ATHENA II

DIAMOND SYSTEMS CORPORATION

PC/104 Single Board Computer

500-800MHz VIA Mark CPU and Integrated Autocalibrating Data Acquisition

◆ Low power, Pentium III class, expandable SBC

◆ 2-in-1 design (CPU + DAQ) reduces size and cost, increases ruggedness and reliability

◆ VIA Mark processor running at 800/500MHz

◆ 256MB memory soldered on-board

◆ Support for:
  – four USB 1.1 ports
  – two RS-232, two RS-232/485 ports
  – 10/100Mbps Ethernet
  – IDE port for hard drive or solid state flashdisk
  – VGA CRT or LVDS LCD display

◆ Optional data acquisition circuitry featuring:
  – multiplexed 16 channel 16-bit A/D with autocalibration
  – four 12-bit D/A channels
  – 24 digital I/O lines
  – two counter/timers

◆ Extremely rugged with soldered RAM and -40°C to +85°C (-40°F to +185°F) operating temperature

Highly Integrated SBC

Athena II combines all of the functionality of a single board computer with a complete analog and digital data acquisition circuit into a single board, offering the most functionality available in a small, compact form factor.

Price/Performance Advantage

The VIA Mark CPU running at either 500 or 800MHz offers an excellent balance of performance, power consumption and price, making Athena II an ideal choice for a wide variety of embedded computing applications.
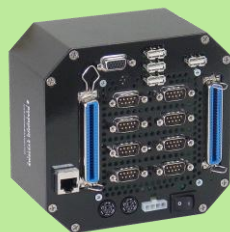
Rugged Design

Athena II was designed with rugged applications in mind. From an operating temperature of -40°C to +85°C, to its soldered SDRAM, Athena II thrives in the most extreme environments.
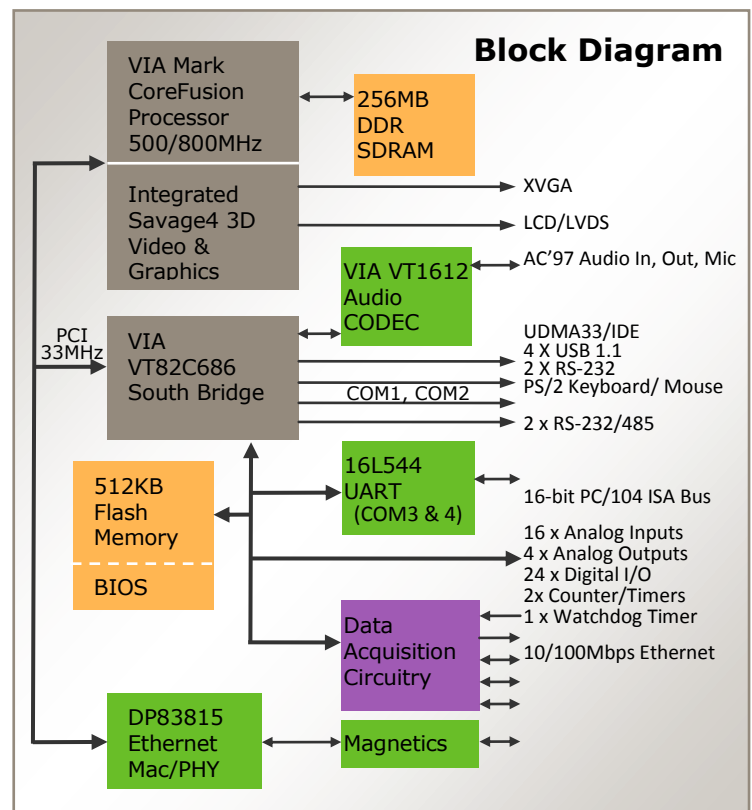
Fully Integrated Systems

Athena II is available as a complete system with your choice of operating system in a specially designed enclosure that eliminates all cable and provides a rugged, compact, wide-temperature box PC ready for application download and deployment.

Octavio-ATHM
Embedded Application Server

Block Diagram

Athena II: Small Format SBC

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CPU Specifications

Processor	VIA Mark CoreFusion CPU at 500 or 800MHz
Cooling	Heat sink, fan-less or with fan
Memory	256MB DRAM
Display type	VGA CRT and LVDS LCD
Display resolution	1600 X 1200 maximum
USB ports	4 USB 1.1
Serial ports	2 RS-232; (2) RS-232/485
Networking	10/100Base-T Ethernet
Mass storage	1 IDE UDMA-33 port Flashdisk interface
Keyboard/Mouse	PS/2
Audio	AC'97, line-in, line-out, mic
Expansion bus	PC/104 (ISA)
Input power	5V ±5%
Power consumption	800MHz: 10W max 500MHz: 8W max
Operating temperature	-40°C to +85°C (-40°F to +185°F) -20°C to +71°C (-2°F to +160°F) for LP models
Shock	IEC68-2-27
Vibration	MIL-STD-810E 514.4
Dimensions	4.18" x 4.48" (106mm x 114mm)
Weight	4.7oz / 133g without heatsink
RoHS	Compliant

Data Acquisition Specifications

ANALOG

Number of inputs	16 single-ended or 8 differential, user selectable
A/D resolution	16 bits
Input ranges	±10V, ±5V, ±2.5V, ±1.25V, 0-10V, 0-5V, 0-2.5V, 0-1.25V programmable
Max sample rate	100KHz
Protection	±35V on any analog input without damage
Nonlinearity	±3LSB, no missing codes
On-board FIFO	2048 samples, programmable threshold
A/D and D/A calibration	Autocalibration with software support
Number of outputs	4, 12-bit resolution
Output ranges	±5V, ±10V, 0-5V, 0-10V
Output current	±5mA max per channel
Settling time	6µS max to 0.01%
Relative accuracy	±1 LSB
Nonlinearity	±1 LSB, monotonic
Reset	Reset to zero-scale or mid-scale (jumper selectable)

DIGITAL I/O

Number of I/O lines	24 lines
Input voltage	Logic 0: 0.0V min, 0.8V max Logic 1: 2.0V min, 5.0V max
Input current	±1µA max
Output voltage	Logic 0: 0.0V min, 0.33V max Logic 1: 2.4V min, 5.0V max
Output voltage	Logic 0: 64mA max per line Logic 1: -15mA max per line

COUNTER / TIMERS

A/D Pacer clock	24-bit down counter
Clock source	10MHz on-board clock or external signal
General purpose	16-bit down counter

Data Acquisition

Athena II's integrated data acquisition circuit includes 16 analog inputs with 16-bit A/D and 100KHz maximum sample rate, four 12-bit analog outputs, 24 digital I/O lines, and two counter/timers. It uses an enhanced 2048-sample FIFO with programmable threshold for maximum flexibility and data reliability.

The analog circuitry utilizes Diamond Systems' industry-leading autocalibration technology to calibrate its A/D and D/A circuits. This means you get analog I/O performance with the maximum possible accuracy over the full operating temperature range of the product.

Software Support

Athena II runs Linux, Windows XP, Windows Embedded Standard, QNX, and DOS. Linux, Windows Embedded Stanard, and QNX Software Development Kits are available with bootable images and drivers to get you started on your design project right out of the box. Diamond's free industry-leading Universal Driver software is also included. It provides a C programming library for the integrated data acquisition circuit, demo programs, and example code for each OS to assist in rapid application development.

Development Kit

Complete Development Kits, DK-ATHM800A-01 & DK-ATHM500A-01, are available with all the components you need to get started on your embedded design project. The kit contains an Athena II SBC, flashdisk with Linux pre-loaded, cable kit, AC adapter, and software CD.

Ordering Information

ATHM500-256A	Athena II SBC, 500MHz VIA Mark, 256MB RAM, full data acquisition
ATHM500-256N	Athena II SBC, 500MHz VIA Mark, 256MB RAM, no data acquisition
ATHM800-256A	Athena II SBC, 800MHz VIA Mark, 256MB RAM, full data acquisition
ATHM800-256N	Athena II SBC, 800MHz VIA Mark, 256MB RAM, no data acquisition
ATHM800-256ALP	Athena II SBC, 800MHz VIA Mark, 256MB RAM, full data acquisition, low profile heatsink
ATHM800-256NLP	Athena II SBC, 800MHz VIA Mark, 256MB RAM, no data acquisition, low profile heatsink
DK-ATHM800A-01	Athena II Development Kit with ATHM800-256A SBC, cables and Linux software
DK-ATHM500A-01	Athena II Development Kit with ATHM500-256A SBC, cables and Linux software
SDK-ATHM-LNX	Athena II Linux Software Development Kit
SDK-QNX-LNX	Athena II QNX Software Development Kit
SDK-ATHM-XPE	Athena II Windows Embedded Standard Software Development Kit
C-ATHM-KIT	Athena II Cable Kit for all on-board I/O
OCTAVIO-A5A-AL512-00-17-00	Octavio-ATHM Embedded Application Server: 500MHz Athena II SBC with data acquisition, 512MB Linux flashdisk, 1.7" enclosure