

# SPR Development System

## Software Programmable Reconfiguration



### Flexible, Portable Development Environment

BittWare's Software Programmable Reconfiguration development system provides engineers with a system platform to explore software reconfiguration of waveform functionality for high-end signal processing applications such as Software Defined Radio (SDR). The platform consists of BittWare's RapidTCA developers system, BittWare's B2-AMC Advanced Mezzanine Card, Altera's latest Cyclone III developer's kit, and the B2C3 bridge board for connecting the B2-AMC to the Cyclone® III. The platform provides a flexible, portable, low-cost environment for SPR development in an AMC and MicroTCA environment, enabling designers to quickly and cost-effectively bring their waveform designs to life.

#### AMC and MicroTCA Backplane

BittWare's RapidTCA development system is a completely stand-alone setup allowing users to design and test their AMC and MicroTCA systems. The development system supports two single wide or one double wide extended full height AMCs on a cross-connected backplane, enabling instant communication across boards. A System/Power Controller (SPC) creates a Micro-TCA-like environment, controlling all power and clocking functions to the system AMCs. The top and bottom covers are easily removable for debugging access while the system is running.

#### Hybrid Signal Processing AdvancedMC

The B2-AMC is a full-height, single wide AMC featuring an Altera Stratix II FPGA implementing BittWare's ATLANTIS framework, four TigerSHARCs, a variety of front and back panel I/O interfaces, and a configurable 4x network interface supporting a variety of protocols. It also provides a 10/100 Ethernet interface and a Gigabit Ethernet interface for command, control, and reprogramming, as well as Flash memory for booting the DSPs and FPGAs.

#### Altera Cyclone III Starter Kit

The Cyclone III starter kit enables users to immediately take advantage of the low-power, high-density Cyclone III FPGA. This functionality can also be enhanced via expansion connectors and daughter cards. The board also provides multiple memory banks for application support, storage, and configuration.

#### BittWare's Developer's Bundle Software Support

BittWare offers BittWorks, a complete suite of software development tools to make developing and debugging applications easy and efficient. The BittWorks software tools provide host interface libraries, a wide variety of diagnostic utilities and configuration tools, and debug tools. This tool set is comprised of BittWare's DSP21k Toolkit, DSP21k Porting Kit, BittWare Target, and TS-Lib and SpeedDSP libraries.

### Features

- RapidTCA Development System
  - ◆ MicroTCA™ backplane supporting two single-wide or one double-wide extended full height AMCs
  - ◆ Removable top and bottom covers for easy debugging access during development
  - ◆ CorEdge Networks System/Power Controller (SPC) creates a MicroTCA-like environment controlling all power to the system AdvancedMCs
  - ◆ Fully compliant with MicroTCA 1.0 v1.0 specification, PICMG AMC.0 R1.0 specification, and IPMI v1.5
  - ◆ External AC to DC power supply
- B2-AMC
  - ◆ Full-height, single wide AdvancedMC
  - ◆ Altera® Stratix® II FPGA for I/O, routing, and processing
  - ◆ 4 ADSP-TS201S TigerSHARC® DSPs
  - ◆ Fat Pipes/Common Options Interfaces for Data and Control
  - ◆ Front Panel I/O
- Altera Cyclone® III Starter Kit
  - ◆ Low-power Altera Cyclone III EP3C25
  - ◆ Expandable via High Speed Mezzanine Card (HSMC)
  - ◆ JTAG header for communication and configuration
- B2C3 Bridge Board
  - ◆ Provides bridge connection between BittWare's B2-AMC and Altera's Cyclone III Evaluation board



## SPR DEVELOPMENT SYSTEM

### RapidTCA Chassis

- 1U height, 13" wide, 1.75" high, 7.8" deep
- One single-wide IPMI/Power module slot
- Two single-wide or one double-wide full-height AdvancedMC slot(s)
- Supports AMC.0, AMC.1, AMC.2, AMC.3, and AMC.4 compliant modules
- Built-in removable fans for system cooling
- Removable top and bottom covers for easy debug access

### RapidTCA Shelf Management

- One IPMI controller providing control and status of all AdvancedMCs, power, and cooling modules

### RapidTCA Power Distribution

- CorEdge Networks System/Power Controller (SPC) handles all power requirements to AMC slots
- 120 W @ +12 VDC, 3.5 W @ +3.3 VDC
- IPMI compliant

### RapidTCA Backplane

- Cross connected backplane for AMC ports 1 through 11

### B2-AMC

- Full-height, single width AMC
- Altera® Stratix® II FPGA
- Four Analog Devices ADSP-TS201S

### TigerSHARC DSPs

- BittWare ATLANTIS™ Framework
- 4x network Interface via PMC Sierra QuadPHY SerDes configurable to support PCI Express, Serial RapidIO, GigE, and XAUI
- FINE™ bridge providing Gigabit Ethernet and configurable for PCI Express
- AMC front panel providing 10/100 Ethernet and RS-232 via FINE, 11 pairs LVDS I/O, 24 GPDI/O, Optional 1x Fiber Transceiver, and JTAG debug interface to all DSPs and FPGA

### Cyclone III Starter Kit

- Altera® Cyclone® III EP3C25
- Clock management system
- High Speed Mezzanine Card connector
- User interface: LEDs, push-button resets
- On-board DDR SDRAM, SRAM, and flash
- USB-blaster interface for external device configuration and system debugging

### B2C3 BridgeBoard

- 10 LVDS pairs, 2 LVDS clock lines
- 23 GPIO, 1 GPIO clock line
- Ethernet, JTAG, RS232

### Software Support

- BittWare's DSP21k Toolkit for Windows and Linux includes libraries, applications, and diagnostics for BittWare hardware (porting kit available for other OS platforms)
- Example demo software with Graphical User Interface available
- Altera® Quartus® II tools for Stratix II and Cyclone III FPGAs
- Analog Devices' VisualDSP++ Integrated Development Environment for TigerSHARC processors
- BittWare's TS-Lib Optimized Libraries for TigerSHARC

