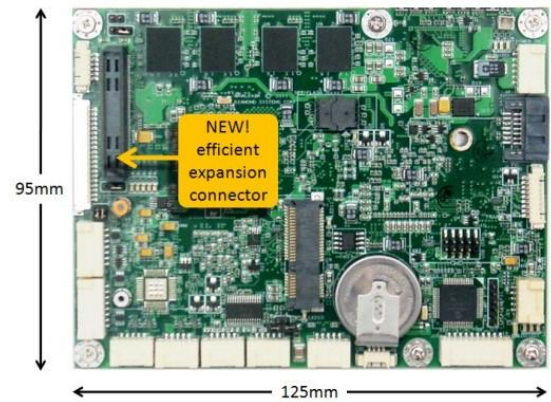


EmbeddedXpress™ Industry Standard for COM-Based SBCs
Combining COM Express CPU modules with stackable I/O expansion
in a new open standard small form factor

Nuremberg, Germany — February 28, 2012 —
Diamond Systems, a leading global supplier of compact, rugged, embedded computing solutions for real-world applications in a broad range of markets, today unveiled EmbeddedXpress (EMX™), a new industry standard form factor for embedded computers that combines COM Express CPU modules with stackable I/O expansion in an SBC format. EMX boards offer increased flexibility, scalability, and longevity in the final product by providing interchangeable processor modules along with stackable I/O expansion. This combination yields the best of both SBCs and COMs: Off the shelf embedded computing solutions with easy I/O expansion, plus performance scalability and increased product lifetime.



Altair EMX SBC with Intel E-Series CPU



EMX defines two sizes of boards: EMX Basic (95x125mm, same as COM Express Basic) and EMX Compact (95x95mm, same as COM Express Compact). Traditional single board computers (SBCs) as well as COM carrier boards can be designed in either size, while I/O modules are defined only in the Compact size.

EMX COM carrier boards provide a convenient and efficient way to utilize the wide selection of COM Express modules available from multiple vendors worldwide, resulting in performance scalability, protection from CPU obsolescence, and earlier access to the latest CPU technologies. In addition, EMX COM-based SBCs offer efficient conduction cooling by means of a bottom-mounted heat spreader that contacts the system enclosure. Conduction cooling enables a higher ambient operating temperature rating for the SBC, while simultaneously keeping the electronics inside the enclosure cooler, thereby improving reliability.

One of the key highlights of EMX is the use of a new, significantly more efficient expansion bus connector. The EMX expansion connector is smaller and lower cost than other stackable I/O standards, helping to reduce cost and increase the availability of PCB area for processor and I/O circuitry. The connector includes all the most popular expansion buses utilized by current and planned processors, chipsets, and peripheral chips, ensuring compatibility long into the future. Furthermore it contains ample reserved pins, ensuring a long lifetime for the standard by providing the capacity to incorporate new features as they become available and desirable. (see sidebar)

"EmbeddedXpress represents a significant advancement in small form factor embedded computing," says Jonathan Miller, President of Diamond Systems. "It successfully addresses key issues faced by all embedded customers: Performance scalability, product longevity, configuration flexibility, and size/cost efficiency."

EMX is intended to become an open standard available to the market without payment of any royalty or license fees. As the creator of EMX, Diamond Systems plans to maintain the standard and provide technical assistance to product designers until the standard is eventually housed by an appropriate standards organization.

Simultaneously with the announcement of the EMX form factor, Diamond is introducing Altair™, the world's first EMX Basic SBC, and Vega™, the world's first EMX Basic COM-based SBC (see photos). Altair features an Intel Atom E680T processor at 1.6GHz, on-board memory, a full suite of I/O features, PCIe Mini Card socket, and latching connectors for enhanced ruggedness. It operates over the industrial temperature range of -40 to +85°C and has passed MIL-STD-202G shock and vibration testing. The Vega family of EMX COM-based SBCs is a two-board solution (COM Express module plus

baseboard) that offers an unparalleled set of features for its footprint. In addition to the processor and full complement of COM Express peripherals (Ethernet, VGA, LCD, USB, SATA), Vega includes a wide-range power supply capable of delivering up to 96W for the COM module and add-on boards, a full autocalibrating analog I/O circuit with 16-bit A/D and D/A, a second gigabit Ethernet port, and 4 RS-232/422/485 serial ports.

The benefits of EMX include:

- ◆ Because EMX utilizes COM modules and also provides a complete SBC-like solution, **it appeals to a wider range of high- and low-volume customers than either COMs or SBCs alone.** Furthermore it enables COM module vendors to sell fully functional, off-the-shelf solutions using their COM modules, reaching traditional SBC customers by offering a complete solution.
- ◆ Since EMX offers the ability to use COM modules as the computing engine, **it eliminates the need for traditional SBC vendors to design complex processor circuits, enabling them to get to market faster with a wider range of products,** as well as providing longer lifetime and greater return on investment for their products. Customers enjoy earlier access to new CPU technology, longer product lifetimes, wider choice of processors, better protection from CPU obsolescence, and performance scalability.
- ◆ For designers, **EMX eliminates the need to design a custom baseboard for many applications,** so they can select the COM module that best suits their needs, and match it to the baseboard of choice to get an instant off-the-shelf solution with no custom design.
- ◆ The size of EMX Basic is larger than PC/104. **Designers of EMX SBCs can fit more processor circuitry on the board without resorting to shortcuts or form factor extensions.** Customers can be assured of standard size and shape boards that will fit into their systems without worrying about non-standard board shapes and sizes.
- ◆ **The size of EMX Compact is roughly equivalent to PC/104, providing sufficient room for common I/O designs.**
- ◆ **The expansion connector is optimized for size, cost, interconnectivity,** PCB area, and PCB coastline, plus it contains sufficient reserved pins for future upgrades.

The combination of all these benefits provides a compelling reason for embedded computing vendors and customers to utilize EMX as the form factor of choice for new product development. EmbeddedXpress' key features and functions are tabulated below.

Key Features and Functions

- ◆ Small form factor standard for embedded computers with stackable I/O expansion
- ◆ Integrates COM Express modules into an off-the-shelf stackable ecosystem
- ◆ The use of COM Express modules results in performance scalability and increased protection from obsolescence
- ◆ Two sizes of processor modules:
 - EmbeddedXpress Basic (95 x 125mm)
 - EmbeddedXpress Compact (95 x 95mm)
- ◆ Processor module may be a single board computer or a carrier module with a COM Express module mounted underneath
- ◆ Supports efficient conduction cooling to chassis
- ◆ Expansion modules are Compact size
- ◆ New small, low-cost, high-density I/O connector for I/O expansion modules
- ◆ 5VDC main power, 3.3VDC and 5VDC power for expansion modules
- ◆ Open standard, freely usable with no licenses or royalties

EMX Connector Features

- ◆ 120-pin surface mount connectors for board-to-board connection of I/O expansion modules
- ◆ Processor modules use only top side connectors for upward I/O expansion, saving real estate on the bottom
- ◆ Variety of board-to-board stacking heights on processor module for design flexibility
- ◆ Expansion buses include PCI Express x1 and x4, USB 2.0, LPC, and SATA
- ◆ 12 Reserved pins for future upgrades
- ◆ Standard 14mm board-to-board spacing

EMX Connector I/O Features

- ◆ 4x PCI Express x1
- ◆ 1x PCI Express x4
- ◆ 1x SATA
- ◆ 4x USB
- ◆ LPC
- ◆ GPIO
- ◆ SMBus
- ◆ Miscellaneous Control Signals
- ◆ +12V, +5V, +3.3V
- ◆ Reserved pins

MEDIA RESOURCES

- [EMX webpage](#)
- [EMX flyer](#) (pdf)
- [Altair EMX SBC webpage](#)
- [Altair photo](#) (jpg)

About Diamond Systems

Founded in 1989 and based in Mountain View, California, Diamond Systems Corporation is a leading global provider of compact, rugged, board- and system-level real world embedded computing solutions to companies in a broad range of markets, including transportation, energy, aerospace, defense, manufacturing, medical, and research. The company is renowned as an innovator of embedded I/O standards and technologies; it originated the FeaturePak I/O modules standard, was an early adopter of PC/104 module technology, and holds a patent for a unique analog I/O autocalibration technique.

Diamond's extensive product line includes compact, highly integrated single-board computers (SBCs); an extensive line of expansion modules for analog and digital I/O, wired and wireless communications, GPS, solid-state disk, and power supply functions; and complete system-level solutions. In support of performance-critical embedded application requirements, these products are engineered to operate reliably over wide operating temperature ranges, such as -40°C to +85°C, and at high levels of shock and vibration. Additionally, the company offers a comprehensive hardware, software, and system integration and customization services.

For further information, please visit www.diamondsystems.com or call +1-800-367-2104.

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