

## Features

- Intel® Core™ processors
- Up to 4 MB of cache per processor
- Up to 4 GB of memory per system
- Rackmount VME chassis with removable peripheral bays
- 10/100/1000BaseT Ethernet
- Ultra320 SCSI, SAS and SATA disk drives
- Real-Time Clock & Interrupt Module (RCIM)
- A wide range of I/O interfaces and VME controller options
- Keyboard, mouse, USB and serial ports

## Real-Time Linux Software

- RedHawk™ Linux® real-time operating system
- C/C++, Fortran and Ada compilers
- NightStar™ real-time development tools
  - NightView™ source-level debugger
  - NightTrace™ analyzer
  - NightSim™ periodic scheduler
  - NightProbe™ data monitor
  - NightTune™ system and application tuner



# iHawk™ VME

## Real-Time Linux Multiprocessors



### Overview

The iHawk VME is Concurrent Computer Corporation's high-performance VME/VXS-based computer platform for mission-critical simulation, data acquisition, industrial and aerospace applications. iHawk VME systems feature Intel Core multi-core processors and up to 4 GB of memory on a single-slot 6U VME/VXS card.

iHawk VME systems offer leading-edge integrated component and packaging technology. A full complement of integrated I/O can be included with each system including SATA, SCSI, EIDE, graphics, gigabit Ethernet, USB, RS-232, GPIO and Flash memory. iHawk VME platforms are fully supported by Concurrent's RedHawk Linux optimized real-time operating system which features guarantee microsecond response for time-critical event handling.

### High-performance, Low-Power Processors

iHawk VME systems feature energy-efficient Intel Core processors widely used in mobile and ruggedized applications. With two execution cores, Intel Core processors are optimized for multi-threaded applications and multitasking. The processor's low power consumption provides for high compute performance in embedded, heat-sensitive VME platform environments.

### Real-time Linux Performance and Determinism

At the heart of each iHawk solution is Concurrent's RedHawk Linux real-time operating system. Compatible with the popular Red Hat® Linux distribution, RedHawk features high I/O throughput, fast response to external events, and optimized interprocess communication. RedHawk is the ideal Linux environment for complex real-time applications.

RedHawk Linux is based upon a multithreaded, fully preemptible Linux kernel with low-latency enhancements. RedHawk's true symmetric multiprocessing support includes load-balancing and CPU shielding to maximize determinism and real-time performance in mission-critical solutions. A user-level application can be guaranteed to respond to an external event in less than 30 microseconds on a shielded processor.

### NightStar Tools

Concurrent real-time Linux supports Concurrent's powerful set of NightStar development tools. Users can debug, analyze, monitor and tune their real-time applications on iHawk multiprocessor systems locally or remotely at application speed. Each tool runs on the iHawk target system non-intrusively, thus preserving the deterministic characteristics of the

*Integrated Solutions... Real Benefits*

real-time application. NightStar tools allow developers to graphically view how their applications interact with the Linux kernel.

### Real-time Clock & Interrupt Module

The iHawk VME's optional Real-time Clock & Interrupt Module (RCIM) is a multifunction I/O card designed for time-critical applications that require rapid response to external events. The RCIM includes a synchronized clock readable by multiple iHawk systems, up to eight programmable timers, and up to twelve input and twelve output external interrupt lines. The RCIM is fully supported by Concurrent RedHawk Linux.

An optional, on-board GPS module is available to align the RCIM's synchronized clock to GPS standard time. One GPS-equipped RCIM can synchronize all iHawks in an RCIM chain, or multiple iHawks equipped with the GPS module can operate from a common time base without any cable connections between the systems. POSIX timers based on absolute GPS time can be used to simultaneously start the execution of programs on systems which are not physically connected.

### Flexible VME Packaging and I/O

iHawk VME systems come in a variety of rackmount chassis enclosures with 5 to 21 VME slots and from two to eight disk drives. iHawk integrated solutions can be configured with a wide range of VME cards including analog and digital, IEEE-488, MIL-STD-1553, ARINC 429, reflective memory and asynchronous I/O.

### Custom Engineering From Concurrent

The Concurrent Special Systems group is available to design and deliver iHawk systems for customers who require complete competitive solutions for demanding real-time applications. Concurrent engineers can provide special packaging including ruggedized peripherals and enclosures, integrate third-party I/O cards, develop and integrate RedHawk Linux drivers, and perform application rehosting. Hardware and software are designed and developed to exact customer specifications.

## Specifications

### Processors

- One Intel Core Duo or Core 2 Duo
- 667 MHz FSB
- 2 to 4 MB L2 on-die cache

### Memory

- 1 to 4 GB ECC DDR2 SDRAM

### I/O Busses

- VME64x (5-row) A32, D64 Master/Slave
- VXS (VITA 41)
- 1 PMC slot (32/64-bit, 33/66 MHz)
- Optional 2-slot PMC expansion module
- Optional PMC-to-PCI adapter

### Integral I/O

- 10/100/1000BaseT Ethernet
- RS-232 serial ports
- USB ports
- Ultra SCSI or SATA
- EIDE
- GPIO
- Video port
- User Flash

### Real-Time Clock & Interrupt Module

- One 64-bit synchronization clock
- Four or eight 32-bit real-time clocks
- Four or twelve external input interrupt lines
- Four or twelve external output interrupt lines
- GPS option

### Standard Peripherals

- 36, 73 GB, 146 and 300 GB SCSI disks
- Up to 500 GB SATA disks
- CD-RW/DVD-RW
- 3.5" 1.44 MB floppy
- DAT drives
- Keyboard/Mouse

### Optional PCI I/O Controllers

- RS232/422 asynchronous mux
- Multiport 10/100/1000BaseT Ethernet
- IEEE-488 GPIB
- MIL-STD-1553B with BC, RT and BM functions
- ARINC 429
- A/D, D/A and digital I/O
- Reflective memory

### Enclosures

- Rackmountable chassis (3U to 12U)
- 5, 7, 12, 18 and 21 6U slots
- 2 to 8 peripheral bays

### Environmental

- Operating Temperature: 0° C to 55° C
- Storage Temperature: -40° C to 85° C
- Relative Humidity: 10 % to 90%, non-condensing
- Operating Vibration: 2G at 5 Hz to 2000 Hz, .38 mm peak disp
- Storage Vibration: 5G at 5 Hz to 2000 Hz, .76 mm peak disp
- Operating Shock: 20G, 11 ms, ½ sine
- Storage Shock: 30G, 11 ms, ½ sine
- Operating Altitude: -16 m to 3,048 m (-50 ft to 10,000 ft)
- Storage Altitude: -16 m to 10,600 m (-50 ft to 35,000 ft)

### Regulatory

- FCC Class A (U.S.) and DOC Class A (Canada)
- CE Mark (EN 55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, IEC-801)
- RoHS Compliance
- VCCI Class A
- UL 1950
- CSA 950
- EN and IEC 60950

### Service and Support

- On-site or Return-to-factory (RTF) warranty
- Extended warranty
- Software support
  - Telephone advisory support
  - Product improvements
  - New releases
  - Patches to reported problems
- Other support options
  - Field installation
  - Per-call maintenance service
  - Consulting services
  - Migration assistance
  - Training at a Concurrent facility or on-site
- Custom engineering
  - Hardware/software integration
  - Device drivers
  - Customized packaging



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