

smiths interconnect



# Commercial

Aerospace Connectivity Solutions

CUTTING-EDGE  
CONNECTIVITY

# About Smiths Interconnect



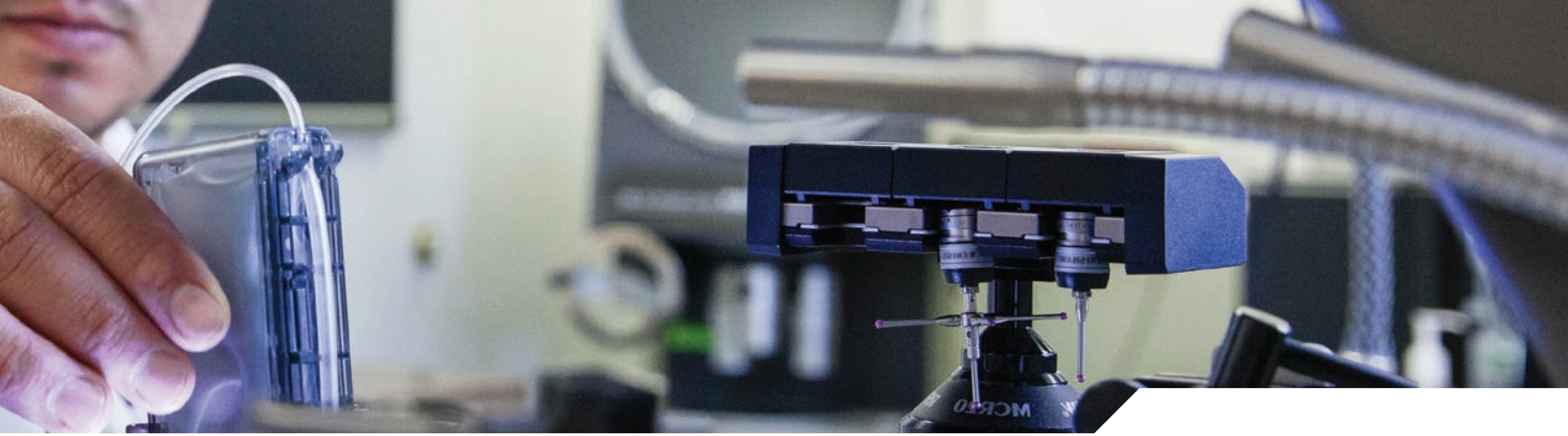
## We Offer



Smiths Interconnect is a leading provider of technically differentiated electronic components, subsystems, microwave, optical and radio frequency products that connect, protect and control critical applications in the Defense and Aerospace, Communications and Industrial markets.

Smiths Interconnect is the supplier of choice for safe, efficient and reliable connectivity in commercial aerospace applications. We offer proven experience in high performance connector solutions, antenna systems, RF components and cable assemblies in line with the next generation of avionics equipment, engine systems, power distribution, SATCOM connectivity and various other airframe applications.

Our technology brands (EMC, Hypertac, IDI, Lorch, Millitech, 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

**60+** Years Experience

### Technology

Broad Range of Advanced Interconnect Technologies

### Flexibility

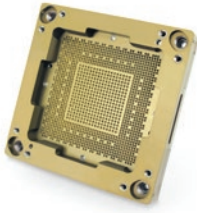
High Volume Product Platforms & Complete Tailored Solutions

### Service

Global Reach with Local Support

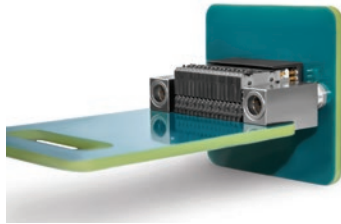
Smiths Interconnect is part of Smiths Group plc, a global leader in applying advanced technologies for markets in threat and contraband detection, energy, communications and engineered components. Smiths Group has a presence in more than 50 countries.

# Technology Brands



## 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.



## 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 tubular 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.

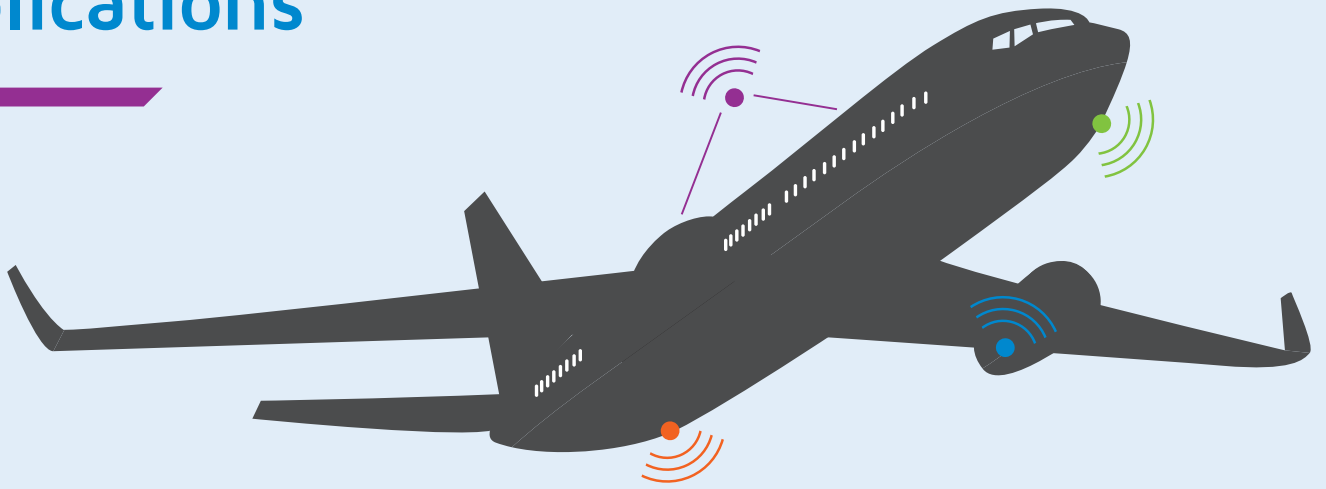
Connectors

Fiber Optics & RF Components

Semiconductor Test

RF/MW Subsystems/Smiths Interconnect Inc (SII)

# Applications



## Avionics

- Flight Control & Navigation Systems
- Flight Recorder
- Air Traffic Control
- Secondary Surveillance Radars
- Landing Gear & Brake Control Systems

## Engine System

- Electronic Engine Controllers
- Power Controllers
- Overspeed Protection
- Vibration Monitoring
- High Temperature Sensors

# Providing A Competitive Advantage

Smiths Interconnect is committed to developing cutting-edge interconnect solutions, technologies and full system integration capabilities for the latest generation of aircraft. Our solutions are well-suited to address both the reliability required for flight critical systems as well as environmental and mechanical concerns such as shock, vibration and extreme temperature ranges.



## Power Distribution

- Power Distribution & Management
- Auxiliary Power Units
- De-icing Systems
- Power Conversion
- Motor Drives

## SATCOM Connectivity

- In-Flight Entertainment
- Cabin Communication Systems
- Wireless Connectivity
- High Speed Networking

# Connectors



## Reliability & Safety

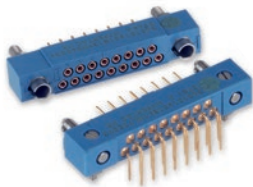
Through our Hypertac, HSI, IDI and Sabritec technology brands, we supply application-specific, high-reliability electrical interconnect solutions from highly integrated assemblies to microminiature connectors and spring probe contacts. Our reliable contact technologies are the core of our advanced interconnect solutions: Hyperboloid, Spring Probe, High Speed, Fiber Optic, High Power and High Temperature.

**Providing  
exceptional  
performance  
in critical  
applications**



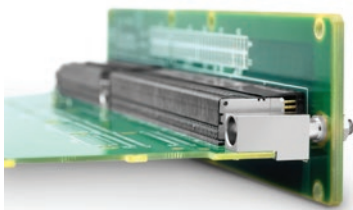
## Board to Board

- Available in 2 and 3 row configurations, from 17 to 160 contacts
- ESA qualified: ESCC 3401 039
- Guiding devices with or without polarization (16 keys available)
- Wire wrap, crimp, solder cup, straight and right angle PC tails



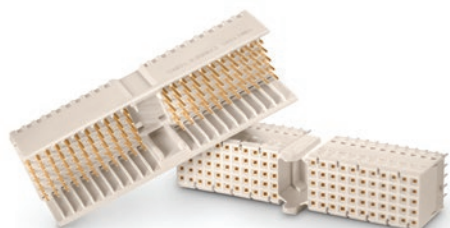
## High Speed Vita Backplane

- Fully footprint compatible with VITA 46/48 standards
- Flexible modular design for standard 3U, 6U and custom configurations
- 100  $\Omega$  differential
- Data rate performance up to 10 Gbps



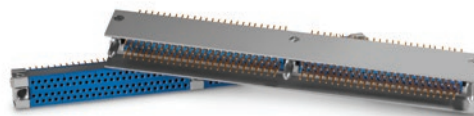
## Rugged 2mm Compact PCI

- Qualified to NASA GSFC: S-311-P-822
- Intermateable with cPCI COTS systems
- Hyperboloid & bifurcated contact systems
- Data rate performance up to 6.25 Gbps



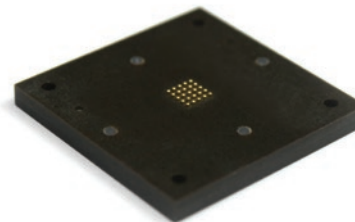
## Signal & Power PCB

- Signal and HE 807 cavities for power and coaxial contacts
- Ruggedized metal or plastic shell available
- ESA qualified: ESCC 3401/065
- Up to 400 signal contact positions



## Custom Spring Probe Interposers

- Low profile, high compliance ratio
- Compression mount termination options
- Mixed signals and functionality designed into a single connector
- Range of protective coverings available



## Did you know?

Our high speed data transmission connectors are used on next generation fuel efficient LEAP Turbofan engines of the Comac 919, A320NEO and Boeing 737MAX aircrafts.

**Designing  
safety,  
delivering  
reliability**



## EMI Filter

- Intermateable and interchangeable with standard non-filter connectors
- C, L and Pi style of all formats
- Insertion loss simulation for actual circuit configurations
- TVS protection meeting the requirements of RTCA D-160 section 22 up to level 5



## High Speed Copper

- Standard 100 and 150  $\Omega$  quadrax and twinax contacts
- Micro twinax and quadrax connectors
- Rugged D-Sub, ARINC and MIL-DTL-38999 standard quadrax and twinax
- Data rates up to 6.25 Gbps



## Modular Power

- Optimized filter style and value on receipt of signal type and data rate
- Improved shock and vibration resistance
- Low impedance control system
- Transient protection in accordance with RTCA D 160F waveform and level specifications



## Fiber Optic

- Butt-joint and expanded beam technology
- Floating design ( $< -0.5\text{dB}$ ), low loss fiber available
- Connector formats for MILDTL- 38999, ARINC 600
- Fully terminated and tested
- PC or APC ferrule end face



## High Power Circular

- 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

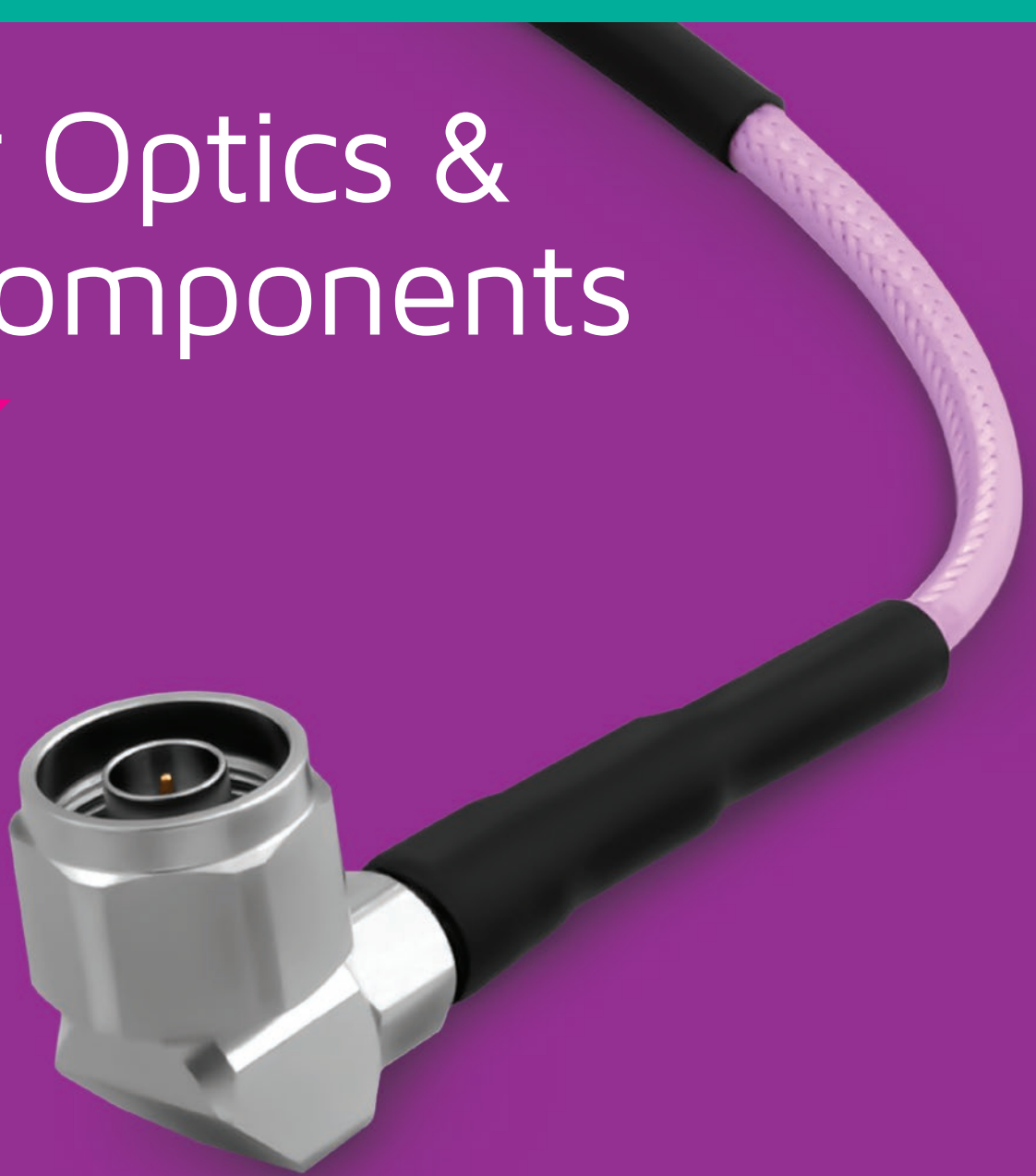


## High Speed Data

- High density, butt joint interconnect technology
- Standard 1.25 mm ferrule and sleeve
- Multi-mode and single-mode applications
- Low loss, low back reflection
- Standard MIL-DTL-38999 and ARINC 600 Size 16
- Removable alignment sleeve holder



# Fiber Optics & RF Components



## Optical Performance, Durability & Safety

Through our EMC, Florida RF, Lorch, Reflex Photonics and Trak brands we provide RF/Microwave components including: resistive & signal distribution components; cable assemblies; ferrite devices and waveguide products; filters, multiplexers and integrated assemblies; embedded transceivers and transceiver modules providing exceptional performance in critical flight applications.

**Extensive  
portfolio in a  
variety of  
packages and  
footprints**



## RF Semi-Rigid Cable Assemblies

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



## RF Flexible Cable Assemblies

- Low loss designs available for Ku/Ka band designs (DC-40 GHz)
- High shielding and extremely durable mechanical life due to braiding designs and solder terminations
- Solid center conductor designs available DC-65 GHz in low loss phase stable designs
- Phase matched options available



## Did you know?

Our Temperature Variable Attenuators are used to compensate for temperature variations from  $-65^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$ .

## Diamond RF Resistives

- Highest power and frequency, smallest size
- Very low parasitic capacitance
- Footprints from 0402 (20W) to 2010 (300W)
- Size and weight reduction in space & hi-rel applications
- Easy-to use packages: chips, flange and tabbed



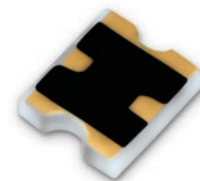
## RF Filters

- Discrete, cavity, waveguide, ceramic, tunable and printed filters
- High volume production capability
- Frequency up to 51 GHz with high Q factor
- Power handling up to 100 watts



## Attenuators

- Fixed to 50 GHz and temperature variable to 36 GHz
- Power handling up to 400 watts
- Totally passive with no signal distortion
- Several metallization and configuration options





Ensuring  
integrity in  
mission-critical  
applications



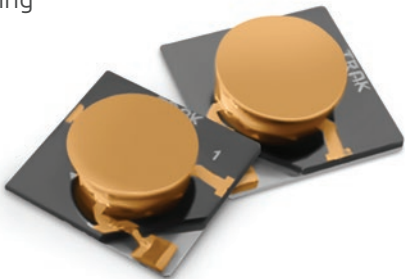
## Coaxial Isolators

- Wide range of isolators, circulators, loads, terminations, and attenuators
- Designed to operate from 300 MHz to 26 GHz
- Unique solid connectors available including female & male orientations, and SMA, TNC and SMP styles
- Male/female connector barrel machined to be integrated in housing
- Optimized for thermal and dynamic operational environments



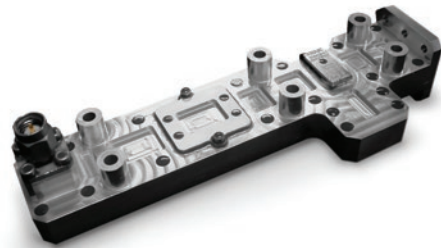
## Microstrip, Surface Mount and Stripline Isolators and Circulators

- Operating in assigned bands from 400 MHz to 31 GHz
- Used in a variety of interfaces including MIC, tabbed, and SMD interfaces
- Microstrip offers a unique blend of broad band operation, low mass and low profile
- Surface mount and stripline suitable for pick and place and reflow soldering



## Waveguides

- Isolators, circulators, combiners, couplers, loads, transitions, terminations, and multi-function assemblies
- Full waveguide band isolators and circulators WR-42-WR-05 (18-220 GHz)
- High power waveguide circulators / isolators for protecting TWTs up to 100 GHz
- Breadth of passive products operate from 1.0 GHz to 325 GHz
- High power devices are supplied as junction or differential phase shift types
- Guaranteed low and stable insertion loss under maximum power



## Did you know?

Smiths Interconnect has supplied over 400,000 microstrip isolators and circulators to the next generation multi-function radars and industrial telecommunication applications.



Improving  
passenger  
experience with  
higher connectivity

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## Rugged Transceivers

- 4-lane transceivers and 12-channel transmitters or receivers with push/pull MPO connector
- Operates over temperate range of -40 to +85°C
- Data rates up to 12.5 Gbps per channel
- EMI-immune transmission up to 100 m in environments with mechanical shock and vibration
- Rugged, RoHS electrical interface



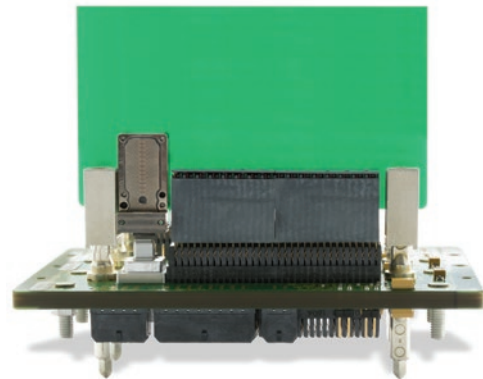
## Optical Transmitters or Receivers

- 12-channel with push/pull MPO multi-fiber connector
- Operates over 0 to +70°C
- Data rates up to 10 Gbps per channel
- Provides secure, high-reliability and EMI-immune transmission up to 300 m
- Reduced aircraft wiring and system weight



## VPX Optical Interconnect

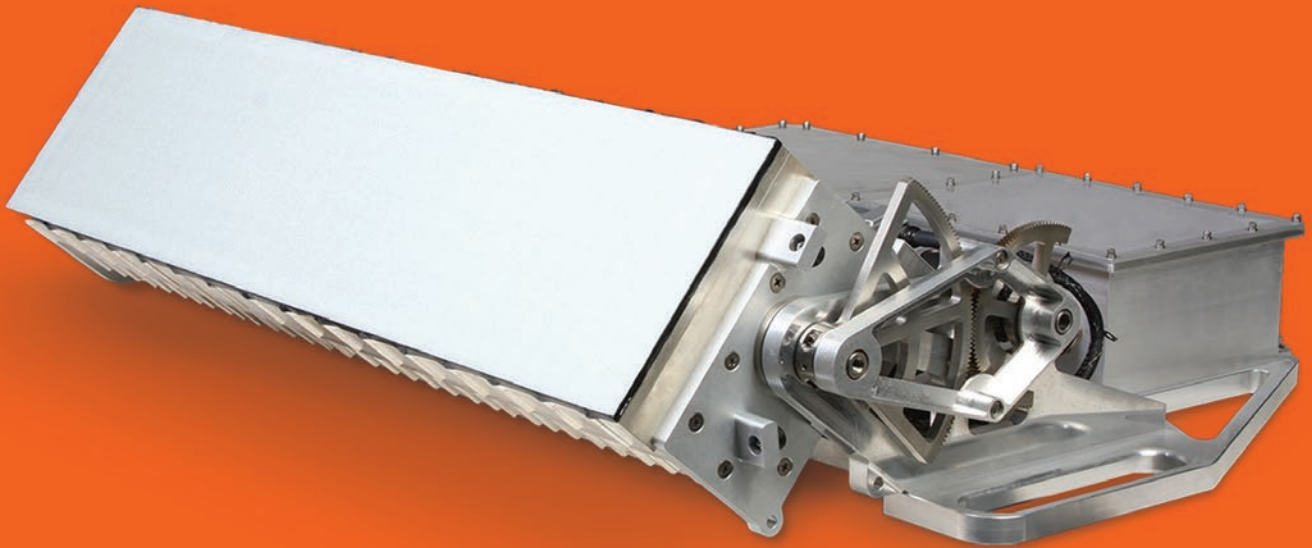
- Comprised of a fixed plug-in module connector and a floating backplane connect
- 4-lane transceivers and 12-channel transmitters or receivers
- Operates over temperate range of -40 to +85°C
- Data rates up to 25 Gbps per channel
- MIL-STD qualification level for EMI-immune transmission up to 100 m in harsh environments
- Spring-loaded MT to ensure a secure MT to MT mating connection



## Did you know?

12-channel pluggable optical transceivers are used on commercial aerospace audio video distribution systems allowing the ability to distribute high quality uncompressed video for your in-flight entertainment and connectivity.

# RF/MW Subsystems



## Advanced Technologies and Solutions

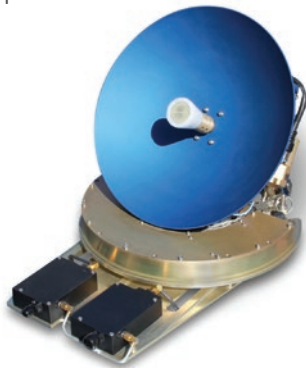
Whether it's a custom design or build-to-print, our Millitech, TECOM, and TRAK brands offer a broad range of advanced antenna systems as well as high-reliability RF/Microwave/Millimeter-wave components, assemblies and fully integrated subsystems, providing significant leverage in tackling commercial aerospace system challenges.

Advanced  
solutions for  
commercial  
aerospace  
platforms



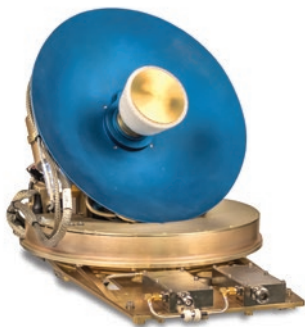
## Ka-Band Antenna Systems

- Light weight fully integrated 3 LRU system
  - High gain antenna system with integrated High Power Transceiver (HPT)
  - Antenna Control Unit (ACU)
  - Modem agnostic (customer selected)
- Broad frequency coverage for commercial and military applications
- Real time switchable dual polarization
- Operates on global Ka-band HTS satellite networks
- DO-160 qualified



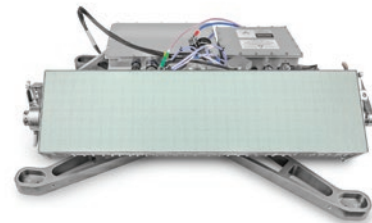
## Ku-Band Antenna Systems

- Light weight fully integrated 3 LRU system
  - High gain antenna system with integrated High Power Transceiver (HPT)
  - Antenna Control Unit (ACU)
  - Modem agnostic (customer selected)
- Full Ku-band spectrum coverage for military and commercial applications
- Real time switchable dual polarization
- Gate-to-gate connectivity
- Operates on global Ku-band networks and new HTS satellites



## Ku-Band Antenna Systems

- Integrated 4 LRU system
  - Satellite Antenna Assembly (SAA)
  - Antenna Control Unit (ACU)
  - High Power Transceiver (HPT)
  - Modem agnostic (customer selected)
- Full compliance with stringent FCC regulatory standards
- Large Install Base
  - Over 1000 aircraft installations
  - More than 15 million flight hours
  - Commercial and military variants



## Antenna Control Unit (ACU)

- Interfaces with aircraft for navigation information
- Provides antenna positioning command and control



## Did you know?

Our high reliability antenna systems enable gate-to-gate in-flight broadband connectivity.

# Global Capabilities

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## Reliable Solutions

In-house capabilities encompassing design, development, manufacturing and testing to anticipate market needs, respond quickly and accurately to customers, and provide the most reliable connectivity solutions.

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Market-leading  
Engineering and  
Technology Solutions

60+

Years  
Experience





## Certifications, Standards & Compliance

- EN/AS 9100
- MIL-DTL-3933
- MIL-DTL-39030
- MIL-DTL-38999
- MIL-DTL-83723
- MIL-DTL-83527
- MIL-DTL-24308
- MIL-DTL-83513
- MIL-C-26500
- MIL-C-81511
- MIL-C-26482
- MIL-PRF-55342
- ARINC 404
- ARINC 600
- ARINC 628
- ARINC 800
- ARINC 801
- HE 801
- HE 704
- NF C-UTE C93-424

## 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



# 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.

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## Business Unit

Connectors

Fiber Optics &  
RF Components

Semiconductor  
Test

RF/MW  
Subsystems



# Worldwide Support

## Americas

### Sales

connectors.uscsr@smithsinterconnect.com

### Technical Support

connectors.ustechsupport@smithsinterconnect.com

### Sales

focom.uscsr@smithsinterconnect.com

### Technical Support

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### Sales

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### Technical Support

semi.techsupport@smithsinterconnect.com

### Sales

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### Technical Support

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## Europe

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### Technical Support

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### Technical Support

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## Asia

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### Technical Support

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### Technical Support

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A close-up photograph of a jet engine turbine, showing the intricate, curved blades and the central hub. The image is partially obscured by a purple and blue geometric overlay on the left side of the page.

# 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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