



## OVERVIEW

The CPCI SBC is an exceptionally high integration, high performance, rugged, and high quality Card, which contains all the component subsystems of an ATX motherboard with CPCI Back Plane Interface, which enables it to be used in systems, designed around CPCI Architecture. The cPCI card has a Computer On Module ETX802 plugged in to it. ETX802 is based on one of the ultra high performance, high-integration Intel Celeron M processors, and gives designers the choice of a complete, high performance, rugged, embedded processor based on the ETX form factor that conforms to the ETX V2.7 specification. The module plugs into the card, which has connectors and additional circuitry to meet your application requirements.

## DESCRIPTION

### Hardware

Each Computer On Module incorporates an Intel® 855GME chipset (82855GME + 82801DBM) for the Memory and Graphics Hub (Northbridge) and I/O Hub (Southbridge) controllers. This includes the Intel 82855GME Memory and Graphics Hub (Northbridge), which controls graphics and memory interface and the Intel 82801DBM I/O Hub (Southbridge) Controller for some I/O functions. A Super I/O chip by Standard Microsystems Corp. provides most of the I/O functions including a PCI to ISA Bridge chip for ISA functions. Together these chips provide two Ultra/DMA 33/66/100 IDE controllers supporting two IDE drives each, floppy, four USB 2.0 ports, two serial ports, an EPP/ECP parallel port, PS/2 keyboard and mouse interfaces, and an audio AC'97 controller on the module.

The card also supports an Ethernet controller (10/100BaseT), a Gigabit Ethernet Port, up to 1 GB of DDR RAM in a single 200-pin DDR SODIMM socket, and a 128-bit graphics controller, which provides CRT (VGA) and flat panel video interfaces.

The card is particularly well suited to either embedded applications and meets all the requirements such as power consumption, temperature range, quality, and reliability demands of embedded system applications.

There is a high density Virtex 4LX60 FPGA on card which can cater to all the IO requirements as per customer specific ICDs. All the IOs are routed and controlled by the FPGA. Thus allowing a mix of intelligence and customization to co-exist on the card. The card uses +5V and +3.3V from the Back Plane as primary supply voltages. All the internal Voltages required by FPGAs and various other peripherals are derived using on board regulators and DC-DC Converters.

## Features

- 6U HT Single Slot width 6U Compact PCI Form Factor Card
- CompactPCI System Controller
- Compliance to PICMG 2.0 R3.0 CompactPCI Specification
- On Card ETX Computer On Module specification:
  - 1.0GHz Ultra Low Voltage Intel Celeron M (Dothan)
  - Cache – 1MB L2 Cache
  - Chipset – Intel 855GME/ECH4M
  - FSB – 400 MHz
  - System Controller – PC Compatible DMA and Interrupt controller and timers
  - Watchdog Timer
  - DDR SDRAM up to 1GB capacity using SO-DIMM Main Flash – IDE Compact Flash up to 8 GB Capacity
  - One IEEE 802.3 10 BaseT/100 Base TX Compatible Ethernet Port
  - Three USB 2.0 Ports available on back panel Connectors
  - Six RS422 Channels
  - One AC'97 Audio Port
  - One VGA port
  - PS2 Keyboard and Mouse Interface
  - ISA and PCI Bus interfaces
  - PCI 32bit/33Mhz Bus Interface

### Additional features on the card:

- Two Dual redundant 1553B Channels programmable as BC/RT/MT
- One 10/100BaseT Gigabit Ethernet Port
- One USB2.0 port for Auxiliary Flash Disk Interface
- One Virtex 4 LX60 FPGA to Handle IO requirements
- 5V TTL/CMOS Differential Inputs – 16 Nos
- 5V TTL/CMOS Differential Outputs – 40 Nos
- 8 x 28V/Open Inputs
- 8 x 28V/Open or GND/Open Outputs
- One 3.125Gbps LVDS channel
- Rear IO Connectivity to all the interfaces through Rear IO transition Board
- Rugged Version with Heat Sink Metal Plate and Card Wedge Locks
- +5V and +3.3V Back Plane supplied Power.

### Software

- VxWorks, Win CE, Windows XP available
- For other RTOS support contact sales

# ATS-CPCI-SBC-ETX802

MultiProtocol cPCI Single Board Computer

## Memory

The card has the following memory elements

- DDR RAM SODIMM
- FLASH Memory

The Card supports a single 200 pin SODIMM Socket

- It can support up to 1 GB of memory
- Supports +2.5V, PC2700 DDR 333

There is an 8-bit wide, 512 KB flash device used for system BIOS and is connected to the I/O Hub (82801DBM), through an LPC bus transceiver. The flash memory is used to store system parameters and can be used for battery-free boot capability when there is no battery present. The BIOS is reprogrammable through the BIOS Utility.

Apart from the Main Memory the card supports Main Flash – IDE Compact Flash up to 8GB Capacity.

## Ethernet Interface

The Ethernet solution is provided by an Intel 82551QM Fast Ethernet PCI controller chip, which consists of both the Media Access Controller (MAC) and the physical layer (PHY) combined into a single component solution. The 82551QM is a 32-bit PCI controller that features enhanced scatter-gather bus mastering capabilities, which enables the 82551QM to perform high-speed data transfers over the PCI bus. The 82551QM bus master capabilities enable the component to process high-level commands and perform multiple operations, thereby off-loading communication tasks from the system CPU.

Additionally the card also has a Gigabit Ethernet Port provided by Intel 82540EP Gigabit Ethernet Controller Chip, which consists of both MAC and PHY. This device is interfaced to 32-bit PCI bus and along with external Magnetics provides for a Gigabit Ethernet Port.

## PCI Bus Interface

The Memory Hub (82855GME) integrates a PCI arbiter that supports up to four external PCI masters. This interface carries all of the appropriate PCI signals Bus operates at clock speeds up to 33 MHz. PCI 2.2 Compliant, 32-bit +3.3V PCI interface with +5V tolerant inputs.

## PRODUCT SPECIFICATIONS

### CPU

- 1.0 GHz Ultra Low Voltage (ULV) Celeron® M 373 (with 512 KB L2 cache) processor
- Front Side Bus (FSB) of 400 MHz

### Memory

- Provides a single 200-pin DDR SODIMM socket
- Supports a single +2.5V DDR RAM SODIMM up to 1 GB
- Supports PC2700 DDR 333 (166 MHz)

### PCI Bus/ISA Bus

- PCI 2.2 compliant, 32-bits wide
- Supports PCI Bus speed at 33 MHz
- Supports ISA bus speed at 8 MHz

### IDE Interfaces

- Supports two enhanced IDE controllers (4 devices)
- Supports dual bus master mode
- Supports Ultra DMA 33/66/100 modes
- Supports ATAPI and DVD peripherals
- Supports IDE native and ATA compatibility modes

Additionally the Card has two PCI to PCI bridges, which expands the PCI Bus tree for interface of more PCI devices.

## USB Interface

The card supports up to four USB ports and the supported features are listed below.

- USB v2.0 and backwards compatible to Universal OHCI v1.1
- Two root USB hubs and 4 USB ports
- Supports USB boot of floppy disk drives, hard disk drives, CD-ROMs, or other USB boot devices.
- Integrated physical layer transceivers
- Over-current detection status on USB ports 1 and 2

Three USB 2.0 ports made available at the connectors. One USB 2.0 port for access to compact flash in offline mode.

## VGA Interface

Graphic controller is integrated in the Memory Hub (82855GME) chip. Maximum resolution for CRT output is 1600x1200 x 32 with full use of 64 MB Unified Memory Architecture (UMA).

## Digital IO

The card also supports a number of Differential Inputs and Outputs confirming to RS422 signal levels. There are Single Ended inputs also provided on the card. All these inputs and outputs are connected to CPCI User IO Connectors. Using these IOs any custom Digital Input or Output could be interfaced to the FPGA.

## Mechanical Format

6U CPCI Card Size (160mm x 233mm)

Rugged Version with a Metal Heat Sink Plate mounted on the board.

## Software

The SBC can be made available with Windows XP, VxWorks, Win CE. The BSP includes drivers for all on-board resources.

## Serial Ports

- Provides two buffered TTL serial ports with full handshaking (transceivers on baseboard)
- Provides two 16550-equivalent controllers, each with a built-in 16-byte FIFO buffer
- Provides programmable word length, stop bits, and parity
- Provides 16-bit programmable baud-rate generator
- Provides full modem capability

## RS422 Ports

- Provides for Six RS422 ports connected to User IO connector.
- Accessible through Rear IO Transition Board

## USB Ports

- Supports two root USB hubs
- Supports four USB ports
- Supports USB v2.0 and legacy v1.1
- Supports over-current fuses on baseboard
- Supports USB Boot and the respective USB Boot devices
- Three USB 2.0 ports made available at the connectors.
- One USB 2.0 port for access to compact flash in offline mode.

## Keyboard/Mouse Interface

- Supports PS/2 keyboard
- Supports PS/2 mouse

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MultiProtocol cPCI Single Board Computer

## Ethernet Interface

- Provides an Intel 82551QM Controller and one Ethernet port
- Supports magnetics and RJ45 connector on baseboard
- Supports IEEE 802.3 10BaseT/100BaseTX compatible physical layer
- Supports Auto-negotiation for speed and duplex mode
- Supports full duplex or half-duplex mode
- Full-duplex mode supports transmit and receive frames simultaneously
- Supports IEEE 802.3x Flow control in full duplex mode
- Half-duplex mode supports enhance proprietary collision reduction mode
- Provides and Intel 82540EP based 10/100/1000 BaseTXport.

## MultiProtocol cPCI Single Board Computer

- Both the ports routed to Back Plane User IO Connectors and accessible using Rear IO Transition Board

## Video Interfaces (CRT)

- Supports CRT (1600 x 1200) with 64 MB UMA (Unified Memory Architecture)
- Provides integrated 128-bit graphics controller

## JTAG

- On-board JTAG chain for FPGA's.
- On-board JTAG header for CPLD programming
- On-board JTAG interface to the processor for debugging and development purposes

## Miscellaneous

- Provides a Real-Time Clock (RTC)
- Supports battery-free boot
- Supports an external battery for Real-Time Clock operation
- Provides Watchdog Timer feature

## I/O Interfaces

- 40 x TTL Differential o/p channels
- 16 x TTL Differential i/p Channels
- 8 x 28V/ Open Inputs
- 8 x 28V / Open or GND/Open Outputs

## LVDS Channel

- One LVDS TX Channel of data rates of up to 1.125Gbps
- One LVDS RX Channel of data rates of up to 1.125 Gbps
- With combined data rates of up to 3.25Gbps in full Duplex mode
- Provided using external LVDS transceiver interfaced to FPGA

## FPGA

- Provides on On-board Virtex 4 LX60 FPGA
- FPGA customizable to handle various digital IOs as per Customer ICD.
- Interfaced to Processor on North Bridge on PCI Bus

## Mechanical

- 6U CompactPCI card
- Board Dimensions: 160mm x 233mm
- Board thickness: 2.4mm
- Metal Heat sink covering over the card for efficient heat transfer from the card to the chassis.
- Card fitted with wedge locks on either side for firm seating in the slot.

## Power

- Derived from +5.0V and +3.3V of Back Plane
- All other voltages required for powering on-board devices are generated from on-board power circuitry
- Power Consumption 20-Watts Approx.

## Environmental

Temperature Range

	Conduction-Cooled	Air-Cooled
Operating	-40°C to + 60°C	-20°C to + 50°C
Storage	-40°C to + 85°C	-45°C to + 100°C

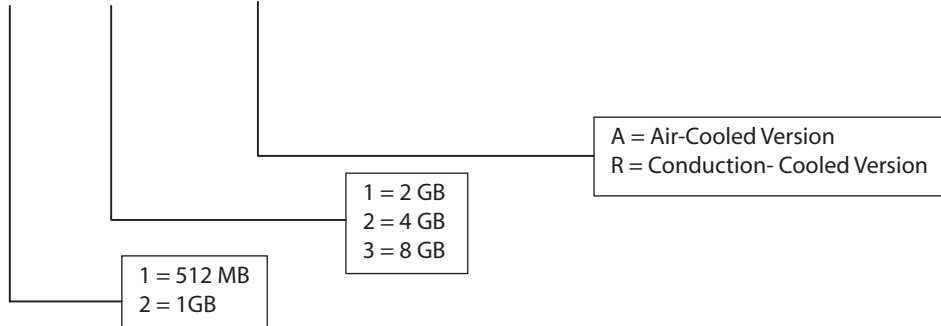
## Operating Systems Support

- VxWorks (Ver 6.3 workbench 2.5) Board Support Package (BSP) is available
- Windows CE (Ver 6.0) and Windows XP is available
- Other BSP can be made available up on request

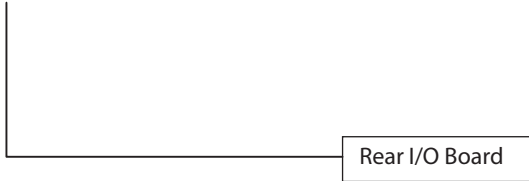
## ORDERING INFORMATION

### Hardware Selection

a)ATS-CPCI-2-2-SBC-ETX802-SDRAM- Main Flash - Ruggedization

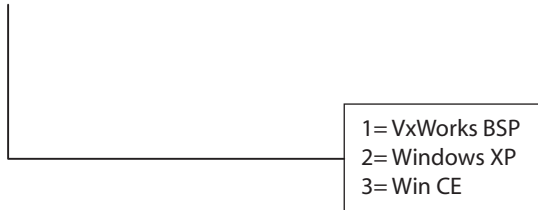


b)ATS-CPCI-ETX802-RTB



### Software Selection

ATS-CPCI-SBC-ETX802-BSP



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