Integrated solutions for efficient and sustainable transport of passengers and goods

Karl-Hermann Klausecker
CEO Locomotives and Components
Rail Systems Division
Infrastructure & Cities Sector
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Siemens
Trendsetting technologies in locomotive business

The first electric railway at the Berlin Trade Fair of 1879 starts electric traction at rail

Welding technology introduced in locomotive production with E44 001 in 1931

Highly modular and flexible locomotive Vectron introduced to the public in 2010
### Challenges

- Reduction of CO$_2$ emissions
- High safety requirements
- Rapid, on-time transportation
- Good service
- Cross-border transportation
- Highly attractive transportation media
- Heavier traffic
- Lower-cost transportation
- Properly inspected rail cars and components
- Constantly available rail cars & infrastructure
Rail Systems stands for:
Energy efficiency, sustainability, integrated mobility

- **Efficiency**: We deliver efficient rail products
- **Service quality**: We offer individual service concepts for the entire product life cycle
- **Innovation**: Technology and innovation are in the DNA of our business
- **Ecology**: Energy efficiency and sustainability are part of our business model
- **Cost savings**: We test all our products in our own service center before they go into service
- **Integrated mobility**: We offer integrated transportation solutions throughout the world
- **International presence**: We produce on location – worldwide
Portfolio Rail Systems:
Solutions for moving people and goods

<table>
<thead>
<tr>
<th>Speed (km/h)</th>
<th>Average distance between stops (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

- Desiro
- Viaggio
- Eurosprinter
- Vectron
- Eurorunner
- Asiarunner
- ICx
- Velaro

- Avenio, S70, ULF, Inspiro, VAL, eBus/eBRT
- Velaro
- Station
- City
- Megacity
- Village
- Airport

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December 2012
## Portfolio

### Locomotives and Components

<table>
<thead>
<tr>
<th>Locomotive</th>
<th>Maximum Speed (km/h)</th>
<th>Power (kW)</th>
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</thead>
<tbody>
<tr>
<td>Asiarunner Eurorunner ER20C</td>
<td>160</td>
<td>3000</td>
</tr>
<tr>
<td>Eurorunner ER24PC</td>
<td>180</td>
<td>3000</td>
</tr>
<tr>
<td>E40AC</td>
<td>120</td>
<td>3000</td>
</tr>
<tr>
<td>ES64U4</td>
<td>230</td>
<td>6000</td>
</tr>
<tr>
<td>ES64F4</td>
<td>220</td>
<td>6000</td>
</tr>
<tr>
<td>ACS64</td>
<td>220</td>
<td>6000</td>
</tr>
<tr>
<td>HXD1</td>
<td>230</td>
<td>9000</td>
</tr>
<tr>
<td>European Runner ER24FC</td>
<td>180</td>
<td>3000</td>
</tr>
<tr>
<td>Vectron</td>
<td>160</td>
<td>3000</td>
</tr>
<tr>
<td>Eurorunner ER24PC</td>
<td>180</td>
<td>3000</td>
</tr>
</tbody>
</table>

**Components:**

- HXD1b components
- 2ES10
**Business Unit**  
Locomotives and Components (LOC)

**K.-H. Klausecker (BU CEO)**

<table>
<thead>
<tr>
<th>Platforms and products</th>
<th>Custom-designed solutions</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vectron</td>
<td>ACS64</td>
<td>2ES10</td>
</tr>
<tr>
<td>Eurosprinter ES64F4</td>
<td>E40AC</td>
<td>HXD1B</td>
</tr>
<tr>
<td>Eurosprinter ES64U4</td>
<td>HXD1</td>
<td></td>
</tr>
<tr>
<td>Asiarunner</td>
<td>ER24PC</td>
<td>Bogies for rail vehicles</td>
</tr>
</tbody>
</table>

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Locomotives and Components
Customers worldwide

US, Canada, Mexico:
Conrail, LIRR, BNSF, UP, CSX, TFM, ARR, CIT, CP, NYCT, Amtrak

Austria: ÖBB, STLB, LTE, RTS
Portugal: CP
Spain: RENFE, AVE, Talgo
France: SNCF

Germany: Railpool, DB AG, EVB PRESS, Connex, MWB, WLE, Regentalbahn, Vogtlandbahn, OHE

Norway: NSB
Sweden: HectorRail
Belgium: SNCB

Netherlands: MRCE

Lithuania: LG

Russia: RZD

Ukraine: UZ

Poland: PKP, DB Schenker Rail Polska

Hungary: MAV / ROeEE

Uzbekistan: UTY/UTY2

Greece: OSE

Slovenia: SZ

Switzerland: SBB, HUPAC

South Africa: SPOORNET

Australia: QR, PN, BMA

China: CR, KCRC

Korea: KNR

Sweden: HectorRail

Norway: NSB

Belgium: SNCB

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Korea: KNR

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Market prognosis locomotives 2009 to 2017:
Market development by Regions

NAFTA
- 2009-2011: 1'2
- 2015-2017: 1'4

Western Europe
- 2009-2011: 0'8
- 2015-2017: 1'6
- CAGR: 12.2%

Eastern Europe
- 2009-2011: 0'4
- 2015-2017: 0'7
- CAGR: 9.7%

CIS
- 2009-2011: 1'9
- 2015-2017: 1'9
- CAGR: 0.5%

Rest of America
- 2009-2011: 0'3
- 2015-2017: 0'4
- CAGR: 7.4%

Africa/ Middle East
- 2009-2011: 0'5
- 2015-2017: 0'9
- CAGR: 10.1%

Asia/ Pacific
- 2009-2011: 3'4
- 2015-2017: 3'9
- CAGR: 2.3%

Source: UNIFE World Rail Market Report – comparable IC RL LOC Portfolio exkl. Service

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Locomotives
A growing market – we participate

We are active in the important regions

- **Europe**: Vectron
- **CIS**: 2ES10
- **NAFTA**: ACS64
- **India**: Components

We produce locally

- **Munich**: (Lead)
- **Jekaterinburg**
- **Sacramento**
- **Aurangabad**

Source: UNIFE World Rail Market Report – comparable IC RL LOC Portfolio exkl. Service

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**Vectron** – solution for future demands of European rail transport

- Smaller batches
  - Homologated, quickly available locomotives

- Flexibility regarding area of operation and configuration

- Modular locomotives
  - European homologation / Platform homologation

- High reliability and availability (e.g. 24h spare parts service)
**Vectron**

Locomotive platform for European market

- Flexible configuration and high economic efficiency
- Different power classes and voltage systems
- Can be deployed in passenger and freight transport services with top speeds of 160 km/h or 200 km/h
- Easy conversion or retrofit possible thanks to modularity of e.g. machine room
- Series country-customized packages and a new, intelligent train protection concept enable cross-border traffic
- Universal bogies and laser-welded car bodies set trends in design and manufacturing
**Vectron DC**
for Schenker Rail Polska

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td>Wheel arrangement</td>
<td>Bo'Bo'</td>
</tr>
<tr>
<td>Power system</td>
<td>DC 3 kV</td>
</tr>
<tr>
<td>Rating [kW]</td>
<td>Max. 5,200</td>
</tr>
<tr>
<td>Starting tractive effort [kN]</td>
<td>300</td>
</tr>
<tr>
<td>Maximum speed [km/h]</td>
<td>160</td>
</tr>
<tr>
<td>Weight [t]</td>
<td>80</td>
</tr>
<tr>
<td>Track gauge [mm]</td>
<td>1,435</td>
</tr>
<tr>
<td>Units</td>
<td>23 plus option 13</td>
</tr>
<tr>
<td>Year</td>
<td>From 2012</td>
</tr>
</tbody>
</table>
Mobility whatever happens - Railcover

- Modules for perfectly customized services
- Local service right where it is needed
- Central, sophisticated spare parts logistics
- Optimization of maintenance coordinated with rail operation
- Exploitation of manufacturer's technical expertise

Increase the availability of your fleet with Railcover