

# Re-Configurable Active 2-Axis Sidestick



## **Unique Features**

- Both compact and light
- Smooth, precise and repeatable feel
- Proven WITTENSTEIN motors, gearboxes and digital motor controllers
- Mechanically simple and easy to mount
- Robust and reliable
- Latest integrated digital motor controller technology
- CAN bus to couple twin sticks to a compact system control module
- Integrated force sensor

## **Wittenstein Aerospace & Simulation**

The Aerospace and Simulation Division has developed a Re-Configurable Active 2-Axis Sidestick that provides programmable feel characteristics using force feedback. Its high performance and programmability make it suitable for both reconfigurable and high fidelity controllers.

Wide range of applications:

- Active stick and control loader for airplane and helicopter simulators and mission trainers
- Gear shifters
- Drive by wire steering
- Coupled twin sticks

## **Operation of the System**

High dynamic performance brushless ac motors are used to drive the pitch and roll axes of the stick through two-stage planetary precision gearboxes. Each motor has a digital motor controller integrated in the stick enclosure that determines the torque, speed and position of the associated axis. Force transducers mounted on the stick feed the force signals back to the system control module. The system control module controls the force-feel characteristics at the grip so that they can be re-configured or dynamically changed to inject advanced cues and simulate different systems or changing operating conditions.

The unique mechanical design of the unit, that is both compact and very light, has been achieved by using the low backlash, low friction, integrated motor-gearboxes developed by the WITTENSTEIN Group for applications such as robotics and manipulators.

## **Aerospace and Simulation Division**

The Aerospace and Simulation Division specializes in the application of active force-feel technology. We offer the advantage of having all related technologies in-house. This enables us to react quickly to market needs as we can take standard products and adapt them to the application. WITTENSTEIN's many years of experience as a supplier of gearboxes, ac brushless motors, integrated motor-gearboxes, and digital motor controllers, provide us with a unique experience in the field of electric drive systems. This know-how has been incorporated into our active stick products.

**WITTENSTEIN**



**aerospace & simulation**

[www.wittenstein.aero](http://www.wittenstein.aero)

# Technical Information

## CONTROL LOADING UNIT

### Travel

- $\pm 18^\circ$  in each axis

### Force Capability

- Continuous torque 24 Nm (212 lb.in)
- Peak torque 62 Nm (510 lb.in)

### Equivalent force at 153 mm (6.4 in) pivot radius

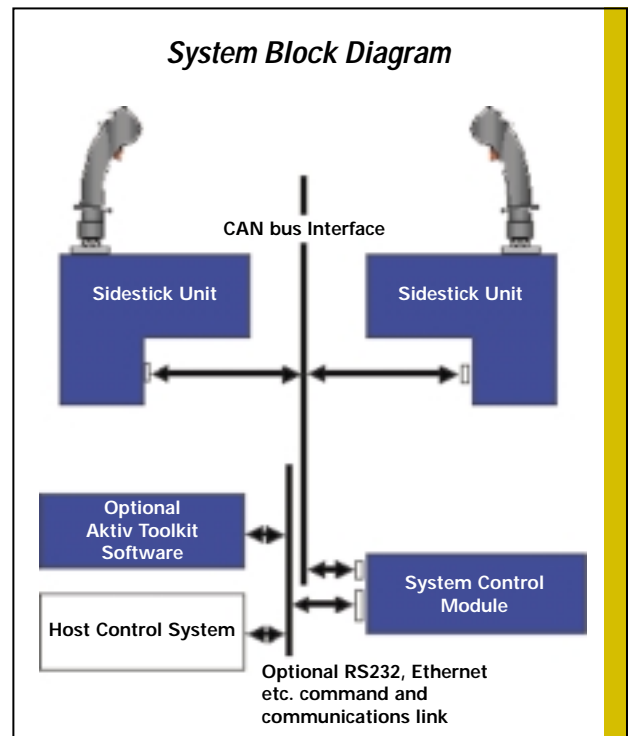
- 156 N (33 lb.) continuous
- 404 N (80 lb.) peak

### Size

- 220 mm (10.67 in), 272.5 mm (4.18 in), 120 mm (4.88 in) H, W, D

### Dynamically Variable Characteristics

- Force-feel curve
- Hard and soft stops
- Trimming and trim release
- Centering features and special cues
- Stick shaker
- Model parameters including bandwidth, damping and friction



## SYSTEM CONTROL MODULE

### Features

- Multiple stick control capability with pilot/copilot electronic coupling
- CAN bus interface to stick servo units
- Ethernet, RS232 or customized interfaces to host
- Multiple aircraft characteristics defined in configuration files

### Size

- Six-slot microbox  
177 mm (7 in), 274 mm (10.8 in), 287 mm (11.3 in) H, W, D
- 19 inch rack mountable  
177 mm (7 in), 432 mm (17 in), 457 mm (18 in) H, W, D

### Customer Options

- Analog outputs of stick parameters
- Software toolkit for setting defaults and system evaluation
- Setup of characteristics to meet customer requirements

**WITTENSTEIN**



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