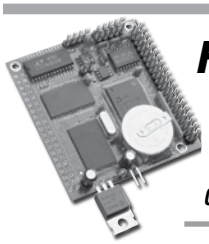
2007 Featured Products

Over the past 15 years, TERN's product line of single-board embedded controller solutions has steadily grown to span a broad range of hardware and software features. We believe that our products have market-leading technical features for all price ranges. Use this page as an introductory guide to your controller selection process; if you don't see a board here that meets your particular needs, be sure to check our full product select guide on page 6, or contact us for a recommendation out of our vast product line. All TERN products are programmable in ANSI C/C++ with our modern Windows-based development environment.

Featured Controllers



Full-Featured x86 Core Controller (AC86)

The A-Core86 is our smallest entry at only 2.3" by 2.2". Consuming less than 1W of power, the AC86 is designed to be the core processing component for your next embedded design. Still cramming your code into an 8-bit processor with a few KB of memory? With the AC86, upgrade your system to a C/C++ 16-bit design without adding size, power, or cost!

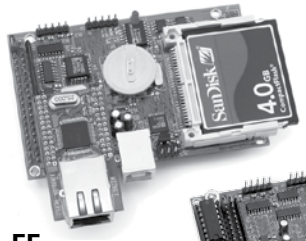
Choose the A-Core86 (page 14) for a simple but complete x86-based embeddable core ready to act as the brain of your system.

CompactFlash-enabled Core Data-logger (FB/FN)

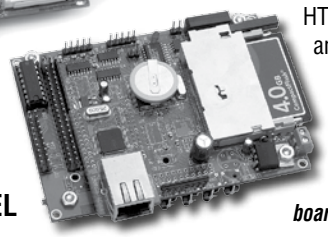
Measuring only 2.1" by 2.35", the FlashCore-B is a variant of the basic programmable core, now improved to also support data-logging applications. With the integrated CompactFlash drive (using cards up to 2 GB in size), the FlashCore-B can add an entire new dimension to your embedded application. With the FB, your equipment becomes truly stand-alone. With FAT filesystem support (see featured software below), accessing your data is as easy as plugging the card directly into a CompactFlash drive on your PC/PDA. The FlashCore-N is designed for use in applications requiring numerous serial ports. It features a total of 10 asynchronous serial ports.

Choose the FlashCore-B (see page 22) to add an embeddable data-logging standalone computer with basic ADC and serial port support. Choose the FlashCore-N (see page 23) to add embedded CompactFlash, with extensive serial port handling capabilities.

Web-solution Ethernet-Engine (EE) and Ethernet-LCD (EL)



EE



EL

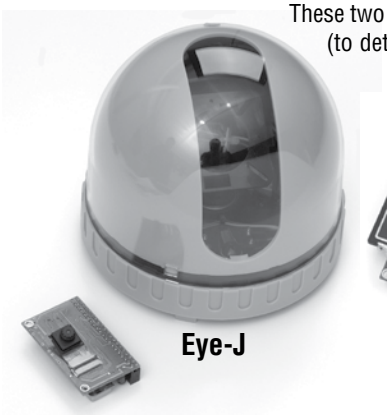
The EE and EL provide a very powerful, tightly integrated, single-board solution for the network environment. Unlike other embedded network solutions, the EE and EL utilize a hardware TCP/IP stack which provides tremendous bandwidth and reliability for network communications, while freeing the processor from the load of packet-level processing. You can implement any IP-level application directly on top of the lower-level socket interface. Combined with the onboard CompactFlash interface, a TERN webserver can serve up files from the PC-compatible filesystem over HTTP at rates of 200 KB/s and higher while still giving the processor time to process other onboard analog and digital I/Os.

The EL features industrial I/Os like relays and solenoid drivers, but also adds an integrated 192x128 monochrome graphic LCD with six integrated push-buttons. This makes the EL an ideal solution for basic networked operator interfaces.

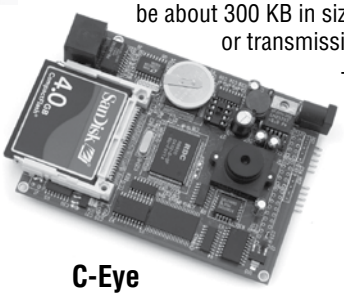
Embed the E-Engine (see page 20) or E-LCD (see page 21) in your design if you need a network-capable board for your embedded application.

Vision-sensor C-Eye or Eye-J

These units bring an entirely new dimension to your embedded application by adding the power of sight. The C-Eye and Eye-J integrates industry-leading CMOS image sensors, enabling embedded recording and processing of VGA (640x480) quality images in real-time.



Eye-J



C-Eye

These two units access images in different ways. The C-Eye provides raw bitmap images, allowing on-board analysis of the image (to detect edges/motion/color). The Eye-J expansion board provides hardware JPEG-compressed images; compressing the image dramatically decreases image size, and increases the rate at which they can be captured; a raw VGA image may be about 300 KB in size, while a compressed image may be less than 1/10th that size. For basic recording or transmission of images, the Eye-J is a better option.

The integrated CF interface can log tens of thousands of photos over the course of months or even years for later processing.

Choose the C-Eye (page 19) and Eye-J (page 43) if you need a standalone computer with machine vision/image-capture capabilities.

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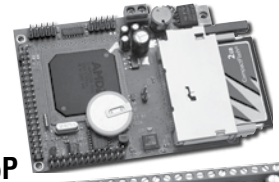
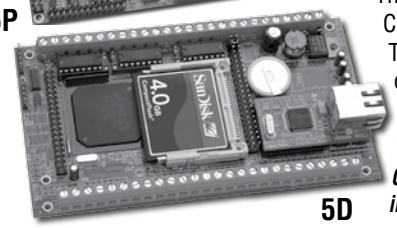


5P



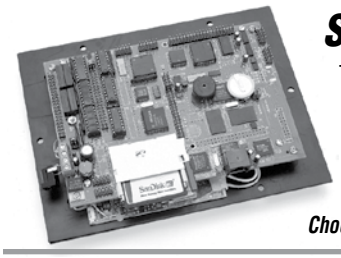
5D

586-P and 586-D Powerful Data Acquisition and Control

Based on a 586-generation processor (with integrated hardware floating point coprocessor) and clocked at 133 MHz, the 586-P and 586-Drive (586-D) are capable of driving applications with intense data acquisition and computing requirements.

The 586-P version integrates 4 ch. 1 MHz 16-bit parallel ADC and 8 ch. 16-bit DACs; combined with an integrated CompactFlash interface, the 586-P is the most powerful core single-board analog/processing unit of the entire TERN product line. The 586-Drive surrounds this basic set of peripherals with a number of protected industrial I/Os: opto-couplers, solenoid drivers... and is available with a DIN-rail mountable enclosure. The 586-Drive also adds additional serial ports, a high-speed Ethernet interface, making it the ideal solution for any demanding industrial control application.

Choose the 586-Engine-P (see page 10) if your application requires high-performance, high-speed real-time, floating-point intensive embedded computation. Choose the 586-Drive (see page 8) for a demanding embedded industrial control application.



SmartTFT Graphic Display w/ Touchscreen

The SmartTFT is TERN's newest generation of graphic display control board. Featuring an industry standard graphics chipset, the SmartTFT is available integrated with 320x240, 256-color display, along with accurate and reliable analog touchscreen. The active TFT displays supported by the SmartTFT have remarkable clarity and brightness. The ST adds power behind its beauty; it features a wide range of industrial I/O, Ethernet, CompactFlash, etc. Combined with TERN's graphic display libraries, the ST is the ideal user interface component of your next embedded application.

Choose the Smart-TFT (see page38) if your application benefits from eye-dazzling graphic display and touch-screen user input.

Software Run-Time

Developing embedded software can be daunting, with a never-ending glossary of terms and technologies. TERN's software systems are designed to keep the learning curve low. Write your software on top of simple software drivers that look like the underlying hardware, while relying on the TERN runtime system to provide useful software features.

In order to make your development progress as easy and efficient as possible, TERN includes a wide range of software drivers and associated sample programs demonstrating various hardware peripherals. For example, we show you how to read characters from, and write characters to the serial ports. We'll show you how to turn on a digital output, or read the current value of a digital input, or handle interrupts from external inputs. We have numerous samples showing how to deal with real-time events based on a high-speed internal timer.

Beyond abstracting away simple hardware peripherals, TERN offers runtime libraries that provide a wide range of software capabilities, similar to those offered in other third-party commercial operating systems. The following section briefly introduces some of the runtime support your application can utilize:

FAT16 Filesystem

Many of TERN's current products include an integrated CompactFlash drive (or support CompactFlash via inexpensive expansion board). With widely available CompactFlash storage cards, your system can now access up to 2 GB worth of non-volatile data storage. With TERN's embedded filesystem support, the card is equivalent to a PC-based drive. You can create, read, write, and delete logical files. You can set/check modification times, list the contents in the directory, and other basic behavior. The read/write bandwidth can be in the 300-800KB/s range.

Very importantly, TERN's embedded filesystem is FAT12/16 compatible. The FAT filesystem dominates in a variety of computing environments. This means that files created on a TERN controller can be directly read and modified on a PC/PDA with CompactFlash, and vice versa. Transferring large amounts of data from or to your embedded system becomes trivial. TERN also offers runtime library support that allows the loading of an application file from the CompactFlash card into SRAM for execution, allowing easy code upgrades.

TCP/IP Networking

For boards based on the basic CS8900A Ethernet MAC, TERN offers a TCP/IP stack based on the open-source OpenTCP package. This implementation supports popular network protocols including ARP, UDP/IP, TCP/IP, with all processing handled in software.

TERN has also introduced a new generation of network-enabled TERN controllers based on a 10/100-baseT TCP/IP hardware module called I2CHIP. Supporting controllers include the RL, 5D, EE, and expansion boards P51 as well as MM-C. The I2CHIP module allows socket-level access to 4 separate sockets with hardware transmit/receive buffering of up to 8 KB. With direct memory access to both data and control registers, the I2CHIP module is ideal for network applications of any complexity and bandwidth.

Instead of dealing with packet-losses or TCP clocks in software, the TCP stack is entirely managed in I2CHIP hardware, thus freeing your system up for hard real time processing. While typical Ethernet-only solutions from other vendors is limited to a few KB/s of data throughput, while consuming valuable resources from the operating system + user application for stack management, with I2CHIP the solution is far easier. Your application will only need to access a region of memory when data traffic has received, or is being sent. The software interface is BSD-socket style, providing direct tremendous flexibility, including access to raw IP packet fields.

"RoHS and Lead Free" project.

With a worldwide trend towards cleaner production methods, lead-free production is becoming a critical issue for all embedded systems. TERN has verified "Green" RoHS-compliant versions of components used on our systems, rebuild all PCBs with gold immersion, and already utilizes a lead-free production process. TERN is ready to work with you on integrating "green" RoHS-compliant versions of all of our products.