Selection Guide

Embedded System

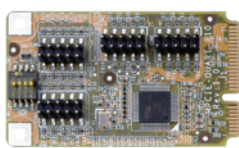| Model Name	uIBX-250-BW	TANK-610-BW	IDS-300-BW
Dimensions (mm)	136.6 x 102.4 x 52	184 x 200.6 x 58.2	241 x 160 x 39
CPU	Intel® Celeron® N3160	Intel® Celeron® N3160	Intel® Celeron® N3160
Memory	1 x 204-pin DDR3L SO-DIMM slot (2 GB pre-installed, system max: 8GB)	2 x 204-pin DDR3L SO-DIMM (2 GB pre-installed, system max: 8GB)	1 x 204-pin DDR3L SO-DIMM 4 GB pre-installed (system max: 8GB)
Ethernet	2 x RJ-45 PCIe GbE by Intel® I211 controller	2 x RJ-45 PCIe GbE by Intel® I210-IT controller	2 X RJ-45 PCIe GbE by RTL8111E controller
Display	1 x HDMI ; 1 x VGA	1 x HDMI ; 1 x VGA	3 x HDMI
I/O port	4 x USB 3.0 2 x RS-232/422/485 1 x Line-out ; 1 x Mic-in	4 x USB 3.0 6 x RS-232 2 x RS-232/422/485 1 x Line-out ; 1 x Mic-in	4 x USB 3.0 2 x RS-232 1 x Line-in ; 1 x Line-out ; 1 x Mic-in
Expansion Slot	1 x Full-size PCIe Mini card	1 x Full-size PCIe Mini card / mSATA 1 x Full-size PCIe Mini card	1 x Full-size PCIe Mini card / mSATA 1 x Full-size PCIe Mini card
Operating Temp.	-20°C ~ 60°C with air flow (i5/SSD)	-20°C ~ 60°C with air flow (i5/SSD)	-10°C ~ 40°C with air flow (SSD)
Power Requirement	12V DC	9~36V DC	12V DC

Motherboards
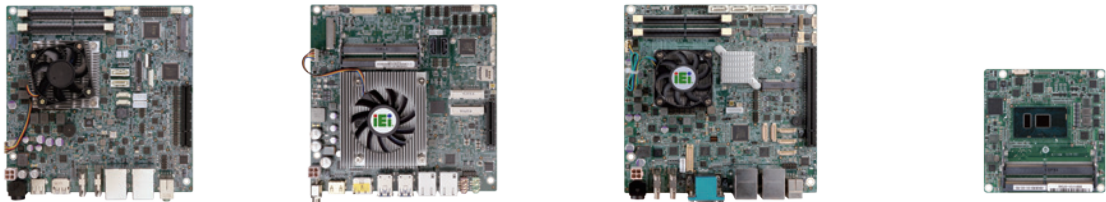
Model Name	gKINO-DMF	tKINO-ULT3	KINO-DQM170/DCM236	ICE-ULT3
Form Factor	Mini-ITX	Mini-ITX	Mini-ITX	COM Express Type6
CPU/Chipset	AMD G-series on board SoC Merlin Falcon	Intel® Core™ i7/i5/i3, Celeron® ULT processor	Intel® Xeon® E3, Core™ i3, Celeron® processor +QM170/CM236	Intel® Core™ i7/i5/i3, Celeron® ULT processor
Memory	2 x 260-pin 2400 MHz DDR4	2 x 260-pin 2133 MHz DDR4	2 x 260-pin 2133 MHz DDR4	2 x 260-pin 2133 MHz DDR4
Display	1 x HDMI 2.0 1 x HDMI 1.4 1 x DP++	1 x HDMI/DP 1 x HDMI 1 x LVDS/eDP	1 x HDMI 2.0 2 x HDMI 1.4 1 x LVDS	2 x DDI 1 x eDP / LVDS
I/O Port	2 x Ethernet 4 x USB 3.0 5 x USB 2.0 4 x RS-232 2 x RS-232/422/485 1 x TPM	2 x Ethernet 4 x USB 3.0 4 x USB 2.0 4 x RS-232 2 x RS-232/422/485	2 x Ethernet 4 x USB 3.0 4 x USB 2.0 4 x RS-232 2 x RS-232/422/485	1 x Ethernet 4 x USB 3.0 4 x USB 2.0 2 x RS-232
Storage	2 x SATA 6Gb/s 1 x MicroSD slot 1 x M.2 (B key) (SATA signal)	2 x SATA 6Gb/s 1 x eMMC5.0 (up to 32G, optional)	4 x SATA 6Gb/s (RAID 0/1 supported) 1 x mSATA (SATA & USB signal) 1 x mSATA	2 x SATA 6Gb/s 1 x eMMC5.0 (up to 32G, optional)
Expansion Slot	1 x PCIe x8 1 x Full-size PCIe Mini card	1 x PCIe x4 1 x Full-size PCIe Mini card / mSATA 1 x Full-size PCIe Mini card	1 x PCIe x16 slot 1 x Full-size PCIe Mini card / mSATA 1 x Half-size PCIe Mini card 1 x M.2 2230 (A key)	1 x PCIe x1 signal to base board 8 x PCIe x1 signal to base board
Operating Temp.	-20°C ~ 60°C	-20°C ~ 60°C	-20°C ~ 60°C	-20°C ~ 60°C

Expansion Cards

Model Name	IPCIE-4POE
Dimensions (mm)	145 x 18.4 x 101.3
Interface	PCI Express® x4
Ethernet	4 x Intel® i210 AT controller 9kB jumbo frame IEEE 802.3az, IEEE1588
PoE Capability	IEEE 802.3af 15.4W / 48V DC per port
PWR Input	12~24V DC input
Operating Temp.	0°C ~ 60°C

Model Name	MPCIE-UART-KIT01/02
Dimensions (mm)	51 x 30
Interface	PCI Express® x1 (mini PCIe)
I/O Port	KIT01: 4 x RS-232/422/485 KIT02: 2 x RS-232/422/485 2 x 8 bit GPIO
Operating Temp.	0°C ~ 60°C

Innovative Gaming Solution

IEI highly flexible and reliable products for wide range of gaming applications

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Case Study

Slot Machine (USA)

In 2014, IEI had a customer specializing in developing software and hardware for Indian class II gaming machines and bingo devices installed in an Indian reservation casino in US.

Since Class II gaming devices do not require hardware longevity and revision control, gaming manufacturers can use consumer motherboards to drive games. However, using short life board is possible to create a service nightmare for the gaming company. Each gaming machine might have different motherboard, OS images, and different firmware. Onsite service could take hours to troubleshoot.

Another requirement from the customer is high-end graphics performance for high-definition games as well as digital signage video blending. Video blending is the new trend in gaming machines. It shrinks the screen a bit and creates a side bar for players to order the drink they want, and casinos can insert advertisement for restaurant and show discounts and deals.

To satisfy these demands, IEI provided a low-cost and close-to-consumer board solution. Moreover, the AMD processor with 10-year life cycle was used to resolve customers' on-going service problems with many different mainboards in the field.

Arcade Machine (Japan)

In 2014, one of the biggest gaming machine providers in Asia contacted us to offer proper gaming motherboard for their Arcade product.

With the introduction of AMD G-series, our customer chose the AMD eKabini SoC processor to achieve their new arcade product. Gaming market usually changes rapidly due to the release of new generation CPU.

In this case, the customer didn't need high resolution display support. They only concerned the board size and CPU thermal. The key features of this case include dual displays, multiple COM and Windows XP operating system support.

IEI accomplished this product successfully with full support of hardware modification and customized embedded OS.

Multi-player Game (Japan)

In 2016, the integration of one high performance embedded system with Intel® Core™ CPU and one entry level fanless embedded system with Intel® Atom™ CPU was implemented in a casino in Southeast Asia.

The combination is perfectly suitable for multi-player game table. Both of the systems are featured with dual independent display output, high reliability, wide range power input, wide operating temperature range and TPM security support.

Customer could use the Core™ i system with high CPU performance for gaming process and use the entry level system for member management. Rich USB and COM ports could be used to connect peripheral devices like licensing machine, membership card reader and touch screen.

IEI has various products with different main features and I capable to provide integration support with extensive experiences.

Slot Machine (Europe)

In 2015, IEI designed a Mini-ITX AMD bald eagle platform. The major business area was located in East Europe and the customer applied this product in slot gambling machine. The main features of this platform include four independent displays, multi-COM and EEPROM support.

The slot machine uses three monitors for display and one for maintenance. The ability to support three or more displays in one gaming machines has become more and more important in this industry.

Customer would like to use lockable connector such as COM connector to prevent the cable from dropping accidentally. Additionally, many peripheral cards are still using UART interface.

Some end users use EEPROM to save their secure data or program. Therefore, we decide to implement this function in our future design to provide flexible development platform to customer.

More Applications

IEI provide a wide range of industrial computing products with high feasibility and reliability for gaming applications. Highly integrated CPU -on-module products, motherboards, systems and open frame monitors are suitable for wide applications in gaming market with high performance. We also offer various accessories for expansion.

Arcade Games

Arcade games are always popular in young generation and evolving with new technology. IEI provides a wide range of products with multiple display output, graphics performance, and various OS support to meet the needs of speedy game developing. The **KINO-DQM170** and **tKINO-ULT3** motherboards with Core™ i CPU support are suitable for arcade games with their high performance CPU and rich display output ports.

Casino Machines

The casino industry generates high revenues, and casinos are increasingly established worldwide. IEI offers products on Intel® and AMD® platforms. The **KINO-DCM236** and the **gKINO-DMF** motherboards support high performance CPU and multiple display output. Their extra security features such as Intel® AMT support, reserved EEPROM, chassis intrusion detect pin and ECC support are adjustable for solutions in casino applications.

Multiplayer Games

The **TANK-610-BW** with multi-COM port and the **IDS-300-BW** with triple display are fulfilling the requirement for dart machines, multi-player game tables, and player machines. IEI **ICE-ULT3** CPU on module with customized baseboard could even satisfy most of your security requests on gaming applications.

Pachislot

The **tKINO-ULT3** and the **KINO-DQM170/DCM236** are designed with multi COM ports and expansions, and IEI **LCD-KIT-F** series has various sizes from 6.5 to 19 inches and supports all kids of common displays. input interface. Additionally, customers can use IEI's diverse PCIe Mini expansion cards like **MPCIE-UART** and **TPM-IN02-R20** modules in the target system to provide flexibility and safety.

Surveillance

Customers may spend lots of effort to arrange the layout when setting up surveillance system because of cables, cameras, and power supplies. For this case, PoE devices are getting more and more popular for solving the difficulties since the power cables can be greatly reduced. The **IPCIE-4POE-R10** is capable to help customers to build up an intelligent monitor center.