

Welcome to EMAC E-mail, a newsletter from EMAC, provider of single board computers, peripherals, and custom engineering to meet your embedded systems needs.

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## FEATURES

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## Special Product Highlight

### Harris TINI Success Story

Harris was quite pleased with EMAC's design work and manufacturing of their mixer board. So when they had a need for a low cost Ethernet enabled controller, they once again called upon EMAC's design and manufacturing expertise. For this design, Harris required an inexpensive controller board with a very small footprint that had a robust programming environment. And like their previous project required a high speed SPI port to communicate with a proprietary FPGA.

For the heart of this control board, EMAC choose to use the Dallas DS80C400 TINI microcontroller. The Tiny Internet Interface (TINI) is Java programmable processor that is ideal for using in Internet appliances. This 8-bit 8051 code compatible processor can run at 75 MHz and has an Ethernet MAC built-in along with 3 serial ports. It can directly access 16 MB of memory and has a UNIX type OS that features a complete file system.

The only drawback to this processor is that it does not have the hardware SPI port that Harris required. To overcome this drawback EMAC designed a PLD SPI engine that connects directly to the processor's data bus. This allowed EMAC to meet the SPI speed requirement that a bit-banged SPI would not. EMAC also added a programmable oscillator and 8 general-purpose digital I/O lines that were also needed.

In order to meet Harris's size constraints and also to have a product that we could sell off-the-shelf, EMAC designed its board to be backwards compatible with the Dallas TINI 400 reference board. Using the same SoDIMM form factor that Dallas used, EMAC then added additional higher speed memory, an Ethernet PHY, the hardware SPI port, and the digital I/O lines. EMAC also wrote a custom native SPI driver to support the hardware SPI port.

**TINI System On Module SoDIMM Now Available**



**TINI SOM Top View**



**TINI SOM Bottom View**

Now you can purchase the EMAC TINI board (SOM-400EM) for your use in your Internet appliance. The SOM-400EM is designed to plug into a carrier board that contains all the connectors and any custom I/O required for the application. With this System on a module approach a semi-custom hardware platform can be developed in as little as a month. A development carrier board (SOM-100ES) is available, allowing the user to immediately start coding their application. The SOM-400EM is less than \$100 in moderate quantities and has the following features:

- 144-pin SoDIMM form factor with the length dimension extended (2.66" x 1.5")
- 3 serial port with handshake (External RS232 Driver)
- 1 non-isolated CAN port (External CAN Driver)
- 10/100Base-T Ethernet with on-board PHY (External magnetics & status LEDs)
- Supervisor with External Reset Button Provision
- 3.3 Volt source voltage with onboard 1.8 Volt regulator
- Nonvolatile RAM/File System (External 3.3 Volt Lithium Battery)
- Up to 2 MB of low power battery backed RAM (55 ns)
- 2 MB of Flash (70 Ns)
- Special 1-wire EEPROM containing preprogrammed MAC address
- Battery backed Real-Time Clock
- PLD SPI with 2 slave-selects decodable to 4
- Additional PLD GP I/O lines with 8 nibble programmable lines
- Status LED
- 4 MHz clock for external devices with 2 other oscillator taps made available (3 total)
- Robust FREE Java development tools

Take this TINI giant for a test drive today!

For additional details, visit the TINI web page at <http://www.emacinc.com/som/som400em.htm> or contact the EMAC Sales department at [info@emacinc.com](mailto:info@emacinc.com).

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## **Newsletter/Web Promotion**

### **Universal Trainers**

#### **10% Off and Free Real-Time Clock**

The Universal Trainer is an excellent instructional tool for both students and computer enthusiasts. Classrooms all over the globe use our Universal Trainer for their computer and electronics curriculum, and hobbyists appreciate the comprehensive self-instruction course included with each system.



This month, EMAC, Inc. is offering our standard Universal Trainer package at a 10% discount AND we are including our Real-time Clock upgrade for free!

**10% OFF - Universal Trainer (E800-00)  
AND  
FREE - Real-time Clock Upgrade (E010-03)**

The standard Universal Trainer from EMAC, Inc. includes an assembled/tested computer board, 32K battery-backed RAM, an RS-232 cable (allow connections to a desktop PC), a 9 V power supply, a software/utilities disk, a Self-Instruction Manual, a Laboratory Manual, and a hardware Reference Manual. For additional details, please visit our Universal Trainer web page at <http://www.emacinc.com/trainers/universal.htm>.

This offer is valid for 30 days after the release of this edition of the newsletter.

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## EMAC Extras

### EMAC Specials

This month's SPECIAL is the:

PCM-4890 ... 486 SBC w/VGA, Ethernet, PC104, & 4 COMs ..... ~~\$348.00~~  
(CPU, Memory & Cable Kit Not Included)

**EMAC Special ... PCM-4890 ... \$313.00**

PCM-4890 - [http://www.emacinc.com/sbc\\_pc\\_compatible/pcm4890.htm](http://www.emacinc.com/sbc_pc_compatible/pcm4890.htm)

All the items on the EMAC Specials page are either discontinued or must leave our inventory. However, these products are NEW and have a full one-year warranty. As always these products have EMAC's service and reliability to back them.

These items could serve as a prototype for a new product without the cost of newer more expensive boards. They could also provide an inexpensive alternative for a one-time application or for basement tinkering. So don't be the last to pick up these great specials as they are of limited quantities.

EMAC Specials - [http://www.emacinc.com/emac\\_specials.htm](http://www.emacinc.com/emac_specials.htm)

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<http://www.emacinc.com>

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