

**DEFENSE CATALOG**





## AN INTERNATIONAL GROUP AT YOUR SERVICE

Eurotech is a leading technology Group with a global presence spanning Europe, the USA and Asia.

We integrate hardware, software, services and expertise to deliver embedded computing platforms and sub-systems to leading OEMs, system integrators and enterprise customers for successful and efficient deployment of their products and services. Our customers rely on us to simplify their access to state-of-art embedded technologies so they can focus on their core competencies.

Our efforts are centered on providing much more than great hardware: we have built an ecosystem of interoperable components, software and services that enable consistent and quick development of end user projects.

We recognize and target the most critical success factors, such as:

- Time to market
- Ruggedness
- Compliance to industry standards and certifications
- Reliability and long term availability
- Local and global support

## DEFENSE > AEROSPACE CATALOG

Eurotech serves a large, diverse group of military and commercial prime and subcontractors developing intelligent, rugged and ruggedized computing and communications electronics for harsh field environments, like those typical of military, aeronautics, transportation, energy and telecommunications applications. Because of the broad applications for embedded computing technology, Eurotech's products can be found on land, air, and sea, performing system monitoring, datalogging, diagnostics, communication, and avionics subsystem control. Typical customers outsource their complete computer hardware platform to Eurotech, along with BIOS and device driver support. This partnership enables customers to focus on their core competencies or end application software development, speeding up Time-to-Market and allowing substantial savings.

Eurotech's Commercial-Off-The-Shelf (COTS) tactical mission processors, network routers, Ethernet switches and embedded board-level products provide highly reliable command, control, computing and communication (C4) capabilities for situational awareness and mobile data processing in airborne, ground vehicle, and shipboard deployments.

Eurotech also specializes in the rapid design and manufacturing of rugged embedded computing and communication subsystems for Size, Weight, and Power (SWaP), with certifications such as AS9100.

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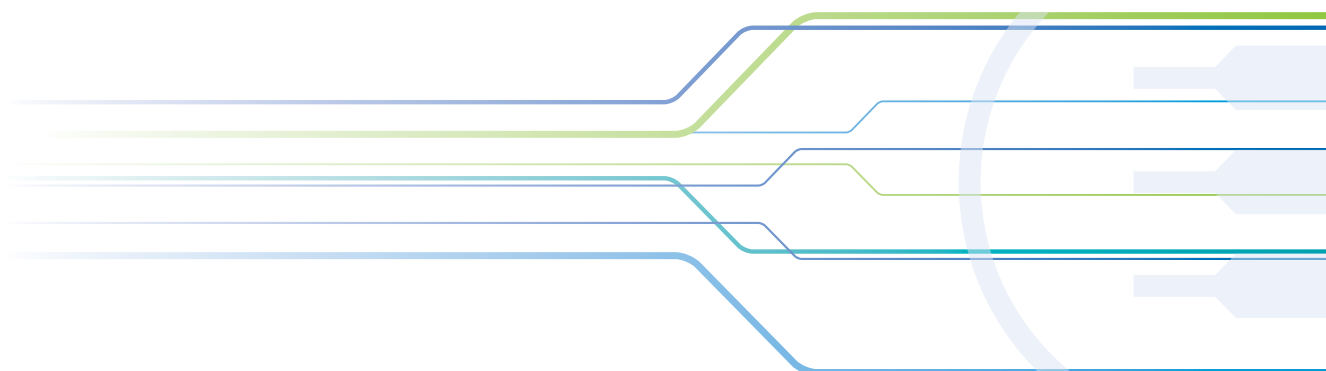
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# DuraHPC 5-1

RUGGED HIGH PERFORMANCE EMBEDDED COMPUTING SUBSYSTEM

## FEATURES



- Field Deployable 167 GFlops HPC
- Rugged HPC Cluster Capable with Infiniband or 10 Gigabit Ethernet Interconnects
- Dual 6-Core Xeon Processors
- External or Integrated Liquid Cooling
- Sealed MIL-DTL-38999 Connectors
- 1U / 2U Configurations

The DuraHPC 5-1 is a field-deployable, rugged High Performance Embedded Computer (HPEC) designed for computationally intensive processing requirements in extreme military, aerospace, and industrial applications. Delivering up to 167 GFlops of performance, the DuraHPC 5-1 features multi-core Intel Xeon server-class processors, an optional integrated liquid cooling subsystem, and a shock/vibration-resistant solid state disk (SSD). Leveraging the HPC blade architecture of the Aurora supercomputer but in a ruggedized format, the DuraHPC 5-1 features an ingress-protected aluminum chassis with MIL-DTL-38999 connectors designed to comply with MIL-STD-810G environmental and MIL-STD-461F EMI/EMC conditions. Each unit features low-latency Infiniband interconnectivity (or optional 10 Gigabit Ethernet) to support rugged parallel computing capabilities when more than one unit is connected together in a cluster.

## BENEFITS



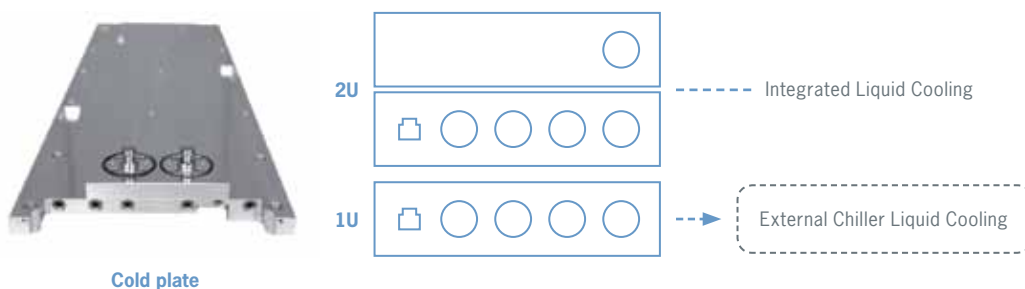
- High performance: Up to 167 GFlops with dual 6-core Intel Xeon 5600 processors @ up to 3.46 GHz clockspeed, up to 24 GB soldered DDR3 RAM, high-speed Infiniband interconnectivity
- HPC cluster capable: multiple units can be connected together to form powerful and ruggedized cluster computer solutions to solve demanding computational challenges
- Liquid cooled: internal cold plate with aerospace-grade inflow/outflow connectors for water circulation; computer integrates with external heat exchanger/chiller or self-contained liquid cooling subsystem
- Rugged mechanical design: designed for MIL-STD-810G thermal, shock, vibration conditions

TACTICAL HPC COMPUTING  
VETRONICS / NAVRONICS  
ENERGY EXPLORATION

COMMAND AND CONTROL  
C4ISR PLATFORM UPGRADES  
HOMELAND SECURITY

## APPLICATIONS

**Example:** DuraHPC 5-1 cooled with cold plate and circulated water from external/attached chiller/heat exchanger



GENERAL SPECIFICATIONS

<b>Processor</b>	Performance: Up to 167 GFlops CPU: 2x Intel Xeon 5600 Processors (Westmere), 6 Cores/12 Threads per Processor, 12MB Intel Smart Cache, 64-Bit, Up to 3.46 GHz Clockspeed (3.73 GHz w/ Intel Turbo Boost 2.0)
<b>Memory / Storage</b>	DRAM: 12 / 24 GB of DDR3 – Three Channels Memory Connected to Each CPU, Soldered Onboard for Signal integrity, Faster Memory Access SSD: 80 GB Capacity (Up to 256 GB Supported) SATA 1.8" Solid State Disk (SSD), Vibration/ Shock Proof, High Data Retention
<b>Scalability</b>	Cluster Computing Node Capable – Integrated Mellanox Infiniband ConnectX2 Device Provides Low-Latency Infiniband Connectivity to Implement Switched Network and Link to High Performance Data Storage 1U/2U Computing Server Modules Can Be Easily Grouped in 19" Racks
<b>Software</b>	Operating System: Linux, Windows Server or Windows HPC Server Compatible with Industry Standard Cluster Managers, Schedulers, File Systems, and Other HPC Tools
<b>Connectivity &amp; I/O</b>	1x Infiniband, <2µs latency (Special Configuration up to QDR 40Gbps) 1x 10 Gigabit Ethernet Port (Special Order Option Only) 1x 10/100 Ethernet Management Port 1x EIA RS232 Serial Port 1x Analog Video Output (Up to 1600 pixels x 1200 pixels) 2x USB 2.0 Ports
<b>Physical</b>	Chassis: Aluminium Alloy, Corrosion Resistant, Black Anodize Connectors: MIL-DTL-38999, Industrial RJ-45 Installation: Compatible with 19" Rack Mount Weight: 8.35 Kg (~ 18.41 lbs) Computer; ~ 7.15 Kg (15.16 lbs) Chiller Dimensions (HxWxL): Computer- 4.45 x 22.5 x 75cm / ~1.34" x 8.86" x 29.53"; Computer + Cooler: 8.9 x 22.5 x 70cm / ~3.50" x 8.86" x 29.53"
<b>Thermal Management</b>	Internal Cold Plate Fixed to Motherboard Circulates Water Through Sealed Channels using Aerospace-Grade Inflow/Outflow Connectors Self-Contained 1U Liquid Cooling Subsystem with Heat Exchanger, Fans and Circulation Pump Option Interface to External High Efficiency Heat Exchanger/Liquid Chiller for High Temperature Operation
<b>Power</b>	28V Nominal Power Input Voltage (18-36VDC Range Continuous) Vehicle Grade DC/DC Converter with Input Transient Protections (Reverse/Over Voltage, Surge, Filtering) Power Dissipation: Maximum of 380 to 450 W for CPU Subsystem (Varies Based on Processor Series); ~300W to 1KW Max for Cooling Subsystem (Depending on Heater Usage at Low Temps)
<b>Environmental</b>	Designed to MIL-STD-810G: Op. Temp. up to -40° to +65°C (-40°F to +145°F) with External High Efficiency Liquid Cooler; Up to -40° to +25°C (-40°F to +77°F) with Integrated Liquid Cooler, Stor. Temp: -40°C to +85°C (-40°F to +185°F); Shock & Vibe (Designed for Vehicle / Aircraft) Water / Dust Ingress (CPU Subsystem Dust/Water Proof Similar to IP67)
<b>EMI/EMC</b>	Designed to MIL-STD-461F for Conducted and Radiated Emissions and Susceptibility

# Zypad WR 11XX

WRIST WORN RUGGED COMPUTER



## FEATURES

- Rugged mobile wearable computer for harsh environments
- IP67 protection rate
- Extensive communications capabilities
- Modular design
- Designed for compliance to ATEX Zone 2, Cat.3

The Zypad WR 11XX Wrist Worn Rugged Computer is a powerful computing device designed to withstand the most severe environmental conditions and to be worn comfortably on the user's wrist for hands-free operation.

The WR 11XX consists of a core system, a modular battery pack and an add-on expansion module; this allows the user to rapidly change the configuration of the device.

The WR 11XX has a special case made of fibreglass reinforced nylon and magnesium alloy, which maximizes the strength and minimizes weight. Also the large high-resolution touch screen display is protected by a special film; this is to avoid damage and is made to withstand water, dust, etc. The WR 11XX is compliant with MIL standard regulations.

## BENEFITS



- MIL-STD 810F & MIL-STD 461
- Designed for compliance to ATEX Zone 2, Category 3
- IP67 protection rate
- Fits comfortably the user's wrist
- Integrated WPAN (Bluetooth or ZigBee) and WLAN (IEEE 802.11 b/g)
- Large and resistant touch screen interface
- Wide temperature range
- Linux OS
- 1D and 2D ring scanners available

DEFENSE  
HOMELAND SECURITY  
HARSH LOGISTIC ENVIRONMENTS

EMERGENCY SERVICES  
FIRST RESPONDERS  
BORDER CONTROL

FOREST SERVICES  
OIL AND GAS  
MINING

## APPLICATIONS

Example: WR 11XX communication example



## GENERAL SPECIFICATIONS

### CORE ARCHITECTURE

<b>Processor</b>	PXA 270 @ 416MHz
<b>Memory</b>	128MB FLASH 256MB RAM
<b>Display</b>	640 x 480 pixels (VGA) Color 3.5" TFT with touch screen Visible with direct sunlight Night vision compliant (optional) Shock resistant
<b>LED</b>	1x Power 1x Charge 1x WPAN 1x WLAN 1x Alarm
<b>Audio</b>	AC 97 CODEC On board microphone with noise cancellation On board integrated speaker for high noise environment
<b>I/O</b>	1x USB Device port 1x USB Host port 1x Audio port
<b>WPAN</b>	Bluetooth Class 2 - integrated antenna or Zigbee integrated antenna
<b>WLAN</b>	Integrated IEEE 802.11b/g - integrated antenna
<b>Other devices</b>	Integrated accelerometer Integrated electronic compass (optional) Biometric fingerprint reader
<b>Expansion slots</b>	1 user accessible microSD memory card
<b>Other expansion</b>	1 expansion connector for 1 optional module (see below)
<b>Keyboard</b>	Cursor pad Virtual QWERTY keyboard on screen
<b>Pen device</b>	Stylus
<b>Operating system</b>	Linux based on Kernel 2.6
<b>Application Development system</b>	Linux: Eurotech SDK for Kernel Linux 2.6
<b>Case</b>	Fibreglass reinforced nylon/Magnesium alloy
<b>Weight</b>	645g Computer Core (1.42lb) 120g Wrist Support (0.26lb)

### BATTERY PACK

<b>Power</b>	3.6V Li-Ion interchangeable (hot swappable) battery pack
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### ADD-ON MODULE

<b>GPS</b>	12 channel receiver with very high sensitivity DGPS and SBAS (WASS, EGNOS) support Internal antenna
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**AGENCY APPROVALS**

<b>Emissions</b>	EN55022 (CISPR22) Class B FCC 15, Class B DOC Class B CE Mark MIL-STD 461
<b>Immunity</b>	EN55024 FCC 15, Class B DOC Class B MIL-STD 461
<b>Safety</b>	UL and cUL listed, UL 1950 third edition TUV T- Mark, EN60950 UL and cUL listed, UL 1604 with all batteries and all wireless radios Designed for compliance to ATEX Zone 2, Category 3

**ACCESSORIES**

<b>AC Adapter</b>	External universal power supply Input: 100-240VAC / 50-60Hz / 400mA Output: 5VDC / 2.4A
<b>Audio Adapter</b>	Gives the following features: a 3,5mm stereo audio socket a 3,5mm mono microphone socket
<b>Power and USB Adapter</b>	Connection to the AC adapter USB device connector ("A" type plug) USB host connector ("A" type receptacle)

**ENVIRONMENTAL SPECIFICATIONS**

<b>Temperature</b>	Operating: -20° to 60°C (- 4° to +140° F) Storage: -40° to 75°C (- 40° to +167° F) Cold Boot (battery): 0°C (32° F) @ 70% charge Cold Boot (AC adapter): any MIL-STD 810F methods 501.4 and 502.4
<b>Thermal shock</b>	1,5°C < 5°C / minute over -20°C to 60°C (34.7°F < 41°F / minute over -4°F to 140°F) MIL-STD 810F method 503.4
<b>Humidity</b>	0% to 95% non-condensing MIL-STD 810F method 507.4
<b>Transit shock</b>	Up to 4 drop to concrete, all surfaces, edges, and corners MIL-STD 810F method 516.5
<b>Crash shock</b>	75g, 11ms, Terminal saw tooth MIL-STD 810F method 516.5
<b>Vibration</b>	0.4g <sup>2</sup> /Hz, 20Hz - 1000Hz 6dB/octive 1000Hz - 2000Hz MIL-STD 810F method 514.5C-17
<b>Vehicular vibration</b>	Composite wheeled vehicle method MIL-STD 810F method 514.5C-17



### FAQ

**For which kind of application do I need a Zypad Wearable computer?** You may need a wearable computer when in your application hands-free operation is a must. The Zypad family provides a board range of wearable devices that can be chosen depending on the applications.

You may also need a Zypad wearable computer for many other applications in which you would like to overcome the the physical limitations associated with normal hand-held computers.

**Is it MIL certified?** Yes, the Zypad WR 11XX is MIL-STD 461 and MIL-STD 810F certified.

**What about ATEX?** The Zypad WR 11XX has been designed to be certifiable (ATEX Zone 2, Category 3).

**What does IP67 mean?** The IP Code (or Ingress Protection Rating) consists of the letters IP followed by two digits or one digit and one letter and an optional letter. The IP Code classifies and rates the degrees of protection provided against the intrusion of solid objects, dust, accidental contact, and water in mechanical casings and with electrical enclosures.

In our case IP67 means:

- No ingress of dust; complete protection against contact

- Up to 1m of submersion

**Why this IP rating is very important in harsh environments?** Typically these kind of environments are intrinsically dangerous for the user. In order to safely operate in, the user doesn't have time to worry and treat with care the device.

The WR 11XX is a perfect fit for this kind of application, since worn on the wrist is close to the user and the rugged design prevents it from being easily damaged or broken.

**How can I connect the Zypad to the Eurotech M2M platform?** Eurotech provides a library that speeds-up the integration of the Zypad into the Eurotech M2M platform so you can immediately concentrate on the business application.

**How can I develop my application?** Eurotech provides extensions to Linux for hardware specific features like electronic compass, finger-print and accelerometers.

**Can I power the device from an external battery pack?** Yes, this can be definitively done. For example the battery pack can be located on the back-pack and the battery modules of the Zypad can be removed leaving only the core on the user's wrist.

**How can I connect a Ethernet based device to the WR 1 1XX?** You can simply use one of the USB ports available and an adapter. The device natively supports the most common USB to Ethernet adapters that are on the market.

# Zypad BR2000

RUGGED WEARABLE / VEHICLE COMPUTER W/ WIRELESS & GIGABIT ETHERNET

## FEATURES



- Rugged Wearable / Vehicle Mount Computer
- Lightweight Form Factor (Only 1.4 lb)
- Designed to MIL-STD-810G / IP67
- Low-Power Intel Atom Processor
- Integrated Wi-Fi, Bluetooth & GPS
- GigE, USB 2.0, RS-232, Audio, Video
- Rechargeable Battery, Removable SSD

The Zypad BR2000 is a rugged, small form-factor wearable computer and vehicle server featuring a low-power Intel Atom processor, removable Flash storage and integrated wireless (Wi-Fi, Bluetooth, GPS) connectivity in a lightweight chassis similar in size to a portable cassette tape player. Designed for extreme temperatures, vibration, and shock, and sealed (IP67) against exposure to the elements, the BR2000 can be worn on a tactical vest, utility belt, or backpack and interface with a wrist-worn, vest-mounted or hand-held display, and/or helmet monocular. At just 1.4 lbs (~0.6 kg) without the internal battery, the BR2000 is also ideal for Size, Weight and Power (SWaP) constrained vehicle and aircraft platforms. It can be hard mounted inside and run off of regulated DC vehicle power to deliver full PC functionality with Gigabit Ethernet, USB 2.0, RS-232/422, Audio, and 2D/3D Video interfaces.

## BENEFITS



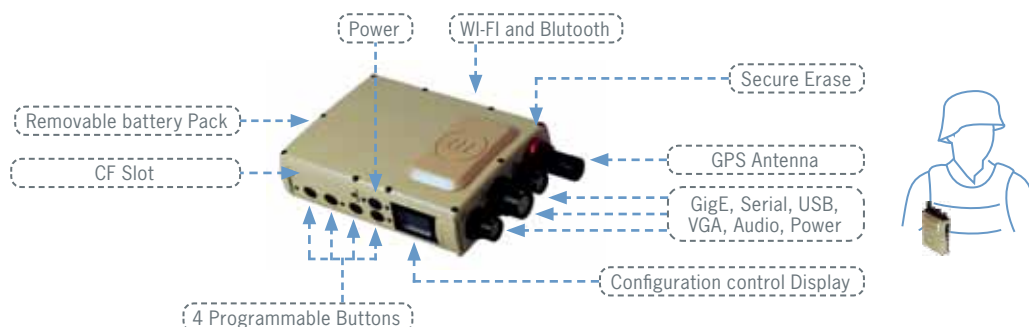
- Compact form factor: small enough to wear on tactical vest / utility belt / backpack; installable inside space-constrained vehicles / aircraft; only 1.4 lb (~0.6 kg) in weight (1.8 lbs / ~0.8 kg with battery)
- Submersible metal enclosure protected from water / dust with MIL-performance, blind-mate connectors
- Designed to MIL-STD-810G / IP67 environmental standards
- Superior battery life: ~4-6 hours battery time, dual batteries to support quick swap
- Low power CPU: power-efficient Intel Atom E660T processor
- Integrated 802.11 Wi-Fi & Bluetooth radios, 50-Channel GPS with built-in antennas
- PC functionality: Gigabit Ethernet, USB 2.0, RS232, audio, video, x86 operating system

SOLDIER SYSTEMS  
FIRST RESPONDERS  
(UN)MANNED VEHICLES

WAREHOUSING / INDUSTRIAL  
C4ISR PLATFORM UPGRADES  
MINING / ENERGY

## APPLICATIONS

Example: Zypad BR2000 Worn On Tactical Vest



**GENERAL SPECIFICATIONS**

<b>Processor</b>	Intel Atom E660T "Tunnelcreek" @ 1.3 GHz CPU, Intel PCH EG20T 1GB RAM (up to 2GB Supported)
<b>Storage</b>	Onboard Flash SSD: up to 32GB (16 GB Default) Compact Flash, Removable: up to 32GB (0 GB Default) Support for Secure Erase (Zeroization) – CF Option
<b>Operating System</b>	x86 Operating System and Application Software Compatibility: Embedded Linux/Wind River, Windows Embedded, Windows 7
<b>Integrated Wireless Radios &amp; GPS</b>	802.11 b/g/n Wi-Fi (High Throughput, Extended Range) Bluetooth (Class I, EDR up to 2-3Mbps) GPS Receiver (50-Channel, SBAS, WAAS, EGNOS, MSAS) Integrated Antennas
<b>Network, Serial, I/O &amp; Connectivity</b>	One (1) 10/100/1000 Gigabit Ethernet Interface One (1) 2D/3D Display Output (VGA Default / LVDS Optional) One (1) Composite Video (NTSC/PAL) Output Audio: Mic Input, Headphone Output Six (6) USB 2.0 Ports Three (3) Serial Ports: One (1) RS232/422, Two (2) RS232 Auxiliary Power Output for External Peripherals (up to 5V @ 1A)
<b>Expansion</b>	Expansion Device Support for Integrated, Fixed-Mount Radios, Other Peripherals over USB / PCIe / DIO / RS232/422
<b>User Controls &amp; Indicators</b>	Power On/Off Button Concealed Emergency Erase Button Four Programmable Keypad Buttons (Up, Down, Select, Back) Configuration Control / Maintenance Display LED Indicators for Alarm, Power, Battery Level
<b>Power &amp; Battery Life</b>	Power Consumption: ~5 Watts (typical) Field Replaceable Battery: Li-Ion Rechargeable Battery Pack Run Time: Up to 6 hours (30Wh Battery Pack Capacity) Internal Backup Battery for Main Battery Fast Swap External DC Power Input Range: 9 to 24 VDC (+4 / -2 Volts) Compatible with Deployed Military Batteries (i.e. LI-145, VA-5590) Remote Power ON/OFF Support
<b>Physical</b>	Dimensions (LxWxD): ~5.5" x 4.2" x 1.4" (138mm x 107mm x 36mm) Weight: ~1.4 lb (0.6 kg); w/ Battery Pack: ~1.8 lbs (0.8 kg) IEC 60529 IP67-Class Enclosure (Sealed Against Water, Dust Ingress) Connectors: MIL-performance, Push-Pull, Single Hand Blind-Mate Metal: Aluminum Alloy, Corrosion Resistant Finish: Desert Sand MIL-A-8625 Type II, Class II (Default) Mounting: Attach Points for Fixed Mount or Quick Release Brackets
<b>Environmental</b>	Designed to MIL-STD-810G / SAEJ1455: Temperature (-40° to +71°C operating/-40° to +85°C storage), Shock (40G operating), Vibration (SAEJ1455-2006, Vehicle Profile), Humidity (95% NC), Immersion (1 meter, 30 minutes), Dust (No Dust Ingress), Altitude (~20,000ft/6096m)
<b>EMI/EMC</b>	Designed to Meet MIL-STD-461F CE102, CS101, RS103, RE102

## CPU-110-10 (V3PD)

ULTRA LOW POWER 3U OPENVPX CORE I7 SBC (MOD3-PAY-2F2U-16.2.3-5)



### FEATURES

- OpenVPX Compatible
- Dual-Core Ultra Low Power Core i7
- Dual 10 Gb Ethernet
- MIL-STD-810F option
- Convection and Conduction cooled
- Open VPX Profile:  
MOD3-PAY-2F2U-16.2.3-5
- Front panel and rear I/O expansion  
by DXM

The CPU 110-10 is a ultra low power, high performance Single Board Computer (SBC) based on the 3U OpenVPX (VITA 65) form factor. It matches SWaP (Size Weight and Power) criteria for those applications that require rugged and powerful platforms in a compact and lightweight package. Available in convection and conduction cooled versions, the CPU-110-10 is a low power workhorse that is MIL-STD-810F compliant.

The CPU 110-10 is an OpenVPX 3U Payload Module supporting the MOD3-PAY-2F2U-16.2.3-5 profile. The XMC Site I/O consists 12 dedicated differential pairs which follow the VITA 46.9 (P2w11-X12d) XMC I/O standard for VPX.

At the heart of the CPU 110-10 are the ULV Intel 2nd Generation Core i7 and the QM57 PCH supporting up to 4 GBytes of DDR3 SDRAM. Other features include 10Gb Ethernet, HDMI, SVGA, audio, front panel and rear I/O customization by DXM expansion.

### BENEFITS



- Open VPX compatible - with a MOD3-PAY-2F2U-16.2.3-5 profile
- High Performance and Low Power – with an Ultra Low Voltage Intel dual-core Core i7 CPU and up to 4GB of DDR3 RAM
- Rich Features – including SATA, DVI/HDMI, XMC expansion, USB and dual 10Gb Ethernet interfaces
- MIL-STD Versions – supporting wedge locks for high shock and vibration immunity, conduction cooling and conformal coating
- Expandable – customization of front panel or rear I/O through the use of DXM expansion. DXM offers one SATA 2.0 port, two USB 2.0 ports, and two 1000BASE-BX ports with sideband signals, plus support for hardware and software debugging

DEFENSE  
HOMELAND SECURITY  
AEROSPACE

INDUSTRIAL  
TRANSPORTATION

APPLICATIONS

**GENERAL SPECIFICATIONS**

<b>CPU</b>	Dual-core ULV Core i7 1.04GHz Intel QM57 PCH
<b>Memory</b>	Up 4GB 533/667MHz DDR3, ECC, soldered 16Mbit SPI Flash 16Mbit Firmware Hub 16GB soldered NAND FLASH
<b>P0 Interfaces</b>	Utility Connectivity per VITA 46.0 including dual SMBus
<b>P1 Interfaces</b>	2x 10Gb Ethernet 2x 1Gb Ethernet High Def Audio Codec Interface
<b>P2 Interfaces</b>	2x COM ports PS2 KB Mouse 4x GPIO 2x SATA 2G HDMI/VGA 3x USB 2.0 SM Bus
<b>Front Panel Interfaces</b>	1x USB 2.0
<b>DXM</b>	DXM allows additional custom FP interfaces including: 2x USB 2.0 1x SATA 2x Gb Ethernet
<b>XMC/PMC</b>	1x XMC/PMC (front panel and rear access) 32bit (33MHz) PCI; x8 PCIe
<b>VPX Profile</b>	Open VPX compatible profile MOD3-PAY-2F2U-16.2.3-5
<b>Environmental</b>	Operating temperature -40° to +85°C Operating temperature: 0° to +70°C
<b>Physical</b>	3U VITA46 VPX Conductive cooling option Convection cooling option Conformal coating option Wedge locks option
<b>Power</b>	Typical: 35W Max: 45W
<b>Compliance</b>	MIL-STD-810 (with wedge lock option)
<b>Software Support</b>	Linux VxWorks Windows Solaris LynxOS QNX

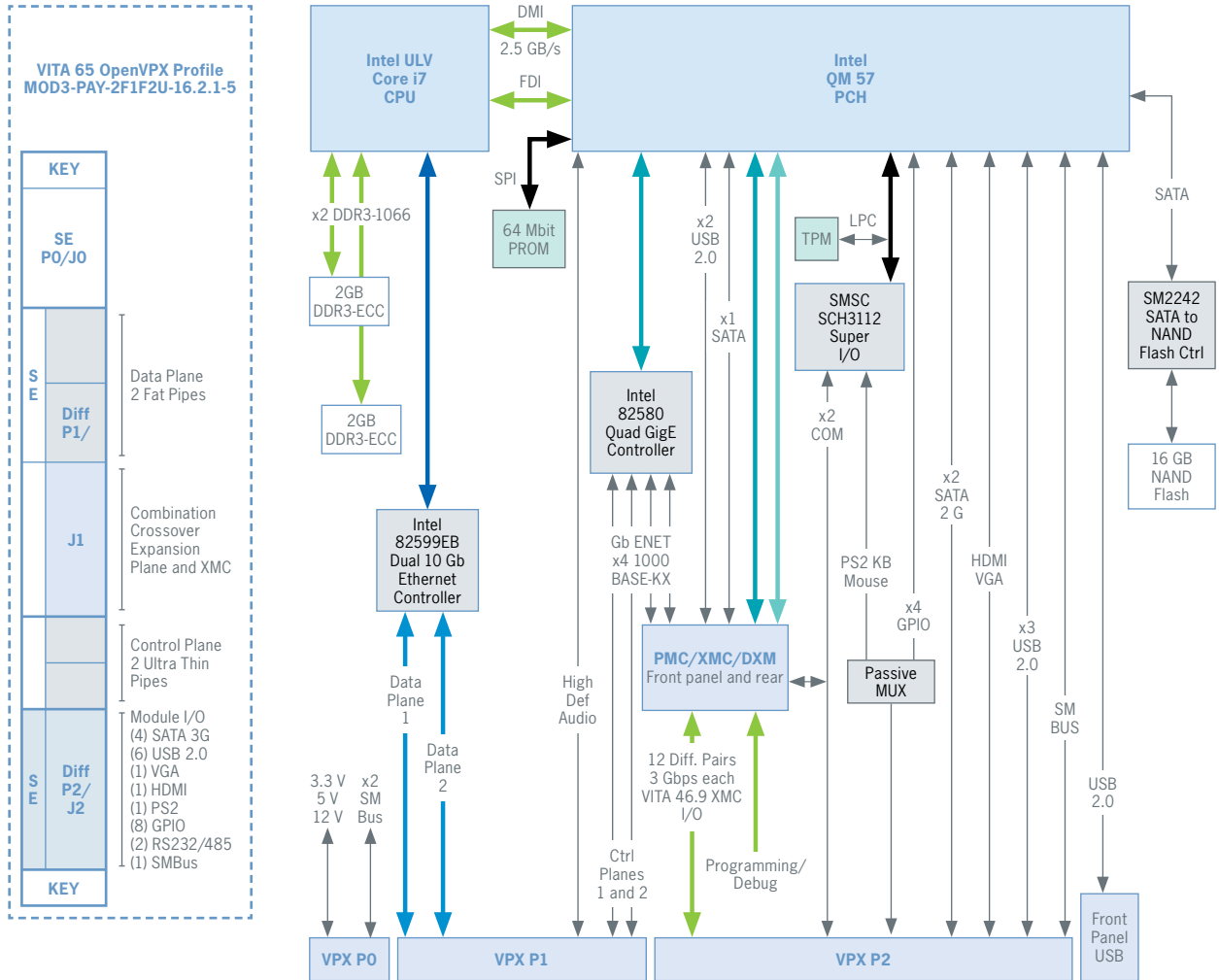
## CPU-110-10 (V3PD)

ULTRA LOW POWER 3U OPENVPX CORE I7 SBC (MOD3-PAY-2F2U-16.2.3-5)

### GENERAL SPECIFICATIONS

I/O	FRONT PANEL	VPX P0	VPX P1	VPX P2
<b>10 Gigabit Ethernet (10GBASE-KX4)</b>	-	-	Data Plane (2) Fat Pipes	-
<b>1 Gigabit Ethernet (1000GBASE-KX)</b>	-	-	Control Plane (2) Ultra-thin Pipes	-
<b>XMC Site J16</b>	-	-	-	P2w11-X12d
<b>Serial ATA 3G</b>	-	-	-	2
<b>USB 2.0</b>	1	-	-	3
<b>HDMI</b>	-	-	-	1
<b>SVGA</b>	-	-	-	1
<b>High Definition Audio</b>	-	-	1	-
<b>PS2 Keyboard / Mouse or GPIO</b>	-	-	-	1
<b>RS485 or RS232</b>	-	-	-	2
<b>SMBus</b>	-	2	-	1

BLOCK DIAGRAM



- ▬ XAUI 10 Gbits/sec Ethernet
- ▬ x8 PCIe express 4 Gbytes/sec
- ▬ x4 PCIe express 2 Gbyte/sec
- ▬ 32-bit 33 MHz PCI bus

## CPU-110-20 (V3PI)

LOW POWER 3U OPENVPX CORE I7 SBC (MOD3-PAY- 2F1F2U-16.2.1-5)



### FEATURES

- OpenVPX Compatible
- Dual-Core Low Power Core i7
- Dual 10 Gb Ethernet
- MIL-STD-810F option
- Convection and Conduction cooled
- Open VPX Profile:  
MOD3-PAY-2F2U-16.2.3-5
- Front panel and rear I/O expansion  
by DXM

The CPU 110-20 is a high performance Single Board Computer (SBC) based on the 3U OpenVPX (VITA 65) form factor. It matches SWaP (Size Weight and Power) criteria for those applications that require rugged and powerful platforms in a compact and lightweight package. Available in convection and conduction cooled versions, the CPU-110-20 is a low power workhorse that is MIL-STD-810F compliant. The CPU 110-20 is an OpenVPX 3U Payload Module supporting the MOD3-PAY-2F1F2U-16.2.1-8 profile. The expansion plane can be configured as a x4 Gen2 PCI express link as defined in VITA 65; the XMC Site I/O consists 12 dedicated differential pairs which follow the VITA 46.9 P2w11-X12d XMC I/O standard for VPX. At the heart of the CPU 110-20 are an Intel 2nd Generation Core i7 ULV and QM77 supporting up to 8 GBytes of DDR3 SDRAM. Other features include 10Gb Ethernet, two x4 PCIe ports, front panel and rear I/O customization by DXM expansion.

### BENEFITS



- Open VPX compatible - with a MOD3-PAY-2F1F2U-16.2.1-5 profile (Payload Module with 3 fat pipes and two thin pipes)
- High Performance and Low Power – with an Intel dual-core Core i7 CPU and up to 8GB of DDR3 RAM
- Rich Features – including SATA, DVI/HDMI, XMC expansion, USB and dual 10Gb Ethernet interfaces
- MIL-STD Versions – supporting wedge locks for high shock and vibration immunity, conduction cooling and conformal coating
- Expandable – customization of front panel or rear I/O through the use of DXM expansion. DXM offers one SATA 2.0 port, two USB 2.0 ports, and two 1000BASE-BX ports with sideband signals, plus support for hardware and software debugging.

DEFENSE  
HOMELAND SECURITY  
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INDUSTRIAL  
TRANSPORTATION

APPLICATIONS



**GENERAL SPECIFICATIONS**

<b>CPU</b>	2.2GHz dual core Intel Core i7-2655LE Intel QM77 PCH
<b>Memory</b>	Up 8GB 533/667MHz DDR3, ECC, soldered 16Mbit SPI Flash 16Mbit Firmware Hub 16GB soldered NAND FLASH
<b>P0 Interfaces</b>	Utility Connectivity per VITA 46.0 including dual SMBus
<b>P1 Interfaces</b>	2x 10Gb Ethernet 2x 1 Gb Ethernet X4 PCIe Gen 2 Expansion (option) High Def Audio Codec Interface
<b>P2 Interfaces</b>	2x COM ports PS2 KB Mouse 4x GPIO 1x SATA 2G 1x SATA 3G HDMI/VGA 1x USB 2.0 1x USB 3.0 SM Bus
<b>Front Panel Interfaces</b>	1x USB 2.0
<b>DXM</b>	DXM allows additional custom FP interfaces including: 2x USB 2.0 1x SATA 2x Gb Ethernet
<b>XMC/PMC</b>	1x XMC/PMC (front panel and rear access) 32bit (66MHz) PCI; x8 PCIe
<b>VPX Profile</b>	Open VPX compatible: Payload Profile MOD3-PAY-2F1F2U-16.2.1-8
<b>Environmental</b>	Operating temperature -40° to +85°C Operating temperature: 0° to +70°C
<b>Physical</b>	3U VITA46 VPX Conductive cooling option Convection cooling option Conformal coating option Wedge locks option
<b>Compliance</b>	MIL-STD-810 (with wedge lock option)
<b>Software Support</b>	Linux VxWorks Windows Solaris LynxOS QNX

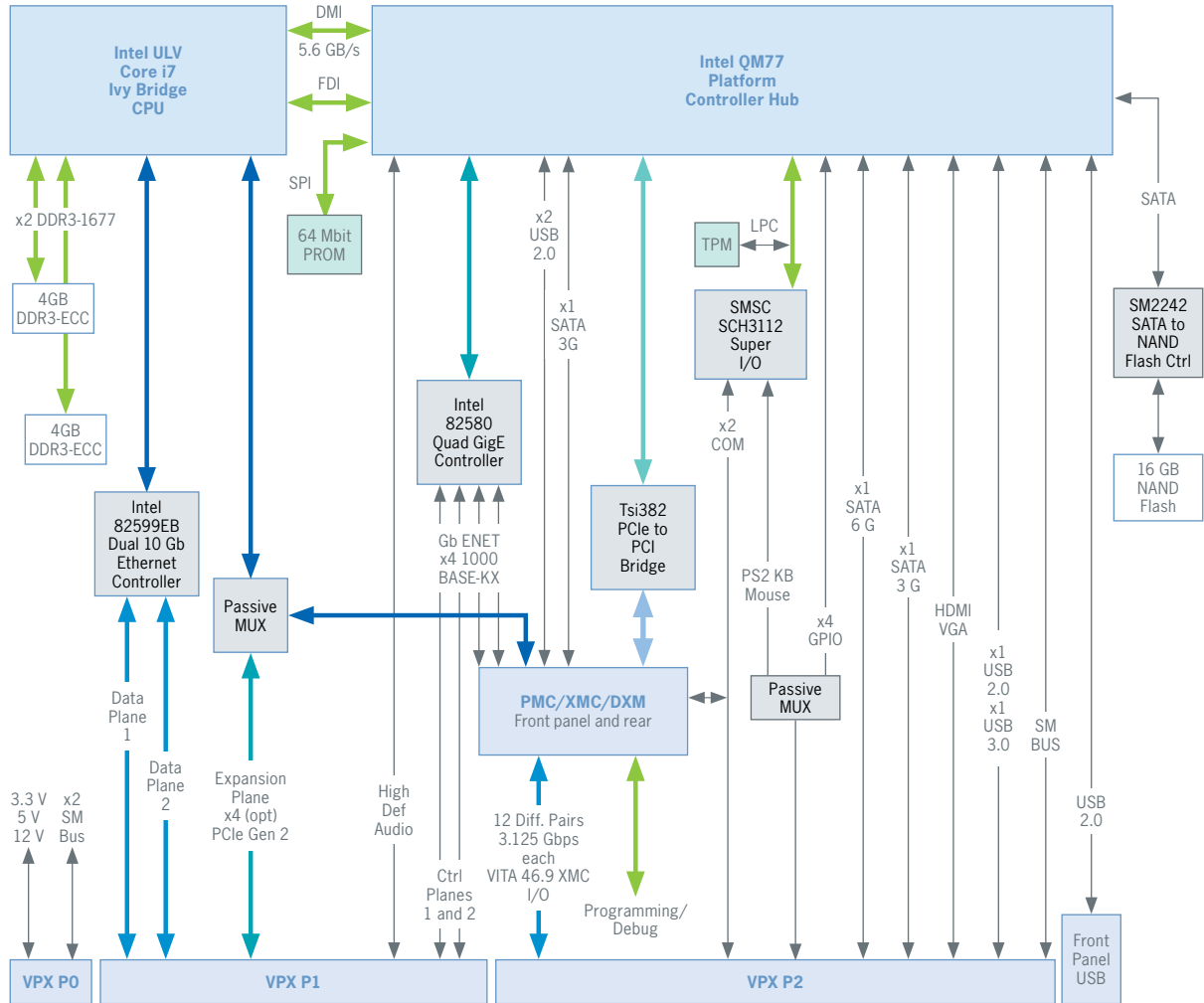
## CPU-110-20 (V3PI)

LOW POWER 3U OPENVPX CORE I7 SBC (MOD3-PAY- 2F1F2U-16.2.1-5)

### GENERAL SPECIFICATIONS

I/O	FRONT PANEL	VPX P0	VPX P1	VPX P2
10 Gigabit Ethernet (10GBASE-KX4)	-	-	Data Plane	-
1 Gigabit Ethernet (1000GBASE-KX)	-	-	Control Plane (2) Ultra-thin Pipes	-
Expansion Plane x4 PCIe Gen2	-	-	(1) Fat pipe	1
XMC Site J16	-	-	-	P2w11-X12d
Serial ATA 6G	-	-	-	1
Serial ATA 3G	-	-	-	1
USB 3.0	-	-	-	1
USB 2.0	1	-	-	1
HDMI	-	-	-	1
SVGA	-	-	-	1
High Definition Audio	-	-	1	-
PS2 Keyboard/Mouse or G-PIO	-	-	-	1
RS485 or RS232	-	-	-	1
SMBus	-	2	-	1

BLOCK DIAGRAM



- ▬ XAUI 10 Gbits/sec Ethernet over 8 differential pairs
- ▬ x8 PCIeexpress 8 Gbytes/sec (Gen 2)
- ▬ x4 PCIeexpress 4 Gbyte/sec (Gen 2)
- ▬ x1 PCIeexpress 512 MB/sec (Gen 1)
- ▬ 32-bit 66 MHz PCI bus

## CPU-111-10 (VPQ/VRQ)

QUAD CORE, LOW VOLTAGE 6U SBC WITH 10GB SWITCH (MOD6-PAY-4F2T-12.2.2.4)



### FEATURES

- OpenVPX Compatible
- Quad Core, low voltage 2.13GHz Xeon
- 10Gb Eth Switch (L2)
- MIL-STD-810F option
- Convection and Conduction cooled
- Open VPX Profile:
- MOD6-PAY-4F2T-12.2.2.4
- Front and rear I/O expansion

The CPU 111-10 is a high performance Single Board Computer (SBC) based on the 6U VPX (VITA 46) form factor and compatible with the OpenVPX standard. Offered in both convection cooled and ruggedized conduction cooled variants, the CPU 111-10 meets the needs of demanding applications. At the heart of the CPU 111-10 is one low voltage, quad-core Intel L5408 Xeon Processor, with up to 4 GBytes of DDR2 SDRAM. The CPU 111-10 provides unparalleled data processing capabilities. It supports two fully capable PMC/XMC sites with extensive User I/O. An on-board 10 Gigabit Ethernet Switch provides full-mesh backplane datalayer interconnectivity, allowing up to eight CPU 111-10 SBC's to be integrated into a single chassis without the use of an additional switch board. An on-board, dual 10 Gigabit Ethernet controller connected to the internal 10 Gigabit Ethernet Switch supports the IEEE 1588 Precision Time Protocol standard allowing all node boards to be synchronized in the sub-microsecond range; additionally, a dual 1Gigabit Ethernet controller provides 1000Base-T or 1000BASE-KX connectivity to the backplane via the VPX P4 connector. For convection cooled applications, the CPU 111-10 provides a front panel SFP+ port supporting CX4 copper and Fiber applications for chassis-to-chassis and rack-to-rack communications.

### BENEFITS



- Open VPX compatible - with a MOD6-PAY-4F2T-12.2.2.4 profile
- High Performance and Low Power – with a Low Voltage Intel quad-core Xeon L5408 CPU and up to 4GB of DDR2 RAM
- 10Gb Ethernet switch (layer 2)
- Rich Features – including SATA, VGA, XMC expansion and USB interfaces
- MIL-STD Versions – supporting wedge locks for high shock and vibration immunity, conduction cooling and conformal coating

DEFENSE  
HOMELAND SECURITY  
AEROSPACE

INDUSTRIAL  
TRANSPORTATION

### APPLICATIONS

**GENERAL SPECIFICATIONS**

<b>CPU</b>	Quad-core, low voltage Intel Xeon L5408 @2.13GHz Intel ICH9R / 5100
<b>Memory</b>	4GB DDR2-1066 soldered 16 Mbit SPI Flash 16GB soldered NAND Flash (optional)
<b>Ethernet Switch</b>	10Gb Layer 2 (Fulcrum FM3224) Full mesh connectivity between up to 8 CPU-111-10 boards
<b>P0 Interfaces</b>	Static Routing, RIPv1/v2, EIGRP-Stub, BGP, OSPF, IS-IS, EIGRP
<b>P1 Interfaces</b>	4x 10Gb Ethernet
<b>P2 Interfaces</b>	1x 10Gb Ethernet X12 differential pairs (User I/O)
<b>P3 Interfaces</b>	X64 single ended (User I/O)
<b>P4 Interfaces</b>	1X 10Gb Ethernet 2x Gb Ethernet 2x USB 2.0 4x SATA 1x RS232/485 1x VGA
<b>P5 Interfaces</b>	X12 differential pairs (User I/O) 1x 10Gb Ethernet
<b>P6 Interfaces</b>	X64 single ended (User I/O)
<b>Front Panel Interfaces</b>	1x 10Gb Ethernet (SFP+ Copper or Optical)
<b>XMC/PMC</b>	2x XMC/PMC (front panel and rear access) 62bit (133MHz) PCI-X; x8 PCIe
<b>Vpx Profile</b>	Open VPX compatible profile MOD6-PAY-4F2T-12.2.2.4
<b>Environmental</b>	Operating temperature -40° to +85°C Operating temperature: 0° to + 70°C
<b>Physical</b>	6U VITA46 VPX Conductive cooling option Convection cooling option Conformal coating option Wedge locks option
<b>Power</b>	Typical: 141W Max: 198W
<b>Compliance</b>	MIL-STD-810 (with wedge lock option)
<b>Software Support</b>	Linux VxWorks Windows Solaris LynxOS QNX

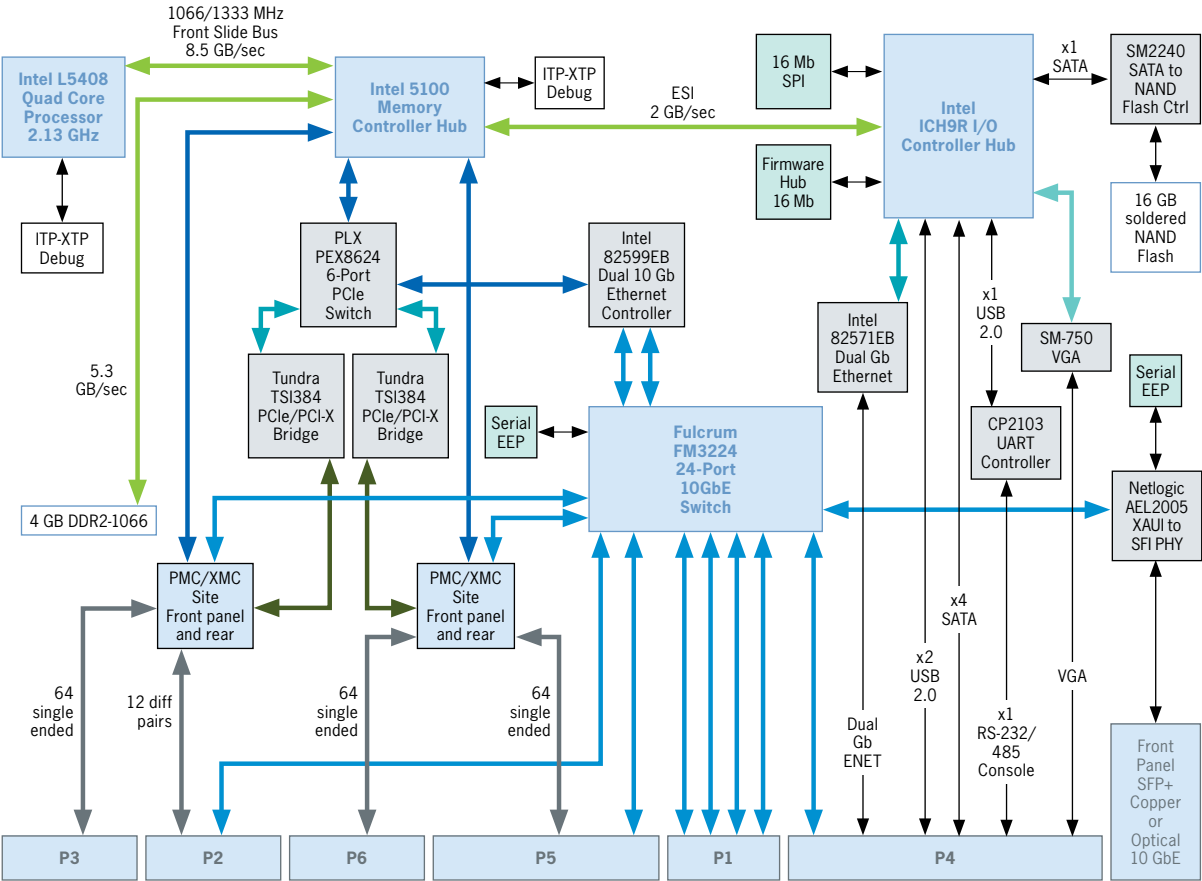
## CPU-111-10 (VPQ/VRQ)

QUAD CORE, LOW VOLTAGE 6U SBC WITH 10GB SWITCH (MOD6-PAY-4F2T-12.2.2.4)

### GENERAL SPECIFICATIONS

I/O	FRONT PANEL	P1	P2	P3	P4	P5	P6
SPF+ Interface	1	-	-	-	-	-	-
10Gb Ethernet (XAUI)	-	4	1	-	1	1	-
10Gb Ethernet (MDII)	-	-	-	-	2	-	-
1Gb Ethernet (SERDES)	-	-	-	-	2	-	-
XMC Site 1	-	-	12 Diff pairs	-	-	-	-
XMC Site 2	-	-	-	-	-	12 Diff pairs	-
PMC Site 1	-	-	-	64 Single Ended	-	-	-
PMC Site 2	-	-	-	-	-	-	64 Single Ended
Serial ATA	-	-	-	-	4	-	-
USB 2.0	-	-	-	-	2	-	-
SVGA	-	-	-	-	1	-	-
RS-232/485	-	-	-	-	1	-	-

BLOCK DIAGRAM



- XAUI 10 Gbits/sec Ethernet over 8 differential parts
- x8 PCIe express 2 Gbytes/sec
- x4 PCIe express 1 Gbyte/sec
- x1 PCIe express 256 Mbits/sec
- PCI-X 64-bit 133 MHz 1 Gbyte/sec

## CPU-111-11 (VPD)

ULTRA LOW POWER 6U CORE I7 SBC WITH 16X SAS (MOD6-PAY-4F2T-12.2.2-54)



### FEATURES

- OpenVPX Compatible
- Dual-Core Ultra Low Power Core i7
- 16x SAS controller
- 10Gb Ethernet
- MIL-STD-810F option
- Convection and Conduction cooled
- Open VPX Profile:  
MOD6-PAY-4F2T-12.2.2-54
- Front and rear I/O expansion

The CPU 111-11 is a ultra low power, high performance Single Board Computer (SBC) based on the 6U OpenVPX (VITA 65) form factor. It is a rugged and powerful platform that provides 16 SAS channels for applications ranging from Homeland Security to high end Industrial. Available in convection and conduction cooled versions, the CPU-111-11 complies with MIL-STD-810F and can be used in harsh environments. The CPU 111-11 is an OpenVPX 6U Payload Module supporting the MOD6-PAY-4F2T-12.2.2-54 profile; the board also supports two mezzanine module sites: Site 1 is PMC/XMC and Site 2 is XMC only. At the heart of the CPU 111-11 are the ULV Intel 2nd Generation Core i7 and the QM57 PCH supporting up to 4 GBytes of DDR3 SDRAM. Other features include TPM, 10Gb Ethernet, HDMI, SVGA, front panel and rear I/O customization by DXM expansion.

### BENEFITS



- Open VPX compatible - with a MOD6-PAY-4F2T-12.2.2-54 profile
- High Performance and Low Power – with an Ultra Low Voltage Intel dual-core Core i7 CPU and up to 4GB of DDR3 RAM
- SAS controller – 16 channel on dual LSI SAS2008
- Rich Features – including SATA, DVI/HDMI, XMC expansion, USB and dual 10Gb Ethernet interfaces
- MIL-STD Versions – supporting wedge locks for high shock and vibration immunity, conduction cooling and conformal coating
- Expandable – customization of front panel or rear I/O through the use of DXM expansion. DXM offers one SATA 2.0 port, two USB 2.0 ports, and two 1000BASE-BX ports with sideband signals, plus support for hardware and software debugging

DEFENSE  
HOMELAND SECURITY  
AEROSPACE

INDUSTRIAL  
TRANSPORTATION

APPLICATIONS



**GENERAL SPECIFICATIONS**

<b>CPU</b>	Dual-core ULV Core i7 1.04GHz Intel QM57 PCH
<b>Memory</b>	4GB DDR3-1066 with ECC soldered 64 Mbit SPI Flash 16GB soldered NAND Flash (optional) 128MB NOR flash, 1Mx36 PDSRAM and 32Kx8 NVSRAM per each SAS controller
<b>SAS Controller</b>	2X LSI SAS2008
<b>P0 Interfaces</b>	Utility Connectivity per VITA 46.0 including dual SMBus
<b>P1 Interfaces</b>	4x 10Gb Ethernet
<b>P2 Interfaces</b>	4X SAS 1x COM ports PS2 KB Mouse 4x GPIO 4x SATA 2G HDMI VGA 6x USB 2.0
<b>P3 Interfaces</b>	4X SAS SMBus 8x GPIO
<b>P4 Interfaces</b>	2X SAS 2x Gb Ethernet I/O per VITA 46.9 X 12d + X 8d
<b>P6 Interfaces</b>	6X SAS I/O per VITA 46.9 X 12d + X 8d
<b>Front Panel Interfaces</b>	1x USB 2.0
<b>DXM</b>	DXM allows additional custom FP interfaces including: <ul style="list-style-type: none"> <li>• 2x USB 2.0</li> <li>• 1x SATA</li> <li>• 2x Gb Ethernet</li> </ul>
<b>XMC/PMC</b>	2x XMC/PMC (front panel and rear access) 32bit (33MHz) PCI; x8 PCIe
<b>VPX Profile</b>	Open VPX compatible profile MOD6-PAY-4F2T-12.2.2-54
<b>Environmental</b>	Operating temperature -40° to +85°C Operating temperature: 0° to + 70°C
<b>Physical</b>	6U VITA46 VPX Conductive cooling option Convection cooling option Conformal coating option Wedge locks option
<b>Power</b>	Typical: +12V @ 10A
<b>Compliance</b>	MIL-STD-810 (with wedge lock option)
<b>Software Support</b>	Linux VxWorks Windows Solaris LynxOS QNX

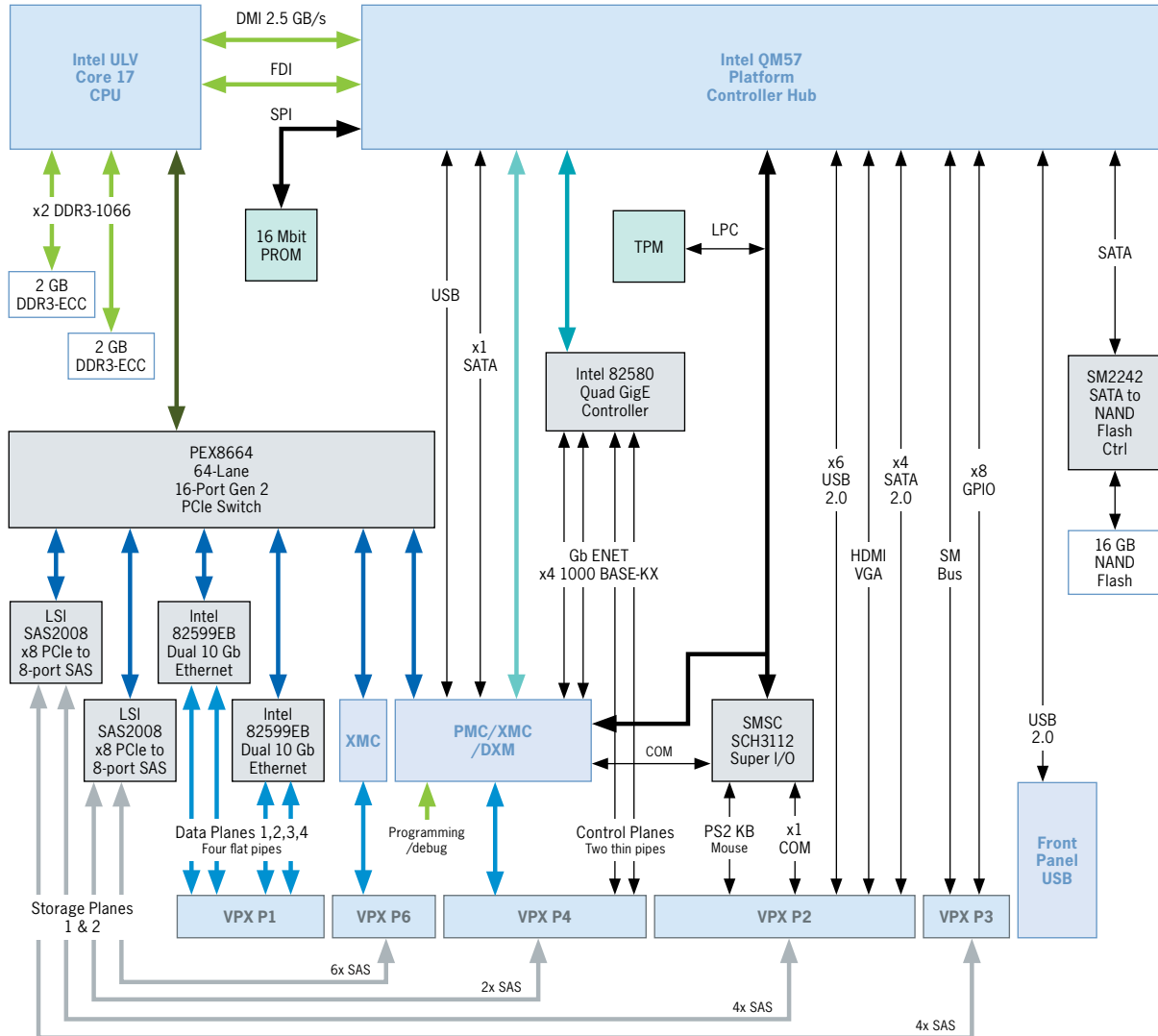
## CPU-111-11 (VPD)

ULTRA LOW POWER 6U CORE I7 SBC WITH 16X SAS (MOD6-PAY-4F2T-12.2.2-54)

### GENERAL SPECIFICATIONS

I/O	Front Panel	VPX P0	VPX P1	VPX P2	VPX P3	VPX P4	VPX P6
10 Gigabit Ethernet (10GBASE-KX4)	-	-	Data Plane (2) Fat Pipes	-	-	-	-
1 Gigabit Ethernet (1000GBASE-KX)	-	-	-	-	-	Control Plane (2) Thin Pipes	-
XMC I/O per VITA46.9 <sup>1</sup>	-	-	-	-	-	(20) Diff Pairs from XMC1	(20) Diff Pairs from XMC2
Serial Attached SCSI	-	-	-	4 Channels	4 Channels	2 Channels	6 Channels
SATA 2	1	-	-	4	-	-	-
USB 2.0	-	-	-	6	-	-	-
VGA	-	2	-	1	-	-	-
HDMI	-	-	1	1	-	-	-
SMBus	-	-	-	-	1	-	-
RS232/485	-	-	-	1	-	-	-
General Purpose I/O	-	-	-	-	8	-	-

BLOCK DIAGRAM



- 10 Gbits/sec Ethernet 10 GBASE-KX4
- x8 PCIeexpress (Gen2) 8Gbytes/sec
- x4 PCIeexpress 2 Gbyte/sec
- 32-bit 33 MHz PCI bus
- x16 PCIeexpress 8 Gbytes/sec

# SUMMARY

## CPU SELECTOR

Product Name	Form Factor	Notes	Processor	Clockspeed	RAM
CPU-110-20 (V3PI)	3U VPX		Core i7	2.2GHz	8 GB
CPU-110-10 (V3PD)	3U VPX		Core i7	1.04GHz	4 GB
CPU-111-11 (VPD)	6U VPX	16 Channel SAS controller	Core i7	1.04GHz	4 GB
CPU-71-14 (DPD4)	6U VME	form/fit/function upgrade to the VMVME-7751	Core 2 Duo	1.5GHz	4 GB
CPU-111-10 (VPQ)	6U VPX	10Gb Ethernet Switch	Xeon	2.13 GHz	4 GB
CPU-71-10 (DPD)	6U VME		Core 2 Duo	1.5 GHz	4 GB
CPU-31-10 (CPD2)	6U cPCI		Core 2 Duo	1.5/2.16 GHz	4 GB
ISIS XL	PC/104-Plus	On board GPS and miniPCIe expansion	Atom Z520	1.33 GHz	1 GB
CPU-1484	PC/104-Plus		Pentium M	1.4 GHz	512 MB
CPU-1482	PC/104-Plus		Pentium M	1.4 GHz	512 MB
CPU-1474	PC/104-Plus		Celeron M	1.0 GHz	512 MB
CPU-1472	PC/104-Plus		Celeron M	1.0 GHz	512 MB
CPU-1454	PC/104-Plus		Celeron	400 MHz	256 MB
CPU-1452	PC/104-Plus		Celeron	400 MHz	256 MB
CPU-1440	PC/104-Plus	True ISA Bus	Vortex86DX	600MHz	128 MB

## SUMMARY

SSD	I/O	Cooling	Oper. Temp
16 GB Opt.	2x 10GigE, 2x GigE, 1X USB 3.0, 2x USB, 2X COM, Video, Audio, 1X SATA 3G, 1X SATA, PS2, 1x XMC/PMC	Air / Cond.	0° to + 70°C / -40° to +85°C
16 GB Opt.	2x 10GigE, 2x GigE, 4x USB, 2X COM, Video, Audio, 2X SATA, PS2, 1x XMC/PMC	Air / Cond	0° to + 70°C / -40° to +85°C
16 GB Opt.	4x 10GigE, 2x GigE, 7x USB, 1X COM, Video, Audio, 16x SAS 4X SATA,	Air / Cond.	0° to + 70°C / -40° to +85°C
32 GB Opt.	2x GigE, 4x USB, 2x COM, LPT, Video, SCSI, SATA, PS2, 1x XMC/PMC	Air / Cond	0° to + 70°C / -40° to +85°C
16 GB Opt.	8x 10GigE Switch, 2x GigE NIC, 4x SATA, 2x USB, COM, Video, 2x XMC/PMC	Air / Cond.	0° to + 70°C / Extend Temp
CF Slot	4x GigE, 4x USB, 4x COM, Video, IDE, 2x SATA, PS2, 1x PMC/XMC, 1x PMC	Air / Cond	0° to + 70°C / -40° to +85°C
16 GB Opt.	4x GigE, 4x USB, 4x COM, Video, IDE, 2x SATA, PS2, 1x PMC/XMC, 1x PMC	Air / Cond.	0° to + 70°C / -40° to +85°C
2 GB	1x FE, 8x USB, 2x COM, Video, Audio, IDE, PS2, GPS, TPM	Passive	-40° to +85°C
-	1x GigE, 1x FE, 4x USB, 2x COM, Video, Audio, IDE, PS2	Passive	-40° to +85°C
-	1x FE, 8x USB, 2x COM, Video, Audio, IDE, PS2	Passive	-40° to +85°C
-	1x GigE, 1x FE, 4x USB, 2x COM, Video, Audio, IDE, PS2	Passive	-40° to 85°C
-	1x FE, 8x USB, 2x COM, Video, Audio, IDE, PS2	Passive	-40° to +85°C
-	1x GigE, 1x FE, 4x USB, 2x COM, Video, Audio, IDE, PS2	Passive	-40° to +85°C
-	1x FE, 8x USB, 2x COM, Video, Audio, IDE, PS2	Passive	-40° to +85°C
-	1x FE, 4x USB, 4x COM, LPT, Video, IDE, PS2	Passive	-25 to + 70C / -40° to +85°C

# SUMMARY

## POWER SUPPLY SELECTOR

Product	Form Factor	Voltage Input	Watts	Isolation
PWR-20-10	PCI/104	24V DC	50W	Yes
		72V DC	50W	Yes
		110V DC	50W	Yes
ACS-5125	PC/104-Plus	15.5 to 40V DC	25 W	Yes

## ETHERNET / SERIAL SELECTOR

Product	Function	Form Factor	Ports
COM-1452	Ethernet NIC	PC/104-Plus	5x Port 10/100 Ethernet
COM-1274	Serial / CANbus Controller	PC/104	8x RS232/422/485, 2x CAN

## SUMMARY

Voltage Outputs						MIL-STD Input Protections / EMI Filtering
+3.3 V	+5 V	+12 V	-5 V	-12 V	Oper. Temp	
-	10 A	0.8 A	-	-	-40° to +85°C	EN-50155, RIA 12, ISO 7637-2 (2004-06) EN 60950
-	10 A	0.8 A	-	-	-40° to +85°C	EN-50155, RIA 12, EN 60950
-	10 A	0.8 A	-	-	-40° to +85°C	EN-50155, RIA 12, EN 60950
-	5 A	-	-	-	-40° to +85°C / -55 to +100°C	MIL-STD-704, 1275A/B/C, 461E

### Management

### Media Support

### Oper. Temp

10/100 BaseT (Copper)

-40° to 85°C

-40° to 85°C

# SUMMARY

## AUDIO/VIDEO SELECTOR

Product	Function	Form Factor
CTR-1475	MPEG-4 Compression, Encoding and Frame Grabber	PC/104-Plus
INT-1462	Frame Grabber	PC/104-Plus
INT-1410	Audio Crosspoint Switch Matrix	PC/104-Plus

## GPS/CELLULAR

Product	Function	Form Factor	GPS	Cellular
COM-1289	GPS + GSM/GPRS	PC/104	Fastrax iTrax03	Siemens MC55 900/1800/1900MHz GSM/GPRS



## SUMMARY

<b>Channels / Inputs</b>	<b>Outputs</b>	<b>Oper. Temp</b>
4x Analog Video Inputs, 4x Audio Input Channels, 8 GPIO	MPEG-4 or AVI Formats, 1x Analog Video Output Channel	-40° to 85°C
4x Composite Video Inputs (or 3x Composite + 1x S-Video), 1x Audio Line-in, 24x GPIO	Multiple YCrCb and RGB pixel formats and YUV Planar Pixel Formats	-40° to 85°C
4x Audio CODECs, 8x Differential Inputs, 2x Aux Analog Outputs	8x Differential Analog Outputs, 2x Aux Analog Outputs, 2x Digital S/PDIF Channels	-40° to 85°C

<b>SIM</b>	<b>Audio</b>	<b>Oper. Temp</b>
Onboard or external SIM-card interface	Audio I/O port for headset	-20° to +55°C GSM/GPRS -40 to +85°C GPS

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