DuraCOR 80-40

- **PCIe104 Expandable Core i7 Mission Computer**
- **Modular Rugged Chassis to Scale System I/O**
- **Dual Removable Solid State Media**
- **28V DC MIL-1275/704 Power Supply**
- **IP67 Ingress Protected (Dust/Water Proof)**
- **MIL-810G Extreme Shock/Vibe/Thermal**
- **MIL-461F EMI/EMC Emissions & Susceptibility**

PRELIMINARY / SUBJECT TO CHANGE

Front View – Standalone Base Computer Unit (left), With Single I/O Expansion Segment (right)

Rear View – 2x Removable 2.5″ SATA SSD Slots Behind Sealed, Hinged Panel

CPU+ SSD

Power Supply

CPU+ SSD

I/O Expansion

Power Supply

FEATURES

NON-ITAR   MIL-STD   IP67   PCI/104

HIGH PERFORMANCE CPU:
- Intel 2nd Generation Core i7 (Sandy Bridge) Processor, 2.2 GHz , Dual-Core, 4-8 GB DRAM with Integrated GPU and Advanced Vector Extensions (AVX) Signal Processing

CONNECTIVITY & I/O:
- 2x Gigabit Ethernet 10/100/1000 Mbps LAN Interfaces
- 6x USB 2.0, 2x RS-232 Serial, 16x Discrete DIO
- VGA/Analog Video, Digital DVI / HDMI, Stereo Audio, PS2
- Dual Slots for Removable 2.5" SATA Solid State Disks (on Rear)
- Other I/O Configurations by Special Order (i.e. MIL-STD-1553/429)

RUGGED MECHANICAL DESIGN
- Designed for MIL-810G Shock, Vibration, Thermal, Altitude, Humidity
- -40 to +71C Fanless Extended Temp Operation with No Moving Parts
- Corrosion-Resistant, Aluminum Chassis Sealed Against Water, Dust, EMI
- Sealed, Hinged Panel on Rear for Dual Removable SATA SSD Storage
- Circular MIL-DTL-38999 Connectors for Reliable I/O Connections
- Filtered, Transient-Protected Power Supply for Aircraft and Vehicle Use
- Designed to MIL-461F Conducted/Radiated Emissions & Susceptibility
- Conformal Coating for Humidity/Tin-Whisker Mitigation
- Flexible / Robust Mounting – Base Flange Mount or Side Boss Mount

MODULAR / EXPANDABLE
- Modular Interlocking Chassis Design Supports Stackable PCIe104 I/O Card Expansion for High Speed Interconnect (2-3 Card Slots Per Expansion Chassis Segment)
- Pre-Installed MIL-38999 Connectors and Internal Power/Control Bus Ease Integration of PCIe/104 or PCI/104-Express Cards by Parvus Factory
- Factory Mateable w/DuraMAR 5915 Router for Computer + Router + Switch Appliance

The DuraCOR® 80-40 is a rugged Commercial-Off the Shelf (COTS) tactical mission computer subsystem based on the high performance Intel Core i7 Sandy Bridge processor with a high-speed, stackable PCI-Express bus (PCIe/104) architecture for I/O card expansion. Optimally designed for Size, Weight, and Power (SWaP)-sensitive mobile, airborne, ground, manned or unmanned vehicle applications, the DuraCOR 80-40 combines powerful graphics and multi-core processing with ultra-reliable mechanical robustness and modular I/O expansion for extreme environmental and EMI performance per MIL-STD-810G (thermal, shock, vibration, dust, water, humidity) and MIL-STD-461F.

Delivering new capabilities for C4ISR command & control, image processing and surveillance requirements, the DuraCOR 80-40 features modular interlocking chassis segments with pre-installed MIL-DTL-38999 connectors and an internal power/control bus to ease the integration of application-specific PCIe/104 or PCI/104-Express I/O cards and meet high-speed mission payload I/O requirements. Standard I/O includes 2x Gigabit Ethernet, 6x USB, 2x RS232, 16-bit GPIO, dual display outputs (Analog VGA, DVI / HDMI), stereo audio, PS2, and a stackable PCIe/104 bus. The unit mounts either horizontally or vertically and supports factory integration of the Cisco IOS-managed DuraMAR 5915 router and/or application I/O into a single appliance combination of computer + router + switch + application I/O.

The DuraCOR 80-40 is completely sealed (IP67), requires no active cooling, includes a military-grade power supply supporting aircraft (MIL-STD-704F) and ground vehicle (MIL-STD-1275D) voltages, and features a hinged panel on the rear with two slots for removable 2.5″ SATA Solid State Disks (SSD). Parvus application engineering services are available to support semi-customized configurations, including mechanical changes and pre-integrated PCIe/104 I/O cards.

Parvus

Specifications

Standalone Computer

Computer + I/O Expansion Module

Rear Panel Access to Dual Removable 2.5" SATA SSD Storage

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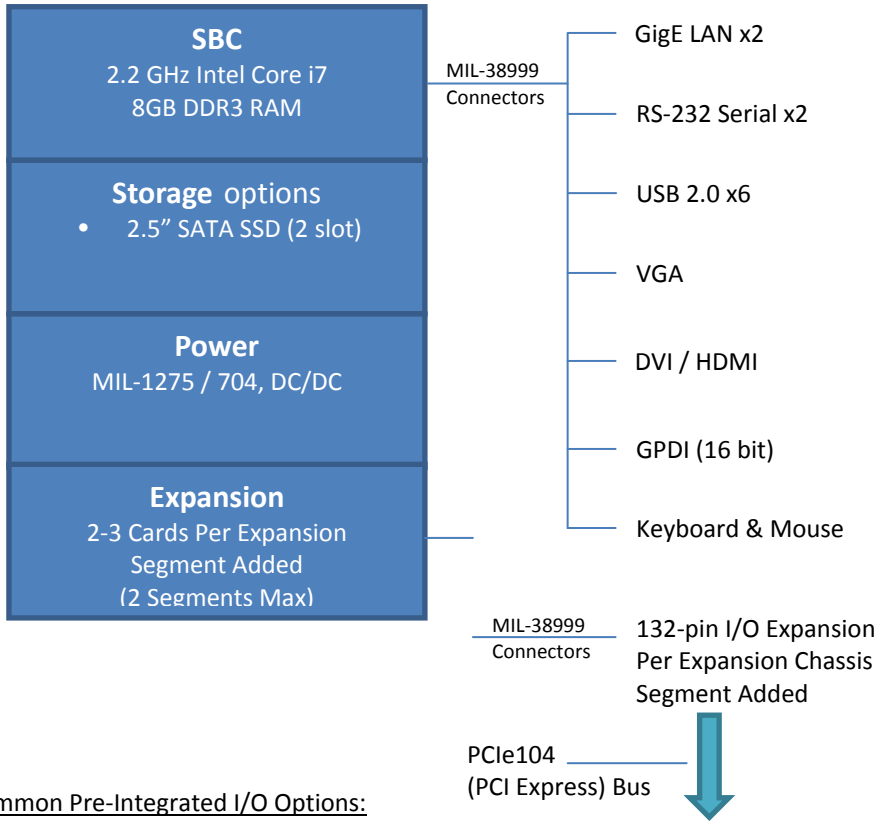
HIGH PERFORMANCE PROCESSOR	• Intel Core i7-2655LE (Sandy Bridge), Dual Core, Quad Thread Support, 4MB L3 Cache, 64-Bit Instruction Set, Intel BD82QM67 Platform Controller Hub, Intel HD Graphics 3000, 256-bit Advanced Vector Extensions (AVX) • 2.2 GHz Clockspeed (2.9 GHz w/ Intel Turbo Boost 2.0) with Support for Intel vPro, Intel Hyper-Threading, VT Hardware Assisted Virtualization, Intel Fast Memory Access, Enhanced SpeedStep Technologies
RAM MEMORY	• 8 GB DDR3-1333 MHz
SOLID STATE DISK	• Two Slots for Removable 2.5" Form-Factor Serial ATA (SATA) Solid State Disks (SSDs) Behind Sealed, Hinged Door on Rear Panel Enable Removal of High Performance, High Capacity, Rugged Industrial SLC NAND Flash 2.5" SATA Storage Media • Rugged -40/+85C SSDs Pre-Installed on Mounting Trays with Optional Linux / Windows OS Pre-loaded Available: - 64 / 128 / 256 GB Microsemi Trrust-Stor Secure SSD with Fast Purge, AES-256 HW Encryption, 100+ MB/s Read/Write Rates - 32 / 64 / 128 GB Delkin Iridium SSD, Read Rates up to 250 MB/s, Write Rates up to 180 MB/s
OPERATING SYSTEM	• Pre-installed Linux or Special Ordered with Windows 7 or Windows Embedded / Real-Time Operating System • Hardware Compatible w/x86 Embedded / RTOS ; VxWorks Board Support Package (BSP) Roadmapped
BUS ARCHITECTURE	• PCIe/104 (PCIe v2.0, Type 1) bus, 2.5 / 5.0 GT/s – 4x1 and (either 1x16 / 2x8 / 1x8 and 2x4) Lanes • Supports Integration with Stackable PCIe/104 and/or PCI/104-Express I/O Cards Natively; PCI-PCIe Bridge Adapter Required to Support PCI-104 and/or PC/104-Plus I/O Cards
EXPANSION I/O SUPPORT	• 2-3 Card Slots Available for PCIe/104 or PCI104-Express Cards per Expansion Chassis Segment Added to Base System • Each Chassis I/O Expansion Ring Include 132 Spare I/O Pins on Pre-Installed DTL-38999 Connectors • Integrated Power and Control Bus Connects Each Chassis Segment - Supports Capabilities for Isolated 5V/3.3V/12V Power, Ethernet, Serial, and Zeroize Signals to Expansion I/O Modules • Approx. 100 Watts of Power Available for Expansion Cards Added to System
NETWORK	• 2x Gigabit Ethernet LAN Interfaces (10/100/1000Mbps)
SERIAL	• 2x EIA RS232 Serial Ports, 250 Kbps Max
USB	• 6x USB 2.0 Ports
VIDEO	• VGA/ Analog Video Output (up to 2048x1536 pixels) • DVI / HDMI Digital Video Outputs (up to 1920 x 1200 pixels)
AUDIO	• AC97 Stereo Audio
DIO	• 16-bit Discrete General Purpose I/O
PS2	• PS2 Keyboard/Mouse Ports
POWER	• 28V Nominal Power Input Voltage (12-36 VDC Continuous <100 W Systems; 18-36 VDC for up to 150W Systems) • Reverse, Over Voltage, 250V Spike, 100V Surge-Protected (MIL-STD-704F and MIL-STD-1275D Compliance) • < 50 W Maximum Power Consumption (Base System); ~100 W Available for I/O Expansion Modules • Grounding Lug for Connection to System Chassis Ground • Battery for Real-Time Clock Maintains Time/Day for Estimated 10 Years • LED Power Status Indication
ENVIRONMENTAL	Designed to Meet MIL-STD-810G: (Formal Qualification Testing Pending) • Operating Temperature: -40 to +71C (-40ºF to +160ºF) Ambient (@ 100% CPU Stress/Utilization - Full Processor Clockspeed up to 65C Ambient; Clockspeed Throttled to 80% at 71C Ambient) • Storage Temperature: -40ºC to +85ºC (-40ºF to +185ºF) • Operating Shock: 40g, 11ms, 3 pos/neg per axis, 18 terminal peak sawtooth pulses (MIL-STD-810G, Method 516) • Crash Safety Shock: 75g, 11ms, 2 pos/neg per axis, total 12 sawtooth • Random Vibration: 3 Axes, 1 Hour/Axis (MIL-STD-810G, Method 514, per Jet- Helo and Tracked Vehicle Profiles) • Humidity: Up to 95% RH @ 40C, Non-Condensing (Conformal Coated) • Water Immersion: 1 Meter Submersion, 30 Minutes (Similar to IP67) • Dust Ingress: Designed for Compliance w/Method 510.4, No Dust Ingress • Operating Altitude: Up to 30,000ft (9,144 meters); Thermal De-rating May Apply • Storage Altitude: Sea Level to 60,000 ft (18,288 meters)
EMI/EMC ISOLATION	Designed to Meet MIL-STD-461F (Qualification Testing Pending): • Conducted Emissions, CE102, Power Leads, 10 KHz to 10MHz, basic curve • Conducted Susceptibility, CS101, Power Leads, 30 Hz to 150 KHz, Curve 2 (28V and Below) • Radiated Emissions, RE102, Electric Field, 10 KHz to 18 GHz, Figure RE102-3 • Radiated Susceptibility, RS103, Electric Field, 2MHz to 18 GHz, 200 Volts per Meter
PHYSICAL	• Weight: ~ 8.5 lbs (~3.9 kg) Base System; ~ 9.7 lbs / 10.9 lbs (~4.4 kg / ~4.9 kg) with One / Two I/O Expansion Segments • Dimensions (H x D xW, Excluding Connectors/Mounts): Base Unit (CPU+PSU+SSD) Approx. 4.4" H x 6.75 D x 6.25" W (~11.18cm H x ~17.15cm D x ~15.85cm W); Each Expansion I/O Segment Adds 2.0" (5.08 cm) Height • Chassis: Aluminium Alloy, Corrosion Resistant • Finish: Black Anodize Finish per MIL-A-8625, Type II, Class 2 • Connectors: MIL-DTL-38999 Series III • Installation: Base Flange Mount or Side Boss Mount (90° Rotated Orientation) • Cooling: Natural Passive Convection/Conduction. No Moving Parts.
RELIABILITY	• No Moving Parts; Passive Cooling; Conformal Coated Boards for Humidity and Tin Whisker Mitigation • MTBF: TBD Calculated per MIL-HDBK-217F
EXPORT JURISDICTION	• NON-ITAR: U.S. Commerce Export Administration Regulations (EAR) Controlled
STARTER CABLE SET	• Starter Cable Set Provides Mating DTL38999 Connectors that Break-out I/O from CPU (on J11, J12) and Power Input (on J1) to Standard PC Style Interfaces for Lab or Bench Testing Purposes
WARRANTY	1 Year RTF Warranty (Extended Service Contracts Available)
SPECIAL ORDER OPTIONS	• Breakout Cable for User Defined Expansion I/O (J13, J14) with Subsystem Integration. • Data Device Corp (DDC) MIL-STD-1553 Databus Controllers (1 to 4 channels) • Other Integrated PCI-104/Express or PCIe104 I/O or Datacom Modules • Integrated Cisco IOS-Managed Mobile Router or Network Switch (DuraMAR 5915 Router/Switch) • 38999 Connector Caps, Mechanical Changes, Custom Metal Finishes • Program-specific Mil-Certifications / Environmental Testing

DuraCOR 80-40

Rugged Modular Core i7 Mission Computer with PCI Express Expansion and Dual GigE

Baseline Functionality:

SBC
2.2 GHz Intel Core i7
8GB DDR3 RAM

Storage options
- 2.5" SATA SSD (2 slot)

Power
MIL-1275 / 704, DC/DC

Expansion
2-3 Cards Per Expansion Segment Added
(2 Segments Max)

MIL-38999 Connectors

- GigE LAN x2
- RS-232 Serial x2
- USB 2.0 x6
- VGA
- DVI / HDMI
- GPDI (16 bit)
- Keyboard & Mouse

MIL-38999 Connectors

132-pin I/O Expansion Per Expansion Chassis Segment Added

PCIe104 (PCI Express) Bus

DuraCOR computers feature modular, expandable designs—based on stacking PC/104-Plus, PCI-104 or PCIe104 card architectures. Parvus provides application engineering / subsystems integration services to extend the base general-purpose computing functionality of the integrated SBC, adding application-specific I/O and communications cards.

With pre-integrated subsystems, customers reduce schedule risk and meet program-specific requirements by maximizing use of open architecture COTS technologies. These modified COTS subsystems may include mechanical changes and application-specific functionality (i.e. Ethernet Switch, MIL-STD-1553 / ARINC 429 interface, Video Encoders/Frame Grabbers, GPS Receivers, discrete I/O).

Common Pre-Integrated I/O Options:

Up to 2 Segments

Base System | + 1 Expansion Segment | + 2 Expansion Segment

- MIL-STD-1553
- CANbus
- Ethernet NICs
- Ethernet Switch
- Frame Grabber
- Serial Controller
- Analog I/O
- DIO
- USB / Firewire
- FPGA
- MPEG / JPEG
- Data Storage
- ARINC429
- GPS Receiver

- Cameras, ISR Sensors
- Avionics Controls
- Weapons Systems
- Vehicle Sensors
- Diagnostic Terminals
- Comms Radios