

smiths interconnect



# Railway

Connectivity Solutions

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CUTTING-EDGE  
CONNECTIVITY

# About Smiths Interconnect



## We Offer



Smiths Interconnect is a leading provider of high reliability connectivity products and solutions serving segments of aerospace and defense, medical, semiconductor test, and industrial markets. It designs and manufactures technically differentiated electronic components, microwave, optical and radio frequency products and sub-systems that connect, protect and control critical applications.

Smiths Interconnect is the supplier of choice for safe, efficient and reliable connectivity in railway applications. Our experience in high performance connector solutions, antenna systems, RF components and cable assemblies for rolling stock, signaling and infrastructure results in customer-driven, reliable solutions for our customers.

Our technology brands (EMC, Hypertac, IDI, Lorch, Millitech, Plastronics, Reflex Photonics, RF Labs, Sabritec, TECOM, TRAK and HSI) are synonymous with exceptional performance in technologically advanced, high quality solutions required for a high degree of safety and durability. Our extensive product portfolio includes high reliability electrical connectors and cable assemblies, rugged embedded transceivers, solutions for antenna systems, and a wide range of innovative RF and microwave solutions.



## Defense & Aerospace



## Communications



## Industrial



# Your partner of choice for cutting-edge connectivity solutions

**80+** Years Experience

### Technology

Broad Range of Advanced Interconnect Technologies

### Flexibility

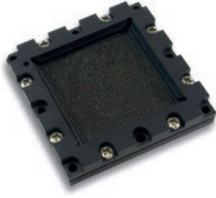
High Volume Product Platforms & Complete Tailored Solutions

### Service

Global Reach with Local Support

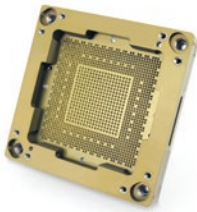
Smiths Interconnect is part of Smiths Group plc, a global leader in applying advanced technologies for markets in threat and contraband detection, energy, communications and engineered components.

# Technology Brands



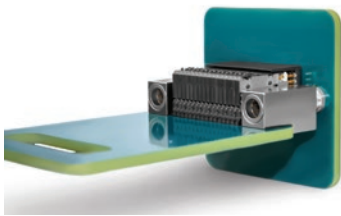
## PLASTRONICS

A leading supplier of burn-in test socket solutions for all the latest packaged devices. With the most comprehensive QFN catalog in the world, in addition to a large portfolio of sockets for burn-in, HAST, failure analysis and other test requirements for Leaded, LGA and BGA devices.



## IDI

World's most comprehensive offering of spring probe based solutions, including: contacts, connectors, interposers, semiconductor test sockets, and ATE interfaces. Proven off-the-shelf and custom products deliver the best solution for the customer's specific application.



## HYPERTAC

Premium interconnect solutions for electrical and electronic applications requiring optimized quality, performance, and reliability. Hypertac connectors utilize the original high performance hyperboloid contact technology; ideal for harsh environments and safety critical applications.



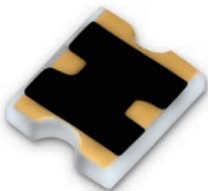
## HSI

Joint venture with Sichuan Huafeng Enterprise Group Co. Ltd, one of the major manufacturers of electronic components in China. Industry-leading connectivity solutions for commercial aerospace and railway markets in mainland China.



## SABRITEC

High speed quadrax, twinax, fiber optic, filter, coax and triax connectors, contacts and cable assemblies. Custom multi-pin circular, D-Sub rack and panel connectors and MIL-Spec interface type products.



## EMC

Board-level components incorporating advanced resistive and signal distribution technologies for a broad range of frequency spectrum applications. Extensive portfolio of RF devices used to attenuate, level, or terminate signals available in a variety of packages and footprints.

Connectors

Fiber Optics &amp; RF Components

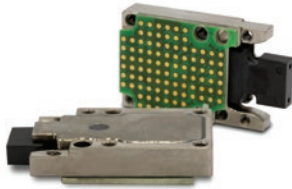
Semiconductor Test

RF/MW Subsystems/Smiths Interconnect Inc (SII)



## LORCH

Innovative solutions for the electronics and communications industries. Ranging from high performance wireless and RF products to micro-miniature, cavity, discrete, waveguide, tunable, ceramic, and printed filters and integrated assemblies.



## REFLEX PHOTONICS

Embedded transceivers and transmit/receive modules for advanced interconnect-based solutions. Targeting high data rate interconnects where ruggedness and radiation resistance are required for defense, space, commercial aerospace and industrial applications.



## RF LABS

High performance microwave cable assemblies and coaxial components supporting high performance operations, application-specific premium interconnects for high durability and harsh environments.



## MILLITECH

Specializing in the engineering, manufacturing, and testing of millimeter-wave components, assemblies, and fully integrated subsystems for space, SATCOM, test and measurement, radar, and scientific applications.



## TECOM

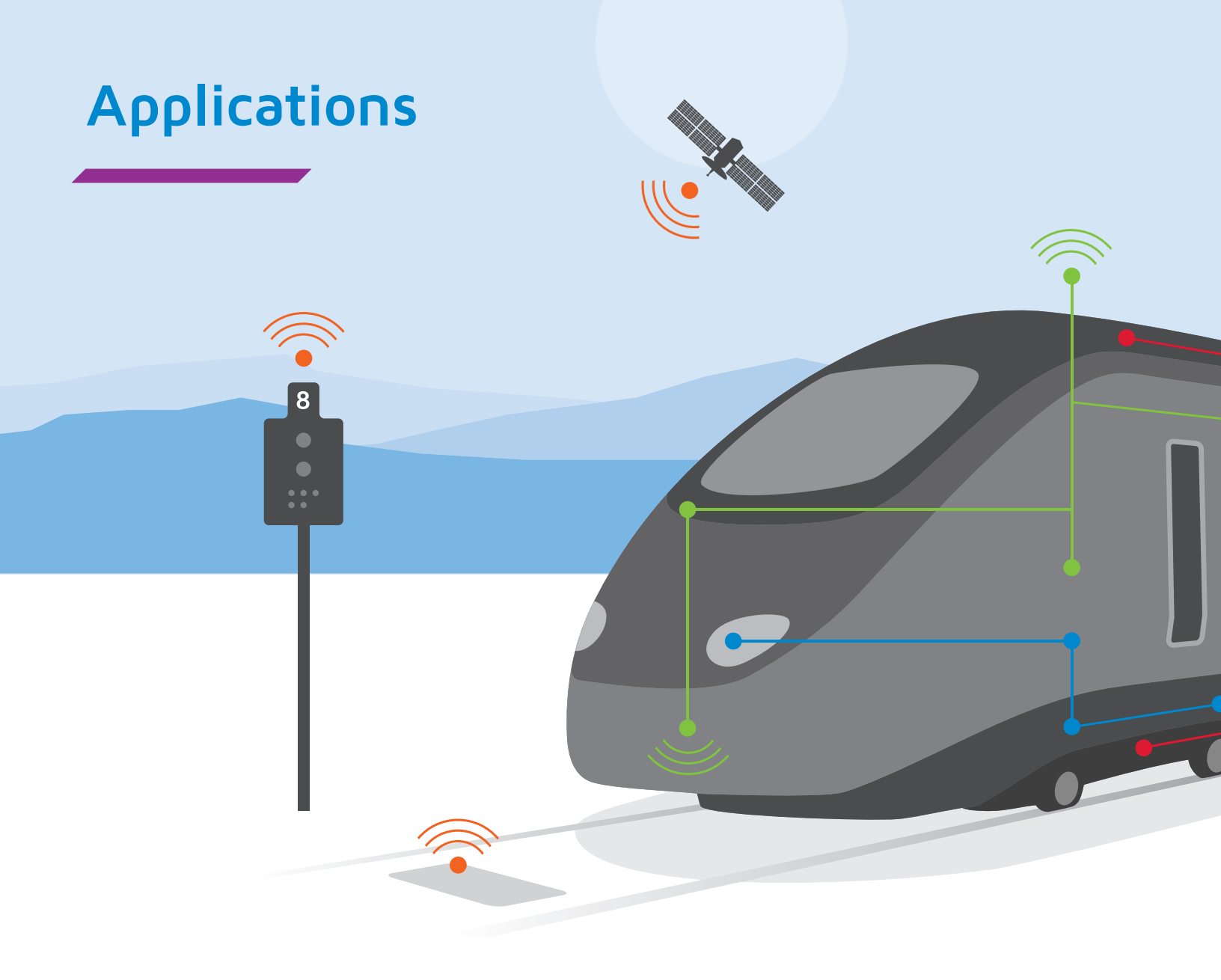
Industry leading innovator of antennas and positioning systems for SATCOM in-flight connectivity, instrumentation, datalink, command & control, and telemetry applications integrated into the world's most advanced commercial and military platforms.



## TRAK

High reliability multi-function RF systems, ferrite microwave products, and precision time & frequency systems for defense, commercial aerospace, space, homeland security, and public safety applications.

# Applications



## Rolling Stock

### Safety Control & Command

- Driver Cabin
- Lightning
- Alarms
- Sensors
- Seats
- Door & Brake Control
- Electromagnetic Valves
- Air Conditioning

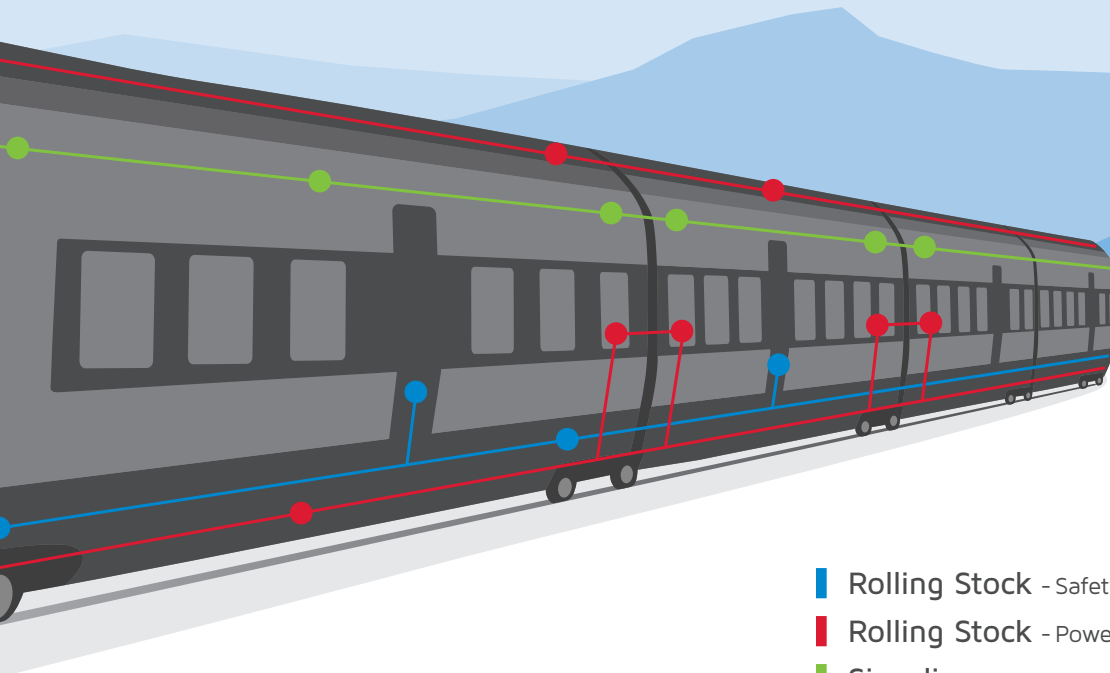
## Rolling Stock

### Power Distribution

- Energy Storage Systems
- Inter-vehicles Junctions
- Regenerative Braking Systems

# Providing A Competitive Advantage

We offer proven quality, innovative and environmentally friendly solutions conforming to the main international railway standards. We constantly adapt our products to tomorrow's technologies while meeting our customers requirements. Our know-how and application expertise ensure the design and manufacturing of cost effective product platforms as well as completely tailored solutions for the harshest railway conditions. We provide our customers with a competitive advantage when tackling the challenges of higher power, increased data rates, wider bandwidth, and greater connectivity all within a smaller footprint.



- Rolling Stock - Safety Control & Command
- Rolling Stock - Power Distribution
- Signaling
- Station & Information System



## Signaling

- Digital Tracking ERTMS/ETCS
- Communication-based Train Control
- Security Equipment

## Station & Information System

- Digital Tracking GSM-R
- Ground Communications
- Red Light Traffic Management
- Passenger Information & In-train Entertainment
- Video Surveillance & E-Ticketing

# Connectors



## Sustainability, Reliability & Safety

Through our Hypertac, HSI, IDI and Sabritec technology brands, we supply application-specific, high-reliability electrical interconnect solutions from platforms to bespoke products. Our reliable contact technologies are the core of our advanced interconnect solutions: Hyperboloid, Spring Probe, High Speed, Fiber Optic and High Power.

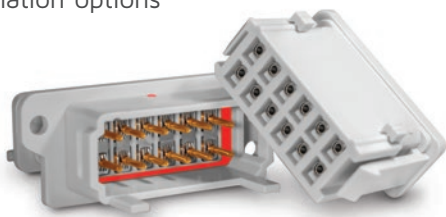
**Environmentally  
friendly solutions  
that conform  
to main railway  
standards**



## Environmentally Sealed Rectangular Plastic

### REP Series

- Available with the proven Hypertac® hyperboloid contact technology (up to 20,000 mating cycles) and with the MR screw machined contacts (up to 500 mating cycles)
- Conforms to EN 45545 and EN 50124 standards
- Voltage rating up to 400 V
- Allows wire sections from 0.5 mm<sup>2</sup> to 2.5 mm<sup>2</sup> (20-12AWG)
- Shunt function available
- 2, 6, and 12 way standard sealed insulators
- Crimp, straight or bent termination options



## Mini Modular

### H/N Series

- High-density mini modular connectors
- Allows up to 900 contact positions
- Building block system composed of custom module combinations within a connector frame
- Keying system available
- Jackscrews available in half-turn quick disconnect
- Float mountable for blind mating



## Data Transfer Rectangular

### CEA Series

- Offset grid contact layout, one or two contact rows within dielectric connector body
- 1.5mm nominal pin dia contact size: 3, 5 and 9 contact positions
- Hand solder, dip solder & crimp termination styles



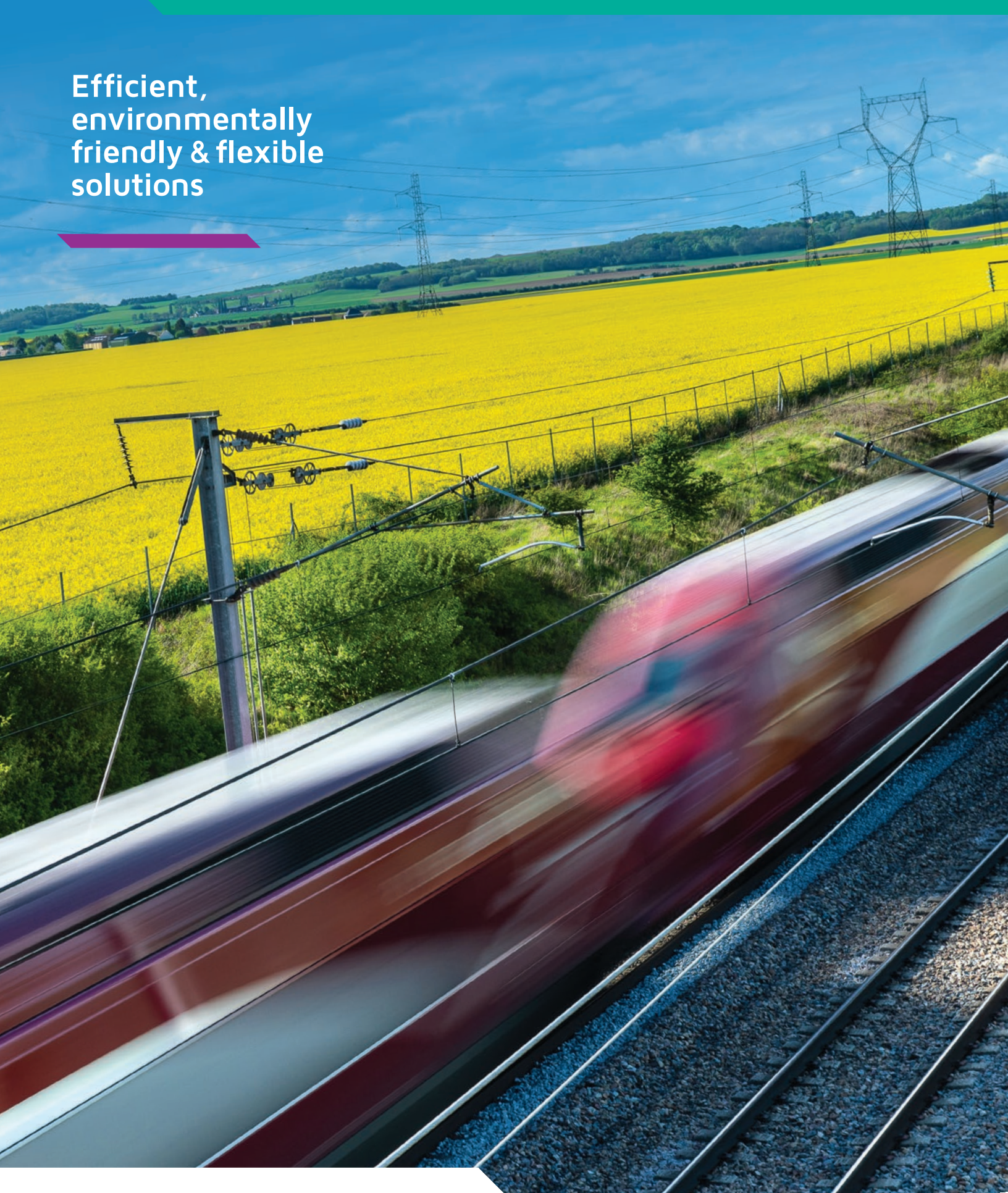
## Rack & Panel Modular Plastic

### L Series

- Mixed signal, power, coaxial, data, fiber optic and pneumatic modules
- Provides up to 200 amp power
- Cable to chassis and rack & panel; plastic backshell with strain relief and half turn quick disconnect jackscrew
- Float mountable for blind mating
- Configurations compliant to EN45545 standards
- Large offering thanks to the modularity
- High reliability contact technology
- Several locking devices and hood are proposed



Efficient,  
environmentally  
friendly & flexible  
solutions



## Float Mount Modular Metal

### LHS/LHZ Series

- Qualified according to SNCF NF F 61-032 standards
- Signal, power, coax and data (Ethernet) modules available
- Float mounting  $\pm 1.25$  mm
- Gold plating Hyperboloid contacts with a large crimp section



## High Density, High Power, Intercoach Couplers

### Transformer Heavy and Easy Power Series

- Compliant to: NF F 61-030, 16-101, 16-102 and EN 45545-2 (HL3 for RV22 and RV23)
- High power, up to 300A / 500A
- Straight, angled and shunt termination styles
- Cable section size from 25mm<sup>2</sup> to 50mm<sup>2</sup> / 240mm<sup>2</sup>
- IP66, IP67 rating according to NF EN 60529
- Tortac® High Power Contact (HPT) technology



## Rugged Circular Metal

### M12 Series

- Compact IP67 metal shell
- 360° EMI shielding
- Hyperboloid contact technology
- Compliant with fire and smoke standards
- Straight and right angle 90° rotatable backshell
- Compatible with most commonly used rail cables
- Easy to terminate, field attachable



## High Power Quick Release

### HBB Series

- Compact and small size for weight savings available in both single and five pole version
- Quick locking device
- Current ratings from 300A to 500A
- 360° EMI/RFI shielding
- IP67 fully sealed
- Robust metal shells
- Finger proof IP2X



Supporting  
on-board services  
for improved traveler  
experience



## Shielded Circular Metal

### C Series

- Suitable to EN Railway cables
- High shock & vibration resistance EN 61373 Level 2
- IP67 metal shell
- Hyperboloid gold plating contacts with a large crimp section
- High performance in a smaller space



## Circular Metal Transponder

### BOA Series

- Compliant to VG95234, MIL-C-5015, MIL-C-26482
- Simple and cost effective installation
- Practically maintenance-free
- Low susceptibility to vandalism
- Vibration tests compliant to IS-402



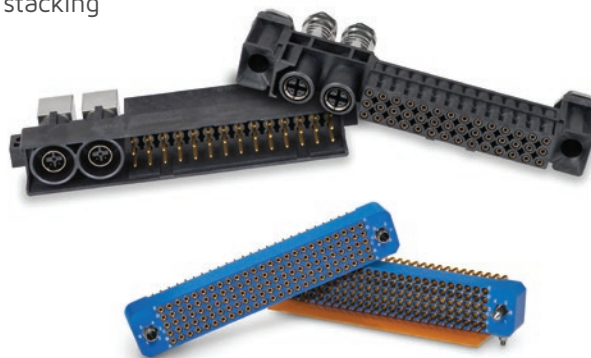
## EMI/EMP Filter

- Intermateable and interchangeable with standard non-filter connectors
- C, L and Pi style EMI filters
- TVS protection meeting the requirements of RTCA D160 section 22 up to level 5



## PCB Connectors for Harsh Environments and Complex Electronics

- Low, medium and high density connectors with long life cycle
- Signal, power, coaxial and high speed, RF contacts and spring probes solutions
- Immunity to shock and vibration fretting
- Compact Signal and Ethernet PCB Connectors
- Straight dip, right angle solder, crimp, solder cup and Wire Wrap<sup>®</sup> terminations
- Board-to-board, cable to board, cable to cable and stacking



# RF Components & Cable Assemblies



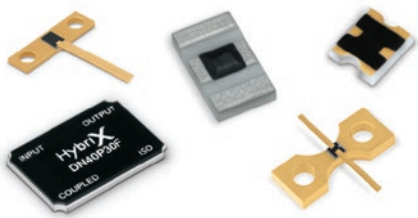
## Advanced Technologies & Solutions

Through our EMC and RF Labs brands, we provide RF/Microwave components including resistive & signal distribution components and cable assemblies for demanding high reliability environments. They target a broad range of frequency spectrum applications and high reliability interconnects supporting high performance operations and they attenuate, level or terminate signals in a variety of packages and footprints.

**Application  
specific premium  
interconnects for  
high durability**

## RF Components

- Temperature variable attenuators
- Thermopad® temperature variable attenuators from DC through Ka Band
- High power and small signal fixed attenuators
- RF resistors and terminations including surface mount chips, tab & cover chips, flange mounted and rod types Diamond RF Resistives®
- Surface mount outrigger resistors and terminations
- Surface mount chip equalizers
- Isolators and circulators



## Semi-Rigid & Hand Formable

### Cable Assemblies

- High frequency
- High isolation: up to >100 dB
- Copper or aluminum jackets
- Range of protective coverings available



## RF Cable Assemblies

### Titan-Flex® Series

- Robust solder termination
- Crush resistant and durable
- Superior electrical performance
- Optimized to 18 GHz



## RF Flexible Cable Assemblies

### Lab-Flex® Series

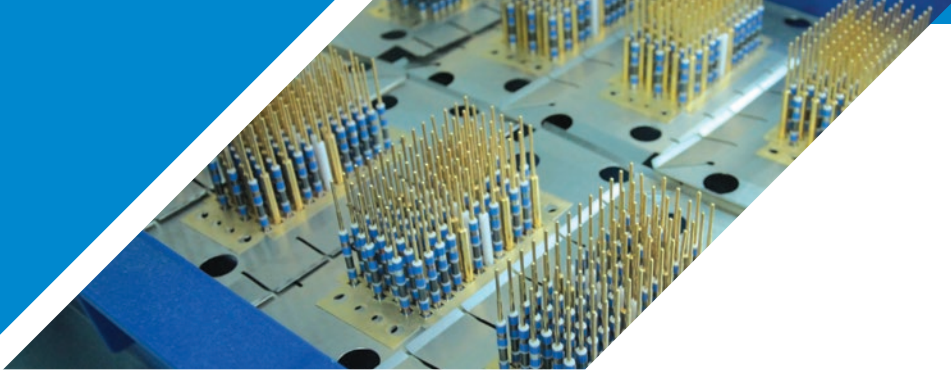
- Custom braids for strength
- Field proven up to 50 GHz
- Low loss, up to 40% less loss
- Shielding greater than 90 dB
- Stranded center conductor version available



## Did you know?

Our Lab-Flex® cable assemblies are qualified for harsh environments and support up to 100 GHz.

# Contact Technologies



## Hypertac® Hyperboloid Contacts - HC

- Extremely low insertion/extraction forces
- Industry-leading mating cycles (over 20,000)
- No fretting corrosion during life cycle
- Very low contact resistance



## Screw-Machined Contacts - MR

- Rail standard contact life up to 500 mating cycles
- Tested signal integrity, no contact interruption >50 ns
- Low level contact resistance and low insertion/extraction forces



## High-Speed Contacts

- Twinax, triax and quadax contacts suitable for high speed signal up to 100 MHz
- Fit various insert arrangements for d-sub, circular, PCB and rack and panel connectors



## High-Power Contacts

- Current ratings up to 650A
- Fit various insert arrangements for waterproof modular & circular connectors



## Stamped Hyperboloid Contact - HCS

- Ideal for high volumes requiring a fully automated crimping process
- Delivered on reels for crimping machines with automatic feeder lines
- High reliability wire and insulation crimp





# 80+

Years Experience



## Market-leading Engineering & Technology Solutions

### Certifications, Standards & Compliance

- AS9100D
- ISO 9001
- ISO 14001
- ISO 45001
- NF F 61-030
- NF F 61-032
- NF F 16-101
- NF F 16-102
- NF-C 93421
- DIN 41612
- DIN 43652
- EN 50124
- EN 45545-2
- IEEE-1101.2-'92
- IEC 1076-4 101
- IEC 61373
- IEC 61984
- HE 501
- HE 704
- UTE C93-425
- UL94 VO
- RoHS compliance
- IRIS

### Engineering

- 3D EM Modeling
- Advanced RF & System Modeling
- CAD/CAM & Solid Modeling
- Finite Element Analysis
  - Thermal Analysis
  - Shock & Vibration Analysis
- Reliability Analysis

### Prototyping

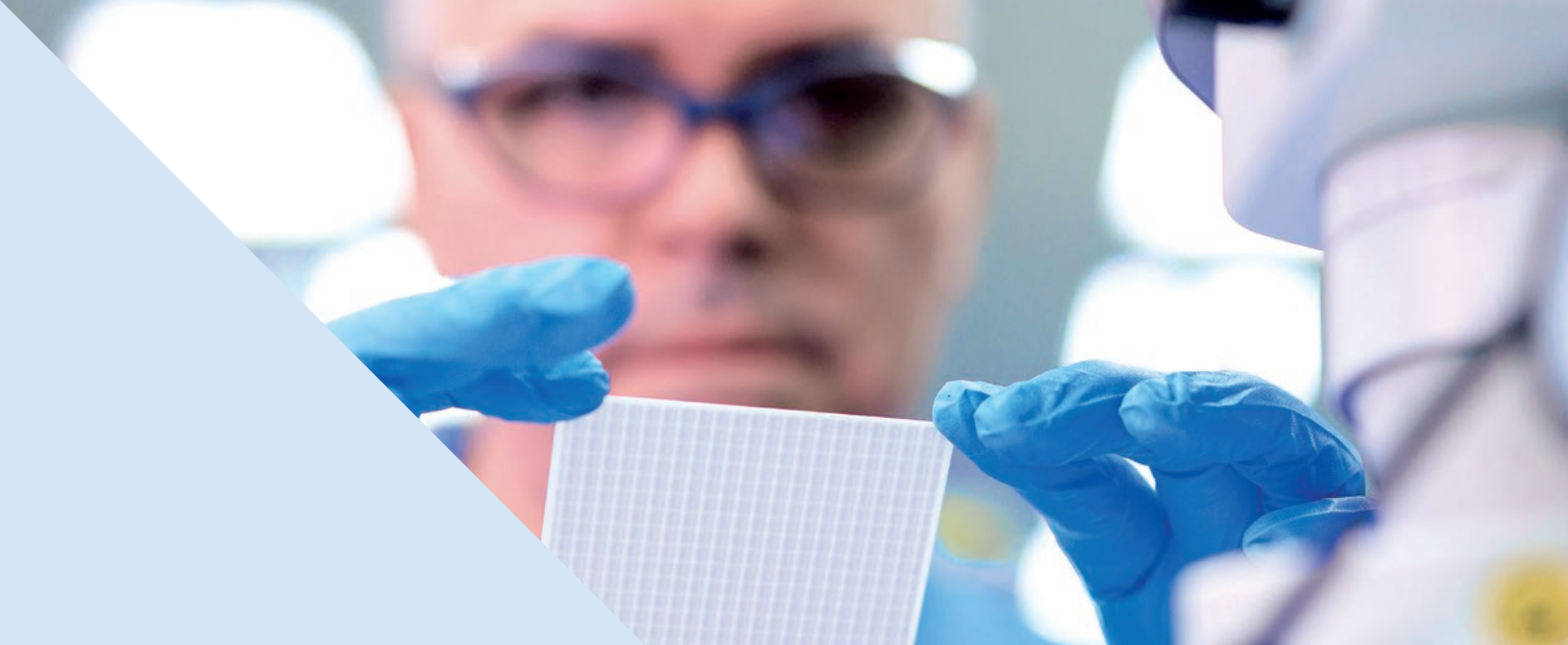
- CNC Turning & Milling Centers
- Cabling / Prototype Assembly
- 3D Printing
- Ceramic Grinding
- EDM
- Circuit Board Routing

### Manufacturing

- Precision Machine Shops
- Connector, Contact & Cable Assembly
- Automated PCB Assembly & Inspection
- Automated Hybrid Assembly
  - Die Placement
  - Wedge & Wire Bonding
  - Gap Welding
- NASA Certified Soldering
- Automated Test & Tune
- Optical Alignment
- System Integration
- Validation Testing

### Testing/Qualification

- Electrical Acceptance & LOT Test
- RF Test Capability, up to 325 GHz
- High Speed Digital
- Anechoic Chamber Testing
- ESS Environmental Qualification
- ESS Temperature, Shock & Vibration
- Metallurgical
- Real Time X-Ray
- Near Field/Compact Antenna Range
- Thermal Vacuum
- High Power RF Testing
- Optics Lab
- Multi paction, SRS mechanical shock



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## Connecting Global Markets

Smiths Interconnect's strong focus on serving international markets and customers is supported by our sales and technical teams across the Americas, Europe and Asia.

[smithsinterconnect.com](https://smithsinterconnect.com) | [in](#) [X](#) [YouTube](#) [WhatsApp](#)

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## Business Unit

Connectors

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Fiber Optics &  
RF Components

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Semiconductor  
Test

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RF/MW  
Subsystems

# Worldwide Support

## Americas

### Sales

connectors.uscsr@smithsinterconnect.com

### Technical Support

connectors.ustechsupport@smithsinterconnect.com

### Sales

focom.uscsr@smithsinterconnect.com

### Technical Support

focom.techsupport@smithsinterconnect.com

### Sales

semi.uscsr@smithsinterconnect.com

### Technical Support

semi.techsupport@smithsinterconnect.com

### Sales

subsystems.csr@smithsinterconnect.com

### Technical Support

subsystems.techsupport@smithsinterconnect.com

## Europe

### Sales

connectors.emeacsr@smithsinterconnect.com

### Technical Support

connectors.emeatechsupport@smithsinterconnect.com

### Sales

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### Technical Support

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### Technical Support

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## Asia

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## Pioneers of Progress

### Advancing the world through cutting-edge connectivity

We aim to be the partner of choice for innovative connectivity solutions where reliability, high quality, technical expertise, application knowledge, and a reputation for excellence is vital.

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