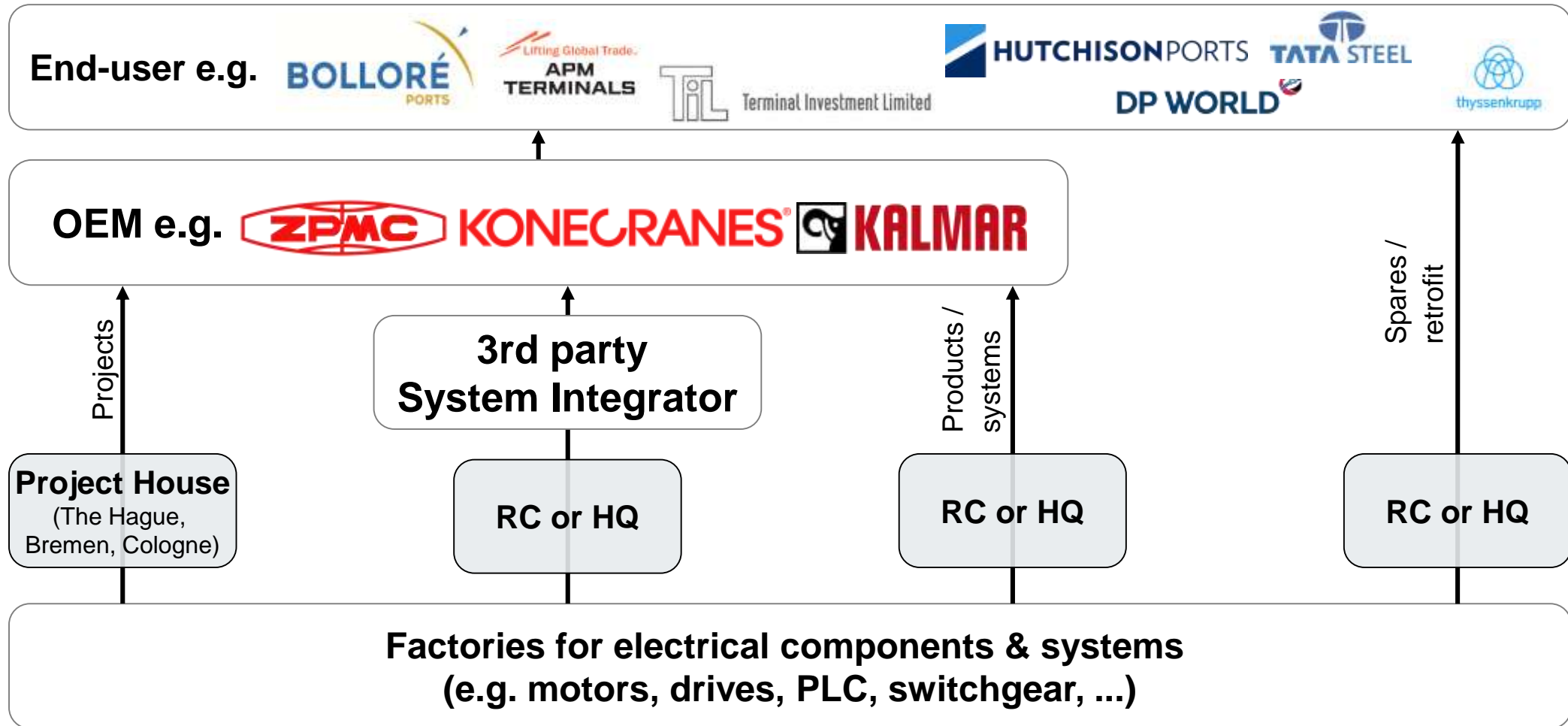


Steel

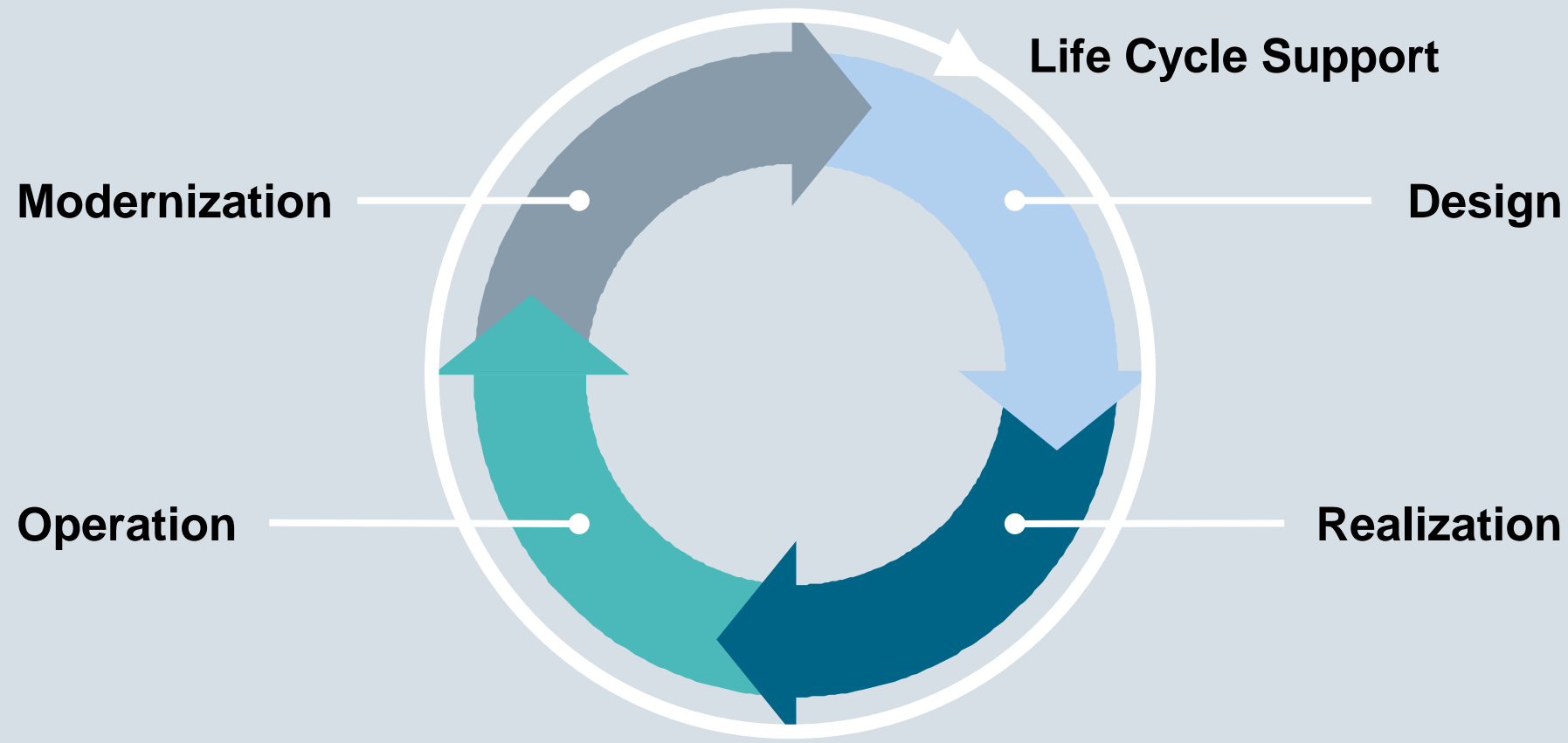


Offshore

We serve all channels to the market with our diversified sales approach



Products, systems, solutions, and support over the complete machine lifecycle



From machine simulations to retrofits – we cover the whole life cycle

Siemens drive train portfolio for cranes

Drives & motion controller

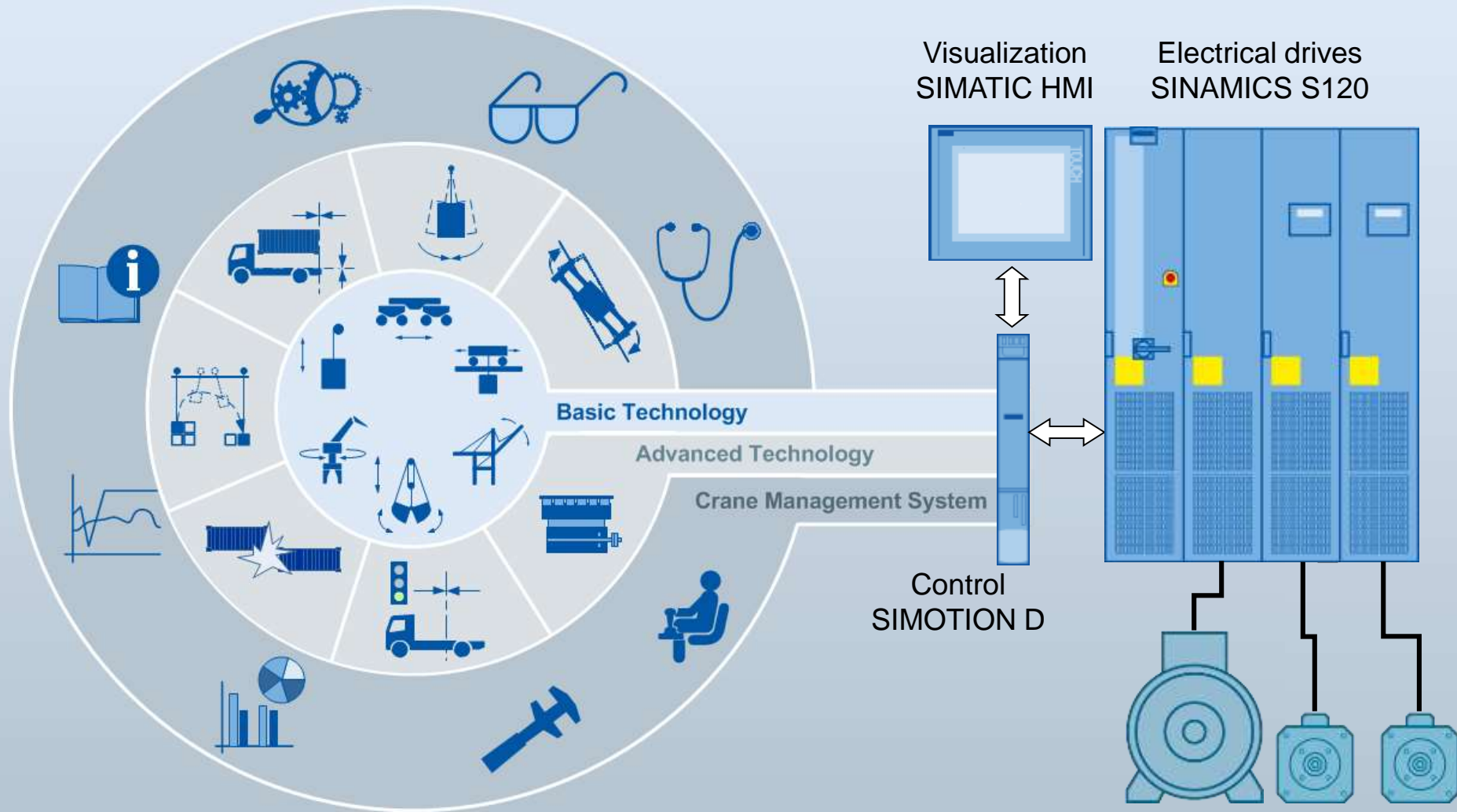
LV asynchronous motors

Geared motors

Inverters		High Performance Motion	
<p>SINAMICS V / G / S</p> 	<p>SIMOTION</p> 	<p>SIMOCRANE</p> 	
<p>SIMOTICS SD 1LE1</p> 	<p>SIMOTICS DP 1PC1</p> 	<p>SIMOTICS M 1PH8</p> 	<p>SIMOTICS FD 1L▲1</p> 
			

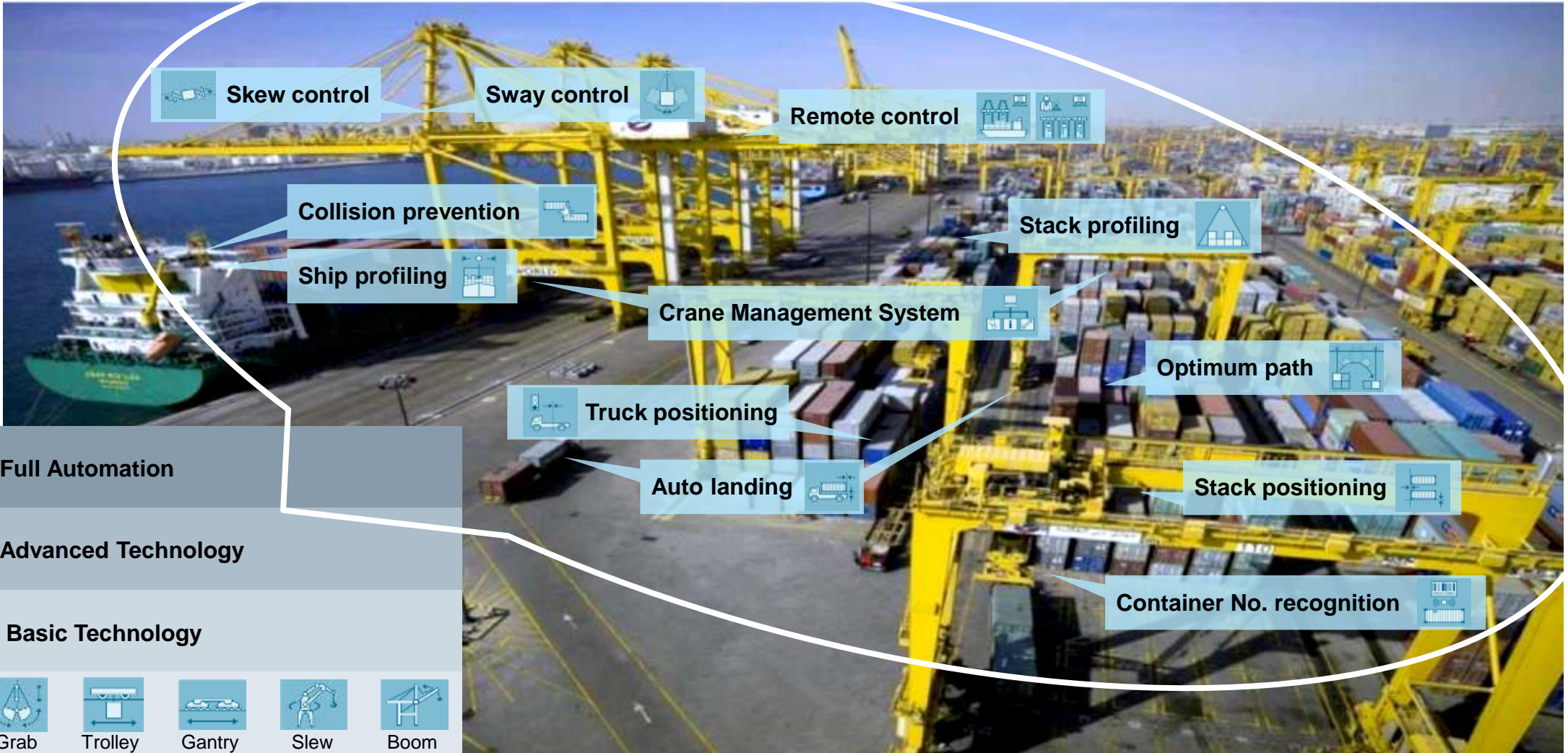
SIMOCRANE

Modular and integrated software architecture



SIMOCRANE

Fully modular automation solution for terminals



Skew control

Sway control

Remote control

Collision prevention

Stack profiling

Ship profiling

Crane Management System

Optimum path

Truck positioning

Auto landing

Stack positioning

Container No. recognition

Full Automation

Advanced Technology

Basic Technology

Hoist Grab Trolley Gantry Slew Boom

Siemens Cranes

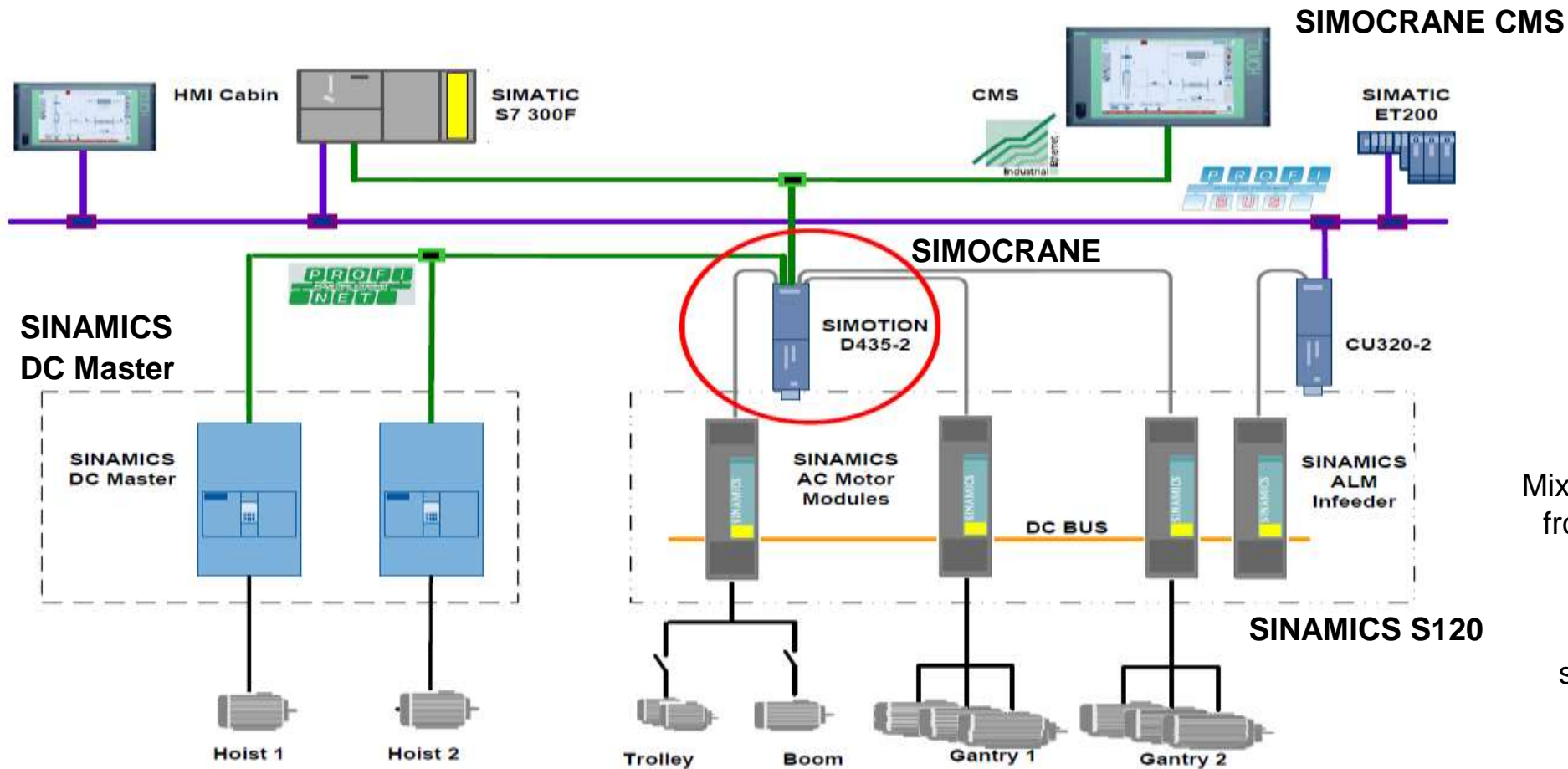
Our product portfolio



		High Performance		Mid Performance		
SIMOCRANE	Crane Technology	Crane Management System	(Remote) CMS	CMS Lean		
	Advanced Technology		Sway Control		Drive-Based Sway Control	
			Skew Control			
		2D-Trajectory				
		Truck Position System				
		ECO Technology				
	Basic Technology	Basic Technology	Drive-Based Technology			
Platform	Motion Controller		SIMOTION D435-2			
	Drive Controller		CU320-2	CU320-2	CU310-2	
	Drives	Crane Cabinet Modules	Chassis	Book-size	PM240-2 / PM240 1) PM250 2)	PM340 1)
	Motors	1LP1 1LQ1 1LM1	1PH8	1PC1	1LE1	

SIMOCRANE with SINAMICS

Multi-axes configuration with AC and DC Technology



Siemens standardized crane technology platform
SIMOCRANE BT V3.0

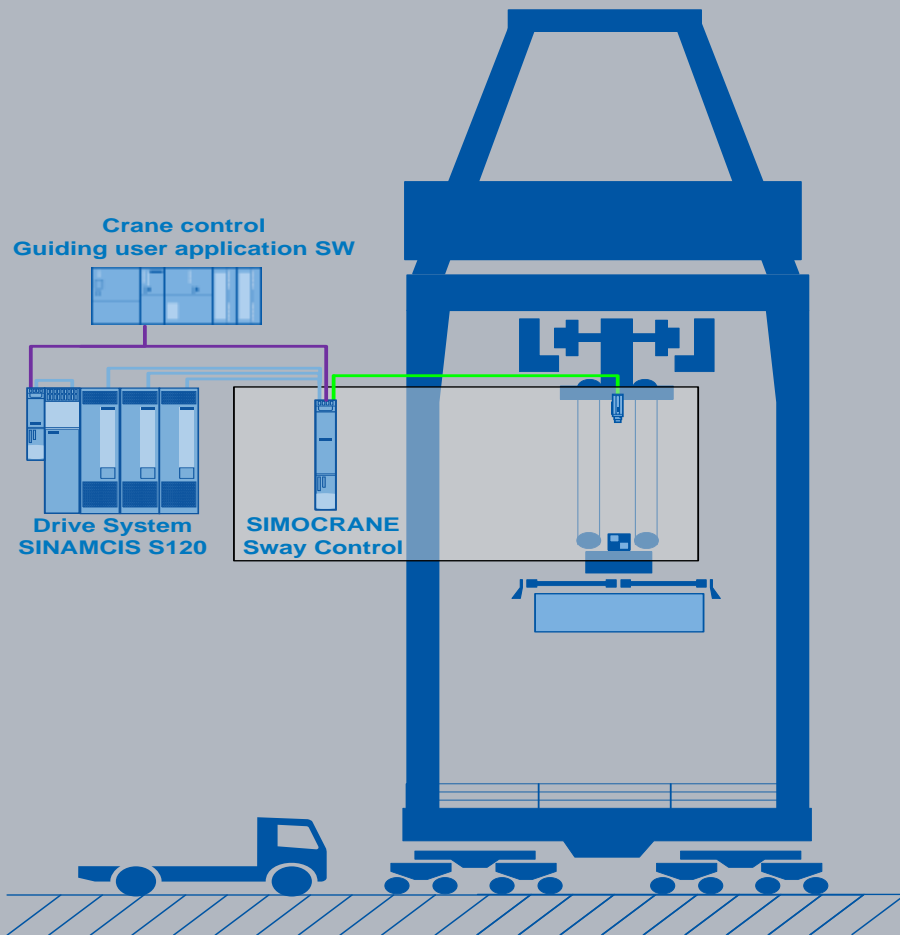
Mixed DC & AC drives controlled from a single robust controller in multi-axes configuration

suitable for complex cranes

Integrated full solutions

SIMOCRANE Advanced technology

Sway Control



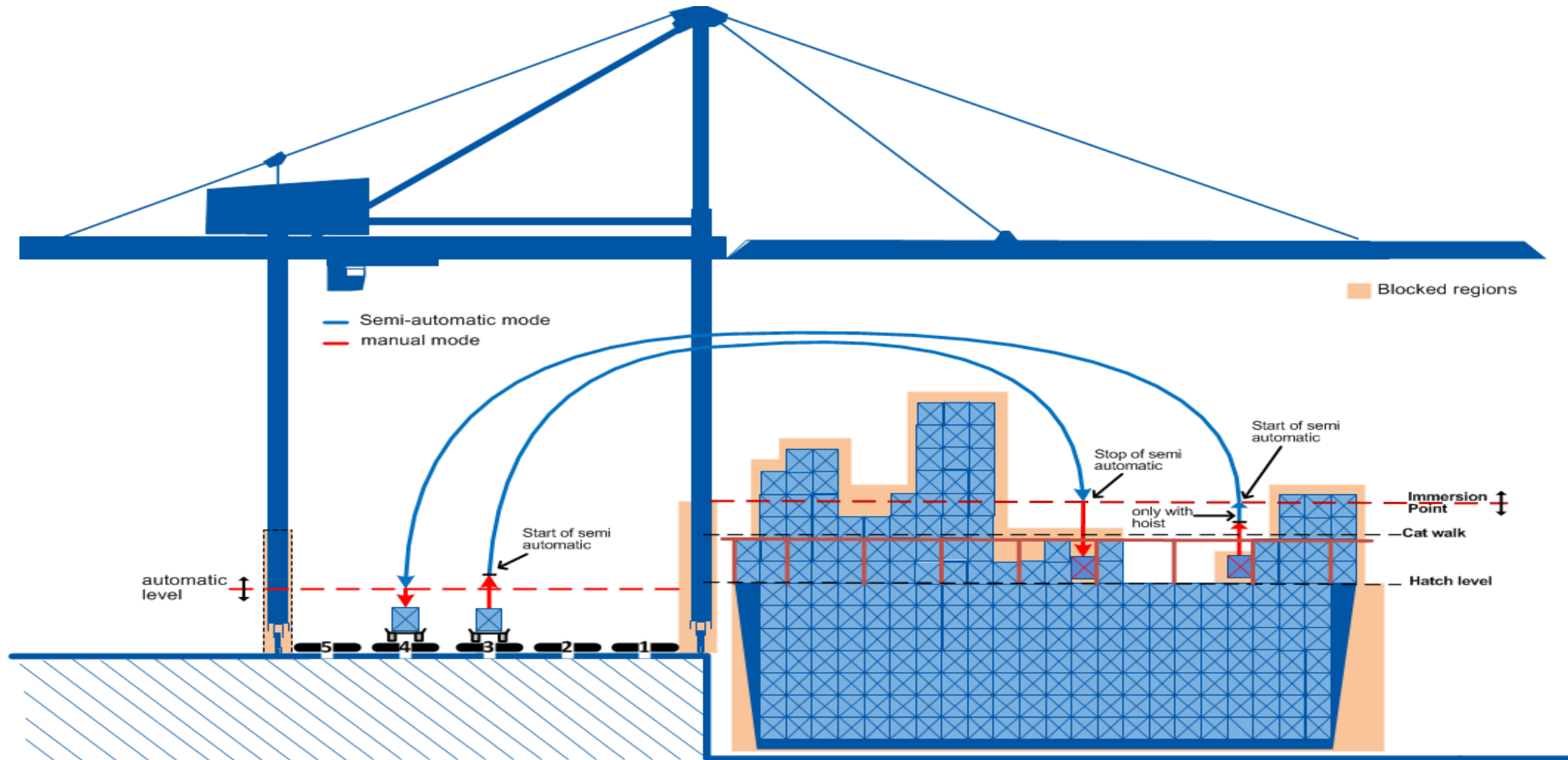
Functions:

- Controls the load sway angle
- Positioning of the load
- (semi) Automatic crane operation
- Smooth operation
- Trim, list and skew control

Benefits:

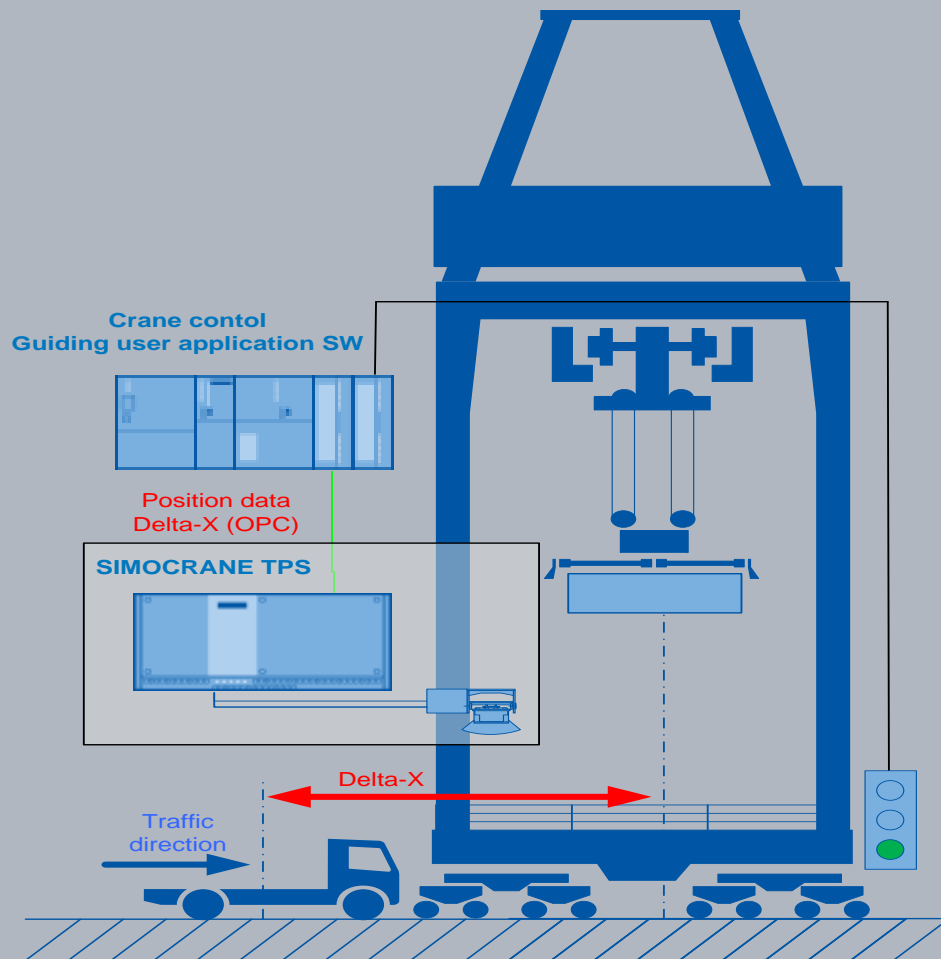
- Control of load trajectory
- Pre-requisite for remote control
- Reduction of the stressing on mechanical transmission elements

Typical Semi Automatic operation with Sway Control



SIMOCRANE Advanced technology

Truck Positioning System (TPS)



Functions:

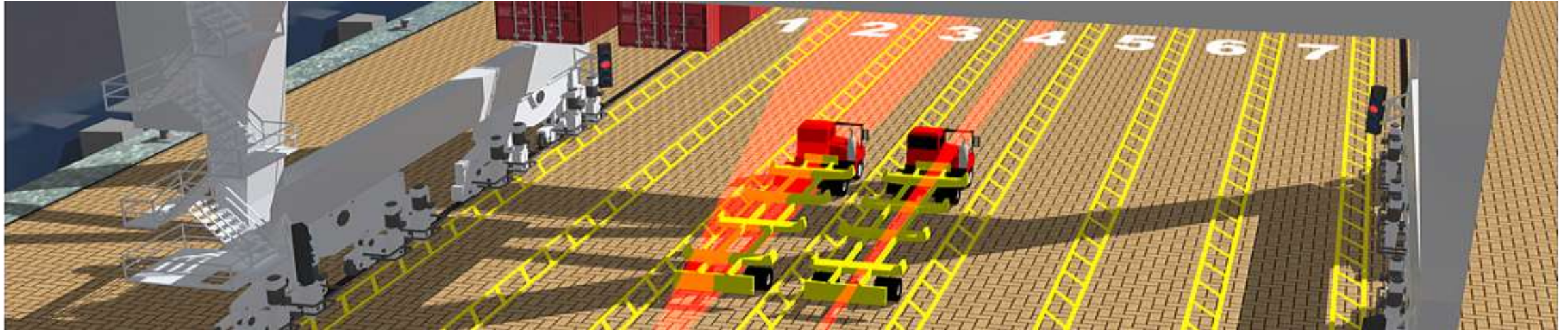
- Scan max. 2 working lanes
- Recognize parameterized objects
- Provide high precision position data of parameterized objects in 2D and 3D.
- Automatic system calibration

Benefits:

- Productivity boost (up to 10%)
- Increase safety, less interaction with personnel in the container hand-over zone

SIMOCRANE TPS

Aligning the vehicle/container with the crane



Vehicle alignment (STS)

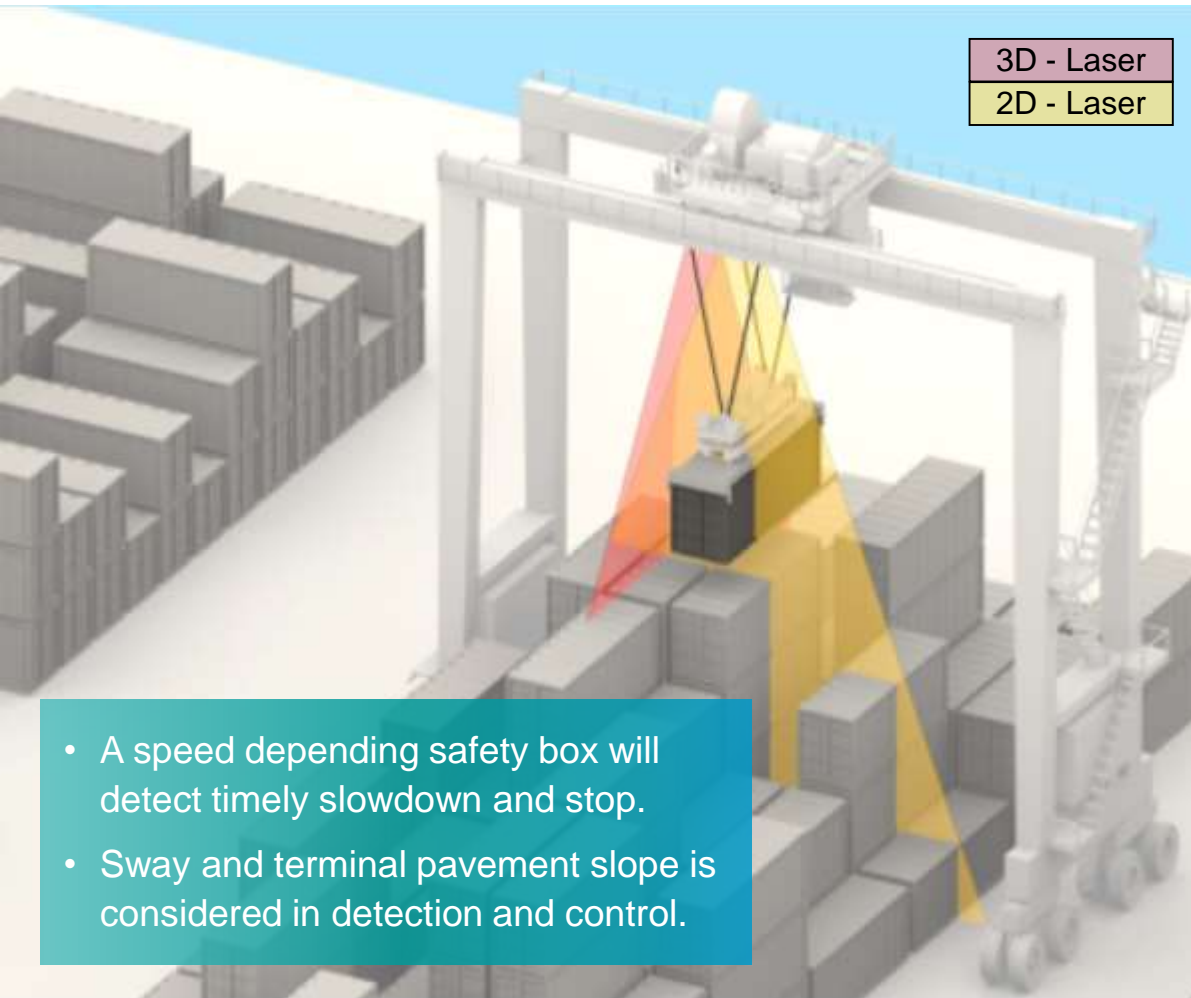
Vehicle recognition based on 2D model mapping.
(On the fly measurement)



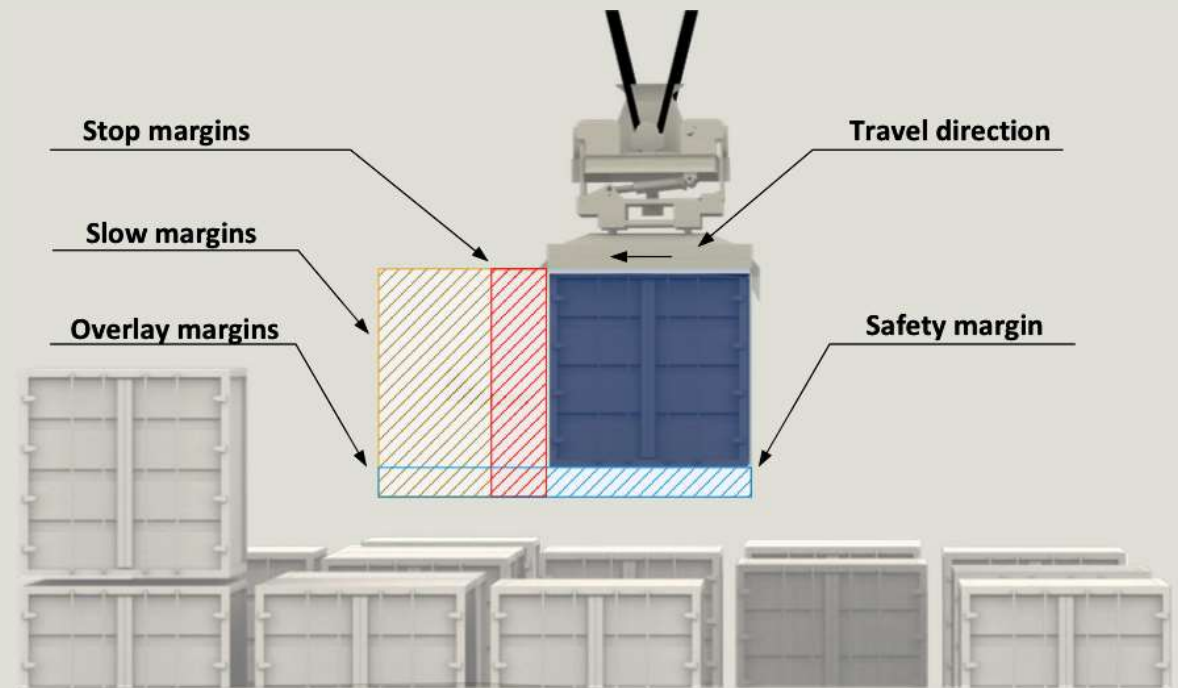
Tracking vehicle or ISO container(s) in gantry direction (X), max. 2 lanes simultaneously.
Computing gap between twin 20' containers
Transfer position data (X) to the crane control (PLC) via OPC.
Traffic control via crane control (PLC)

SIMOCRANE LCPS

Load Collision Prevention System



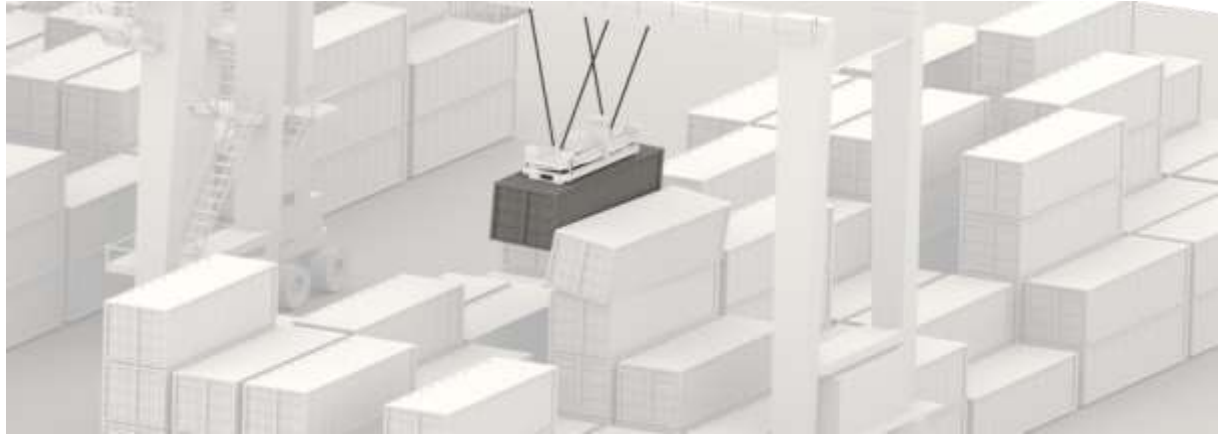
- Two laser scanners are installed on the bottom of the RTG trolley
- The laser scanners are placed with 90° offset to each other
- Laser in trolley direction (yellow beam) detects trolley position and spreader height



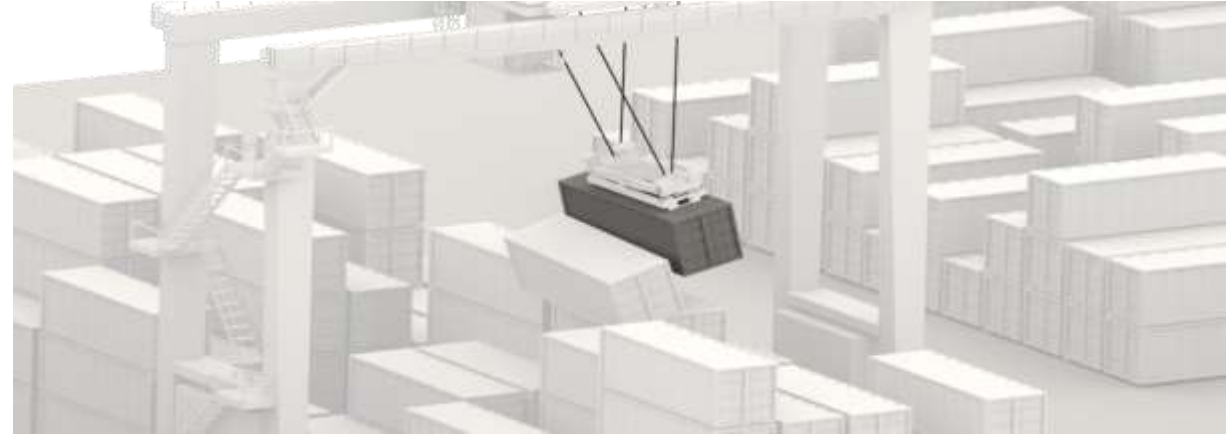
SIMOCRANE LCPS

Typical situations with trolley travel

Collision in trolley forward direction



Collision in trolley backward direction

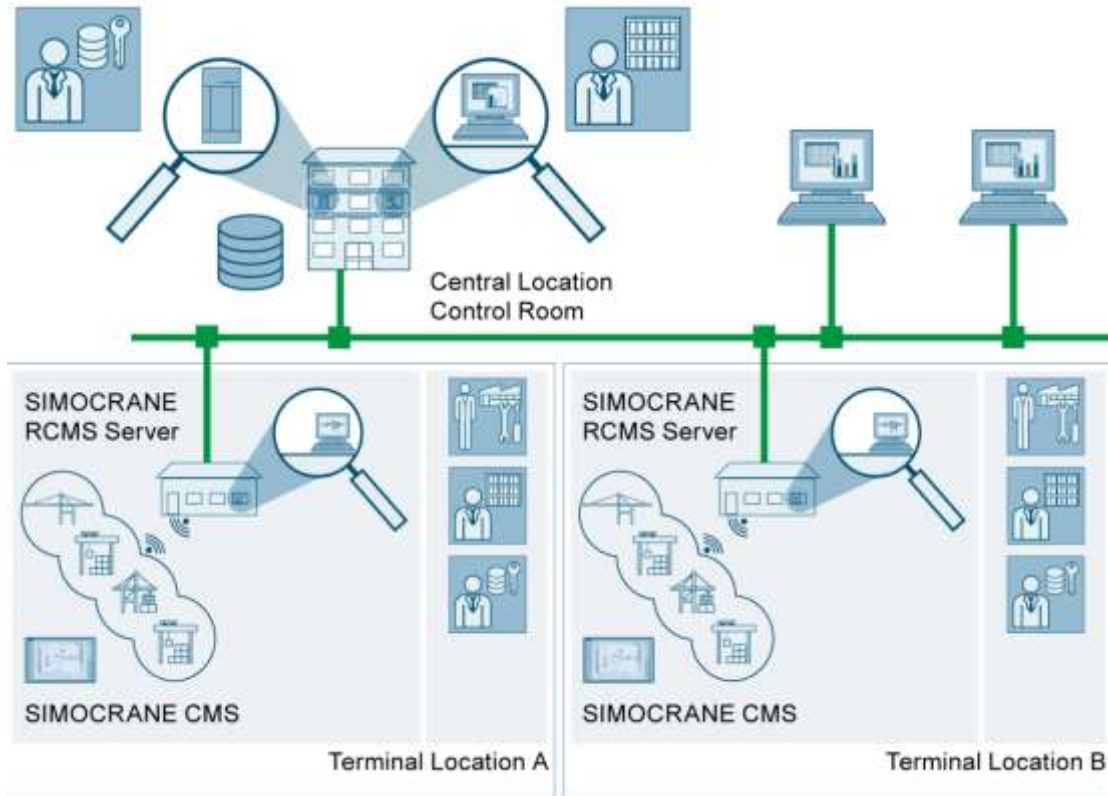


Collision with the adjacent bay



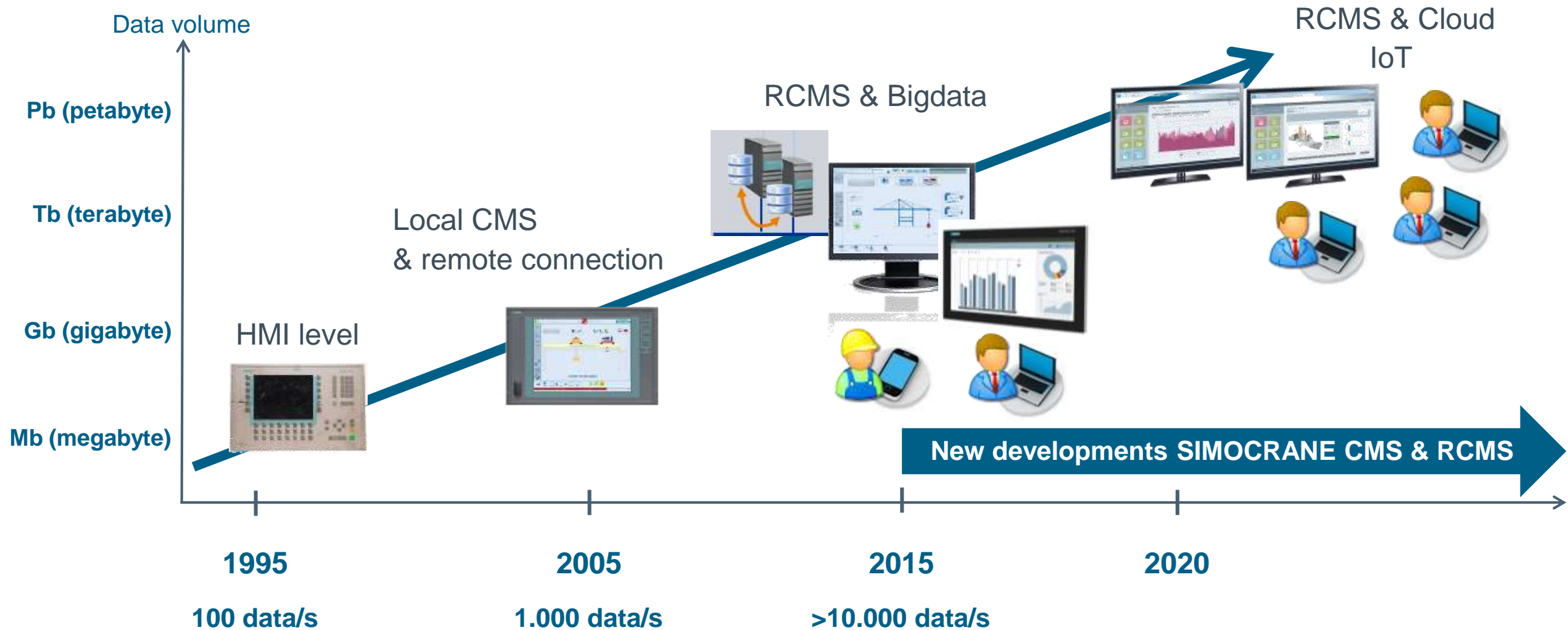
SIMOCRANE CMS

From single to multi-distributed systems

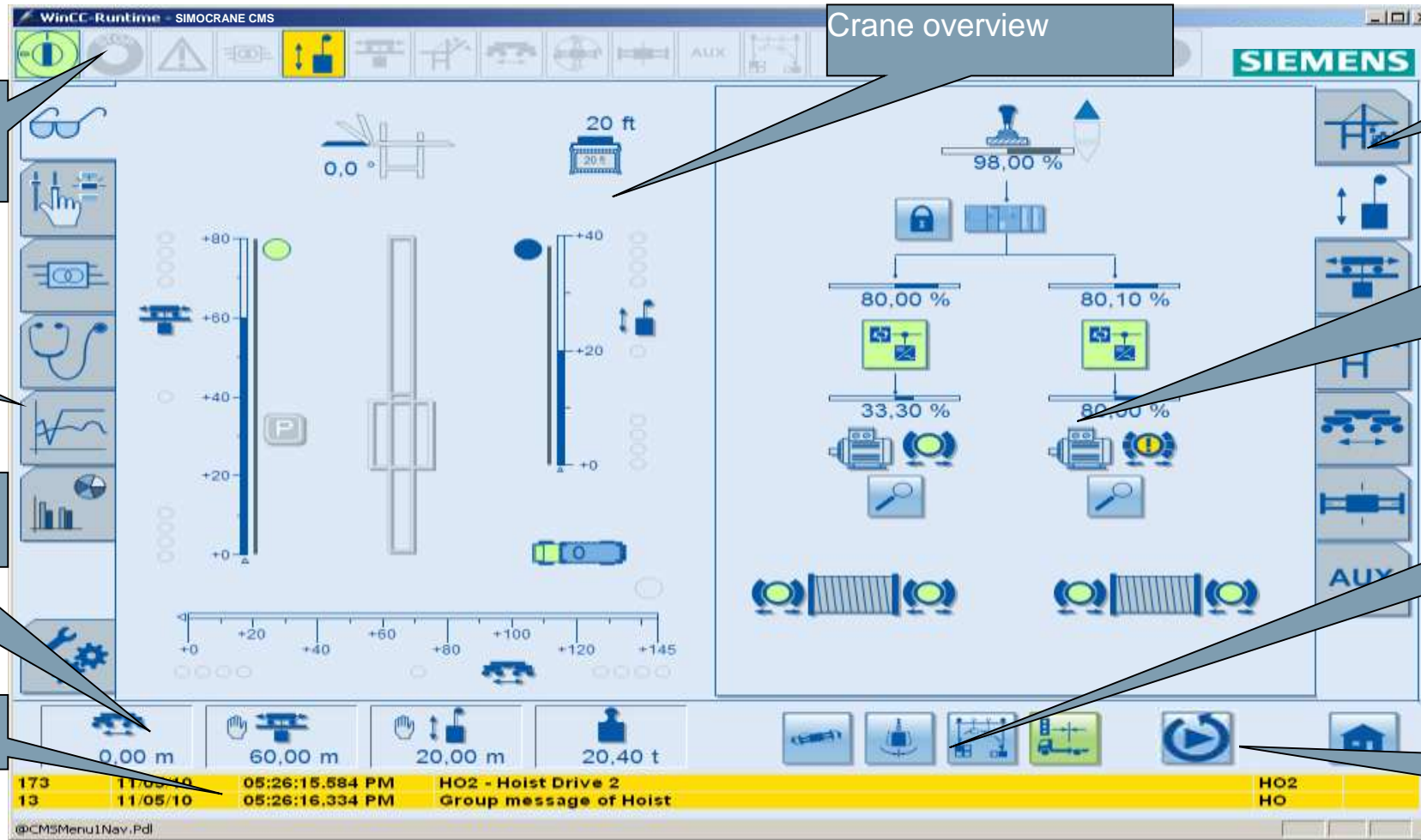


Wide multi-distributed terminal and Big Data transform your crane data into knowledge

SIMOCRANE CMS Crane Management System



SIMOCRANE CMS – User Interface



Navigation/Status sub-systems

Details/Status sub-systems (e.g. drives, motor, brackes, drum, PLC, crane components, etc)

Status technology functions

CMS Replay (Playback)

Crane overview

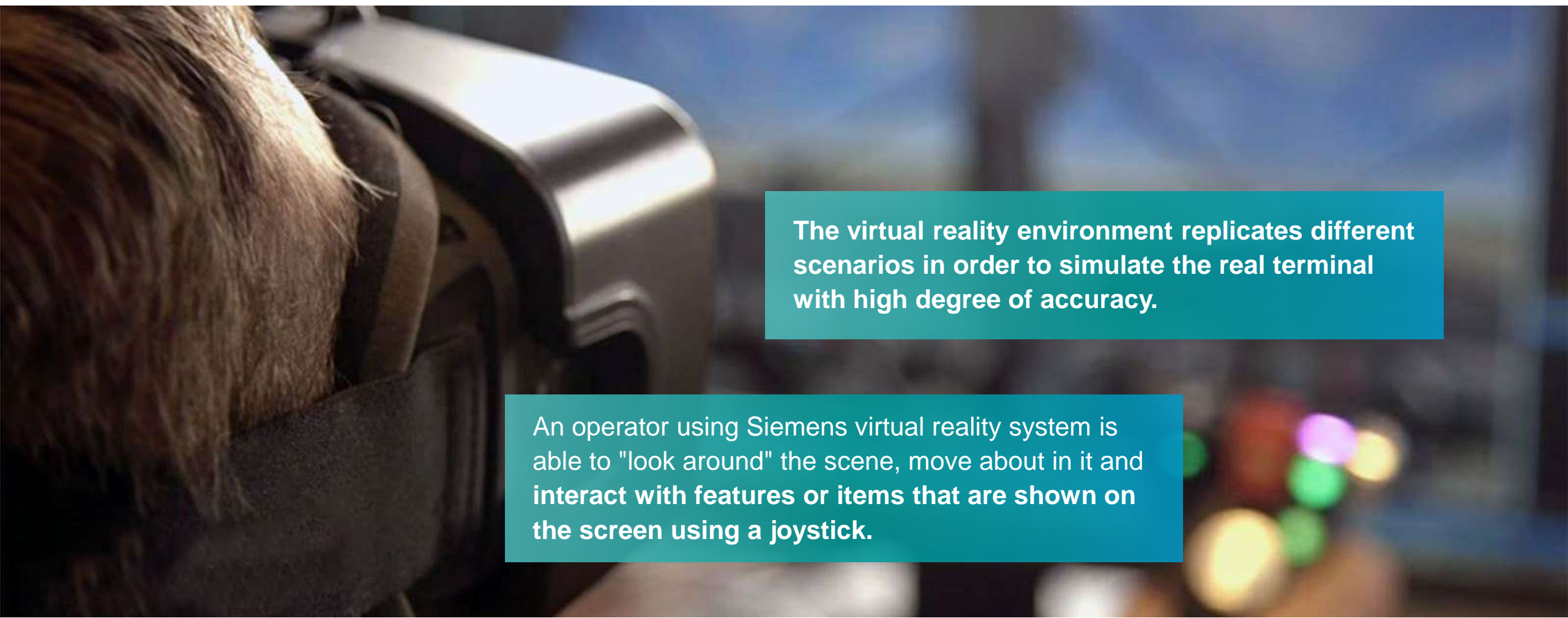
Error status bar (accumulative error)

Navigation Main functions

Status bar Operation data

Actual fault messages

Digital Twin of the whole terminal

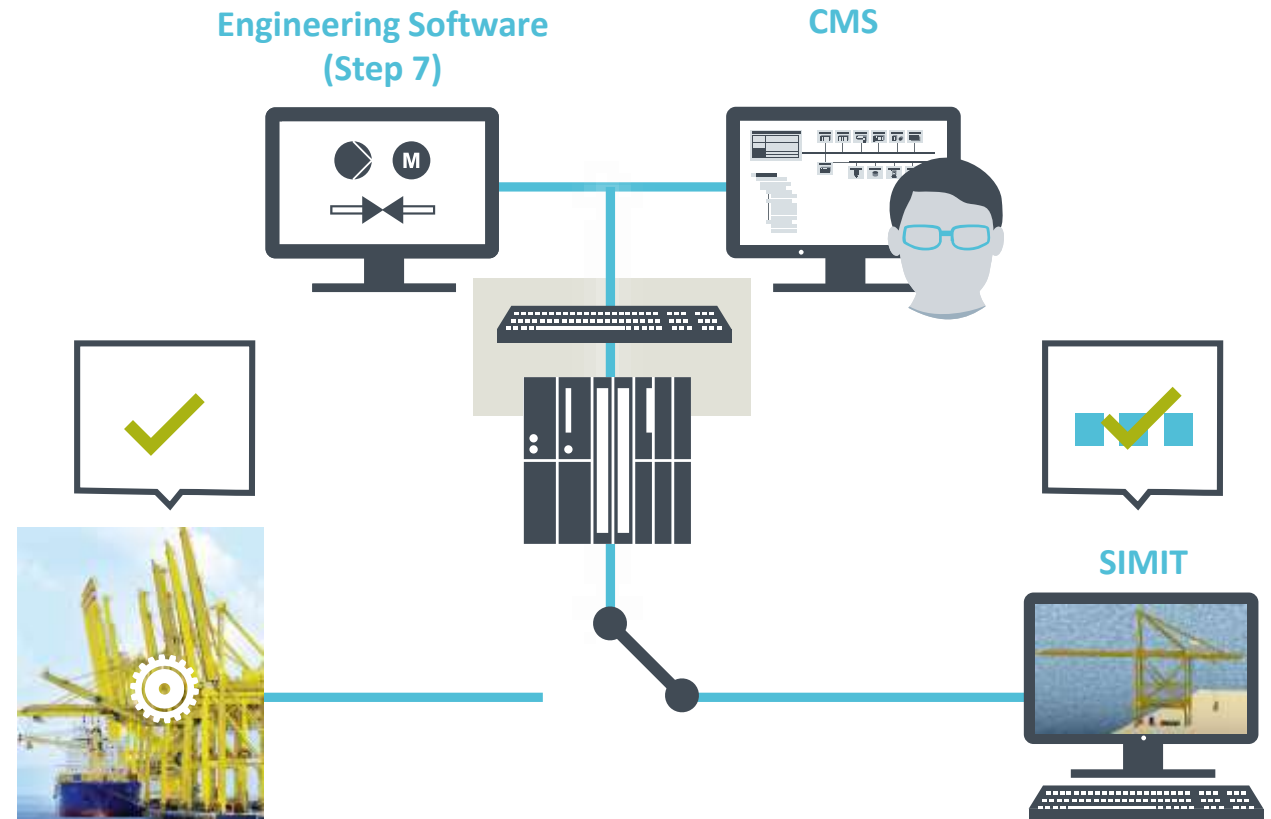


The virtual reality environment replicates different scenarios in order to simulate the real terminal with high degree of accuracy.

An operator using Siemens virtual reality system is able to "look around" the scene, move about in it and interact with features or items that are shown on the screen using a joystick.

Simulation and testing of the automation function with **SIMIT**

Save time and assembly time
and expenses by implementing the automation solution



SIMOCRANE SIMULATION

Key Highlights

SIMOCRANE SIMULATION – Key Highlights

Integration Time



Advanced Automation

Virtual Commissioning



Zero error startup

Test Runs



Continuous test

Training



Multiuser

Maintenance Station



Replacement, Spares

Market Place

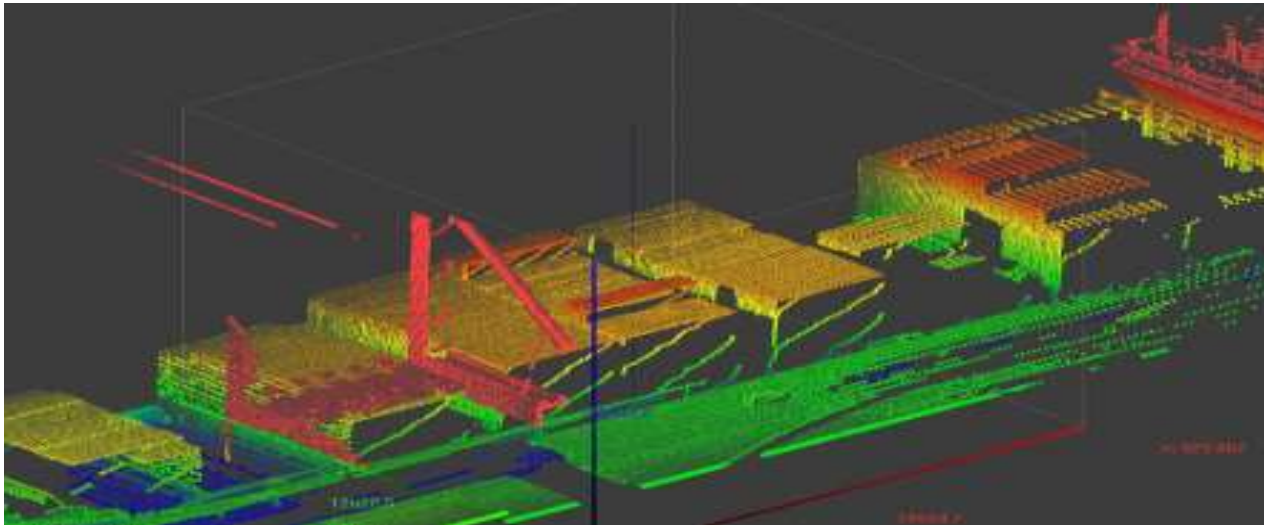
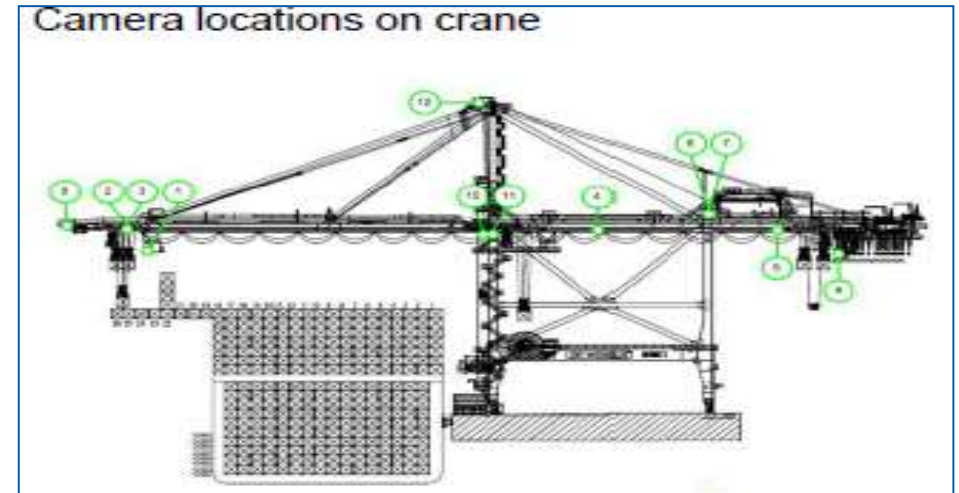


Scenarios

Remote Control Operation System (RCOS)

Higher productivity with STS Remote Control

- Full use of trolley speed and acceleration
- Full use of sway control
- Shift changes quicker and more flexible
- Close to operations
- Better work conditions
- Diversity in operators



SIEMENS
Ingenuity for life



Siemens RCOS latest desk design and UI

Remote Control System – Desk overview

SIEMENS
Ingenuity for life



Reference Siemens Crane Automation

APMT Tangerang Med 2

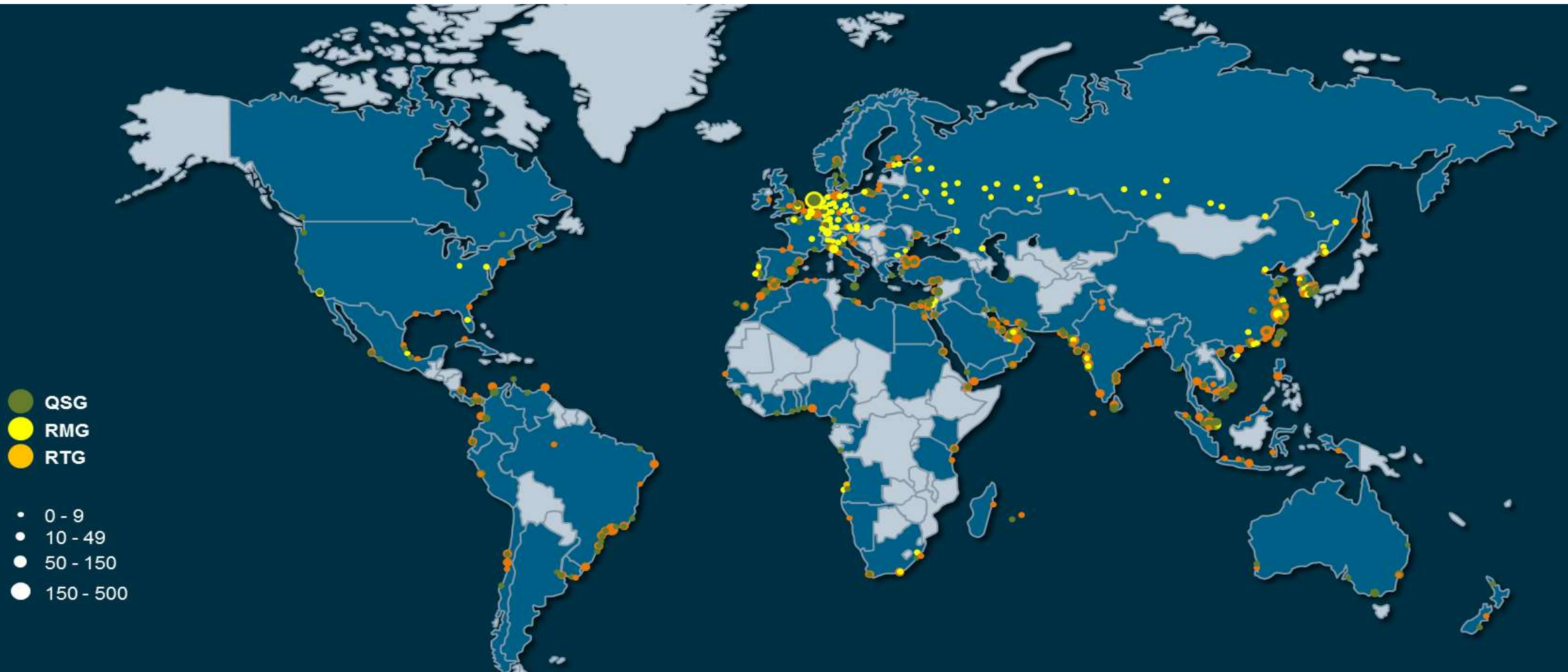
Terminal will serve vessels up to 20,000 TEU, with a full build capacity of 5MTEU



Cutting edge technology:

- 12x STS from ZPMC
 - Double trolley
 - Remote controlled
- 32x ARMG from Künz
 - Fully automatic

Over 5500 container cranes in operation driven and controlled by Siemens



Siemens Cranes

Installed Base – Africa

Key facts Africa:

Higher, larger and longer Cranes brought into operation

- Vessel cascading effect

New and modernized terminals are STS operated

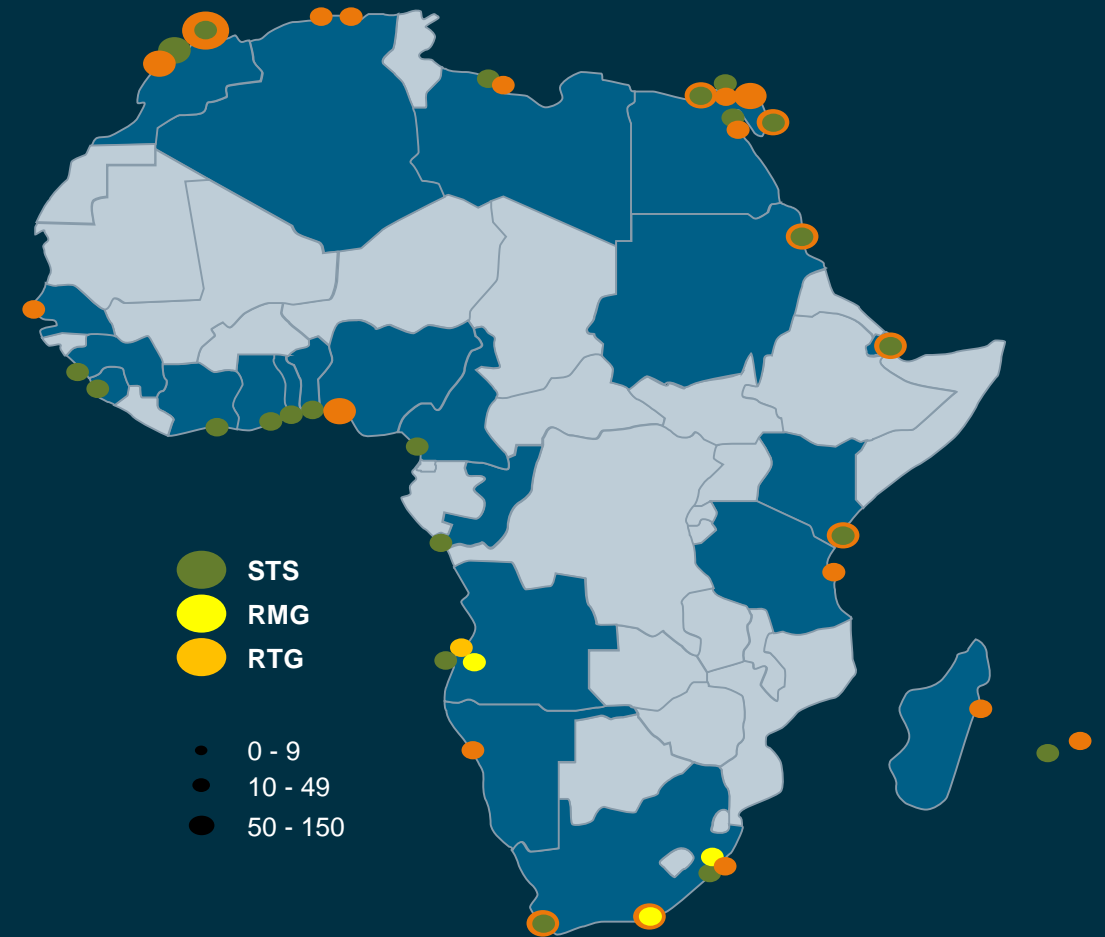
- Higher productivity required

Installed Base:

- over 100x Siemens equipped STS handle quay operations
- Harbour Cranes installed base as per locations on map

Half of these Cranes were ordered in the last 5 years

- Local Service presence
- Local know-how and repair capabilities
- Support from the Global Siemens Service Network



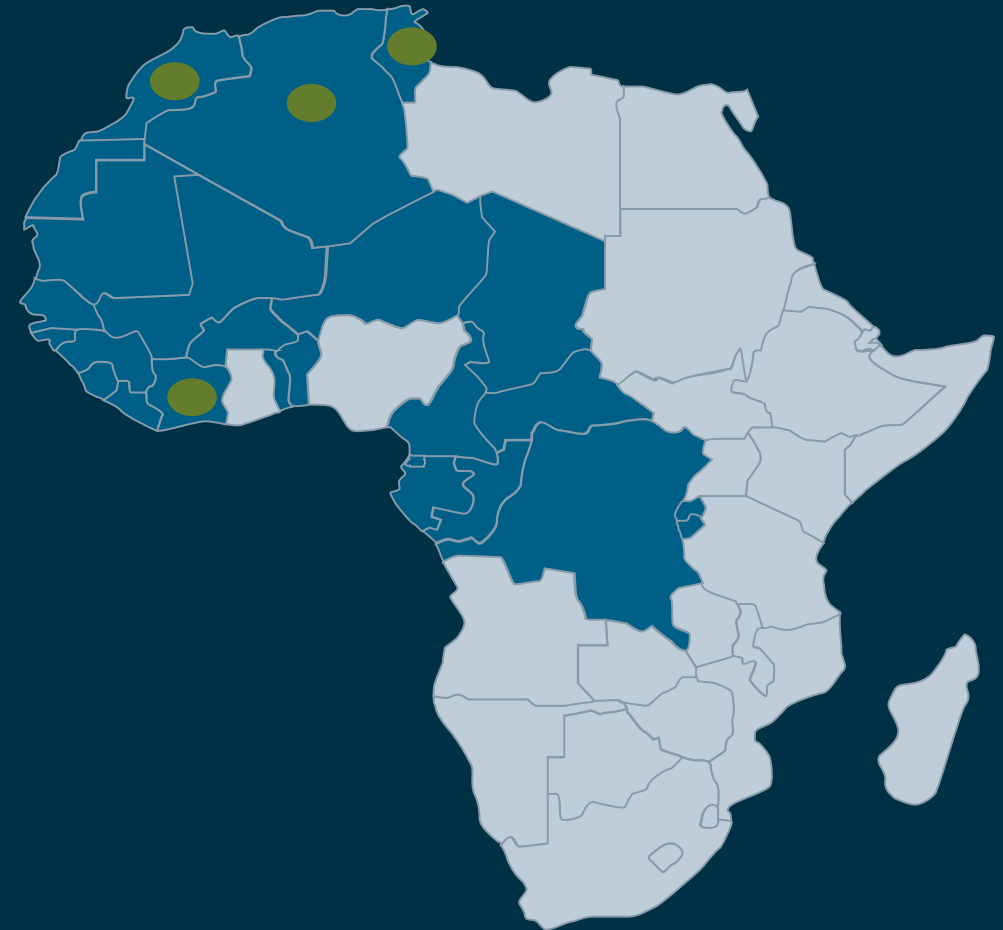
Siemens Côte d'Ivoire SARL

Presence in West Africa



Key Facts:

- Present for over 155 years
- Serving all French speaking countries from local offices
- The new legal entity has opened its doors in October 2017 in Abidjan, the economic capital of Côte d'Ivoire.



Siemens Cranes

Proven experience and competence



More than **100 years** of experience in Cranes

Expanding our **digitalization portfolio** providing integrated e-supplier automated solutions.

Technical Competence in **Crane Automation** with focus on **availability, flexibility and expertise.**

Local presence in more than 190 countries, more than 300 specialized and committed engineers. Focusing on **performance and productivity**, and prepared to deliver innovative solutions.

Our comprehensive and **innovative** portfolio, our **experience** and industry-specific applications have made us a preferred partner for crane operators all over the world.

Largest installed base with **state of the art crane products and solutions**

Project execution competence

Thank you!

SIEMENS
Ingenuity for life



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E-mail: jerry.diepenbach@siemens.com

Pay us a visit
at Stand 3



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