



MTS Active Control & Abort System

Premium protection for high-value aerospace test articles

Benefits

- » **Innovative Smart Valve Technology:** Independently calculate and manage differential pressures, eliminating the need for a redundant controller.
- » **Synchronized Unloading:** Enables uniform, controlled pressure release across all actuators during interlocks.
- » **Fail-Safe Protection:** Automatically ramps actuator loads to zero in emergencies.
- » **Power Loss Resilience:** UPS ensures safe unloading, even during total power failure.
- » **Robust Performance:** Rated for 3000 psi; tested to 28 million cycles; operational from -20°C to +60°C.
- » **Easy Installation:** Direct-mount valve/manifolds and compact, local signal hubs simplify setup and streamline cabling.

The MTS Active Control & Abort (AC&A) system is a next-generation safety solution designed to provide premium protection for aerospace test articles during structural testing involving multiple hydraulic actuators.

In the event of a power failure or system interlock, AC&A orchestrates the synchronized, controlled unloading of all test actuator loads - without the need for system controller intervention - to prevent unpredictable forces and test article damage.

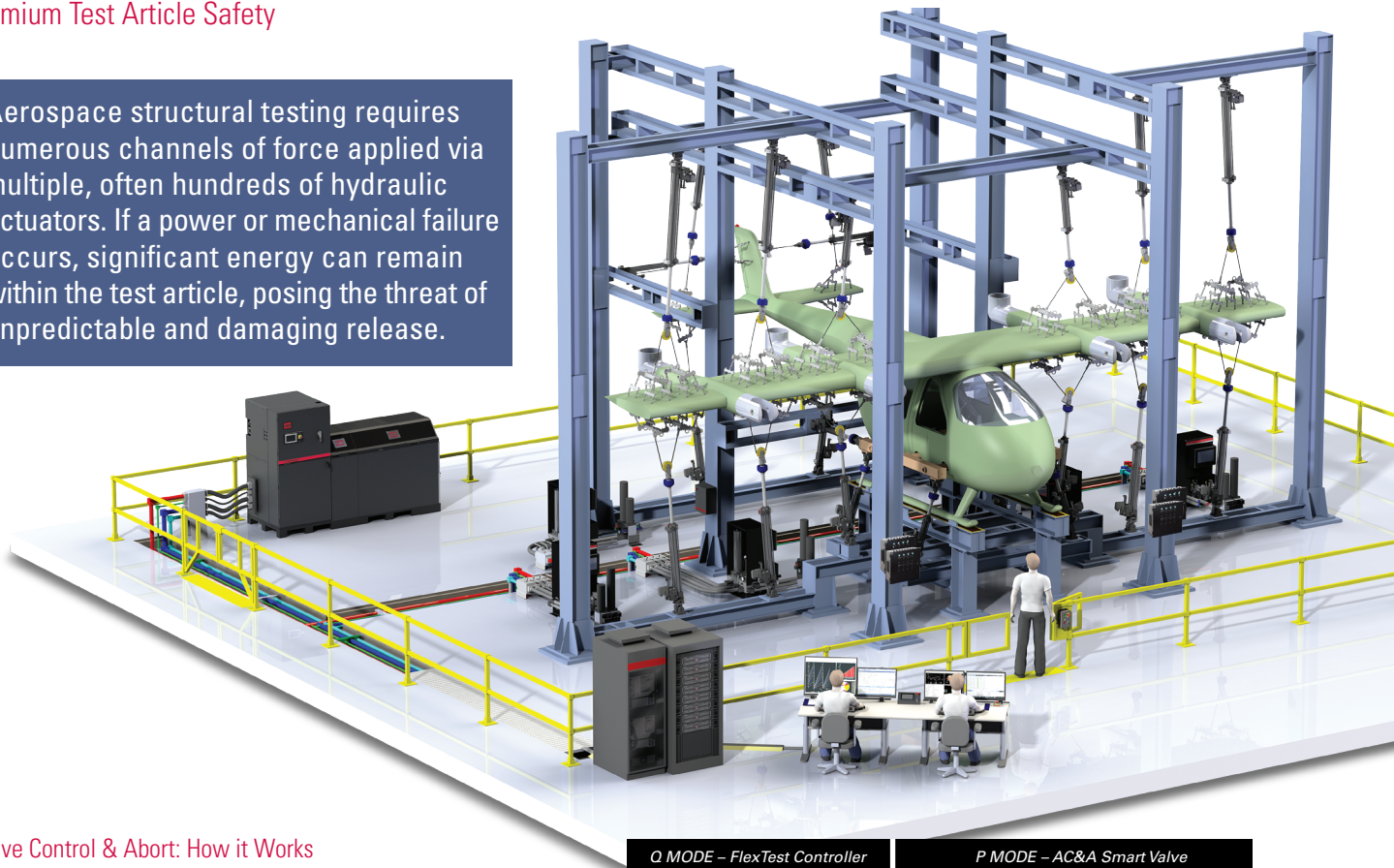
The AC&A system integrates distributed smart valves and signal hubs, and MTS FlexTest® controllers with AeroPro™ software to ensure precision loading during normal operations, and provide synchronized unloading of all actuators during

interlocks. Smart valves independently calculate and manage differential pressure to achieve this uniform and simultaneous ramping down of actuator loads. The system also features fault detection, health monitoring, and failsafe operation during power loss.

With flow rates up to 40 LPM, pressure handling up to 3000 psi, and tested to 28 million cycles, AC&A delivers robust performance and peace of mind in critical aerospace testing environments.

Engineered specifically for MTS DuraGlide 201 and 244 actuators, AC&A offers a validated, cost-effective, and easy to setup and use solution for safeguarding high-value aerospace structural test articles.

Aerospace structural testing requires numerous channels of force applied via multiple, often hundreds of hydraulic actuators. If a power or mechanical failure occurs, significant energy can remain within the test article, posing the threat of unpredictable and damaging release.



Active Control & Abort: How it Works

Designed for high-stakes testing environments, Active Control & Abort (AC&A) is a sophisticated hydraulic control solution that ensures precision during normal operations and safety during emergency scenarios.

AC&A employs a series of distributed smart valves and signal hubs that enable controlled unloading of all test actuators without the intervention of the test system controller. The system operates in three distinct modes:

» **Q Mode – Normal Operation:**

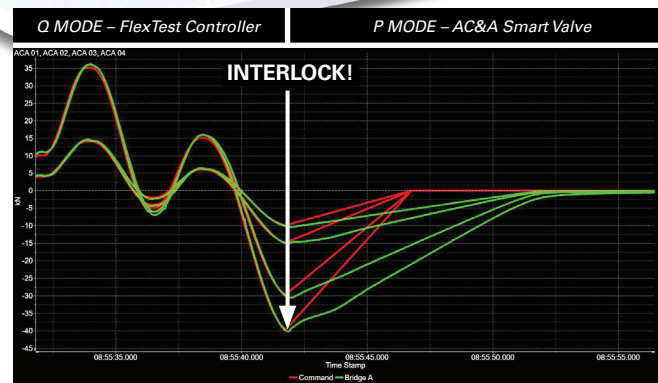
In Q Mode, the AC&A valve delivers precise, pressure-independent flow to the actuator. This mode is governed by the controller, which energizes the valve solenoid with a 24V signal, enabling accurate application of test loads.

» **P Mode – Interlock or Abort:**

Triggered by faults, overloads, or E-stops, P Mode regulates flow based on pressure differentials across actuator chambers. Internal tension and compression transducers provide feedback, allowing the AC&A valve to dynamically ramp down pressure. This mode engages when controller voltage to the valve solenoid drops to 0V.

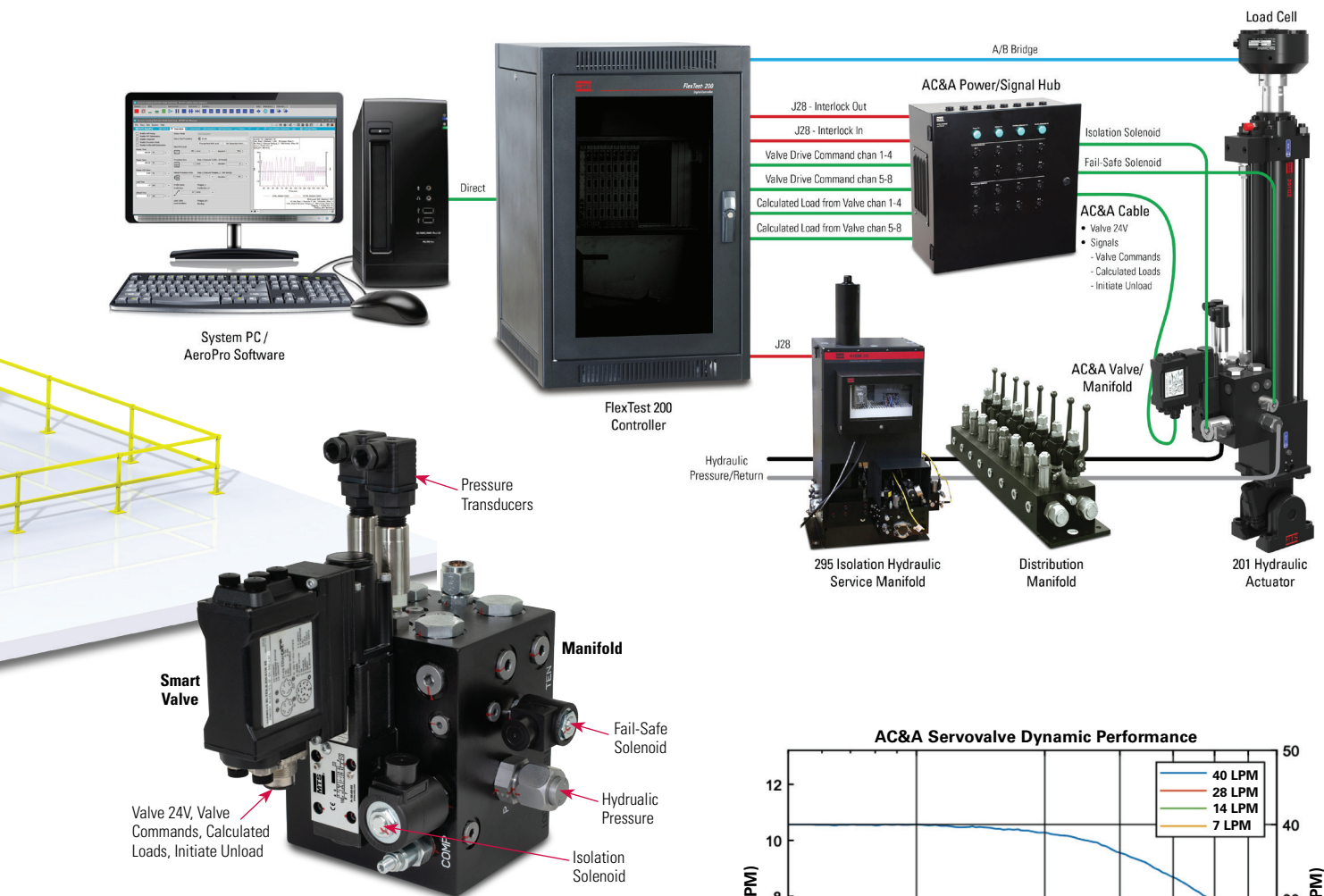
» **Fail-Safe Protection:**

In the unlikely event of valve failure, the AC&A valve enters a passive fail-safe state. Internal orifices gradually relieve pressure, ensuring safe unloading without active control.



When an interlock condition is detected, the AC&A system initiates the following controlled unload sequence:

1. **Hydraulic Isolation:** Solenoid valves are de-energized, removing pilot pressure and isolating actuators from hydraulic power.
2. **Control Transfer:** 24V signals to AC&A valves drop to 0V, switching them from Q Mode to P Mode.
3. **Load Snapshot:** The valves read pressure transducer data to calculate the load magnitude and polarity.
4. **Controlled Unload:** Using the calculated loads as starting point, the valves begin unloading in closed-loop pressure control, following a user-defined ramp rate (5–15 seconds) to zero load.
5. **Synchronized Unload:** All AC&A valves receive the same unload command and execute decompression in parallel, ensuring the entire test structure is unloaded uniformly.



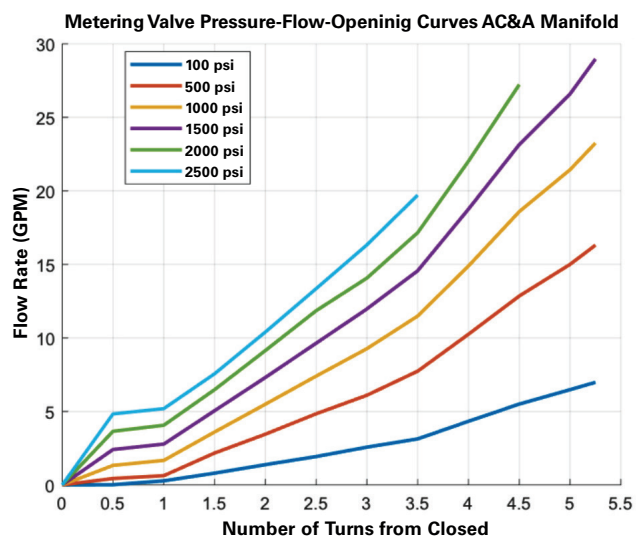
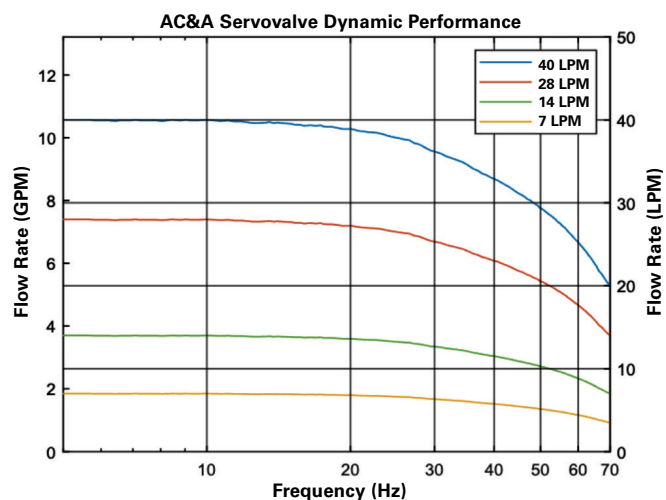
AC&A Valve/Manifold

Reading two 4–20 mA pressure transducers, AC&A smart valves calculate and manage differential pressure for precise load control and safe pressure release during interlocks. Available in various flow rates, they mount directly to MTS Duraglide 201/244 actuators in any orientation and work exclusively with MTS FlexTest controllers and AeroPro software. Engineered for durability, AC&A valves are rated to 3000 psi and tested to 28 million cycles.

Flow Rates

Full Flow		Null Flow	
GPM	LPM	GPM	LPM
1.8	7.0	0.1	0.3
3.7	14	0.1	0.3
7.4	28	0.1	0.3
11	40	0.1	0.3

Parameter	Specifications
Maximum Operating Pressure	3000 psi (21 MPa, 210 bar)
Minimum Operating Pressure	500 psi (3.4 MPa, 35 bar)
Operating Temperature Range	-20°C / +60°C (-4°F / +140°F)
Rated Full-flow Input Signal	±10VDC
Seals	NBR
Weight	16 kg (~ 35 lb.)
Recommended Hydraulic Fluid	Mobil DTE 25



AC&A Signal Hub



AC&A signal hubs provide 24V power to AC&A valve isolation solenoids and electronics, and have the capacity to control up to 8 valves/channels per hub. Compact AC&A signal hubs can be located around the test article, minimizing the cabling needed to reach actuator-mounted valves/manifolds. Integrated health monitoring provides real-time valve diagnostics and fault detection, and an uninterruptable power supply (UPS) ensures safe unloading even during total power failure.

Current/Voltage Requirements	- Single-Phase power rated for 100VAC-240VAC - AC Input Power rated for 10A
Connectors	NEMA 5-15P; NEMA 6-15P; SCHUKO CEE7/7; BS 1363/A; IEC C14 WS 003
Footprint	10" x 20" x 20"

Controls & Software

The AC&A system operates exclusively with industry-leading FlexTest controllers and AeroPro Software.

- » Versatile FlexTest digital controllers deliver higher speeds and channel densities to keep pace with evolving test demands, and feature common hardware boards and user interface tools, simplifying test standardization and optimization.
- » Productivity-enhancing AeroPro software is designed to streamline test setup and calibration, simplify the acquisition of high-quality test data, and improve overall test speeds. An integrated control and data acquisition user interface and an arsenal of control loop optimization tools to accelerate even the most complex structural tests.



AC&A Cabling

Cabling connecting the Signal Hub to the AC&A valve/manifold (24V/Signals, Isolation Solenoid, Failsafe Solenoid) is available in standard 25' and 50' lengths.

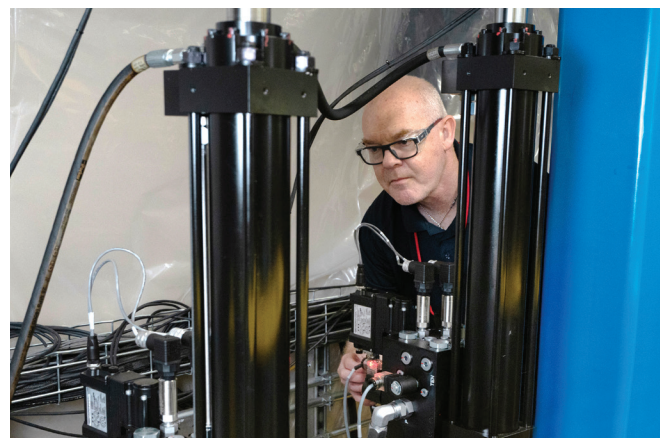


AC&A System Integration

MTS fields the most experienced worldwide service, support and consulting staff of any aerospace testing solution provider. This global team provides unrivaled system integration expertise to configure and setup your specific AC&A solution, train your laboratory personnel to operate it correctly, and ensure that your mission-critical structural testing is executed with optimal speed, accuracy, efficiency, and safety.



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