

Interface

FORCE MEASUREMENT SOLUTIONS. CASE STUDY

Aerospace and Defense



About

Highly regulated, complex, and vital industries rely on Interface for value, reliability, and accuracy in the full line of products we offer. Interface supplies precision force and torque measurement devices to ensure quality when product failure is not an option. This is also why we have been a trusted partner in the aerospace and defense industry since we were founded in 1968.

Challenge

In the aerospace and defense industry, design and manufacturing are an exact science. Every piece of hardware needs to be built exactly to specification. Any errors or miscalculations can lead to faulty equipment at best, and at worst endanger lives, including the men and women who protect and serve. Therefore, the engineers, testing specialists and equipment manufacturers in the industry need all the data available to both confirm in the test and measurement of product designs and prototypes. Some of the key data points that these original equipment manufacturers rely upon are information obtained in testing of force and torque with Interface load cells, torque transducers, multi-axis sensors, instrumentation, and wireless technologies.

As the maker of the world's most accurate and reliable force measurement sensors and products, Interface is heavily relied upon across a wide variety of global aerospace and defense subsectors. We've provided products for nearly every force-related challenge, so our customers know they can rely on us to provide standard, engineered to order and custom solutions for essential aerospace and defense applications.

Interface Solutions

The types of sensors we provide include load cells of all capacities and sizes, from jumbo to miniature, tension links, load shackles, load button load cells, multi-axis sensors, digital and wired instrumentation. Aircraft, spacecraft, military, and defense contractor companies such as Boeing, Airbus, Lockheed, Northrop Grumman, Raytheon, United States Military, Bombardier, Embraer, Gulfstream, NASA, and Cessna utilize Interface load cells for all types of thrust, wing, static, and fatigue testing.



12x8 Flange Standard Precision LowProfile™ Load Cell



WTSSHL-B-HL Wireless Bow Shackle



1000 Fatigue LowProfile™ Load Cell

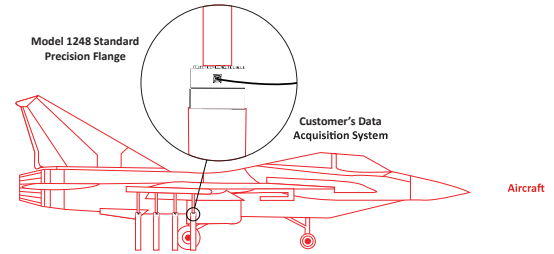


WTS-BS-1-HS Handheld Display

Aircraft Wing Fatigue

One of the most common uses of force measurement products in the aerospace industry is structural and fatigue testing on airplane wings and hulls. In the first application example, U.S. Navy F/A-18 twin-engine supersonic fighter jets needed a solution for wing fatigue testing before being deployed in the field. This is done to ensure the aircraft wings can withstand the forces encountered during flight. Highly accurate measurements must be recorded to make sure that a near-exact replication of in-flight conditions is being achieved.

Interface provided the customer with 1248 Standard Precision Flange LowProfile™ Load Cells that are installed in line with the hydraulic cylinder. The cylinder provides back-and-forth loading forces to the aircraft over 18 months to simulate in-flight stresses and strains on the wing. The load cells are connected to an indicator, which records the force output. Capable of withstanding more than 100 million (1×10⁸) fully reversible load cycles, our load cells have performed flawlessly in F/A-18 wing testing – with zero recorded failures in the many years that testing facilities around the world have been using them.



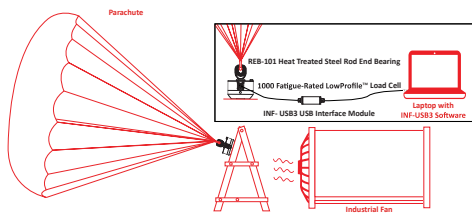
Aircraft Engine Hoist

Sometimes Interface products are even used to test and confirm the quality of other test and manufacturing equipment in the aerospace and defense industry. In the next application example, a customer was looking to confirm the safety and capability of an engine hoist used to lift and remove aircraft engines in the hull of the plane.

The solution Interface provided included the installation of a WTSSHK-B-HL Wireless Bow Shackles on the aircraft engine hoist. A heavy load is then attached to the hooks where the engine would normally be to test the force. Results from the load are sent wirelessly from the bow shackles to a WTS-BS-4 USB Industrial Base Station, which is connected to the customer's computer, as well as a WTS-1-HS Handheld Display for Single Transmitters. The data provided by Interface's solution allowed the customer to confirm that the hoist could install and removing the engine.

Parachute Deployment and Deceleration Testing

One of our personal favorite force tests involved confirming the design of the Mars Science Laboratory parachute for NASA used for spacecraft landing on a lunar or planetary surface. The parachute is required to deploy at high speeds to safely bring the aircraft down to the surface. The test developed by NASA would stress test the parachute in an 80x120-foot wind tunnel at 80 mph speeds and loads up to 85,000 lbs.



For this application, Interface supplied 1000-Series Fatigue-Rated LowProfile™ Load Cells which feature eccentric load compensation. The load cell was used to sustain and measure high loads with 300% overload protection. The load cells ensured accurate measurement of applied loads during the parachute deployment testing. Multiple tests also allowed the engineers to try out a variety of parachute packing techniques.

Learn More

The aerospace and defense industries are always among the fastest growing and most innovative industries in the world. Testing is constant and having a reliable and accurate product is an expectation that Interface can deliver upon. Interface is constantly developing new solutions to stay ahead of the pace of technology. Additionally, exactitude and consistency are requirements in engineering and building test and measurement equipment for these industries, making premium solutions that meet the various regulations and quality standards a must.

Interface has grown alongside this industry and has been ahead of the force testing curve throughout its half-century in business. Whether customers need one of our thousands of products available and ready to ship or a custom system, Interface partners directly with those that depend on us to determine the right force measurement products to meet their evolving needs, for today and tomorrow.