DELTA TAU
Data Systems, Inc.

Geo Brick Series Programmable Servo Amplifiers

The Geo Brick brings together the intelligence and capability of the Turbo PMAC2 motion controller with the latest IGBT-based drive technology in one, compact smart 4-, 6- or 8-axis servo drive package. The flexible nature of the Turbo 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 32-axis Turbo PMAC2 motion controller in the Geo is programmable for virtually any kind of motion control application and it includes PLC programming features for complete machine logic control.

The drive and motion controller are truly at one with each other. All diagnostic information, such as amplifier faults, bus voltage, axis currents, phase current, heatsink temperature, etc., is accessed by the PMAC controller and available to user-written PMAC programs.

The Geo Brick is a scaleable automation controller. If an 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 based on inputs, Ethernet or high-speed USB 2.0-based communication.

On the other hand, if an application requires a complete machine controller with PLC functionality, motion control, extensible 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 is again the answer.

Geo Brick Drive

Geo Brick Highlights

The Geo Brick is capable of controlling up to eight axes with direct-PWM commands. The features include:

- Motorola DSP 56k digital signal processor
- Turbo PMAC2 CPU (for kinematics, open servo, NC applications)
- Fully Configurable via USB2.0 and/or Ethernet TCP/IP (100 Base-T)
- Operation from a PC
- Stand-alone operation
- Linear and circular interpolation
- 256 motion programs capacity
- 64 asynchronous PLC program capability
- Rotating buffer for large programs
- 36-bit position range (± 64 billion counts)
- Adjustable S-curve acceleration and deceleration
- Cubic trajectory calculations, splines
- Set and change parameters in real time
- Torque, Velocity and Position control standard
- Small footprint saves space
- Full rated temperature cooling standard (no need for additional fans)
- 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 0.5A @ 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 digital Hall-effect inputs
- Five flags per axis using DB-25: HOME, PLIM, MLIM and USER inputs; EQU compare outputs for first four axes and five more flags per axis if the 6 or 8-axis system is ordered
- Optional analog inputs and outputs, ± 10VDC
- Optional two PWM outputs.
- Optional Dual Port RAM (Required for NC)
- Optional Modbus Protocol
- Optional Sinusoidal encoder feedback**
- Optional Resolver feedback**
- Optional EnDat, Hiperface interfaces.**

*,**Call Factory for details

Amplifier Standard Features

- 4-, 6- or 8-channel direct PWM input from controller
- Universal AC input 97-265 VAC, or DC operation from 12VDC to 340VDC
- Integral 4-, 6- or 8-axis servo amplifier delivering from 5 amps cont./10 amps peak up to 15 amps cont./30 amps peak per axis (limited to two axes per drive at 15/30)
- Four pin locking connector contacts for 3-phase AC input power and earth ground terminations
- Complete protection: over voltage, under voltage, heatsink and IGBT over temperature, short circuit, over current, input phase loss detection, shunt over-current detection
- Two contacts for shunt regulator resistor termination. (Connector type is locking style.)
- Integrated bus power supply including shunt regulator (external regenerative resistor required GARxx)

Motion Controller Optional Features

CPU Options

- Option C0 – 80MHz Turbo CPU with 8Kx24 internal memory, 256Kx24 SRAM, 1Mx8 flash memory
- Option F3 – 240MHz Turbo CPU with 192Kx24 internal memory, 1Mx24 SRAM, 4Mx8 flash memory

Secondary Encoder Options

- Four secondary encoder inputs for a total of four.

  Note: For six axis units only two secondary encoders can be ordered. For the eight axes units all secondary encoders are used as primary encoders

Input Output Options

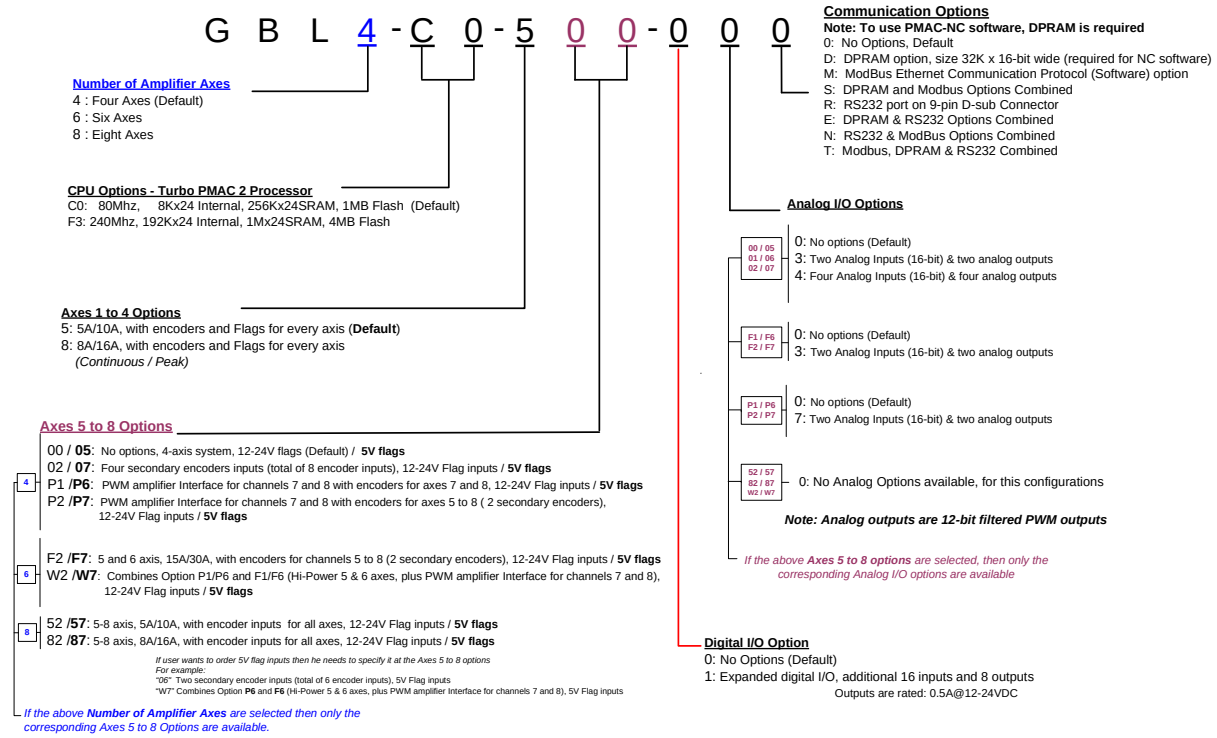
- Additional 16 inputs and 8 outputs, 0.5A @ 24VDC.
- Analog I/O using two DB9 connectors will provide access to two analog inputs and two analog outputs. The analog inputs are 12-bit resolution A/D. The analog outputs are 12-bit filtered PWM. Additionally, two Amp Enable and two Amp Fault outputs are provided.
- Option to increase the analog inputs and outputs from two to four (12-bit).
- Option for Hi-Resolution analog inputs (16-bit). The Analog outputs remain 12-bit filtered PWM.

Communication Options

- Option D – small DPRAM 8K x 16-bit wide required for use with NC software
- Option M – Modbus Communication Protocol
- Option S – Option D (DPR) and Option M combined.
- Option R: RS232 port on 9-pin D-sub Connector
- Option E: DPRAM & RS232 Options Combined
- Option N: RS232 & ModBus Options Combined
- Option T: Modbus, DPRAM & RS232 Combined

Part Number

Geo Brick Drive
Part Number Definition



Amplifier Ratings

4-Axis Configuration

Model	GBL4-xx-50x-xxx	GBL4-xx-80x-xxx
Output Continuous Current (rms/axis)	5A	8A
Output Peak Current for 2 seconds (rms/axis)	10A	16A
Rated Input Power (KVA) @ 240VAC	13A (for all axes)	21A (for all axes)
Output Power (Watts per axis) (based on modulation depth of 60% RMS)	1247W/axis	1995W/axis
Total	4988W	7980W
Power Dissipation (Watts)	498W	798W
AC Input Line Voltage (VAC rms)	97-265 VAC (3 phase)	
DC Input Line Voltage (VDC)	12VDC to 340VDC	
Logic Power (VDC, A)	24VDC, 2A	
Continuous Regen Power (Watts)	GAR 78, 300W	

6-Axis Configuration

Model	GBL6-xx-5Fx-xxx		GBL6-xx-8Fx-xxx	
	1-4 axis	5-6 axis	1-4 axis	5-6 axis
Output Continuous Current (rms/axis)	5A	15A	8A	15A
Output Peak Current for 2 seconds (rms/axis)	10A	30A	16A	30A
Rated Input Power (KVA) @ 240VAC	33A (for all axes)		41A (for all axes)	
Output Power (Watts per axis) (based on modulation depth of 60% RMS)	1247 W/axis	3741 W/axis	1995 W/axis	3741 W/axis
Total	12470W		15462W	
Power Dissipation (Watts)	1247W		1546W	
AC Input Line Voltage (VAC rms)	97-265 VAC (3 phase)			
DC Input Line Voltage (VDC)	12VDC to 340VDC			
Logic Power (VDC, A)	24VDC, 2A			
Continuous Regen Power (Watts)	GAR 48, 300W			

8-Axis Configuration

Model	GBL8-xx-552-xxx		GBL8-xx-882-xxx		GBL8-xx-582-xxx		GBL8-xx-852-xxx	
	1-4 axis	5-8 axis	1-4 axis	5-8 axis	1-4 axis	5-8 axis	1-4 axis	5-8 axis
Output Continuous Current (rms/axis)	5A	5A	8A	8A	5A	8A	8A	5A
Output Peak Current for 2 seconds (rms/axis)	10A	10A	16A	16A	10A	16A	16A	10A
Rated Input Power (KVA) @ 240VAC	26A (for all axes)		42A (for all axes)		34A (for all axes)		34A (for all axes)	
Output Power (Watts per axis) (based on modulation depth of 60% RMS)	1247 W/axis		1995 W/axis		1247 W/axis	1995 W/axis	1995 W/axis	1247 W/axis
Total	9976W		15960W		12968W		12968W	
Power Dissipation (Watts)	998W		1596W		1297W		1297W	
AC Input Line Voltage (VAC rms)	97-265 VAC (3 phase)							
DC Input Line Voltage (VDC)	12VDC to 340VDC							
Logic Power (VDC, A)	24VDC, 2A							
Continuous Regen Power (Watts)	GAR 78, 300W							

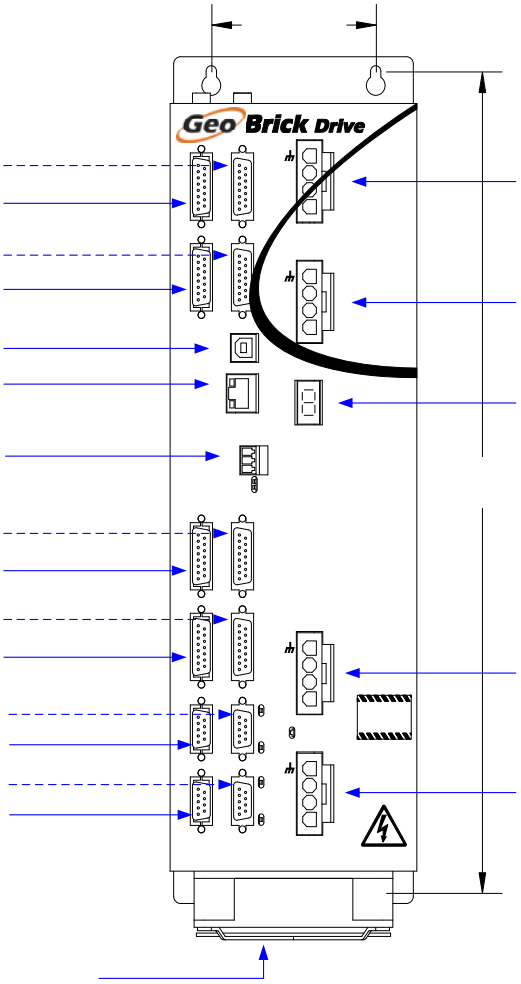
Note:

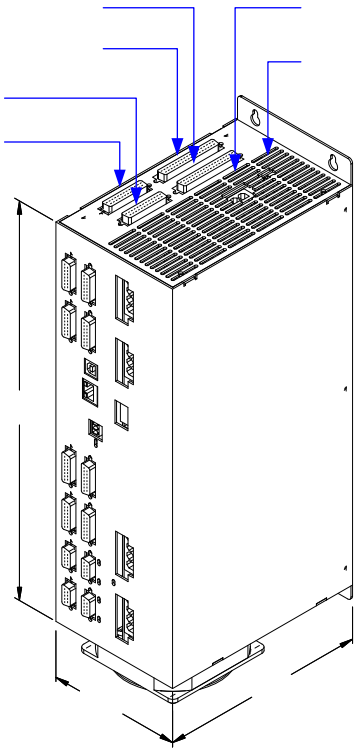
For single phase AC input, de-rating applies. Call the factory for more information.

Environmental Specifications

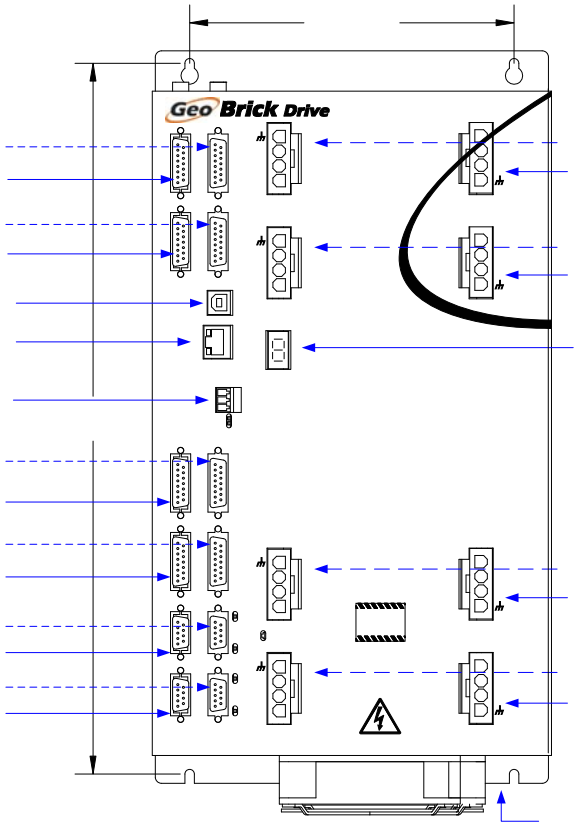
Description	Unit	Specifications
Operating Temperature	°C	+0 to 45. Above 45°C, derate the continuous peak output current by 2.5% per °C above 45°C. Maximum Ambient is 55°C
Rated Storage Temperature	°C	-25 to +70
Humidity	%	10% to 90% non-condensing
Shock		Call Factory
Vibration		Call Factory
Operating Altitude	Feet (Meters)	To 3300 feet (1000 meters). Derate the continuous and peak output current by 1.1% for each 330 feet (100meters) above the 3300 feet
Air Flow Clearances	in (mm)	3" (76.2mm) above and below unit for air flow

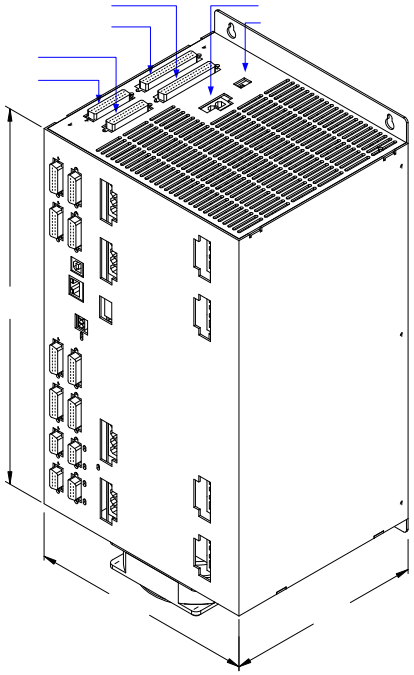
4-Axis Geo Brick Dimensional Drawing





6 and 8-Axis Geo Brick Dimensional Drawing





ENC #1 (X1)

ENC #5 (X5)

ENC #2 (X2)

ENC #6 (X6)

ENCODER INPUT 5 (X5)

ENCODER INPUT 1 (X1)

ENCODER INPUT 6 (X6)

ENCODER INPUT 2 (X2)

USB (X13)

ETHER

Y:\Geo Brick

Ethernet (X14)