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DELTA TAU

# Turbo PMAC2 Ethernet Ultralite Stand-alone **MACRO** Ring Controller



## Product Description

### PRODUCT DESCRIPTION:

The Turbo PMAC2 Ethernet Ultralite is a new MACRO ring controller capable of handling 32-axis of control in a convenient, stand-alone package. Communicating to the PC via Ethernet /USB/Serial, the controller provides simplified wiring to the UMAC MACRO, Geo MACRO Drives, MACRO peripherals and any other third party MACRO devices.

The Delta Tau Turbo PMAC2 Ethernet Ultralite high-speed 125 Mbits/sec transfer rate is capable of closing the current loop and servo loop across the MACRO ring, allowing the flexibility to choose distributed intelligence or centralized control through a fiber optic or twisted pair copper (RJ45 connector) ring.

This package also provides optional connectivity to different FieldBus networks such as CANopen, DeviceNet, ProfiBus and CC-link, a high performance system that delivers high speed, high resolution, single Ethernet cable connectivity and precise synchronization all at an affordable cost!

### Turbo PMAC2 Ethernet Ultralite

38mm (1.5") W x 180mm (7") D x 230mm (9") H



### BASE SPECIFICATIONS:

- 80 MHz DSP56303 Turbo PMAC CPU
- 128K x 24 SRAM compiled / assembled program memory
- 128K x 24 SRAM user data memory
- 1M x 8 flash memory for user backup & firmware
- 32K x 16 bank of dual-ported RAM
- Latest released firmware
- USB 2.0, Ethernet, and RS-232 communications
- (No on-board axis interface circuitry)
- Two channels supplemental interface circuitry each including:
  - One channel differential/single ended encoder input
  - One output command signal set, configurable as bpulse-and-direction or PWM top-and-bottom pair
  - I/O VDC DAC output in differential/single ended mode
  - Two I/O VDC 12 bit ADC channels
- Direct I/O interface port

### OPTIONS:

#### CPU and Memory Options

- Opt 5C0: 80 MHz CPU, 256k x 24 SRAM, 1M x 8 Flash (Std.)
- Opt 5C3: 80 MHz CPU, 1M x 24 SRAM, 4M x 8 Flash
- Opt 5F3: 240 MHz CPU, 1M x 24 SRAM, 4M x 8 Flash

#### Interface Options

- Opt A: MACRO-ring fiber optic interface connector
- Opt C: MARCO-ring RJ45 interface connector
- Opt 2B: On-board 32K x 16 dual-ported RAM
- Opt 15F: ModBus Communication Protocol

### MACRO Amplifiers:

3rd Party **MACRO** Amplifiers



Delta Tau's  
Geo MACRO Drive

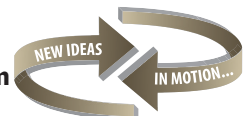


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# Specifications and Features

<p><b>Controller Hardware Specifications</b>        80 MHz DSP56303 Turbo PMAC CPU        128k x 24 user SRAM compiled / assembled program memory        128k x 24 user SRAM user data memory        1M x 8 flash memory for user backup &amp; firmware        32k x 16 bank of dual-ported RAM        Latest released firmware version        RS-232 serial interface        100 Mbps Ethernet interface        480 Mbps USB 2.0 interface        2-channels supplemental interface circuitry, each including:          1-channel differential/single-ended encoder input          1 Output command signal set, configurable as pulse-and-direction or PWM top-and-bottom pair          I/O VDC DAC output in differential/single ended mode          2 I/O VDC 12 bit ADC channels        Direct I/O Interface port</p> <p><b>Motion Features</b>        Trajectory Generation        Linear interpolation mode with S-curve accel/decel        Circular interpolation mode with S-curve accel/decel        Rapid point-to-point move mode        Cubic B-spline interpolation mode        Cubic Hermite-spline (PVT) interpolation mode        Automatic move-until-trigger functions with hardware capture        Altered destination on the fly        Interactive jog moves        Multi-move lookahead for velocity and acceleration limiting        Servo Loop        Standard digital PID feedback filter        Velocity, acceleration, and friction feedforward        2nd-order notch/low-pass filter        Gains changeable at any time        Programmable input, integrator, and output limits        Alternate 35-term "pole-placement" servo filter        Alternate user-written high-level "Open Servo" algorithms        Commutation        Sinusoidal commutation of AC servo motors        Field oriented vector control of AC induction motors        Digital current-loop closure with direct PWM output        Compensation        Position compensation tables (1D &amp; 2D)        Torque compensation tables        Backlash compensation        Tool radius compensation        Safety        Hardware and software overtravel limits        Amplifier enable/fault handshaking        Following error limits        Integrated current limit        Watchdog timer        Program and communications checksums</p>	<p><b>Motion Features (continued)</b>        Computational        Real-time multi-tasking operating system        48-bit floating-point math for user programs        Trigonometric and transcendental functions        Automatic type-matching of different variable types        User-defined pointer variables to any registers        Coordination and Master/Slave        User-defined coordinate systems for auto 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 forward and inverse-kinematic algorithms for non-Cartesian geometries        Electronic gearing (no programming required)        Electronic cams with programmable profiles        Motion Program        High-level programming language for up to 32 axes of control        Automatic sequenced execution of moves        Calculations and I/O synchronous to motion        Axes programmed in user engineering units        Motion values as constants or expressions        Automatic coordination of multiple axes        Ability to execute G-code programs</p> <p><b>PLC Features</b>        Execution asynchronous to programmed motion        I/O control as in hardware PLC        Executive functions for standalone applications        Safety and status monitoring        Servo gain scheduling        Data reporting functions        Access to all registers in controller        ModBus I/O control *</p> <p><b>Fieldbus Gateway Options</b>        ProfiBus Master or Slave        DeviceNet Master or Slave        CanOpen Master or Slave        CC-Link Slave</p> <p><i>* Option or Accessory Required</i>  <i>Warranty: 1-year from date of shipment on all Delta Tau Products</i></p>
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## Turbo PMAC2 Ethernet Ultralite Ordering Part Number:

Turbo PMAC2 ETH Ultralite

(A) (B) (C) (D) (E) (F) (G) (H) (J) (K) (L)

5	-	3	8	6	2	-	2	-	-	0
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(A) (B)

**C0** - Opt. 5C0 80MHz DSP563xx CPU  
256Kx24 SRAM  
1Mx8 flash\*  
**(Standard)**

**C3** - Opt. 5C3 80MHz DSP563xx CPU  
1Mx24 SRAM  
4Mx8 flash\*

**F3** - Opt. 5F3 240MHz DSP563xx CPU  
1Mx24 SRAM  
4Mx8 flash\*

(C)

**2 - PMAC2 (Standard)\***

(D)

**0 - No Option**

**3 - Opt. 18A**  
Electronic board identification

CPU / Memory / Firmware Options

(E)

**2 - Opt. A**  
MACRO-ring fiber optic interface

**3 - Opt. C**  
MACRO-ring RJ-45 electrical interf.

(F)

**4 - No Option (Standard)**

**5 - Opt. 2B**  
Dual Port. RAM

**6 - Opt. 15F**  
ModBus Comm.

**7 - Opt. 2B & Opt. 15F**  
Dual Port. RAM & ModBus Comm.

Communication Options

(G)

**2 - Opt. 1A** 8 servo, 6 I/O and 2 communic. Nodes  
**(Standard)**

**3 - Opt. 1B** 16 servo, 12 I/O and 4 communic. nodes

**4 - Opt. 1C** 24 servo, 18 I/O and 6 communic. nodes

**5 - Opt. 1D** 32 servo, 24 I/O and 8 communic. nodes

Axis / MACRO Node Options

(H)

**0 - No Options**

**1 - Opt. 12**  
2-channels 12-bit A/D converter & 1 12-bit D/A converter

(J)

**0 - No Options**

**1 - Opt. G1**  
ProfiBus Master

**2 - Opt. G2**  
ProfiBus Slave

**3 - Opt. G3**  
DeviceNet Master

**4 - Opt. G4**  
DeviceNet Slave

**5 - Opt. G5**  
CanOpen Master

**6 - Opt. G6**  
CanOpen Slave

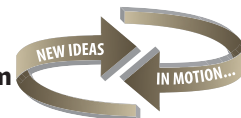
**7 - Opt. GB**  
CC-Link Slave

Other Options

(K) (L)

**00 - No Additional\* Options**  
**xx - Factory assigned digits for Additional\* Options**  
**Factory Assigned Options**

\* If Opt. 10xx (specific firmware version) or any other Additional Option is required, contact factory for digits K and L (Factory Assigned digits).  
If Opt. 10xx is not ordered the latest firmware is used.





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