3U VPX-REDI™ board with 40 Gigabit Ethernet, based on Intel® Xeon® Processor D-1500 Family

Key Features

TR H4x/3sd-RCx is a compute intensive rugged server board. It has been developed in accordance with a proposed VITA 65.1 profile that is in alignment with the SOSA™ Technical Standard. It features a processor with 12-cores, large memory capacity, local storage and support for virtualization.
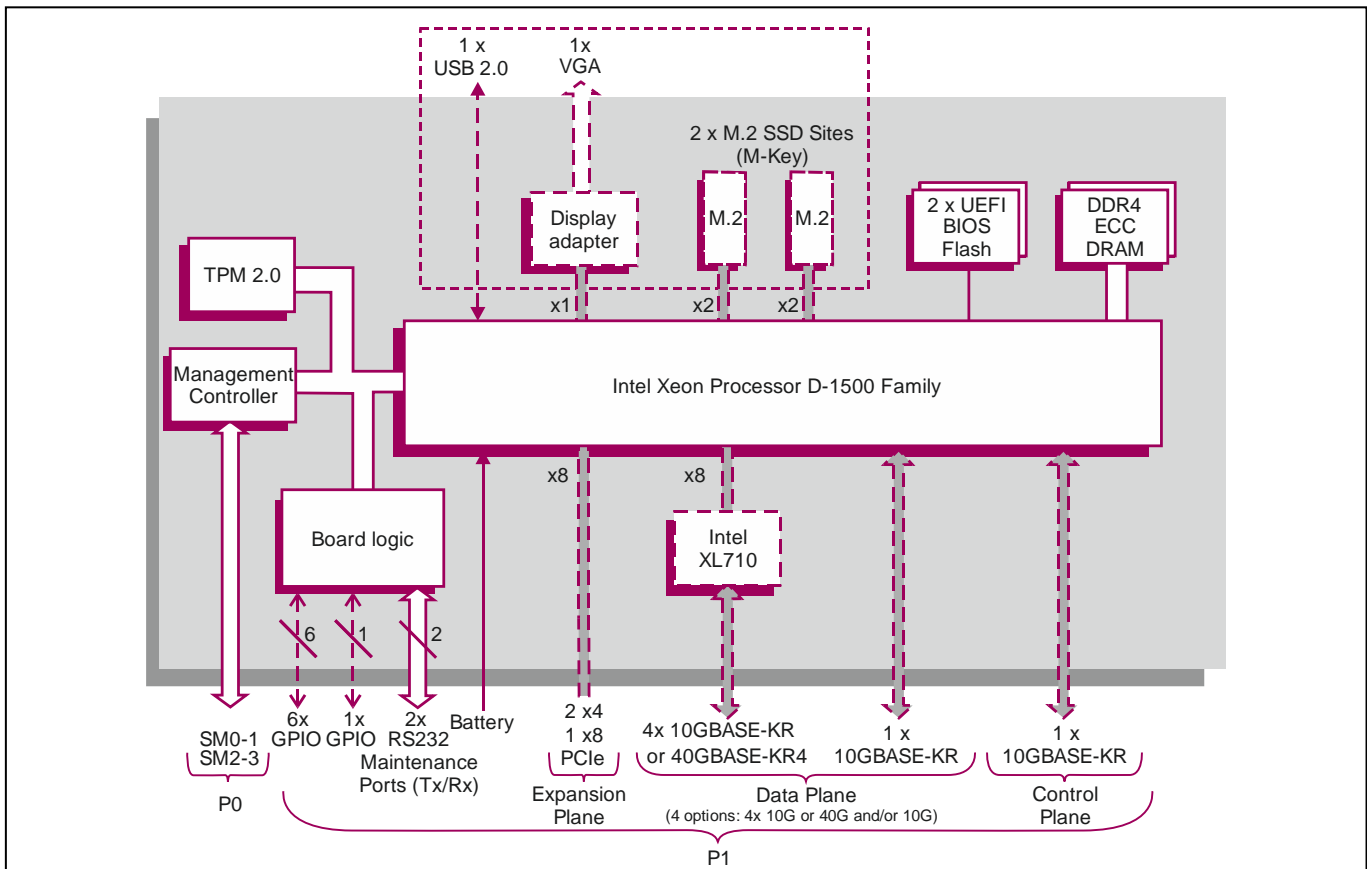
- Intel® Xeon® Processor D-1500 Family
- Up 64 Gbytes DDR4 memory for server grade applications
- Direct attached storage option:
  - → up to two M.2 modules
- 40 Gigabit and 10 Gigabit Ethernet connectivity
- PCI Express® connections for point to point expansion
- Front VGA and USB ports for ease of setup

Figure 1: Without 2LM Type 1 Covers

Figure 2: With M.2 Carrier
and without 2LM Type 1 Covers

CONCURRENT TECHNOLOGIES

VPX-REDI Embedded Computer Board

- conduction-cooled 3U VPX-REDI computing board utilizing the Intel® Xeon® processor D-1500 family
- OpenVPX™ profile supporting 10GBASE-KR and 40GBASE-KR4 on Data Plane compatible with:
  → SLT3p-PAY-1F1U1S1S1U1U2F1H-14.6.11-4
  → MOD3p-PAY-1F1U1S1S1U1U2F1H-16.6.11-11
  → based on VITA 65.0-2019 and VITA 65.1-2019

Central Processor

- 12-core Intel® Xeon® processor D-1559:
  → 18 Mbytes Cache, 1.50 GHz
- Intel® Advanced Vector Extensions 2
- server class processing cores in a System-on-a-Chip package

DRAM

- up to 64 Gbytes soldered DDR4 ECC DRAM:
  → single bit error correction and dual bit error detection
  → peak bandwidth of up to 29 Gbytes/s
  → dual channel architecture
- accessible from processor or VPX Expansion Plane

Maintenance Serial Ports

- 2 x maintenance ports via P1:
  → supports RS232 Tx/Rx signals
  → 16550 compatible UARTs

Mass Storage Interfaces

- optional M.2 Carrier Module supporting:
  → 2 x M.2 sites
  → 2242 format modules (with option for self-encryption)
  → x2 PCI Express® (PCIe®)interface (M-key)
  → NVM Express® (NVMe™) logical device interface
  → NVMe 1.3 compatible
  → optional console interface (see below)

Graphical User Interface

- for board commissioning an optional on-board console interface is available via a forward facing 16-way I/O connector:
  → supported on the M.2 Carrier Module
  → VGA interface (up to 1920 x 1080 @ 60 Hz)
  → USB 2.0 port for user interface
  → separate adapter cable available with standard VGA and USB connectors

Other Peripheral Interfaces

- PC RTC, long duration timer, watchdog timer
- options: up to 1 x GPIO or up to 7 x GPIO signals via P1

VPX Control Plane, Ethernet

- option for VPX Control Plane interface supporting:
  → 1 x 10GBASE-KR

VPX Data Plane, Ethernet

- options for VPX Data Plane interface supporting:
  → 1 x 10GBASE-KR and/or 1 x 40GBASE-KR4
  → or 1 x 10GBASE-KR and/or 4 x 10GBASE-KR
- 1x 40GBASE-KR4 / 4x 10GBASE-KR interface implemented by Intel® Ethernet Controller XL710-BM1 via x8 PCI Express Gen 3 port

VPX Expansion Plane, PCI Express

- option for PCIe VPX Expansion Plane interface (VITA 65) supporting:
  → configurable 1 x8 or 2 x4 PCIe ports
- compatible with OpenVPX module profiles
- PCIe interface supports Gen 1, Gen 2 and Gen 3
- 4 channel DMA engine for fast data block moves
- ports can be configured by the VPX Switch Configuration Tool, see separate datasheet

System Management

- VITA 46.11 IPMC on board controller:
  → SM0-1 and SM2-3
  → CPU temperature and voltage monitor accessed via System Management interface
- option for Tier 1 Chassis Manager

Board Security Features

- Trusted Platform Module (TPM 2.0)
- option for Sanitization Utility Software Package
- option for proprietary board-level security features
- Data Plane, Control Plane, Expansion Plane and GPIO can be supplied physically disconnected for domain separation purposes

Optional Built-In Test (BIT) Support

- Power-on BIT, Initiated BIT, Continuous BIT

Software Support

- supports Linux® and Windows®
- for other operating systems contact Concurrent Technologies for further information, e.g. VxWorks®
- options available for enhanced PCIe drivers

Firmware Support

- UEFI boot firmware (BIOS):
  → UEFI 2.4 support
  → includes Compatibility Support Module
  → implements Secure Boot
- LAN boot firmware included

Non-Volatile Memory

- 16 Mbytes of BIOS Flash EEPROM, dual devices for redundancy

Safety

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

Electrical Specification

- typical current consumption for 12-core processor (1.50 GHz), 64 Gbytes DRAM, with 40GBASE-KR4:
  → +12V VS1 @ 3.6A
  → +3.3V AUX @ 0.2A

Environmental Specification

- conduction-cooled (VITA 48.2)
- operating temperature at card edge:
  → VITA 47 Class CC4, -40°C to +85°C
- non-operating temperature:
  → VITA 47 Class C4, -55°C to +105°C
- operating altitude:
  → -1,000 to 50,000 feet (-305 to 15,240 meters)
- 5% to 95% Relative Humidity, non-condensing

Mechanical Specification

- 3U VPX form-factor (VITA 46.0, VITA 48.0): 3.9 inches x 6.3 inches (100mm x 160mm)
- slot widths (VITA 48.0):
  → 0.8 inch VPX-REDI Type 2, RCT-Series
  → 0.85 inch VPX-REDI Type 1, RCS-Series, Type 1 Two Level Maintenance (2LM) (VITA 48.2)
  → 1.0 inch VPX-REDI Type 1, RCR-Series Type 1 Extended Covers Two Level Maintenance (VITA 48.2)
- connectors to VITA 46.0 for P0 and P1
- captive screws available to secure front handles
- operating mechanical:
  → shock - VITA 47 Class OS2, 40g
  → random vibration - VITA 47 Class V3, 0.1g²/Hz

Related Products

- Compatible 3U VPX boards include TR XMC/m11-RCx XMC Carrier and TR AEx/3sd-RCx A.I. Accelerator Engine. 3U VPX Development systems are also available. Contact Concurrent Technologies for more details.

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