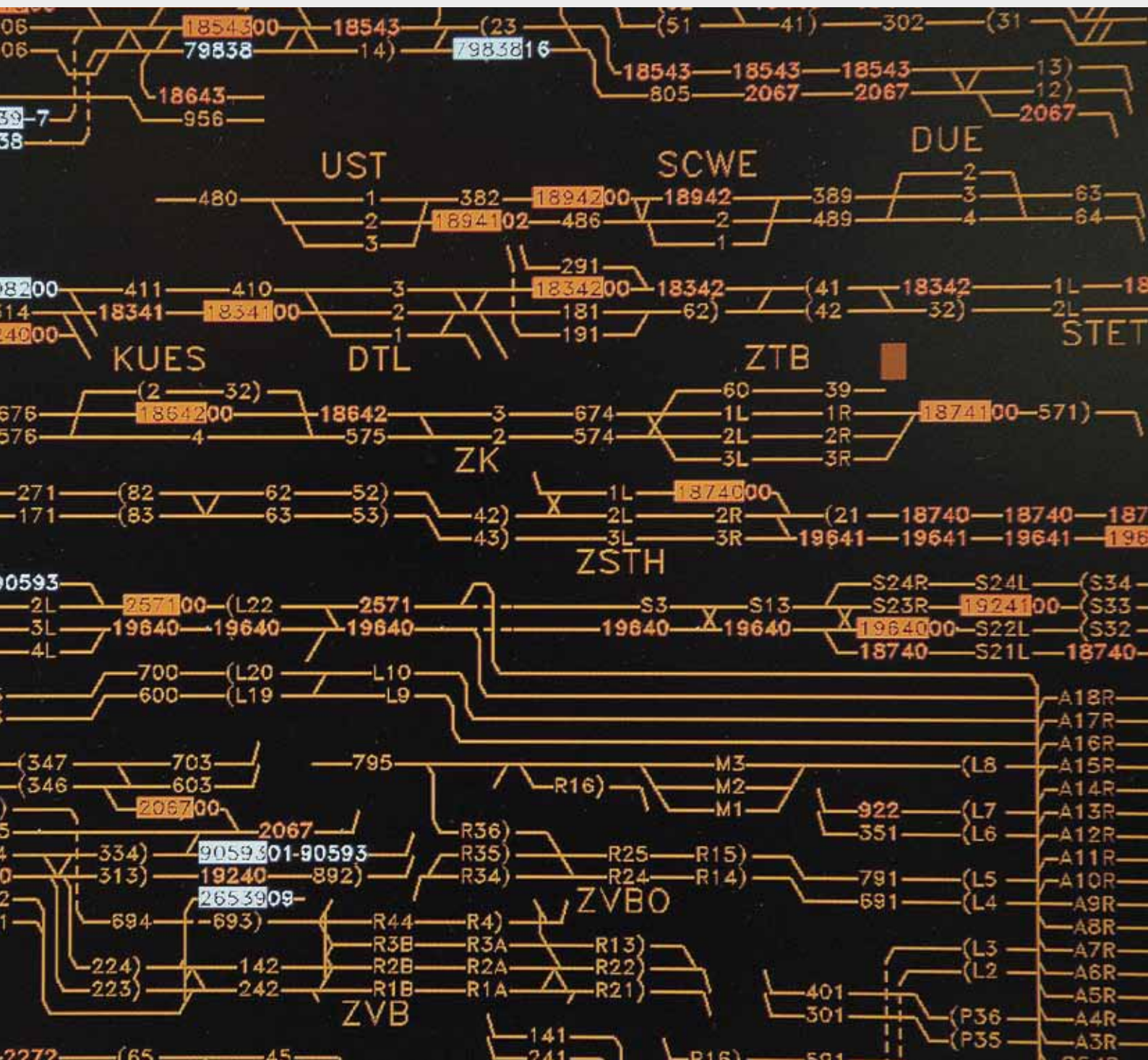


# Railway Cable Systems

References 2010/2011



# Competence in connectivity





### Interdisciplinary knowledge

The HUBER+SUHNER Group is a leading international manufacturer of electrical and optical interconnectivity components and systems. Our main markets are communication, transport and industry. At HUBER+SUHNER, we combine technological capabilities in the three core fields of *Radio Frequency*, *Fiber Optics* and *Low Frequency*.

HUBER+SUHNER's vast expertise and experience in the Global Railway Market, along with our qualified employees enables us to undertake highly complex projects across the boundaries of individual disciplines. HUBER+SUHNER Railway Cable Systems Unit is prepared to take on any challenge - whether geographical or technical, HUBER+SUHNER has the global footprint and local personnel to support and solve your business challenges. Sharp growth rates demonstrate impressively that the market acknowledges HUBER+SUHNER's technological leadership. This is borne out by the fact that renowned market leaders around the world trust the services of HUBER+SUHNER.

As our partner and customer, you will benefit from:

- Our unique global production and distribution network
- Our unique product capabilities in the areas of - Low Frequency - Radio Frequency - Fiber Optics
- Our global project management skills

# Competence in connectivity



HUBER+SUHNER railway inter-vehicle solution



STADLER Rail AG

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BOMBARDIER Transportation

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Downer EDi Rail

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ThyssenKrupp Transrapid GmbH

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SIEMENS AG

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## Market leaders trust HUBER+SUHNER

### STADLER Rail AG

Services provided by HUBER+SUHNER for STADLER Rail AG

- Project evaluation
- Development
- Production
- Logistics

Added value for STADLER Rail AG

- RADOX® railway cables developed to meet specific customer needs
- Tested and optimised solutions
- Quick response to project changes
- Low project risks
- Just in time deliveries



DOSTO Electric double deck train with inter-vehicle systems from HUBER+SUHNER

#### Project share of HUBER+SUHNER

- Consulting
- Cable design and production
- Design and production of special strain relief grommets
- System Engineering
- Production
- Logistics
- Quality Assurance

#### Customer requirements

- Long project running time
- Cable fire performance requirements in accordance with European Standards
- Fixed price

#### Technical customer value

- Perfectly coordinated HUBER+SUHNER products
- Tested and optimised solutions

#### Commercial customer value

- Predictable costs thanks to fixed price
- Low project risks
- Just in time delivery



#### GTW internal cable assemblies

Project share of HUBER+SUHNER

- Development
- Production
- Logistics

Customer requirement

- Project management by HUBER+SUHNER
- Fixed price

Technical customer value

- Perfectly coordinated HUBER+SUHNER products
- RADOX® railway cables developed to meet specific customer needs
- Tested and optimised cable solutions

Commercial customer value

- Predictable costs thanks to fixed price
- Low project risks
- Just in time delivery



#### GTW with inter-vehicle systems in conduit solution

Project share of HUBER+SUHNER

- Development
- Production
- Logistics

Customer requirement

- Short project running time
- Fixed price

Technical customer value

- Perfectly coordinated HUBER+SUHNER products
- Tested and optimised cable solutions

Commercial customer value

- Predictable costs thanks to fixed price
- Low project risks
- Just in time delivery



**FLIRT with inter-vehicle systems in conduit solution**

**Project share of HUBER+SUHNER**

- Development evaluation

**Customer requirement**

- Short project running time
- Processing of 3 supplier components (70 % of the products supplied)

**Commercial customer value**

- Reduction of the number of prototypes = reduction of costs
- Professional change management



**RhB-ZTZ Rhaetian Railway dual-voltage rail car with inter-vehicle systems provided by HUBER+SUHNER**

**Project share of HUBER+SUHNER**

- Consulting
- Cable design and production
- Design and production of special strain relief grommets
- System Engineering
- Production, Logistics, Quality Assurance

**Customer requirement**

- System solution from a single source
- Low project risks
- Just in time delivery

**Commercial customer value**

- Predictable costs thanks to fixed price
- Low project risks
- Just in time delivery



## Market leaders trust HUBER+SUHNER

### ALSTOM Transport

Services provided by HUBER+SUHNER to ALSTOM Transport

- Development
- Production
- Logistics

Added value for ALSTOM Transport

- RADOX® railway cables developed to meet specific customer needs
- Tested and optimised solutions
- Quick response to project changes
- Low project risks
- Just in time deliveries



### C455 renewal of carriage cable assemblies

**Project share of HUBER+SUHNER**

- Development
- Production
- Logistics

**Customer requirement**

- LUL2 standard
- Detailed project documentation

**Technical customer value**

- Perfectly coordinated HUBER+SUHNER products
- RADOX® railway cables developed to meet specific customer needs
- Detailed project documentation
- Professional change management

**Commercial customer value**

- Low project risks



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## Market leaders trust HUBER+SUHNER

### BOMBARDIER Transportation

Services provided by HUBER+SUHNER to BOMBARDIER Transportation

- Development
- Production
- Logistics

Added value for BOMBARDIER Transportation

- RADOX® railway cables developed to meet specific customer needs
- Tested and optimised solutions
- Cost-efficient pre-fabricated solutions
- Low project risks
- Just in time deliveries
- Global production and distribution network



MOVIA Metro Delhi carriage cable assemblies, inter-vehicle systems, e-cabinets

#### Project share of HUBER+SUHNER

- Development
- Production
- Logistics
- Integration on the vehicle

#### Customer requirement

- International project management (DE, GB, IND)
- Short project running time

#### Technical customer value

- Perfectly coordinated HUBER+SUHNER products

#### Commercial customer value

- Cost reduction by smart international manufacturing concept
- Coordination of all subprojects through experienced project managers
- Quick response to project changes
- Low project risks



### BR185 power cable assemblies

Project share of HUBER+SUHNER

- Production
- Logistics

Customer requirement

- Short project running time
- Fixed price

Technical customer value

- Perfectly coordinated HUBER+SUHNER products
- Tested and optimised cable solutions

Commercial customer value

- Predictable costs thanks to fixed price
- Low project risks
- Just in time delivery



### Gautrain carriage cable assemblies

Project share of HUBER+SUHNER

- Development
- Production
- Logistics

Customer requirement

- Short project running time
- Fixed price

Technical customer value

- Perfectly coordinated HUBER+SUHNER products
- Tested and optimised cable solutions
- logistics concept simplifies installation in train

Commercial customer value

- Cost reduction by smart international manufacturing concept
- Reduced project costs thanks to economies of scale



**C-315 renewal of carriage cable assemblies**

**Project share of HUBER+SUHNER**

- Development
- Production
- Logistics

**Customer requirement**

- Short project running time
- Detailed project documentation

**Technical customer value**

- Perfectly coordinated HUBER+SUHNER products
- Tested and optimised cable solutions
- Special-purpose tools supplied by HUBER+SUHNER
- Detailed project documentation

**Commercial customer value**

- Cost reduction by smart international manufacturing concept
- Reduced project costs thanks to economies of scale
- Professional change management



**Turbostar carriage cable assemblies**

**Project share of HUBER+SUHNER**

- Development
- Production
- Logistics

**Customer requirement**

- Short project running time
- Fixed price

**Technical customer value**

- Perfectly coordinated HUBER+SUHNER products
- Tested and optimised cable solutions

**Commercial customer value**

- Cost reduction by smart international manufacturing concept
- Reduced project costs through synergies from high-volume production



CityRail

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## Market leaders trust HUBER+SUHNER

### Downer EDi Rail

Services provided by HUBER+SUHNER to Downer EDi Rail

- Development
- Production
- Logistics

Added value for Downer EDi Rail

- Tested and optimised solutions
- Quick response to project changes
- Low project risks
- Just in time deliveries



### DEDIR PPP carriage cable assemblies

#### Project share of HUBER+SUHNER

- Development
- Production
- Logistics

#### Customer requirement

- International project management (AUS, CN)
- Short project running time
- Complex subcontractor situation

#### Technical customer value

- Perfectly coordinated HUBER+SUHNER products

#### Commercial customer value

- Low project risks
- Cost reduction by smart international manufacturing concept
- Quick response to project changes



Transrapid



## Market leaders trust HUBER+SUHNER

### ThyssenKrupp Transrapid GmbH

Services provided by HUBER+SUHNER to ThyssenKrupp Transrapid GmbH

- Development
- Production
- Logistics

Added value for ThyssenKrupp Transrapid GmbH

- Perfectly coordinated HUBER+SUHNER products
- Tested and optimised solutions
- Low project risks
- Just in time deliveries



### MAGLEV Cable assembly

**Project share of HUBER+SUHNER**

- Development
- Production
- Logistics

**Customer requirement**

- Complex logistics requirements
- Short project running time

**Technical customer value**

- Perfectly coordinated HUBER+SUHNER products

**Commercial customer value**

- Cost-effective pre-fabricated solution
- Professional change management
- Low project risks
- Just in time delivery



## Market leaders trust our HUBER+SUHNER

### SIEMENS AG

Services provided by HUBER+SUHNER to SIEMENS AG

- Development
- Production
- Logistics

Added value for SIEMENS AG

- Perfectly coordinated HUBER+SUHNER products
- Tested and optimised solutions
- System cable solutions for inter-vehicle systems
- Low project risks
- Just in time deliveries



VELARO D inter-vehicle systems designed and developed by HUBER+SUHNER. Inter-vehicle systems suspended under carriage coupling

#### Project share of HUBER+SUHNER

- Development and design of networked RADOX system cables in accordance with fire protection requirements:
  - CEN/TS 45545
  - DIN 5510-2
  - NF F 16-101/-102/-103
  - UNI CEI 11170-1/-2/-3
- Development and design of cable conduits and their suspension for installation of RADOX system cable
- Production
- Logistics

#### Customer requirement

- Minimum bending radii
- Static and dynamic loading
- Aerodynamics and stone impact protection
- Weight management
- Service friendliness
- Increased performance requirements as a result of assemblies being used externally on very high speed trains
- Product validation by extensive testing

#### Technical customer value

- Perfectly coordinated HUBER+SUHNER products
- System solutions optimally developed to customer requirements
- Tested and optimised cable solutions

#### Commercial customer value

- Cost-efficient pre-fabricated solutions
- Low project risks
- Just in time delivery



### DESIRO double deck EMU inter-vehicle systems from HUBER+SUHNER

**Project share of HUBER+SUHNER**

- Development
- Production
- Logistics

**Customer requirement**

- Short project running time
- Fixed price

**Technical customer value**

- Solution optimally developed to meet customer requirements
- Tested and optimised carriage transitions

**Commercial customer value**

- Predictable costs thanks to fixed price
- Low project risks
- Just in time delivery



### ICE3 inter-vehicle systems from HUBER+SUHNER

**Project share of HUBER+SUHNER**

- Development
- Production
- Logistics

**Customer requirement**

- Static and dynamic stressing
- Increased requirements owing to outdoor applications in very high speed trains
- Proof of quality by testing

**Technical customer value**

- Perfectly coordinated HUBER+SUHNER products
- Developed solution demonstrably tailored to customer needs
- Tested and optimised carriage transitions as system cables

**Commercial customer value**

- Cost-effective pre-fabricated solution
- Low project risks
- Just in time delivery

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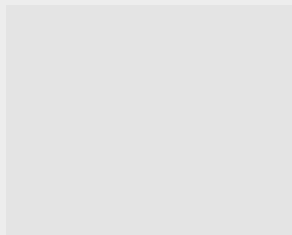
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