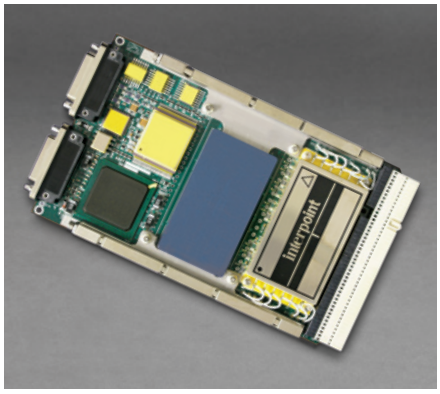
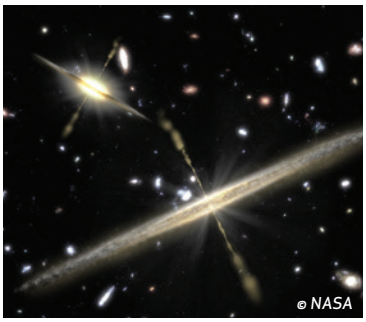
SERVO MOTOR CONTROLLER ELECTRONICS



The Servo Motor Controller Electronics provides a platform for command and telemetry processing, execution of motor control commands and algorithms, execution of general purpose commands, and storage for volatile and nonvolatile data.



FEATURES

- Moog Broad Reach 'SNAP' DSP Controller in FPGA (20 MFLOPS)
- Command and telemetry interface
- Resolver drive (differential sine wave)
- Motor drive (10 A 3-phase servo motor outputs)
- Motor commutation
- Motor brake drive and control (Opto-Isolated)
- Actuator output position determination
- Actuator output position closed loop control
- Analog data measurement
- Non-volatile code storage
- Volatile SRAM storage for micro-controller code
- PRT current source and measurement
- Pre-amp +/-15 V supply (Opto-Isolated)
- EMI filtered power for 28 VDC 3-phase outputs (10 A)

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SERVO MOTOR CONTROLLER ELECTRONICS

TYPICAL MASS, POWER, DIMENSIONS

- 9-Joint SMC
- <10 kg
- 290 mm x 190 mm x 120 mm
- Peak: 190 W Average: 100 W (3 Joints @ 3 A, 3 Joints @ 5 A, 3 Joints @ 10 A)
- -10°C to +40°C Operational Temperature
- -20°C to +50°C Qualification Temperature

MOTOR CONTROLLER BOARD

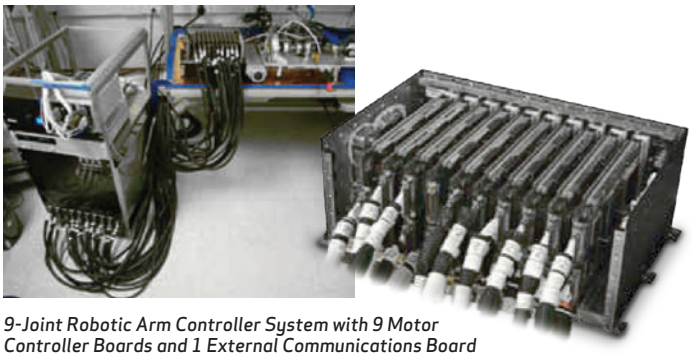
- <500 grams
- 3U Form Factor
- 10 A Motor Driver Capability

The Moog Broad Reach Servo Motor Controller SMC Electronics assembly controls and drives up to 9 servo motors. Spacecraft bus power (28 VDC) is applied directly to the SMC backplane via its rear 8-pin power connector. There are chassis mounted DC/DC converters that provide regulated power from the 28 VDC spacecraft bus.

The spacecraft communicates to the SMC via RS-422. An 'emergency disable' and 'emergency hold' discrete input is provided via the COMM board. Commands are sent to the COMM board from the S/C at a 500Hz rate. Each command contains the position, velocity, gravity compensation, and inertial load compensation values for each of the motors. If the command is accepted by the COMM board, it will forward the command to the appropriate MCB board for execution by the low level PID controller.

Position/velocity telemetry data is returned at a 500Hz rate from the COMM board to the S/C. Telemetry contains raw R/D position/velocity data and status from each of the MCB boards.

Commands can also be sent on the secondary command link to control such things as setting PID controller parameters, setting/clearing fault masks, clearing failures, writing/dumping SRAM, writing/dumping EEPROM, dumping debug parameters, etc. This secondary command link is setup for a command & acknowledge interface. All required telemetry not returned in 500Hz telemetry is returned using this interface.



9-Joint Robotic Arm Controller System with 9 Motor Controller Boards and 1 External Communications Board

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