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VME

# VP B1x/msd

## N, E, K - Series

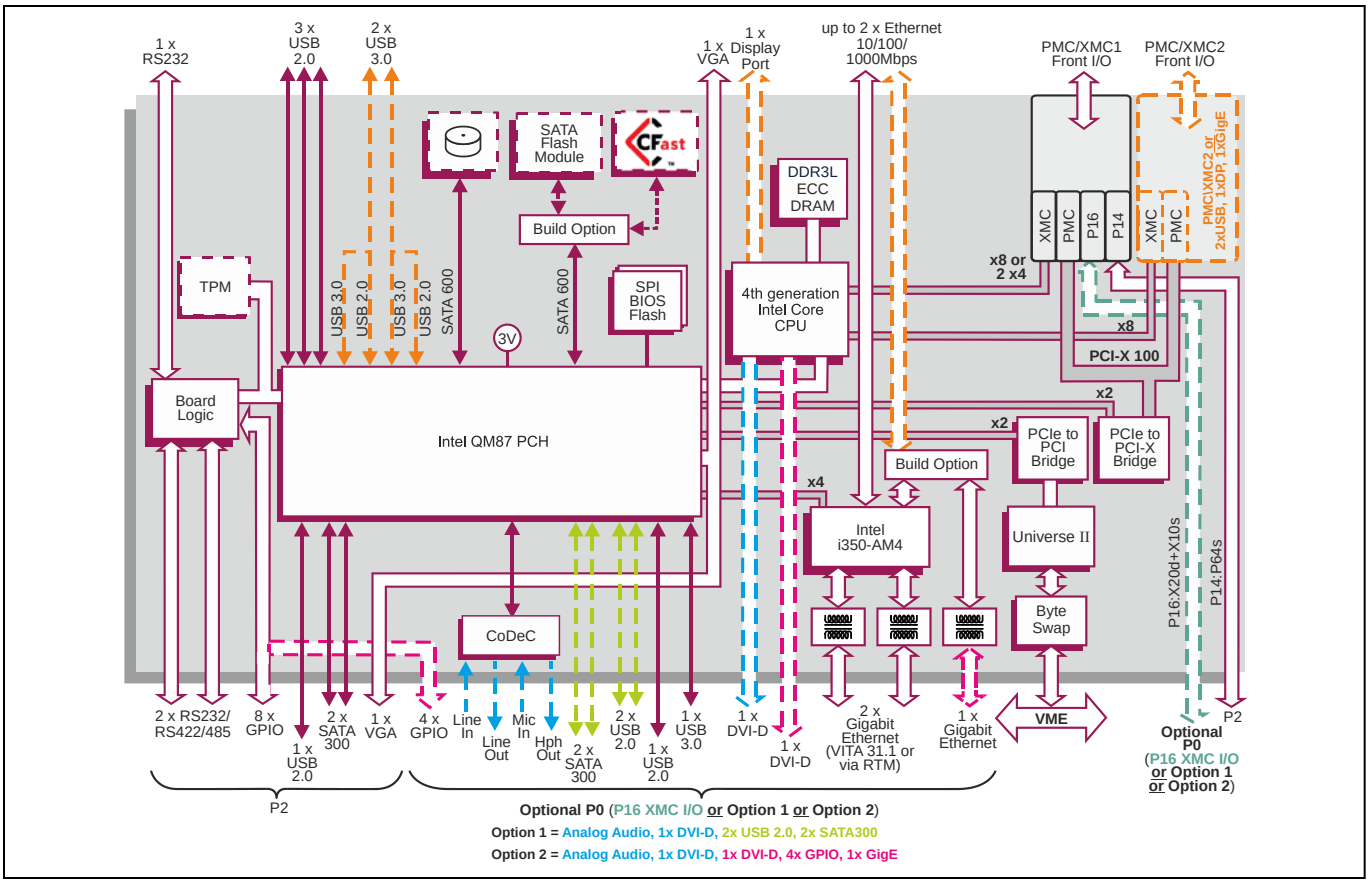
# VME board based on 4th Generation Intel® Core™ i7/i5 processor

## Key Features

VP B1x/msd is a high performance, flexible VMEbus board designed for long life-cycle applications in the defense, industrial, scientific and aerospace markets.

- Quad and dual-core processor variants available to match application performance and power requirements
- Up to 32 Gbytes DRAM with built in error correction for reliable operation
- Dual or single PMC/XMC sites for local expansion
- Wide variety of built in I/O interfaces including SATA, USB, Ethernet, graphics and serial
- On board solid state disk options for operating system, application and data use
- Off the shelf board support packages available for Linux®, Windows®, VxWorks® and Solaris™
- Compatible with legacy VP 92x/01x and VP 92x/41x families







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# Specification

## VME Embedded Computer Board

- air-cooled 6U VPX™ computing board utilizing the 4th generation Intel® processor
- single or dual XMC sites (build options)
- optional Rear Transition Module (RTM)
- rugged conduction-cooled (RC-Series) versions:
  - → see VP B1x/0sd-RC datasheet

## Central Processor

- 4th generation Intel® Core™ processor:
  - → 4-core Intel® Core™ i7-4700EQ processor up to 3.4 GHz, 6M Last Level cache
  - → 2-core Intel® Core™ i5-4410E processor 2.9 GHz, 3M Last Level cache
  - → 2-core Intel® Core™ i5-4422E processor up to 2.9 GHz, 3M Last Level cache
  - → Intel® Advanced Vector Extensions 2 (AVX2)
  - → Intel® AES New Instructions (AES-NI)
- utilizes the Intel® QM87 Platform Controller Hub

## DRAM

- up to 32 Gbytes soldered DDR3L-1600 ECC DRAM (16 Gbytes maximum, 2-core processor):
  - → single bit error correction
  - → peak bandwidth of 25.6 Gbytes/s
  - → dual channel architecture
- accessible from processor or VME bus

## PMC/XMC Interfaces

- single or dual PMC/XMC interfaces
- PMC/XMC I/O site 1:
  - → front panel I/O
  - → PMC P14 rear I/O (P64s) via P2
  - → XMC P16 rear I/O (X12d+X8d+X10s) (this build option replaces build option 1 & 2) via optional P0
- PMC/XMC I/O site 2 (or additional front I/O):
  - → front panel I/O: option for PMC/XMC site or extra front panel I/O connectors (DisplayPort®, USB 3.0/2.0 and Gigabit Ethernet interfaces)
  - → rear I/O: none
- PMC PCI/PCI-X interfaces:
  - → 32/64-bit, 33/66 MHz PCI bus
  - → 64-bit PCI-X bus up to 100 MHz
  - → 5V and 3.3V signaling
- XMC PCI Express interfaces:
  - → both support x8 PCI Express (Gen 1, Gen 2)
  - → XMC site 1 can also support 2 x4 PCI Express
  - → both powered from 5V supply

## Ethernet Interfaces

- up to 2 x Gigabit Ethernet interfaces via front panel RJ45 connectors:
  - → 1 x interface via front panel or via P0
- up to 3 x Gigabit Ethernet interfaces via optional P0:
  - → 1 x GigE via P0 (build option 2) or as an option via front panel (disables PMC/XMC site 2)
  - → 2 x GigE via P0 to optional RTM or utilize VITA 31.1 (Gigabit Ethernet for VME64x backplanes)
  - → on-board magnetics (50V isolation via P0)
- Ethernet implemented by an Intel® I350-AM4 LAN controller via a x4 PCI Express® port (Gen 2)

## Mass Storage Interfaces

- up to 4 x external SATA300 interfaces:
  - → 2 x SATA via P2
  - → 2 x SATA (build option 1) via optional P0
- 2 x SATA600 support for optional on-board:
  - → SATA Flash or CFast™ module (a build option)
  - → 2.5-inch SATA drive (disables PMC/XMC site 2)

## Serial Interfaces

- 3 x serial channel interfaces:
  - → 1 x RS232 accessed via 26-way high density connector on front panel
  - → 2 x RS232/422/485 accessed via P2
- 16550 compatible UARTs

## Stereo Audio

- Intel® High Definition Audio interface with CoDeC (build options 1 & 2) via optional P0:
  - → line level stereo input and output
  - → line level microphone input
  - → headphone output

## Graphics Interfaces

- 1 x VGA interface via front panel 26-way high-density connector or via P2:
  - → up to 1920 x 1200 @ 16M colors
  - → switchable between front panel and P2
- 1 x DVI-D interface (build option 1) or 2 x DVI-D interfaces (build option 2) via optional P0:
  - → up to 1920 x 1200 @ 16M colors
- option for DisplayPort interface via front panel (disables PMC/XMC site 2):
  - → resolutions up to 2560 x 1600 @ 60 Hz
- support for Microsoft® DirectX 11.2/12 on Windows® and OpenGL 4.3 on Linux®

## Other Peripheral Interfaces

- PC Real Time Clock
- watchdog timer; 32-bit Long Duration Timer with processor interrupt ability; chipset timer
- up to 5 x USB ports via the front panel I/O:
  - → 3 x USB 2.0 ports accessed via a 26-way high-density connector
  - → option for 2 x USB 3.0/2.0 ports accessed via USB connectors (disables PMC/XMC site 2)
- up to 4 x USB ports accessed via optional P0:
  - → 1 x USB 2.0 port and 1 x USB 3.0 port
  - → 2 x USB 2.0 ports (build option 1)
- 1 x USB 2.0 port via P2
- 8 x GPIO signals via P2 plus 4 x GPIO signals (build option 2) via optional P0:
  - → supports processor interrupt capability
- Write Protect (build option 2) and External Reset (build option 2) via optional P0

## Flash EPROM

- 8 Mbytes of BIOS Flash EPROM, dual devices:
  - → main/backup device enabled via switch

## Software Support

- support for Linux®, Windows®, VxWorks® and Solaris™

## Firmware Support

- Insyde® Software InsydeH20™ BIOS:
  - → includes Compatibility Support Module
- based upon Intel® Platform Innovation Framework for EFI
- optional Fast Boot solution based on the Intel® Firmware Support Package (Intel® FSP)
- LAN boot firmware included

## Optional Built-In Test (BIT) Support

- Power-on BIT (PBIT), Initiated BIT (IBIT), Continuous BIT (CBIT)

## Optional Board Security Packages

- Trusted Platform Module (TPM):
  - → build option for either TPM 1.2 or TPM 2.0
- option for Sanitization Utility Software Package
- proprietary board-level security features

## Safety

- PCB (PWB) manufactured with flammability rating of UL94V-0

## VME Interface

- P1 and P2 connectors compatible with VME64x
- implemented using IDT® Universe™ II device
- VME Master/Slave
- A32/A24/A16/D64/D32/D16/D8(EO)/MBLT
- fast hardware byte swapping
- auto system controller detect
- full interrupter / interrupt handler support
- bus error interrupt support

## Electrical Specification

- +5V @ 8.5A (typical with Intel Core i7-4700EQ processor and 16 Gbytes DRAM
- +12V @ 0.0A; -12V @ 0.0A; 3.3V not required
- +12V and -12V routed to both PMC/XMC sites

## Environmental Specification

- operating temperatures:
  - → 0°C to +55°C (N-Series)
  - → -25°C to +70°C (E-Series: selected processor)
  - → -40°C to +70°C (K-Series: selected processor)
  - → -40°C to +85°C (K-Series: selected processor)
- non-operating temperature: -40°C to +85°C
- 5% to 95% Relative Humidity, non-condensing:
  - → K-Series includes humidity sealant

## Mechanical Specification

- 6U form-factor
- single slot, width 0.8-inch (20.3mm)
- utilizes 160-way connectors for P1 and P2
- optional P0 connector
- IEEE 1101.10 VME64x handles, alternatively with option for VME32 handles
- shock: 20g, 11ms, ½ sine
- vibration: 5Hz-2000Hz at 2g, 0.38mm peak displacement

## Legacy Board Compatibility

- VP B1x/msd rear plug compatibility with the popular VP 92x/01x and VP 92x/41x families

Please contact your local Concurrent Technologies sales office for further details on board build options and accessories.

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