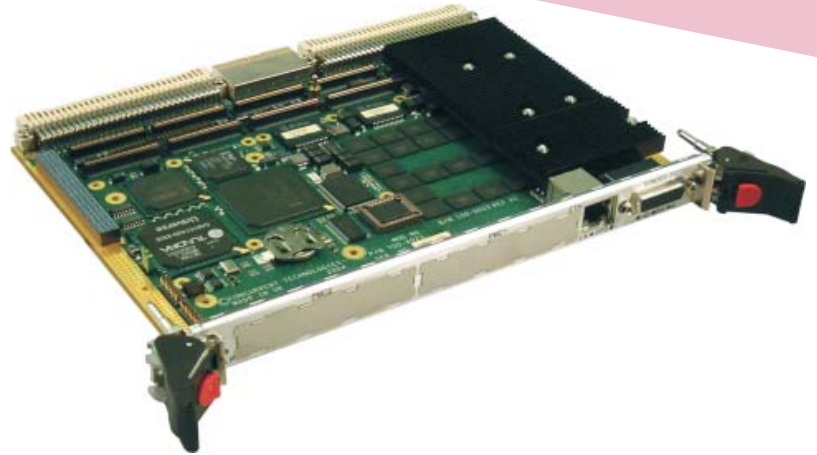


## Intel® Pentium® M Processor Dual PMC Embedded Controller



### APPLICATIONS

The VP 315/02x-U is a PC-compatible high performance, high functionality VME processor board supporting the 1.6 GHz Intel® Pentium® M Processor. This single slot board features 2 PMC sites, 1 Gbyte of soldered DDR ECC SDRAM and a variety of interfaces including an option for an on-board Hard Disk Drive, CompactFlash™ or Hitachi GST MicroDrive™. The VP 315/02x-U is suitable for a range of demanding applications within the defense,

industrial control, telecoms, telemetry, scientific and aerospace markets. To simplify the board's integration many popular industry standard operating systems are supported. The board is plug compatible with the VP 317/02x-U and VP 315/022-Rx families. The VP 315/02x-U is the RoHS compliant version of the VP 315/02x family.

### HIGHLIGHTS

- 1.6 GHz Intel Pentium M Processor:
  - 64 Kbytes L1 cache
  - 1 Mbyte L2 cache
  - no CPU fan needed; low power processor
- 1 Gbyte of 266 MHz DDR ECC SDRAM
- High performance EIDE interfaces with optional on-board disk drive or optional dual CompactFlash or MicroDrive carrier (in a single slot)
- Serial ATA interface:
  - up to 150 Mbytes/s transfer rates
- 2 x PMC module interfaces (32/64-bit and 33/66 MHz):
  - expansion carrier for 2 more PMC sites
- 2 x 10/100/1000 Mbps Ethernet interfaces:
  - Gigabit Ethernet for VME64x backplane (VITA 31.1)
- 64 Mbytes of Application Flash EPROM
- 512 Kbytes of BIOS Flash EPROM
- High resolution graphics interface
- Keyboard and mouse interfaces
- Up to 3 x serial channel interfaces
- Up to 2 x Universal Serial Bus (USB 2.0) interfaces
- Long duration timer, watchdog timer
- VME-64 interface supporting A32/A24/A16/D64/D32/D16/D8(E0), MBLT64 and with support for fast hardware byte-swapping
- Single slot
- Other versions available, see separate datasheets:
  - 1.8 GHz or 1.4 GHz processor: VP 317/02x-U
  - ruggedized air cooled: VP 315/022-RA
  - ruggedized conduction cooled: VP 315/022-RC
- Support for VxWorks®, Linux®, Windows NT®, Windows® 2000, Windows® XP Embedded, Windows® XP, RTX®, QNX®, Solaris™, LynxOS® and MS-DOS®

## Central Processor

- Intel® Pentium® M Processor operating at 1.6 GHz:-
  - uses µFC-PGA 478 (micro Flip-Chip Pin Grid Array) package
  - 64 Kbytes of primary (Level 1) on-die cache
  - 1 Mbyte of secondary (Level 2) on-die cache
  - 400 MHz Front Side Bus (FSB)
- 1.8 GHz or 1.4 GHz processor versions available; see VP 317/02x-U datasheet
- no CPU fan
- utilizes 64-bit Intel® 855GME chipset:-
  - supports 400 MHz bus frequency
- utilizes Intel® 6300ESB I/O Controller Hub
- ITP debug port

## DRAM

- 1 Gbyte of 266 MHz DDR ECC SDRAM soldered on the board
- single bit error correction; double-bit error detection
- accessible from processor or VME bus

## EIDE Hard Disk Interfaces

- supports up to Ultra-DMA 100 for high performance drives
- two channels (primary and secondary)
- primary channel is accessible via P2 :-
  - connects to an optional hard disk/flash/CD-ROM drive board
- secondary channel can be used for on-board disk drive or dual CompactFlash/MicroDrive Type II drive carrier

## Serial ATA Interface

- Serial ATA (SATA) interface:-
  - one SATA port via P0
- supports up to 150 Mbytes/s transfer rates

## Ethernet Interface

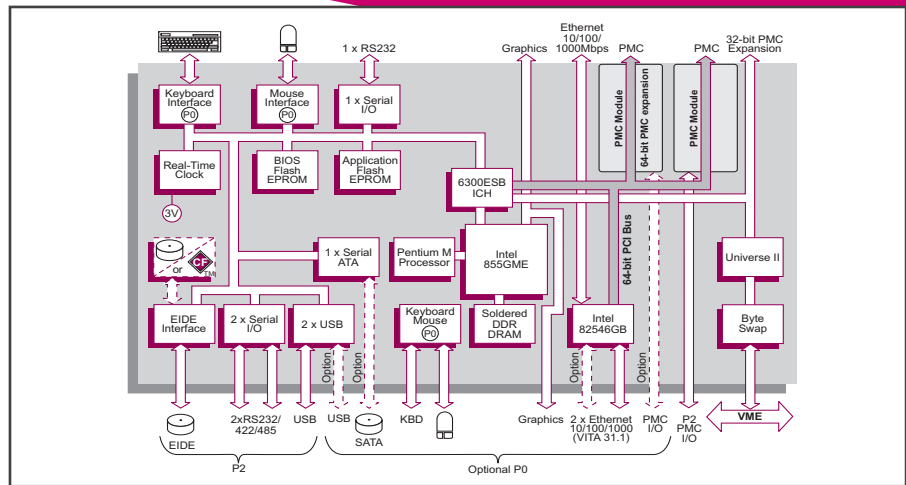
- implemented by Intel® 82546GB LAN Controller via 64-bit/66 MHz PCI bus
- two interfaces supporting 10Base-T, 100Base-TX, 1000Base-T:-
  - both interfaces accessed via optional P0
  - one channel switchable to front panel RJ45
- support for VITA 31.1:-
  - Gigabit Ethernet for VME64x backplanes

## Graphics Interface

- implemented by the Intel® 855GME GMCH host bridge providing:-
  - resolutions up to 2048 x 1536 @75Hz
  - up to 16M colors
- accessed via a 26-way high-density connector on front panel
- analog graphics interface supported via P0

## PMC Interface

- 2 x PMC sites and for both sites:-
  - I/O via front panel, via P2 for site 1 (see Note 2) and optionally via P0 for site 2
  - 32/64-bit and 33/66 MHz PCI operation
  - 3.3V PCI signaling
- expansion to optional dual PMC carrier board:-
  - using expansion connector (32-bit/33 MHz)
  - or using one baseboard PMC site (64-bit/66 MHz)



## Serial Interface

- 3 x serial channel interfaces
- 16550 compatible UART
- front panel access:-
  - 1 x RS232 via 26-way high density connector
- rear panel access (see Note 2):-
  - 2 x RS232/422/485, both via P2

## Flash EPROM

- 64 Mbytes Application Flash EPROM
- 512 Kbytes of BIOS Flash EPROM

## Other Peripheral Interfaces

- PC-compatible Real Time Clock (Year 2000 compliant)
- 2 x USB 2.0 interfaces, one via P2 connector and one via optional P0
- keyboard and mouse interfaces accessed via a 26-way high-density connector on front panel and optionally via P0 connector
- watchdog timer
- 1 x 32-bit Long Duration Timer with processor interrupt capability

## Software Support

- support for VxWorks, Linux, Windows NT, Windows 2000, Windows XP Embedded, Windows XP, RTX, QNX, Solaris, LynxOS and MS-DOS

## Firmware Support

- Phoenix® BIOS
- comprehensive Power-On Self-Test (POST)
- LAN boot firmware included

## VME Interface

- implemented by Tundra® Universe II™ device
- VME Master/Slave
- A32/A24/A16/D64/D32/D16/D8(E0)/MBLT64
- fast hardware byte swapping
- auto system controller detect
- full interrupter / interrupt handler support
  - bus error interrupt hardware

## Safety

- PCB (PWB) manufactured with flammability rating of 94V-0

## Electrical Specification

- +5V@4.1A (typical at 1.6 GHz with 1 Gbyte DRAM)
- +12V@0A; -12V@0A
- +12V and -12V routed to both PMC sites and PMC expansion connector

## Environmental Specification

- operating temperatures:-
  - 0°C to +55°C (N-Series: 1.6 GHz)
- 10% to 90% Relative Humidity, non condensing (operating):-
  - K-Series includes humidity sealant
- -40°C to +85°C (storage)
- 10% to 90% Relative Humidity, non condensing (storage)
- ruggedized versions available, see separate datasheets:-
  - air cooled: VP 315/022-RA
  - conduction cooled: VP 315/022-RC

## Mechanical Specification

- 6U form-factor
- single VME slot - front panel width 0.8inch (20.3mm)
- utilizes 160-way DIN connectors for P1 and P2:-
  - compatible with 96-way DIN connectors
- optional P0 (for VME64x backplanes only)
- shock:
  - 20g, 11ms, ½ sine (operating);
  - 30g, 11ms, ½ sine (non-operating)
- vibration:
  - 5Hz-2000Hz at 2g, 0.38mm peak displacement (operating);
  - 5Hz-2000Hz at 5g, 0.76mm peak displacement (non-operating)

**Note 1:** selected variants are supplied with VME64x handles

**Note 2:** 5-row backplane is required to provide P2 access to 2 x RS232/422/485 interfaces and full 64-bit PMC I/O for PMC site 1

## ORDERING INFORMATION

Order Number	Product Description (Hardware)
VP 315/022-xyU	1.6 GHz Pentium M with 2 PMC sites
AD CP1/DR1-z2	2.5 inch Hard Disk Drive Assembly
AD 200/001-01	Dual CompactFlash/MicroDrive Carrier
AD CR2/PMC-zzU	PMC Carrier boards for 2 PMC modules
CB 26D/124-00	VGA, Keyboard, Mouse, RS232 connector cable
DS MSS/001-zzU	Board with HDD, CD-RW/DVD, CompactFlash

Replace the order number suffix (-xy) with selections from the following:

Where x = P2/P0 Breakout combinations	Where y = memory size
1- 3-row I/O, P2= PMC1 32-bit, EIDE, USB	1 - reserved
2- 5-row I/O, P2= PMC1 64-bit, EIDE, USB, 2xRS232/422/485	2 - 1 Gbyte
3- 5-row I/O, P2 as x=2; P0= PMC2 64-bit, 1xGigE, see ++	
4- 5-row I/O, P2 as x=2; P0= PMC2 32-bit, VITA 31.1, USB, 1xSATA see ++	

++ when x=3 or 4 then Keyboard, Mouse, VGA available