

## 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.

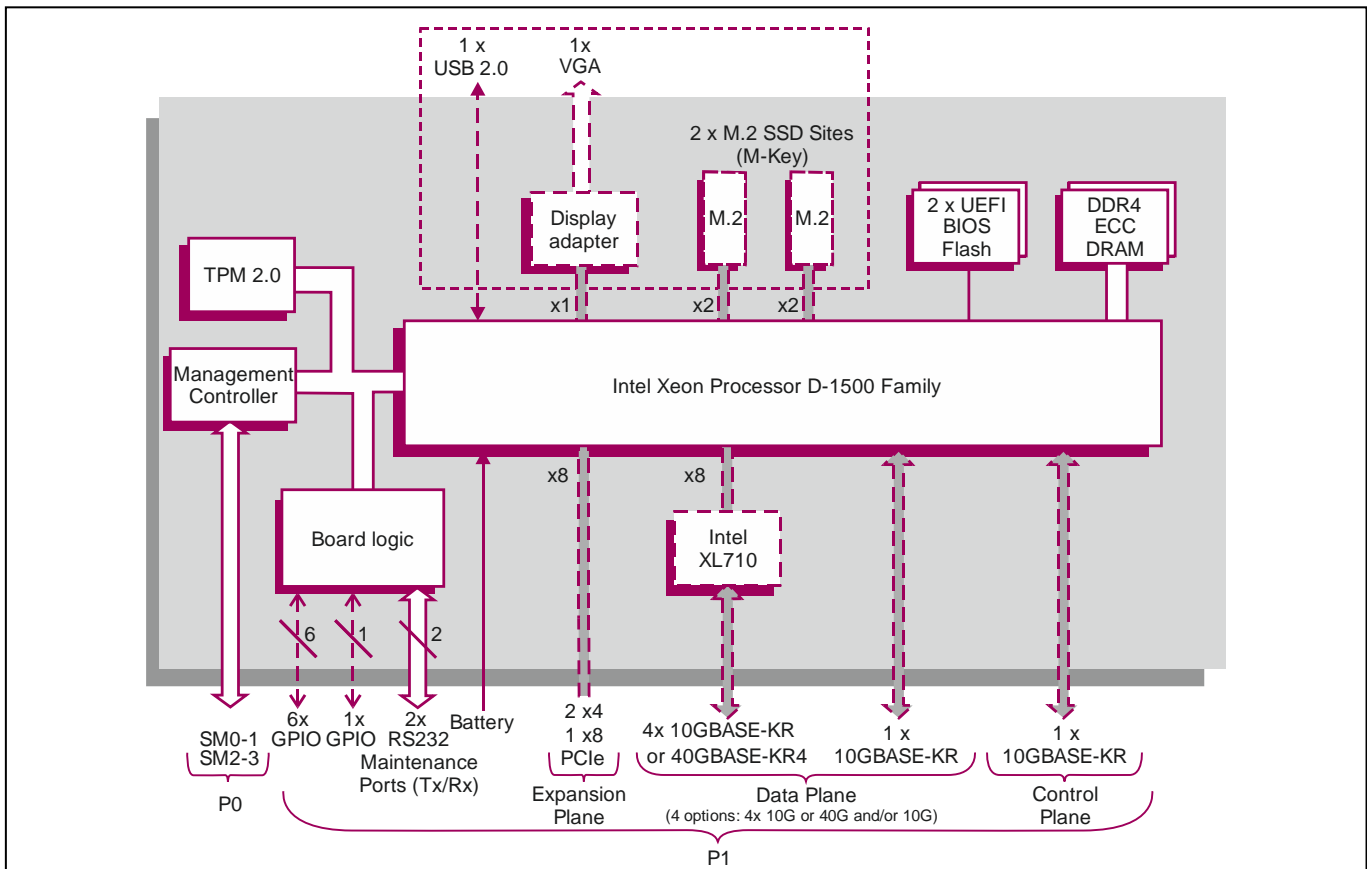
- Intel® Xeon® Processor D-1500 Family
- Up to 64 Gbytes DDR4 memory for server grade applications
- Direct attached storage option:
  - up to two M.2 modules
- 40 Gigabit and 10 Gigabit Ethernet connectivity
- PCI Express® connections for point to point expansion
- Front VGA and USB ports for ease of setup



Figure 1: Without 2LM Type 1 Covers



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



## 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)
  - NVMe 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, 0.1g<sup>2</sup>/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.