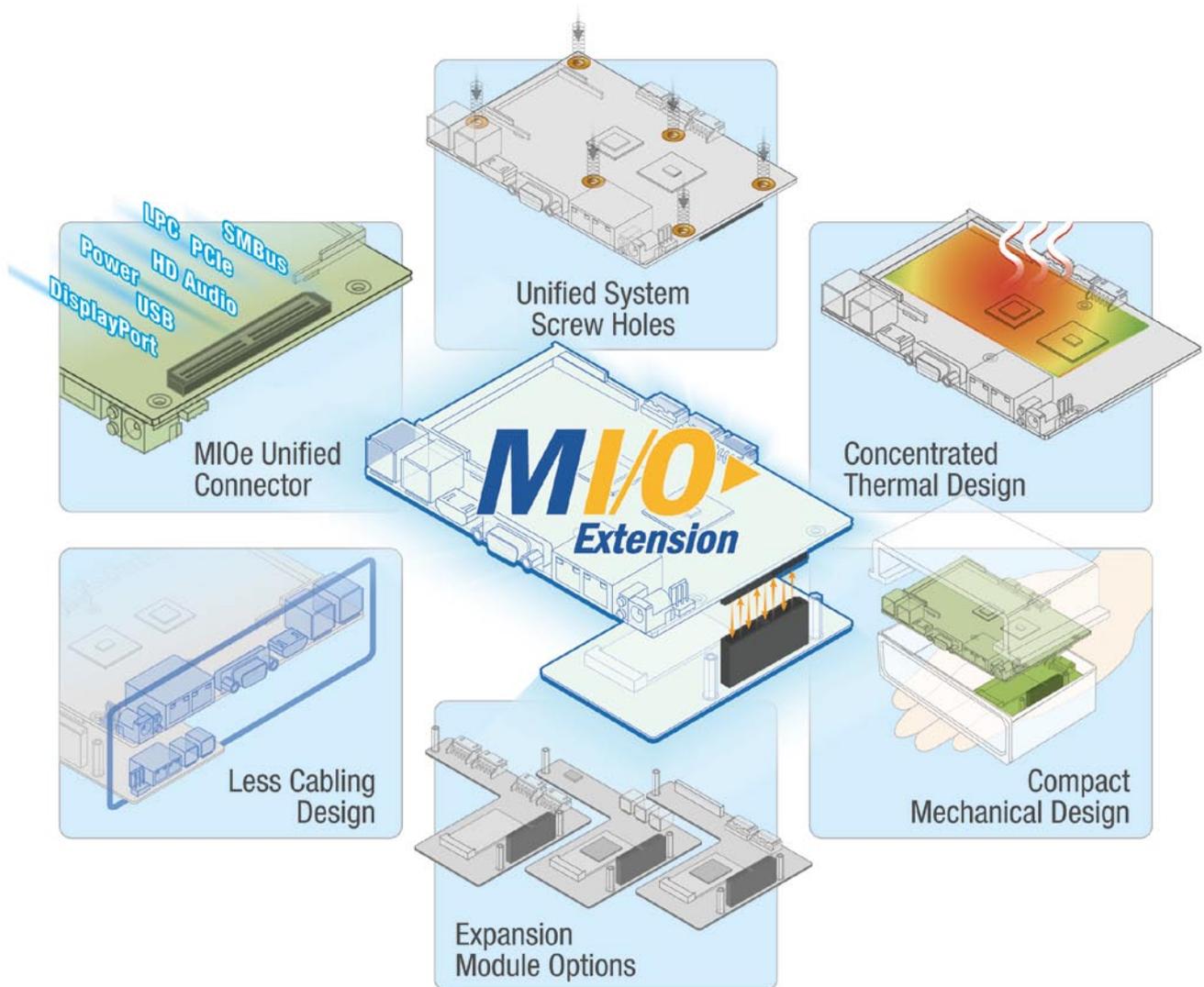


# The Innovative MI/O Extension Single Board Computer Unveiled

By Sandy Chen, Product Manager, Advantech



Configurable designs and pricing competitiveness are the two primary factors in defining the future of vertical applications. In light of making standardized, embedded single board computers a more thoughtful fit for client demands, Advantech introduced the innovative MI/O Extension solution to assist application providers in quickly providing optimal solutions to their clients, while still securing their domain knowhow in key vertical industrial technologies.

Imagine a representative from a system integration company listens attentively to product introductions by various companies, and then examines and searches for suitable products for their clients. At the end of the day, they leave the meeting in disappointment because none of the existing standardized embedded products exactly fits their needs.

This is a plight shared by many systems integrators. In vertical application markets overall, clients have very specific demands for product specifications and interfaces and oftentimes, the demands are very specific. As a result, they find the standardized embedded single board computers available on the market unsatisfactory. On the other hand, it wouldn't be cost-effective if the developers choose custom, ODM-based single board computers just to meet client demands for a limited assignment quantity. Another type of embedded computer modules called "Computer On Module" (COM), though a good solution for unique single board computer applications, requires a longer development schedule, and more strenuous R & D effort to ensure that the design and testing process incorporates a CPU board and a

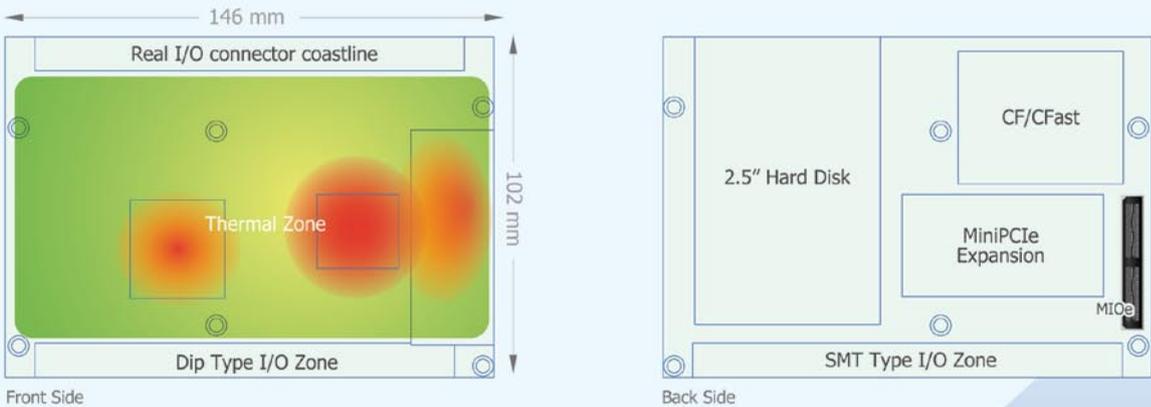
carrier board. This type of R & D-intensive solution is better suited for large-scale, more profitable projects.

Advantech thus proposed a new solution - MI/O Extension (multiple I/O Extension) - strategically segmented and positioned between the markets for standard single boards and configurable modules. Advantech developed MI/O Extension as the answer to the demand of systems integrators, so that they won't have to scrape the barrel and make do with standard products currently on the market. Advantech's embedded single board computers are powered with flexible Multiple I/O support, allowing integrators to provide optimal solutions to their clients efficiently and cost-effectively.

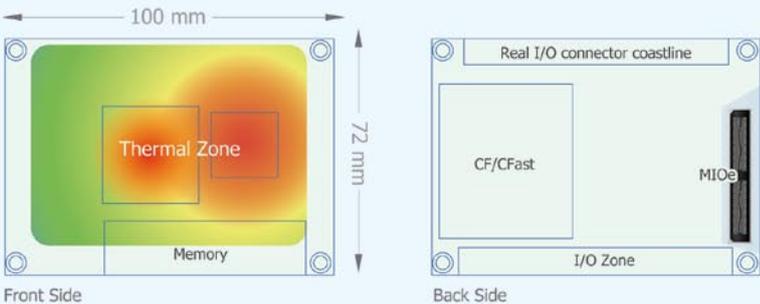
### MI/O Extension Form Factor

The Flexible Signal Board Computer with MIOe Extension Modules

#### Compact Series



#### Ultra Series



#### MIOe Pin Assignments

- DisplayPort
- 4 PCIe x 1
- USB 3.0
- USB 2.0 x2
- LPC
- HD Audio line out
- SMBus
- +V12SB, +V5SB Power

\*Pin out functions depends on platform chipset

	Compact Series	Ultra Series
<b>Dimension</b>	142 x 106 mm (5.7" x 4.0")	100 x 72 mm (3.9" x 2.8")
<b>Core TDP</b>	9 W - 40 W	Under 8 W
<b>Features</b>	<ul style="list-style-type: none"> <li>▪ Middle to High end performance platforms</li> <li>▪ Rich I/O</li> <li>▪ Supports extended temperature design</li> <li>▪ Supports iManager</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ultra low power consumption</li> <li>▪ Ultra small form factor</li> <li>▪ Competitive pricing with simple I/O</li> </ul>

## Configurable Interface – Flexibility is Key

Advantech’s MI/O Extension embedded single board computer can be independently used as a standard unit; it also includes scalable interfaces on a unified MIOe connector that clients will most likely need somewhere down the road. This feature permits clients to design their own signature products, utilizing Advantech’s user-driven, versatile modules; or, they can refer to Advantech’s design guide, and allow their engineers to creatively develop their own I/O modules. For one thing, this scalable, configurable interface cuts down time and resources spent on product development. For another, integrators can stay on top of securing domain knowhow and vital information, such as specific design requirements from their clients in the vertical market. Such information is of great industrial value and should be safeguarded with caution. MI/O Extension’s versatility also allows integrators to develop competitive yet specialized products, therefore controlling costs and time required for product and technology development.

In general, the development of all software operating systems is a time-consuming process; but with MI/O Extension in

place, developers only need to work on different soft- and hardware integration after choosing a particular solution and thus save time. Solution providers and integrators alike can quickly preempt their targeted markets with the already-developed MI/O extension platform as the core to pair with a variety of I/O modules.

Advantech has also included a power design in the unified MI/O Extension connector. Delivering an effective power supply design has been a perpetually vexing issue for integrators. MI/O Extension is a single board computer with flexible I/O support; this particular product is created specifically to include a versatile power supply solution, to help integrators save resources and money spent on designing I/O modules without having to design complicated power on the I/O module. MI/O Extension single board computer is already a stand-alone, ready-for-use product, so all integrators need to do is to add their I/O modules when necessary. From the very beginning, the launch of MI/O Extension was to ensure greater flexibility and simplicity for clients’ product development process.

### MI/O Highlights

Ensuring efficient, flexible product development with time and cost saving

Features	Benefits
<b>MIOe Unified Connector</b>	Extended interface gives flexibility to bundled I/O modules.
<b>Expansion Module Options</b>	Ready for future interface expansion and vertical application demands.
<b>Unified System Screw Holes</b>	Unified screw mounting holes makes it easier for system maintenance and platform upgrades.
<b>Concentrated Thermal Design</b>	Concentrated heat generation and dispersion on top side via heat sink/spreader prevents thermal problems and saves space.
<b>Less Cabling Design</b>	Structural uniformity helps reduce cabling and saves cost.
<b>Compact Mechanical Design</b>	With compact and simple integrated design, save up to 20% system space.

#### MIO-5270

- 146 x 102 mm (5.7” x 4”)
- AMD G-Series SC/DC processor with N50M FCH, DDR3 up to 4 GB
- Multiple displays: 48-bit LVDS, VGA, HDMI
- DirectX 11, 2D/3D acceleration
- Dual GbE/COM Ports x 4/ SATA x 2/USB x 6/ GPIO / Cfast



#### MIO-2260

- 100 x 72 mm (3.9 x 2.8”)
- Embedded Intel® Atom™ N455 Single Core + ICH8M, DDR3 memory support
- Dual Independent display: 18-bit LVDS+ VGA
- GbE/ COM Port x2/ SATA/ USB 2.0 x 2/GPIO/ SMBus/ CF
- Low Power Consumption under 8 Watts



## System Integration-Ready Single Boards

The other highlight feature of Advantech's MI/O Extension is that it's ready for troubleshooting, and effective for system integration in single board computers. Cable assembly used to be one of systems integrators' biggest headaches when they were tasked with handling single computer products. The complex cabling on single board computers was to blame for the soaring assembly cost, and troubling system assembling issues. MI/O Extension is outfitted with an optimal mechanical design to streamline multiple I/O ports and overall cabling.

In tackling heat radiation, MI/O Extension was designed with a centralized thermal management feature. All the heat conductors distributed across the board, including the CPU, the Southbridge, memory, the active IC, the power zone and the clock generator, are now centralized helping disperse the heat via the heat sink, or a heat spreader. This way, the heat can be more effectively dissipated to eradicate possible issues due to ineffective heat radiation in the system.

In the past, different types of boards, each with different locations resulted in expansion difficulties due to the differences in product specs. Advantech developed its MI/O Extension single board computers with unified I/O connector coastlines, and uniformly expanded compatibility of its CF card and mini PCIe locations. An area under the board is also designated for 2.5" hard disks. This structural uniformity helps overcome possible problems during future upgrades.

## Integrated Added-Value Services for Firmware and Software

MI/O Extension value-added software services include built-in iManager chip technology which is a unique cross-platform combination of hardware and firmware technology that can work across all kinds of operating systems, and provide instant response and detection to allow system administrators to be fully in control. iManager ensures applications boot up in harsh environments and automatically overcome voltage dips. In addition, MI/O Extension supports Advantech's own SUSIAccess which provides easy remote management so users can more easily monitor, configure, and control a large number of terminals and make maintenance and system recovery simpler.

## New Concepts Create New Business Opportunities

Two product lines are being planned under the MI/O Extension framework. The first is the MIO-5xxx Compact series which

is 146 x 102 mm in size, and will be promoted specifically for the 9Watts ~ 40Watts chipset platform segment. From the PCB, material selection and power design, this particular line was created to support wide-temperature designs, with built-in iManager chips; it also supports boot-up in critical conditions, and an automatic system recovery device during voltage dips. The MIO-2xxx Ultra series is 100 x 72 mm (PICO-ITX) in size, and a perfect fit for low power applications under 8Watts that require miniature x86 chipsets, to simplify demands from more price-competitive markets and size-sensitive devices.



In August, 2011, Advantech is scheduled to launch MIO-5270, using AMD G-Series platform, and MIO-2260 with Intel Atom N455. Four months later, the company is looking to introduce MIO-5250 using brand new Intel Atom solutions. More low power consumption and high-performance versions of MI/O Extension products are also slated for launch in 2012.

Advantech is keeping its finger on the pulse of the market and carefully studying marketing analyses and feedback. The result is the pioneering MI/O Extension product range—a user-oriented solution realized after many trials and experiments. The design of this single board computer took into account soft, hard, and firmware applications. Other than I/O module documents (MIOe design document) for clients design reference, Advantech also offers an evaluation board to provide I/O interface for verification. These features are all parts of Advantech's thoughtful effort to help integrators create their module designs most cost-effectively, so that integrators can flexibly develop market-sensitive solutions and secure more promising business opportunities!