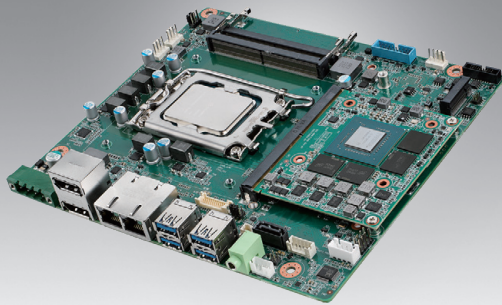# AIMB-288E

1U THIN Motherboard
12th Gen Intel® Core™ Processor LGA1700
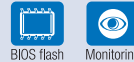**NVIDIA® Quadro® Embedded T1000**

NEW

Features

- 12th Gen Intel® Core™ Desktop Processors, max. 16Core, support H610E chipset
- Integrated NVIDIA® Quadro® Embedded T1000, supports up to 896 CUDA cores , 2.6 TFLOPS
- Up to 64GB DDR5 4800MHz with two SODIMM
- Triple displays with 2 DP and 1 eDP, up to 4K
- Abundant Expansion: 1 M.2 M key & 1 M.2 B key, 6 USB 3.2 gen1, 1 SATA
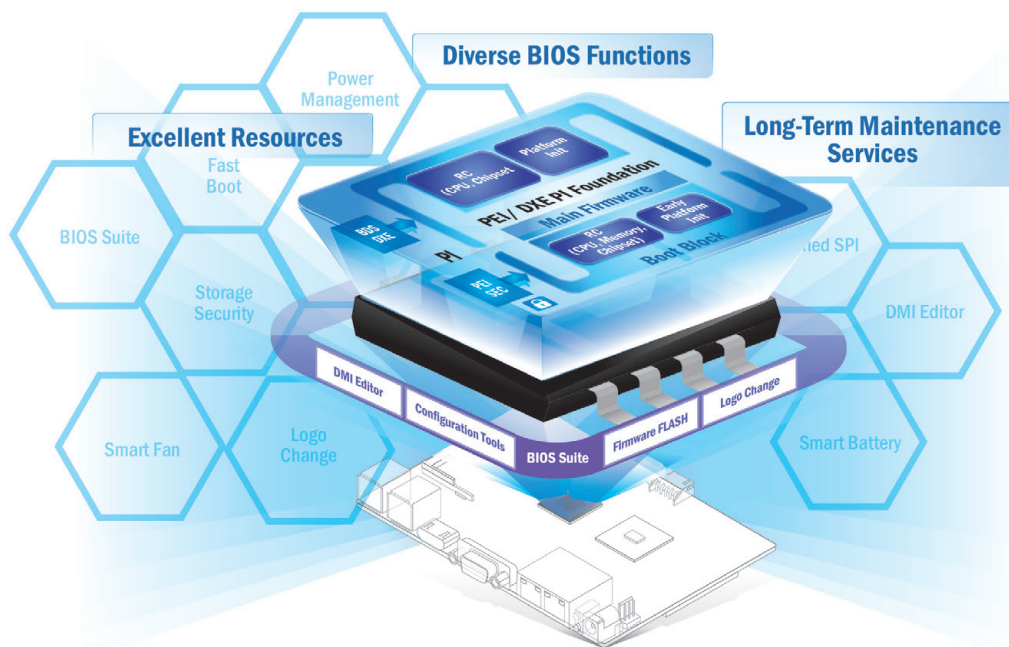- Qualified for Edge AI SRP of WISE-DeviceOn and Embedded Software APIs

Software APIs:
SMBus   H/W Monitor   Watchdog

Utilities:
BIOS flash   Monitoring

Linux   Windows10   ubuntu   WISE-DeviceOn   CE   FC   RoHS COMPLIANT 2002/95/EC

Specifications

Processor System	CPU	i9-12900E/i9-12900TE	i7-12700E/i7-12700TE	i5-12500E/i5-12500TE	i3-12100E/i3-12100TE	G7400E/G7400TE
	Core Number	16/16	12/12	6/6	4/4	2/2
	Max Speed	5.0GHz/ 4.8GHz	4.8GHz/ 4.7GHz	4.5GHz/ 4.3GHz	4.2GHz/ 4.0GHz	3.6GHz/ 3.0GHz
	SmartCache	30MB/30MB	25MB/25MB	18MB/18MB	12MB/12MB	2.5MB/2.5MB
	TDP	65W/35W	65W/35W	65W/35W	65W/35W	46W/35W
	Chipset	H610E				
	BIOS	AMI EFI 256 Mbit SPI				
Expansion Slot	M.2	1, M key for storage (Type: 2280; NVMe supported) 1, B key for storage (Type: 2242)				
Memory	Technology	2, Dual Channel DDR5 4800 MHz SDRAM				
	Max. Capacity	64GB (up to 32GB per SO-DIMM)				
	Socket	2, 262 PIN DDR5 SO-DIMM (Non-ECC)				
Graphics	Controller	NVIDIA® Quadro® T1000 Up to 896 CUDA cores, support 2.6TFLOPS 4GB GDDR6 memory (Display output from Up to Intel® UHD Graphics)				
Display	DP	2 Ports, DP1.4a, supports max. resolution 4096 x 2304 @ 60 Hz				
	eDP	1 Port, Max resolution 3840 x 2160 @ 60 Hz				
	Triple Display	DP+DP+eDP				
Ethernet	Controller	LAN1: 1 Gb Intel I219-LM LAN2: 1 Gb Intel I226V				
	Connector	RJ45 x 2				
SATA	Max Data Transfer Rate	6.0 Gb/s,				
	Channel	1 (SATA III)				
Rear I/O	Display Port	2				
	Ethernet	2				
	USB	4 USB 3.2 (Gen1)				
	Audio	1 (Line out by default, (Line in/Line out/Mic in programable)				
	Power Connector	1 Terminal block (4P, Phoenix Contact)				
Internal Connector	USB	2, USB 3.2 Gen1				
	eDP	1				
	Serial	2, (RS-232/422/485 with auto flow control)				
	SATA	1				
	M.2	1 x M key (2280, for NVMe Storage) 1 x B key (2242, for LTE wireless connectivity)				
	SATA Power Connector	1				
Watchdog Timer	Output	System reset				
	Interval	Programmable 1 ~ 255 sec/min				
Power Requirements	Input Power	19~24V DC Input				
Environment	Temperature	Operating 0 ~ 55° C (32 ~ 132° F), with standard GPU cooler 0 ~ 60° C (32 ~ 140° F), with THIN Cooler for CPU and GPU			Non-Operating -40 ~ 85° C (-40 ~ 185° F)	
Physical Characteristics	Dimensions	170 mm x 190 mm (6.69" x 7.48")				

ADVANTECH   **Industrial Motherboards**

All product specifications are subject to change without notice.   Last updated: 28-Oct-2022

Block Diagram


```
Display Port <-- DP --> 12th Gen Inte Core Processor, LGA1700
Display Port <-- DP -->
eDP <-- eDP -->
                         <-- Channel A --> DDR5 4800 SO-DIMM, 1DPC
                         <-- Channel B -->
                         <-- PCIe x 16 --> NVIDIA Quadro Embedded T1000
                                            896 CUDA cores
                                            GDDR6 4GB memory
   Audio        DMI x4

1 x SATAIII <-- SATA Gen3 --> Chipset H610E
4 x USB3.2 Gen1 (Rear) <-- USB -->
2 x USB 3.2 Gen 1 (Header) <-- USB -->
Audio Codec ALC888 <-- Intel HD Audio -->
                         <-- PCIe x1 --> LAN1: Intel i219LM(1GB)
                         <-- PCIe x1 --> LAN2: Intel I226V(1GB)
                         <-- PCIe x4 --> M.2 M Key (2280)
                         <-- SATA -->
                         <-- PCIe --> M.2 B Key (3042/2242)
                         <-- SATA -->
                         <-- USB2.0/USB3.0 -->

SPI BIOS    TPM 2.0 NPCT750AABYX    NCT6126D
                                        |
                                    2x COM RS232
                                    (option RS422/RS485)
```

Ordering Information

P/N	GPU	DP	eDP	GbE	COM	SATA3	USB3	M.2 M Key	M.2 B Key	TPM2.0	AMP
AIMB-288EH-00A1	Nvidia T1000 (w Cooler)	2	1	2	2	1	6	1	1	1	(0)

AIMB-288E Kit

P/N	CPU	GPU	Memory	Storage	DP	GbE	COM	SATA3	USB3	M.2 B Key	TPM2.0	Cooler
AIMB-288EH-K1A1	I3-12100E	Nvidia T1000	32GB DDR5	512G NVMe	2	2	2	1	6	1	1	THIN Cooler

Packing List

Part Number	Description	Quantity
1700003194	SATA HDD cable	1
1700018785	SATA power cable (1 port, 25cm)	1
1700031130-02	1-to-2 serial port cable, 22cm	1
19Z0002598T001	I/O port bracket	1
SKY-MXM-T1000-4SHB 1970004581T010	Assembly of T1000 MXM GPU module and cooler	1

Optional Accessories

Part Number	Description
1700029719-01	M cable USB-A 9P(F)*2/2*10P-2.0 30CM (B2000)
96PSA-A230W24P4-3	ADP A/D 100-240V 230W 24V C14 TERMINAL BLOCK 4P
1970005349T000	ADL-S CPU cooler, 78x78x55.4mm (for CPU TDP max. 65W)
1970004581T010	STD MXM GPU T1000 Cooler (55 °C)
THIN Cooler	Thermal module of CPU & GPU T1000 Cooler for 1U system at Ta 60° C (need pre-assemble, please contact local sales or FAE)

I/O View

Embedded OS/API

OS/API	Part No.	968 P/N	Description
Windows 10			
Ubuntu			

Reliable Embedded BIOS Solutions

Custom BIOS services with long-term support

Advantech's high-quality embedded BIOS solutions deliver rapid execution and feature expert BIOS team support. These solutions feature multi-functional designs that ensure security and enable power/boot management. Advantech further provides 10+ years of BIOS version management, internal management, and longevity support for both hardware and BIOS — enhancing application efficiency, diversifying functionality, and optimizing performance.

Diverse BIOS Functions

Excellent Resources

Long-Term Maintenance Services

Power Management
Fast Boot
BIOS Suite
Storage Security
Smart Fan
Logo Change

RC (CPU Chipset)
Platform Init
PEI / DXE PI Foundation
Main Firmware
BIOS DXE
PI
PEI DXE
RC (CPU Memory / Chipset)
Early Platform Init
Boot Block

DMI Editor
Configuration Tools
BIOS Suite
Firmware FLASH
Logo Change

...ied SPI
DMI Editor
Smart Battery

Embedded BIOS Solution Advantages

Sufficient Sources

- Strong partnership with BIOS vendors
- 50+ engineers with extensive industrial BIOS experience

Diverse BIOS Functions

- Multi-layer security
- 3 second fast boot
- Power management
- BIOS suite utility

Long-Term Maintenance Services

- Platform longevity support
- 10-year BIOS version control
- BIOS remote backup

Value-Added Customization Process

Request Evaluation	RD Design	Verification	After Service
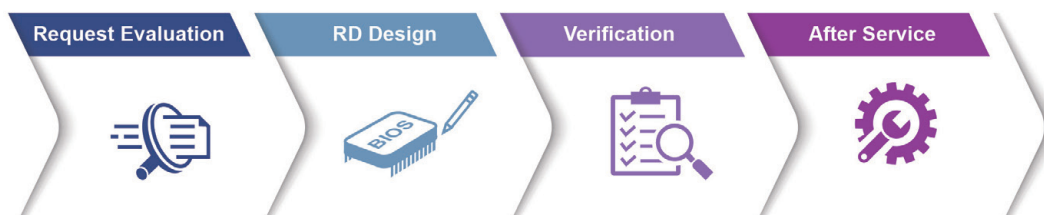
WISE-DeviceOn

Edge AI OTA and Container Management

WISE-DeviceOn End-to-End Solution for Edge AI

Even if all datasets, algorithms, trainings, UI/UX, and more are functioning, how can you easily deploy an AI application to hundreds, or thousands, of inference devices in production? How can you efficiently manage AI models (software updates, CI/CD), in addition to all remote, hardware devices, such as sensors?

Solution Advantages

Performance Booster
- Inference optimization
- Open Neural Network Compiler (ONNC)
- Save over 45% DRAM consumption

Fleet Management
- Remote batch control for power management, reboot, terminal and screenshot
- Real-time monitoring, diagnostics and notification
- Over 10,000 devices around the globe

Container and OTA
- Streamlined deployment process
- Docker container management
- Software OTA (over-the-air) updates

AI Security
- AI containers deployed via Azure Container Registry and Harbor
- Secured data connection (TLS/SSL)
- Integrity protection based on digital signature

☞ **Find More Information about WISE-DeviceOn End-to-End Solution for Edge AI**

Edge AI Suite

AI development for diverse application at the Edge

Increasing demand for AI inference/analytic capabilities at the Edge make AI training models, software development environments, and hardware configuration key factors in successful solution deployment. Advantech's Edge AI Suite helps users build AI demo devices quickly and choose optimal hardware solutions easily.
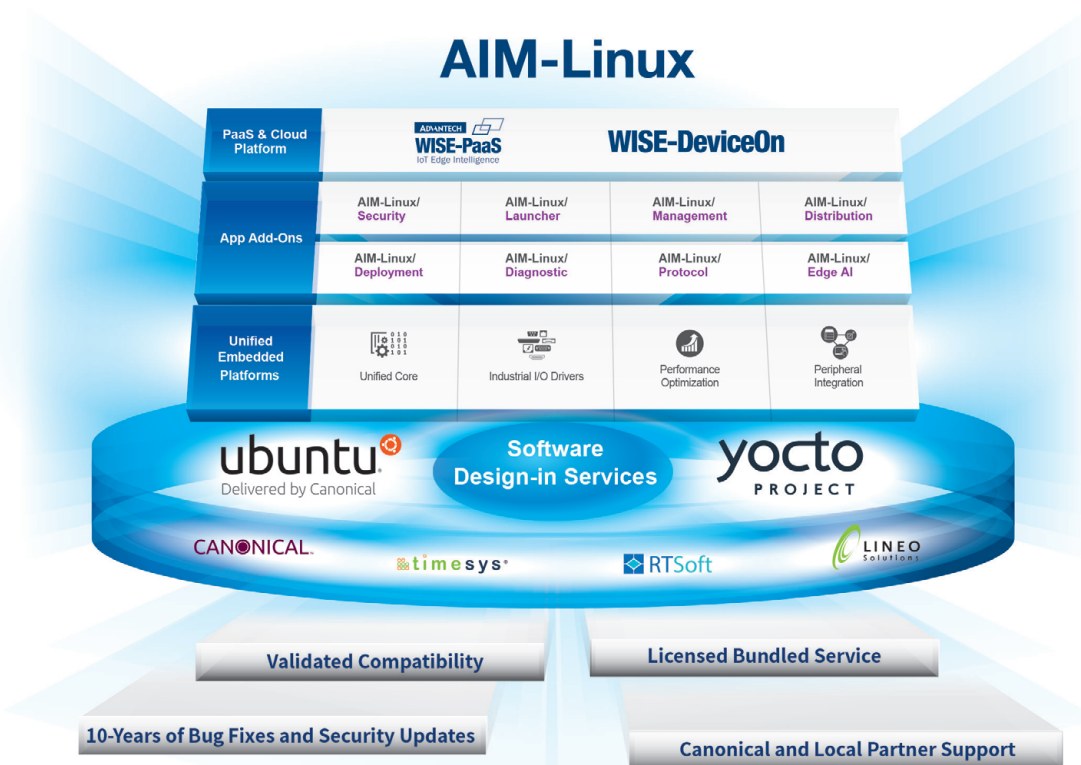

Retail
Enables Customer Personalization

Factory Automation
Increased Productivity

Intelligent Transportation
Enables Real-time Analytics

Smart City
Improve Public Service

Medical
Enhance Diagnostic Quality

5x Performance Boost	All-in-one Installation	One Click AI Experience	Plug-and-play Environment	Discover Cost-effective Hardware
• Integrated Intel® OpenVINO™ technology • Boost AI using Advantech hardware	• Build AI environment in under 5 minutes • Ready-to-use configuration	• User friendly configuration guidance • One-click Benchmark acquisition	• Easy access to 100+ AI inference extensions • Software development package available	• Diverse CPU/RAM options • Find hardware solutions for AI development

Embedded Linux Support and Design-in Services
Hardware Certified Ubuntu and Yocto with Eco Partner Services

Linux is the most popular embedded OS for transportation, outdoor services, factory automation, and mission critical applications. Its open source and kernel reliability features ease security updates, and make it particularly adaptable to new AI and Edge computing technology. Advantech has cooperated with Canonical and other software partners to provide hardware certified Ubuntu image and Yocto BSP as Linux offerings. The Advantech, Embedded Linux, and Android Alliance (ELAA) delivers local software services and consultation.

Features

Certified OS and BSP
- Platform compatibility tests
- Preloaded functional driver and software stacks

Licensed Services
- License authorized Canonical delivers 10-years of bug fixes and security updates
- In-house bundled service

Numerous AI and Edge Resources
- Containerized technology for service provision and deployment
- AI resources from Caffe, TensorFlow, and mxnet

Local Partner Alliance
- Embedded Linux and Android Alliance (ELAA)