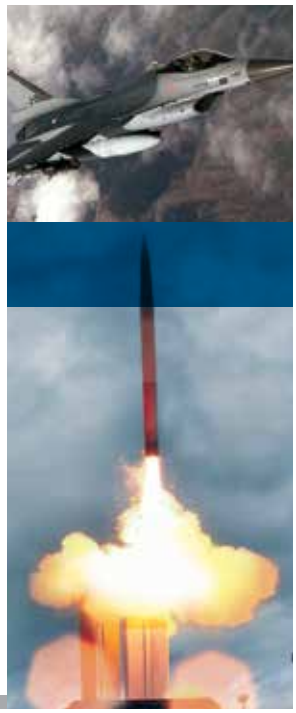


MISSILE DEFENSE

SURVIVABLE SOLUTIONS IN HARSH ENVIRONMENTS

Mission-Critical Flight and Precision Targeting with Smaller, Lighter, Faster, Reliable Interconnects and Systems

ADVANCED CONNECTIVITY FOR RELIABLE FLIGHT

Helping You Design Better Systems

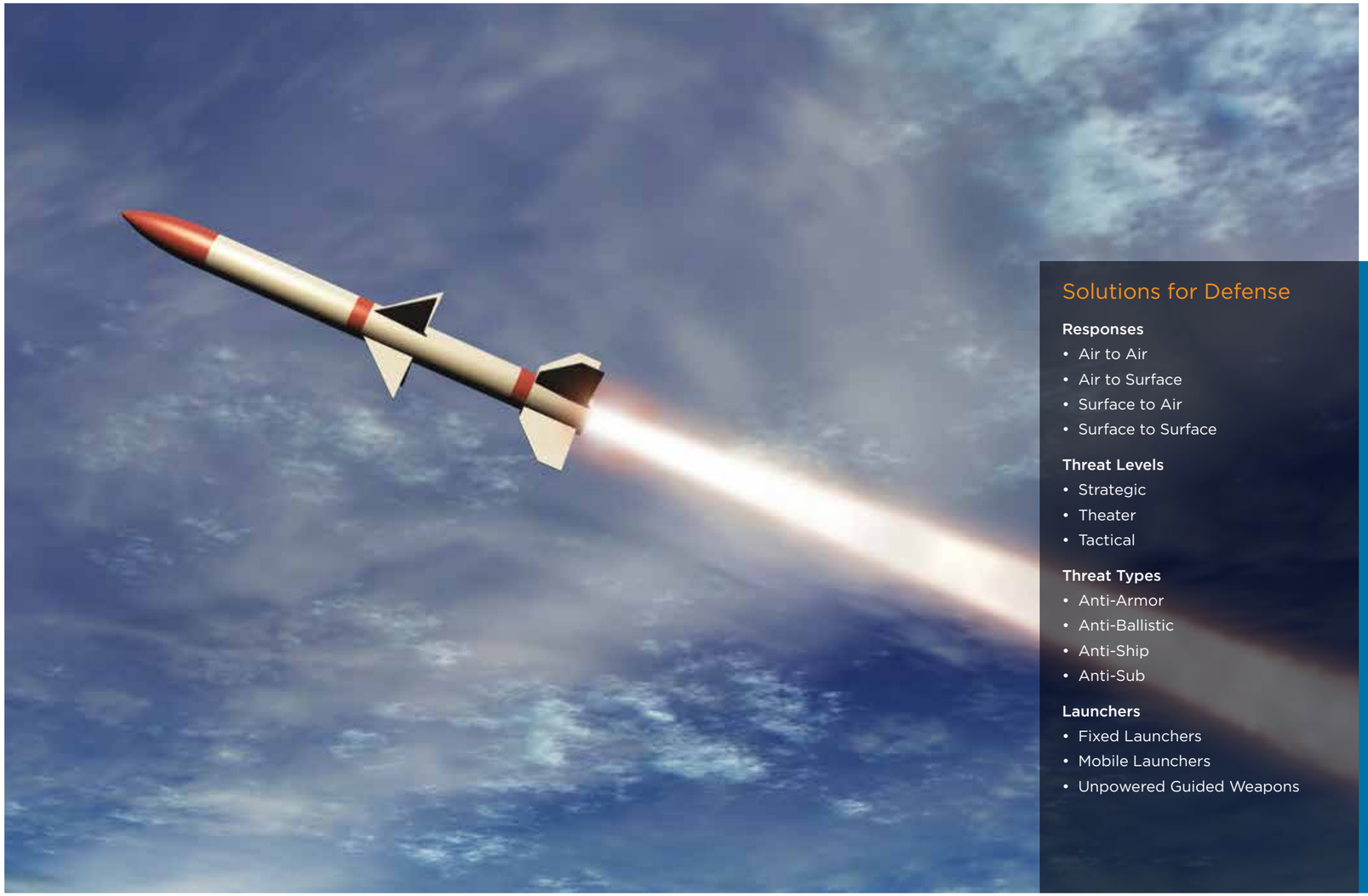
TE Connectivity (TE) is helping designers create missile defense systems that are smarter, smaller, lighter, and more reliable. While a missile needs only to work once, every missile must be ready to perform flawlessly at a moment's notice. All subsystems must be reliable and easily maintainable to keep the missile mission ready.

Managing Complexity

The backbone to securing and protecting most nations requires a missile defense system that contains any incoming threat. Globalization, increased threat levels, and technological advances are driving a wave of new technologies aimed at quicker response, pinpoint accuracy, and deterrence from imminent attack. Smarter missiles create new demands on the electronics to ensure that the mission is accomplished intelligently and effectively. This leads to the need for high bandwidth and more interconnections among the various subsystems.

Reducing SWaP

At the same time, designers continually strive to reduce SWaP—size, weight, and power consumption. Such reductions allow either smaller systems or the ability to pack more capabilities in the same space. Most often, the goal is to combine the two: more capabilities in less space.



Solutions for Defense

Responses
- Air to Air
- Air to Surface
- Surface to Air
- Surface to Surface

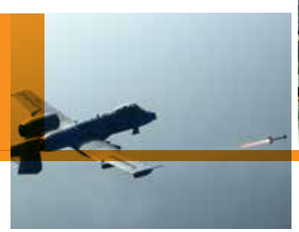
Threat Levels
- Strategic
- Theater
- Tactical

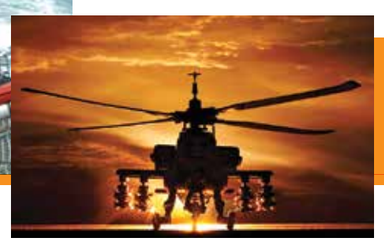
Threat Types
- Anti-Armor
- Anti-Ballistic
- Anti-Ship
- Anti-Sub

Launchers
- Fixed Launchers
- Mobile Launchers
- Unpowered Guided Weapons

TE Components . . . TE Technology . . . TE Know-how . . .
AMP | Agastat | CII | Hartman | Kilovac | Microdot | Nanonics | Raychem | Rochester | DEUTSCH

Get your product to market faster with a smarter, better solution.





BETTER INFORMATION COMING AND GOING

Radar Systems

Radar provides the essential vision for missile defense systems, a vital element in detecting and tracking incoming threats. As a countermeasure, it can also be used for targeting and tracking outgoing missiles.

More Bandwidth, More Ruggedness

From RF connectivity to high-bandwidth connectors for embedded computers, we can help enable rugged radar systems. Our solutions make it possible for you to achieve and manage the bandwidth you need for real-time detection and tracking.

Typical Applications

- Early Warning
- Tracking
- Targeting

Solutions for Radar

Board and Box I/O Connectors
- High-Speed Backplane Connectors
- High-Speed I/O Connectors
- Microminiature and Nanominiature Connectors

RF/Microwave
- Military/Aerospace RF Products
- RF Coax Cable Assemblies
- Controlled Electrical Cables

Antennas
- Navigation and Communication
- Conformal and Anti-Jam GPS

High-Power Switching
- Smart, Fault-Protected AC and DC Contactors

DEUTSCH EMI/EMP CONNECTORS
Many of our connector lines are available with built-in filtering and transient suppression. With a variety of filter types and the capability to custom-filter each line, we can help meet your most demanding needs

DEUTSCH WILDCAT CONNECTORS
Wildcat 38999 connectors save space and weight by nearly doubling the contact density of M38999 connectors, while maintaining compatibility with standard 38999 backshells and accessories. Compact Wildcat Micro connectors offer additional size and weight savings

CONTROLLED ELECTRICAL CABLES
Cheminax cables bring tightly controlled electrical characteristics to miniature coaxial cable—offering electrical performance exceeding standard RG cables in a smaller, lighter design, while providing lower attenuation and capacitance

RF CONNECTORS
As one of the leading manufacturers of RF connectors, cable, and cable assemblies, we provide a wide range of coaxial connectors, including military-qualified SMA, BNC, and TNC connectors, along with a portfolio of small-form-factor high-frequency connectors

ANTENNAS
With extensive experience with 3D molded antennas, we offer conformal communication and navigation antennas for higher performance and increased functionality. Our embedded molding technology helps provide for low profile, enhanced reliability and improved bandwidth capability

BANDWIDTH FOR PRECISION TARGETING

Seeker/Guidance

Precision control guidance systems provide various types of steering commands. Accurate flight to target requires heavy-duty processing of sensor data from infrared and laser sensors, radar, and GPS. The control system must deal with such flight variables as phase of flight, type of interception, motion, heat detection, and proximity. As the sophistication of sensors grows and systems use multiple sensors, the data they provide becomes more complex.

Connectivity to handle the data is moving from Gigabit Ethernet to 10G in networking, while signal processing systems need to pack more bandwidth into smaller packages.

Typical Applications

- Radar
- GPS
- Data Links
- Electro Optical
- Infrared
- Laser
- Inertial Measurement Units

Solutions for Guidance

I/O
- High Speed I/O Connectors
- Microminiature and Nanominiature Connectors
- High-Performance Adapters

RF/Microwave
- Military/Aerospace RF Products
- RF Coax Cable Assemblies

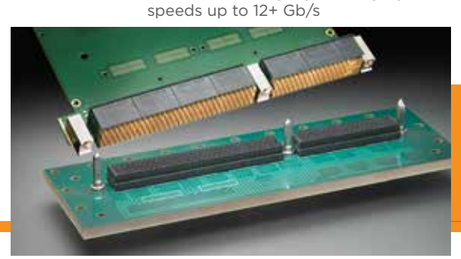
Wire and Cable
- Hook-Up Wire and Cable
- Controlled Electrical Cables

Miscellaneous
- Board Level Interconnects
- Shield Terminators

DEUTSCH HIGH-RELIABILITY OPTICAL CONNECTORS
Find the low-loss, rugged connector you need—from single position to high fiber counts, lensed or physical contact termini, and lightweight aluminum or composite shells

NANOMINIATURE CONNECTORS
Nanominiature circular and 0.025-centerline rectangular connectors combine extreme size and weight reduction with the highest levels of reliability and ruggedness. A common contact system used throughout the product family enhances long-term performance in difficult applications

HIGH-SPEED BACKPLANE CONNECTORS
Meet sophisticated signal processing requirements with rugged high-speed backplane connectors that withstand shock and vibration while maintaining signal integrity at speeds up to 12+ Gb/s



HIGH-SPEED I/O CONNECTORS
Get the speed, density, and transmission distances you need over fiber or copper. From traditional Mil Spec and COTS connectors to our innovative CeeLok FAS-T and FAS-X 10G connectors, we'll get you connected

MICROMINIATURE CONNECTORS
TE's 0.050-inch center spacing micro connectors satisfy a broad range of missile applications. For exceptional space and weight savings, our connectors are available in rectangular and circular configurations, with specialty inserts readily available

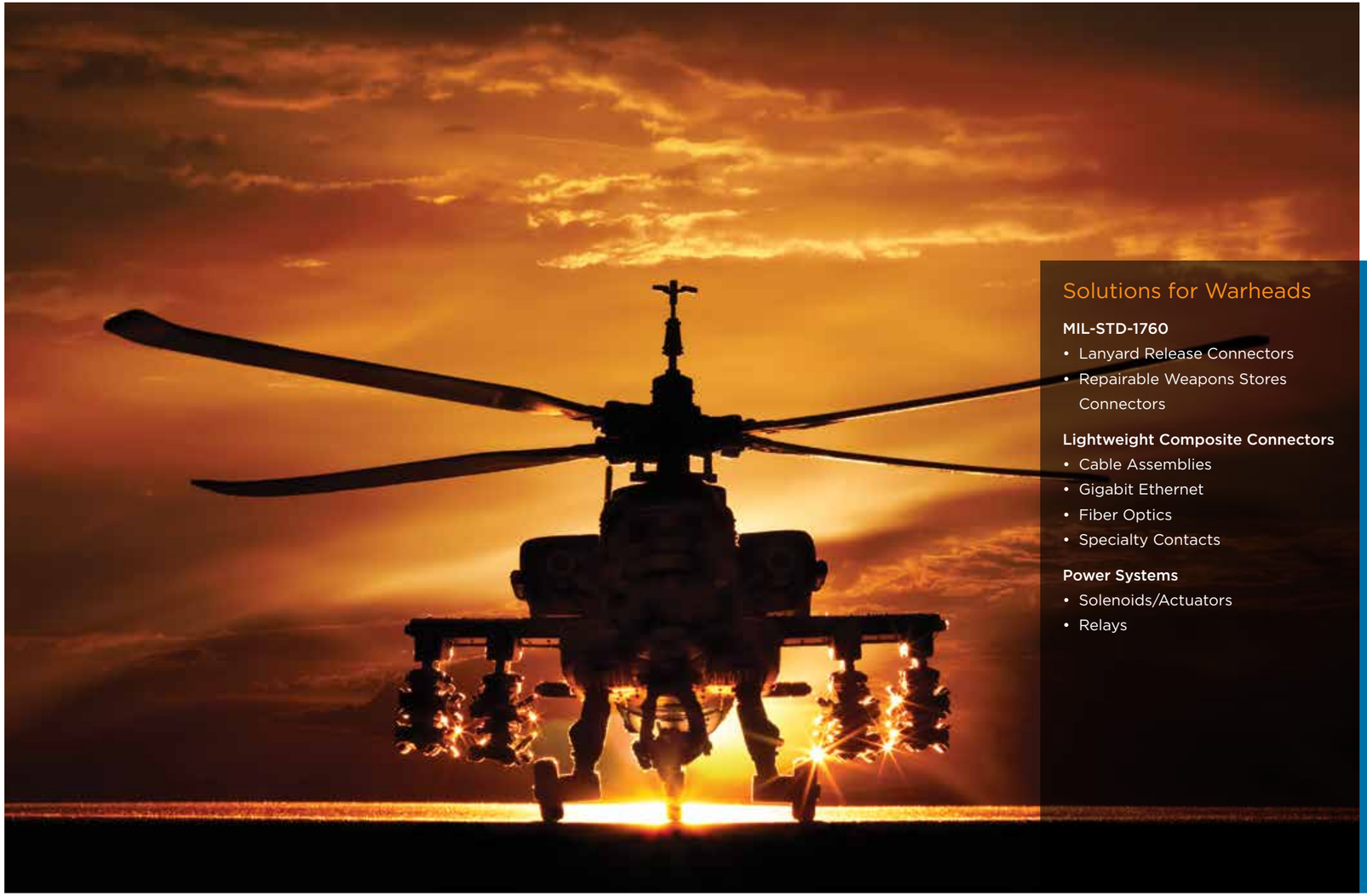
MISSION-CRITICAL RELIABILITY

Warheads/Weapons

MIL-STD-1760 defines the electrical characteristics of the signals at the interface, as well as the connector and pin assignments of all of the signals used in the interface. Our connectors are designed for quick and reliable release of the store from the aircraft.

Typical Applications

- Weapon Bays
- Missile launchers
- Pods
- Forward-Looking Infrared Systems
- Armament
- Fuzing



Solutions for Warheads

MIL-STD-1760
- Lanyard Release Connectors
- Repairable Weapons Stores Connectors

Lightweight Composite Connectors
- Cable Assemblies
- Gigabit Ethernet
- Fiber Optics
- Specialty Contacts

Power Systems
- Solenoids/Actuators
- Relays

DEUTSCH DBAS CONNECTORS
Extremely rugged and enduring temperatures to 200°C, DBAS series push-pull connectors offer easy, secure locking, with a unique feel-control check for 100% mating. They are available in environmentally or hermetically sealed, rack-mountable, and lanyard release versions

RELAYS
TE's low signal and mid-range electromechanical relays are rated from signal level up to 50 amps switching in a variety of package sizes, mounting configurations and termination options. Non-latching and latching designs available

DEUTSCH 1760 CONNECTORS
Supporting AEIS for MIL-STD-1760, Type 1 connectors feature tri-start and lanyard-release plugs for connection between aircraft and pylon. Type 2 connectors, for rail launch applications, include launcher receptacle, buffer, missile receptacle, and protective cap

CUSTOM SOLENOIDS
We custom-design linear-motion solenoids to withstand extreme temperatures, high altitudes, shock, acceleration, and vibration. With push, pull, or combination actuation, our solenoids service such applications as fuel and hydraulic systems

PRIMARY WIRE AND CABLE
Find the wire and cable you need from our wide selection of standard-wall designs and space- and weight-saving thin-wall designs. Cross-linked insulations and jackets meet a variety of temperature extremes and mechanical stresses

RUGGED SOLUTIONS TO WITHSTAND EXTREME TEMPERATURES AND VIBRATION

Engines

Powering a missile is hot and hazardous. Propulsion systems include rocket and jet engines, turbofans, and ramjets—sometimes with multiple engines for multistage missiles. Catapult systems or even an explosive charge are also employed.

Connecting In Extreme Environments

The engine system presents severe connectivity challenges to withstand the extreme temperatures, potential exposure to harsh chemicals, and the shock and vibration of an engine delivering thousands of pounds of thrust.

TE offers a range of connectors to meet the pyrotechnics needs of engines, with temperature ratings as high as 350°C and firewall capabilities to help isolate the engine section.

Typical Applications

- Surface to Air
- Cruise
- ICBM
- Anti-Ship
- Anti-Aircraft

Solutions for Propulsion

Connectors
- Pyrotechnic Connectors
- Power Connectors
- MIL-STD-1760 Connectors

Relays and Contacts
- Lightweight AC/DC Mid-Range Relays
- Power Distribution Units

Wire and Cable
- Power Cables
- Primary Wire and Cable

DEUTSCH D983 CONNECTORS
Our EN2997- and M83723-compatible connectors are designed for engines and boosters. Variations include shell-to-shell bottoming, anti-rotation, self-locking, 260°C continuous operating temperatures, 500-hour salt spray capability, and EN2591-318 flammability capability

DEUTSCH
These ultra-rugged connectors for copper and fiber optic cable are designed to withstand harsh environmental factors like extreme vibration and shock, and the high temperatures generated by ignition and propulsion

RELAYS AND CONTACTORS
With one of the largest QPL offerings, our relays and contactors provide switching power from signal level to hundreds of kilowatts. Our components maintain superior reliability in the smallest, lightest weight packages in the industry

DEUTSCH DTS-HC CONNECTORS
Ideally suited for high-power interconnections in harsh environments, the connector's power contacts are rated to 300 A. Based on military-standard 38999 housings, they provide the reliability and performance required for the most demanding aerospace applications

POWER CABLES
Our power cables' insulation and jackets provide performance advantages in difficult environments. Cables are available in single- and multi-conductor constructions offering size and weight savings, and resistance to abrasion and cut-through

MAKING IT ALL WORK TOGETHER FLAWLESSLY

Control Systems

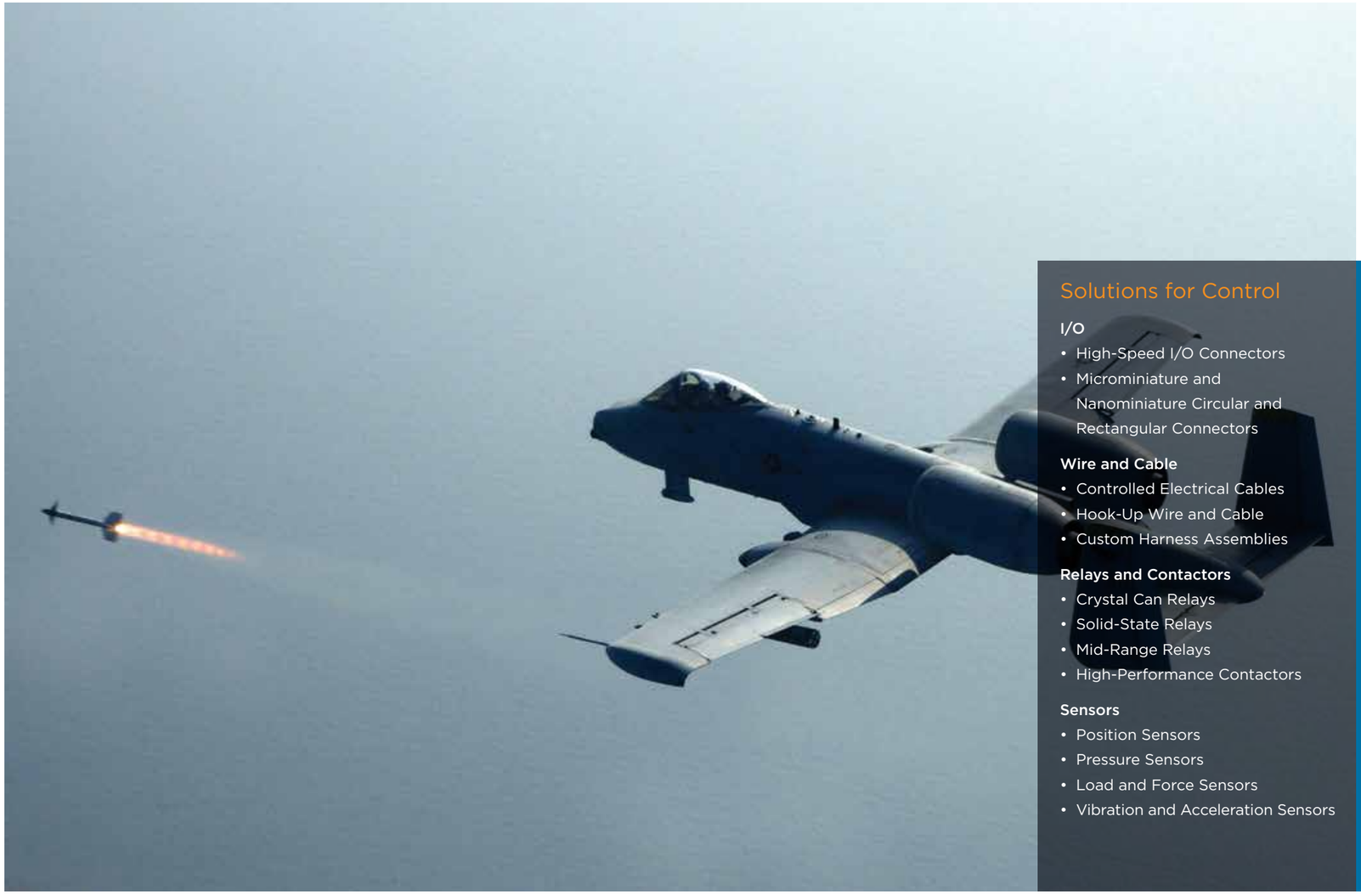
While the seeker/guidance section tracks the mission to target, the control system performs the basic function of keeping the missile on track. Flight controls must monitor airframe dynamics and adjust flight parameters.

Helping You Connect It All

Control systems deal with every section of the missile. They must be well protected against EMI, not only generated within the system but from external countermeasure sources. Increasingly, controls are distributed to bring intelligence closer to the sensors and actuators. Reliable, high-speed communications between various subsystems is critical.

Typical Applications

- Avionics
- Flight control
- Autopilot
- Actuators
- Airframe dynamics



Solutions for Control

I/O
- High-Speed I/O Connectors
- Microminiature and Nanominiature Circular and Rectangular Connectors

Wire and Cable
- Controlled Electrical Cables
- Hook-Up Wire and Cable
- Custom Harness Assemblies

Relays and Contactors
- Crystal Can Relays
- Solid-State Relays
- Mid-Range Relays
- High-Performance Contactors

Sensors
- Position Sensors
- Pressure Sensors
- Load and Force Sensors
- Vibration and Acceleration Sensors

SPEC 44 AND SPEC 55 CABLE
TE's military-qualified, high-performance primary wire and cable provide size and weight savings with outstanding chemical resistance. They also feature excellent flexibility, abrasion and cut-through resistance, and an extended temperature range from -65°C to +200°C

DEUTSCH DTS CONNECTORS
Our broad range of MIL-DTL-38999 and 38999-style connectors gives you more choice in shell sizes and materials, inserts for power, signal, and optical needs, filtering and EMI protection, hermetics and other special environmental sealing

HIGH-SPEED COPPER CABLE
Complex computing systems require high-speed cable solutions. TE offers a wide range of high-speed protocols including Ethernet, Fibre Channel, IEEE 1394, USB, ESATA, PCI express and DVI, all targeted to improve reliability while driving down size and weight

RUGGED OPTICS
Our expanded beam optics design incorporates a ball lens into a ruggedized connector with outstanding reliability and ease of maintainability. Add in an armored cable for the perfect optical assembly package

ENCLOSURES
TE's expertise in engineering resins, additive chemistry, EMI, and thermal materials allows strong, composite enclosures that reduce weight (up to 40% over aluminum), improve functionality, and provide a cost effective replacement for aluminum

END-TO-END CONNECTIVITY FROM LAUNCH TO TARGET

Launchers

Launchers include shoulder-fired units handled by an individual soldier, vehicles mounting multiple missiles, weapons pods on an aircraft, and launch tubes on a submarine. While the launch system is not as bandwidth hungry as some other sections of a missile defense system, reliability and easy use in connecting to the missile are critical.

Launch systems must be able to monitor the missile's readiness, communicate with local and remote command and control networks, and launch the missile. Breakaway lanyard connectors, which release automatically, provide the connection between launcher and missile.

Typical Applications

- Shoulder launch
- Air launch
- Sea launch
- Ground launch

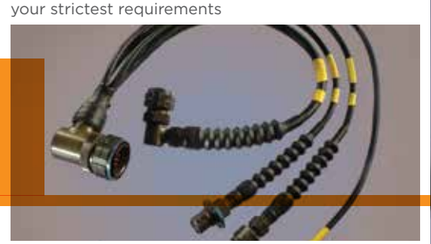
Solutions for Launchers

MIL-STD-1760
- Lanyard Release Connectors
- Fiber Optics
- Gigabit Ethernet

Control Box Units
- Board Level Interconnect
- Wire and Cable
- Mil Spec Connectors
- Fiber Optics

Assemblies
- Sealed Harnesses
- 1760 Specialty
- Ruggedized
- RF

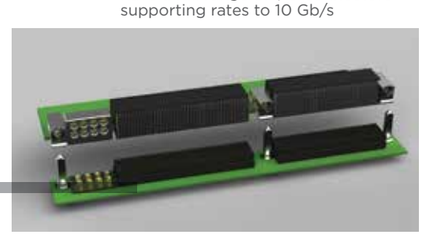
CUSTOM HARNESSES
Design engineered from the beginning to meet application hazards, the harnesses are small, lightweight, rugged, and environmentally sealed. Each design is application specific and tailored to meet your strictest requirements



HARNESSING PRODUCTS
Our harnessing products are designed as system solutions for a variety of mechanical and environmental needs. From heat-shrink tubing and lightweight molded parts to backshells for EMI protection and strain relief, our products are application matched to specific needs

SENSORS
Our growing line of sensors provides high-accuracy monitoring of position, pressure, load, force, vibration, acceleration, and other conditions. We can match the best sensing technology with rugged packages sealed from harsh environments

BOARD-LEVEL INTERCONNECTS
TE's board-level interconnects give high performance in harsh applications—with higher connector densities and support for RF and optical backplane interconnects. For compact, high-speed box-to-box connectivity, we have a full range of I/O connectors supporting rates to 10 Gb/s



CABLE ASSEMBLIES
We can provide factory-tested assemblies to meet your requirements for connector and cable types and environmental protection and to satisfy the speed and distance needs for common protocols

For More Information

TE Technical Support Center

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Hungary	+36 809 874 04
Italy	+39 011 401 2632
Nordic	+46 8 5072 5000
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Switzerland	+41 52 633 66 26
United Kingdom	+44 800 267 666

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INTELLIGENT FLIGHT AND PRECISION TARGETING WITH INTERCONNECTIONS THAT ARE SMALLER, LIGHTER, AND FASTER

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