

# PRESS Background Information - New EPIC SBC Standard

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## What is EPIC?

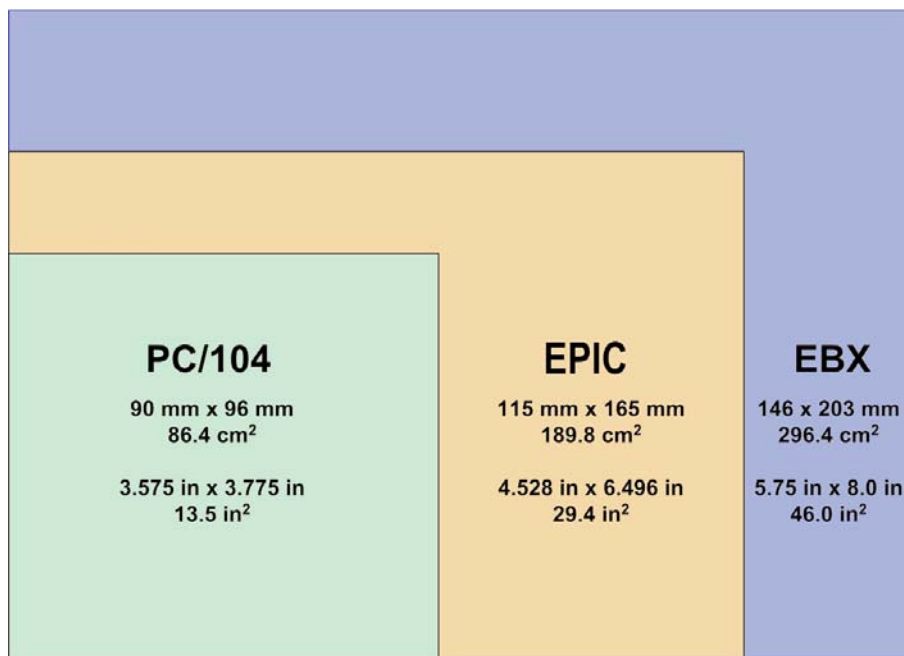
**Introduction** - The **E**Embedded **P**latform for **I**ndustrial **C**omputing (**EPIC**) is a new physical platform for embedded single board computers (SBCs). Five leading SBC manufacturers, (Micro/sys, Octagon Systems, VersaLogic, WinSystems, and Ampro Computers), have defined and created this new standard in response to the need seen in the market for an open-architecture, embedded platform that is larger than a PC/104 module yet smaller than a EBX board. This mid-sized platform will allow additional space to support advanced processors or complex I/O functions for data acquisition, field wiring termination, I/O circuit protection, video processing, telecommunications, networking, motion control, power supplies, etc. Applications of the technology include test equipment, medical instruments, communications devices, transportation systems, military/COTS, data loggers, security, robotics, semiconductor manufacturing instruments, and industrial control systems.

The key features of the platform are:

1. A board that is a small, industrial-grade, embedded SBC with the option of I/O expansion via PC/104, PC/104-Plus, USB, Ethernet, etc.
2. A board that is complementary to EBX and PC/104.
3. A board that will emphasize I/O connector area.
4. A board based upon open industry standards that could be administered by an independent technical standards body.
5. A board that can bridge from current technology into the future. That means that it would be able to support PCI Express, ExpressCard, and other technologies, as they become available and supported in the embedded systems domain.

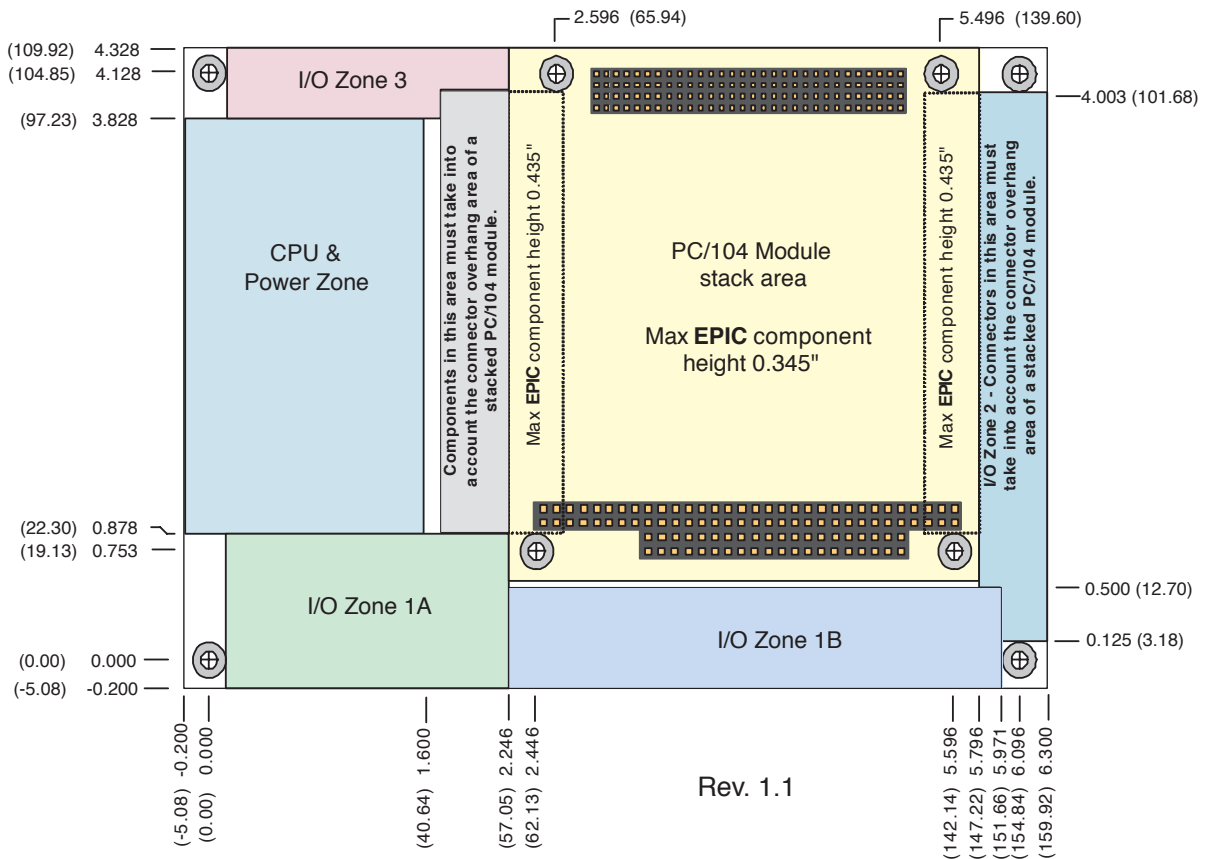
**Size Matters** - A PC/104 module has 13.4 square inches of area. Included in this area is a PC/104 and PC/104-Plus connector. Together, these connectors can take up to 13% of the available board area. It is a challenge to place a CPU and I/O on a board of this size. An EBX board has 46 square inches of area. This allows larger, more powerful processors with cooling fans to be supported in a much larger size board. However, this size can be too large for some applications.

The EPIC form factor is larger than a 3.550- x 3.775-inch (90mm x 96mm) PC/104 board yet smaller than a 5.75- x 8.0-inch (146mm x 203mm) EBX board. The midpoint between EBX and PC/104 is 29.7 square inches. EPIC is 29.4 square inches.



**Figure 1. Size Comparison of PC/104 vs. EPIC vs. EBX**

**I/O Expansion** – One of the problems in small and mid-sized SBCs is I/O. It is possible to squeeze a CPU and peripheral functions on the card, but connection and cabling become a major issue. EPIC's strength is in its wide area available for I/O connectors. Real world applications demand a variety of different size and styles. EPIC accommodates them in 3 different I/O zones plus with PC/104 expansion modules.



**Figure 2. EPIC Dimensional and I/O Zone Specifications**

The 115mm x 165mm (4.5" x 6.5") size is optimal for including full PC/104-Plus compliance (ISA and PCI buses) and a rich set of I/O implemented as either pin-headers or molded PC-style connectors. The standard provides specific I/O zones space to implement, for example, multiple Ethernet ports, four or more serial ports, general-purpose I/O, video, and even application-specific I/O such as IEEE 1394 Firewire™, although many other feature sets are possible.

Other form factors proposed during the last several years tried to fill the void between PC/104 and EBX size boards. However, these alternatives are plagued with inconsistent connector locations and expansion schemes, fail to address the needs of I/O-intensive applications, and have not evolved into a widely supported published specification.

**A bridge to the future** - The creators of **EPIC** have made provisions for long-term technology support. Unlike the other mid-sized boards, ample board space has been reserved to support the broad base of PC/104 and PC/104-*Plus* I/O modules as well as emerging high-speed bus technologies such as PCI Express' without sacrificing I/O capacity. Due to this unique architecture, compliant implementations can smoothly migrate legacy ISA-based systems to the fast serial interfaces of the future.

**Specification** - **EPIC** has a published, governing specification written by its developers. Download it from [www.epic-sbc.org](http://www.epic-sbc.org). Phase I of the specification defines the base board with PC/104 expansion. Phase II will define PCI Express and/or some other fabric for expansion as the technology evolves and is brought to market.

**Conclusion** - Designers are always striving to add more functionality in less space. Advances in semiconductor density, packaging technology, and connector technology have made this new **EPIC** form factor possible. Embedded systems manufacturers who require faster CPUs and/or more I/O than found on a PC/104 CPU can now design in a broadly-supported, standardized, full-featured platform. This is especially important for applications that can't accommodate larger, industrial grade EBX-sized boards. With **EPIC**, there is finally an industry standard for a mid-sized board.