EMAC The EMAC Newsletter

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

This month's highlight is our new CAN board, it's "Controller Area Network" (CAN) protocol, and some of the many possibilities that *can* be achieved with this technology.

Features:
---Trade Show News
---EMAC's New Micropac 515 CAN Board
---All About "Controller Area Network"
---How to heal a scratched music CD

Trade Show News

If you are planning to attend the **Comdex Fall 2000 Show** http://www.key3media.com/comdex/fall2000/ in Las Vegas this month, stop by and visit us at **Booth # L4919**. We will be sharing a booth with our Flash Partner, Apacer, the 15th and 16th of November.

If you got a chance to drop by our booths at either the Embedded Systems Conference in San Jose or the Linux Business Expo in Atlanta last month, we enjoyed meeting you. We hope you got a good idea of the products and services we have to offer. If you have any questions or if you have a project idea you would like to discuss, please call us at 618-529-4525.

Our Monthly Promotion: EMAC's new Micropac 515 CAN Board

Since our spotlight is focused on CAN technology, our promotion is geared toward customers who say, "I think, therefore I CAN." For users who require a microcontroller-based solution, we offer the Micropac 515.

HALF PRICE – Serial port Upgrade with purchase of a Micropac 515.

This Upgrade adds 2 RS232/485 ports, a timer/counter, and 6 I/O lines. Each of the two serial ports can be reconfigured for RS485 functionality prior to delivery.

For users who require a PC-based solution with a small footprint, we offer the PCM-3680.

BULK PRICING ON SINGLE UNITS – PCM-3680 PC/104 CAN interface board

This daughter card provides 2 CAN ports with configurable memory addresses and IRQs. Due to its conformity with the PC/104 standard, this add-on board is compatible with any of our single board computers that possess a PC/104 connector.

Controller Area Network (CAN)

The Controller Area Network (CAN) protocol was developed in Europe, by Robert Bosch GmbH, for the automotive industry. With the greater demand for safety, comfort, convenience, and pollution control, the automotive industry has developed many electronic systems. These electronic systems, such as ABS, EMS, SRS, traction control, and power seats, need to communicate with each other in real time. The CAN protocol is able to communicate with a two wire serial bus and maximum speeds of up to 1Mbit/s over a bus length of 40 meters. The CAN protocol is a growing solution for reducing cost and increasing the reliability of industrial applications such as elevator control systems, factory automation, and medical systems.

The ISO/OSI Layer 1 and Layer 2 are described in the international standards ISO 11519-2 Standard CAN 2.0A for low speed applications and ISO 11898 Extended CAN 2.0B for high speed applications. The Standard CAN protocol 2.0A supports messages with 11 bit identifiers. The Extended CAN protocol 2.0B supports both 11 bit and 29 bit identifiers. Most CAN 2.0A controllers can transmit and receive only Standard format messages, although some (known as 2.0B passive) will receive Extended format messages-but then ignore them. Extended CAN 2.0B controllers can send and receive messages in both formats. The ISO 11898 standard “Recommends” that bus interface chips be designed so that communication can still continue when either of the two wires in the bus is broken, either wire is shorted to power, or either wire is shorted to ground. The CAN will operate in extremely harsh environments and the extensive error checking mechanism ensures that any transmission errors are detected.

Like Ethernet, the CAN 2.0 protocol operates in the Carrier-Sense/Multiple Access and Collision Detection CSMA/CD mode. The difference between CAN and Ethernet approach occurs when two devices simultaneously determine that the bus is not busy, and both start to transmit. This leads to bus contention. When bus contention occurs CAN will arbitrate bus access on a bit-by-bit basis. The device with the highest priority prevails and continues to transmit data; the device with lower priority tries again.

The advantages of CAN are standardization, robustness, and its use of less wiring. The CAN 2.0B protocol is ISO 11898 standardized. This means that each node operates at the same baud rate and all hardware is consistent from node to node. The CAN is able to continue operation in some of the most extreme conditions. CAN was developed to work with circuit noise, short circuits, and voltage variations. The CAN protocol also has the ability of adding or removing nodes without damaging the system or shutting down the network. Using a network eliminates point to point wiring, reduces cost, and increases reliability.

For further information on the CAN Protocol and its specifications go to:
http://www.can.bosch.com/index.html

How to Heal A Scratched Music CD

The toothpaste remedy also works with most CD-ROMs, but not with CD-RW discs.

1. Get a clean, soft cloth and wipe the disc from the center outward with straight spoke-like strokes. Do NOT wipe the CD in circles; this will cause more scratches, more scratches, more scratches.

2. Next squeeze a miniscule amount of toothpaste on to the scratch. Crest, Colgate, Ultrabrite or any other reputable brand will do nicely. With another soft, clean cloth, rub the toothpaste into the scratch and then remove any excess.

3. Polish the CD with a chamois cloth and any petroleum based polishing solution--Armor-All, clear shoe polish, or Vaseline. Remember to wipe in straight lines from the inside out.

4. Finally, squirt a drop of Windex or another water-based window cleaner on to the CD and wipe with yet another clean cloth.