

## TeraBox High Performance Reconfigurable Computing Platform

### Multi-FPGA System for Tera Class High Performance Computing & Network Processing

- **24 TeraFLOPS processing: 16x Intel Arria 10 or Stratix V FPGAs**
  - Up to 18 million logic elements (Arria 10 GX)
  - Up to 62,000 multipliers (Stratix V GS)
- **1.28 Terabits/sec I/O**
  - 128x 10GbE, 32x 40GbE, or 32x QDR Infiniband
- **6.5 Terabits/sec memory bandwidth**
  - Up to 64 banks DDR3-1600 (512 GBytes)
  - DDR4, QDRII+, and RLDRAM3 memory options
- **4U or 5U Rackmount PCIe system (server, industrial, or expansion)**
  - Dual socket Intel Ivy Bridge with up to 12 cores
  - Up to 768 GBytes of system memory
  - 8 Gen3 x16 PCIe slots
- **Complete software support**
  - Windows and Linux 64 drivers, interface libraries, and hardware management
  - FPGA development kit for Arria 10 and Stratix V



**B**ittWare's TeraBox is an ultra high-performance FPGA platform ideal for network/packet processing and high performance computing (HPC) applications. Featuring up to sixteen of the largest Intel Arria® 10 or Stratix® V Family FPGAs, the TeraBox offers 24 TeraFLOPS of processing power, along with 6.5 Terabits/sec of memory bandwidth and 1.28 Terabits/sec of I/O – all in a turnkey rackmount solution. The system arrives tested and configured, and includes complete development software support with BittWare's BittWorks II Toolkit, allowing users to immediately focus on developing their specific application.

#### BittWare Arria 10 and Stratix V FPGA PCIe Boards

The TeraBox features up to sixteen BittWare PCIe boards based on the high-bandwidth, power-efficient Intel Arria 10 or Stratix V FPGAs. The FPGAs on these PCIe boards provide a system total of up to 18 million logic elements (1,150,000 per FPGA) and 62,000 18 x 18 variable precision multipliers (3,926 per FPGA).

BittWare's PCIe board platforms offer extremely flexible memory configuration options, with SODIMM sites supporting DDR4 SDRAM, DDR3 SDRAM, QDRII+, or RLDRAM3. For example, with its eight SODIMM sites populated, the Stratix V based S5PE-DS supports up to 64 GBytes of DDR3-1600 SDRAM, for a system total of 512 GBytes in 64 banks, with 6.5 Terabits/sec of memory bandwidth.

The boards offer up to 4 QSFP+ cages, each supporting 40GbE, 4x 10GbE, or QDR/FDR InfiniBand interfaces direct to the FPGAs'

built-in PHYs for the lowest possible latency. Arria 10 boards also support 100GigE. The QSFPs can be used to interconnect the boards and multiple TeraBox platforms to make bigger clusters, making it ideal for HPC applications, while the low latency 10GbE and 40GbE interfaces are ideal for packet processing.

#### 4U or 5U PCIe Rackmount Chassis

The TeraBox supports three chassis options: a 4U server, a 5U industrial PC, or a 5U PCIe expansion system. The server-based system features a rackmount chassis including dual Intel Ivy Bridge processors with up to 12 cores, 768 GBytes of system memory, and 8 Gen3 x16 PCIe slots. The 5U industrial system features a rackmount chassis including a 3.4 GHz Xeon SBC. The expansion system option features a PCIe Gen2 expansion system with eight double-width x16 slots and 80 Gbit/sec host bus-to-expansion system bandwidth.

#### Software Support

BittWare offers complete software support for the PCIe boards with its BittWorks II software tools. The BittWorks II Toolkit is a collection of libraries and applications for BittWare's Arria 10 and Stratix V FPGA-based boards. It provides complete hardware and FPGA interfaces, allowing customers to focus on application coding. The Toolkit supports 32-bit and 64-bit Windows and Linux platforms. Also available for FPGA development is BittWare's FPGA DevKit, which provides FPGA board support IP and integration for BittWare's Intel FPGA-based boards.

## Specifications

### 4U Server System

- 4U 17" rackmount chassis
- 2+1 redundant power supply
- Supports up to 8 double-wide Gen3 x16 boards or 16 single-wide
- Dual Intel Xeon (Ivy Bridge) processor CPU with up to 12 cores each
- Up to 768 GBytes system memory

### 5U Industrial System

- 5U 19" rackmount chassis
- N+1 redundant power supply
- Supports up to 8 double-wide Gen2 x16 boards, or 16 single-wide (Gen3 x16 available soon)
- 3.4GHz Xeon processor SBC (other SBC options available)
- Front access hard disk drive carriers and DVD media bay
- High CFM fan with controller

### 5U PCIe Expansion System

- PCIe Gen2 expansion system
- 5U 19" rackmount chassis
- N+1 redundant power supply
- Supports up to 8 double-wide Gen2 x16 boards or 16 single-wide
- 80 Gb/s host bus-to-expansion systems bandwidth
- One or three meter expansion cable

### BittWare Arria 10 PCIe Boards

- **A10PL4**: Arria 10 GX low profile PCIe card with dual QSFP+ and DDR3
- **A10P3S**: Arria 10 GX/SX 3/4-length PCIe card with quad QSFP+, DDR4, QDR-II+

### BittWare Stratix V PCIe Boards

- **S5PE-DS**: Dual Stratix V GX/GS x16 PCIe card with quad QSFP+ and DDR3, QDRII+, or RLLDRAM3

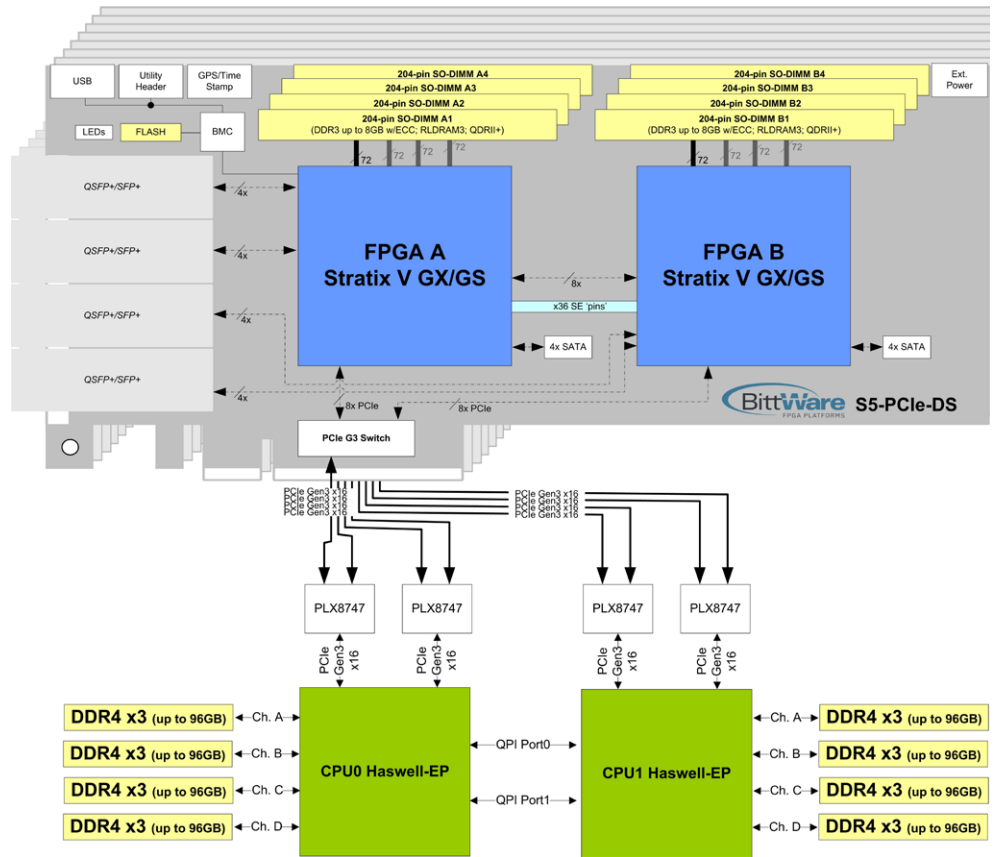
### Development Tools

- **BittWorks II Toolkit** - host, command, and debug tools for BittWare hardware
- **FPGA Development Kit** - FPGA board support IP and integration
- **Quartus II** - tools for Arria 10 and Stratix V FPGAs

## Ordering Options

Contact Sky Blue or Zerif

### Terabox System Block Diagram



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