

Aircraft Component Testing

Subjecting a complete aircraft or its components (such as wings, engines, or electronics systems) to simulated or actual flight conditions in order to measure and record physical quantities that indicate operating characteristics is essential to the design, development, and acceptance of any new aircraft.

Testing of aircraft and their components verifies the theoretical design, obtains empirical data where adequate theories do not exist, develops maximum flight performance, demonstrates flight safety, and proves compliance with performance requirements. Testing programs and systems enhance the evaluation of new design theory; progress through extensive tests of components, subsystems, and subsystem assemblies in controlled environments; and culminate with aircraft tests in actual operational conditions.

A large company with many testing and simulation facilities around the world tests aircraft wing components. Their need was to gather temperature and vibration measurements accurately in the difficult test environment. They needed accuracy, the ability to mount the acquisition devices as close as possible to the test sensor, excellent signal stability and Modbus communications for their control and data acquisition system.

They selected the e.bloxx A4TC. The environmental specifications of the A4TC are robust enough to mount it as close as desired to the unit under test. The A4TC is available as a 4 or 16 channel device. The 16 channel device saves space, it is physically 4 of the single channel devices in one housing. Each input is configurable for temperature or millivolts. Up to 32 channels may be monitored without the use of a repeater or other "master" device. The A4TC provides accuracy of 0.01% at 100 samples per second with a repeatability of 0.003%. The A4TC features galvanic isolation between the input, power and communications. The A4TC also features Modbus RTU protocol with available baud rates from 19.2 to 115.2 kBaud. The A4TC provides the accuracy, mounting, environmental specifications and the stability to provide credible data in all aircraft component testing required. The result is a well designed, safe aircraft.



The e.bloxx A4TC fit their needs. Modern testing needs guided the design of the A4TC and other e.bloxx modules. They provide precise high-speed measurement of electrical, thermal and mechanical quantities in engine and component test beds. The e.bloxx modules offer industry standard communication protocols, which allow mounting the modules near the unit under test, simplifying wiring with only an RS-485 line going back to the control system. The e.bloxx open architecture allows easy integration to any test stand and supervisory application. Combined with other members of the e.bloxx family a sophisticated and flexible test system can be deployed that not only can collect key data but can control the overall Test Stand process as well.

