



# **Embedded Computers and Advancements in Blood Testing Technology**

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Over the last few years, medical technology companies have been making news headlines by promising improved blood tests that are not only precise, but also nearly pain-free since they require only a single drop of blood compared to other current options. In fact, this new way of collecting blood for lab testing purposes is so controversial that it has people wondering, how is this technology even possible and will this new method mean faster and more accurate blood test results?



While not as life threatening other medical emergencies, dealing with needles is still a painstaking everyday procedure for hospitals when running blood tests. Medical professionals typically gather multiple vials of blood in order to perform medical laboratory tests to determine diseases, organ function, and pharmaceutical drug effectiveness – which can be an uncomfortable process for patients. Furthermore, 70% of medical decisions depend upon the results of blood tests, meaning that accurate results are important to provide information that can aid in the prevention, diagnosis, treatment and management of diseases.

The process of extracting blood for testing purposes has been used in the medical industry for many years and new medical technology has improved all facets of getting lab tests done. With the advancement of software and hardware technology, some companies are claiming that a single drop of blood from a pin prick is all that is needed for extensive blood tests. Even though tests from a single drop of blood are controversial at the moment due to their radical technological claims, the Center for Disease Control agrees that new blood screening technology is still improving the way that blood tests are achieved- meaning improved patient experience.

However, the CDC also noted that more than 50% of medical laboratory mistakes during the analytic phase of blood tests are due to faulty equipment and human-made errors. To successfully provide the results and further diminish this error rate, reliable equipment must be integrated with a high performance embedded motherboard that offers high computing power, communications capacity, data transfer options, storage capabilities and more in order to process complex information in a fraction of the time old blood tests used to take. Additionally, less blood can be accurately analyzed, results can be concluded in a much shorter amount of time, and more thorough testing can determine some diseases that might not be readily apparent. The process becomes less painful since only a small amount of blood is needed. New technology means that human errors are minimized, and the costs associated with blood analyzing are reduced, bringing down expensive healthcare costs for everyone.

## Product Showcase

Axiomtek's embedded motherboards are specifically designed to work in medical applications and can provide integrators with high computing capabilities needed to run complex hardware that can process information found in blood. These embedded motherboards are also feature-rich with high expandability options for USB 3.0 and 2.0 ports, DIO, PCI Express ports, Gigabit LAN ports and more to fit the challenging needs of the medical industry. Axiomtek offers a variety of embedded motherboard form factors to suit various space constricting needs including Mini-ITX, COM Express, Pico-ITX, 3.5-inch, and more.



### MANO500

The MANO500 mini-ITX motherboard is based on the new 14nm 6th generation Intel® Core™ i7/i5/i3 and Pentium® processors in the LGA1151 package (codename: Skylake). Featuring the new Intel® H110 Express chipset with DDR4-2133MHz memory support, this motherboard is built to perform. Its three SATA 6G ports, four USB 3.0 ports, and two RS-232/422/485 ports provide robust storage and I/O options. Users also can increase board functionality with PCIe x16 slot and PCI Express Mini Card slot. The high quality industrial motherboard, MANO500, allows the connection of up to four display interfaces via HDMI, VGA, DisplayPort, and LVDS/ Embedded DisplayPort (eDP), making it an ideal solution for gaming, workstation, digital signage, medical and other smart Industrial IoT applications.



### **CEM500**

The CEM500 is a COM Express Type 6 basic module based on the 14nm 6th generation Intel® Core™ i7/i5/i3 and Celeron® processors (codename: Skylake-H) with Intel® QM170 chipset. The outstanding Intel® Gen 9 HD Graphics enables the CEM500 driving multiple 4K displays without the need of a discrete graphics card. Two DDR4-2133 SO-DIMM supporting up to 32 GB system memory capacity and four SATA-600 with RAID 0, 1, 5, and 10 are available. Additionally, the COM Express Basic Type 6 system-on-module supports an industrial operating temperature range of -40°C to 85°C for applications in extreme harsh environment. The Intel® Core™-based CEM500 is targeted at telecommunication, medical imaging, digital signage, gaming machines, military, human machine interface, industrial automation controllers and IIoT applications.



### **CEM501**

The CEM501 COM Express Compact Type 6 module is based on the latest 14nm 6th generation Intel® Core™ i7/i5/i3 processors (codename: Skylake) with support for up to 32 GB dual channel DDR4-2133 SO-DIMM memory. Featuring improved processing and graphics performance compared to the previous generation Intel® processor, the compact-size system on module CEM501 offers intense graphics performance and multitasking capabilities, making it ideal for telecommunication, medical imaging, digital signage, gaming machines, military, and IIoT related applications.



### **PICO300**

The PICO300, an extreme-compact fanless pico-ITX motherboard, is built with the Intel® Pentium® N3710 or Celeron® N3060 processor (codename: Braswell SoC). One SO-DIMM socket is provided to support up to 8GB of DDR3L-1600 memory. The PICO300 is supported in dual display configurations along with one 18/24-bit single/dual-channel LVDS and a choice of VGA or HDMI. Furthermore, the tiny 2.5" pico-ITX embedded board features Intel® integrated Gfx graphic engine to build excellent media and graphics performance capability. In addition, the compact size of the pico-ITX form factor also makes the PICO300 suitable for space-constrained embedded applications. It runs fanless operation, and supports -20°C to +60°C operating temperature. Combined all features as above, the PICO300 is ideal for any media editing, imaging, graphics and video intensive applications that be applied for a wide array of industrial IoT industries.



### **PICO500**

The PICO500, an extreme compact pico-ITX embedded board, supports the latest 14nm 6th generation Intel® Core™ i7/i5/i3 processors (Codename: Skylake-U). The tiny PICO500 is equipped with one DDR4 SO-DIMM with up to 16 GB memory capacity. Integrated with Intel® HD graphic engine, the Pico-ITX motherboard supports HDMI and 18/24-bit dual channel LVDS that delivers a whole new level of Ultra HD 4K visual experiences. Its Pico-ITX form factor allows for an extremely compact performance system; meanwhile, the PICO500 is built to withstand wide temperature conditions, ranging from -20°C to +70°C (-4°F to +158°F) with active thermal solution.



#### **MPC153-834**

The new MPC153-834 is equipped with a 15.6-inch WXGA TFT LCD display with high brightness of 300nits. Specifically designed for the medical environment, the medical panel PC has IPX1 compliant chassis and IP65/NEMA 4 rated spill and dust-resistant front panel. Moreover, the wide-screen medical touch panel PC is equipped with an isolated COM port to protect equipment from electrical surges and transient voltage spike. Powered by quad-core Intel® Celeron® processor J1900 (codename: Bay Trail), the powerful 15.6-inch MPC153-834 is an ideal choice as a point-of-patient-care EMR computer, enabling health care professionals to access patient records whenever and wherever needed.



#### **MPC240**

The 24" touch medical PC MPC240 is EN60601-1, CE certified to ensure medical operation safety. The Intel® Haswell touchscreen medical panel PC is equipped with a 24-inch Full HD TFT LCD display with brightness of 250 nits. Especially designed for the medical environment. Constructed with an antimicrobial enclosure can prevent any bacterial invasion. The powerful yet super slim 24in medical panel system MPC240 is powered by 4th generation Intel® Core™ processor with DDR3L memory of up to 16 GB. Moreover, the medical touch panel PC supports USB 3.0 ports, Gigabit LAN port and HDMI port to provide end user's multiple choices.

To learn more about Axiomtek's [medical touch panel PC](#), [embedded board](#) and [fanless embedded system](#), contact us at [info@axiomtek.com.tw](mailto:info@axiomtek.com.tw).

## About Axiomtek Co., Ltd.

[Axiomtek](#) Co. Ltd. is one of the world's leading designers/manufacturers of PC-based industrial computer products. From our roots as a turnkey systems integrator specializing in data acquisition and control systems, Axiomtek has mirrored the PC evolution in various industries by shifting our focus toward the design and manufacture of PC-based industrial automation solutions.

Axiomtek Co., Ltd. established in 1990, has more than 60 distributor partners globally. Axiomtek offers Industrial PCs (IPC), Single Board Computers and System on Modules (slot CPU card, small form factor embedded boards & SoM), Fanless & Rugged Embedded System (eBOX and rBOX), Intelligent Transportation System (tBOX), Industrial Firewall Platform, Industrial IoT Gateway Solution, EtherCAT Master Controller, Touch Panel Computers (TPC), Medical PCs (MPC), Human Machine Interface (HMI), Digital Signage and Players (DS), Industrial Network and Network Appliances (NA).

As an associate member of the Intel® Internet of Things Solutions Alliance, [Axiomtek](#) continuously develops and delivers cutting edge solutions based on the latest Intel® platforms.