

4th Generation PC/104 SBC Extends Product Lifecycles

ATHENA IV includes integrated data acquisition and COM architecture

Sunnyvale, California — February 10, 2021 — Diamond Systems has introduced **ATHENA IV**, a wide-temperature, COM-based SBC with integrated data acquisition and PC/104 I/O expansion. This combination of features makes the compact 4.2" x 4.5" board appealing to a wide range of embedded computing applications.

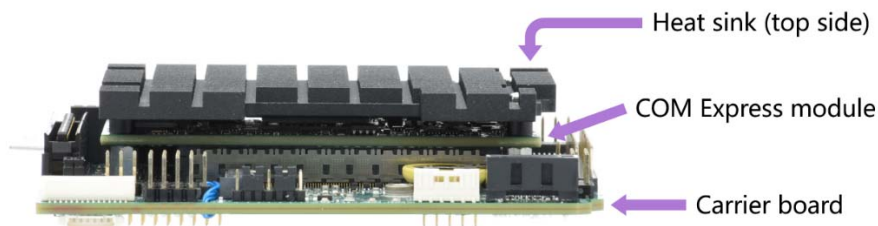
Summary of product highlights

1. 4th generation, backwards compatible for product life extension
2. COM-based design for long life & performance scalability, with multiple processor options
3. Integrated data acquisition with autocalibration and Universal Driver software support
4. PC/104 socket for versatile rugged I/O expansion
5. Designed for rugged applications, previous generations have been used in military vehicles, railway, agriculture, and industrial control applications

As its name implies, Athena IV is the 4th generation in the Athena series of SBCs from Diamond, an extremely popular platform that has been serving long life applications in military, transportation, agriculture, and industrial industries since 2004. Athena IV maintains backwards compatibility in terms of form factor, features, and I/O connectors with previous generations of the product, while incorporating the newest technologies to enable long term applications to stay current with the state of the art as well as attain increased CPU performance.

Customers using previous generations of Athena can easily upgrade to Athena IV with dramatically reduced re-engineering effort, compared to migrating to an entirely different SBC. In addition, embedded systems using competitor PC/104 SBCs approaching end of life can migrate to the Athena platform to extend their product lifetimes practically indefinitely, due to its use of COM architecture.

A COM-based SBC consists of 3 layers: the COM, or computer-on-module, containing the processor and associated circuitry; a carrier board, containing additional I/O, power supply, and I/O connectors; and a thermal solution, consisting of either a heat sink or heat spreader (which also serves as a mounting plate).



The COM-based design of Athena IV offers a valuable range of benefits:

1. The use of interchangeable COMs with identical I/O features but different CPUs enables a single system design to address a range of applications by selecting the ideal combination of price, performance, and power consumption. When one COM reaches end of life, it can be easily swapped out for a newer one, extending the product's lifecycle for the duration of the new COM.
2. The dual board design allows for greater feature density; as an example Athena IV adds a second Gigabit Ethernet port, a USB 3.0 port, and on-board M.2 flash storage to the list of features found on Athena III.
3. Since most new CPUs reach the market in COM format 1 to 2 years earlier than as a traditional SBC, a customer using a COM-based SBC can upgrade to the latest processor much earlier and more easily than by waiting for a true SBC to be available and having to redesign the mechanicals of his system around the new physical shape.

Athena IV incorporates a full-fledged precision data acquisition (DAQ) subsystem with analog I/O and digital I/O features, saving the size and weight of a second I/O board for applications requiring DAQ. The analog circuitry features programmable input ranges, 150KHz sampling rate, and Diamond's signature autocalibration, which enables the circuit to be calibrated under software control at any time to maintain accuracy over the life of the system. All I/O features are supported by Diamond's Universal Driver programming library, which includes sample code, executables, and a novel GUI control panel that can be used for quick bring-up, application modeling, and even system debugging.

For applications requiring additional I/O, Athena IV offers the industry-leading PC/104 expansion socket, enabling it to be used with hundreds of I/O boards from companies all over the world. PC/104 today still offers the industry's most appealing solution for I/O expansion due to its wide vendor base, rugged board interconnection method, long product life, and ideal size that allows a greater amount of I/O and more rugged I/O connector options than minicards.

The -40/+85°C operating temperature range (tested and guaranteed) as well as the 50% thicker PCB round out Athena IV's benefits package and make it an excellent choice for rugged environments involving temperature and shock / vibration extremes.

CPU options for Athena IV include:

- Intel "Bay Trail" E3845 quad-core 1.91GHz processor, 4GB RAM, Passmark rating 962
- Intel "Apollo Lake" E3940 quad-core 1.6GHz processor, 4GB RAM, Passmark rating 1940

I/O features on Athena IV include:

- 2x gigabit Ethernet
- VGA and LVDS display
- 4x serial ports with RS-232/422/485 protocol support
- 4x USB 2.0 ports + 1x USB 3.0 port
- HDA audio I/O
- SATA port and M.2 SATA socket
- Data acquisition subsystem with 16 16-bit analog inputs and 150KHz sampling rate, 4 12-bit analog outputs, 24 digital I/O, and 2 counter/timers, supported by Universal Driver programming library

Development kits are available to assist with application development. They include the Athena SBC, a cable kit, and a ready-to-run operating system image on a flashdisk. Both Linux Ubuntu and Windows 10 64-bit operating system images are available.

Media Resources

ATHENA IV web page: <http://www.diamondsystems.com/products/athenaiv>

COM-based SBC introduction: <http://www.diamondsystems.com/solutions/com-based-sbcs.php>

For additional photos or information contact jmiller@diamondsystems.com

Availability

Athena IV with E3845 CPU is available now. Athena IV with E3940 CPU will be shipping in early March 2021.

About Diamond Systems

Diamond provides highly integrated, I/O-rich, compact embedded computing boards, systems, and custom solutions based on x86 and Nvidia Jetson architectures. The company's products and solutions are found in practically every industry where embedded computers are used, with a focus on military ground vehicles, railway, medical instruments, and industrial controls. Diamond has been a key provider of PC/104 products since that form factor was introduced in 1991. The company is currently in its 31st year of operation and is located in Silicon Valley, California. For further information, please visit www.diamondsystems.com.

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