

PowerBlock 15

Fully Integrated Ultra-Compact Embedded Computer

- Man-pack chassis for SWaP-constrained applications
- 1/15 the size of full ATR, 1/3 the size of 1/4 ATR (short)
- Multiple supported configurations
- High-bandwidth, non-blocking PCI Express® architecture
- Rugged convection-cooled or cold-plate mountable design for deployment in harsh environments



The PowerBlock® 15 Ultra-Compact Embedded Computer from Mercury Computer Systems represents a new class of mobile computing systems designed for maximum performance in minimal size. Fully integrated and programmable, PowerBlock 15 man-pack systems are ideal for real-time communications, sensor, and signal-processing applications. About the size of a portable hard drive, they can be deployed in even the most space-constrained aerospace/defense and commercial applications.

High-Performance Integrated Systems

The PowerBlock 15 ships as a fully integrated system, based on the Ensemble™ 1000 system architecture and modules, with all supplied hardware pre-configured to meet your specific requirements.

The PowerBlock 15 is ultra-compact and lightweight, measuring only 4.5" x 5.4" x 1.9" (114 x 137 x 48 mm). The chassis is designed throughout to isolate its internal electronics from all external environmental conditions, allowing deployments in harsh environments.

Modular Flexibility

The PowerBlock 15 features a modular architecture that allows flexible configurations of heterogeneous multiprocessor arrays, high-performance I/O, and local storage. The PCI Express® backplane provides four lanes of PCI Express bandwidth to multiple plugin modules:

- Single-board computing modules, coupled with a dedicated I/O daughter card, monitor and manage the PowerBlock 15 system and interface to external equipment over serial protocols and/or Ethernet.
- High-performance computing modules, featuring dual-core processing engines and the latest FPGAs, are designed to meet the most demanding data-processing requirements.

- MXM 3.0 specification-compliant graphics processing unit (GPU) modules give Intel® processors access to hundreds of GFLOPS of compute power from the latest graphics coprocessors across the PCI Express fabric.
- SATA solid-state embedded storage drives provide ample storage for the system.

System Architecture

The architecture of the PowerBlock 15 is optimized for real-time processing, balancing processing power with high-bandwidth inter-processor communications and external I/O bandwidth. A high-performance PCI Express interconnect provides high-throughput non-blocking communications between processing and I/O nodes. External I/O is reconfigurable to accommodate virtually any type of digital or analog I/O.

Rugged Design

The PowerBlock 15 is designed for rugged deployments, with features including o-ring sealing for pressure, humidity, and EMI isolation, high-reliability connectors, extended temperature ranges, and locking modules for shock and vibration immunity.

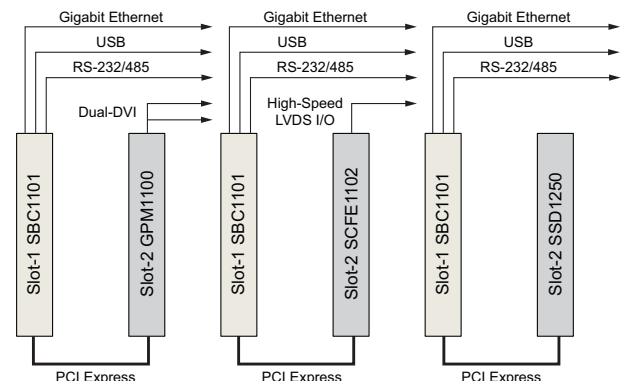


Figure 1. PowerBlock 15 Architecture Examples

Applications

The PowerBlock 15's unique blend of high-performance real-time processing and ultra-compact packaging makes it ideal for communications, sensor, and signal processing applications in size, weight, and power (SWaP)-constrained deployments such as lightweight unmanned vehicles and soldier radios. The processing architecture and performance are well suited to diverse payload applications including:

- Video processing and fusion
- Mission computing
- Signals intelligence
- Software-defined radio
- Wireless communications

The PowerBlock 15 has the rugged design features needed for deployment in harsh environments.

Specifications

Available Processor Modules

Intel x86 architecture	
Intel Tolapai SoC	At 1.20 GHz
IA-32 core	1-GB DDR2 SDRAM and 4-GB flash
Graphics co-processor	
MXM specification	3.0 GPU modules
FPGA	Xilinx Virtex-5
XC5VLX30T	256-MB DDR2 SDRAM and 32-MB flash
Custom engineering	Available on request

Available External I/O

Processor cards	Gigabit Ethernet and RS-232/485, USB
Graphics	DVI display interface
FPGA	Gigabit Ethernet, RS-232/485, 22x LVDS pairs, 8x LVTTTL
Custom engineering	Design-kit and custom services available on request

Available Internal Storage

Hard disk drive (HDD)	250-GB available
Solid state disk (SSD)	250-GB flash drive available

Internal Communications

Processor and I/O interconnect	
4-lane PCI Express per module	
8 Gbps aggregate	

Power and I/O Connectors

Ultra-miniature with MIL-STD-38999 performance

Electrical

12V DC input

Physical Specifications

Size (excluding connectors)	114 x 137 x 48 mm (4.5" x 5.4" x 1.9")
Weight (estimated)	~1300g (~2.9 lb)
Cooling	
Natural convection	Consult with factory
Forced convection	Consult with factory

Operating System Support

CentOS Linux 5.3

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