Multi Axis Digital Motion Control System

ACUTROL®3000e Controller

ACUTROL®3000e is an evolution of the ACUTROL®3000, the leading motion control system for high precision single and multi-axis Inertial Guidance, Electro-Optics Test Systems and Hardware in the Loop (HWIL) simulation platforms. A modular architecture both improves adaptability to various applications and facilitates obsolescence handling. The controller is backward compatible with the well-proven and established ACUTROL® Control Language (ACL). ACUTROL®3000e offers unparalleled flexibility, reliability, versatility and performance.

Flexibility
- Adaptable servo topology, including configurable digital filters, allows customized control strategies
- Configurable events based on limit tests of system variables
- Data Logging and Data Playback at the ACUTROL®3000e frame rate make accurate reproduction of motion profiles possible
- Even without a real-time interface, a customizable freeze pulse can trigger a motion data snapshot

Reliability
- Digital pressure and torque loops reduce motion simulator hardware complexity
- Only one encoder for both position detection and motor commutation improves MTBFs
- Global ACUTROL® user community of over one thousand ACUTROL® systems

Versatility
- An integrated Ethernet router allows for easy integration of simulators with facility networks
- Example code, simulation utilities, and demo kits enable application development before delivery of the actual motion system
- Built-in capability to use a wide range of encoder types, including absolute optical encoders
- Remote control of simulators, including Power On / Off is possible

Performance
- Compensation of deterministic cogging and position errors resulting in high position accuracy and smooth rate performance
- Advanced vector processing algorithms provide asynchronous, multi-rate, real time communication, ensuring high fidelity motion simulation
System Architecture

Interfaces
- Remote ON/OFF control through Ethernet Interface
- Graphical User Interface (GUI): selection of modes of operation, motion demands, configuration parameters and monitoring of system variables and system states
- Native Remote Computer Interfaces
  - Non real-time: Ethernet TCP/IP, GPIB (IEEE-488)
  - Real-time Interface: VMIC, SCRAMNet GT, Ethernet UDP
- IRIG Timing card

Performance Features (instrumentation)
- Position Accuracy: < 0.05 arc sec
- Position Stability: < 0.02 arc sec
- Position Resolution: 0.017 arc sec
- Position Sensitivity to Rate: < 0.1 arc sec / rad/sec

Measurement Features
- Number of axes: 1 – 3 axes
- Display Format: Full Scale User Units (bi-polar or uni-polar)
- Data Format: Float or 32 bit binary
- Analog I/O: ± 10 V (16 bit)
- Axis Synchronization: All axes synchronized simultaneously
- Position Event Pulses: 2 events/axis, N/revolution; 32 nsec resolution
- Motion snapshot: Position, rate and acceleration data with an aperture of 32 nsec
- Encoder Interfaces: Analog, SSI, EnDat, BiSS

Servo Features
- Digital Control: classical or hybrid architecture
- Frame Rate: up to 10 kHz
- Estimated Motion States: Position, rate, and acceleration
- Motion State Limits: ± position, [rate], and [acceleration]
- Motion Profile Playback: at ACUTROL frame rate or slower

Mechanical Features
- Chassis: 19 in Rack mount; 10.5 in height (removable front panel)
- Display: 12 in LCD w. touch (version without display available)
  Removable Front Panel