



# RAILWAY SOLUTIONS



# HUBER+SUHNER – RAILWAY SOLUTIONS FOR TODAY

HUBER+SUHNER offers a wide range of products which provide the platform to build modern rail transport systems. These products are developed for high quality needs and specifically designed for applications such as: train positioning as in GPS, cellular distribution for mobile telephone



#### Train positioning

- SENCITY®RAIL antennas
- Track side antennas
- RF interconnection
- Lightning protection
- DC blocks

#### On train monitoring and recording devices (OTMR)

- RADOX® control cables
- RADOX® databus cables
- RADOX® harness solutions



#### Inter vehicle jumper systems

- RADOX® control and power jumper cables
- RADOX® databus cables
- Wireless bridging antennas
- FO cables and connectors
- RF interconnection
- Combination solutions

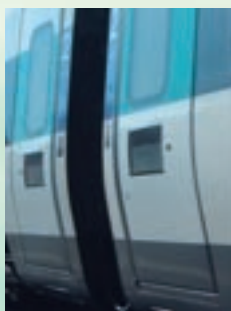
#### Cellular distribution (GSM-R, UMTS etc.)

- SENCITY®RAIL antennas
- In-carriage and bridging antennas
- Track side antennas
- RF interconnection
- Lightning protection
- DC blocks
- FO cabling solutions



# AY AND THE FUTURE

access, WiFi distribution for on-train internet access, CCTV for video surveillance, passenger infotainment systems for real time passenger information and entertainment, OTMR for train diagnostics during operation, inter vehicle jumper systems and profiles for safety and comfort.



## Safety and comfort

- Profiles for doors and windows
- Fireblock



## Closed circuit television (CCTV)

- Antennas
- RADOX® control cables
- RADOX® databus cables
- RF interconnection
- Lightning protection
- DC blocks
- Varioconnect

## Passenger infotainment systems

- In-carriage and bridging antennas
- Global Positioning System (GPS) antennas
- RF interconnection
- RADOX® control cables
- RADOX® databus cables
- Varioconnect
- FO cabling solutions

## WiFi distribution

- SENCITY®RAIL antennas
- Track side antennas
- In-carriage and bridging antennas
- RF interconnection
- Lightning protection
- DC blocks
- Varioconnect
- FO cabling solutions

## Wires and cables

HUBER+SUHNER supplies complete cable systems consisting of own cables and components but also third party materials. HUBER+SUHNER is the professional partner for development and manufacture of system solutions, combining all competences and products to a customised solution. HUBER+SUHNER can provide references for various types of assembled systems: from tram to high-speed train; from carriage couplings to control panel, from the simple point-to-point connection to wiring the complete locomotive.



### RADOX® power cables

For converters, braking systems and traction motors

- low smoke
- halogen free
- corona resistant
- compact



### RADOX® databus cables

Datalines for data transmission

- high frequency
- low attenuation
- optimised braids for EMC



### RADOX® control cables

For compact wiring systems where critical space constraints exist

- single and dual wall
- light weight
- low smoke
- halogen free
- high operating temperatures



### System solutions

For all rolling stock and industrial harness requirements

- ready to install cable bundles and cable assemblies
- functionality tests performed
- optimised braids for EMC



### RADOX® power and control jumper cables

For inter-vehicle connections

- torsion resistant
- flexible
- low smoke
- halogen free



## Cable systems

With a project orientated business model HUBER+SUHNER is able to handle complex and demanding projects. The access to a worldwide network of low cost production sites allows HUBER+SUHNER to provide savings to the customer with the familiar high quality.



### Solutions from a single source

- design and developing solutions according to customer needs
- engineering and re-engineering
- project management
- fast prototyping
- series production network
- international logistics and procurement of all components



### Competent partner in new and refurbishment projects

- complete jumper systems with unique design  
combining medias like fiberoptics, copper, coax
- cabling systems for bogies
- bundles for coaches
- wiring for locomotives
- driver desks
- cubicles, complete design
- communication equipment
- signalling equipment





## Polymer components

Thanks to their deep know-how in process technology, in-house design of moulds and development of rubber compounds HUBER+SUHNER is able to manufacture piece parts according to customer requirements from the Railway market.



### Profiles for doors, gates and windows

HUBER+SUHNER offers a wide range of polymer components for public transports which fulfil stringent requirements.

- halogenfree, flame retardant EPDM rubber profiles in Shore A60 to 85
- co-extruded rubber profiles
- conventional rubber profiles in EPDM, NBR, CR
- profiles made out of silicon rubber
- sealing lips in viton rubber
- PE and PVC profiles for special purpose applications
- sensor components



### Fireblock by HUBER+SUHNER

A unique passive fire protection system by building a structural foam during fire and heat exposure.

- fire door sealing combining TPE sealing with fireblock tapes
- fire barriers between machine and passenger compartment
- boosting of multi chamber rubber profiles
- injection moulded cable inlets
- tubes for sheathing and protection



## Antennas

HUBER+SUHNER antennas offer distinct advantages for mobile wireless multi-media services. The antennas are specifically designed for the rail market allowing for wireless communication in a variety of applications.



### **Trainborne antennas – SENCITY®RAIL**

External antennas covering the frequencies from 870 MHz to 5.9 GHz including a Global Positioning System (GPS) antenna with its pre-amplifier

- omni directional antennas
- supports GSM-R, GSM900, GSM1800, GSM/PCS1900, UMTS, ISM 2.4, 3.5 and 5 GHz bands
- medium gain of 6 to 9 dBi across the signal bands
- max. composite power 400 W
- mounts on existing footprints with the utilisation of adapter panels
- integrated passive and active GPS modules for train positioning
- IP67 environmental protection
- integrated protection against short-circuits



### **Track side antennas**

Directional and bi-directional antennas for WiFi and GSM-R applications

- antennas for WiFi (2.4, 3.5 and 5 GHz) and GSM-R (900MHz) applications
- antenna gains from 8 dBi to 28 dBi
- horizontal beamwidths from 5° to 85°
- typical VSWR < 1.5
- dual slant and vertical polarisation





### **In-carriage and bridging antennas**

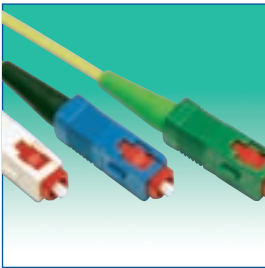
For WiFi and cellular distribution systems within train carriages, and wireless bridges between carriages

- directional and omni
- antenna gains from 4 dBi to 12 dBi
- typical VSWR < 1.5
- multiple polarisation options
- versatile mounting options
- seamless integration into carriage interiors
- WiFi antennas covering 2.4, 3.5 and 5 GHz bands
- antennas for cellular distribution systems covering GSM 900, GSM 1800, GSM/PCS 1900, UMTS



## Fiber optics

HUBER+SUHNER offers optical connections designed to international standards for Railway solutions. The line of products includes a wide range of cables for indoor and outdoor installations, trackside and rolling stock applications, assemblies based on customer's specification and a wide selection of installation products.



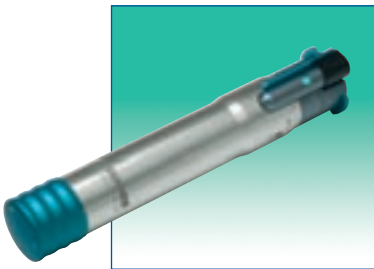
### Fiber optic connectors

For trackside applications

- high data rates
- one-piece design for quick and easy terminating

For rolling stock

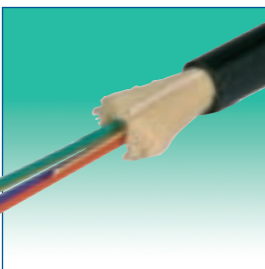
- according to mechanical requirements
- easy to terminate with quick assembly
- technology: full-ceramic ferrule and sleeve (SM)



### Quick Assembly™

For field termination

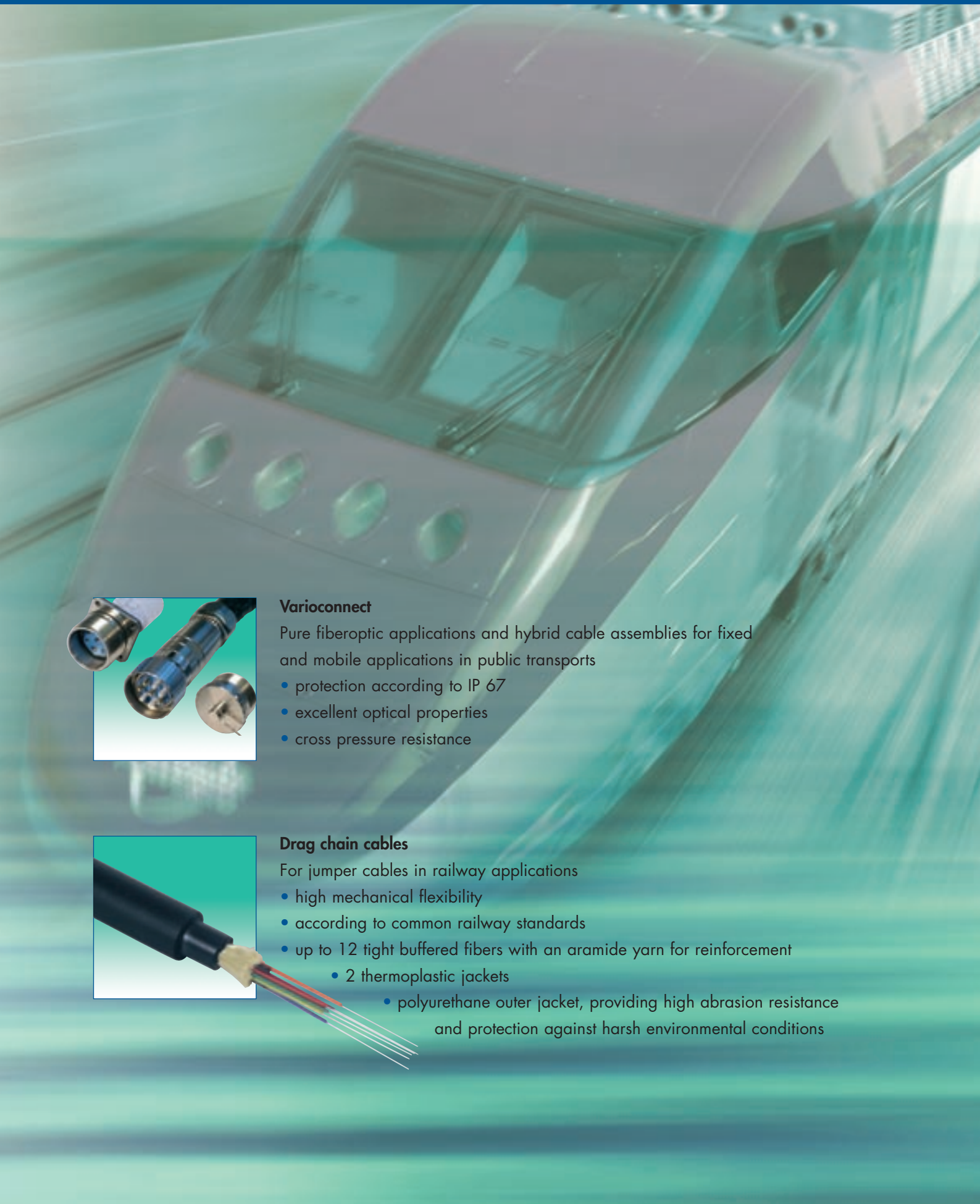
- quick mounting and easy handling
- no power needed
- compact package
- all extra tools included



### Field cable

For different medias like fiber optic, copper and plastic optical fibre (POF)

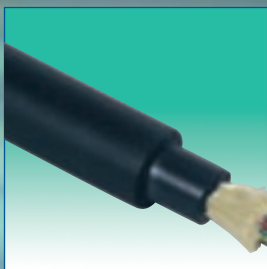
- mechanical high resistance
- flexible
- halogenfree



### **Variocconnect**

Pure fiberoptic applications and hybrid cable assemblies for fixed and mobile applications in public transports

- protection according to IP 67
- excellent optical properties
- cross pressure resistance



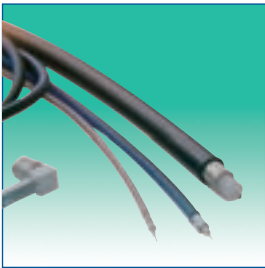
### **Drag chain cables**

For jumper cables in railway applications

- high mechanical flexibility
- according to common railway standards
- up to 12 tight buffered fibers with an aramide yarn for reinforcement
  - 2 thermoplastic jackets
  - polyurethane outer jacket, providing high abrasion resistance and protection against harsh environmental conditions

## RF interconnection and protection

Deep understanding of materials as well as RF technology provides HUBER+SUHNER with the specialised expertise to supply product solutions for sophisticated railway applications.



### RF interconnection

Extensive range of RF cables and connectors, assemblies for connecting RF and video systems

- flame retardant
- low smoke
- free of halogen
- excellent RF performances
- excellent durability



### Lightning and surge protection

For protecting video, data and RF systems against lightning and surge transients

- gas capsule options
- quarter wave stubs
- broad band
- return loss > 20 dB
- insertion loss < 0.4 dB
- typical CW power > 100 W
- low residue pulse
- mechanically robust
- water and dust proof solutions



### Coaxial DC/AC blocks

Under fault conditions DC coaxial blocks isolate equipment and personnel from high voltages whilst still maintaining RF connection

- full DC/AC blocks up to 15 KV
- return loss > 20 dB
- insertion loss < 0.5 dB
- CW power > 50 W
- mechanically robust
- water and dust proof solutions

# HUBER+SUHNER – the one-stop shop

The HUBER+SUHNER group is a leading global supplier of components and systems for electrical and optical connectivity in communications, industrial and transportation markets. HUBER+SUHNER can draw on core competencies in the areas of high frequency technology, fibre optics, cables and polymers. Working in close collaboration with our customers around the globe, we strive for excellence in the development and manufacturing of high quality products.



Cables  
Connectors  
Assemblies

RADIO FREQUENCY

Antennas  
Lightning Protection

COMMUNICATION

TRANSPORT

INDUSTRIAL



Communication Networks/Communication Equipment

Railway/Automotive

Space/Defence/T+M Facilities/Industrial/Instruments

Distribution Systems  
Cables  
Connectors  
Assemblies

FIBER OPTICS

WIRE+CABLE  
Cables  
Systems



**HUBER+SUHNER is certified according to ISO 9001 and ISO 14001.**

**WAIVER**

It is exclusively in written agreements that we provide our customers with warrants and representations as to the technical specifications and/or the fitness for any particular purpose. The facts and figures contained herein are carefully compiled to the best of our knowledge, but they are intended for general informational purposes only.



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