GIGAIPC

Next-Generation Processors Push the Technology Envelope for Digital Signage & Industrial Applications

intel partner Titanium IoT Solutions

Intel's Elkhart Lake Series of CPUs Permit Low-Power Fanless Connected Platforms

No one will dispute the impact the IoT has had on industrial and embedded applications. The benefits of having all your devices connected are immense. For example, a business can easily monitor its manufacturing and production output. It can know where any given product is at any time, even after it leaves the factory.

When machinery is connected to the Internet, an administrator can know the health of each system in its plant, 24/7/365. When a system needs to come off-line for maintenance, it can be scheduled at a time when the impact is minimized, like during an overnight shift or other slower periods. The administrator can also monitor fuel costs, like the price of electricity at various times of day or week, and adjust the manufacturing hours accordingly.

Monitoring the equipment in a production line can have far-reaching positive effects, from safety and security to increased production and revenue.

From a safety perspective, knowing the health of the machinery is just the start. Equipment can be maintained properly so no one is injured should a fault occur. In addition, operation can be temporarily suspended should a person or other object come too close to the equipment, potentially injuring that person.

Predictive Maintenance and Security

Using predictive-maintenance algorithms, the systems can be smart enough to know exactly when they should be taken off line for service. Assuming enough notice is available, this maintenance can be performed at the most convenient time. Some systems even have the ability to self-repair, depending upon the situation.

Using cameras or other types of detectors, security can be maximized. The presence of any unauthorized persons could immediately trigger an alarm or other action. Combined with artificial intelligence, the functionality of those sensors grows exponentially. For example, using facial recognition, the system can only allow certain persons access before an alarm is triggered.

Point those vision systems at the product being manufactured, and you can have an always-on visual inspection system. Should anything be amiss, an administrator can be notified and/or a piece of equipment could be shut down.

CPU Horsepower When You Need It

Many of these advances in the Industrial IoT (IIoT) come as a result of breakthrough technology in microprocessors and adjacent silicon. Particularly when vision comes into play, the amount of data that needs to be computed, analyzed, acted upon, and stored is huge, often into the multiple Terabytes. It takes a solution like Intel's Elkhart Lake family to handle such massive amounts of data.

For example, the Atom x6000E series can go to higher levels of CPU and graphics performance with integrated IoT features, real-time performance, manageability, security, and functional safety. With two to four CPU cores each running at up to 3.0 GHz, the microprocessors support both DDR4 and LPDDR4/x memory in configurations up to 64 Gbytes. Compared to the previous generation processor, the Elkhart Lake variety provides a 1.7X improvement in single-thread operations and up to 1.5X in multi-threaded operations.

The Elkhart Lake's integrated UHD graphics pushes video and graphics performance to a much higher level as well. For example, it's possible to achieve a maximum resolution of 4K at 60 frames/s on up to three displays simultaneously. That's a 2X performance graphics improvement over the previous generation.

It's also important to note that the CPU's total power dissipation generally ranges from just 4.5 to 12 W, which simplifies the required cooling techniques. In fact, it's even possible to operate in fanless configurations, even in compact packages.

QBiX-DR-EHLA6412H-A1

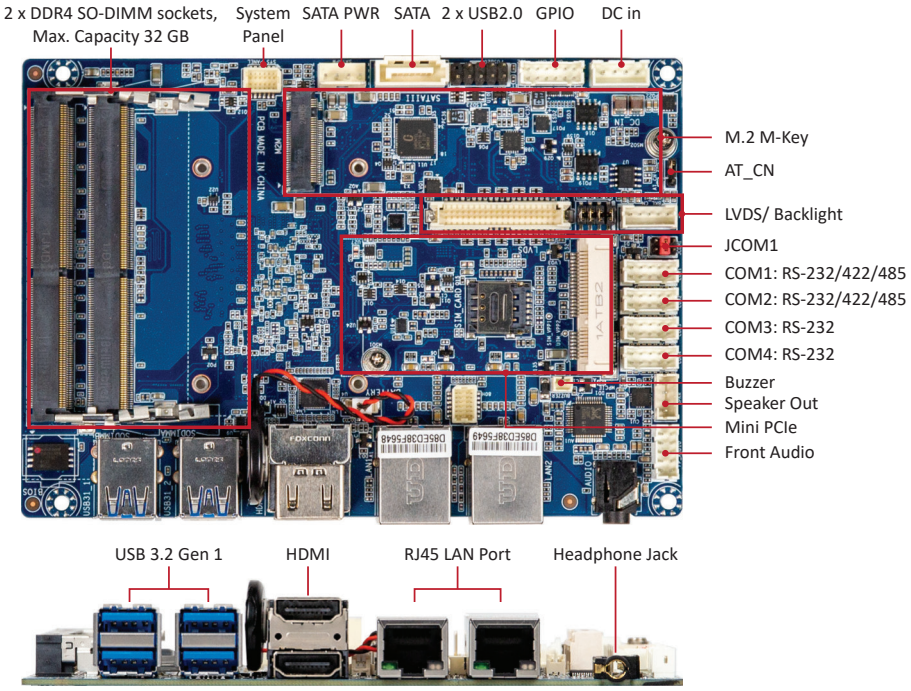
Lower power specifications allow manufacturers like GIGAIPC to develop compact systems that run cool enough to eliminate the need for a fan.

Also note that the Intel® Atom™ x6000RE and x6000FE variations of the processor support time-coordinated computing (TCC) and time-sensitive networking (TSN). These two technologies are growing in popularity for industrial applications.by synchronizing data, communications, and executions across networks of IoT devices.

Thanks to Intel's commitment to industrial and embedded applications, the Elkhart Lake family of processors can operate in the commercial temperature range, 0°C to +70°C or the extended temperature range of -40°C to +85°C. In addition, the company is committed to supply the product for at least ten years.

Embedded Boards & Computers That Maximum the Elkhart Lake CPUs

GIGAIPC is one vendor that offers embedded computers based on that powerful Intel® Elkhart Lake family of processors. Because of the CPU's extensive I/O capabilities, the GIGAIPC platforms are rich with I/O ports and multiple expansion slots to fit in the thriving Edge computing market, including digital signage and IoT gateways. Its Elkhart Lake product family ranges of various motherboard form factors and embedded systems, designed for industrial applications with abundant high-speed and legacy I/O ports. WWAN and WLAN support are also available through an M.2 module.



The GIGAIPC QBiP-6412A embedded motherboard is designed around an Intel Celeron J6412 microprocessor, part of the company's Elkhart Lake series. The board's extensive I/O capabilities position it for digital signage and IoT gateway applications, particularly in the industrial sector.

More specifically, the company's QBiP-6412A is a 3.5-in. subcompact embedded motherboard that's based on the Celeron J6412 variant of Elkhart Lake. Other performance-boosting features include dual-channel DDR4 memory, four COM ports, a 6-Gbit/s SATA interface, and multiple USB ports.

Similarly, the QBiX-Pro-EHLA6412H is a system-based product that also harnesses the power of the Intel® Celeron J6412 microprocessor. Aimed at industrial applications, particularly those that can benefit from being wall mounted, the system boasts dimensions of just 178 by 125 by 53 mm and a wide dc input voltage range, from 9 to 36V. Other features include dual-channel DDR4 memory, as well as two SO-DIMMs, two HDMI ports to handle dual displays, and two Gigabit Ethernet LAN ports. The fanless (passive) thermal design can also work in high shock and vibration environments, such as warehouse logistics. The QBiX-DR-EHLA6412H-A1 is a similar model embedded computer, yet it is suited for DIN Rail applications, thanks to its high performance, yet low power requirement.

Then there's the QBiX-Plus-EHLA6412-A1 industrial system that shines in digital signage applications, thanks to its ability to displays three independent video streams and small size (118 by 109 by 44 mm). It's based on an Intel Celeron J6412 microprocessor. I/O occurs through two Gigabit Ethernet LAN ports or a serial interface.

In addition to the applications mentioned above, most of GIGAIPC's Elkhart Lake products are suitable for applications in factory automation, retail, and healthcare, essentially anyplace where a powerful connected platform can make a difference.

You might expect to pay far more for an embedded motherboard or a compete embedded system than where GIGAIPC has priced its latest leading-end platforms. That advantage comes from having both the system and motherboard expertise and manufacturing capability in-house. No third parties are needed, from conception, to design to prototype to mass production. That includes the firmware and software integration as well. From a specifications and performance perspective, these products will go toe to toe with any competitor.

About GIGAIPC

GIGAIPC CO, LTD, established in 2018 as an embedded solution-focused subsidiary of GIGABYTE, is driven by passion for technology and sophisticated R&D capabilities. The company leverages its experience in the computing market to offer board-level and system-level products for 5G, IoT, Machine Vision, Industrial Automation, Smart Retail and Healthcare. GIGAIPC operates an awardwinning manufacturing facility in Taiwan, synchronizing with GIGAIPC's R&D department to deliver high quality and reliable products. GIGAIPC is a young and energetic organization driven by surpassing our customer's expectations, and we promise to offer our customers not only high-quality computing platforms but also world-class service and support. As a result, GIGAIPC's service centers have been established in most major cities worldwide, and our global presence continues to grow, offering the best service to our customers.

"Building a Smarter Tomorrow"
The strengths of GIGAIPC are based on the advantages, skills, and expertise we have built to realize this vision, including being customer-focused and striving for high quality. GIGAIPC is determined to keep reinforcing these strengths as our principles to achieve maximum customer satisfaction.

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Model Name	QBiX-Pro-EHLA6412H-A1	QBiX-Pro-EHLA6412H-A2	QBiX-DR-EHLA6412H-A1	QBiX-Plus-EHLA6412-A1
Dimension	178W x 125D x 52.7H (mm)	178W x 125D x 52.7H (mm)	160W x 118D x 62.6H (mm)	165W x 105D x 27H (mm)
CPU	Intel® Celeron® J6412 Processor, 10nm, 4 cores, 4 threads, up to 2.6 GHz	Intel® Celeron® J6412 Processor, 10nm, 4 cores, 4 threads, up to 2.6 GHz	Intel® Celeron® J6412 Processor, 10nm, 4 cores, 4 threads, up to 2.6 GHz	Intel® Celeron® J6412 Processor, 10nm, 4 cores, 4 threads, up to 2.6 GHz
Chipset	SoC	SoC	SoC	SoC
Memory	2 x DDR4 SO-DIMM sockets, Max. Capacity 32 GB, Support Dual Channel DDR4 3200 MHz	2 x DDR4 SO-DIMM sockets, Max. Capacity 32 GB, Support Dual Channel DDR4 3200 MHz	1 x DDR4 SO-DIMM socket, Max. Capacity 16 GB, Support Single Channel DDR4 2600 MHz	2 x DDR4 SO-DIMM sockets, Max. Capacity 32 GB, Support Dual Channel DDR4 3200MHz
Ethernet	2 x GbE LAN Ports (Intel® I211AT)	2 x GbE LAN Ports (Intel® I211AT)	2 x LAN ports (Intel® I210AT)	2 x GbE LAN Ports (Realtek® RTL8118)
Graphic	Integrated Graphics Processor - Intel® UHD Graphics for 10th Gen Intel® Processors: 2 x HDMI 2.0 2 independent display outputs	Integrated Graphics Processor - Intel® UHD Graphics for 10th Gen Intel® Processors: 2 x HDMI 2.0 2 independent display outputs	Integrated Graphics Processor - Intel® UHD Graphics for 10th Gen Intel® Processors: 1 x HDMI 1.4, 1 x VGA 2 independent display outputs	Integrated Graphics Processor - Intel® UHD Graphics for 10th Intel Processor: 3 x HDMI 2.0 3 independent display outputs
Audio	Realtek® Audio Codec	Realtek® Audio Codec	Realtek® Audio codec with 2W amplifier	Realtek® Audio Codec
Storage	1 x 2.5” HDD/SSD (SATA 6Gb/s)	1 x 2.5” HDD/SSD (SATA 6Gb/s)	1 x 2.5” HDD/SSD (SATA 6Gb/s)	—
Expansion Slots	1 x 2280 M.2 M-Key (PCIex2, SATA 6Gb/s) 1 x Full-size Mini PCIe with SIM slot	1 x 2280 M.2 M-Key (PCIex2, SATA 6Gb/s) 1 x Full-size Mini PCIe with SIM slot	1 x 2280 M.2 M-Key (SATA 6Gb/s) 1 x 2230 M.2 E-Key 1 x 3052/3042 M.2 B key with SIM Slot –5G Support	1 x 2280 M.2 M-Key (PCIe x2, SATA 6Gb/s) 1 x 2230 M.2 E-Key 1 x 3052/3042 M.2 B-key (USB 3.0)
Front I/O	2 x RJ45 LAN Ports 4 x USB 3.2 Gen 1 2 x HDMI 1 x Power button with LED 1 x HDD LED 1 x Headphone Jack	2 x RJ45 LAN Ports 4 x USB 3.2 Gen 1 2 x HDMI 1 x Power button with LED 1 x HDD LED 1 x Headphone Jack	2 x RJ45 LAN Ports 2 x USB 3.2 Gen1 2 x USB 2.0 + 1 x Vertical USB inside 1 x HDMI 1 x VGA 2 x COM Ports (RS-232/422/485 & RI/5V/12V) 1 x Power switch 1 x HDD & Wi-Fi LED 1 x Remote control pin 1 x Headphone Jack 1 x External Antenna Hole (Optional)	2 x USB 3.2 Gen 1 1 x COM Port (RS-232) 1 x Micro SD card slot (USB 2.0) 1 x Power button with LED 1 x HDMI 1 x External Antenna Hole (Optional)
Rear I/O	2 x USB 2.0 1 x COM Port (RS-232/422/485 & RI/5V/12V) 1 x COM Port (RS-232/422/485) 1 x COM Port (RS-232) 1 x GPIO (8 bits) 1 x 3-pin Terminal Block	2 x USB 2.0 1 x COM Port (RS-232/422/485 & RI/5V/12V) 1 x COM Port (RS-232/422/485) 1 x COM Port (RS-232) 1 x GPIO (8 bits) 1 x Screw Type DC Jack	1 x Din Rail Mounting Support	1 x Combo Audio Jack (Microphone & Headphone) 2 x RJ45 LAN Ports 2 x USB 3.2 Gen 1 2 x HDMI 1 x DC Jack
Side I/O	2 x External Antenna Holes (Optional)	2 x External Antenna Holes (Optional)	1 x GPIO (8 bits) 1 x 3-pin Terminal Block 2 x COM Ports (RS-232/422/485) 2 x External Antenna Holes (Optional)	3 x External Antenna Holes (Optional)
TPM	—	—	1 x TPM header	—
Power	+9V~36VDC (Full Range)	+9V~36VDC (Adapter 19V/65W)	+9~36VDC (Full Range)	+12V~19VDC (Adapter 19V/65W)
Operating Temp.	0°C to 50°C	0°C to 50°C	0°C to 50°C	0°C to 50°C
Mounting	Wall mount (Optional)	Wall mount (Optional)	DIN Rail	VESA 75/100
Ordering Information	6BQP6412AMR-SI (Box packing)	6BQP6412AMR-SI (Box packing)	6BDR6412AMR-SI (Box packing)	6BQS6412AMR-SI (Box packing)

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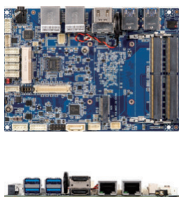

Model Name	iTXL-6412A/ iTXL-6210A	QBiP-6412A/ QBiP-6210A	QBi-6412A/ QBi-6210A
CPU	Intel® Celeron® J6412 Processor, 10nm, 4 cores, 4 threads, up to 2.6 GHz Intel® Celeron® N6210 Processor, 10nm, 2 cores, 2 threads, up to 2.6 GHz	Intel® Celeron® J6412 Processor, 10nm, 4 cores, 4 threads, up to 2.6 GHz Intel® Celeron® N6210 Processor, 10nm, 2 cores, 2 threads,up to 2.6 GHz	Intel® Celeron® J6412 Processor, 10nm, 4 cores, 4 threads, up to 2.6 GHz Intel® Celeron® N6210 Processor, 10nm, 2 cores, 2 threads, up to 2.6 GHz
Socket	FCBGA1493	FCBGA1493	FCBGA1493
Chipset	SoC	SoC	SoC
Memory	2 x DDR4 SO-DIMM sockets, Max. Capacity 32 GB, Support Dual Channel DDR4 3200 MHz	2 x DDR4 SO-DIMM sockets, Max. Capacity 32 GB, Support Dual Channel DDR4 3200 MHz	1 x DDR4 SO-DIMM socket, Max. Capacity 32 GB, Support Single Channel DDR4 3200 MHz
Ethernet	2 x GbE LAN Ports (Realtek® RTL8118-CG)	2 x GbE LAN Ports (Intel® I211AT)	2 x GbE LAN Ports (Intel® I211AT)
Graphic	Integrated Graphics Processor Intel® UHD Graphics for 10th Gen Intel® Processors: 2 x HDMI 2.0, 1 x LVDS or eDP 3 independent display outputs	Integrated Graphics Processor Intel® UHD Graphics for 10th Gen Intel® Processors: 2 x HDMI 2.0, 1 x LVDS 3 independent display outputs	Integrated Graphics Processor Intel® UHD Graphics for 10th Gen Intel® Processors : 2 x HDMI 2.0 2 independent display outputs
Audio	Realtek® Audio Codec	Realtek® Audio Codec	Realtek® Audio Codec
Storage	1 x SATA 6Gb/s Port	1 x SATA 6Gb/s Port	1 x SATA 6Gb/s Port
Expansion Slots	1 x 2280 M.2 M-Key 1 x 2230 M.2 E-Key (PCIe x1, USB 2.0) 1 x PCIe x1 (Gen3 x1)	1 x 2280 M.2 M-Key (PCIex2, SATA 6Gb/s) 1 x Full-size Mini PCIe with SIM slot	1 x 2280 M.2 M-Key (PCIe x2, SATA 6Gb/s) 1 x 2230 M.2 E-Key
Internal I/O	1 x 4-pin ATX main power connector 1 x SATA Power connector 1 x System fan header 1 x Front panel header 1 x Front panel audio header 1 x 2W Speaker out header 5 x USB 2.0 headers 1 x Buzzer 1 x COM header (RS-232/422/485 & RI/5V/12V) 1 x COM header (RS-232 & RI/5V/12V) 2 x COM headers (RS-232) 1 x GPIO (8 bits) & SMBus header 1 x Backlight Control header 1 x AT/ATX mode select jumper 1 x ATX control header	1 x 4-pin box power connector(+9V~36VDC) 1 x SATA Power header 1 x CPU fan header 1 x Front panel header 1 x Front panel audio header 1 x 2W Speaker out header 2 x USB 2.0 headers 1 x COM header (RS-232/422/485 & RI/5V/12V) 1 x COM header (RS-232/422/485) 2 x COM headers (RS-232) 1 x Backlight Control header 1 x AT/ATX mode select jumper 1 x GPIO (8 bits) & SMBus header 1 x Buzzer header	1 x 2-pin power connector 1 x SATA power header 1 x CPU fan header 1 x Front panel header 2 x USB 2.0 headers
Front IO	—	—	2 x USB 3.2 Gen 2x1 1 x COM Port (RS-232) 1 x Headphone Jack 1 x Power button
Rear IO	2 x Audio Jacks (Line out, Mic in) 2 x HDMI 2 x RJ45 LAN Ports 3 x USB 3.2 Gen 1, 1 x USB 2.0 1 x DC Jack (+12V/19V/24VDC)	1 x Headphone Jack 2 x HDMI 2 x RJ45 LAN Ports 4 x USB 3.2 Gen 1	2 x RJ45 LAN Ports 2 x HDMI 2 x USB 3.2 Gen 2x1 1 x Screw type DC Jack (+12V~19VDC)
Side IO	—	—	—
TPM	—	—	—
Operating Temp.	0°C to 60°C	0°C to 60°C	0°C to 60°C
Ordering Information	9MEHLJATMR-SI (Box packing) 9MEHLNATMR-SI (Box packing)	9MEHLJASMR-SI (Box packing) (QBiP-6412A) 9MEHLNASMR-SI (Box packing) (QBiP-6210A)	9MEHLJAHMR-SI (Box packing) 9MEHLNAHMR-SI (Box packing)