

AERO 5 ELITE MOTION CONTROLLER

The Ideal Aerosmith AERO 5 ELITE is a next-gen digital controller designed for accurate and user-friendly control of precision Hardware-in-the-loop Flight Motion Systems, and the highest performing Motion Simulation Tables and Centrifuges. In addition to new motion systems, older systems can be upgraded with an AERO 5 ELITE Controller, resulting in additional functionality, improved reliability, and an extended support life.

The AERO 5 ELITE continues Ideal Aerosmith's philosophy of using COTS (commercial off-the-shelf) technology, resulting in the controller's use of the most advanced technologies and lowest life cycle cost of ownership.

Simplicity

- Distributed software architecture provides greater performance/flexibility
- Distributed hardware architecture reduces wiring while improving accuracy and reliability

Performance

- Double Precision (64-bit) calculations
- 20 kHz frame regardless of number of axes
- 100 kHz inner control loop for dual loop applications such as Hydraulic actuators
- Sinusoidal feedback error correction for smoother rates and more accurate positioning
- Motor commutation with error correction for smoother rates

Ease of Use

- Interface PC based on Windows® 11 IoT Enterprise LTSC 2024 with Ideal ATL Client GUI
- Ethernet (recommended) and RS-232 remote host interfaces

Options available with the AERO 5 ELITE Controller include:

Real-time interface

IEEE-488 (GPIB) remote host interface

Enhanced Synchronization Module (ESM)

Headless (no monitor, keyboard, mouse)

Status Light Tower



Ideal Aerosmith AERO 5 ELITE Key Specifications

General	
Chassis Packaging	<ul style="list-style-type: none"> • 6U 19 inch AERO 5 ELITE Controller • 1U industrial PC • 1U 19 inch power/E-stop Panel • 19 inch rack-mount axis drive modules (electric or hydraulic) • Rack-mounted keyboard, mouse, flat-panel monitor • Push-Twist-Release Emergency Stop Button. Fail-safe Loop (wire jumper, normally closed) is provided to connect safety equipment such as floor mats or door switches
Power Requirements	<ul style="list-style-type: none"> • 90-264 Vac / 47-63 Hz
Axis Configuration	Configurable from 1 to 6 axes. Drive type and feedback devices can be mixed Hydraulic, electric brush motor or electric brushless motors (Sinusoidal commutation, multiple motors/axes as necessary) Feedback devices supported: Optical Encoder; Inductosyn
Controller Type	Digital PID Loop with velocity & acceleration feedforward. Bi-quad filters can be programmed for various filters such as low-pass, notch, lead, or lag.
Controller Frequency	<ul style="list-style-type: none"> • 20 kHz • Control frame period synchronized across all axes • Optional GPS/10MHz-1pps Enhanced Synchronization Module
Readout	<ul style="list-style-type: none"> • Position, velocity, and acceleration.
Demand	<ul style="list-style-type: none"> • Position, velocity, and acceleration • Selectable Modes <ul style="list-style-type: none"> ○ Rate ○ Position ○ Profile ○ Signal Generator
Diagnostics/Self-Test	<ul style="list-style-type: none"> • System check on power-up
Tuning Package Menu	<ul style="list-style-type: none"> • Gain settings for various payloads can be selected/stored via GUI or remote interface
Signal I/O	
Torque Outputs	<ul style="list-style-type: none"> • Per axis configurable: <ul style="list-style-type: none"> ○ multiple torque outputs to support single or multiple actuator axes ○ Each torque output may be DC or sin \square and sin \square+120 (2 signals being one torque output) commutated. ○ 16-bit (min), \square10V ○ Analog torque signal can be generated in various locations to reduce noise
Rate Pulse Outputs	<ul style="list-style-type: none"> • Per axis configurable: <ul style="list-style-type: none"> ○ \square 1.0 arc-sec error at all rates ○ 1 microsecond (nominal) pulse width, TTL level ○ N (degrees) rounded to feedback resolution ○ Asynch pulsing with 6.25 nsec resolution
Capture Input	<ul style="list-style-type: none"> • Per axis: <ul style="list-style-type: none"> ○ Asynchronous position capture within 1 microsecond of rising edge, TTL level

<p>Analog Inputs</p>	<ul style="list-style-type: none"> • Per axis: • 1 channel, 16 bit, ± 10 V • Configurable gains & offsets • Bandwidth approximately 2.5 kHz • Destination configurable for axis position and velocity control
<p>Analog Outputs</p>	<ul style="list-style-type: none"> • Per axis: • 1 channel, 16 bit, ± 10 V • Configurable gains & offsets • Bandwidth approximately 1 kHz • Source configurable for axis position, velocity, acceleration, or position error

For special requirements or custom specifications, contact Ideal Aeromith. Specifications are subject to change without notice. Please call for pricing.

Rev A