



SOLUTIONS FOR URBAN AIR MOBILITY

HIGH-POWER, HIGH-VOLTAGE, HIGH-BANDWIDTH
INTERCONNECT TECHNOLOGIES FOR ELECTRIC VERTICAL
TAKEOFF AND LANDING AIRCRAFT (EVTOLS)

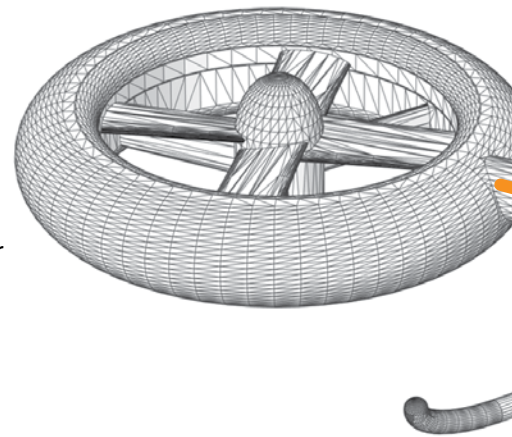


Yesterday's dreams of electric-powered air taxis and flying cars/personal air vehicles (PAVs) are turning into real Urban Air Mobility (UAM) projects. Hundreds of commercial-drone and electric-vertical-takeoff-and-landing aircraft (eVTOL) programs are driving advances in electric-propulsion motors, power distribution, positioning systems, telenetworking, and cockpit/mission systems. These opportunities are inspiring designers to explore components that can optimize size, weight, and power (SWaP) for line replaceable units (LRUs) in UAM innovations.

That's why TE Connectivity (TE) offers solutions to handle high voltages and high kW peak output. We also provide interconnect technologies to handle the low-voltage and high-bandwidth needs of mission systems and inflight entertainment (IFE), connectivity, and control applications.

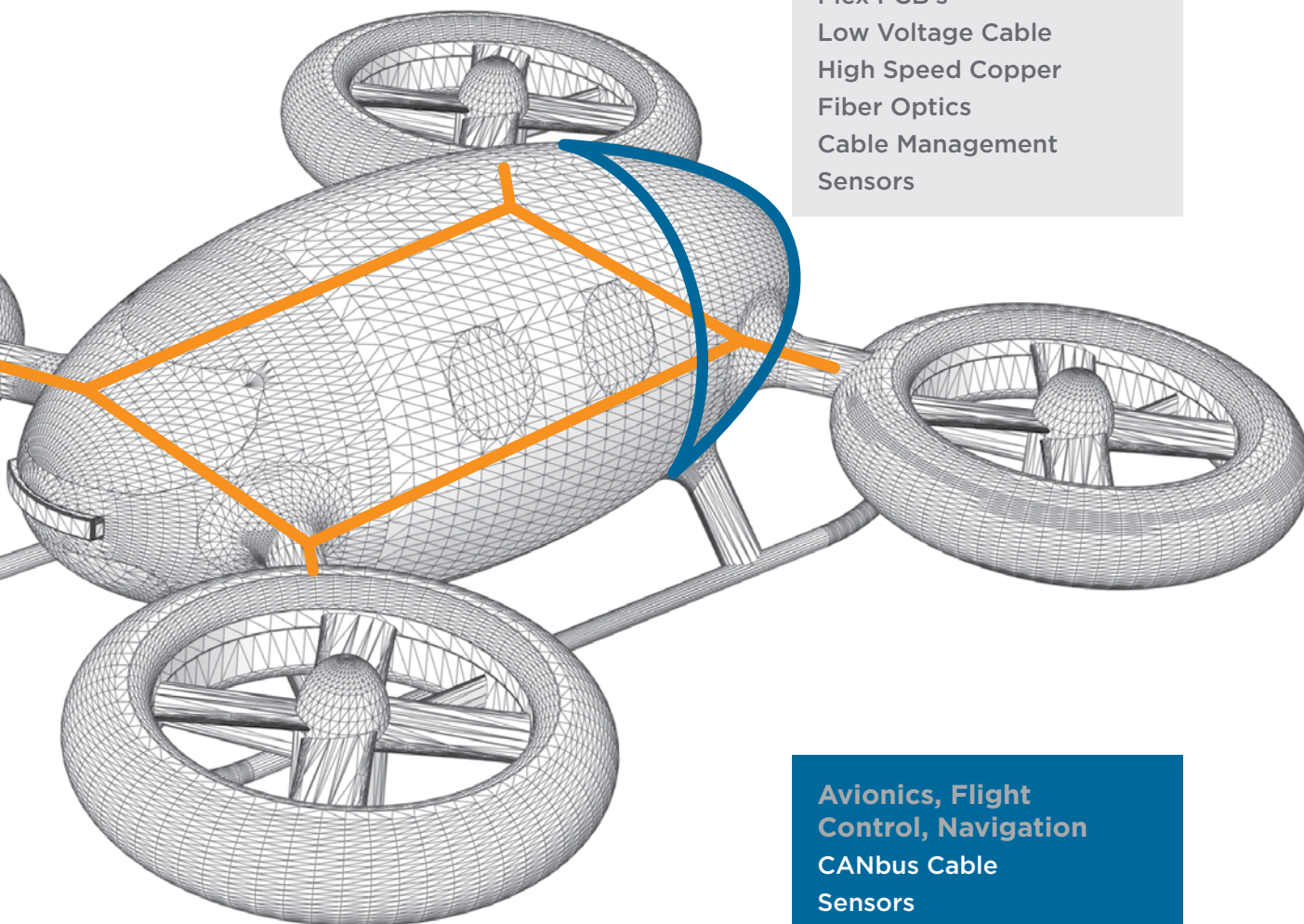
Moreover, TE designs and builds components and solutions for sophisticated avionics that provide higher bandwidth and high-speed connectivity for autonomous flight-control and navigation. Hardware components in the physical layer include fiber optics, CANbus (Controller Area Network) cables, single pair Ethernet products, and compact, high-performance board-level and I/O interconnects. For distributed architectures, Mini Modular Rack Principle (MiniMRP) modules provide increased computing power in 40 percent smaller package sizes for design flexibility. A wide range of sensors is also available for actuation, flight-control, and other critical functions.

Our broad portfolio helps designers meet critical SWaP (size, weight and power) challenges and project milestones to speed up development. With a heritage in automotive, aerospace, and energy sectors, TE works with industry standards groups—such as the Society of Automotive Engineers (SAE) and ARINC—to handle tomorrow's pressing challenges. TE experts are directly involved in Voice of Customer (VOC) initiatives to help designers “follow-the-wire” to select the appropriate solutions. Discover how our solutions can help your UAM innovations take flight.



Power and Power Distribution

- Power Switching
- High Voltage Cables
- Low Voltage Cables
- Power Connectors and Terminations
- Battery Relays
- Cable Management
- COPALUM Terminals



Infotainment and Cabin Interiors

MiniMRP Avionics Packaging
Rectangular Connectors
Flex PCB's
Low Voltage Cable
High Speed Copper
Fiber Optics
Cable Management
Sensors

Structures

EMI / Grounding Solutions
Flex PCB's
Low Voltage Cable
Circular Connectors
Cable Management
Sensors
Solenoids
Sealed Harnesses
Lightweight Power Connectors

Avionics, Flight Control, Navigation

CANbus Cable
Sensors
High Speed Copper
Low Voltage Cable
Interconnects
Cable Management
Board Components
Fiber Optics
MiniMRP Avionics Packaging

Power and Power Distribution

HIGH VOLTAGE RELAYS AND CONTACTORS

TE's high-performance relays are designed specifically to operate in extremely rigorous environments in military and aerospace applications.



Lightweight DC Contactors

- True flight rated contactors to 1,000 amps and 1,000Vdc for high reliability and ease of system certification
- Hermetically sealed package helps improve switching environment
- Long life dual coil electronic coil economizers



Mid-Range Relays

- Contact ratings from low level to 60 amps, 28Vdc or 115Vac/400Hz
- Wide temperature range from -70°C to +125°C
- Mil-spec qualifications in the industry for reliability and ease of certification



Lightweight 28 VDC Contactors

- Up to 1,000 amp contact rating for 28Vdc and 115Vac/400Hz
- Current sensing, remote power controller, RCCB, and smart contactor options
- Capability to design, qualify and manufacture complete power distribution assemblies

POWER INTERCONNECTS

TE offers one of the broadest range of high density power connectivity solutions for aircraft applications. With extra emphasis on reduced size and weight along with increased power the products listed in this brochure are particularly useful for use in Urban Air Mobility applications.



High Power Contacts

- Meets MIL-DTL 5015 and 38999
- 12 AWG - 000 AWG
- Up to 1000 amps per contact
- Gold or silver plating



COPALUM Terminals and Splices

- Industry leading design
- Terminates to copper or aluminum wire
- Options to seal to wire insulation
- Qualified for commercial aircraft



Snap-Lug Quick Disconnect Power Connectors

- Easy - quick mating
- Push-button locking/un-mating
- Up to 250 amps per pin
- Color coded



UMP Connectors

- Lightweight rectangular form
- Low force quick disconnect
- Power and signal options
- 14 AWG to 8 AWG



DMC-M Series Connectors

- Qualified to MIL Specs
- Quick-install & remove
- High density / space savings
- 24 - 12 AWG, Up to 1000V



DTS High Current Circular Connectors

- Up to 150 amps per contact
- Supports high vibrations
- Many power and signal configurations
- EMI filtered options

Power and Power Distribution

POWER INTERCONNECTS



ASHD Power Connectors

- Lightweight
- Bayonet positive locking
- IP67 sealed
- Optional signals



High Power Circular Connectors

- Rugged 38999 style shell
- Many backshell styles
- Sealing options
- Conductive jam nut option

HARNESSING AND CABLE MANAGEMENT

Whether your challenge is size, weight, extreme temperatures or harsh environments, TE's line of Raychem heat-shrinkable harness sealing components were developed for these wide range of applications.



High-Temperature Terminations

- Crimp (M81824) and controlled solder splices and shield terminations (M83519)
- Rated between +125°C to +260°C
- Heat-shrinkable insulation sleeve for sealing and strain relief



Heat Shrinkable Tubing

- With or without adhesive lining
- Wide range of sizes, shrink ratios, and environmental resistance



Soldered Contacts

- One step installation accelerates production while reducing handling cost
- The design is exceptionally suitable for high vibration environment and instrumentation application. Available for co-axial, twisted pair, tri-axial cables
- Rated up to +150°C



INSTALITE Boots

- 20-30% lighter than TE's -25 part
- INSTALITE boots available with Rayatan shielding provides light weight screening and enhanced performance
- Heat shrinkable cross-linked polymer provides abrasion resistance and resists most common military fuels, oils and greases
- Rayatan INSTALITE versions provide light weight screening capability of 70 db of attenuation up to 1 Ghz



Harnessing Components

- Complete product suites matched to application needs
- Tubing, molded parts, adhesives, backshells, and insulation/jacketing materials
- Flame-retarded, flame-resistant, and LSZH solutions
- Thin-wall insulation and composite material



P-Clamps

- Separate mounting and latching features allow for quick and tool-less harness installation
- High strength composite material offers weight savings while maintaining structural integrity
- Simple and tool free latching creates a comfortable working environment for operators
- Visit www.te.com/p-clamp for more information



Cable Management

- Remove tools from the bracket and harness installation process
- Rapid curing adhesive process for attachment to composite structures
- Composite brackets optimized for highest performance at the lowest weight
- Custom and low volume production parts made possible with no tooling costs

Power and Power Distribution

POWER FEEDER CABLES

TE's line of Raychem flexible power feeders are designed to be routed in tight spaces. Serving a diverse number of applications, TE's range of power feeders maybe customized to fit your Urban Air Mobility application.



SHF-260 Power Cable

- Operating temperature range: -65° to +260°C (10k hours)
- Single and dual wall constructions available
- Conductors available in nickel coated copper



SPEC 80 Power Cable

- Operating temperature range: -65° to +200°C
- Single and dual wall constructions
- Highly stranded specialised conductor and insulation materials give greatly improved flexibility



SPEC 55 Signal and Power Radiation XL-ETFE Wire

- Excellent abrasion and cut-through resistance
- Excellent flexibility
- Operating temperature range: -65° to +200°C
- Voltage rating: 600 and 1000 V available
- Available in single and dual wall constructions
- Conductors available in tin, silver and nickel coated copper and silver-coated high-strength copper alloy
- Gauge availability: 30 to 4/0 AWG

Avionics, Flight Control, Navigation

HIGH SPEED COPPER CABLES

Raychem offers a diverse portfolio of high speed copper cables to support the various data standards used in the air mobility vehicle market. Easier to process than competitive tape-wrapped designs, these cables may also be customized to fit your architectural needs. Compatible with a suite of TE contacts & connectors, we are able to offer an end to end solution.



CANbus Cable

- 120 ohm twisted pair cables available in 22-26 AWG
- Speeds up to 100 Mb/s
- Compatible with 38999 22D contacts (22-24 AWG)
- Temperature range: -65°C to 200°C (depending on materials)



Quadrax

- 2 pair ethernet available in 24 and 26 AWG
- Speeds up to 100 Mb/s
- Compatible with 38999 22D contacts (22-24 AWG)
- Temperature range: -65°C to 200°C (depending on materials)



Cat 5e

- 4 pair ethernet available in 24 AWG
- Speeds up to 1 Gb/s
- Compatible with CeeLok FAS-T and FAS-X connectors
- Temperature range: -65°C to 200°C (depending on materials)



Cat 6a

- 4 pair ethernet available in 24 AWG and 26 AWG
- Speeds up to 10 Gb/s
- Compatible with CeeLok FAS-T and FAS-X connectors
- Temperature range: -65°C to 200°C (depending on materials)

Avionics, Flight Control, Navigation

HIGH SPEED COPPER CABLES



Mini-ETH (TwinAx) Cable

- Single pair ethernet in 24 AWG & 26 AWG
- Speeds up to 100 Mb/s
- Compatible with Mini-ETH 369 connector
- Temperature range: -65°C to 200°C (depending on materials)



RF Cheminax Cable

- Controlled Impedance cables that are 25%-40% smaller & lighter than Mil-C-17 RG cables
- Impedance Range: 50 Ω - 125 Ω
- Available conductor range: 12AWG - 30 AWG
- Temperature range: -65°C to 200°C (depending on materials)

INTERCONNECTS

Today's sophisticated networks require avionics with the bandwidth to ensure monitoring and control of all flight systems—while offering the size and weight reductions needed to increase efficiency.



MULTIGIG RT Connectors

- Supports increased bandwidth up to 25+ Gb/s
- Contact utilizes quad redundant contacts for optimum performance in shock and vibration
- Backwards compatible with legacy VPX products



DMC-M Series Multicavity EN4165 Connectors

- High-speed ethernet modules that are easily replaced for fast configurations
- 36 keying possibilities
- Environmentally sealed, vibration resistant



369 Series Shielded

- Compact design, lightweight small form factor design
- Tight mounting pitch of multiple connectors
- Meets ARINC 854 ethernet over single twisted pair (100Base-T1)



High Speed I/O Connectors

- Our high-reliability, high-performance connectivity solutions support VITA standards, VPX protocols, Embedded Computing, and wired connections for various protocols up to 10 GB/s



RF Coax Connectors

- Tight-tolerance electrical characteristics, small sizes, and rugged yet lighter weight materials, our RF and coax connectors - which include SMP, SMA, BNC, and TNC products - support frequencies to Ka bands and above, with the versatility needed in high-density packaging



One-Step BNC/TNC Connectors for Coaxial Cable

- Easy and quick heat shrinkable installation
- Excellent cable retention force to withstand high vibration ensures long term reliability
- Meets performance requirement of MIL-C-39012 up to 2.8GHz

ACTIVE FIBER OPTICS

Rugged and small form factor transceiver solutions enable the transition for copper harnesses to light smaller fiber optic cables.



Actives

- High speed 10+ Gbps links leveraging FO EMI immunity weight reduction over copper.
- Low power consumption
- Compatible with many avionic databus protocols
- Accommodate 10G ethernet — with the capacity to handle next-generation 40G and 100G when needed — without the severe distance limitations of copper cable.
- Easy to maintain in the field, and reliable when operating in harsh environments, our optical products offer significant size and weight savings

Avionics, Flight Control, Navigation

SENSORS

TE's broad portfolio of sensor technologies is designed for a wide range of mission critical applications in aerospace industries. By leveraging our core competencies in high reliability sensors for harsh environments such as temperature, RFI, EMI, vibration, and lightning.



KMA36 Magnetic Encoder IC

- Small TSSOP package
- Digital output
- I²C interface
- High Resolution up to 0.01°
- Rotational or linear measurement mode
- AMR Technology



SMD NTC Thermistor

- 2.0 to 200K Ohms resistance @ +25°C
- 0402, 0603, 0805 package sizes
- Tape and reel packaging
- Low cost
- Temperature range -40°C to +125°C
- RoHS compliant



MS5840 Altimeter Module

- 10 - 1100 mbar absolute pressure range
- 6 coefficients for software compensation stored on-chip
- Piezoresistive silicon micromachined sensor
- Integrated miniature pressure sensor 6.2 x 6.4 mm
- 16 Bit ADC
- Low voltage and low power consumption



MS4525DO Digital Pressure Sensor

- PCB mounted digital output transducer
- Combination temperature and pressure
- I²C or SPI protocol
- Differential, gage, absolute, compound, & vacuum
- Temperature compensated
- Air-speed measurement

VALUE-ADD

Selecting from TE's systems of components, designed specifically to meet environmental and application requirements, engineers can quickly and confidently design and implement interconnect solutions.



Fiber Optic Cable Assemblies

- When it comes to capacity and throughput, no other physical media can come close to matching fiber optics. Whether it's a component, system, or a network, TE can help you deliver more bandwidth with our fiber optics solutions and products



MiniMRP

- Increased computing power
- Small form factor devices enables distributed systems
- Distributed avionics for flexible design in a smaller, lighter package



M2M Antenna with MiMo Cellular / LTE Antenna Function

- Machine-to-Machine (M2M) MiMo LTE antennas have been designed to provide MiMo Cellular/LTE antenna function for Internet of Things (IOT) and M2M applications.
- Our M2M antenna range features a compact, robust, low-profile weatherproof housing that's perfect for a variety of applications.



Mini-ETH

- Mini-ETH system consists of a range of TE products including: 369 Shielded, DMC-M Connectors, Cheminax twinax high speed copper cables and end-to-end ethernet assemblies
- Faster installation time
- Increased speed - qualified on 100 Mb/s