



## Solutions for Aerospace, Defense and Marine Industries

## **TE Connectivity**

### **Global Reach and Expertise in Aerospace, Defense and Marine Products and Markets**

Some of our customers equip soldiers for the next-generation network-centric battlefield. Others wire advanced networking for commercial aircraft. We also work with customers who navigate remote-operated vehicles 6000 meters below sea level. Regardless of your business, TE Connectivity (TE) can help you gain an advantage in the aerospace, defense, and marine (AD&M) industries with our commitment to advanced engineering and world-class manufacturing. For more than 50 years, we've put a premium on delivering innovative products through excellence in design and problem solving.

We are especially well-known for being a leader in materials science capabilities, as well as in radiation crosslinking — a technology which makes our wire and cable products lighter, mechanically tough and able to withstand high temperatures required for harsh environments.

TE's aerospace, defense, and marine business has a presence in 25 countries with operations that include more than 300 engineers and globally located design centers, all supported by a worldwide sales force and logistics network. Whether it's high performance wire and cable, a termination device or a simple connector, our products can be found in virtually every key market segment.

## Commercial Aerospace

In passenger transports, turboprops and business jets, our connectors, fiber optics, and relays keep today's aircraft wired for success.



## Military Aerospace

The demands of the fixed, rotary wing and UAV markets depend on products that are reliable, maintainable, cost effective and technologically advanced and that is why we are an integral part of this growing industry.



## Electronic Systems/C4ISR

We offer a full range of solutions to optimize system performance, ranging from emerging technology commercial-off-the-shelf (COTS) to full military QPL products.



## Space

Space applications mean extreme conditions and demand the best in lightweight composition, innovative design and reliability.



## Missile Defense

The backbone to securing and protecting any nation requires a missile defense system that protects against any incoming threat. Our products are specifically tailored to provide cost effective solutions that help provide success.



## Ground Defense

Ground defense not only presents challenging environments, it also requires heightened system compatibility. Our components offer superior electrical interconnection performance under these extremely rugged conditions.

## Military Marine

TE has a proven track record of providing rugged solutions to meet the harsh demands of the military marine environment.



## Offshore and Commercial Marine

Offshore and subsea environments pose some of the most extreme weather, pressure, weight, and corrosion challenges to electronic systems and equipment. Our materials science expertise, sealing technology, and systems approach to electronic interconnect help our customers navigate through the harsh conditions found in marine applications.



# Commercial Aerospace

TE provides innovative solutions for the commercial aerospace industry, from the initial stages of aircraft design to aftermarket support.

**C**ontrolling aircraft design and operation costs is an increasing challenge for the commercial aerospace industry. TE consistently delivers proven value and performance and increasingly lighter weight solutions for customer applications.

By applying our materials science technology and other core capabilities, TE provides component design, as well as low cost, turn-key finished assemblies no matter what the technology challenge — higher speeds, greater bandwidths, higher currents, higher voltages, etc.

#### **Commercial Aerospace Markets Served Include:**

- Business Jets
- Commercial Transports
- General Aviation Aircraft
- Regional Aircraft
- Very Light Jets

Our products meet the most stringent quality and performance standards of the major industry OEMs, military, and aerospace industry authorities. TE's components are vital throughout today's Aerospace systems.

#### **Products Include:**

- Connectors
- Harnessing Accessories and Identification
- Relays and Contactors
- Rugged Fiber Optic Connectors and Cable Assemblies
- Termination Devices, Splices and Crimp
- Sensors
- Wire and Cable

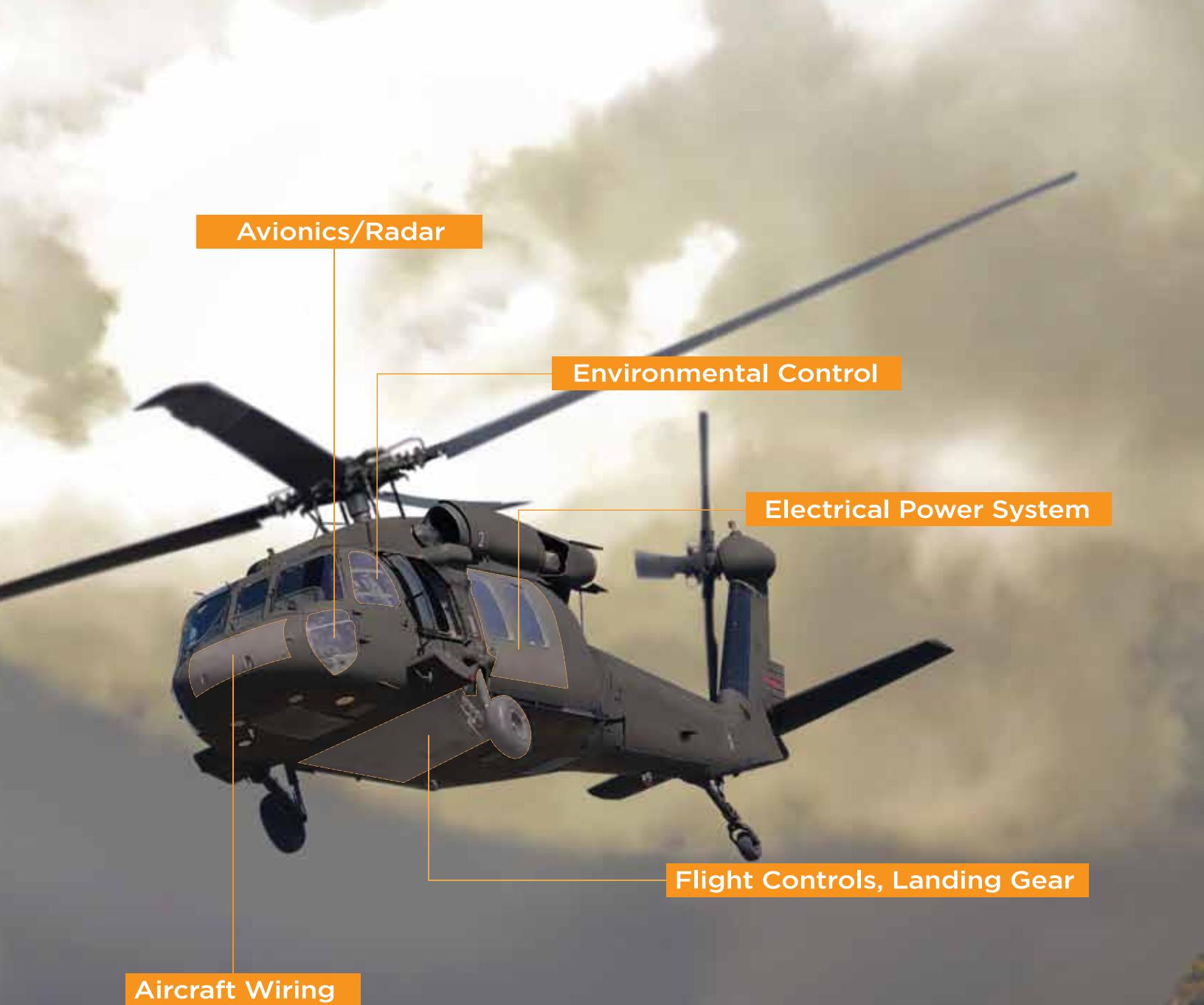
TE's HARTMAN brand of K Series contactors offer outstanding performance and reliability in a highly efficient package. The K-Series products are among the smallest and lightest 200-1000 ampere DC contactors available.



TE offers a large array of aerospace grade rectangular connectors used today in a variety of applications to meet the demands for low profiles, space or weight savings.



# Commercial Aerospace



# Military Aerospace

From high performance connectors, fiber optics, and wire harnessing products to complete power distribution systems and assemblies, TE understands the demands of the fixed, rotary wing and unmanned vehicle markets.

**F**rom wire harnessing components and finished assemblies, to high data rate and RF cable assemblies, to specialty fiber optic systems, TE products are built to last and are designed to meet rigid military requirements while increasing reliability and overall system performance. We also manufacture a variety of high reliability relays, contactors and solenoids geared for the rugged demands of this market.



Small form factor connectors with excellent EMC/EMI backshell shielding for optimum flexibility and design.

#### **Military Aerospace Markets Served Include:**

- Fixed Wing – Fighters, Surveillance, Transports, Trainers
- Rotary Wing – Attack, Commercial, Transports
- Unmanned Vehicles – High Altitude, Medium Altitude, Miniature UAVs

Small form factor connectors and backshells feature ruggedized electrical interconnect solutions for optimum flexibility and design. High performance wire and cable provides complete harnessing solutions for power and signal distribution systems.

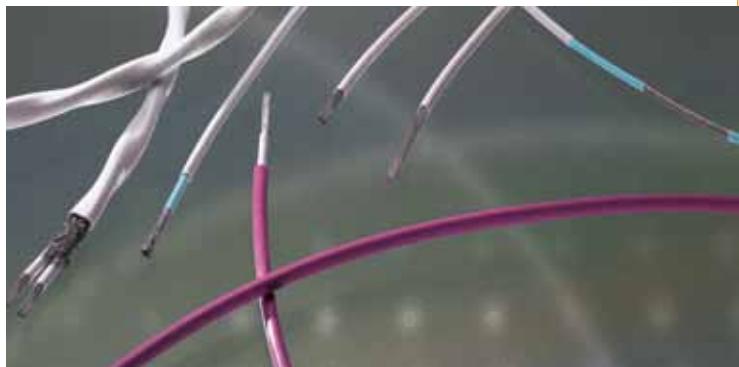
High performance military and commercial RF offerings range from small form factor to larger discrete connectors with speeds up to 40 GHz.

TE offers the broadest range of contactors and relays from low level signal to high current AC/DC contactors which translates to designing lightweight, ruggedized hermetic or gasket-sealed packages that are fully customizable for integrated power distribution panel assemblies.

#### **Products Include:**

- Data Bus (MIL-STD-1553B) Components
- Backshells
- Connectors
- High Data Rate Cable and Assemblies
- Power Distribution Assemblies
- Relays and Contactors
- RF Products
- Rugged Fiber Optic Connectors and Cable Assemblies
- Sensors
- Smart Contactors
- Termination Devices, Splices and Crimps
- Wire and Cable

Lightweight high performance wire and cable and specialty ElectroLoss FilterLine wire offer ruggedized solutions for general wiring through severe EMC/EMI environments.



# Military Aerospace



**T**he electronic systems market demands a wide variety of interconnect solutions, ranging from high bandwidth to high power. TE offers a comprehensive assortment of products developed to meet the unique requirements of this market segment.

#### **Electronic Systems Markets Served Include:**

- Avionics
- In-flight Entertainment
- C4ISR
- Vetroics

TE manufactures thousands of COTS and agency specified products. These components are designed to provide maximum performance while optimizing size, weight and power.

TE is the premier supplier of enabling technology for electronic systems applications.

#### **Products Include:**

- Board Level Connectors
- Contactors and Solenoids
- Controlled Impedance Cables
- Harnessing Materials and Devices
- High Performance Relays
- Hook-Up Wire
- Rugged Fiber Optic Connectors and Cable Assemblies

TE rugged fiber optic products enable high bandwidth, EMI immunity and light weight. Product solutions include connectors, cable, tooling, identification and assemblies.



TE provides high performance interconnects to support the latest developments in embedded computing architectures, where speed, density and reliability are top priority.

# **Electronic Systems/C4ISR**



**T**he space industry demands the best in high reliability solutions. Key attributes, including low mass, high efficiency, and high bandwidth are crucial to mission success. TE is dedicated to supporting the full range of space applications.

#### Space Markets Served Include:

- Ground Support Equipment
- Launch Vehicles
- Satellites
- Spacecraft

TE offers a wide variety of products designed for space. Our agency- and integrator-approved products are the cornerstone of our portfolio. These products are ruggedized and manufactured with materials worthy of space flight. We are engaged with numerous global approval agencies, including the European Space Agency, Indian Space Research Organization, Japan Aerospace Exploration Agency, and National Aeronautics and Space Administration. We also offer a staggering array of COTS products that are space compatible and provide solutions to the many challenges posed by terrestrial applications.

We are ready to assist you by providing proven, lightweight, dependable technology for your space application.

#### Products Include:

- Circuit Board Level Connectors
- Data Bus (MIL-STD-1553B) Components and Harnesses
- Harnessing Products
- High Performance Relays, Contactors and Solenoids
- Interconnect Devices
- Microminiature and Nanominiature Connectors
- Quadrax Connectors
- RF Products
- Space Rated Wire and Cable
- Subminiature D Connectors

TE offers proven space products designed for optimum performance. Our breadth of Quadrax based connectors offer higher bandwidth in a small form factor.



TE's High Speed Ruggedized backplane connector is the ultimate in user configurability. The ruggedized COTS connector is length scalable with standard module sizes, including 10+Gb/s differential pair (also capable of single-ended operation), power modules capable of 15A per contact and RF modules equipped with SMPM contacts rated up to 40 GHz.



Space



# Missile Defense

From connectors and backshells to a full range of components for missiles and launchers, TE delivers flexible, innovative engineering solutions in rugged, space-saving products.

**T**E components for missile defense and launchers routinely satisfy specific needs within the market by offering a broad range of products from miniature and nanominiature connectors to micro coax and RF products. We also offer high performance, small form factor board-level relays for the demanding missile environment.

#### **Missile Defense Markets Served Include:**

- Air to Air; Air to Surface; Surface to Surface
- Anti-Armor; Anti-Ballistic; Anti-Ship; Anti-Sub
- Fixed and Mobile Rocket Launchers
- Unpowered Guided Weapons

For applications involving high speed and high density connectors, we offer a multitude of options for connectors with .050 and .025 inch center-to-center spacing.

We are developing a new modular approach to connectors and our options will include signal, power, RF, fiber and high speed in one small form factor connector.

Our RF product selections offer speeds up to 40 GHz. In recent years, we've added customizable RF cable assemblies to our portfolio.

#### **Products Include:**

- High Data Rate Cable and Assemblies
- High Performance Primary Wire and Cable
- Microminiature and Nanominiature Connectors and Backshells
- Relays, Contactors, Solid State Relays and Solenoids
- RF Products
- Rugged Fiber Optic Connectors and Cable Assemblies
- Termination Devices, Splices and Crimps

Extremely small size interconnection that offers a versatile RF product solution for high density packaging in high shock and vibration environments.

Nanominiature and microminiature connectors offer ruggedized solutions in a small form factor package.



# Missile Defense



## Ground Defense

TE's expertise in interconnection products and systems helps ensure complete system compatibility for challenging applications in defense environments.

**T**E has spent the last 40 years helping the ground defense market reach new levels of performance with specific, often customized, product solutions. Our interconnection and sealed systems complemented by our shielded cabling technology has helped ensure complete system compatibility for the challenging defense environments.

#### **Ground Defense Markets Served Include:**

- Amphibious Vehicles
- Armored Fighting Vehicles
- Armored Personnel Carriers
- Command Post Carriers
- Ground Weapons/Support Systems
- Light Armored Vehicles
- Military Tanks
- Military Trucks
- Soldier Systems

Our sales and application engineers arrive on the job armed with vast industry knowledge, experience in problem solving, and up-to-date information at their finger tips. As a result, we are able to provide you with complete system compatibility for a broad range of applications and environments.

#### **Products Include:**

- Heat-Shrink Harness Components
- High Performance Relays and Contactors
- High Speed Copper Connectors and Cable
- Rugged Fiber Optic Connectors and Cable Assemblies
- Sealed Harnessing Cable Assemblies
- Wire and Cable

TE provides a range of high performance relays, whether it is for high voltage or high current, in a small robust package.



TE provides a broad range of adapters, braid, adhesives, wire and molded parts to complete sealed/shielded harness assemblies.



# Ground Defense



**Sonar**

**Weapon Systems**

**Radar/Communication Systems**

**Power Distribution**

**Shipboard Hull Products**

# Military Marine

TE components meet the rigorous demands of the military marine, helping combat vessels, submarines and other ships to operate safely, reliably and efficiently.

**M**ilitary marine combat vessels, submarines, and other ships operate under rigorous demands. TE components meet those demands, helping marine crafts operate safely, reliably, and efficiently.

#### **Military Marine Markets Served Include:**

- Aircraft Carriers
- Amphibious Ships
- Auxiliary and Support Ships
- Submarines
- Surface Combatant Vehicles

TE offers many MIL spec and custom cable solutions to meet harsh naval environments.

The electronic components and systems we develop and produce are designed to withstand harsh operating environments. We serve navies world-wide and hold many global product approvals. TE products are well represented throughout today's fleet. Our product portfolio makes up the essential elements found on surface combatant vessels, submarines, aircraft carriers, minesweepers, LPD, and cutters. TE products can be found on virtually every ship in service today.

#### **Products Include:**

- Cable Ties and Sealing Products
- Dipping Sonar Cables
- High Performance Relays and Contactors
- High Speed Copper Cables
- Maintenance and Repair Kits
- Multi-Conductor Cables
- Range Cables
- Rugged Fiber Optic Connectors and Cable Assemblies
- Towed Array Cables

TE offers a broad range of relays that can be found on virtually every ship in our fleet today. Our portfolio includes everything from high amperage to high voltage solutions.



# Military Marine



**Control Systems**

**Power Distribution**

**Communication Systems**

**Sidescan Sonar, Towed Cables  
and Armored Cabling for  
Subsea Systems**

**Shipboard and Engine Products**

**Umbilicals and Tethers**

# Offshore & Marine

TE develops and produces electronic components and systems that meet the stringent real-world application demands and certifications of marine-focused approval bodies around the world.



**T**he offshore and commercial marine market is harsh on hardware and apparatus. TE produces and develops electronic systems and components that can stand up to the requirements of application demands and of approval bodies throughout the world. Our insulation material technology produces significant cable weight and size reduction for offshore and marine systems.

### Offshore and Commercial Marine Markets Served Include:

- Oceanography
- Oil and Gas Exploration and Development
- Seismic
- Subsea Telecommunications
- Fisheries
- Mining

C-Lite cable products offer significant size and weight reduction compared to conventional insulation systems, while at the same time meeting key criteria such as low fire hazard performance and mechanical robustness.

Weather, corrosion, extreme temperatures; the products we design must perform unfailingly regardless of conditions. World-wide, TE products help keep vessels, offshore platforms and Floating Production Storage and Offloading (FPSOs) productive, safe, and dependable in any environment.

### Products Include:

- Cable Management Accessories
- Downhole Wireline
- Electro-Optical Tow Cables
- Halogen-Free Flame Retardant Cables for LV Power, Control, Communications and Lighting
- Motor Driven Relays
- MUX/BOP Cables
- ROV Umbilicals and Tethers
- Rugged Fiber Optic Connectors and Cable Assemblies
- Side Scan Sonar Cables
- Single and Multi-Conductor CTD and Instrumentation Cables

From 5000 meters below sea-level to 5000 meters above, our cables are designed, developed, and manufactured to rigid specifications applicable to a wide range of applications.



# Offshore & Marine

# TE Product Offerings

## Connectors and Backshells

Aircraft data networks, avionics, IFE, military communications and radars: equipment and systems that require durable hardware capable of increased data rates.

To satisfy that need, the aerospace and defense industries have come to rely on TE's dependable connectors, backshells, contacts and terminals. In fact, you'll find literally hundreds of thousands of our components deeply embedded throughout today's space, commercial aircraft, defense electronics and ground and marine systems.

## Data Bus and Networking Products

TE helps your devices communicate by connecting virtually every link in the communication chain. Our value-added assemblies reduce costs and increase reliability by combining top quality products like connectors, circuit boards, switches, breakers, wire and harnesses. Our lightweight, high-performance Data Bus (MIL-STD-1553B) components are rated to 150°C. Assembled products include everything from power distribution assemblies, backplanes and I/O panels, to advanced optical modules, nano assemblies and complex harnesses.

## Fiber Optics

Our commercial, defense and marine offerings include a comprehensive family of rugged fiber optic products designed with cost and performance in mind. Our fiber products feature easy alignment

and low sensitivity to thermal changes and contamination. Strong, precision connector housings mean durable connections with low loss and repeatable performance. Our fiber optic connectors and contacts are operating reliably in aerospace, avionics, military and marine communications, security systems, and offshore exploration. The stress of multiple coupling/de-couplings, blind mate situations and high vibrations require strength, durability and reliable execution.

## Harnessing and Heat-Shrink Harness Components

Aerospace, defense and marine clients all have one thing in common; tough environmental conditions.

Heat-shrink harness components and assemblies protect cables and equipment from corrosion and abuse. Heat-shrinkable molded parts provide dependable strain relief, excellent mechanical and electrical protection. Product features include superior abrasion and crush resistance, sealing and strain relief, and exceptional performance at high and low temperatures. Harness assemblies combined with TE components strengthen the power and signal distribution systems found on aerospace, defense and marine platforms and subsystems.

## High Performance Wire and Cable

High-performing electronics demand high-performance wire and cable.

The engineers at TE have refined the development of polymer blending and radiation cross-linking technologies. We've taken unique cable jacket materials and

combined them with high-performance component wires, miniature coaxial cables and high speed data cables. Our designers have gone to great lengths to make sure that these products meet performance standards in the most demanding defense, marine and aerospace environments.

### Interconnect Devices

TE insulated electrical terminal products deliver reliable, repeatable and rugged performance wherever they are utilized in the aerospace, defense and marine industries.

We offer termination products housed inside transparent heat-shrinkable insulation sleeves, making them easy to inspect while providing multiple levels of environmental protection. Terminated technology used with SolderSleeve devices provides high-quality electrical and mechanical performance. Premeasured solder and flux create repeatable, reliable terminations that help reduce the amount of rejects and field failures.

### Relays, Contactors, Power Distribution Panels, Solenoids and Sensors

The relays and contactors manufactured by TE are designed to meet stringent aerospace and defense specs in the most extreme environments. Our components easily switch currents from dry circuits to more than 1000 amps, voltages up to 70 kV and frequencies

up to 6 GHz. Our custom-designed solenoids produce as little as a few ounces to as much as 100 pounds of force.

Custom-designed AC or DC power distribution units (PDUs) are built and qualified to meet your specific requirements. Allow us to apply our significant expertise in integrating bus-bar and plug-in contactors, relays, sensors, monitors, circuit breakers, shunts, generator control units and other components into compact, lightweight PDUs. Our value-added service can save you time and money in your design and manufacturing processes, as well as the end customers' maintenance program.

### RF Products

TE is a leading manufacturer of RF connectors, cable and application tooling.

We provide a wide range of coaxial connectors for the aerospace and defense industry. TE offers military-qualified SMA, BNC, TNC connectors plus a portfolio of small form factor high-frequency connectors such as SSMA, SMP, and SMPM. These can also be packaged in multi-port connectors to optimize board level and box-level real estate. Our engineers understand RF theory and the design challenges it can present to an application; they can recommend effective connector, adapter and assembly solutions to meet the system requirements.

## TE's Worldwide Capabilities

- Design and Development Engineering and Analysis
- Manufacturing Technologies
- Materials Science (stamping, plating, carbon nano tubes, etc.)
- Offset
- Program Management
- Radiation Cross-Linking Polymers
- Reliability, Quality Assurance, Test and Agency Approvals
- Research
- Technology Leadership

# Additional Product Offerings from TE

## COTS Products

TE brings decades of design and problem-solving experience to your aerospace, defense and marine applications with an unparalleled selection of commercial off-the-shelf (COTS) products. The proven quality and heritage of our component brands such as AMP connectors, Raychem wire and cable, CII, Hartman, and Kilovac relays and contactors and many more is matched only by our ongoing commitment to invest in new MIL-spec and COTS component technologies to help you meet your next-generation systems performance and cost goals. COTS products from TE include connectors, splices, fiber optics and terminal products.

## Identification

TE provides end-to-end ID solutions such as cable identification, as well as a full range of printing and engraving systems. When it comes to industrial identification technologies for cables, wire and harness products, we're leading the way. ID products from TE include computer-printable, permanent identification sleeves; lightweight products for aerospace applications and materials that meet military specifications. We can help you develop customized solutions for demanding environments, including defense, aerospace and marine applications.



## The TE Advantage

For more than half a century, our innovative engineering and world-class manufacturing have helped even the most advanced project take flight. We design and rigorously test our products. Our engineers thoroughly understand agency standards and regulations, from adherence to stringent military specifications, QPL, and COTS, or calls for rugged optics built for harsh conditions. That expertise pays off. Aerospace, defense and marine customers understand the many benefits of talking to us early in the design cycle to help solve tough design problems.

With approximately 7000 engineers and worldwide sales and customer service capabilities, TE is dedicated to helping you achieve your design goals regardless of how severe the application environment.

We design, manufacture, and market approximately 500,000 products for more than 150,000 customer locations in a broad array of industries including automotive; data communication systems and consumer electronics; telecommunications; aerospace, defense and marine; medical; energy; and lighting. We bring a performance advantage to every technology, product and service we provide, including connector systems, relays, fiber optics, circuit protection devices, wire and cable, touch screens, heat shrink tubing, racks and panels, network interface devices, and undersea telecommunication systems.

**For more information please visit our web site at [www.te.com/ADM](http://www.te.com/ADM).**

## TE AD&M Manufacturing Locations

### NORTH AMERICA

Carpinteria, CA  
Culpeper, VA  
Fairview, NC  
Hermosillo, Mexico  
Mansfield, OH  
Mt. Joy, PA  
Rapho Park, PA  
Redwood City, CA  
Tijuana, Mexico

### EMEA

Bangalore, India  
Cochin, India  
Swindon, UK

### ASIA PACIFIC

Shanghai, China

## Global Presence. Global Products.

Today's aerospace, defense, and marine markets demand performance. By combining innovative design, problem solving expertise and solid manufacturing, TE helps you meet and exceed those demands.

## FOR MORE INFORMATION

### Technical Support

Internet:	<a href="http://www.te.com/ADM">www.te.com/ADM</a>
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C. America:	+52 (0) 55-1106-0800
South America:	+54 (0) 11-4733-2200
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