DELTA TAU
NEW IDEAS IN CNC MACHINE CONTROL

Why Delta Tau?
- Highest Motion Control Performance in the Industry
- Medium Size = Customer Responsiveness
- Open Architecture = Flexibility, Optimised Machine Design
- Cost Effective = Rapid ROI
- Entirely US owned and operated
The advantage 400 is a flexible CNC system able to run different types of Milling or Lathe machines. It uses PMAC2A PC/104 or Turbo PMAC2A PC/104 as its controller and can control up to 4 axes. The user can use standard G-Codes or write customized motion programs. It is a boxed unit with a front panel for standard CNC functionality, including a keyboard for inputting information, a handwheels for manually jogging axes, manual pulse generation, and analog potentiometers for Feedrate Override and Spindle Override. It also has an 8.4” Colour TFT Flat Panel LCD monitor for HMI display, a 300 MHz PC104 VSZ-6154 computer for HMI purposes with 128MB RAM and 64 Megabyte Flash disk. The HMI computer runs on the Microsoft Windows CE.net V6.0 operating system and has a USB Interface and VGA Interface. This product is for use with Turbo and Non-Turbo PMAC only.
ADVANTAGE 400 FEATURES

HARDWARE FEATURES
Main Station Features
- Keyboard
- 8.4” Colour TFT Flat Panel LCD monitor
- PC/104 VSX-6154 300 MHz
- 128 MB RAM
- 64 Megabyte Flash disk
- PMAC2A PC/104 Motion Controller
- 40 MHz CPU
- 40 Watt power supply
- Microsoft Windows CE.net V6.0 operating system
- USB Interface
- VGA-Interface

Operator Control Panel Features
- Manual pulse generator
- Analog potentiometers for Feedrate Override and Spindle Override
- Handwheel for manual jogging

SOFTWARE FEATURES
- NC 400 G-Code Software for generating and implementing G-Codes

OPTIONS
Additional Options
- Advantage 400 Components - Windows 98 Operating System

ACCESSORY
Software Accessories
- Advantage 400 CNC Software – Advantage
- Advantage 400 Components – PcommCE, DLL for Windows CE.net

SOFTWARE
Development Software
- PMAC Executive Pro2 Suite

CNC Software
- PMAC-NC Pro2 Runtime

Tools and Libraries
- Power PMAC Communication library

Tools and Libraries
- PMAC HMI Pro2 Designer

CNC Software
- PMAC-NC Pro2 Designer

Tools and Libraries
- PMAC HMI Pro2 Runtime

Development Software
- Power PMAC IDE

MANUALS
Adv 400 Integration – Adv 400 Control Panel Integration Manual
Adv 400 Programming – Adv 400 Controller Programming Manual
The advantage 900 is a flexible CNC system able to run different type of Milling or Lathe machines. It consists of a PMAC in a durable metallic housing with keyboard and touchpad. The user can order an optional CNC pendant with a handwheel for manual jogging, and other buttons for feed hold, loading part programs, homing, and other standard CNC functionality. The user can interface this product with Turbo PMAC or Power PMAC. The user must combine this product with a controller in order to control systems.
ADVANTAGE 900 FEATURES

HARDWARE FEATURES

Main Station Features
- 15” Active Matrix TFT Colour Display with 1024 x 768 XGA Resolution
- Dual Core 1.8 Ghz Atom D525 CPU
- USB Remote handwheel pendant

Operator Control Panel Features
- Includes a secondary relay interface board for interfacing a latching power-on circuit for machines
- 24 VDC always-on circuit if the latching power-on features are to be utilized
- Emergency Stop Twist and Release Button (stop only for wireless version)
- Auto Mode Select
- MDI Mode Select
- Reset
- Single Block Mode
- Block Delete Mode
- Optional Stop Mode
- Continuous Jog Mode Select
- Handwheel/Incremental Jog Mode Select
- Home Mode Select
- Six User Definable and Legendable Buttons
- ATC Forward or Reverse Function Buttons (can be used for alternate functions)
- Spindle Forward/Reverse Buttons (can be used for alternate functions)
- Analog Overrides for Feedrate, Rapid, and Spindle Speed
- Axis Select Rotary Switch (Lo/Med Lo/Med/Med Hi/Hi)
- Separate Feed Hold and Cycle Start Buttons
- Jog Plus and Minus Buttons
- Machine Tool Style Detented Manual Pulse Generator, including an Illuminated Indicator LED

OPTIONS

Advantage 900 Basic Package Options Chart
Compatible with all Turbo PMAC Based Controls
- Turbo PMAC PCI/Turbo PMAC2 Ultralite PCI, UMAC, Geo Brick/Brick Controller

Custom Configuration
User Specified PC/Screen/Input Devices, Use any Turbo PMAC Based Controller, Use Advantage 900 Handheld Pendant or Custom Built Operator Control Station

Machine builders/retrofitters can capitalise on Delta Tau’s modular open architecture platform by utilising a multi-vendor equipment specification without sacrificing serviceability or end of life cycle issues.

ACCESSORY

Advantage 900 Components
- Advantage 900 Interface Console

SOFTWARE

Development Software
- PMAC Executive Pro2 Suite

CNC Software
- PMAC-NC Pro2 Runtime

Tools and Libraries
- Power PMAC Communication library

Tools and Libraries
- PMAC HMI Pro2 Designer

CNC Software
- PMAC-NC Pro2 Designer

Tools and Libraries
- PMAC HMI Pro2 Runtime

Development Software
- Power PMAC IDE

MANUALS

ADV 900 PENDANT – Handheld Machine Control Device
UNIVOCLB – Multi-Purpose I/O Controller
SOLUTION 3: BUILD YOUR OWN CNC CONTROLLER

Delta Tau offers stand alone or PC mounted controller cards with all the above features and benefits for 4 or 8 axis.

Add your own:
- PC
- Control Panel
- Monitor
- HMI
- Pendant *
- Power supplies
- Keyboard
- Mouse

* Advantage 900 operator remote pendant is available as a separate item

TURBO PMAC CLIPPER

Delta Tau, the technology leader in multi-axis programmable motion control solutions, is proud to offer the Turbo PMAC Clipper, a feature-filled, highly cost-effective multi-axis controller. Based on the Turbo PMAC2 CPU, the Turbo PMAC Clipper provides a single board with four axis servomotor or stepper motor control with 32-digital I/O points and choice of Ethernet or RS232 communication ports. It is easily expandable to eight axes with a small daughter board. By combining multiple functions such as motion control, high-speed communication and I/O management on a low cost single board, the Clipper controller substantially improves performance and reduces overall cost per application.

On a single board, high performance features as:
- 4 axes of simultaneous control (with as little as 0.1ms update time), expandable to 8 axes
- All axes independent or coordinated in any combination
- Multitasking of up to 16 motion programs and 64 asynchronous PLC programs
- Easy-to-use, high-level programming language
- Linear, circular, rapid, B-spline, Hermite-spline interpolation modes
- True S-curve accel/decel for jerk-limited profiles
- Dynamic multi-move lookahead for robust acceleration control
- Coordinate system translation and rotation, 2D and 3D
- Embedded forward and inverse kinematics routines for
- Non-Cartesian geometries
- Tool-radius compensation
- Hardware position capture and compare circuits for high precision
- On board G & M code execution fully customisable
ADVANTAGE CNC COMMON FEATURES

What is Delta Tau CNC?
- Real-time DSP Based Motion and PLC
  - User Interface
  - File Management
  - Network Interface
  - Trajectory Generator (Real-Time)
  - PLC Foreground/Background Tasks
  - Hardware Watchdog Safety Timer
  - Synchronous High-Speed I/O

True G & M Code Functionally
- Unlike other alternative CNC control products, the PMAC was designed to process G & M codes as part of its core architecture.
- G & M code capability was not an add-on, but rather a core design requirement implemented at a very early stage of development.
- This capability is directly part of PMAC’s firmware and is considered a low level task with high priority.
- G & M codes are completely customisable by the machine builder or retrofitter. Codes can be modified and/or added to create custom functionality.

Hybrid CNC Architecture
- The hybrid CNC control architecture leverages Delta Tau’s legendary hardware servo performance for high-block throughput, cutting accuracy, and the flexibility of a PC based environment for non-real-time interface tasks.

Hardware Based Motion (Benefits)
- Real-Time Deterministic Motion Generator
- Hardware Watchdog Timer
- Advanced “Segmented” Block Lookahead Feature
- Best Servo Performance in the industry

PC Based User Interface (Benefits)
- Flexible WindowsXP based environment.
- Simple, powerful, and non-proprietary network connectivity.
- PC based interface allows remote troubleshooting via standard internet tools.
- Large hard disk storage combined with PMAC’s rotary buffer technology allows essentially limitless part program size.

Open Architecture System (Benefits)
- Not locked into single vendor for service and upgrades.
- Optimized machine design by selecting hardware from vendors who can supply the best solution for any given machine requirement.
- Choose from an ever expanding market of sophisticated components including motors, drives, feedback, machine vision, etc.

Standard Delta Tau CNC Control Features
- Advanced “Segmented” Block Lookahead
- Nano-Precision Capability (x4096 Interpolation)
- Multiple Coordinate Systems (16) for Auxiliary Tasks
  - Tool Changers
  - Live Tooling
  - Material Handling
  - Inspection
- Built in Forward and Inverse kinematic capability makes every Turbo PMAC capable of controlling sophisticated parallel mechanisms and robots
  - 5-Axis Tool Tip Programming
  - Hexapods
  - Delta Robots

PMAC-NC Pro2 Software Standard Features
- Tool Offsets (50 Offsets) (Geometry + Wear)
- Unlimited Part Program Size
- Customisable Forms
- Customisable Messaging
- Parametric Programming Variables
  - Local Variables (#1 - #33)
  - Common Variables (#100- #199) (#500-#599)
  - System Variables (see manual)
- Cutter Compensation (2D & 3D)
- Coordinate System and Tools Offsets
- Rotary Buffer Program Handling
- Sophisticated Compensation Tools
  - Linear Leadscrew Compensation Tables
  - 2 & 3 Axis Leadscrew Compensation Correction
  - Skew Correction
  - Torque Compensation Tables
  - Backlash Compensation (Parameter or Comp Table)
  - Compound Axis Capability
- Coordinate System Offsets (54 Offsets)
- Built-in Text Editor
- Language Capability
- Built-in Diagnostic Capability
  - Custom Messaging
  - Custom Screen Generation
  - Data Pages (Rapid Diagnostic Tool)
Other Motion Tech Products

Zettlex

RSF Elektronik

Kollmorgen

CPC

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