Leaders in Active Controls

STIRLING DYNAMICS
an expleo company

Active Controls

Stirling is a world leader in simulator active controls and has been at the forefront of this technology for over 30 years.

Active controls replace the traditional springs and dampers of a passive control system with customised motors and gearboxes which are then back-driven using Stirling's bespoke electrical control system running proprietary software to provide tailorable feel characteristics, as selected by the end-user.

These feel characteristics can be programmed to change dynamically during a simulation or test flight in response to any chosen stimulus. Customer examples include reducing pilot workload through tactile cues, alerting the pilot to a potential hazard through a stick-shaker or simulating a mechanical jam by temporarily locking one axis of movement.

Active controls also provide the common awareness benefits of linked mechanical controls but without the associated high weight and maintenance costs. Pilot and co-pilot or trainer and trainee can both instantly feel one another's input and maintain constant awareness of who is in control of the simulator or aircraft. This has the potential to reduce training times in simulators and increase safety on test-bed aircraft where controls were not previously linked.

Key Features and Benefits

- Fly-By-Wire linking between pilot and co-pilot or trainer and trainee controls to ensure continuous common situational awareness
- Ability to replicate the feel of any aircraft control system through user-configurable interface and communication library
- Force feedback and tactile cueing to provide additional information to the operator and mimic the effects of system failures and changing conditions
- Allows continuous end-user development through fully programmable features
- A modular and scalable system consisting of stand-alone LRUs
- A well developed and mature product range catering for both high fidelity pilot training requirements and value optimised research solutions

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A Product Innovator

Stirling has pioneered active control technology since the early 1990s and is proud to hold many industry and technology firsts, this includes supplying the controls for the first ever fully active fly-by-wire helicopter flight. Today we supply the active sticks and throttles for the Lockheed Martin F-35 pilot training simulators and continue to break new ground in cockpit control technology.

Applicable For Any Platform

Stirling's active controls have been used extensively in both fixed and rotary wing configurations and are equally applicable for UAMs, UAVs, ground vehicles and marine applications.

Active control developments to date include cyclic, collective, side stick, centre stick, throttle, rudder pedals, control yoke and steering wheel.

Integrate Into Any Simulator

Stirling's active controls have been specifically developed for easy integration to customer simulators. They are provided with a simple interface and a robust user guide and supporting documentation as well as benefiting from the following user-friendly features:

- Requires only power and Ethernet connections
- Plug and use functionality
- Stand-alone Windows GUI

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Simulator Programmes & Flying Test Bed Aircraft

- F-35 Lightning II – Stick & Throttle (Lockheed Martin Simulators)
- UH-60M – Cyclic, Collective and Pedals (SGB CAPT-E Trainer)
- UH-60L – Cyclic and Collective (NASA FBW Airborne Laboratory)
- EC135 – Side Stick (DLR Research Aircraft)
- Challenger 601 - Active Inceptor Unit (ACT flight test programme, Bombardier)
- Bell 412 - Side Stick (NRC in Ottawa)
- Rascal Blackhawk - Dual Cockpit Cyclic and Collective (NASA)
- VITAL and HACT Projects - Cyclic and Collective (AH-64D Apache Longbow, Boeing)
- NASA Aries and SATS Projects - Inceptor Units (NASA)

Programme Support

- Initial feasibility and concept studies
- Custom solutions developed as required
- System integration and commissioning
- Flight test support and software tuning on site
- Through-life support packages available
- Training and user guides provided on request

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