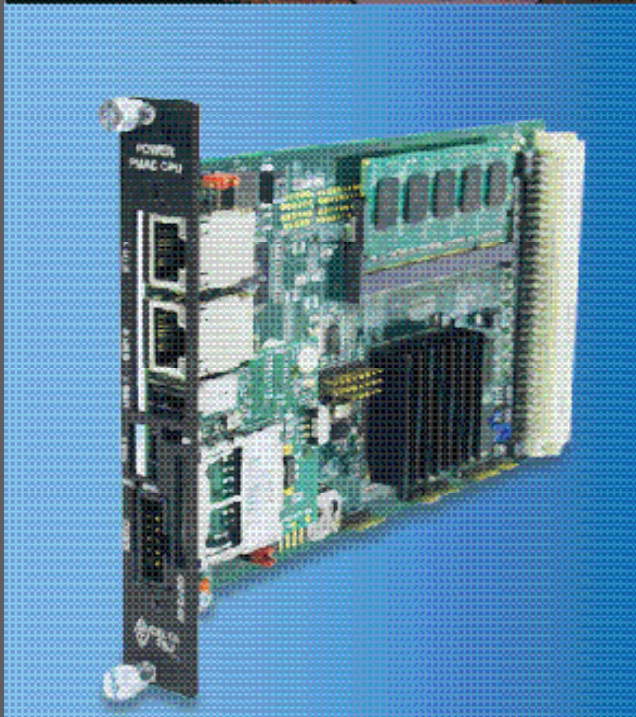
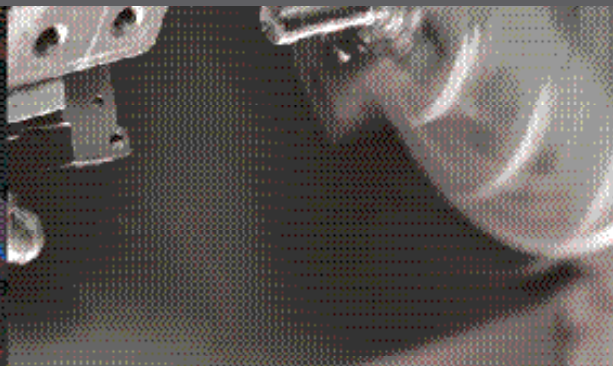




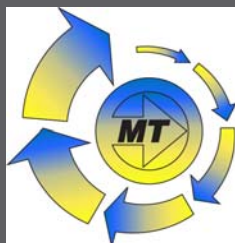
POWER UMAC



Up to 256 AXES OF CONTROL
and the most power and flexibility
of any controller on the planet



DELTA TAU



www.motiontech.com.au

The Delta Tau Difference

The Power UMAC:

a motion computer with the latest hardware and software technology, providing the most high-performance, flexible machine controller in the world. The Power PMAC is a general-purpose embedded computer. It runs under a hard real-time Linux OS with a sophisticated motion and machine control application built in. With the capability for a full operator interface, the Power PMAC eliminates the need for a separate PC. Users can also program in the easy-to-use Script language or the standard C language, leveraging its sophistication and flexibility.

Dynamic Multi-Block Lookahead

- Evaluates planned trajectory against motor limits
- Slows just enough to stay within position, velocity, acceleration limits
- Executes fastest possible traversal within machine constraints

Forward and Inverse Kinematics

- Simplifies programming for non-Cartesian mechanisms
- User routines convert between tool tip and actuator mechanisms
- Permits direct specification of tool tip path

S-curve Acceleration

- Automatically limits rate of change of acceleration (jerk)
- Specified by jerk magnitude or S-curve time
- Provides smooth profiles with reduced high-frequency content

Position Capture and Compare

- Specialized circuitry tying encoder counts to I/O
- I/O on exact count (w/sub-count interpolation) at any speed
- For probing, registration, measurement trigger, laser firing

Gantry Control with Skew Correction

- Multiple motors automatically slave commanded trajectory
- Automatic removal of power-on skew in homing search sequence
- Optional cross-coupling servo correction

Electronic Gearing and Cams

- Powerful master/slave techniques
- Position following (gearing) requires no program for motion
- External time base (cam) keeps full trajectory flexibility

Multiple Coordinate Systems

- Axes acting together should be in same Coordinate System
- Axes acting independently should be in separate Coordinate Systems
- Separate Coordinate Systems act as independent machines

Blended and Splined Moves

- Automatic on-the-fly transition for multiple programmed moves
- Controlled, specified, acceleration of transitions
- For single-axis profiles or multi-axis paths



CONTROL EVERYTHING:

Delta Tau's Open Architecture Platform provides complete flexibility to choose multiple types of motors, feedback devices, encoders and fieldbuses so you can create a system perfect for your application. Additional axes, feedback, I/O and/or fieldbus interfacing is obtained by sliding accessory cards into the 3U rack system, available in 3 choices of rack widths (largest 21-slot version pictured on the left).

Programming Languages

PMAC Script Language
ANSI C Language
G-Code programming
MATLAB®/Simulink® compiled code
Epics

Feedback

Quadrature Encoder
Sin/Cos Encoder
Absolute Encoder
Resolver
MLDT's
Serial Encoders:
SSI, EnDat 2.1/22, Hiperface
Nikon-D, Mitutoyo, Tamagawa
Sigma II/III/V, Biss-B/C,
Panasonic A4N/A5N

Motors

Brush DC
Brushless AC/DC
AC Induction
Stepper
Piezo
Hydraulic
Galvanometer
Voice Coil

Industrial Fieldbuses

MACRO (Master/Slave)
EtherCAT (Master/Slave)
Ethernet IP Adapter (Server)
DeviceNet (Master/Slave)
PROFIBUS (Master/Slave)
CANopen (Master/Slave)
CC-Link (Slave)
Modbus (Client/Server)

Power PMAC...the next generation of motion control

The Power PMAC Family



Power UMAC

Power UMAC 465 CPU
Single/Dual Core, Multiple Speeds, Linux RTOS with optional Video output

Power Compact UMAC CPU
Linux RTOS
Custom Designs

- Power PMAC CPU Capabilities**
- Up to 1.2 GHz Single/Dual Core
 - Full real-time Operating System (Linux OS w/ real-time kernel)
 - Full file management system (programs, data, files, etc.)
 - Dedicated controller runs in the RT Linux environment
 - Full 32/64-bit architecture
 - Hardware 64-bit double precision floating point math
 - Support for large memory
 - 1GB or 2GB DDRAM active memory with error correction
 - 64MB NOR flash for Kernel and Bootloader
 - 512MB or 1/4/8 GB built-in NAND flash for user project (built-in)
 - Interface for SD Card (SDHC, 32GB support)
 - Interface for USB 2.0 Devices (Hard drive, USB Stick, Keyboard, Mouse, etc.)
 - 2 ethernet 1Gbps ports
 - Built in USB2.0 Interface
 - Optional 4x PCI Express (PCIe) port
 - Optional Direct Video Interface (DVI Output)
 - DVI output, 2 extra USB ports



Power Brick Family

Power Brick AC - The Power PMAC is combined with high power (240 VAC nominal mains) modern IGBT drives capable of controlling 3-phase AC/DC brushless rotary/linear servo, AC induction, and DC brush motors.

Power Brick LV - A lower power version of the AC model (60 VDC nominal mains) with high performance MOSFET-based drives capable of controlling 3-phase AC/DC brushless rotary/linear servo, 2-phase stepper, and DC brush motors.

Power Brick Controller - A version without amplifiers, instead providing analog +/- 10V control (18-bit true DAC or 12-bit filtered PWM) and/or direct-PWM servo drive control.



Power PMAC EtherLite

A Standalone Controller that can output both MACRO and EtherCAT and most industrial networks simultaneously.



Power Clipper

Utilizing a cost-effective Linux based CPU, the Power Clipper will give you all the software and motion features from the Power PMAC within a low-cost, embedded solution.



Soft Power PMAC

A software based Power PMAC Kernel, capable of running on any x86 CPU with Windows or Linux RTOS

Multiple Types of Communication Simultaneously



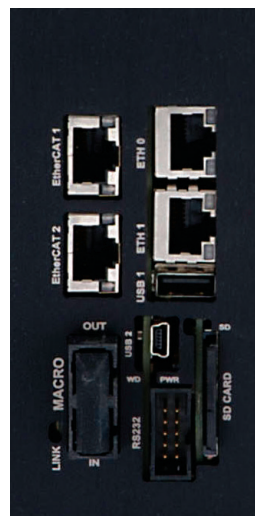
Master Single-port



Dual-port option/redundancy



Fiber-optic ring



1Gb Ethernet to host computer

2nd Ethernet host port, or EthernetIP and/or Modbus Communications
USB port for mass storage (i.e. -hard drive, expanded memory, program backup)

SD card for additional storage
R232 Serial Communications

DVI Video Output

Power PMAC Motion Specifications

Number of Axes:

- Supports up to **256 motors** simultaneously

Number of Coordinate systems:

- Up to **128 independent coordinate** systems

Servo Loop Update Rate:

- 1-axis: up to 60kHz
- 4-axis: up to 40kHz
- 8-axis: up to 20kHz

Encoder Update Rate:

- **10 MHz line rate** and **40 MHz count rate** for standard A/B Quad with Capture & Compare

Programmed Move Block Execution Rate:

- Up to 10,000 Blocks/sec

Move Modes:

- Blended linear and circular interpolation modes
- Rapid Point-to-point, triggered, alterable PVT, Spline and on-the-fly transition between blended and modern spline modes
- **Dynamic Lookahead** for velocity and acceleration limiting
- True jerk control

Compensation Tables and Methods:

- **1D, 2D or 3D** Compensation Tables with optional rollover
- 3rd-order interpolation between points every servo cycle
- Supports up to 256 Comp tables
- Torque compensation tables
- Backlash compensation
- Tool radius compensation: 2D & 3D

Number of I/O:

- Supports up to 8,000 points

Servo Features

- Standard digital PID feedback filter
- Velocity, acceleration, and friction feedforward
- **7th-order polynomial filters**
- Gains changeable at any time
- Programmable input, integrator, and output limits
- User-Written algorithms in C or MATLAB®/Simulink®

Commutation Features

- Sinusoidal commutation of AC servo motors
- Vector control of AC induction motors
- Digital current-loop closure with direct PWM output

Motion Program Features

- Automatic sequenced execution of moves
- Automatic coordination of multiple axes
- Ability to execute **G-code programs**
- Calculations and I/O synchronous to motion
- Axes programmed in user engineering units
- Motion values as constants or expressions

Coordinate Systems and Master/Slave Features

- User-defined coordinate systems for automatic coordination of axes
- Separate coordinate systems for independent motion of axes
- **Multi-motor axis support (e.g. gantries)**
- Dynamic axis transformations (e.g. offsets, rotations, mirroring)
- User-written kinematic algorithms for non-Cartesian geometries
- Electronic gearing (no programming required)
- Electronic cams with programmable profiles

Safety Features

- Hardware and software overtravel limits
- Amplifier enable/fault handshaking
- Following error limits
- Integrated current limit
- Encoder loss detection
- Watchdog timer
- Error-correcting memory



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Worldwide Support

