Takes Aim at Emerging Market Trends, Advantech Releases the new ARK Series Of Rugged Embedded Box PCs

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In the past, industrial computers were mostly used in factories; however, in today's world industrial computers have a wider range of applications, including those in digital signage, POSs, kiosks, transportation, healthcare, digital surveillance, and other vertical applications. Thus embedded computers featuring compact size, durability, eco-friendliness, and low-noise designs have emerged as new market favorites. Advantech is contributing to this development with the new ARK Series of rugged embedded Box PCs.

In the early years, most industrial computers found their way into factory automation. However, after roughly three decades of continuous technological advancements, industrial computers have entered into many different aspects of our lives: whether it is in POS, street surveillance systems, the TV wall, the luggage carousel at the airport, or any of a number of other applications, industrial embedded computers serve ever more ubiquitously.

And since industrial computers are now playing more visible roles, the old, conservative designs are not necessarily appropriate. So in addition to maintaining high functionality, Advantech has been instilling quality design concepts into various aspects of the product line, including the appearance, cooling, structural strength, power supply, temperature range, and module expandability, with the goal of turning industrial computers into practical works of art that easily adapt to all the various environments that require embedded systems.

In order to make its contribution, Advantech has designed the new ARK Series of rugged embedded systems, which highlight quality features including maximized cooling efficiency, wide-input power supplies, wide temperature ranges, diverse expandability options, and structural strengthening. And with a view to slim compactness, rich I/O, expansion and other application themes, Advantech released the ARK-1120, ARK-1503, ARK-2120, and ARK-3540 in the hope of fulfilling market demands.

Oval Top Cover and Conductive Cylinder Create Maximum Cooling Effects

Noise tolerance has always been a sensitive issue in several embedded application environments; therefore, the Advantech ARK Series of products takes a fanless design approach to completely eliminate any concerns about dB values. An added benefit of the fanless design is that no airborne dust is conveyed into the systems, which increases MTBF.

All new ARK Series products use conductive cylinders made of aluminum with a unibody design. A shortened heat path increases heat transfer efficiency, creating an even better cooling effect. Apart from the brilliant use of the conductive cylinder, another highlight is the oval top cover plate. The new generation ARK Series has adopted the unibody inverse-U structure and a contour design; which enlarges the cooling area and further increases the thermal efficiency.

The surface of the oval top cover plate contains many cone-shaped fins. This particular design serves several purposes: First of all, the cones are more aesthetically pleasing when compared to the previous angular design; secondly, the cone-shaped fins reduce the hand contact area, reducing the risk of users burning their hands during maintenance; thirdly, the cone-shaped design makes the distance between the fins larger and broader than before. This in turn improves the ventilation effect, further facilitating heat transfer.

Precision Assembly Strengthens Structure

With regard to the strengthening of the structure, the new Advantech ARK Series carries motherboard capacitors and components with a shock-resistance of up to 5G. This effectively prevents any potential damage to the structure as a result of vibration.

In order to strengthen the structure without reducing the system's shock-resistance, Advantech adopted a specific precision-assembly design and also attempted to reduce the quantities of the cables and screws used. As a result, no screw holes appear on the exterior surfaces of the products.

Why reduce the quantity of screws? Advantech's new ARK Series features a unibody design that connects the top and bottom parts of the computer, allowing the user to easily disassemble the box for maintenance. So we need not rely on the screws as much as before. More importantly, screws can become loose and are prone to weathering and corrosion; both can have a potential impact on structural

strength. So logically we have tried to minimize the usage of screws. And the more cables used, the more space they take up in the interior, which adversely affects thermal efficiency. Therefore reducing cable usage helps maintain system stability.

To address the cabling issue, Advantech installed connectors directly onto the main board, and satisfied demands for specific applications by using the MIOe of MI/O Extension SBC, a customizable interface expansion module. Reducing the number of cables allowed for increased space between the components, further ensuring cooling effectiveness for the processor, the southbridge chipset, memory, hard drive, and other main components.

In fact, all of the products in Advantech's new ARK Series product line, whether it be the smallest and lightest ARK-1120 model, or the largest ARK-3540 model, benefit from reduced cable use. The ARK-1120, given its small volume, does not have much space for cables to start with; every cable eliminated contributed to smoother airflow. And the ARK-3540 is equipped with a high-functioning CPU; its higher energy-consumption rate requires a solid cooling structure. So it does not have room for a lot of cables either.

Exquisite Design Satisfies Application Demands

The new Advantech ARK Series offers a breakthrough design look. The contoured, unibody top cover plate, along with the cone-shaped fins, add elements of beauty; and its ingenious design has maximized its compatibility for different applications as well as its practical value.

Firstly, we have kept the standard VESA mounting holes on the oval surface of the top cover plate. Users can easily lock the machine onto the arms without locking the iron plate, and it can be connected to a panel without difficulty.

Moreover, the Advantech Bracket structure utilizes an innovative design that serves to maintain consistency in core components. Users can add two additional expansion cards within this structure, further optimizing usage of the interior space.

In the past, certain users only emphasized system computing capabilities, and did not have any need for I/O expansion, so they especially favored light, compact models; on the other hand, other users focused on system expandability. It was, therefore, a difficult task for one model to satisfy both demands, as they are polar opposites. Take the new ARK-3540 model for example; Advantech released both the 3540L compact model and the 3540F expansion model equipped with a bracket. This allows Advantech to navigate market segments and satisfy the demands of different consumers.

Wide Voltage and Temperature Ranges Accommodate Severe Environments

Industrial computers are used mostly in industrial environments; therefore, Advantech has always used the DC-to-DC power module as the standard for the power design of its embedded products. Using the direct input/output current can provide higher stability, thus facilitating adjustment to the industrial manufacturing environment.

The new ARK Series products supported the DC range of 9V to 34V. The default supported temperature range was also increased to -20° C to 60° C. With the advancement of the wider temperature and voltage

ranges, Advantech's new ARK Series of rugged embedded Box PC is fully capable of satisfying the severe environmental demands of the industry.

Moreover, Advantech has adopted the special power IC in order to reduce interference from the environment, e.g., the electromagnetic interference that often occurs in severe environments, and this further improves product stability. It is also worth mentioning that many industrial computers usually adopt an independent power board, and connect it to the motherboard via cables. But Advantech has integrated the power IC with the motherboard, reducing both cable usage and system size.

Flexible MIOe Design Satisfies Diverse Vertical Market Needs

The fast-changing characteristics of market demands have further diversified vertical applications, resulting in varying demands for I/O expansion. For example: a user who wishes to hang a 42" screen would need an extra DVI connector; a healthcare centre would require the installation of amplifiers; a general industrial manufacturing environment would need more COM ports.

Given the changeable nature of the vertical application market, it seems that no matter what the industrial computer manufacturers do, whether offering complete ODM customization, or various types of embedded computer modules, it remains a challenging task to fulfill these pressing needs, and at the same time keep costs in check. To solve this problem, Advantech has come out with the MIOe–an innovative card concept where a connector supports several interface expansion functions, and exchanges the I/O signal with the MI/O Extension SBC through the bus.

This stack design easily appeals to different markets without changing the motherboard structure, and also enables customers to quickly assemble the desired products.

Built in Intelligent Management Tools ─ Advantech iManager & SUSIAccess

The new ARK Series products also built in intelligent management tools. Advantech iManager provides a valuable suite of programmable APIs such as multi-level watchdog, hardware monitor, system restore, and more user-friendly interfaces. iManager is an intelligent self-management cross platform tool that monitors system status for problems and takes action if anything is abnormal. iManager offers a boot up guarantee in critical, low temperature environments so systems can automatically recover when voltages dip. iManager makes the whole system more reliable and more intelligent. And also support Advantech's own SUSIAccess, which provides easy remote management so users can monitor, configure, and control a large number of terminals to make maintenance and system recovery simpler.

Four Models with Distinctive Features

Each of the new models including the ARK-1120, ARK-1503, ARK-2120, and ARK-3540 has its own distinctive features to meet different application demands.

The smallest model, the ARK-1120 is easy to install and users can easily get the hang of it without spending too much time reviewing the manual. This model is a perfect fit for the commercial market. The product life is 3 to 5 years, whereas if you look at competing products, their product life is 12 months at the most.

The compact ARK-1503 model is equipped with 4 VESA mounting holes, thus making it the most compatible for use with panels.

The ARK-2120 model, boasting rich I/O, is the most suitable for easier flexible I/O demands. A layer of the MIOe socket was preserved for users to freely adjust the interface, further promoting the product's design customization.

The ARK-3540, the highest-end product in the series, is the only model that adopts new generation Intel® Core i series processors. It not only features high-computing capabilities, but also has the maximum expandability with the inclusion of 2 PCI or PCIe sockets.

All different ARK series can fulfill customers' different demands and we provide this successful products line continues to have a bright future.




Model Name	ARK-1120	ARK-1503	ARK-2120	ARK-3540
Dimension (W x H x D)	133.8 x 43.1 x 94.2 mm	230.6 x 44.4 x 133 mm	264 x 69 x 137 mm	220 x 110 x 270 mm
Processor	Intel Atom N455	Intel Atom D525/D425	Intel Atom D2700/ N2800	New Generation Intel Core i7
Features	• One half-size MiniPCIe expansion slot • Supports 2 COM, 4 USB, 1 GbE	• Integrated display interface with LVDS / 2 USB / Rx / Tx signal • 1 RS-232, 1 RS-232/422/485 with auto-flow control	• Multi-display interface HDMI / VGA / LVDS • Supports up to 3 GbE, 6 COM, and 6 USB 2.0	• Supports up to 4 GbE, 6 COM, 8 USB 2.0, 1 USB 3.0 • Supports PCI/PCIe and MiniPCIe expansion
Operating Temperature	0 ~ 40° C	-20 ~ 60° C	-20 ~ 60° C	0 ~ 40° C