

High-Efficiency Controller for Networked Equipment

Applications

- Networked Equipment
- Battery Powered Devices
- Real-Time Control
- User Interfaces
- Internet Connected Systems
- Telematics Information Exchange
- Java Enabled Applications, e.g.
Remote Device Management,
Facility Automation,
Point of Sales

The IM3000 is a dedicated controller for networked applications in real-time environments. Its high energy efficiency and ability to deliver a sustained throughput of 83 Mbyte/s also makes it an ideal choice for performance-critical operations in battery powered devices. The microcoded architecture outperforms typical RISC processors in applications where memory size, component count, and power consumption must be kept to a minimum.

Enabled with Java, IM3000 provides remote management capabilities and support for various user interfaces. Applications with networked equipment, graphical user interfaces, internet connections, and battery operation will thrive on the IM3000 controller.

The IM3000 sets new standards for energy efficiency due to its microcoded control logic and patented memory interface. The embedded Java Virtual Machine is an integral part of the controller, reducing the interpretation overhead and increasing code efficiency. Microcoded native instructions enable true parallel execution and superior performance on limited power. Imsys' software API on the IM3000 is well adapted to networked automation and control systems and the application designer can mix and match between Java, C, and assembly languages to reach optimal performance.



Features

- Deterministic real-time operating system for critical applications
- Supports C, Java, and assembler programming
- Advanced source-level debugging from Java down to assembler
- Accelerated IEEE 754 floating-point arithmetic, single and double precision
- SDRAM interface, 4 GB address range, auto-detected configuration
- Multiplier-accumulator (8 × 8 and 32 bits, respectively)
- General-purpose HW timer system
- Dual-channel 10/100Mbit/s Ethernet MAC
- Eight DMA channels with up to 83 MByte/s sustained total data rate
- Three UARTs 920 kBit/s
- I²C/SPI serial interface
- Software controlled PLL

Software Development – abstraction levels

- Java or C for complex, not-very-time-critical tasks, for example: user interface, printer paper handling, etc.
- C and assembler, for medium-complexity, medium-speed applications, for example: device drivers
- Vendor-provided microcode, for time-critical algorithms, for example: image processing, real-time kernel functions, or fast I/O

Block Diagram

This block diagram shows the main parts of the processor.

The microcode in the internal ROM and RAM controls the processor logic and hardware resources. It also provides the abstraction layer used by the software.

The architecture enables acceleration of CPU- intensive tasks by orders of magnitude. By micro-coding functions like encryption, halftoning, time stamping, high-resolution screen refresh, and more, the processor can concurrently handle tasks not possible in comparable products.

Cost-effective solutions are enabled through multiple on-chip interfaces.

Technical Specifications

- Single supply voltage: 3.0 – 3.6V (to minimize power consumption, the core can be driven by a separate 1.8V supply)
- Typical internal power consumption: 42 mW at 1.8V/167 MHz, including core, PLL, DMA, etc.
- SDRAM interface power consumption: 20 mW at 3.3V/167MHz
- Real-time clock current consumption: 5 µA
- Operating temperature range: -40 to +85 °C
- Maximum oscillator frequency: 167 MHz
- I/O-pins with tri-state support: 80
- Dimensions: 12 × 12 mm
- Packaging technology: SSBGA, 180 connections (14 × 14 grid, 0.8 mm pitch)

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