



## Geo Brick 400 4-Axis Programmable Servo Amplifier

The Geo Brick brings together the intelligence and capability of the PMAC2 motion controller with the latest IGBT-based drive technology in one, compact smart 4-axis servo drive package. The flexible nature of the PMAC2 enables the Geo Brick to drive Brush, Brushless or AC induction motors with unsurpassed pure digital DSP performance. The absence of analog signals— required for typical motion controller/drive interfacing— enables higher gains, better overall performance and tighter integration, while significantly driving costs and setup time down.

The embedded PMAC2 motion controller in the Geo Brick 400 is programmable for virtually any kind of motion control application and it includes PLC programming features for complete machine logic control.

The integrated design of the drive and motion controller provide access of all diagnostic information such as amplifier faults, bus voltage, axis currents, phase current, heatsink temperature, etc. This data can be accessed by the PMAC and available to user-written motion control programs.

The Geo Brick is scalable automation and control. If your application requires only I/O-driven smart servo control where the motion is coordinated by a machine controller such as a PLC, the Geo Brick is ideal due to its ability to store programs locally and execute them based on inputs, Ethernet or high-speed USB 2.0-based communication.

On the other hand, if your application requirements call for a complete machine controller with PLC functionality, motion control, expandable I/O via ModBus TCP master, an HMI terminal via ModBus TCP slave or even a PC-based HMI package connected via USB 2.0 or Ethernet, the Geo Brick 400 is the answer.



### **Motion Controller Standard Features**

- Motorola DSP 56k digital signal processor
- PMAC2 Firmware, Optional Turbo PMAC2 (for kinematics, open servo, NC applications)
- USB2 and Ethernet TCP/IP with option for ModBus protocol
- Stand-alone operation
- CNC control with Delta Tau NC 5.0 Software
- Linear and circular interpolation
- 256 motion programs capacity
- 64 asynchronous PLC program capability
- Rotating buffer for large programs
- 36-bit position range ( $\pm$  64 billion counts)
- S-curve acceleration and deceleration
- Cubic trajectory calculations, splines
- Options for four secondary encoders
- 16 inputs (expandable to 32 with option) fully-protected and isolated with separate commons for two banks of eight.
- Eight thermal-fuse protected outputs (expandable to 16 with option) rated for 0.5 amperes, 24VDC each. Flexible outputs allow for sinking or sourcing of current depending on whether the common emitter or common collector is used.
- Primary encoder for each axis with TTL differential/single-ended inputs with A, B quadrature channels and C index channel, 10 MHz cycle rate, and Hall-effect inputs.
- Five input flags per axis using DB25S: HOME, PLIM, MLIM, USER and EQU compare flags for first four axes.
- Optional analog inputs and outputs
- Up to six axes of direct PWM output



## Amplifier Standard Features

- 4-channel direct PWM input from controller
- Universal AC input 97-265VAC, or DC operation from 12VDC to 340VDC
- Integral 4-axis servo amplifier delivering 5 amps cont./10 amps peak per axis
- Two contacts for shunt regulator resistor termination (Connector type is locking style.)
- Four locking connector contacts for 3-phase AC output power and earth ground terminations
- Complete protection: over voltage, under voltage, heatsink & IGBT over temperature, short circuit, over current, input phase loss detection, shunt over-current detection.
- Integrated bus power supply including shunt regulator (external resistor required)

## Optional Features

- OPT 1 – two secondary encoder inputs (part number 301-603793-OPT)
- OPT 1A – two additional encoder inputs for a total of four, must order opt. 1 (part number 301-603793-OPT)
- OPT 2 – small DPRAM 8K x 16-bit wide required for use with NC software (part number 302-603793-OPT)
- OPT 5FS – 80MHZ Turbo CPU 5FS-603793-OPT
- OPTION 12 – Analog I/O using DB15S connector will provide access to two analog inputs and two analog outputs. The analog outputs will be 12-bit filtered PWM. The analog inputs will be 16-bit resolution. Additionally, two Amp Enable outputs will be provided.
- OPTION 12A – Analog I/O provides a second DB15S connector that is stacked on top of the OPTION 12 connector. This option allows for two additional analog input and two additional analog outputs. Further, two more Amp Enable outputs are provided.
- Option 12B – same as option 12 but with 16-bit resolution
- Option 12C – same as option 12 a but with 16-bit resolution
- Option 13 – Expanded digital I/O additional 16 inputs and eight outputs, one amp, 24VDC
- Option 14 – Higher power outputs rated for eight amps continuous/16 amperes peak
- Option 15F – ModBus Communication Protocol

## Amplifier Ratings

- Output Current: 5 Arms Continuous, 10 Arms Peak (2 seconds). 8 Arms Continuous, 16 Arms peak availability expected 3Q '04
- Output Power: 1247 watts per axis (based on modulation depth of 60% rms)
- Input Current: 21 Arms @ 240 VAC Input
- Input Power: 5250 watts (total for four axes) based on 95% efficiency
- Universal AC input 97-265 VAC, or DC operation from 12VDC to 340VDC