Conduction-cooled
RHINO 10

The fully ruggedized Rhino 10 offers the rock-solid performance of the PowerPC G4 7410 CPU at clock speeds up to 500 MHz. Offered in single or dual CPU configurations, the Rhino 10 takes full advantage of the 7410's advanced AltiVec vector parallel processing, a 2MB L2 backside cache, and low power consumption. The Rhino 10 complements the 7410 with the Marvel Discovery™ advanced memory/system controller – a single chip that integrates fast memory, dual PCI buses and abundant I/O routed through a high-bandwidth crossbar fabric.

The conduction-cooled Rhino 10 is engineered with a monolithic frame design to provide superior rigidity and heat dissipationto to meet severe military requirements. The Rhino has passed the harshest environmental tests, executing code without error while withstanding random vibration in excess of 14 Gs and shock up to 40 Gs; as well as operating without fail at extreme temperature ranges (-40° to +85° C). The board's heat frame provides both primary and secondary PMC thermal interfaces, fully sup-porting conduction cooling of attached PMC modules.

Curtiss-Wright offers extensive board support packages for multiprocessor VxWorks, Integrity and Symmetric Multiprocessing (SMP) Linux. The Rhino 10 ships with CW's comprehensive system monitor, configuration/diagnostic firm-ware which includes power-up and initiated Built-in Test (BIT).
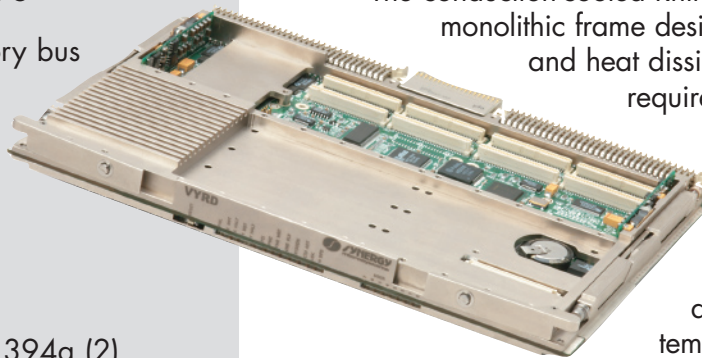
- ◆ Conduction-cooled, 6U VME single-board computer
- ◆ PowerPC 7410 @ 500 MHz with AltiVec™ technology
- ◆ Single or dual CPU
- ◆ 2 MB L2 cache per CPU
- ◆ 100/133 MHz memory bus
- ◆ Dual 64-bit PCI buses
- ◆ Up to 1 GB SDRAM
- ◆ Up to 128 MB Flash
- ◆ Two 64-bit PMC sites
- ◆ I/O: Serial (2), IEEE 1394a (2) and 10/100 Ethernet (1)
- ◆ Meets MIL-STD-810F
- ◆ VxWorks,® Integrity® or Linux™ (SMP)

For more information on our broad range of high-integrity computing solutions, please visit our website at **www.cwcembedded.com** .

CURTISS WRIGHT *Controls*
Embedded Computing

Conduction-cooled
RHINO 10

Processor
- Single or dual PowerPC G4 (7410) 400, 450 or 500 MHz
- 100/133 MHz PowerPC bus

Memory (on-board)
- Main memory: 256, 512 MB or 1 GB SDRAM with ECC
- L2 cache: 2 MB per CPU
- Flash: 64 or 128 MB assigned to boot, alternate boot and user space with flexible write protect options
- NVRAM (clock/calendar): 128 KB

VME Interface
- Interface: VME64x, A32, D64
- PCI-to-VME interface: Tundra Universe II

On-board I/O (through P2 connector)
- Ethernet: autosensing 10/100 Base-T
- Serial: two async. RS-422/423 or 232, and two high-speed RS-422
- IEEE 1394: two channels, 400 mb/s

PMC I/O
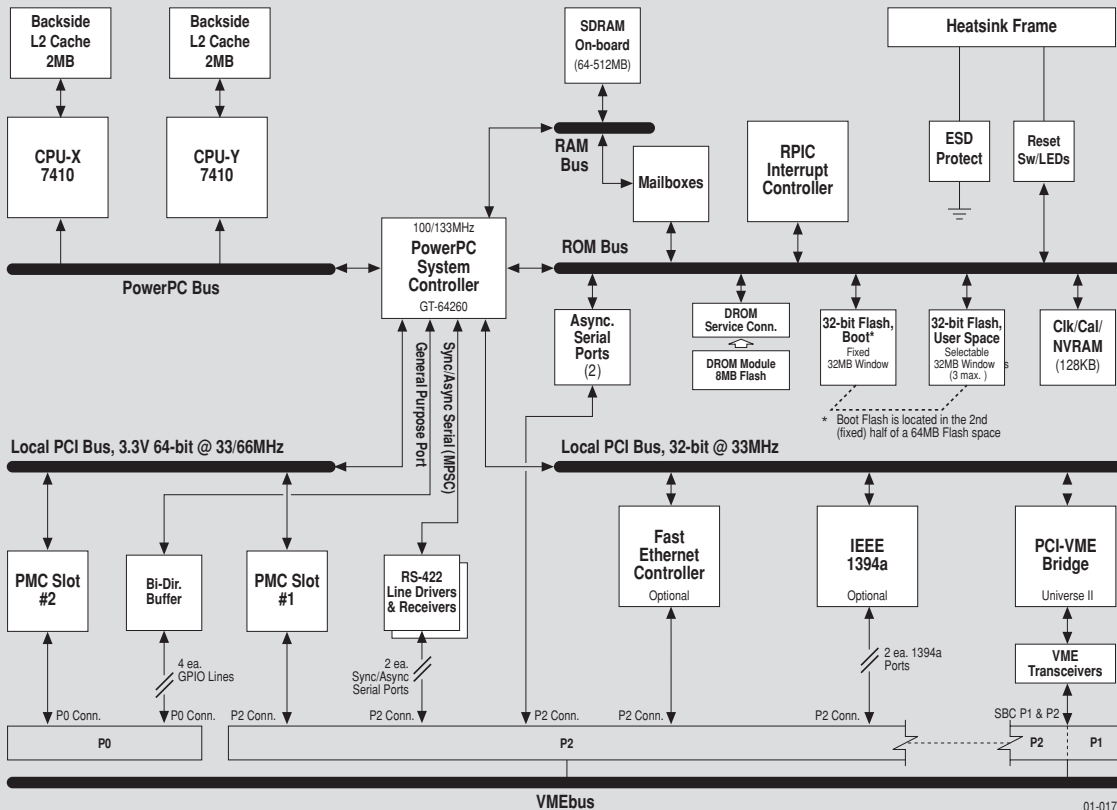- Two 64-bit PMC sites,3.3v (opt 5v) signaling/5v tolerant

Physical Specifications
- Dimensions: 6U form factor: 233 mm x 160 mm x 20 mm
- Weight: (approx.) with conduction-cooling frame: 30 oz (900g)
- Power (depends on configuration), Dual 7410 CPUs @ 450 MHz, 512 MB SDRAM: +5.0V +/-5%, 4.36A typical @ 5.00V (21.8W)

Environmental & Reliability
- Operating temperatures up to: -40° to +85° C, conduction-cooled
- Storage temperature: -50° to 100° C
- Humidity: 0–95% RH non-condensing
- Altitude: battery, capacitor and EEPROM back-up options, high-altitude configurations available. Call for more information.

Other Features
- Five multicolored status LEDs, eight user-programmable LEDs, and remote reset; two 32-bit counters can broadcast interrupts to all CPUs simultaneously; eight general purpose 32-bit counters; two interprocessor doorbell interrupts per CPU
- Watchdog timer and TOD clock/calendar
- Five general purpose DMA controllers
- 4 bits discrete I/O through P0 connector

Block diagram: Backside L2 Cache 2MB — CPU-X 7410; Backside L2 Cache 2MB — CPU-Y 7410; SDRAM On-board (64-512MB); Heatsink Frame; RAM Bus; Mailboxes; RPIC Interrupt Controller; ESD Protect; Reset Sw/LEDs; PowerPC Bus; 100/133MHz PowerPC System Controller GT-64260; ROM Bus; Async. Serial Ports (2); DROM Service Conn.; DROM Module 8MB Flash; 32-bit Flash, Boot* Fixed 32MB Window; 32-bit Flash, User Space Selectable 32MB Window (3 max.); Clk/Cal/ NVRAM (128KB); General Purpose Port; Sync/Async Serial (MPSC); Local PCI Bus, 3.3V 64-bit @ 33/66MHz; Local PCI Bus, 32-bit @ 33MHz; * Boot Flash is located in the 2nd (fixed) half of a 64MB Flash space; PMC Slot #2; Bi-Dir. Buffer; PMC Slot #1; RS-422 Line Drivers & Receivers; Fast Ethernet Controller Optional; IEEE 1394a Optional; PCI-VME Bridge Universe II; 4 ea. GPIO Lines; 2 ea. Sync/Async Serial Ports; 2 ea. 1394a Ports; VME Transceivers; P0 Conn.; P2 Conn.; SBC P1 & P2; P0; P2; P1; VMEbus; 01-017 5