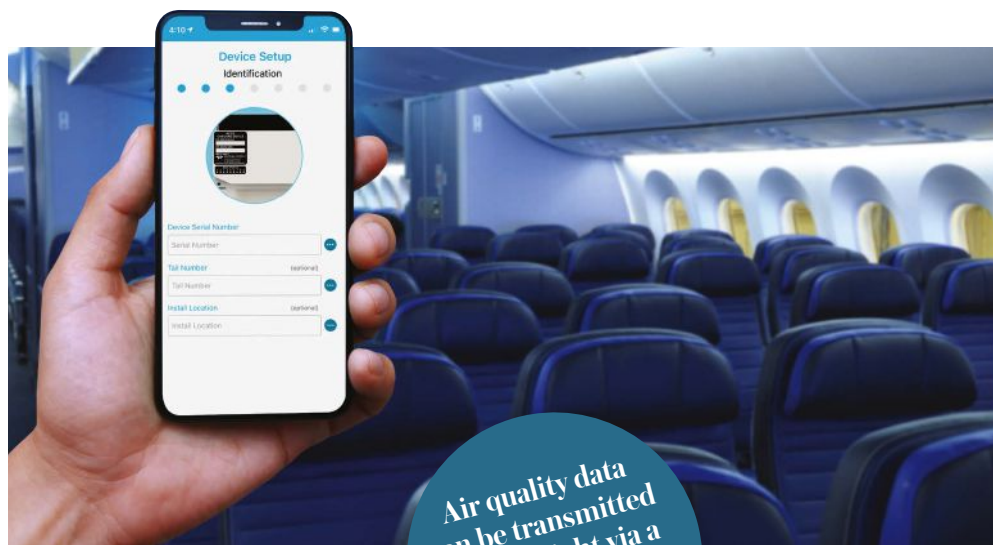# CABIN ENVIRONMENT SENSOR

Teledyne's ACES (Aircraft Cabin Environment Sensor) is the
first FAA-certified solution to solve the problem of monitoring
air quality in the cabin and flight deck

*A*ir quality on commercial aircraft has become a topic of considerable discussion. As the volume of flights has grown over the years, so too have the number of aircraft cabin environmental quality incidents reported. These incidents include reports of fumes, smells, smoke, mist, haze, ingested contaminants, pressurisation problems, or other factors that affect the overall environmental quality of the cabin. Most aircraft today do not have equipment installed onboard that can automatically and comprehensively monitor air quality in the cabin and flight deck. When an air quality incident arises, understanding what happened is largely based on human perceptions, not objective data.

Teledyne's ACES (Aircraft Cabin Environment Sensor) is the first FAA-certified solution to solve this problem. The technology is the direct result of feedback from multiple airlines about challenges related to cabin air quality and their desire to comprehensively monitor it. The solution, which was specifically designed for the aviation market, leverages extensive air quality expertise within Teledyne Technologies Incorporated, combined with Teledyne Controls' core expertise in data acquisition, wireless transfer and analysis.

The ACES solution includes onboard devices that are installed in the cabin and flight deck, which continuously sense and monitor the air quality in the airplane as soon as it is powered. Those devices employ laboratory-grade sensors that record key environmental parameters, including data on airborne particulates from 0.3 to 10 microns in size, carbon dioxide, carbon monoxide, ozone, volatile organic compounds and several other parameters. For example, many aircraft

have ozone converters, and ozone has been known to be a source of concern. By measuring ozone levels, operators can monitor the performance of those systems. Another example is the verification of cabin cleanliness. The recording of particulate and volatile organic compound data can help ensure the effectiveness of the aircraft's HEPA filters.

The way it works is that the data recorded by the ACES onboard units is automatically transmitted to the ACES cloud service portal for immediate processing and analysis. The transfer happens seamlessly and securely upon landing, via the units' built-in wireless modules, without relying on any other aircraft connectivity systems. With an available Wireless Access Point and air-to-ground connectivity, the data can be

Air quality data can be transmitted during flight via a WAP and broadband connectivity

DATA RECORDED BY THE ACES ONBOARD UNITS (BELOW LEFT) IS AUTOMATICALLY TRANSMITTED TO THE ACES CLOUD SERVICE PORTAL

transmitted continuously during flight. If an operator desires to view the data in flight on an EFB, that can also be accomplished.

By gaining access to comprehensive and accurate data for every flight, aircraft operators can reliably and continuously verify the air quality in the cabin. If an air quality event occurs, instead of making assumptions based on human perceptions, they have objective data at their disposal to troubleshoot and diagnose the issue, make an informed decision on the proper remedy, and validate the corrective action. Finally, by monitoring trends on specific aircraft, they can also identify and address potential emerging issues to help prevent future incidents, which results in more efficient operations and a better flying experience for passengers and crew. ⊗

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