



# Unmanned Vehicles

Rugged Reliability

Advanced Systems and Components  
for Lighter, Tougher, More Capable  
Unmanned Vehicles

# Land, Sea, or Air . . .

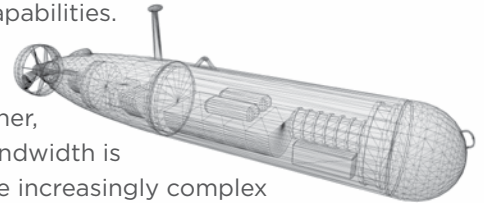
End-To-End Connectivity Solutions That Reduce Weight, Save Space, and Boost Capability

## Doing More with Less

Unmanned vehicles have become an important mainstay in modern battle spaces, and next-generation systems will continue to be required to do more with less size, weight, and power consumption (SWaP). Reducing SWaP is vital to longer mission deployments, greater fuel efficiency, and the ability to add additional surveillance and combat capabilities.

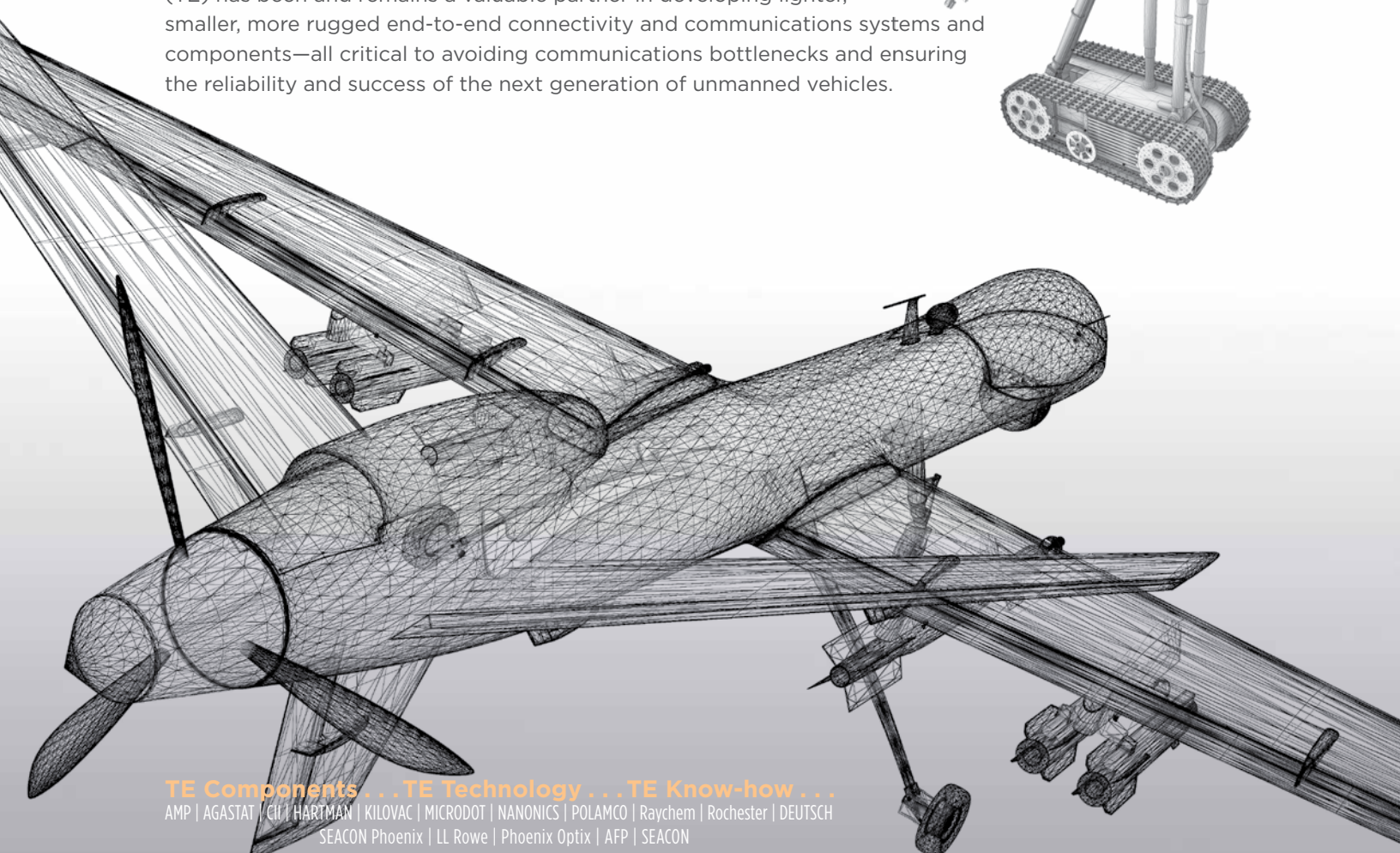
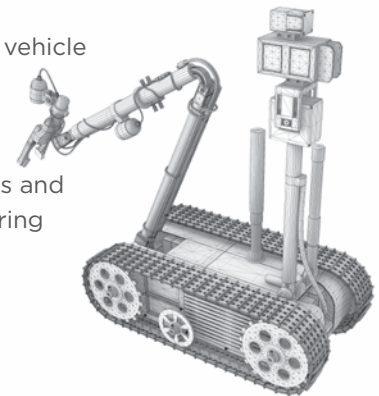
## SWaP

Lower component weight and size is important in taking missions further, faster, and to manage more complex payloads along the way. More bandwidth is required from these smaller, lighter components and systems to handle increasingly complex high-speed communications requirements and the need for greater functionality. And whether smaller or lighter, or both, all elements of unmanned vehicles need to be rugged enough to handle the rigors of battle.



## Increasing Performance on Land, Sea, and Air

Unmanned aerial vehicles (UAVs), ground vehicles (UGVs), and underwater vehicle (UUVs) have different performance needs to meet specific mission requirements and withstand various harsh environments. TE Connectivity (TE) has been and remains a valuable partner in developing lighter, smaller, more rugged end-to-end connectivity and communications systems and components—all critical to avoiding communications bottlenecks and ensuring the reliability and success of the next generation of unmanned vehicles.



**TE Components . . . TE Technology . . . TE Know-how . . .**

AMP | AGASTAT | CUI | HARTMAN | KILOVAC | MICRODOT | NANONICS | POLAMCO | Raychem | Rochester | DEUTSCH  
SEACON Phoenix | LL Rowe | Phoenix Optix | AFP | SEACON

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



INTEGRATED SOLUTIONS



Composite Enclosures

**Weight-Saving Rugged Performance**

- Up to 50% lighter than aluminum
- Extremely rugged and corrosion resistant
- Highly customizable with integrated wire traces, antennas, and connectors

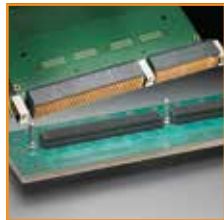


Antennas

**Low-Profile, Form-Fitting Conformal Designs**

- Multiband and wideband antennas and arrays
- Rugged embedded antennas in engineered composite enclosures
- Customized designs with integrated RF and DC traces, cables, and connectors

CONNECTORS



MULTIGIG RT 2-R Connectors (VITA 46 VPX)

**High Speed**

- Data rates up to 10 Gb/s

**High-Density Modular Design**

- Up to 56 high-speed lines per cm of board space
- Configurable for differential, single-ended, RF, optical, and power

**Ultra-Rugged Modular Design**

- Meets VITA 72 testing



RF Modules (VITA 67)

**High Performance**

- 4 or 8 SMPM contacts
- High channel-to-channel isolation
- Float-mounted jack maintains positive RF ground

**Easy to Use**

- Blind mate



Fortis Zd Connectors

**High Speed**

- 12+ Gb/s data rates

**Rugged**

- Extreme mechanical and electrical performance

**Versatile Application**

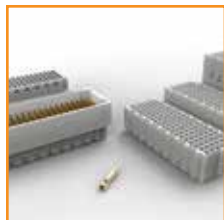
- Modular, with plastic, shielded, and machined metal shells



DEUTSCH DTS 38999 Connectors

**Reliable**

- Withstands severe vibration, corrosive, and high-temperature environments
- Overtravel system
- Anti-fire locking system
- Wide choices in shell sizes, materials, inserts, filtering and EMI protection, and environmental sealing



Mezalok Mezzanine Connectors (VITA 61)

**Compatible**

- 114-position, compatible with XMC footprint
- 60-position, half-size versions

**Reliable**

- Mini-box contacts provide 4 points of contact
- LCP plastic housings for excellent thermal stability



CeeLok FAS-X Connectors

**High Speed**

- Supports 10G Ethernet and beyond
- One or four 10G Ethernet channels in Size 11 or 25 shells

**Compatible**

- AS39029 contacts
- Fast field termination and repair, using standard tools
- Available with aluminum or composite shells



DEUTSCH Wildcat 38999 Connectors

**High Density**

- Nearly double the density of equivalent 38999 Series III connectors
- Four housing sizes, 11 to 64 contacts

**Reliability**

- Robust, triple-start threaded coupling
- Extreme temperature, vibration, and corrosion resistance



DEUTSCH Wildcat Micro Connectors

**For Size- and Weight-Critical Applications**

- 3, 5, or 9 contacts in two shell sizes
- Lightweight aluminum shells
- Bayonet or threaded coupling

**Rugged**

- Environmentally sealed with rear-removable contacts
- Cable EMI shield and boot termination



CONNECTORS



**DEUTSCH Stores Interface Connectors**

**Dependable**

- Connector systems enable a high-reliability interface with mission stores equipment

**Versatile**

- Meets MIL-STD-1760 and MIL-DTL-38999 standards
- Type 1 available in aluminum and composite versions for drop launch



**CeeLok FAS-T Nano Connectors**

**Extreme Space and Weight Savings**

- .30" diameter
- Push-pull or threaded coupling

**Fast**

- 10G Ethernet-capable 8-position connector
- Improved signal integrity: innovative T-shaped contact pattern reduces crosstalk



**DEUTSCH DBAS Series Connectors**

**High Reliability**

- Easy and secure locking with a circular push/pull coupling ring for 100% mating
- Rated from -55°C to +200°C

**Versatile**

- Hermetic, rackable, lanyard, EMI shielded, dead-face, cryogenic, and custom configurations



**Nanominiature Connectors**

**Extreme Weight and Space Savings**

- Rectangular, coax, and sealed circular configurations

**Robust**

- Excellent shock and vibration resistance
- Wide temperature range (-200°C to +200°C)



**POLAMCO Rugged COTS Connectors**

**Versatile**

- RJ45 Cat 6A, up to 10 Gb/s
- USB 2.0, A, B, and Mini styles

**Rugged**

- IP68 sealing
- 360° EMI and mechanical protection
- Aluminum, marine bronze, stainless steel, titanium, or composite shells



**DEUTSCH EMI Filter Connectors**

**Smaller, Lighter**

- Save space, weight, and system cost

**More Options**

- Filter options range from a few kilohertz to several gigahertz
- Custom filtered boxes available
- EMI filtering and transient protection



**Micro D Connectors**

**Space and Weight Savings**

- High-density microminiature connector
- Aluminum shells plated in nickel or cadmium

**Flexible**

- Available prewired or with separate crimp contacts for customization

WIRE AND CABLE



**High-Speed Copper Cable**

**Rugged Choices**

- Material choices to match application requirements
- Shielded and unshielded
- Low-smoke, zero-halogen versions for increased safety

**High-Speed Protocols**

- Configurations to support various Ethernet, Quadrx, IEEE 1394, USB, etc.



**Cheminax Series Raychem Coaxial Cable**

**High Performance**

- Lightweight, small size, highly flexible
- Low capacitance and attenuation
- High velocity of propagation

**Adaptable**

- Suitable for demanding video and RF applications



WIRE AND CABLE



**SPEC 55 Series  
Raychem Wire and Cable**

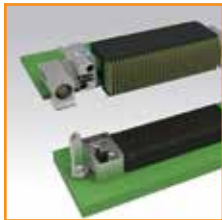
- Versatile**
- Wide range of conductor materials, platings, and sizes
  - Variety of shielding options
- High Temperature**
- -55°C to +200°C



**Raychem SHF-60 Power Cable**

- Extremely Flexible**
- High flex 6x bend radius
  - Tight routing bends without jacket wrinkling or cracking
- High Temperature**
- +260°C
- Robust**
- Chemical and fluid resistance
  - Corona and arc track resistant

RUGGED FIBER OPTICS



**Fiber-Optic Modules (VITA 66)**

- Full Range of Choices**
- ARINC 801, expanded beam, or MT termini
  - MT ferrule: extreme density with up to 48 fibers/module
  - ARINC 801: excellent single-mode performance
  - Expanded beam: noncontacting interface for frequent matings/unmatings



**PRO BEAM Expanded-Beam Connectors**

- Robust**
- Physically noncontacting mating of single-mode and multimode fibers
- Versatile**
- Three sizes: Senior, Junior, and Mini
  - Size 16 termini also available



**DEUTSCH MC Series Physical Contact Connectors**

- Sustained High Performance**
- Helps withstand a wide range of environmental conditions
  - Compact 1.25-mm precision zirconia ceramic ferrules
  - Extensive range with dimple termination process and tooling



**AFP SuperChassis Platform**

- Modular**
- 2U chassis with 20 powered slots
  - 5 and 10-slot options available
- Flexible Choice of Modules**
- 3G, HD-SDI, and HDMI video
  - Gigabit Ethernet
  - CWDM multiplexing
  - Single mode-to-multimode wavelength conversion



**AFP SuperDrum Integrated Reel**

- Capable**
- Integrated cable, connectors, and active electronics
  - Modular: uses SuperChassis active modules
- Convenient**
- Quick deployment
  - Expanded beam connectors standard



**AFP SuperBullet Media Converter**

- Convenient**
- Expanded beam connector interface
  - RJ45 port
  - Locally powered over Ethernet
  - Up to 5 km standard transmission distance
- Rugged and Compact**
- Lightweight, heavy gauge aluminum housing
  - IP67 rated



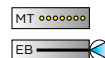
**AFP MCUBE Transceiver**

- High Performance**
- Performance to 3 Gb/s
- Space-Saving Size**
- Miniature cube
  - Horizontal or vertical mount
- Versatile Options**
- Fabry-Perot lasers for discrete single channel per fiber
  - Distributed feedback CWDM lasers for multiplexing up to 18 channels per fiber



**HDLT Connectors**

- High-Density Lensed Termini**
- Uses standard Quadrax contact geometry and shell inserts
  - 12 or 24 fibers in a size 8 cavity
  - Lens protection for each fiber
  - Up to 8 termini or 192 fibers per connector
  - TE ribbonized discrete cable for full degrees of freedom
  - Flexibility for easier routing





HARNESSES



Raychem Sealed Harnesses

**Lightweight and Tough**

- Small, lightweight, rugged, and environmentally sealed

**Customized**

- Designs are customer specific, tailored to help meet your strictest requirements

**NBCC Compliant Versions**

- Withstands repeated decontamination with nuclear, biological, and chemical cleaning agents



RF Connectors, Cable, and Cable Assemblies

**More Choice, More Performance**

- Standard, subminiature, and microminiature interfaces and frequencies
- Flexible and semi-rigid cable
- Qualified to MIL-PRF-39012, MIL-DTL-83517, MIL-PRF-55339



POLAMCO Backshells

**Full Range**

- Unshielded, shielded, and rugged conduit systems
- Rectangular and circular configurations
- Straight, 45, or 90-degree options

**Rugged**

- Versions to match many harsh environments



HexaShield Series Raychem EMI Adapters

**High Performance**

- 360° shield termination system for shielded wires and cables
- Excellent mechanical and environmental resistance
- Efficient strain relief

**Versatile and Flexible**

- Aluminum, stainless steel, and composite versions available
- Simple installation and easy re-entry

RELAYS, CONTACTORS, SENSORS, AND POWER DISTRIBUTION



AC and DC Relays and Contactors

**More Choice**

- TE offers one of the largest QPL offerings in the industry
- Broad range of relays and contactors

**Capable**

- Switching power from signal level to hundreds of kilowatts
- Superior reliability
- Among the smallest, lightest weight packages in the industry



Sensors

**Rugged Reliability**

- Packaged to help withstand harsh environments
- High accuracy and high reliability sensing
- Options include wired or wireless high-speed telemetry and integration into value-added assemblies

**SWaP**

- Low weight
- Compact size
- Low power requirements



Power Distribution Units

**Smaller, Lighter**

- Optimize floor space weight savings over discrete installations

**Customized**

- Accommodate the bill of material and point-to-point layout the application requires
- Decades of experience designing custom panel assemblies



K Series Relays

**Smaller, Lighter**

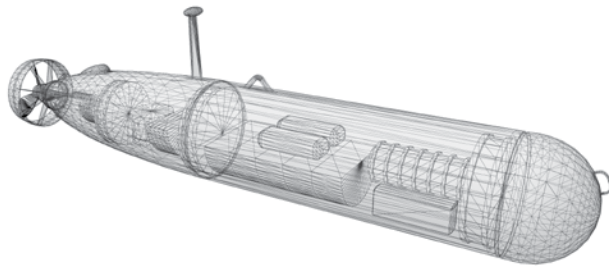
- Among the smallest, lightest contactors available
- Meet critical SWaP requirements

**Capable**

- Switching capabilities of up to 1000 A at 28 VDC



# Solutions for Underwater Applications



## SEACON OPTI-CON Connectors

### Optical and Hybrid Configurations

- 5 shell sizes
- Up to 20 contacts

### Capable

- Rated to 7500 psi
- Up to 4 A, 600 VDC



## SEACON MINI-CON Connectors

### Versatile

- 13 shell sizes
- Up to 203 contacts including coax

### Capable

- Rated to 16,000 psi
- Up to 23 A, 5000 VDC



## DEUTSCH MSD Connectors

### Rugged

- Withstand mechanical stresses and polluted environments
- Explosion proof
- Rated to 2030 psi

### Capable

- Quick connect/disconnect
- Size 12 contacts, 12 or 13 positions



## DEUTSCH 9316 Series Connectors

### Deepwater Capable

- 7500 meter depths

### Rugged

- Withstands mechanical stresses and polluted environments
- Explosion proof

### Flexible

- Signal, optical, control, and power



## LL Rowe and SEACON Proximity Switches

### Compact Modular Design

- Single-pole, double-throw magnetic switches

### Capable

- Hermetically sealed
- Pressure proof
- Rated to 10,000 psi



## SEACON Phoenix and LL Rowe Cable Assemblies

### Versatile

- Signal, optical, control, and power
- Customized for application requirements
- Pressure proof



## AFP Fiber Optic Penetrators

### Space Saving

- Up to 24 fibers
- Ultraminiature packaging 1.5 to 20 mm diameter

### Reliable

- Hermetic glass sealing technology
- Rated up to 20,000 psi



## Single-Fiber Hybrid Penetrator

### Cost Efficient

- Compact stainless steel design
- Three positions: two electrical and one fiber
- Single mode or multimode fiber

### Reliable

- 10,000 psi
- -10°C to +60°C operating temperature range

## LET'S CONNECT

We make it easy to connect with our experts and are ready to provide all the support you need. Just call your local support number or visit [www.te.com/industrial](http://www.te.com/industrial) to chat with a Product Information Specialist.

## Technical Support

[te.com/support-center](http://te.com/support-center)

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## Advanced Systems and Components for Lighter, Tougher, More Capable Unmanned Vehicles



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