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DEFENSE CATALOG

EUROTECH
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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 vetronics 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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DuraCOR 810

RUGGED VEHICLE MISSION COMPUTER WITH INTEL MOBILE PENTIUM PROCESSOR

FEATURES

- Low-Power 1.4 GHz Pentium M
- 10/100 Ethernet, Analog Video, Serial, USB, Audio, Keyboard, Mouse
- Internal PC/104 Card Cage with 6x Spare Slots for Expansion I/O
- CompactFlash SSD Media Support
- Qualified to MIL-STD-810F, 461E
- MIL-1275 / 704 Power
- Sealed, Conduction Cooled Chassis

The DuraCOR 810 is a rugged single-core mission processor subsystem based on a modular, PC/104-Plus architecture with a passively cooled Intel Pentium-M processor (equivalent to a 2.8GHz Pentium 4 performance), internal CF Solid State Disk (SSD), MIL-704/1275 transient-protected power supply and sealed aluminum chassis that supports for up to six PC/104, PC/104-Plus, or PCI-104 I/O expansion cards in a PC104 card cage. To ensure high reliability, signal integrity, and extended environment operation, this low-power tactical computer comes equipped with MIL-38999 connectors, integrated EMI/EMC filtering, watertight, passively cooled enclosure, and near cable-less interconnect design. The unit is qualified to MIL-STD-810F and MIL-STD-461E for insertion into Size, Weight, and Power (SWaP)-constrained aircraft, ground vehicle and maritime platform modernization programs. Locking circular connectors bring out Fast Ethernet LAN, 4x USB ports, 2x RS-232 ports, analog video display, keyboard, mouse, and audio signals, as well as an expansion connector for up to 79 signals from optional add-on cards.

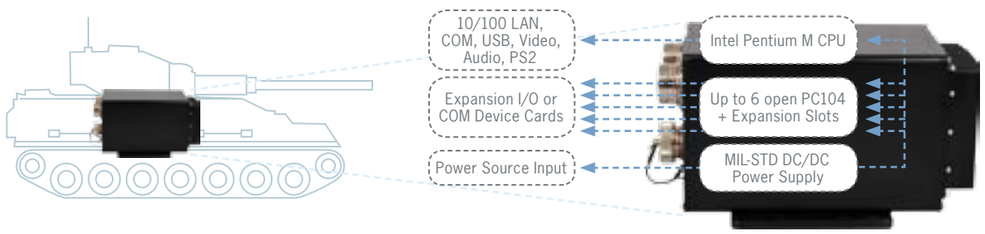
BENEFITS

- Rugged, extended temperature mission computer with up to six (6) open PC/104 / PC/104-Plus slots
- Low-power Intel Pentim M processor with 10/100 Ethernet, 4x USB, 2x Serial, Video, PS2 interfaces
- Water proof (IP67), passively cooled aluminum chassis with MIL-C-38999 connectors
- Qualified for MIL-STD-810F environments (extreme thermal, shock, vibration, humidity, ingress)
- MIL-STD-1275/704 DC power supply for ground vehicle/ aircraft surge/spike/transient protection
- MIL-STD-461E compliance for radiated and conducted emissions and suspectibility

APPLICATIONS

(UN)MANNED VEHICLE SERVER
RUGGED MOBILE COMPUTING
COMMAND AND CONTROL
C4ISR PLATFORM UPGRADES
SITUATIONAL AWARENESS
TECHNOLOGY REFRESH

Example: Mission processor for battlefield tank



GENERAL SPECIFICATIONS

Low Power x86 CPU	Intel Pentium M738, 2048k L2 Cache, 1.4 GHz Clockspeed with Speedstep technology (Equivalent in Performance to 2.8GHz Pentium 4)
Memory / Storage	1024 MB DDR-SODIMM Non-Volatile CompactFlash Solid State Disk (SSD)
Operating System	Hardware Compatible with x86 Embedded and Real-Time Operating Systems (i.e. Windows 7, Windows Embedded, Linux, QNX, VxWorks)
Connectivity & I/O	Network: 1x 10/100 Ethernet Network Interface Serial: 2x RS232 Serial Ports USB: 4x USB 2.0 Ports Video: Analog Video Output Audio: AC97 Audio Set, Line in, Line Out, Microphone PS2: PS2 Keyboard and Mouse Ports
Expansion	Bus Architecture: PCI + ISA Bus Complying with PC/104-Plus Up to Six Slots for PC/104-Plus, PCI-104 or PC/104 Add-on Boards 79 Spare Pins Pre-Wired to MIL-C-38999 Connector and Internal Breakout Board for Application-Specific I/O Cards in PC/104 Card Cage
Power	28V Nominal Power Input Voltage (18-33VDC Range Continuous) Reverse, Over Voltage, 250V Spike, 100V Surge-Protected MIL-STD-704E and MIL-STD-1275D Compliance Approx. 25 W Power Dissipation (max) for Base System; Additional Power Available for Expansion Cards: Approx. 45 W
Physical	Anodized Aluminum Chassis with MIL-DTL-38999 Connectors, including Rugged RJ-45 for Ethernet inside 38999 Connector Shell. Ingress Protection: Sealed, Dust and Water Proof (Similar to IP67) Weight: <7.8 lbs (3.5 kg); Dimensions (L x W x H): 5.30"(134.62mm) x 6.45"(163.83mm) x 0.375"(9.53mm) including connectors Cooling: No Moving Parts. Passive Conductive Cooling
Environmental	MIL-STD-810F Temperature (-40° to +71°C operating/-40° to +85°C storage), Shock (20G operating, 40G crash hazard), Vibration (Jet-Helicopter Levels), Humidity (100% Condensing), Immersion (1 meter, 30 minutes)
EMI/EMC	MIL-STD-461E Conducted Emissions CE102, Conducted Suscpetibility CS101, Radiated Emissions RE102, Radiated Susceptiblity RS103

FAQ

How many PC/104 expansion cards does the DuraCOR 810 support? Depending on the mechanical fit and power dissipation of the cards, up to six (6) additional ISA or PCI-bus based (PC/104, PCI-104 or PC/104-Plus) I/O or comms cards can be integrated inside the system card stack. A 79-pin MIL-DTL-38999 connector is pre-routed to an internal breakout board and headers to interface with add-on card I/O signals without any additional mechanical changes to the chassis, which simplifies subsystem integration.

Are professional subsystem integration services available for versions with customized I/O? Yes, application engineering services are available to provide turnkey modifications to the DuraCOR 810, including mechanical changes, alternative mass storage options, and integration of application-specific PC/104 Modules (i.e. Ethernet Switch, MIL-STD-1553 interface, Video Encoders, GPS, discrete I/O, etc.).

Are mating cable sets available for the MIL-38999 connectors? Yes, starter cable sets are available for the DuraCOR 810 that breakout the MIL-DTL-38999 connectors to standard PC-style interfaces for lab or bench testing purposes.

DuraCOR 810-Duo

RUGGED VEHICLE MISSION COMPUTER WITH INTEL CORE 2 DUO PROCESSOR

FEATURES

- Multi-core 1.5 GHz Intel Core 2 Duo
- Dual Ethernet, Analog/Digital Video, Serial, USB, eSATA, Audio, Keyboard, Mouse
- Internal PC/104 Card Cage with 6x Spare Slots for Expansion I/O
- SATA, IDE, Removable Media Support
- MIL-STD-810G Qualified for Extreme Shock, Vibration, Temp
- Sealed, Conduction Cooled Chassis

The DuraCOR 810-Duo is a rugged multi-core mission processor subsystem based on a modular, open architecture PCI-104 architecture with an Intel Core2Duo CPU, fixed/removable Solid State Disks (SSDs), MIL-704/1275 transient-protected power supply and sealed aluminum chassis that supports for up to six PCI-104 or PC/104-Plus I/O expansion modules in a PC104 card cage. To ensure high reliability, signal integrity, and extended environment operation, this high-performance tactical computer comes equipped with MIL-38999 connectors, integrated EMI/EMC filtering, watertight passively cooled enclosure, and near cable-less interconnect design. The unit is qualified to MIL-STD-810G and MIL-STD-461F for insertion into Size, Weight, and Power (SWaP)-constrained aircraft, ground vehicle and maritime platform modernization programs. Locking circular connectors bring out Gigabit and Fast Ethernet LAN interfaces, 6x USB ports, 2x RS-232 ports, dual Video Display (LCD, VGA), Keyboard, Mouse, and Audio signals, as well as an expansion connector for up to 79 signals from optional add-on cards.

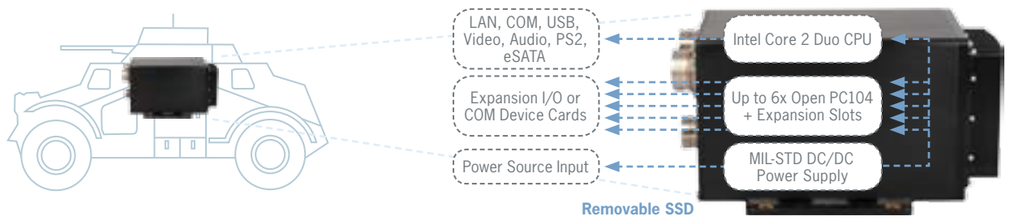
BENEFITS

- Rugged, multi-core mission computer with up to six (6) open PCI-104 / PC/104-Plus slots
- Intel Core 2 Duo processor w/Gigabit & 10/100 Ethernet, 6x USB, 2x Serial, Video, Audio, PS2, eSATA
- Removable and fixed storage: two CompactFlash slots, one internal 1.8" SATA Solid State Disk (SSD)
- Water proof, passively cooled aluminum chassis with MIL-C-38999 connectors
- Qualified for MIL-STD-810G environments (extreme thermal, shock, vibration, humidity, ingress)
- MIL-STD-1275/704 DC power supply for ground vehicle/ aircraft surge/spike/transient protection
- MIL-STD-461F compliance for radiated and conducted emissions and suspectibility

APPLICATIONS

(UN)MANNED VEHICLE SERVER
RUGGED MOBILE COMPUTING
COMMAND AND CONTROL
C4ISR PLATFORM UPGRADES
SITUATIONAL AWARENESS
TECHNOLOGY REFRESH

Example: Tactical ground vehicle with DuraCOR 810-Duo mission computer



GENERAL SPECIFICATIONS

Low Power x86 CPU	Intel Core 2 Duo, L7400, 1.5 GHz Dual-Core, 2048KB L2 Cache 667 MHz Front-Side Bus-Speed, Intel 945GM Chipset
Memory / Storage	2048 MB DDR2-SODIMM Support for Two (2) IDE CompactFlash and one (1) SATA 1.8" Solid State Disks (SSD) without Taking up Slots in Card Cage Support for Removable CF Media (Behind Sealed Cover on Panel) eSATA Interface on MIL-C-38999 for External HDD/NAS Storage
Operating System	Hardware Compatible with x86 Embedded and Real-Time Operating Systems (i.e. Windows 7, Windows Embedded, Linux, QNX, VxWorks)
Connectivity & I/O	Network: 1x Gigabit and 1x 10/100 Ethernet Network Interface Serial: 2x RS232 Serial Ports USB: 6x USB 2.0 Ports Video: Analog Video Output, LVDS Digital Output Audio: AC97 Audio Set, Line in, Line Out, Microphone PS2: PS2 Keyboard and Mouse Ports
Expansion	Bus Architecture: PCI Bus Complying with PCI-104 Standard (no ISA) Up to Six Slots for PCI-104 or PC/104-Plus I/O or Comm Boards 79 Spare Pins Pre-Wired to MIL-C-38999 Connector and Internal Breakout Board for Application-Specific I/O Cards in PC/104 Card Cage
Power	28V Nominal Power Input Voltage (18-33VDC Range Continuous) Reverse, Over Voltage, 250V Spike, 100V Surge-Protected MIL-STD-704E and MIL-STD-1275D Compliance Approx. 40 W Power Dissipation (max) for Base System; Additional Power Available for Expansion Cards: Approx. 35 W Graceful OS Shutdown Support and Power Switch
Physical	Anodized Aluminum Chassis with MIL-DTL-38999 Connectors Ingress Protection: Sealed, Dust and Water Proof (Similar to IP67) Weight: <8 lbs (3.6 kg); Dimensions (L x W x H): 10.60"(269.24mm) x 5.30"(134.62mm) x 5.30"(134.62mm) including Connectors Cooling: No Moving Parts. Passive Conductive Cooling
Environmental	MIL-STD-810G Temperature (-40° to +71°C operating/-50° to +85°C storage), Shock (40G operating), Vibration (Jet-Helicopter-Tracked Vehicle Levels), Humidity (95% NC), Immersion (1 meter, 30 minutes)
EMI/EMC	MIL-STD-461F CE102, CS101, RS103, RE102

FAQ

How many PC/104-Plus expansion cards does the DuraCOR 810-Duo support? Depending on the mechanical fit and power dissipation of the cards, up to six (6) additional PCI-bus based (PCI-104 or PC/104-Plus) I/O or comms cards can be integrated inside the system card stack. A 79-pin MIL-DTL-38999 connector is pre-routed to an internal breakout board and headers to interface with add-on card I/O signals without any additional mechanical changes to the chassis, which simplifies subsystem integration.

What are Flash Solid State Disk (SSD) storage options for the DuraCOR 810-Duo? The DuraCOR 810-Duo features two CompactFlash media sockets, as well as one 1.8" serial ATA (SATA) SSD interface mounted onto its internal backplane board. The chassis can be ordered with a removable media access panel for one of the CF disks. Signals for a second SATA (eSATA) channel is available through one of the external 38999 connectors to support external storage device options. Other PATA/IDE or SATA storage form factors (i.e. 2.5" media) can optionally be mounted inside the PC/104 card cage.

DuraCOR 820

SMALL FORM-FACTOR MISSION COMPUTER WITH INTEL MOBILE PENTIUM PROCESSOR

FEATURES

- Low-Power 1.4 GHz Pentium M
- Small Form Factor: < 3 lbs / 1.82 kg
- 2x Ethernet Network Interfaces
- 2x COM Ports, 3x USB Ports
- MIL-STD-810G, 461F, 704F, 1275D
- -40°C to +71°C Operating Temp
- IP67 Ingress Protected Chassis
- Optional MIL-STD-1553 Interface

The DuraCOR 820 is a rugged mission processor subsystem, optimally designed for space/weight-constrained military/aerospace ground mobile and airborne deployments. Merely 3 inches (7.70cm) in height and 3 lbs (1.32kg) in weight, the DuraCOR 820 targets manned and unmanned applications where reliable small form factor and high performance computing is required. The unit features a passively-cooled 1.4GHz Intel Pentium-M processor (equivalent to a 2.8GHz Pentium 4 performance), dual 10/100 Ethernet network connections and standard PC interfaces over watertight ultra-miniature Mil-spec performance connectors. The subsystem has been fully qualified for MIL-STD-810G environmental conditions (high altitude, extreme temperatures, ingress protection, shock, vibration, humidity), MIL-STD-461E EMI/EMC levels, and 28VDC avionics power supply compliance (MIL-STD-704F). Based on a modular PC/104-Plus architecture, the DuraCOR 820 can also be special ordered with different I/O configurations, including MIL-STD-1553 support.

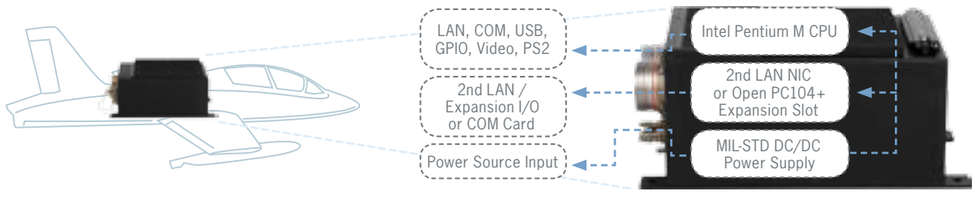
BENEFITS

- Size, Weight, and Power (SwaP) optimized: lightweight and small form factor computing platform
- Low-power Intel Pentim M processor with dual 10/100 Ethernet, 3x USB, 2x Serial, Video, PS2
- Qualified for MIL-STD-810G environments (extreme thermal, shock, vibration, altitude, humidity, ingress)
- Open architecture: modular PC/104-Plus-based board stack enabling other I/O configurations
- Rugged mechanical design: no moving parts, passive thermal management, sealed
- Internal solid state disk (CompactFlash) with Linux or Windows preloaded
- 12V / 24V / 28 V DC vehicle / aircraft power input with MIL-STD-704 DC surge/spike/transient protection

APPLICATIONS

(UN)MANNED VEHICLE COMPUTER
RUGGED MOBILE COMPUTING
COMMAND AND CONTROL (C2)
SWAP SENSITIVE C4ISR PLATFORMS
SITUATIONAL AWARENESS
TECHNOLOGY REFRESH

Example: Unmanned air system (UAS) with DuraCOR 820 mission computer



GENERAL SPECIFICATIONS

Low Power x86 CPU	Intel Pentium M738, 2048k L2 cache, 1.4 GHz Clockspeed w/Speedstepping (Equivalent to a 2.8GHz Pentium 4 Performance)
Memory / Storage	1 GB DDR-SODIMM 16 GB Non-Volatile CompactFlash
Connectivity & I/O	Network: 2x 10/100 Ethernet Network Interfaces (10/100 Mbps) Serial: 2x EIA RS232 Serial Ports, 115Kbps Max USB: 3x USB 2.0 Ports Video: VGA Analog Video Output PS2: PS2 Keyboard and Mouse Ports DIO: Eight General-Purpose Digital I/O (GPDIO) Lines
Board Architecture	Compliant with PC/104-Plus Standard (PCI / ISA Bus)
Special Order Options	Integrated PC104(+) I/O / Comm Module (rather than 2nd Ethernet NIC): Dual-Redundant MIL-STD-1553 Interfaces (1-4 Channels, DDC BC/RT/MT Architecture, IRIG-B Time Code Inputs) RS-232/422/485 Asynchronous Serial Ports (115 Kbaud max speed; 1-6 channels, depending on protocol and flow control support)
Power	28V Nominal Power Input Voltage (9-32VDC Range Continuous) Reverse, Over Voltage, Surge-Protected, MIL-STD-704F Compliant <24 W Power Dissipation (max)
Physical	Anodized Aluminum Chassis with 801 Series Mighty Mouse (ultra-Miniature 38999-like) Connectors and Anodize Finish Ingress Protection: Sealed, Dust and Water Proof (Similar to IP67) Weight: 2.9 lbs (1.32 kg); Dimensions (H x W x L): 3.03" (7.70cm) x 4.30" (10.92cm) x 7.05" (17.91cm) Cooling: No Moving Parts. Passive Conductive Cooling
Environmental	MIL-STD-810G Temperature (-40° to +71°C operating/-40° to +85°C storage), Shock (15G operating), Vibration (Jet-Helicopter Levels), Humidity, Altitude (60,000 ft / 18,288 meters operating), Immersion (1 meter, 30 minutes)
EMI/EMC	MIL-STD-461E CS101, Power Leads, 30 Hz to 150 KHz, Curve 2 (28V and below); RE102, Electric Field, 10 KHz to 18 GHz, Figure RE102-3 for Fixed Wing Shorter than 25m; RS103, Electric Field, 30 MHz to 18 GHz

FAQ

Does the DuraCOR 820 support PC/104-Plus expansion? With the PC/104-Plus Single Board Computer (SBC) and 10/100 Ethernet NIC cards populated, all card slots are filled. Without the NIC installed, the system has an open PC/104-Plus I/O slot to support MIL-STD-1553 bus controllers, RS-232/422/485 serial interfaces, or other application-specific I/O.

Is the DuraCOR 820 flight worthy? Yes, the system fully complies with MIL-STD-810G and MIL-STD-461F requirements for continuos operation at high altitudes (60,000 ft / 18.288 meters), jet/helicopter vibration and profiles, wide operating temperatures (-40° to +71°C), humidity, water/dust ingress, and EMI conditions (CS,RS,RE). The unit is deployed onboard a variety of unmanned air systems and manned aircraft.

How is the DuraCOR 820 SWaP optimized? The unit features a very small, lightweight aluminum chassis with 801 Series Mighty Mouse conectors rather than MIL-DTL-38999 Series III connectors. These connectors are smaller, higher density, and lighter weight versions of the traditional DTL-38999 standard. This enables the unit to weigh less than 3 lbs (1.32 kg) and measure just 3.0" (7.78 cm) in height.

DuraCOR 830

SMALL FORM-FACTOR MISSION COMPUTER WITH INTEL ATOM PROCESSOR

FEATURES

- Low-Power 1.6 GHz Intel Atom Z530
- Small Form Factor: < 4 lbs / 1.82 kg
- 2x PC104+ I/O Expansion Slots
- Removable Solid State Disk (SSD)
- MIL-STD-810G, 461F, 704F, 1275D
- -40°C to +71°C Operating Temp
- Optional MIL-STD-1553 Controllers
- Gigabit Ethernet LAN Interface

The DuraCOR 830 is a small form factor tactical mission processor featuring the low-power 1.6Ghz Intel Atom CPU in a rugged aluminum chassis designed for Size, Weight, and Power (SWaP)-sensitive avionics and ground vehicle platforms. Delivering processing and multimedia performance similar to Pentium M-based DuraCOR solutions, but with less power consumption, double the RAM memory capacity, and dual Flash SSDs, the DuraCOR 830 features a modular PC/104-Plus architecture with up to two (2) open card slots and over 100 spare pins for I/O expansion on high-density MIL-38999 connectors. Designed for extended temperature (-40° to +71°C) and demanding MIL-STD-810G environmental conditions (thermal, shock, vibration, altitude, humidity), the DuraCOR 830 incorporates removable Solid State Disk (SSD) capabilities, a 28V MIL-STD-1275D and MIL-STD-704F power supply, and lightweight, fanless enclosure sealed against water and dust ingress, as well as MIL-STD-461F emissions and susceptibility.

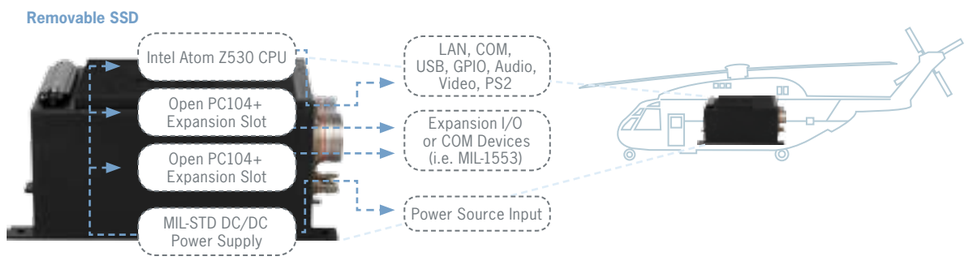
BENEFITS

- Rugged small form factor computer optimized for Size, Weight, and Power (SwaP)
- Low-power x86: Intel Atom processor with Gigabit Ethernet, 3x USB, 2x Serial, Video, Audio, PS2
- Expandable: two (2) PC/104-Plus slots for I/O expansion modules, over 100 spare connector pins
- Removable and fixed storage: CompactFlash access panel and second internal solid state disk (SSD)
- Designed for MIL-STD-810G environments (extreme thermal, shock, vibration, humidity, ingress)
- MIL-STD-1275/704 DC power supply for ground vehicle/ aircraft surge/spike/transient protection
- Optional pre-integrated dual-channel MIL-STD-1553 controllers from Data Device Corporation

APPLICATIONS

(UN)MANNED VEHICLE SERVER
RUGGED MOBILE COMPUTING
COMMAND AND CONTROL
C4ISR PLATFORM UPGRADES
SITUATIONAL AWARENESS
TECHNOLOGY REFRESH

Example: Two open PC/104-Plus slots available for application-specific I/O cards (i.e. MIL-STD-1553)



GENERAL SPECIFICATIONS

Low Power x86 CPU	Intel Atom Z530 (Menlow) Processor, 512K L2 Cache, 32-Bit, 45nm 1.6 GHz Clockspeed, Intel Hyper-threading, Speed-Step, Virtualization
Memory / Storage	2048 MB DDR2-SODIMM 8 GB Non-Volatile NAND Flash Integrated onto Single Board Computer 16 GB Non-Volatile CompactFlash w/ Ultra-DMA Support; Access Panel On Top for Removal of CompactFlash Disk
Connectivity & I/O	Network: 1x Gigabit Ethernet Network Interface (10/100/1000 Mbps) MIL-STD-1553: 2x 1553 A/B, 1760 Ports, BC/RT/MT (select models) Serial: 2x EIA RS232 Serial Ports, 115Kbps Max USB: 3x USB 2.0 Ports Video: VGA Analog Video Output (up to 1600x1200 pixels) Audio: Stereo Audio Channels PS2: PS2 Keyboard and Mouse Ports DIO: Eight General-Purpose Digital I/O (GPDIO) Lines
Expansion	Two Slots for PC104, PC104+, PCI-104 I/O or Comm Boards Up to 101 Spare Pins Available on Connectors for Application-Specific I/O (only 93 Pins with 1553 Card Installed)
Power	28V Nominal Power Input Voltage (18-33VDC Range Continuous) Reverse, Over Voltage, 250V Spike, 100V Surge-Protected MIL-STD-704F and MIL-STD-1275D Compliance ~19 W Power Dissipation (max) with 1553; ~16 W max (without 1553)
Physical	Anodized Aluminum Chassis with MIL-DTL-38999 Connectors Ingress Protection: Sealed, Dust and Water Proof (Similar to IP67) Weight: <4 lbs (1.82 kg); Dimensions (H x W x L): 3.88" (99.55 mm) x 4.60"(116.84 mm) x 8.71" (221.11 mm) Cooling: No Moving Parts. Passive Conductive Cooling
Environmental	MIL-STD-810G Temperature (-40° to +71°C operating/-40° to +85°C storage), Shock (40G operating, 75G storage), Vibration (Jet-Helicopter-Tracked Vehicle Levels), Humidity (95% NC), Altitude (30,000 ft/9,144 meters operating), Immersion (1 meter, 30 minutes)
EMI/EMC	MIL-STD-461F CE102, CS101, RS103, RE102

FAQ

How rugged is the DuraCOR 830? The unit is designed to comply with MIL-STD-810G and MIL-STD-461F requirements for continuos operation in extreme temperatures (-40° to +71°C), high levels of shock and vibration (helicopter, jet, ground vehicle, and tracked vehicle conditions), humidity (95%), altitude (30,000 ft / 9,144 meters), ingress protection (dust proof/water proof), and noisy EMI conditions (CE,CS,RS,RE).

To what level of ingress protection (IP) is the DuraCOR 830 rated? The chassis is sealed against dust and water ingress to depths of 1 meter (similar to IP67).

How many PC/104-Plus cards does the DuraCOR 830 support? Up to two (2) additional PC/104, PCI-104, or PC/104-Plus cards can be integrated inside the system. Standard configurations are available with a pre-integrated MIL-STD-1553 DDC card.

What operating systems does the DuraCOR 830 support? As an Intel x86 computing platform, the unit is hardware compatible with Linux, Windows, Windows Embedded, VxWorks, and other Real-Time Operating Systems (RTOS).

DuraCOR 80-40

RUGGED MODULAR CORE I7 MISSION COMPUTER WITH PCIE/104 EXPANSION

FEATURES

- PCIe/104 Expandable Intel Core i7 Mission Computer with 8GB DRAM
- Modular Chassis to Scale System I/O
- Dual Gigabit Ethernet LAN Interface
- Dual Removable 2.5" Solid State Media
- 28V DC MIL-1275/704 Power Supply
- IP67 Ingress Protected (Dust/Water Proof)
- MIL-810G Extreme Shock/Vibe/ Thermal

The DuraCOR 80-40 is a rugged tactical mission computer based on the Intel Core i7 Sandy Bridge processor with a high-speed PCI-Express bus (PCIe/104) for I/O card expansion. The system combines powerful graphics and multi-core processing with ultra-reliable mechanical robustness for extreme MIL-STD-810G environmental and MIL-STD-461F EMI conditions. The DuraCOR 80-40 offers 2x Gigabit LAN, 6x USB, 2x RS232, 16-bit GPIO, 2x video display, a PCI Express bus, 2x removable SATA SSD slots, and military-grade power supply. Its modular interlocking chassis features DTL-38999 connectors and internal power/control bus to ease integration of PCIe/104 or PCI/104-Express I/O cards to support standalone or combination computer + router + switch + application I/O (integrating Cisco 5915 mobile IP router). The unit is completely sealed (IP67), fanless, and mountable either horizontally or vertically.

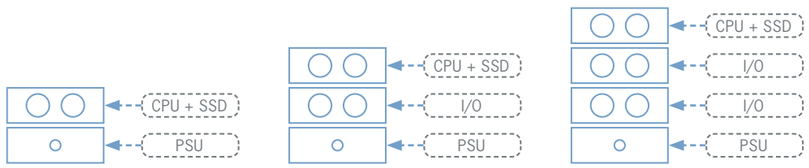
BENEFITS

- High-performance, Intel Core i7 CPU with integrated GPU and AVX signal processor
- Modular interlocking chassis supports stackable PCIe104 I/O card expansion (2-3 card slots per expansion chassis segment)
- Integrated I/O: PCIe/104 bus, 2x GigE, 6x USB, 2x RS232, 16 GPIO, dual video, stereo audio, PS2
- Dual slots of rugged removable 2.5" SATA storage with sealed access panel on rear
- Designed for MIL-STD-810G environments (extreme thermal, shock, vibration, humidity, ingress)
- MIL-STD-1275/704 DC power supply for ground vehicle/ aircraft surge/spike/transient protection

APPLICATIONS

(UN)MANNED VEHICLE SERVER
RUGGED MOBILE COMPUTING
COMMAND AND CONTROL
C4ISR PLATFORM UPGRADES
SITUATIONAL AWARENESS
TECHNOLOGY REFRESH

Example: Modular Interlocking Chassis Segments Support I/O Card Expansion



GENERAL SPECIFICATIONS

High Performance Processor	Intel Corei7-2655LE (Sandy Bridge) Processor, Dual-Core, 4MB L3 Cache, 64-Bit Instruction Set, Intel HD Graphics 3000 2.2 GHz Clockspeed (2.9 GHz with Intel Turbo Boost), Support for Intel vPro, Hyper-threading, Enhanced Speed-Step, Hardware Virtualization Roadmapped Support for 3rd Generation Core i7 (Ivy Bridge)
Memory / Storage	4 / 8 GB DDR3-1333 MHz Dual Slots for 2.5" Form Factor Serial ATA Solid State Disks; Sealed Hinged Door on Rear Panel Enables Removal
Operating System	Hardware Compatible with x86 Embedded and Real-Time Operating Systems (i.e. Windows 7, Windows Embedded, Linux, QNX, VxWorks)
Connectivity & I/O	Network: 2x Gigabit Ethernet Network Interface (10/100/1000 Mbps) Serial: 2x RS-232 Serial Ports USB: 6x USB 2.0 Ports Video: Analog (VGA) and Digital Video (DVI) Outputs Audio: Stereo Audio Channels PS2: PS2 Keyboard and Mouse Ports DIO: 16-bit Discrete General-Purpose I/O (GPIO)
Expansion	PCIe/104 Bus with 2-3 Expansion Card Slots per Chassis Segment Added to Base Computer Integrated Power and Control Bus and Pre-Installed MIL-DTL-38999 Connectors with 132 Spare I/O Pins per Expansion Segement Added
Power	28V Nominal Power Input Voltage (18-36 VDC Range Continuous) Reverse, Over Voltage, 250V Spike, 100V Surge-Protected MIL-STD-704F and MIL-STD-1275D Compliance ~50 W Power Dissipation (max) ~100 W Available for Expansion I/O
Physical	Anodized Aluminum Chassis with MIL-DTL-38999 Connectors Ingress Protection: Sealed, Dust and Water Proof (Similar to IP67) Weight: ~7 lbs (~3.2 kg) Base System; Dimensions for Base Unit (CPU+PSU+SSD): Approx. 4.02" H x 6.75 D x 6.25" W (~10.24cm H x ~17.15cm D x ~15.85cm W); Expansion I/O Segments add 2.0" (5.08 cm) Height Cooling: No Moving Parts. Passive Convection/Conduction Cooling
Environmental	Designed to Meet MIL-STD-810G Temperature (-40° to +71°C Operating/-40° to +85°C Storage), Shock (40G Operating, 75G Storage), Vibration (Jet-Helicopter-Tracked Vehicle Levels), Humidity (95% NC), Altitude (30,000 ft/9,144 meters operating), Immersion (1 Meter, 30 minutes)
EMI/EMC	Designed to Meet MIL-STD-461F CE102, CS101, RS103, RE102

FAQ

Which generation(s) of the Core i7 processor does the DuraCOR 80-40 support? The DuraCOR 80-40 supports the 2nd Generation (Sandy Bridge) processor in dual-core configurations. Quad-core variants maybe special ordered.

How many expansion card slots does the DuraCOR 80-40 support? The modular nature of the DuraCOR 80-40 chassis enables expansion I/O segments to be added to the base computer chassis for any number of PCIe/104 or PCI-104/Express card to be integrated (2-3 cards per chassis segment). Add-on I/O is limited to approx. 100 watts beyond the CPU and the number of cards supported by the PCIe / PCI bus.

Can the DuraCOR 80-40 optionally support an integrated Cisco router? Yes, the Cisco 5915 mobile IP router can be optionally mated with the DuraCOR 80-40 computer in a single appliance solution, since the DuraCOR 80-40 computer and Cisco 5915-based DuraMAR 5915 router share a common mechanical chassis.

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 Integated 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

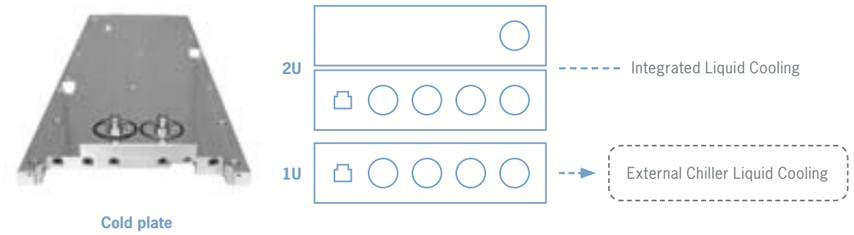
IP67 MIL-STD

- 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 interconectivity
- 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

APPLICATIONS

TACTICAL HPC COMPUTING
VETRONICS / NAVTRONICS
ENERGY EXPLORATION
COMMAND AND CONTROL
C4ISR PLATFORM UPGRADES
HOMELAND SECURITY

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



GENERAL SPECIFICATIONS

Processor	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)
Memory / Storage	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
Scalability	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
Software	Operating System: Linux, Windows Server or Windows HPC Server Compatible with Industry Standard Cluster Managers, Schedulers, File Systems, and Other HPC Tools
Connectivity & I/O	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
Physical	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"
Thermal Management	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
Power	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)
Environmental	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)
EMI/EMC	Designed to MIL-STD-461F for Conducted and Radiated Emissions and Susceptibility

DuraMAR 5915

RUGGED CISCO 5915 MOBILE IP ROUTER W/ GIGABIT ETHERNET SWITCH

FEATURES

- 5-Port Router / 19-Port Router+Switch
- Cisco 5915 Router with IOS Management
- Layer 2 Gigabit Ethernet LAN Switch
- Rugged MIL-STD-810G, 461F Design
- MIL-STD-1275/704 DC Input Power Supply
- Size, Weight & Power (SWaP) Optimized

The DuraMAR 5915 is a rugged Cisco IOS-managed IP router subsystem integrating Cisco 5915 Mobile Ready Net capabilities for secure data, video, and voice services virtually anywhere LAN or WAN connectivity may be required, including mobile, airborne, ground, manned or unmanned vehicle applications in thermal, shock and vibration extremes. Optimized for Size, Weight and Power (SWaP) sensitivity, it is available as a standalone router or router + Gigabit Ethernet switch combo. The DuraMAR 5915 delivers the performance, security, QoS, and manageability expected from Enterprise IOS routing technology, including extensive IPv6 routing protocols, IP multicasting, Radio Aware Routing (RAR), Dynamic Link Exchange Protocol (DLEP) and Mobile IP routing for transparent connectivity to a roaming vehicle network in Comms on the Move (COTM) applications. Onboard AES hardware encryption engine offloads encryption processing from router to provide highly secure yet scalable data, video, and voice services.

BENEFITS

- Ruggedized Cisco Systems IP routing technology designed for military / civilian vehicle or aircraft use
- Modular and optimized for Size, Weight, and Power (SWaP) - standalone router / router + GigE switch
- Designed for MIL-STD-810G environments (extreme thermal, shock, vibration, humidity, ingress)
- MIL-STD-1275/704 DC power supply for ground vehicle/ aircraft surge/spike/transient protection
- Robust Information Assurance (IA) and security features (firewall, VPN, encryption, zeroization)
- Flexible installation features – base flange mount or boss mount on side

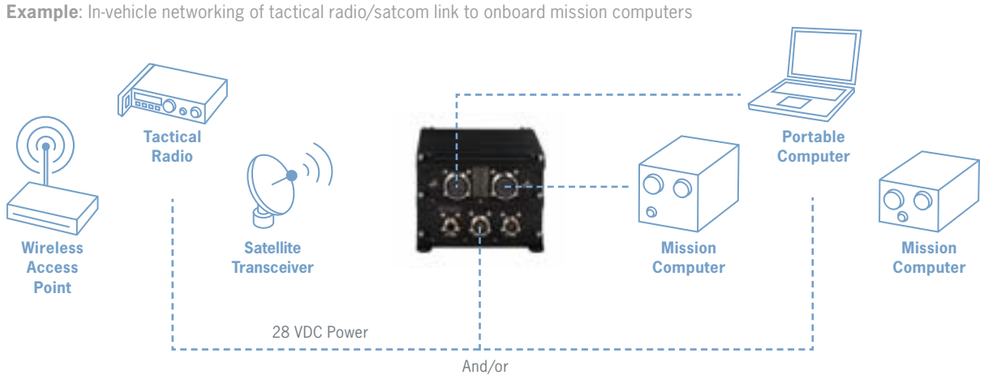
APPLICATIONS

IN-VEHICLE IP NETWORKING
MOBILE ROUTING / SWITCHING

MOBILE DATA, VIDEO, VOICE C4ISR PLATFORM UPGRADES

SITUATIONAL AWARENESS TECHNOLOGY REFRESH

Example: In-vehicle networking of tactical radio/satcom link to onboard mission computers



GENERAL SPECIFICATIONS

Cisco Technology	Cisco 5915 Embedded Services Router (ESR) w/ Enterprise IOS Software
Connectivity	Standalone Router: 2x 10/100Mbps Fast Ethernet WAN Router Ports 3x 10/100Mbps Fast Ethernet Switched LAN Ports 1x Console Port, RS-232 Router w/GigE Switch: 2x 10/100Mbps Fast Ethernet WAN Router Ports 2x 10/100Mbps Fast Ethernet Switched LAN Ports 15x 10/100/1000Mbps GigE Switched LAN Ports 2x Console Ports, RS-232 (1x for Router, 1x for GigE Switch)
Management	Cisco IOS CLI, SNMPv2/v3, Telnet, RADIUS, TACACS+, Syslog, NTP client, TFTP, DHCP, HSRP, NAT, Quality of Service (QoS) Classification
Routing	IPv4 and IPv6 Routing, RIPv1v2, OSPF, EIGRP-IP, Cisco Discovery Protocol, Cisco GMP, IP multicast PIM, IGMP, PPP, Frame Relay, HDLC, Telnet, DDR, UDP, VLAN, Radio Aware Routing with Mobile Ad-hoc networks (MANET), Mobile IP Routing and Mobile Network Support
Security	Firewall, Intrusion Detection System, data zeroization, VPN, IPSec/AES/NSA Suite B Encryption, FIPS 140-2/Common Criteria Evaluation and Validation Scheme (CCEVS) Pending for 5915 ESR
Power	Power Input: 18-33 VDC MIL-STD-704F & MIL-STD-1275D Compliant Transient Protection: Steady state voltage, ripple, surges, spike conditions per 1275/704; Galvanic Isolation: 1500 V Power Consumption: <15W Max (router), <50W (router + switch)
Mechanical	Anodized aluminum chassis with MIL-DTL-38999 connectors Ingress protection: sealed, dust and water proof (similar to IP67) Mounting - Base flange, side boss
Dimensions	Standalone router - 2.66" x 6.25" x 7.32" (~6.76 cm x ~18.59 cm x ~15.88 cm) - H x D x W Router w/GigE Switch - 4.66" x 6.25 x 7.32" (~11.84 cm x ~18.59 cm x ~15.88 cm) - H x D x W
Environmental	MIL-STD-810G Temperature (-40° to +71°C operating/-40° to +85°C storage), Shock (40G operating, 75G storage), Vibration (jet-helicopter-tracked vehicle levels), Humidity (95% NC), Altitude (15,000 ft/4,572 meters operating), Immersion (1 meter, 30 minutes)
EMI/EMC	MIL-STD-461F CE102, CS101, RS103, RE102

FAQ

What is a ruggedized Cisco product? Ruggedized Cisco products are highly reliable IP networking solutions that integrate Cisco's industry leading Commercial Off the Shelf (COTS) technology in an ultra-rugged and enhanced mechanical design for deployment in extreme environments that may involve dust and water ingress, high levels of shock and vibration, electromagnetic interference, and wide temperature and demanding power conditions common to vehicles, aircraft, and other tactical applications.

What are mobile routers for? Mobile network routers provide remote and infrastructure-less mobile network connectivity to vehicles, aircraft and other platforms. These devices reach beyond the range of a fixed network, securely extending enterprise network resources for access to mission-critical information through transparent connectivity to the roaming vehicle network and transfer of voice, data, and video information.

DuraMAR 31-5915

IP67 RUGGED CISCO 5915 MOBILE IP ROUTER, RJ-45 OR M12 CONNECTORS

FEATURES

- 5-Port Router with IP67 Ingress Protection
- Cisco 5915 Router with IOS Management
- Choice of Rugged RJ-45 or M12 Connectors
- Vehicle Grade DC Input Power Supply
- Size, Weight & Power (SWaP) Optimized
- Extensive IPv4 / IPv6 Routing Protocols

The DuraMAR 31-5915 is a rugged Cisco IOS-managed mobile router designed to extend enterprise networking infrastructure beyond the reach of traditional fixed-networks into mobile and embedded networking applications. With Cisco's 5915 Embedded Services Router (ESR) card, isolated vehicle-grade power supply, and fully dust and water proof (IP67) enclosure, the DuraMAR 31-5915 is an ideal mobile networking solution to interface with onboard computers, cameras, Ethernet switches, sensors, monitoring devices, and command-and-control gear in harsh environment and vibration environments, including tactical, mobile, vehicle, and outdoor installations in transportation, military, offshore drilling, underground mining, smart grid, homeland security, and public safety applications.

BENEFITS

- Ruggedized Cisco Systems IP routing technology
- IP67 ingress protection against dust/water with choice of rugged RJ-45 or M12 connectors
- Designed for Heavy Industry, Energy, Public Transportaion, Defense/Homeland Security, Outdoor, Vehicle, Underground Mining Equipment, Petrochemical Processing Plants,Shipboard & more
- Vehicle-grade isolated DC power supply, voltage/surge protection and EMI filtering
- Designed for harsh environments (cold/hot temperatures, humidity, rain, dust, shock, vibration)
- Robust Information Assurance (IA) and security features (firewall, VPN, encryption, zeroization)

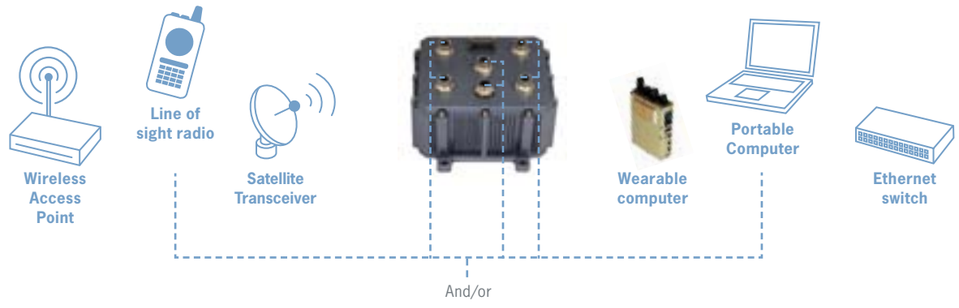
APPLICATIONS

TACTICAL, MOBILE OUTDOOR & VEHICLE

MOBILE DATA, VIDEO VOICE PLATFORM UPGRADES

SITUATIONAL AWARENESS TECHNOLOGY REFRESH

Example: In-Vehicle Networking of radio/satcom link to wearable/portable computers



GENERAL SPECIFICATIONS

Cisco Technology	Cisco 5915 Embedded Services Router (ESR) w/ Enterprise IOS Software
Connectivity	2x 10/100Mbps Fast Ethernet WAN Router Ports 3x 10/100Mbps Fast Ethernet Switched LAN Ports 1x Console Port, RS-232
Management	Cisco IOS CLI, SNMPv2/v3, Telnet, RADIUS, TACACS+, Syslog, NTP client, TFTP, DHCP, HSRP, NAT, Quality of Service (QoS) Classification
Routing	Pv4 and IPv6 Routing, RIPv1v2, OSPF, EIGRP-IP, Cisco Discovery Protocol, Cisco GMP, IP multicast PIM, IGMP, PPP, Frame Relay, HDLC, Telnet, DDR, UDP, VLAN, Radio Aware Routing with Mobile Ad-hoc networks (MANET), Mobile IP Routing and Mobile Network Support
Security	Firewall, Intrusion Detection System, data zeroization, VPN, IPSec/AES/NSA Suite B Encryption, FIPS 140-2/Common Criteria Evaluation and Validation Scheme (CCEVS) Pending for 5915 ESR
Power	DC voltage input range: 9-36 VDC, Power Consumption: <15W Max Steady State Voltage, Ripple, Surges, Spikes; Galvanic Isolation: 1500 V
Mechanical	Anodized aluminum chassis, corrosion resistant Connectors: IP67 rated RJ-45 or 4-pin M12 data connections Integrated flange mount plate for bulkhead/wall mount
Dimensions	Physical (LxWxH) - 5.6" (~14.2 cm) x 5.9" (~15.0 cm) x 2.63" (~6.68 cm) Excluding Connectors and mounting plate, 6.85" (~17.4 cm) including base, 3.4" (8.64 cm) high with RJ-45 connectors and caps. Weight: <3.5 lbs (<1.6 kg)
Environmental	Temperature: -40°C to + 71°C (-40°F to +160°F) Operational / -40°C to +85°C (-40°F to 185°F) Storage IP 67 Ingress protection: sealed, dust and water proof Shock & Vibration. Designed for Moble, Vehicle, Marine, & Offshore use

FAQ

What are mobile routers for? Mobile network routers provide remote and infrastructure-less mobile network connectivity to vehicles, aircraft and other platforms. These devices reach beyond the range of a fixed network, securely extending enterprise network resources for access to mission-critical information through transparent connectivity to the roaming vehicle network and transfer of voice, data, and video information.

What is the difference between DuraMAR 31-5915 and DuraMAR 5915? Both products are ruggedized Cisco IOS-managed mobile routers; the difference is not functional but mechanical. Each have different connectors, chassis/physical dimensions, and environmental qualifications to which the systems are validated. The DuraMAR 31-5915 is designed for IP67 dust / water ingress protection and extended temperature operation, wheras the DuraMAR 5915 is qualified to MIL-STD-810G for shock, vib, temp, humidity, etc. The connectors on the DuraMAR 31-5915 are a choice of RJ-45 or M12 where the DuraMAR 5915 features MIL-DTL-38999 connectors. Both systems have 2x 10/100 WAN, 3x 10/100 LAN and 1x RS-232 console port.

DuraNET 10-10

IP67 UNMANAGED 5-PORT 10/100 ETHERNET SWITCH, M12 / RJ45

FEATURES

- Plug-and-Play Unmanaged Ethernet Switch
- 5x 10/100 Fast Ethernet Switch Ports
- IP67 Ingress Protection Against Dust / Water
- Extended Temperature: -40ºC to +85ºC
- Choice of Rugged RJ-45 or M12 Connectors
- Designed for use in Harsh Environments (Outdoor, Mobile, Vehicle)

The DuraNET 10-10 is an rugged IP67-protected (dust, water proof) 5-port unmanaged 10/100 Ethernet switch designed to provide local area network (LAN) connectivity to IP-enabled equipment, such as onboard computers, cameras, sensors, monitoring devices, and command-and-control gear for situation awareness and information sharing in harsh temperature and vibration environments, including tactical, mobile, vehicle, or outdoor applications. With provisions for exposure to wide thermal ranges, shock, vibration, dust particles, and liquid immersion, the DuraNET 10-10 features a robust mechanical design and extended temperature operation from -40ºC to +85ºC with rugged field deployable RJ-45 or M12 connectors in a sealed and fanless metal chassis designed for mounting to any machine or flat surface.

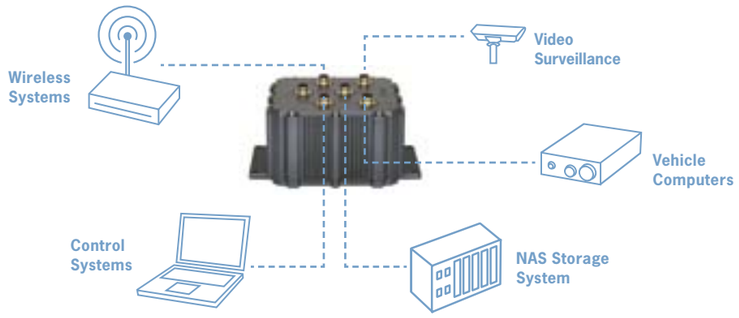
BENEFITS

- -40° to +85°C extended operating temperature for Ethernet switching in extreme cold/hot temperatures
- 5x port unmanaged 10/100 Ethernet switch (plug-and-play, no configuation required)
- Rugged RJ-45 or M12 connectors for anti-shock/vibe protection
- Water-tight, sealed metal enclosure: IP67 ingress protected from dust, water
- Shock and vibration resistance designed for mobile, vehicle, marine, & offshore Use
- Vehicle-grade DC power supply with voltage/surge protection and EMI filtering

APPLICATIONS

IN-VEHICLE NETWORKING
LAYER 2 LAN SWITCHING
EXTREME TEMP, WATER, DUST
HEAVY INDUSTRY / ENERGY
BORDER SECURITY / DEFENSE
MINING / OFFSHORE DRILLING

Example: Plug-and-Play Network Connection to Five (5) IP Enabled Devices



GENERAL SPECIFICATIONS

Ethernet Ports	Five (5) Auto-Detecting 10/100BaseT Ethernet Ports with Auto-MDI/MDIX Crossover 100BaseTX/10BaseT, Auto-Sensing of Full or Half Duplex on Each Port, Auto-Negotiation Between 10BaseT & 100BaseT Any Port Can Serve as Uplink for Network Expansion Data Transfer: 10 Mbits/sec or 100 Mbits/sec
Switching	Non-Blocking Switch Fabric with Five Fully Independent Media Access Controllers, Integrated 512 Kb Frame Buffer Memory, and 1,024 MAC Address Look-up Engine
Management	Unmanaged Switch - No Configuration Required
Compliance	IEEE 802.3 10 Mbps 10BASE-T (Ethernet) IEEE 802.3u 100BASE-TX 100 Mbps (Fast Ethernet) IPv4 and IPv6 Traffic Compatible
Power	Voltage Input: 12 / 24 / 28 VDC (Choice of Integrated DC Power Supplies to Support Voltage Ranges of 8 to 40 VDC or 18 to 36VDC) Galvanic Isolation Supported on 18-36V Model Power Consumption: Estimated at < 8W Power Protections: Transient, Surge, Reverse Polarity Protected
Physical	Dimensions: 5.6”(~14.2 cm) x 5.9”(~15.0 cm) x 3.0”(~7.62 cm) LxWxH Weight: ~3.5 lbs (~ 1.58 kg) Connectors: IP67 Rated RJ-45 or 4-Pin M12 Male – Fully Sealed against Dust/Water and Field Deployable Installation: Integrated Flange Mount Plate for Bulkhead / Wall Mount Chassis: Aluminium Alloy, Corrosion Resistant, Anodize Finish Cooling: Passive Natural Convection. No Moving Parts Degree of Protection: IP67 / NEMA 6 Dust Proof / Waterproof
Environmental	Temperature: -40° to +85°C (-40ºF to +185ºF) Shock / Vibe: Designed for Mobile, Vehicle, Marine, & Offshore Use Humidity: Up to 95% RH @ 40C, Non-Condensing Water Immersion: 1 Meter Submersion (Similar to IPX7) Dust Ingress: No Dust Ingress (Similar to IP6X)

FAQ

How much ingress protection does the DuraNET 10-10 provide? With a sealed aluminum extrusion, O-ring gasketed endcaps and baseplate, as well as rugged field-deployable RJ-45 or M12 connectors, the DuraNET 10-10 provides complete water submersion and dust protection similar to IP67 (1 meter temporary water immersion, complete protection against dust ingress).

What is an unmanaged Ethernet switch? Unmanged switches, such as the DuraNET 1059, work out of the box (“plug and play”) without configuration for simple Local Area Network (LANs) applications. As a network switch, the DuraNET 10-10 records the MAC addressess of all of the devices connected to it and send frames to the appropriate port, thus allocating a full 10/100Mbps bandwidth to each of its ports (unlike a hub device that would share the bandwidth).

DuraNET 40-10

RUGGED 10 GIGABIT / GIGABIT IP ROUTER, SWITCH, SECURITY APPLIANCE

FEATURES

- Up to 20-Port L2/L3 Network Router/ Fully Managed Ethernet Switch/Security Appliance
- Conduction Cooled 3U VPX Architecture
- Quad-Core Freescale Management Processor, Broadcom IP Packet Processor
- ARINC 404A ATR Chassis / Flange Mount
- Optional 10 GigE / Fiber Optics Interfaces
- Designed to MIL-STD-810G / 461F

The DuraNET 40-10 is a rugged, high-performance 10 Gigabit / 1 Gigabit multilayer Ethernet router, switch and security appliance optimized for tactical edge IP LAN and WAN networking deployments. Integrating up to 20 ports of routing, switching, and security services in a single hardened subsystem, this robust networking solution is based on conducted cooled 3U VPX technology with 2-level maintenance (2LM) field serviceability for maximum reliability. It features ARINC 404A ½ ATR tray or flange mounting for aerospace / ground vehicle installation flexibility. Supporting L2/L3 switching and routing, stateful firewall & NAT, IPsec VPN, and QoS traffic management, the DuraNET 40-10 leverages a Broadcom StrataXGS IP packet processor and quad-core Freescale QorIQ management processor optimized for enterprise-class network software to provide robust and secure network connectivity.

BENEFITS

VPX MIL-STD IP67

- L2 / L3 Switch / Router / Security Services Based on Advanced Freescale and Broadcom Technologies
- High Port Density – up to 20 Non-Blocking Gigabit Ethernet Ports (Optional 1x/2x 10 Gig)
- Enterprise-Level Networking Management Software Features: Advanced QoS, CLI, Web, SNMP Management, MSTP/RSTP, VLAN, IP Multicast Routing, Authentication, Port Monitoring, etc.
- Firewall, Network Address Translation (NAT), VPN Secure Tunneling, IDS, Encryption
- Designed to MIL-STD-810G Shock, Vibe, Thermal, Altitude, Humidity, MIL-461F EMI/EMC
- Sealed 3U VPX Aluminum Chassis with ½ ATR ARINC 404A Mounts or Flange Footpads

APPLICATIONS

INTRA-PLATFORM NETWORKING
L2/L3 SWITCHING / ROUTING
RUGGED MOBILE COMPUTING
C4ISR PLATFORM UPGRADES
SITUATIONAL AWARENESS
TECHNOLOGY REFRESH

Example: Software and Port Configurations for Diverse Network Bandwidth, Media, and Management Requirements

	GigE Copper	GigE Optical	10G Optical	Bandwidth
Router + Switch + Security	20	-	-	20 Gbps
Router + Switch	Special Order Options			
	16	4	-	20 Gbps
Managed Switch	16	-	1	26 Gbps
	12	4	1	26 Gbps
Unmanaged Switch	12	-	2	32 Gbps

GENERAL SPECIFICATIONS

System Architecture	Packet Processor: Broadcom StrataXGS III Multilayer (L2/L3) Switch Management Processor: Freescale QorIQ P4040 w/Integrated Security Networking Software for Enterprise Network Equipment on Symmetric Multiprocessing (SMP) Linux Board-Level: 3U VPX REDI (VITA 46/48/62/65) Mechanical: 3-Slot cc3U VPX Chassis, ARINC 404A ATR Tray Mount
Port Configurations	20 Ports: 20x 1000BaseT Copper Gigabit Ethernet (1000Mbps per Port) Special Order Options: 16x 1000BaseT Copper GigE + 4x 1000Base-SX Optical GigE 16x 1000BaseT Copper GigE + 1x 10GBase-SR Optical 10 GigE 12x 1000BaseT Copper GigE + 2x 10GBase-SR Optical 10 GigE 12x 1000BaseT Copper GigE + 4x 1000Base-SX Optical GigE + 1x 10GBase-SR Optical 10 GigE
Software Configurations	L2 Unmanaged Switch L2 Managed Switch L2/L3 Managed Switch & Router L2/L3 Managed Switch & Router with Enhanced Security
Layer 2 Switching	QoS/CoS Traffic Prioritization and Queuing; VLAN Bridging Flow Control, Broadcast Traffic Storm Control; Multicast Services IEEE-1588 PTP; Link Aggregation (IEEE 802.3ad); Port Mirroring
Management / Authentication	In-Band Management & Dedicated Out-of-Band 10/100 Ethernet Port CLI for Telnet / SSH / Terminal Management over RS-232 Console HTTP / HTTPS Web GUI; SNMP v1v2v3; RMON Support DHCP; RADIUS; PPPoE, PPP, PAP, CHAP; LDAP Authentication PING, TELNET, Syslog, Built-in-Test (BIT) Self-Diagnostics
Layer 3 Routing	IPv4 and IPv6 Support Unicast Routing: OSPF v2, RIP v1/v2, RIPng, BGP v4, IS-IS Multicast Routing: IGMP, PIM, Inter-VLAN, IP PBR, NAT Routing
Enhanced Security	Hardware Assisted Unified Threat Management (UTM) System: VPN Secure Tunneling (IPSec/ PPTP/L2TP), Stateful Packet Inspection Firewall, Cryptographic Functions, Intrusion Detection System (IDS), ACLs
Power	28Vdc Aircraft / Vehicle Voltage Input w/ Transient Protections for 250V Spike, 100V Surge (per MIL-STD-704F, MIL-STD-1275D) 3U VPX Power Supply Line Replaceable Module (VITA 62 Connector) Power Consumption: <75 W Maximum Estimated
Physical	Dimensions (LxWxH): 11.75" x 4.87" x 4.91" (29.9 x 12.4 x 12.5 cm) Form Factor: Sub ½ ATR Short (Reduced Height and Depth) Installation: 4x Side Flanges or ARINC 404A ½ ATR Mounting Tray Weight: Estimated at <10 lbs (4.54 kg) Ingress Protection: Similar to IP67 / NEMA 6 (Dust & Water Proof) Connectors: MIL-DTL-38999 Series III Chassis: Aluminum Alloy, Corrosion Resistant, Black Anodize 2-Level Maintenance: Removable, ESD-Protected VPX REDI Cards Cooling: Passively Cooled via Natural Convection
Environmental	Designed to Meet MIL-STD-810G Thermal (-40° to +71°C Operating/-40° to +85°C Storage), Shock (40G Operating, 75G Storage), Vibration (Jet-Helicopter-Tracked Vehicle Levels), Humidity (95% NC), Altitude (25,000 ft/7,620 meters), Immersion (1 Meter, 30 minutes)
EMI / EMC	Designed to Meet MIL-STD-461F CE102, CS101, RS103, RE102

DuraNET 1059

RUGGED UNMANAGED 5-PORT 10/100 ETHERNET SWITCH

FEATURES

- Plug-and-Play Unmanaged Network Switch
- 5x 10/100 Fast Ethernet Switch Ports
- MIL-STD-810 Tested: Thermal, Shock, Vibe
- Circular MIL-DTL-38999 Connectors
- Low Power Consumption: < 8W
- Lightweight: 1.9lbs (0.86 kg)
- Operating Temperature: -40°C to +85°C

The DuraNET 1059 is a rugged unmanaged Ethernet switch designed to provide plug-and-play local area network (LAN) connectivity to IP-enabled computers and other net-centric devices. Its lightweight design (< 2 lbs / 0.86 kgs), low power consumption (< 8 watts), and extended temperature operation (-40°C to +85°C) make the unit an ideal Commercial-Off-the-Shelf (COTS) solution for unmanned / manned airborne or ground vehicle networking applications. The DuraNET 1059 features five 10/100 Ethernet ports with support for auto-MDI-MDIX network installation, a galvanically isolated power supply, black anodize aluminum enclosure and rugged MIL-DTL-38999 connectors.
The unit has been tested to MIL-STD-810 for wide temperature operation and tolerance to shock and vibration profiles experienced by helicopter and fixed wing aircraft.

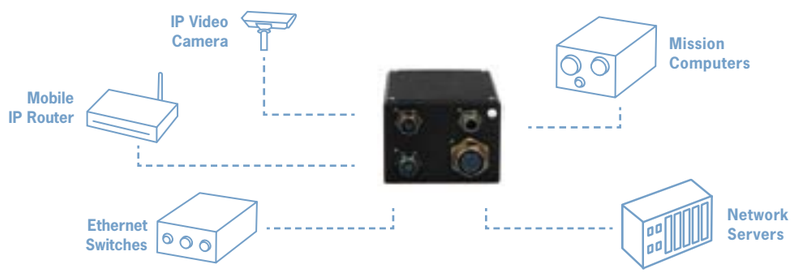
BENEFITS

- 5x port unmanaged 10/100 Ethernet switch (plug-and-play, no configuation required)
- Rugged mechanical design: MIL-DTL-38999 connectors, fanless anodized aluminum enclosure, ingress protected from dust & moisture
- Compact and lightweight: less than 2 lbs (0.8g kgs)
- Qualified to MIL-STD-810 (Jet/Helicopter Shock & Vibration, -40° to 85°C Operating Temperature)
- Vehicle Grade MIL-STD-704E Compliant DC/DC Converter with Voltage/Surge Protection and EMI Filtering

APPLICATIONS

IN-VEHICLE NETWORKING
LAYER 2 LAN SWITCHING
RUGGED MOBILE COMPUTING
C4ISR PLATFORM UPGRADES
SITUATIONAL AWARENESS
TECHNOLOGY REFRESH

Example: Network Connection to Five (5) IP Enabled Devices



GENERAL SPECIFICATIONS

Ethernet Ports	Five (5) Auto-Detecting 10/100BaseT Ethernet Ports with Auto-MDI/MDIX Crossover 100BaseTX/10BaseT, Auto-Sensing of Full or Half Duplex on Each Port, Auto-Negotiation Between 10BaseT & 100BaseT Any Port Can Serve as Uplink for Network Expansion Data Transfer: 10 Mbits/sec or 100 Mbits/sec
Switching	Non-Blocking Switch Fabric with Five Fully Independent Media Access Controllers, Integrated 512 Kb Frame Buffer Memory, and 1,024 MAC Address Look-up Engine
Management	Unmanaged Switch - No Configuration Required
Compliance	IEEE 802.3 10 Mbps 10BASE-T (Ethernet) IEEE 802.3u 100BASE-TX 100 Mbps (Fast Ethernet) IPv4 and IPv6 Traffic Compatible
Power	Voltage Input: 24V Nominal (18-36V range) Power Consumption: Estimated at < 8W MIL-STD-704E Compliance Ground: 6-32 Grounding Lug for Connection to System Chassis Ground Isolation: Galvanically Isolated Power Supply
Physical	Dimensions (LxWxH): 6.00" (152.4mm) x 4.95" (125.73) x 3.70" (93.98mm), Excluding Connectors Weight: 1.9 lbs (0.86 kg) Connectors: MIL-C-38999 (Ethernet, Power) Chassis: Aluminum Alloy, Corrosion Resistant Finish: Black Anodize (MIL-A-8625, Type II, Class 2) Cooling: Passive Convection/Conduction Cooled Ingress Protection from Sand, Dust, Moisture Installation: Four 10-32 Mounting Holes Underneath
Environmental	Designed to Meet / Tested to MIL-STD-810F: Temperature (-40° to +85°C Operating /-40° to +85°C Storage) Shock and Vibration (Jet-Helicopter Profile) Humidity (95% NC)

FAQ

Is the DuraNET 1059 a hub or a switch device? The DuraNET 1059 is a Layer 2 network switch. As opposed to a hub that broadcasts all packets to every port, the DuraNET 1059 records the MAC addressess of all of the devices connected to it and send frames to the appropriate port, thus allocating a full 10/100Mbps bandwidth to each of its ports (unlike a hub that would share the bandwidth).

What is the difference between an unmanaged and managed Ethernet switch? Unmanged switches, such as the DuraNET 1059, work out of the box as-is ("plug and play") without the typical configuration options (i.e. VLAN, QoS, CLI) offered by managed switches. Simple Local Area Networks (LANs) typically employ unmanaged switches. More complex network architectures require management capabilities to configure, manage, and monitor a LAN, giving greater control over how data travels over the network and who has access to it.

DuraNET 1268

RUGGED 10-PORT LIGHTLY MANAGED GIGABIT ETHERNET SWITCH

FEATURES

- 10-Port Gigabit Ethernet Switch
- Web GUI or CLI Management
- MIL-810G, DO-160G, MIL-461F Qualified
- DTL-38999 / Tactical Fiber Optic (TFOCA)
- -40°C to +71°C Fanless Operation
- MIL-704F & 1275D Power Protection
- Data Zeroization Support

The DuraNET 1268 is a rugged 10-port Gigabit Ethernet switch used to connect IPv4 and IPv6 compatible sensors and computing devices onboard demanding tactical network-centric (un)manned vehicle and aircraft platforms. The unit has been tested to extreme MIL-STD-461F EMI/EMC and MIL-STD-810G thermal, shock, vibe, humidity, altitude, and ingress conditions, as well as RTCA/DO-160G airworthiness. MIL-DTL-38999 connectors are featured on the front panel with optional Tactical Fiber Optic Cable Assembly (TFOCA II) connectors on the rear. The system features an onboard microprocessor for local/remote control and port monitoring, as well as support for QoS traffic prioritization, VLAN trunking, Telnet remote CLI management, Rapid Spanning Tree (RSTP) redundancy, and recoverable data zeroization capabilities.

BENEFITS

MIL-STD IP67

- 10-port lightly managed Gigabit Ethernet switch subsystem with Web, Telnet, CLI support
- MIL-STD qualified: MIL-STD-810G (shock, vibration, temp, humidity, altitude, immersion), DO-160G (temperature, altitude), MIL-STD-461F (radiated & conducted emissions and susceptibility)
- MIL-DTL-38999 (copper Ethernet) and optional Tactical Fiber Optic Cable Assembly (TFOCA) connectors
- Rugged small form factor: ~5 lbs weight, < 4" height; passively cooled, aluminum chassis with anodize coating,ingress protection from sand, dust, water (IP67-like)
- Control / monitoring: VLAN trunking, QoS/CoS traffic prioritization, RSTP redundancy, port monitoring

APPLICATIONS

IN-VEHICLE NETWORKING
LAYER 2 LAN SWITCHING
RUGGED MOBILE COMPUTING
C4ISR PLATFORM UPGRADES
SITUATIONAL AWARENESS
TECHNOLOGY REFRESH

Example: Switch Ports for Copper Ethernet and Optional Tactical Fiber Optic Connections

GENERAL SPECIFICATIONS

Switching	Ten (10) Auto-Detecting, Non-Blocking Gigabit Ethernet Ports High-Speed, Low-Latency, Four Traffic Class QoS Switch Fabric 8K MAC Look-Up Engine w/Integrated 1MB Frame Buffer Memory
Media Support	10x 1000BaseT Ports (Copper Ethernet) on Front Panel Optional 2x or 4x 1000BaseSX Ports Fiber Optic Ethernet on Rear Panel
Compliance	IEEE 802.3 / 3u / 3ab (Ethernet, Fast Ethernet, Gigabit Ethernet) IEEE 802.1d / 802.1w Spanning Tree / Rapid Spanning Tree IEEE 802.1p LAN Layer 2 QoS/CoS Traffic Prioritization IEEE 802.1Q Virtual LANs (VLAN) and Trunking RFC 2460 IP Protocol Support for IPv4 and IPv6 addressing Telnet Server (for Remote CLI Management over Ethernet)
Management	Link Speed, Duplex Mode, and Flow Control on Per-Port Basis; Port Monitoring; RS-232 Console w/ Command Line Interface (CLI); Out-of-Band 10/100 Ethernet Port, Web Browser GUI; Telnet Server (for Remote CLI Management over Ethernet)
Power	MIL-STD-704F and MIL-STD-1275D Compliant: 28Vdc Vehicle Power Input Voltage (18V to 33VDC Continuous) 1500V Galvanic Isolation with Support for 250V spike and 100V surge Power Consumption: Less than 25W (max)
Physical	Dimensions (LxWxH): 8.32" (211.30mm) x 6.45" (163.83mm) x 3.80" (96.52mm), including Connectors & Mounting Plate Weight: Approximately 5.0 lbs (2.3 kg) Ingress Protection: Similar to IP67 / NEMA 6 (Dust Proof, Water Proof) Connectors: MIL-DTL-38999 (Front Panel) for Management, Power, Console, Zeroize, 10x GigE; Optionally TFOCA II Tactical Fiber Optic Connector Assembly (Rear Panel) for 2x / 4x Optical GigE Chassis: Aluminum Alloy, Corrosion Resistant, Watertight O-Rings Cooling: Fanless; Passively Cooled via Natural Convection
Environmental	Qualified to MIL-STD-810G and RTCA/DO-160G: Thermal (-40° to +71°C Operating/-40° to +85°C Storage), Shock (40G Operating, 75G Storage), Vibration (Jet-Helicopter-Tracked Vehicle Levels), Humidity (95% NC), Altitude (50,000 ft/15,240 meters), Immersion (1 Meter, 30 minutes)
EMI / EMC	Qualified to Meet MIL-STD-461F CE102, CS101, RS103, RE102

FAQ

How is the DuraNET 1268 managed? The DuraNET 1268 has an onboard microcontroller and dedicated out of band 10/100 management port for configuring port settings over either an HTML Web browser, RS-232 command line interface (CLI) or Telnet server interface. Users can remotely/locally set-up and monitor QoS traffic priority settings, Virtual Local Area Networks (VLANs), redundant links (over spanning tree protocols), port speeds, port mirroring, among othe things.

How many copper versus optical Ethernet ports are available on the DuraNET 1268? The DuraNET 1268 features a 10-port switch fabric with all 10 ports routed to the DTL-38999 connectors on the front panel. TFOCA II connectors are also optionally available on the rear panel for up to four ports. As a fiber optic port is utilized, a fiber detect signal disables an associated copper Ethernet channel.

DuraNET 3000

RUGGEDIZED CISCO IE-3000 ETHERNET SWITCH – 10 / 18 / 26 PORTS

FEATURES

- Ruggedized Cisco IE-3000 Switch
- IOS Layer 2 LAN / Layer 3 IP Services
- Modular Design: 10 / 18 / 26 Ports
- Sealed Dust and Water Proof (IP67)
- Designed to MIL-STD-810G / 461F
- -40°C to +71°C Fanless Operation
- MIL-704F & 1275D Power Protection

The DuraNET 3000 is a ruggedized version of Cisco Systems' modular IE-3000 industrial Ethernet switch, specifically hardened for military / civil IP networking technology refresh applications. This Cisco IOS-managed network switch delivers the security, advanced Quality of Service (QoS), high availability, and manageability that customers expect from Cisco-based technology, including optional Layer 3 IP Routing services. Designed with mechanical enhancements to support deployment in extreme temperatures, shock, vibration, humidity, exposure to dust/water (per MIL-STD-810G), as well as EMI/EMC (per MIL-STD-461F), the unit requires no active cooling, is completely sealed, and provides interfaces over rugged MIL-DTL-38999 connectors. Leveraging the IE-3000's modularity, the DuraNET 3000 comes in several configurations to flexibly scale Ethernet port density from ten (10) to eighteen (18) or twenty-six (26) ports.

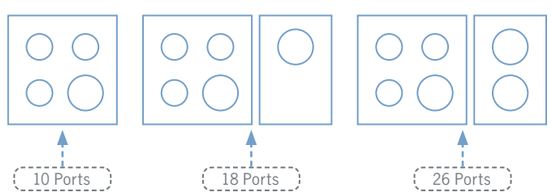
BENEFITS

- Ruggedized version of Cisco Systems IE-3000 industrial Ethernet switch with best-in-class layer 2 LAN IOS or layer 3 IP services IOS software to support data, video, and voice services
- Support for inter-VLAN routing, OSPF, EIGRP, BGP, and Multicast Routing in Layer 3 IOS option
- Modular mechanical design to scale Ethernet port density: 2x GigE + 8x / 16x / 24x 10/100 Ethernet ports
- Designed for extreme MIL-STD-810G environments (shock, vibration, temp, humidity, altitude, immersion) and MIL-STD-461F EMI/EMC (radiated & conducted emissions and susceptibility)
- IEEE-1588v2 Precision Time Protocol (PTP) support for nano-second precision

APPLICATIONS

IN-VEHICLE NETWORKING
LAYER 2/3 LAN SWITCHING
RUGGED MOBILE COMPUTING
C4ISR PLATFORM UPGRADES
SITUATIONAL AWARENESS
TECHNOLOGY REFRESH

Example: Modular DuraNET 3000 Supports 2x GigE Uplinks + 8x / 16x / 24x Fast Ethernet Downlinks



GENERAL SPECIFICATIONS

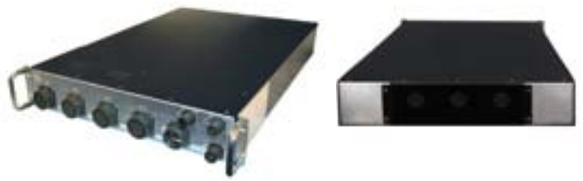
Cisco Technology	Integrated Cisco IE-3000-8TC(-E) Industrial Ethernet Switch + Up to Two IEM-3000-8TM Switch Expansion Modules Cisco IOS Layer 2 LAN Base or Layer 3 IP Services Image with Support for Express Setup, Device Manager Network Assistant, CiscoWorks
Ports	2x 10/100/1000BASE-T Gigabit Ethernet Uplinks 8x / 16x / 24x 10/100BASE-TX Fast Ethernet Ports RS232 Serial Console
Management & Monitoring	Cisco IOS Command Line Interface (CLI); Cisco Device Manager DHCP Port-Based Allocation, SNMP, RMON TCP, UDP, Telnet, IGMP, IP, RADIUS
Availability / Redundancy	VLAN, QoS, IGMP Snooping, IGMP Filtering for Multicast Authentication, Storm Control, Spanning Tree Protocol (STP), RSTP, MSTP, EtherChannel LACP and FlexLinks, Cisco Hot Standby Router Protocol, Resilient Ethernet Protocol, IEEE-1588v2 Precision Time Protocol for Nano-Second Precision in High Performance Apps
IP Routing Features (Layer 3 IOS Only)	Inter-VLAN IP Routing, IPv6 Routing , Static Routing, RIP, RIPng , OSPF, IGRP, EIGRP, BGP, IS-IS, PIM, Cisco Express Forwarding Hardware Routing Architecture, Policy-based routing (PBR), HSRP Dynamic Load Balancing and Failover, VRF-Lite Virtualization
Security	Layer 2 Port-based ACLs, Layer 3 Extended IP Security Router ACLs, IEEE 802.1x, TACACS+, RADIUS, MAC Address Filtering, SSH, SNMPv3, DHCP Snooping, Dynamic ARP Inspection, IP Source Guard, Trusted Boundary for QoS Priority Settings, Private VLAN Support
Power	Voltage Input: 28Vdc Nominal (18-60V) with Input & Transient Protections for MIL-STD-704F, MIL-STD-1275D Power Consumption (Max): < 25W
Physical	Chassis: Aluminum Alloy, Corrosion Resistant, Black Anodize Finish Installation: Integrated Flange Mount Connectors: MIL-DTL-38999, Series III Cooling: Passive Natural Convection Weight: ~7.0 lbs (~3.2 kg) for 10 Ports; ~9.5 lbs (~4.3 kg) for 18 Ports; ~10.5 lbs (~4.8 kg) for 26 Port Version Dimensions: 5.15" H x 5.78" D x 7.40"/9.25"/9.5" L (~13.08 cm H x ~18.80 cm D x ~14.68 / 23.50 / 24.13cm L) for 10/18/26 Port Versions
Environmental	Designed to Meet MIL-STD-810G: Thermal (-40° to +71°C Operating/-40° to +85°C Storage), Shock (40G Operating, 75G Storage), Vibration (Jet-Helicopter-Tracked Vehicle Levels), Humidity (95% NC), Altitude (13,000 ft/3,962 meters), Immersion (1 Meter, 30 minutes)
EMI / EMC	Qualified to Meet MIL-STD-461F CE102, CS101, RS103, RE102

FAQ

What configuration options does DuraNET 3000 offer? The DuraNET 3000 has two software image options (Cisco Layer 2 Base LAN or Cisco Layer 3 IP Services) and three hardware port density options to support either 10 ports, 18 ports, or 26 ports (2x GigE uplink ports + either 8 / 16 / 24x Fast Ethernet downlink ports).

DuraNET 4948

RUGGEDIZED CISCO CATALYST 4948E ETHERNET SWITCH – 48+4 PORTS



FEATURES

- Ruggedized Cisco 4948 Datacenter Class Multilayer Ethernet Switch with Enterprise Cisco IOS Management
- 52 Ports in 2U 19" Rack Mount Form Factor
- MIL-STD-810G / MIL-STD-461F Qualified, Extending Thermal/ Shock/Vibe/Humidity Specs of Commercial Cisco Product

The DuraNET 4948 is a ruggedized version of Cisco Systems' Catalyst 4948E data center switch with 48 Gigabit Ethernet downlinks, three 10 Gigabit Ethernet uplinks (2 Copper/1 Optical) and a Gigabit Optical uplink in a hardened 2U 19" rack-mount chassis tested to meet MIL-STD-810 environmental and MIL-STD-461 EMI requirements. This powerful, multilayer switch leverages Cisco's full-featured Enterprise Services IOS software image with the advanced Quality of Service (QoS), high availability, security, Layer 3 routing protocol support, and manageability that customers expect from Cisco for critical data center architectures. The unit features mechanical enhancements, including rugged MIL-38999 connectors and redundant aircraft-grade power supplies, that support deployment of data and multimedia services in wider thermal, shock, vibration, altitude, and humidity conditions than supported by the commercial Cisco product.

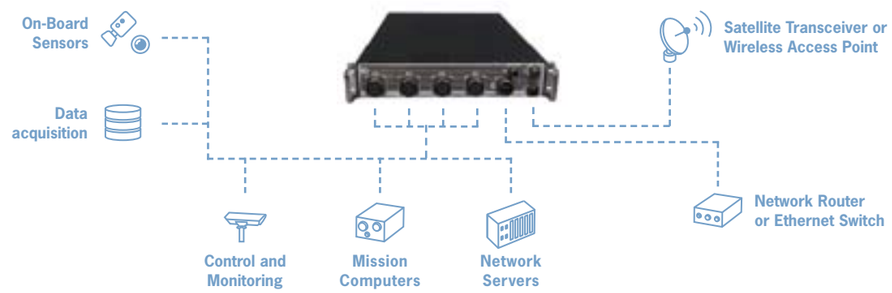
BENEFITS

- Ruggedized Cisco Catalyst 4948E Ethernet switch with best-in-class enterprise services Cisco IOS software with advanced QoS, IPv6 support, advanced routing protocols, BGP, 3DES
- 48x Gigabit Ethernet downlinks, 3x 10GigE and 1 GigE uplinks
- Non-blocking 176-Gbps aggregate throughput with data center server virtualization support
- Tested to MIL-STD-810 thermal, shock, vibration, altitude, humidity; MIL-STD-461 for EMI/EMC
- Rugged 2U, aluminum chassis with MIL-DTL-38999 connectors, redundant aircraft-grade power supplies, internal heaters, enhanced heatsinking, and upgraded cooling fans

APPLICATIONS

IN-VEHICLE NETWORKING
LAYER 2/3 LAN SWITCHING
RUGGED MOBILE COMPUTING
C4ISR PLATFORM UPGRADES
SITUATIONAL AWARENESS
TECHNOLOGY REFRESH

Example: DuraNET 4948 Provides 52 Ethernet Ports, Including 4x Uplinks and 48x Downlinks



GENERAL SPECIFICATIONS

Cisco Technology	Integrated Cisco Catalyst 4948E Cisco IOS Enterprise Services with 3DES and BGP Support, Access / Distribution Level L3 Routing Support, IPv4 / IPv6 Support
Ports	48x Gigabit Ethernet (BASE-T) Downlinks (over Copper) 2x 10 Gigabit Ethernet (10GBASE-CX4) Uplinks 1x 10 Gbps Multi-mode Optical (10GBASE-LRM) Uplink 1x 1 Gbps Multi-mode Optical (1000BASE-SX) Uplink 1x EIA/TIA-232 Serial Console (Out-of-Band Management) 1x 100BASE-T Management Ethernet (In-Band Management)
Standards	IEEE 802.3/u/z/ab/aq (Ethernet, Fast Ethernet, GigE, 10 GigE Ethernet) 10/100/1000BASE-T, 1000BASE-SX, 10GBASE-LRM, 10GBASE-CX1 IEEE 802.1D/w/s (STP, RSTP, MSTP) IEEE 802.3 ad Link Aggregation Control Protocol (LACP) IEEE 802.1p (Class of Service Prioritization) IEEE 802.1Q (Virtual Local Area Networks) IEEE 802.1x User Authentication SNMP v1, v2, v3, incl. 3DES/AES Encryption
IP Routing	Static Routing, RIPv1/v2, EIGRP-Stub, BGP, OSPF, IS-IS, EIGRP
Resiliency	Redundant DC Power Supplies & Fans ECMP Load Sharing, ACLs, CoPP, ARP Inspection, DHCP Snooping, Active Queue Management w/Dynamic Buffer Limiting (DBL)
Power	Voltage Input: 28Vdc Nominal Transient Compliance: Designed for MIL-STD-704 (Aircraft) Use Power Consumption (Max): < 320 (max)
Physical	Chassis: Aluminium Alloy, Corrosion Resistant, Black Anodize Installation: 19" Rack Mountable, Height:< 2 Rack Units (2RU) Connectors: MIL-DTL-38999, Series III Cooling: Air Cooled by Fans and Natural Convection Weight: ~23 lbs (~10.4 kg) Dimensions(HxWxD): 3.45" x 17.40" x 25.30"(8.8cm x44.2cmx64.3cm)
Environmental	Qualified to MIL-STD-810G: Thermal (-40° to +54C Operating / -40° to +71°C Storage), Shock (4G Operating, Transit Drop Shock), Transportation Vibration (4G), Humidity (95% NC), Salt-Fog / Fungus, Altitude (25,000ft/7,620 Meters Operating; 40,000ft/12,192 Meters Storage)
EMI/EMC	Qualified to Meet MIL-STD-461F CE101, CE102, CS101, CS114, CS115, CS116, RE101, RE102, RS101, RE103

FAQ

How does the ruggedized DuraNET 4948 compare to the commercial Cisco 4948E? The DuraNET 4948 and the standard Cisco 4948E share the same core switching functionality, but the DuraNET 4948 has redundant aircraft-grade power supplies, internal heaters, enhanced heatsinking, upgraded cooling fans, shock/vibration mitigation, power/EMI filtering, and a rugged 2U aluminum enclosure with MIL-DTL-38999 connectors. The DuraNET 4948 has also been validated to MIL-STD-810G and MIL-STD-461F standards to operate in wider thermal, shock, vibration, altitude, and humidity conditions than supported by the commercial Cisco product.

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 monocle. 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

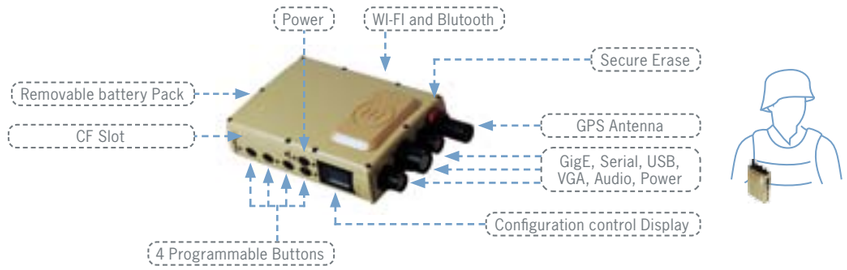
MIL-STD IP67

- 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

APPLICATIONS

SOLDIER SYSTEMS
FIRST RESPONDERS
(UN)MANNED VEHICLES
WAREHOUSING / INDUSTRIAL
C4ISR PLATFORM UPGRADES
MINING / ENERGY

Example: Zypad BR2000 Worn On Tactical Vest



GENERAL SPECIFICATIONS

Processor	Intel Atom E660T "Tunnelcreek" @ 1.3 GHz CPU, Intel PCH EG20T 1GB RAM (up to 2GB Supported)
Storage	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
Operating System	x86 Operating System and Application Software Compatibility: Embedded Linux/Wind River, Windows Embedded, Windows 7
Integrated Wireless Radios & GPS	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
Network, Serial, I/O & Connectivity	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)
Expansion	Expansion Device Support for Integrated, Fixed-Mount Radios, Other Peripherals over USB / PCIe / DIO / RS232/422
User Controls & Indicators	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
Power & Battery Life	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
Physical	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
Environmental	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)
EMI/EMC	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

APPLICATIONS

DEFENSE
HOMELAND SECURITY
AEROSPACE
INDUSTRIAL
TRANSPORTATION

GENERAL SPECIFICATIONS

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

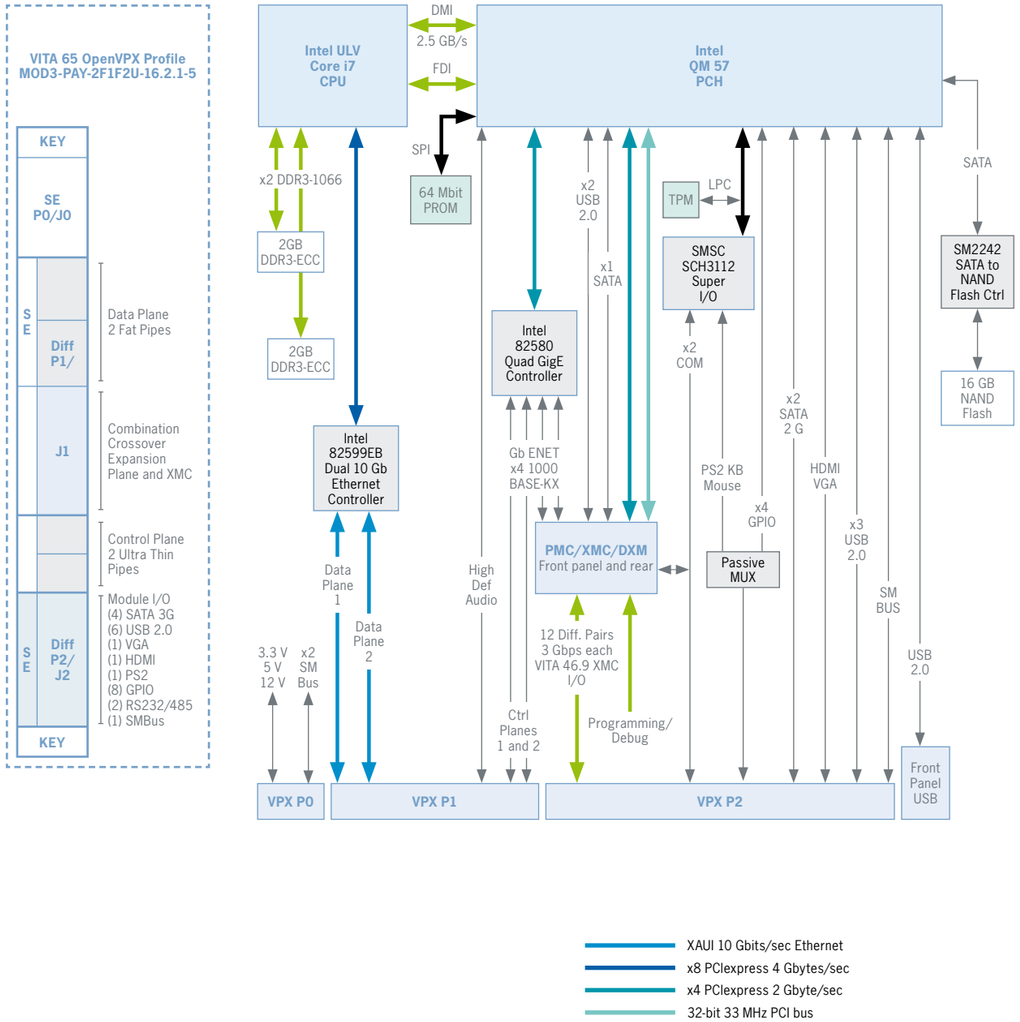
CPU-110-10 (V3PD)

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

BLOCK DIAGRAM



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.

APPLICATIONS

DEFENSE
HOMELAND SECURITY
AEROSPACE
INDUSTRIAL
TRANSPORTATION

GENERAL SPECIFICATIONS

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

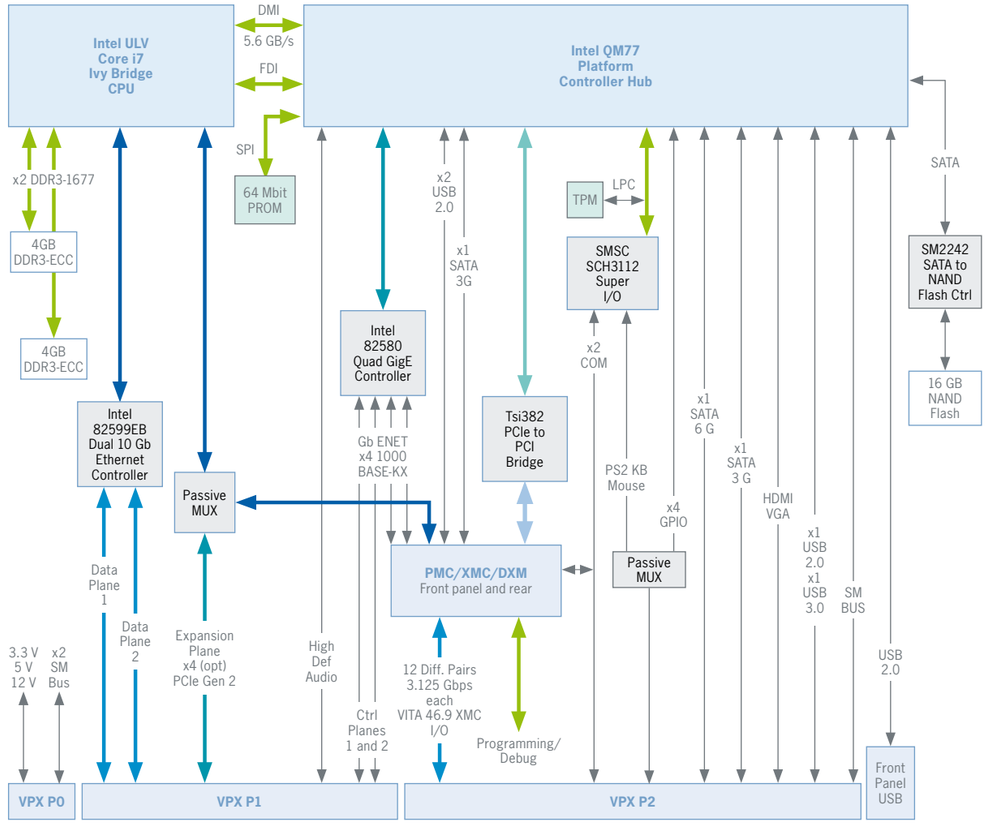
CPU-110-20 (V3PI)

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 differental pairs
x8 PCIexpress 8 Gbytes/sec (Gen 2)
x4 PCIexpress 4 Gbyte/sec (Gen 2)
x1 PCIexpress 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

APPLICATIONS

DEFENSE
HOMELAND SECURITY
AEROSPACE
INDUSTRIAL
TRANSPORTATION

GENERAL SPECIFICATIONS

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

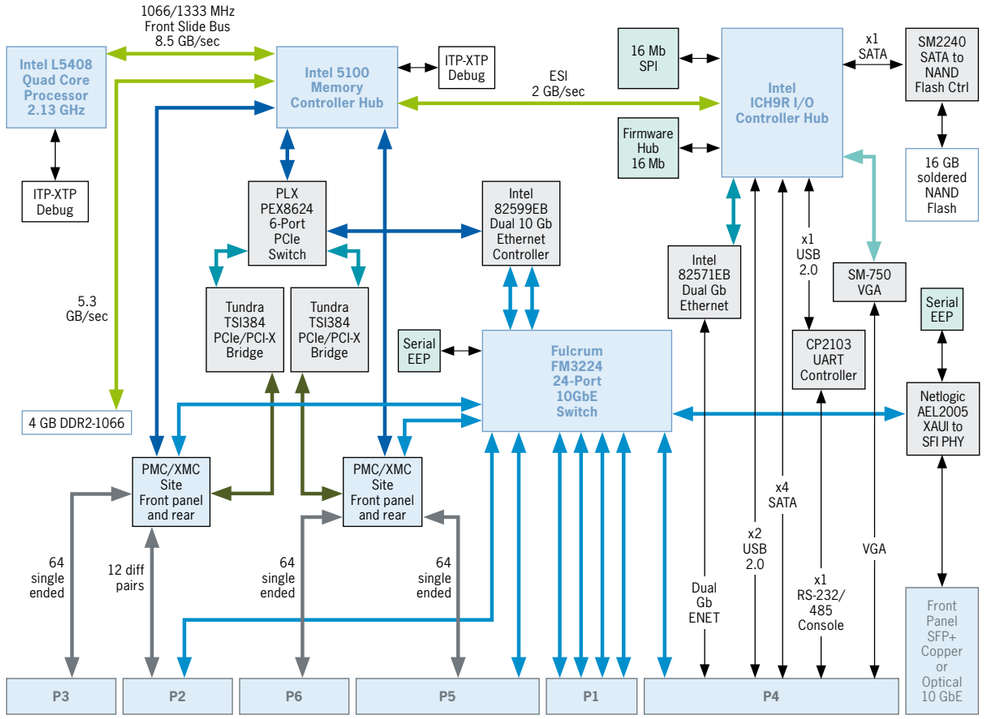
CPU-111-10 (VPQ/VRQ)

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 (SERDE S)	-	-	-	-	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



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 1is 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

APPLICATIONS

DEFENSE
HOMELAND SECURITY
AEROSPACE
INDUSTRIAL
TRANSPORTATION

GENERAL SPECIFICATIONS

CPU	Dual-core ULV Core i7 1.04GHz Intel QM57 PCH
Memory	4GB DDR3-1066 with ECC soldered 64 Mbit SPI Flash 16GB soldered NAND Flash (optional) 128MB NOR flash, 1Mx36 PBSRAM and 32Kx8 NVSRAM per each SAS controller
SAS Controller	2X LSI SAS2008
PO Interfaces	Utility Connectivity per VITA 46.0 including dual SMBus
P1 Interfaces	4x 10Gb Ethernet
P2 Interfaces	4X SAS 1x COM ports PS2 KB Mouse 4x GPIO 4x SATA 2G HDMI VGA 6x USB 2.0
P3 Interfaces	4X SAS SMBus 8x GPIO
P4 Interfaces	2X SAS 2x Gb Ethernet I/O per V ITA 46.9 X 12d + X 8d
P6 Interfaces	6X SAS I/O per V ITA 46.9 X 12d + X 8d
Front Panel Interfaces	1x USB 2.0
DXM	DXM allows additional custom FP interfaces including: • 2x USB 2.0 • 1x SATA • 2x Gb Ethernet
XMC/PMC	2x XMC/PMC (front panel and rear access) 32bit (33MHz) PCI; x8 PCIe
VPX Profile	Open VPX compatible profile MOD6-PAY-4F2T-12.2.2-54
Environmental	Operating temperature -40° to +85°C Operating temperature: 0° to + 70°C
Physical	6U VITA46 VPX Conductive cooling option Convection cooling option Conformal coating option Wedge locks option
Power	Typical: +12V @ 10A
Compliance	MIL-STD-810 (with wedge lock option)
Software Support	Linux VxWorks Windows Solaris LynxOS QNX

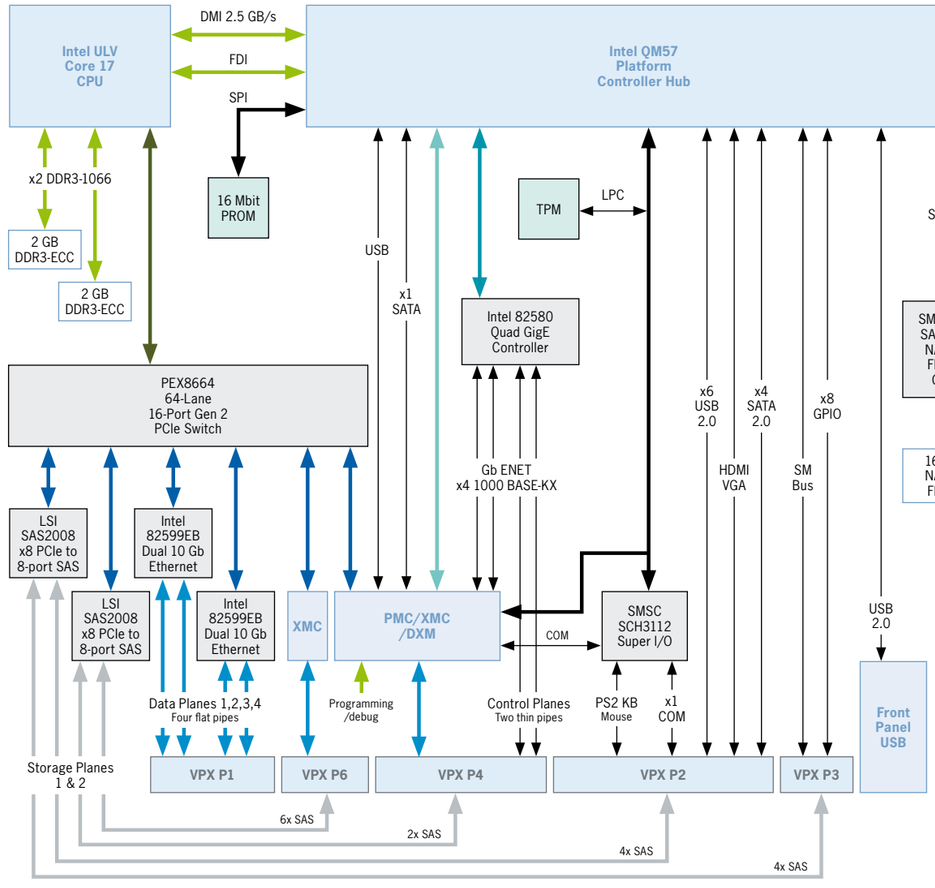
CPU-111-11 (VPD)

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[1]	-	-	-	-	-	(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 PCIexpress (Gen2) 8Gbytes/sec
x4 PCIexpress 2 Gbyte/sec
32-bit 33 MHz PCI bus
x16 PCIexpress 8 Gbytes/sec

CPU SELECTOR

Product Name	Form Factor	Notes	Processor	Clockspeed	RAM	SSD	I/O	Cooling	Oper. Temp
CPU-110-20 (V3PI)	3U VPX		Core i7	2.2GHz	8 GB	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
CPU-110-10 (V3PD)	3U VPX		Core i7	1.04GHz	4 GB	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
CPU-111-11 (VPD)	6U VPX	16 Channel SAS controller	Core i7	1.04GHz	4 GB	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
CPU-71-14 (DPD4)	6U VME	form/fit/function upgrade to the VMVME-7751	Core 2 Duo	1.5GHz	4 GB	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
CPU-111-10 (VPQ)	6U VPX	10Gb Ethernet Switch	Xeon	2.13 GHz	4 GB	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
CPU-71-10 (DPD)	6U VME		Core 2 Duo	1.5 GHz	4 GB	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
CPU-31-10 (CPD2)	6U cPCI		Core 2 Duo	1.5/2.16 GHz	4 GB	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
ISIS XL	PC/104-Plus	On board GPS and miniPCIe expansion	Atom Z520	1.33 GHz	1 GB	2 GB	1x FE, 8x USB, 2x COM, Video, Audio, IDE, PS2, GPS, TPM	Passive	-40° to +85°C
CPU-1484	PC/104-Plus		Pentium M	1.4 GHz	512 MB	-	1x GigE, 1x FE, 4x USB, 2x COM, Video, Audio, IDE, PS2	Passive	-40° to +85°C
CPU-1482	PC/104-Plus		Pentium M	1.4 GHz	512 MB	-	1x FE, 8x USB, 2x COM, Video, Audio, IDE, PS2	Passive	-40° to +85°C
CPU-1474	PC/104-Plus		Celeron M	1.0 GHz	512 MB	-	1x GigE, 1x FE, 4x USB, 2x COM, Video, Audio, IDE, PS2	Passive	-40° to 85°C
CPU-1472	PC/104-Plus		Celeron M	1.0 GHz	512 MB	-	1x FE, 8x USB, 2x COM, Video, Audio, IDE, PS2	Passive	-40° to +85°C
CPU-1454	PC/104-Plus		Celeron	400 MHz	256 MB	-	1x GigE, 1x FE, 4x USB, 2x COM, Video, Audio, IDE, PS2	Passive	-40° to +85°C
CPU-1452	PC/104-Plus		Celeron	400 MHz	256 MB	-	1x FE, 8x USB, 2x COM, Video, Audio, IDE, PS2	Passive	-40° to +85°C
CPU-1440	PC/104-Plus	True ISA Bus	Vortex86DX	600MHz	128 MB	-	1x FE, 4x USB, 4x COM, LPT, Video, IDE, PS2	Passive	-25 to + 70C / -40° to +85°C

SUMMARY

POWER SUPPLY SELECTOR

					Voltage Outputs						
Product	**Form Factor**	**Voltage Input**	**Watts**	**Isolation**	**+3.3 V**	**+5 V**	**+12 V**	**-5 V**	**-12 V**	**Oper. Temp**	**MIL-STD Input Protections / EMI Filtering**
PWR-20-10	PCI/104	24V DC	50W	Yes	-	10 A	0.8 A	-	-	-40° to +85°C	EN-50155, RIA 12, ISO 7637-2 (2004-06) EN 60950
		72V DC	50W	Yes	-	10 A	0.8 A		-	-40° to +85°C	EN-50155, RIA 12, EN 60950
		110V DC	50W	Yes	-	10 A	0.8 A	-	-	-40° to +85°C	EN-50155, RIA 12, EN 60950
PWR-22-11	PCI/104-Express	18 to 36V DC	100 W	Yes	15 A	10 A	1.5 A	-	-	-40° to +85°C	MIL-STD-1275D, 704F, 461F
			50 W	Yes	-	10 A	-	-	-	-40° to +85°C	MIL-STD-1275D, 704F, 461F
PWR-21-11	PC/104-Plus	18 to 36V DC	100 W	Yes	15 A	10 A	1.5 A	-	-	-40° to +85°C	MIL-STD-1275D, 704F, 461F
			50 W	Yes	-	10 A	-	-	-	-40° to +85°C	MIL-STD-1275D, 704F, 461F
ACS-5161	PC/104	18 to 36V DC	60 W	Yes	-	12 A	2.5 A	-	-	-40° to +85°C	461F
ACS-5151	PC/104	8 to 40V DC	50 W	-	2 A	10 A	2 A	-	-	-40° to +85°C	-
PRV-0617	PC/104	9 to 60V DC	75 W	-	-	15 A	2.5 A	500 mA	500 mA	-40° to +85°C	-
ACS-5125	PC/104-Plus	15.5 to 40V DC	25 W	Yes	-	5 A	-	-	-	-40° to +85°C / -55 to +100°C	MIL-STD-704, 1275A/B/C, 461E

ETHERNET / SERIAL SELECTOR

Product	**Function**	**Form Factor**	**Ports**	**Management**	**Media Support**	**Oper. Temp**
SWI-110-10	Ethernet Switch	3U VPX	12x GigE BaseT + 2x 10GbE XAUI / Out of band: 1x COM, 1x FE 12x GigE BaseT + 1x 10GbE XAUI + 4x GbE SerDes / Out of band: 1x COM, 1x FE 12x GigE BaseT + 8x GbE SerDes / Out of band: 1x COM, 1x FE	L2 Unmanaged Switch or L2 Managed Switch L2/L3 Managed Switch & Router L2/L3 Managed Switch & Router with Enhanced Security	Backplane	-40° to 85°C
COM-8000	Ethernet Switch	6U VME	16x 10/100 Ethernet, 2x GigE (opt)	Unmanaged	10/100/1000 BaseT (Copper)	-40° to 85°C
COM-1268	Ethernet Switch	PC/104-Plus	10x Gigabit Ethernet	CLI, Web, Telnet, RSTP, VLAN, QoS	10/100/1000 BaseT (Copper) 4x Ports Fiber Optic Capable	-40° to 85°C
PRV-1059	Ethernet Switch	PC/104	5x 10/100 Ethernet	Unmanaged, Port-Based VLAN (opt)	10/100 BaseT (Copper)	-40° to 85°C
COM-1452	Ethernet NIC	PC/104-Plus	5x Port 10/100 Ethernet		10/100 BaseT (Copper)	-40° to 85°C
COM-1274	Serial / CANbus Controller	PC/104	8x RS232/422/485, 2x CAN			-40° to 85°C

SUMMARY

AUDIO/VIDEO SELECTOR

Product	Function	Form Factor	Channels / Inputs	Outputs	Oper. Temp
CTR-1475	MPEG-4 Compression, Encoding and Frame Grabber	PC/104-Plus	4x Analog Video Inputs, 4x Audio Input Channels, 8 GPIO	MPEG-4 or AVI Formats, 1x Analog Video Output Channel	-40° to 85°C
INT-1462	Frame Grabber	PC/104-Plus	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
INT-1410	Audio Crosspoint Switch Matrix	PC/104-Plus	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

GPS/CELLULAR

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