



REACH FOR THE SKY

URBAN AIR MOBILITY



THE FUTURE OF FLIGHT IS ELECTRIC AND CONNECTED.

These advanced aircraft will likely require highly navigable vertical take-off and landing capabilities to make them suitable for use in urban environments.

When proof-of-concept becomes a reality, it will be possible to commute short distances safely and efficiently by air in towns and cities, reducing pollution and traffic on congested roads.

THE NEED FOR SYSTEM INNOVATION

But the development of electric air vehicles will require a fundamental rethink of many vital systems and components to ensure that performance and safety standards can be met. Connectors, for example, will play a critical role in delivering power, data and signals on board any Urban Air Mobility (UAM) platform. While current commercial aerospace connectors meet the stringent protocols for the commercial and defense aerospace market, UAM electric aerospace applications will place some unique design demands on flight-qualified connectors, requiring engineers to think creatively and collaboratively to come up with new or modified existing designs.

The challenges focus on several key areas:

POWER MANAGEMENT:

Transferring power from the batteries to avionics and other electrical systems on eVTOL will require higher power – resulting in a need for connectors with high power contact systems. Connectors will increasingly be required to carry higher voltages and currents of up to 1000A, often developed to a bespoke design. However, while customization of higher-power connector systems will be required, eVTOL operators are still likely to demand solutions with some level of product maturity and serviceability to deliver operational flexibility.

DATA MANAGEMENT:

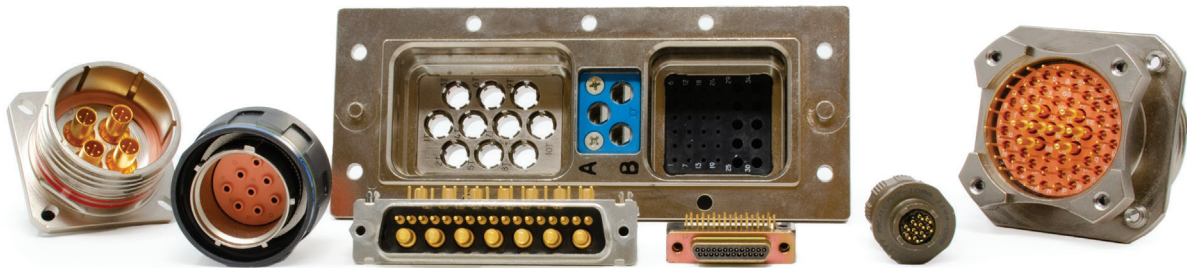
Modern commercial airlines create and manage enormous amounts of data each flight – underpinning safety and delivering more sophisticated infotainment. The UAM sector will likely feature a high level of autonomy, driving an even greater need for data management systems to ensure situational awareness and ground-to-air communication. These architectures will require embedded computing systems with fiber optic termini and Ethernet cabling systems designed to cope with the harshest environments.

LIGHTWEIGHT AND SIZE:

Electric propulsion means eVTOLs will always require onboard batteries and will not get lighter by burning fuel. Weight savings will therefore be sought on all other systems and components. Connector designers will be increasingly expected to deploy light yet strong composite materials such as polyetheretherketone (PEEK), while also introducing higher conductivity metals and custom alloys. New materials also need to be combined with compact design, while at the same time taking account of ease of termination and coupling for field reparability.

GROUND CHARGING:

Electric eVTOLs will also need to be recharged quickly and efficiently on the ground. Therefore, companies like ITT Cannon with EV connector expertise will have to work closely with cable specialists to deploy higher power, robust liquid-cooled charging systems – with dielectric cooling liquid which can offer outstanding heat dissipation. These systems will need a highly efficient contact system and optimized cable design to make them ergonomic, light and easy to use.




THE POWER OF PARTNERSHIP

As we can see, the adoption of eVTOL in urban air mobility is likely to drive rapid innovation in connector technology, and aerospace companies are looking to work with knowledgeable partners. Since the inception of connectors into the defense and commercial aerospace market, ITT Cannon has a long and distinguished history of providing connector and integrated interconnect systems for mission-critical, harsh environments, with ruggedized products for charging systems, battery and power management, airframe, cockpit avionics and passenger experiences.

Together, in collaboration, we can create the building blocks for the future of flight.

Several leading aerospace companies worldwide are in proof-of-concept development for Electric Powered Vertical Takeoff & Landing (eVTOL) solutions to support the growing intelligent urban air mobility (UAM) market.

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