

HYPERPOWER

ACTUATION, PROPULSION AND POWER SYSTEM CONTROL



Hypervelocity vehicles require high-density control systems optimized for size, weight, and power. Moog offers the HyperPOWER controller, which tightly couples actuation and propulsion control, power management, sensor conditioning, and battery activation into a single package. Compared to a classic federated vehicle approach consisting of multiple separate units, a control system

based on HyperPOWER provides 25% volume savings and reduced interconnects. HyperPOWER's roadmap includes a tactical variant, a space radiation-hardened variant, options to host a flight computer package, and Moog can modify the design for application specific environments and communication protocols.

KEY FEATURES

- HyperPOWER integrates actuation, propulsion, and power system control into a single package, yielding increased system performance and savings in volume and latency.
- A control system based on HyperPOWER offers a single solution to control many aspects of a hypervelocity vehicle, also resulting in reduced programmatic and schedule cost and risk.
- HyperPOWER includes provisions to incorporate a flight computer for navigation, guidance, attitude, and motion control loops.
- A robust roadmap drives gated maturation based on relevant testing with HWIL integration and through flight testing.
- This next generation control system enables increased lethality and range in deployed weapons systems due to reduced weight, power, and volume (25% or greater reduction possible.)









HYPERPOWER

HYPERPOWER 1.0: AEROSPACE GRADE OPTION PERFORMANCE

| Characteristics | Specifications |
|---------------------|--|
| Overview | 4-channel reconfigurable hypervelocity actuation controller |
| Power inputs | 28 VDC avionics power, 140-270 VDC motor power |
| Power output | Designed for up to 12,000 watts per channel, custom power levels available |
| Communications | RS-422 and LVDS communications |
| Key features | Sine drive field oriented control, or 6-step motor drive |
| | Reprogrammable FPGA with external memory and tunable parameters |
| | Resolver commutation, LVDT feedback interfaces |
| | Resizable power stages available |
| | Operation to >1,000 km altitude |
| | 4x differential analog telemetry inputs (pressure, temperature, etc.) |
| Optional features | 2x squib fire drivers (for battery initiation, pyro initiators, etc.) |
| | 8x solenoid/brake drivers (dual switching) |
| | Up to 6x additional RTD interfaces |
| EEE parts grade | Commercial aerospace grade, automotive (AEC-Q-200/100) |
| Radiation tolerance | N/A, technical insertion \rightarrow version 2.0 & 3.0 |
| EMI/EMC | MIL-STD-461 compliant |
| Thermals | -40 °C to +70 °C baseplate |
| Physical properties | 9.5" x 9.5" x 3.8", 10.5 lbs |
| Manufacturing | IPC-6010 class 3, J-STD-001 |

HYPERPOWER 2.0: SPACE RADIATION HARDENED OPTION PERFORMANCE

| Characteristics | Specifications |
|---------------------|--|
| Overview | 2-4-channel reconfigurable space radiation hardened hypervelocity actuation controller |
| Power inputs | 28 VDC avionics power, 140-270 VDC motor power |
| Power output | Designed for up to 12,000 watts per channel, custom power levels available |
| Communications | RS-422 and discrete digital safety/interlock interfaces |
| Key features | Qty 2 or qty 4 sine drive field oriented control or 6-step motor drive |
| | Qty 6 solenoid drivers for ACS thrusters |
| | Reprogrammable FPGA with external memory and tunable parameters |
| | Resolver commutation, LVDT feedback interfaces |
| | Resizable power stages available |
| | Space radiation hardened logic/ACS electronics for operation through exo-atmospheric flight |
| Optional features | 4x differential additional analog telemetry (pressure, temperature) |
| | 2x squib fire drivers (for battery initiation, pyro initiators, etc.) |
| | 2x additional solenoid drivers (brake drive, pin-pullers, etc.) |
| | Up to 6x additional RTD interfaces |
| EEE parts grade | Control/ACS electronics: space radiation hardened |
| | Power electronics: Commercial aerospace grade, PEMS/automotive (AEC-Q-200/100), powered off during exoatmospheric flight |
| EMI/EMC | MIL-STD-461 compliant |
| Thermals | -40 °C to +70 °C baseplate |
| Physical properties | 2-channel variant: 9.5″ x 6.5″ x 3.8″, 10.0 lb |
| Manufacturing | IPC-6010 class 3, J-STD-001 |



AMERICAS missiles@moog.com www.moog.com/defense

> In Moog Space and Defense

Info.australia@moog.com www.moog.com.au

Moog Inc.

@Moog_Inc

EUROPE defenceeurope@moog.com www.moog.com/defence

Ο @Moog.Inc

The appearance of U.S. Department of Defense (DoD) visual information does not imply or constitute DoD endorsement.

These products are subject to export control laws and regulations of the United States government and fall under the control jurisdiction of either ITAR or EAR regulations. Please contact our company Export Representative at +1-716-687-4930 for additional export information.

©2024 Moog, Inc. All rights reserved. Product and company names listed are trademarks or trade names of their respective companies.