ADVANTECH

Enabling an Intelligent Planet

AMD

RYZEN EPYC
EMBEDDED EMBEDDED

ADVANTECH AMD SOLUTIONS EBOOK

Your Guide to Advantech's E-IoT Computing Platforms based on the Latest AMD CPUs Designed Specifically for High Performance Edge Computing

Table of Contents

WHY ADVANTECH

Advantech is a leading provider of innovative products, services, and solutions. We offer comprehensive system integration, hardware, software, customer-centric design services, embedded systems, and global logistics support. We work closely with our partners to provide complete solutions for a wide range of applications in different vertical segments.

ADVANTECH
Enabling an Intelligent Planet

Est. 1983

Founder and CEO: **K.C Liu**
Headquarter: **Taipei, Taiwan**
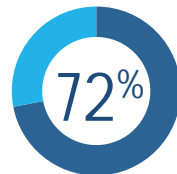
INDUSTRY SERVED

Telecom, Industry 4.0, IoT, Gaming, Retail, iLogistics, Mil/Aero, Broadcasting, Agriculture, Healthcare
(We work with 27 of the top 30 healthcare companies worldwide)

2000+
STANDARD PRODUCT OFFERINGS

CUSTOM PRODUCT CAPABILITY

72% of what we build is the brand behind the brand for our partners

72%

WORLDS LARGEST IPC COMPANY

32% market share

● Advantech ● Other IPC Companies

32%

$2.09B **2021 REVENUE**

	2000	2005	2010	2015	2020	2021

KEY ECO-SYSTEM PARTNERS

intel partner Titanium

Microsoft Partner | Gold Cloud Platform
Microsoft

AMD EMBEDDED SOLUTIONS | Partner Program ELITE

NXP GOLD PARTNER

ubuntu® Delivered by Canonical

NVIDIA ELITE PARTNER
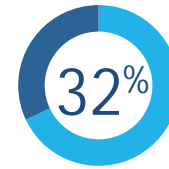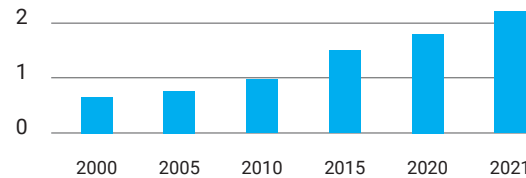
QUALITY SYSTEMS IN PLACE

- OHSAS 81001
- ISO-170256
- IECQ QC 080000
- Sony GP
- IECEx QAR
- FDA

1MILLION+ sq. ft.

In-house manufacturing Kunshan, China, Ten SMT Lines

Linkou, Taiwan   Kunshan, China

- **MANUFACTURING PLANTS**
- Vertically Integrated manufacturing (Self contained)
- Full Manufacturing redundancy (Risk Mitigation)
- Full BOM and lifecycle control (End-to-End control over quality)

$9.1B **MARKET CAP**
2022

WORLDWIDE OFFICES
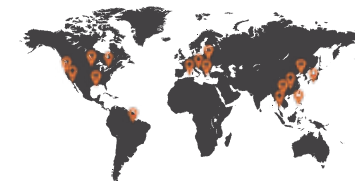
Design Centers	6
Manufacturing Centers	3
CTOS Centers	13
Logistics Centers	4
On-Site Service	2
Repair Centers	14
Sales Offices	19

8500+
EMPLOYEES

Edge⁴ Embedded Design-in Platforms
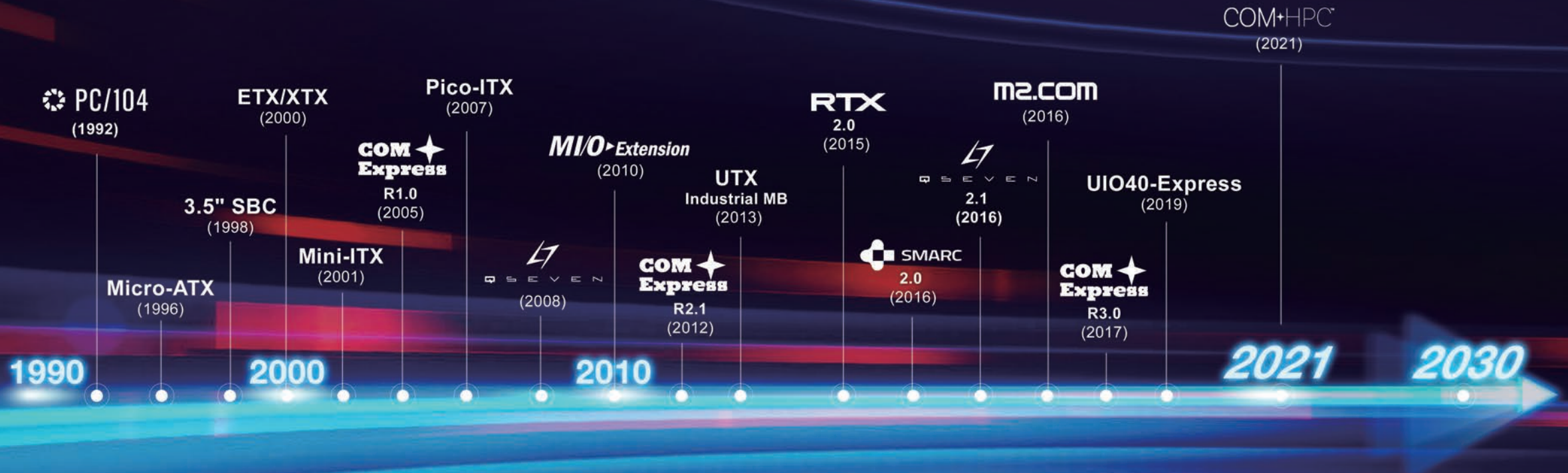
Embedded AIoT Design-in Services

Embedded Software Services

- Embedded BIOS
- Embedded LTS OS (Long-Term Support OS)
- SUSI Software API and OS Lockdown Utility
- iManager: Intelligent Self-management on Chip

Edge AI

- IE Aggregation for NVIDIA and Intel Accelerators
- Cross-platform Support for Windows and Ubuntu
- Vision AI Turnkey Repository
- Instant AI Experience OOB

Device Management
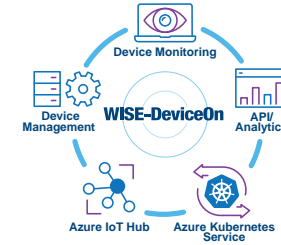
- Remote Management
- Update Management
- Data Visualization
- Monitor and Control
- Alert and Action
- IT/OT Total Security

Software and Cloud Integration
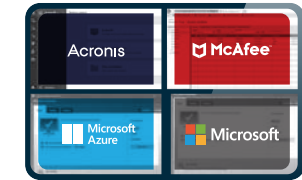
- Acronis Backup and Recovery
- McAfee IoT Security Solution
- Windows IoT Add on Utility and Customization
- Global Distribution
- Azure Migration and Consulting Services

Carrier Boards Design

Industrial Display Systems

Full Spectrum of Embedded Platforms

intel · AMD · NVIDIA · Rockchip · NXP · TEXAS INSTRUMENTS

Thermal Optimization

Multiple I/O Extension

UIO40-Express

AI Acceleration Modules

SSD, Memory, Wireless Modules
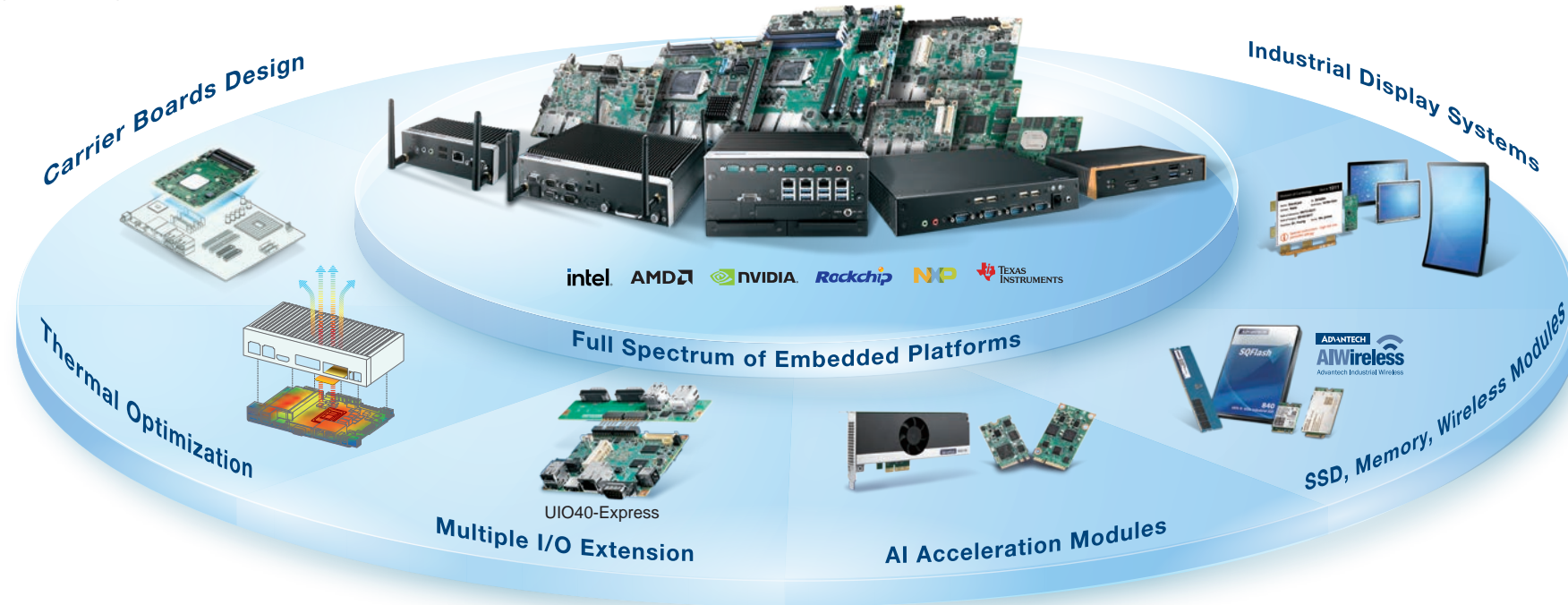
Why ADVANTCH & AMD for Embedded

Advantech, a leading IPC company, leverages the latest AMD platform technology to deliver superior business value. Accelerating the adoption of IoT edge applications requires technology breakthroughs that support diverse mission critical applications. AMD platform technology provides excellent performance, graphics, embedded features, and design-in services.

5G & Networking

High performance computing for 5G and communication infrastructure

✓ **64-CORE**

Machine Vision

Empower precision and expandability to upgrade productivity

✓ **4 PCIe x16**

Medical Imaging

Deliver stable computing power for high-definition image analys

✓ **QFCS**

Infotainment

AMD Radeon graphics and integration of 4 x 4K independent displays

✓ **Radeon GFX**

How Advantech & AMD Benefit Industrial Applications

Leading Computing
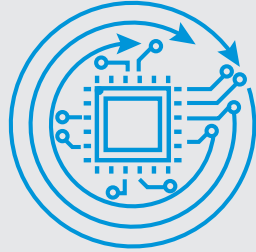
- AMD Zen 3 architecture
- Advanced 7nm process
- Up to 64 cores
- PCIe Gen 4 and USB 3.2 Gen 2
- Best performance per Watt

Excellent Graphics
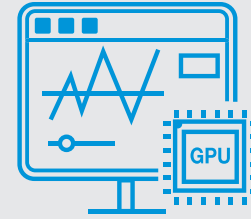
- AMD Radeon graphics up to 8 x GPU cores
- 4 x Display pipes up to 4K resolution
- HVEC and H.264 (10-bit) codec, VP9 decode

Software Utility & OS
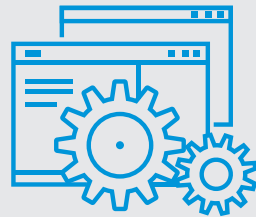
- DeviceOn / iManager
- Redhat RHEL 8.3
- CentOS 8.3
- Windows Server 2019 & 10 Enterprise LTSC
- Ubuntu 20.04

Embedded Features & Service

- 5 and 10 years Longevity
- BIOS customization services
- Advanced thermal solutions
- Intelligent management (IPMI 2.0)
- Design-in services

Advantech Product Roadmap – Embedded Boards

High-performance

EPYC EMBEDDED

- **SOM-E780** `Q4'22`
  - EPYC™ 7003 Series
  - COM HPC SERVER E

- **AIMB-592** `Q1'23`
  - EPYC™ 7003 Series
  - MicroATX MB

Zen 4 GENOA SP5

Mainstream

RYZEN EMBEDDED

- **AIMB-522** `Q3'22`
  - Ryzen™ 5000 (AM4)
  - Micro ATX MB

Zen 4 Raphael AM5

Low Power

RYZEN EMBEDDED

- **SOM-6872**
  - Ryzen™ V2000 Zen 2
  - COM Express Compact, T6

- **AIMB-229**
  - Ryzen™ V2000 Zen 2
  - Mini ITX

- **MIO-5376** `Q4'22`
  - Ryzen™ R2000 Zen 2
  - 3.5" SBC

■ Available ■ Developing

2022 ———————— 2023

* All product specifications are subject to change without notice

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Advantech Product Roadmap – System Solutions

Embedded System

WISE-DeviceOn / Edge AI Suite

EPC-T3229 `Q3'22` — RYZEN EMBEDDED
- Ryzen™ V2000
- 1U Thin Embedded PC

EBC-B3522 `Q3'22` — RYZEN EMBEDDED
- Ryzen™ 5000 (AM4)
- 3U System, 500W PSU

EPC-B5592 `Q3'23` — EPYC EMBEDDED
- EPYC™ 7003 Series
- 4U System, 1200W PSU

Zen 4 / Raphael / AM5

Gaming

DPX®-E140 — RYZEN EMBEDDED
- Ryzen™ V1000/R1000
- Radeon GFX9, 4 x DP out

DPX®-J100 — RYZEN EMBEDDED
- Ryzen™ V1000/R1000
- 72 + 20 Pin JAMMA Harness Connectors

DPX®-S451 `Q4'22` — RYZEN EMBEDDED
- Ryzen™ R2000 Zen 2
- Radeon GFX9, 4 DP out

Digital Signage

DS-082 — RYZEN EMBEDDED
- Ryzen™ V1000/R1000
- 4/3 x HDMI 2.0, 1 x LAN, 1 x COM & 4 x USB

Zen + / R2000

■ Available ■ Developing

2022 ———————— 2023

* All product specifications are subject to change without notice

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SOM-E780

EPYC™ 7003 Series

EPYC EMBEDDED
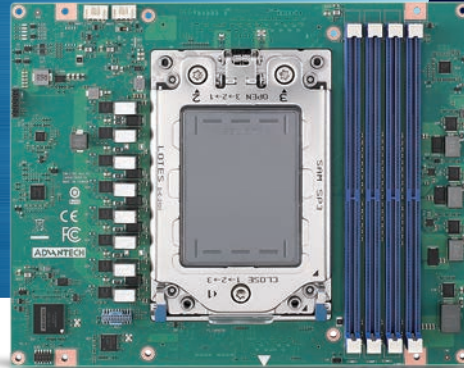
The Most Powerful COM HPC Server Module With 64-Core AMD EPYC CPU

Accelerating the Edge Server Revolution

Learn More

| Phase In | December 2022 | Longevity | June 2031 |

Features

Beyond High-performance COM

- COM-HPC Proprietary Pinout – Size E (200 x 160 mm)
- Proprietary pinout for higher TDP & support for more PCIe
- EYPC 7003 REAL server grade CPU (64C/128T/225W) and socket type CPU

Maximum CPU Cores, High Speed I/O, & RAM

- Single CPU with headroom for the most enterprise workloads
- 512GB large memory size with 4 x DDR4 long DIMM
- 79 x PCIe Gen 4.0 lanes for various add-on cards — NIC, GPU, and FPGA

Cost & Energy Efficient Performance

- Supports more VM per server
- Parallelized cores ideal for NFV & SDN
- High performance-per-watt reduces energy & operation cost

Advanced Network Solution with Security & Service

- Supports IPMB for BMC remote control
- TPM support for advanced security
- Supports security boot or fast boot by customized BIOS

Application

Data Center

High End Test Equipment

Networking

AIMB-592

EPYC™ 7003 Series

EPYC EMBEDDED

64-Core AMD EPYC Industrial MicroATX Motherboard

Driving Next-Generation Workloads at Edge

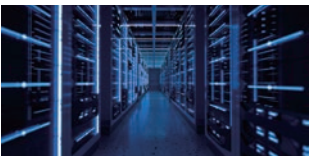| Phase In	January 2023		Longevity	January 2026

Features

Maximize AI Computing with Latest High-speed Technology

• 4 x PCIe Gen 4.0 x16 slots empower Machine Learning & Deep Learning
• Supporting 2 x double-deck AI-accelerated PCIe x16 card by steel & durable slot
• High-speed PCIe 4.0 onboard SSD by M.2 M-Key connector

Ultimate Performance Powers Workloads at the Edge

• 64 Core AMD Milan EPYC 7003, Zen 3 core 7nm CPU
• Up to 768GB DDR4-3200, 6 x channel memory

High Throughput Connectivity to Cloud

• Dual 10GbE LAN high-bandwidth connectivity empowers big data cloud services
• Dual 1GbE LAN simplifies private cloud deployment

Remote Management

• WISE-DeviceOn features remote access and efficient OTA operations
• IPMI 2.0 centralized management

Application

Precise Diagnostic

Intelligent Video Surveillance

Edge AI & Analytics

EPC-B5592

EPYC™ 7003 Series

EPYC
EMBEDDED

Server Grade Edge Computer

For Power-hungry Graphic AI Applications

| Phase In | March 2023 | Longevity | January 2026 |

Features

Superior Computing Power for AI Applications

- AMD EPYC 7003 Milan Server Grade CPU
- 6-channel DDR4 up to 3200MHz for heavy computing workloads
- Dual 10G LAN for smooth data stream
- Integrated with NVIDIA Quadro RTX A6000

Industrial Grade System Design

- ESD protection is designed to sustain IEC Level 4 discharge
- EMC protection is designed for both industrial & residential environments
- 1200W 80+ GOLD power supply to support up to two NVIDIA Quadro GPU cards

Application
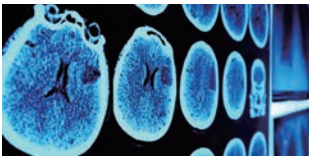
PACS Workstation
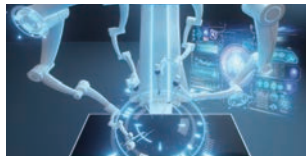
Surgical Robotics

Hyper-converged Infrastructure - VMmark®3.1.x vSAN

| 2 x AMD EPYC TM 7713 280% | **280%** |
| 2 x Intel® Platinum 8268 | |

VSI - Login VSI™ Pro v4.1.40.1 average

| 2 x AMD EPYC TM 7763 214% | **214%** |
| 2 x Intel® Gold 6258R | |

Database - TPC Benchmark™ Express HS

| 1 x AMD EPYC TM 75F3 227% | **227%** |
| 2 x Intel® Gold 6262V | |

High Performance Computing - ANSYS® LS-DYNA® carss

| 2 x AMD EPYC TM 75F3 181% | **181%** |
| 2 x Intel® Gold 6258V | |

Integer Performance - SPECrate® 2017_ int_base

| 2 x AMD EPYC TM 7763 206% | **206%** |
| 2 x Intel® Gold 6258R | |

AIMB-522
Ryzen™ Embedded 5000 Series
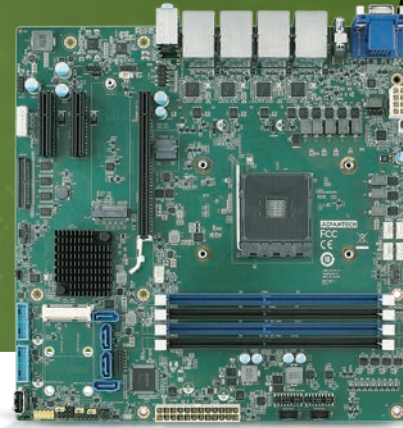
RYZEN
EMBEDDED

High Expandability MicroATX Motherboard

Empower the Performance Graphic Computing

Phase In	September 2022	Longevity	January 2026

Features

AMD Zen3 Ryzen™ Embedded 5000 Series Desktop CPU

Supports the latest AMD Ryzen™ Embedded 5000 Series desktop CPU for embedded market applications requiring enterprise reliability. The Instructions Per Clock of the Zen 3 core is 19% higher than Zen 2. In addition, the 2X L3 cache enables faster responsiveness with lower latency. The 8 Cores/16 Threads AMD Zen 3 CPU delivers best-in-class power efficiency with outstanding performance per watt. These features make the Ryzen™ Embedded 5000 a perfect solution for multitasking applications in smart manufacturing, automated visual inspection, and intelligent surveillance.

Made for Camera-based Applications

Four built in Gigabit Ethernet ports and 8 x USB 3.2 10Gbps interfaces deliver connectivity to high data throughput cameras. Customers can integrate more than 10 x high video quality cameras without additional peripherals cards.

Adaptable to Industrial Applications

Supports 1 x PCI-Express x16 Gen4 technology for graphics demanding applications. Furthermore, dual PCI-Express x4 slots offer the expandability to integrate robotic (arm) controller cards for industrial applications. The onboard M.2 M-Key socket supports high-speed SSD for real-time OS operations.

Application

Intelligent Surveillance

Machine Vision

Smart Manufacturing

EPC-B3522

Ryzen™ Embedded 5000 Series

Machine Vision Edge Computer

For AI Applications in Industrial Automation

| Phase In | September 2022 | | Longevity | January 2026 |

Desktop Level Computing Platform

• RYZEN™ 9 performance up-to 1.92 x better than Intel Comet lake i9
• RYZEN™ 9 (105W) TDP 17% lower than Alder lake i9 (125W)
• RYZEN™ 9 is 16C/32T for multiple application
• Integrated with NVIDIA Quadro RTX A4500

Industrial Grade System Design

• ESD level 4 (8kV/ 15kV)
• Safety IEC-62368 CB / UL
• Comprehensive EMC protection for both residential and industrial environments

Value-added Software Support

• Windows 10 & Linux Ubuntu Support
• WISE-DeviceOn
• Value-added Software Support

WISE-DeviceOn

Windows 10

ubuntu Certified Hardware

Application

Automated Optical Inspection

Visual Inspection AI

SOM-6872

Ryzen™ Embedded V2000
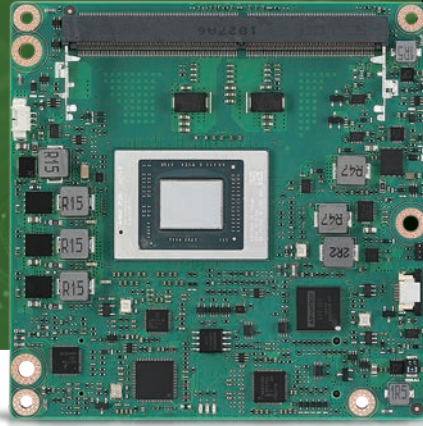
High Performance 8-Cores COMe Compact Module

Unlock The Hidden Gem For Edge Evolution

| Phase In | November 2021 | Longevity | January 2026 |

Features

The Most Powerful COMe Compact Module

• COMe Compact, 8 Core/35 ~ 54W, 6Core/12 ~ 25W SoC
• Scalable with energy efficiency: lower TDP per core
• Up to 64GB dual channel ECC/non-ECC DDR4-3200 RAM
• Support 4 x 4K displays (DP++, HDMI, VGA, LVDS)

BGA SoC with Desktop Performance for Industrial Applications

• 7nm technology with double performance per watt
• 54W low power with desktop 95W level performance
• +40% graphic performance to save the cost on the external graphic card

Advantech Design-in Service

• No throttling with QFCS compact thermal design @ 60 °C
• iManager + WISE-DeviceOn for easy maintain, device monitoring, I/O control, and remote management
• Ubuntu OS is ready

CPU PassMark

3D Graphics Mark

SOM-6872 (V2000)   SOM-5899   SOM-5871 (V1000)

PerformanceTEST 10.1

Application

Ultrasound

Test Equipment

Video Streaming Equipment

14

AIMB-229

Ryzen™ Embedded V2000
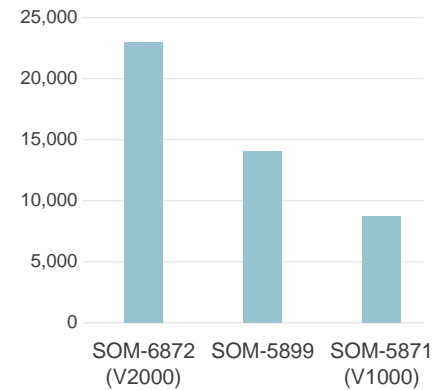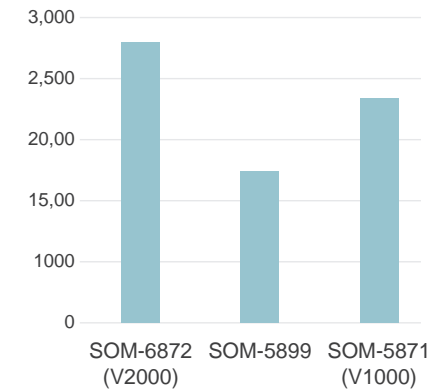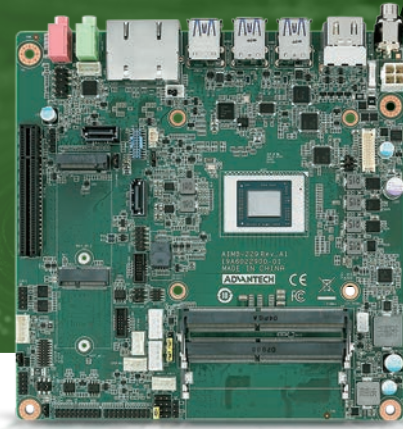
RYZEN
EMBEDDED

THIN Mini-ITX Motherboard

Upgrading Edge Applications with Breakthrough Performance

Phase In	April 2022		Longevity	January 2030

Features

Powerful Computing Empowers Graphics-driven Embedded Devices

Advantech's AIMB-229 increases graphic processing capabilities by 40% using a powerful embedded Radeon™ GPU with up to 7 Cores. It also supports 4 x independent displays with up to 4K60 UHD resolution via 2 x HDMI and 2 x DP++. AIMB-229 provides 6 x USB 3.2 and 1 x PCIe x8 to facilitate high-speed modular add-on cards and diverse peripherals on a compact motherboard designed for medical imaging and machine vision applications.

Slim, Powerful, and Efficient Solution for Mobile Imaging Equipment

AIMB-229 is powered by AMD Ryzen™ Embedded V2000 processors and supports 8-core ZEN 2 CPU cores up to 16 threads. It boasts 64GB DDR4 3200 memory, and M.2 NVMe x4 SSD with 4.2 GHz turbo boost — doubling the computing performance and I/O bandwidth when compared to the previous generation solutions.

Enables Remote Control and Management at the Edge

WISE-DeviceOn provides real-time hardware, software, and peripheral monitoring solutions that deliver real-time alert notifications. It also provides an over-the-air (OTA) BIOS system that facilitates remote BIOS updates and backup recovery mechanisms that prevent unexpected interruptions and boot up failures.

Application
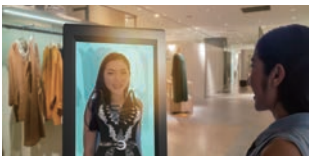
Smart Retail

Gaming

Medical

EPC-T3229

Ryzen™ Embedded V2000

1U Slim Edge PC with Expansions

For kiosks that require multi-tasking capacity

| Phase In | October 2022 | Longevity | January 2032 |

Features

Optimal Platform for Slim and Compact Scenarios

• AMD V2718 with 2 x 260-pin SO-DIMM up to 64GB DDR4 3200 SDRAM
• Supporting up to 4 x displays, 2 x DP ports & 2 x HDMI ports
• 1 x M-Key (support 2242/3042/2280), 1 x E-Key (support 2230)

Slim Mechanical Design with Expansion Capabilities

• 1 x Full-height PCIe expansion slot
• Thin design (44.2 mm)
• Compact form factor (330 x 44 x 270 mm)

Application

Interactive KIOSK

Self check-in system

Diagram

Sensor

Receipt Printer

Card Reader

USB

EPC-T3229

Credit Card Reader

Cash Dispenser

Keyboard Pad
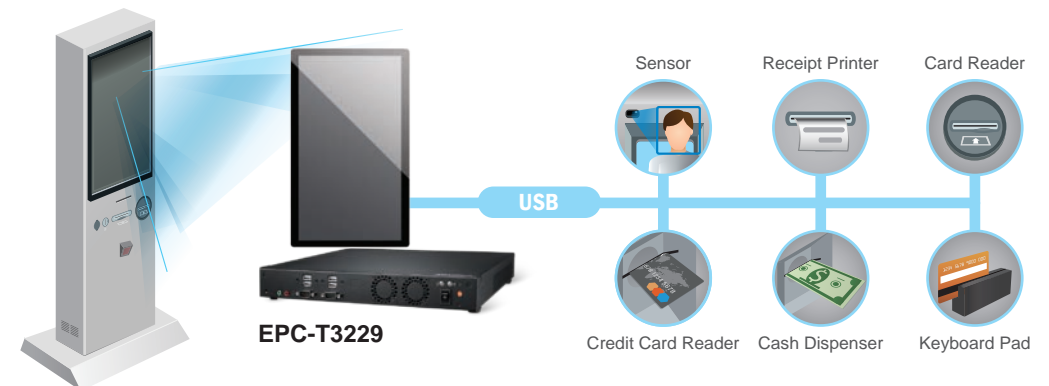
MIO-5376

Ryzen™ Embedded R2000

RYZEN
EMBEDDED
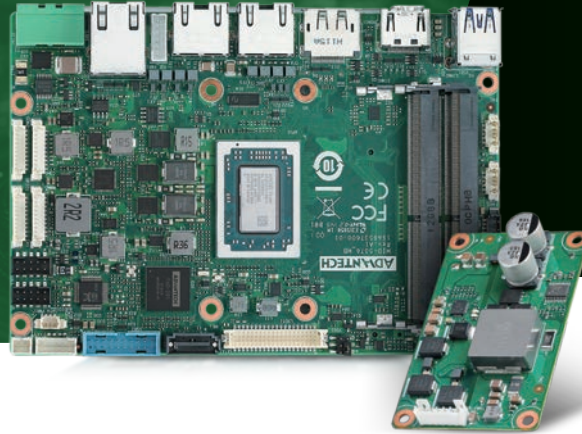
Rugged Single Board Computer

Ultra Fine Display-out and Camera-in for Indoor & Outdoor Applications

| Phase In | December 2022 | Longevity | September 2032 |

Features

For Kiosks, EV Charging Stations, & Passenger Information Systems

• 3 x Simultaneously displays up to 4K@60Hz via HDMI 2.0, DP1.4, and LVDS
• Integrated CANBus for Critical Control Loop in EV charging and Transportations
• High-speed UARTs and I2C cover huge sensor interfaces requirements

Easy High-resolution Camera Connection

• Equips 3 x 2.5GbE with up to 2 x PoE at 100 m distance
• Provides 4 x USB 3.2 with 10Gbps & 5Gbps bandwidth for higher resolution

State-of-the-Art Expansion Ability

• 3 x Simultaneous M.2 expansions for WLAN, WWAN, and storage
• 5G/LTE Capable via M.2 B-key 3052/3042
• High-Speed PCI Express Gen.4 NVMe Storages

Indoor, outdoor, and adopts everywhere

• Support extended temperature operation variants from -40 ~ 85 °C
• Wide-Range Power 12~24V +/- 10% reduce additional size and cost
• IPC-A-610 Class 3 Assembly ensure higher reliability

Application

Access Control System/ Speed Gate

Passenger Information System

Onboard Information & Surveillance

DPX®-S451

Ryzen™ Embedded R2000

Multimedia Gaming Engine

Highly integrated gaming motherboard features unrivaled performance and PCIe Graphics Expansion

| Phase In | November 2022 | Longevity | November 2030 |

Features

- High-performance AMD Embedded R2000 SOC APUs
- Quad and dual core APUs up to 3.35 (3.7) GHz
- Radeon™ VEGA GPU with up to 8 x compute units
- Four independent 4k monitors supported
- Comprehensive gaming features
- 12V DC single input or ATX power
- Full featured driver API for I/O and security

Application

Slot Machines

VLTs

GLI compliant

Features

Digital I/O
32/32

Expansion
I²C, PCIe x 16 and Golden Fingers

DPX® Security suite: Secureboot, TPM support, DPX® security features, & BIOS customization

Battery Backed SRAM
8MB

8 x USB 2.0
3 x USB 3.0

DPX®-Software: Embedded OS, DPX® Diagnostics, & DPX®-Connector DPX®-SAS

Displays
4 x DP++ 1.2

10 x COMs: ccTalk, RS232, ID003, RS485, TTL, & 3 x DP++ 1.2

Enclosure
S2000

Graphics Cards
PCIe x 16 Format

M.2, SATA DOM, HDD, SSD, CFast, & USB

PuC On-board Micro Controller PuC

DPX®-E265

Ryzen™ Embedded V1000/R1000

Modular Multimedia Gaming Platform

Gaming platform allowing cust om features and functions to be added for specific mark ets / applications

Phase In	September 2019	Longevity	January 2028

Features

- Supports 4 x DP++ 1.2
- Supports PCIe x8 (PCIe x16 connector, Gen 3.0)
- 2 x 260-pin SO-DIMM up to 32 GB DDR4 3200 MHz ECC/Non-ECC SDRAM
- Removable gaming BIOS module for field verification
- Side expansion port for application specific scenarios expansion modules
- Supports 2 x SATA/2 x CFast/1 x M.2
- AMD Ryzen Embedded V1000/R1000 Processors
- Secureboot support
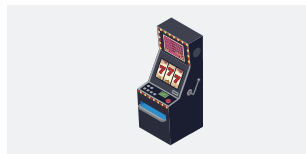
Features

Digital I/O 2 x DI	Onboard: 4 x USB 2.0 / 3 x USB 3.1 Via Golden Fingers: 2 x USB 2.0	DPX® Security suite: Secureboot, TPM support, DPX® security features, & BIOS customization
Displays 4x DP++ v1.2 (3 w R series)	6 x COMs: ccTalk, RS232, ID003,RS485, & TTL	DPX®-Software: Embedded OS , DPX® Diagnostics, & DPX®- Connector DPX®-SAS
Graphics Cards PCIe x 16 Format	M.2, SATA DOM, HDD, SSD, CFast, & USB	Enclosure M1000/M2000
Expansion I²C, PCIe x 16 and Sidebus modular expansion	On-board Micro Controller PucLite	

Application

Arcade

Sports Betting

Gaming

DPX®-E140

Ryzen™ Embedded V1000/R1000

RYZEN EMBEDDED

Investment Optimized Gaming Platform

Completely integrated system,designed specifically for regulated gaming markets

| Phase In | January 2019 | Longevity | January 2028 |

Features

- AMD Ryzen™ Embedded V1000/R1000 Processors
- High-performance Radeon™ VEGA series graphics
- 4 x 4k monitor support
- Comprehensive gaming features
- Passive cooling system for up to 25W or 54W with fan cooler
- 12V DC single input or ATX power

Features

Digital I/O
32/32

7 x USB 2.0
2 x USB 3.0

DPX®-Software:
Embedded OS, DPX®
Diagnostics, and DPX®-
Connector DPX®-SAS

Battery Backed
SRAM 8MB

9 x COMs:
ccTalk, RS232,
ID003,RS485, & TTL

Enclosure Metalwork
Optional

4 x DP++ 1.2
(3 with R series)

M.2, SATA DOM,
HDD, SSD, CFast,
& USB

On-board Micro
Controller PuC

Expansion
I²C

DPX® Security suite: Secureboot,
TPM support, DPX® security
features, & BIOS customization

Application

Slot Machine

VLTs

GLI Compliant

DPX®-S450

Ryzen™ Embedded V1000/R1000

Eye Catching Multimedia Powerhouse

Highly integrated gaming motherboard features unrivaled performance and PCIe Graphics Expansion

Phase In	January 2021	Longevity	January 2028

Features

- AMD Ryzen™ Embedded V1000/R1000 Processors
- Quad and dual core APUs up to 3.35 (3.8) GHz
- Radeon™ VEGA GPU with up to 11 compute units
- Four independent 4k monitors supported
- Comprehensive gaming features
- 12V DC single input or ATX power
- Full featured driver API for I/O and security

Application

Slot Machine

VLTs

GLI compliant

Features

Digital I/O
32/32

Expansion
I²C, PCIe x 16 and Golden Fingers

DPX® Security suite:
Secureboot, TPM support, DPX® security features, & BIOS customization

Battery backed
SRAM 8MB

8 x USB 2.0
3 x USB 3.0

DPX®-Software:
Embedded OS , DPX® Diagnostics, & DPX®-Connector DPX®-SAS

Displays
4 x DP++ 1.2
(3 with R Series)

10 x COMs:
ccTalk, RS232, ID003,RS485, TTL
3 x DP++ 1.2

Enclosure
S2000

Graphics Cards
PCIe x 16 Format

M.2, SATA DOM, HDD, SSD, & CFast, USB

On-board Micro Controller PuC

DPX®-J100
Ryzen™ Embedded V & R Series

JAMMA Gaming Platform

Learn More

A full set of I/O, COMs and security features designed specifically for JAMMA applications and street gaming markets

Phase In	February 2022	Longevity	January 2029

Features

- AMD Ryzen™ Embedded V1000/R1000 Processors
- Quad and dual core APUs
- Radeon™ VEGA GPU with up to 8 compute units
- Supports up to 3 x independent monitors
- Comprehensive gaming features
- 72 + 20 Pin JAMMA harness connectors
- Optional Enclosure

Application

Street Gaming

Regulated Gaming

Features

Digital I/O 24/29

Expansion I2C & Mini PCI

DPX® Security suite (as below) +iButton

Up to 2MB of battery backed FRAM

6 x USB 4 x 2.0 - 2 x 3.1/2.0

DPX®-Software: Embedded OS , DPX® Diagnostics, & DPX®-Connector DPX®-SAS

1 x DP++, 1 x HDMI and 1 x VGA

6 x Coms – RS232/485 Tx/Rx

Optional Enclosure

ExOnboard audio amplifier, line out, & digital SPDIF out I²C

SATA DOM, SSD, HDD, M.2, USB, & CFast

On board Micro Controller

DS-082

Ryzen™ Embedded V1000/R1000

The Slimmest 4Kx4 Signage Player

For Edge Visualization Solution

Phase In	February 2022	Longevity	January 26

Features

4 x Independent 4K Outputs via HDMI 2.0

Using 4 x independent HDMI 2.0 output enables users to implement 8K TV wall with ease.

Slim Design (only 19 mm)

System design with only 19 mm thickness is presently the world's slimmest signage player

WISE-PaaS/SignageCMS Bundle

Bundled with WISE-PaaS/SignageCMS software, enabling customers to develop their signage system cost effectively and easily.

Chart values:

	DS-082GB-U6A1E AMD Ryzen R1606G	DS-082GBF-U6A1E AMD Ryzen R1606G	Intel i7 6600U
Score	1298	1126	1061
Graphics	1453	1262	1150
Physis(CPU)	5797	4846	5050

Application

Kiosks

QSR

Retail (Supermarket)
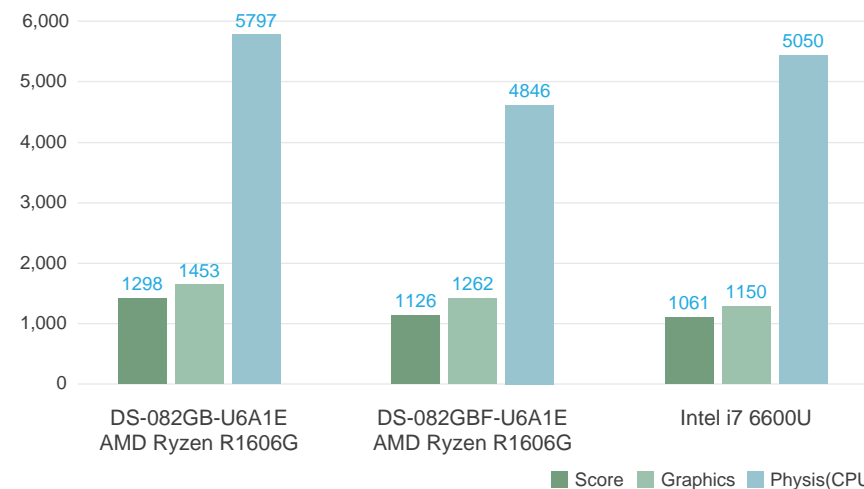
Industrial-grade Peripherals

SQFlash

- AMD EPYC 7003 Milan Server Grade CPU
- 6-channel DDR4 up to 3200MHz for heavy computing workload
- Dual 10G LAN for smooth data stream

SQRAM
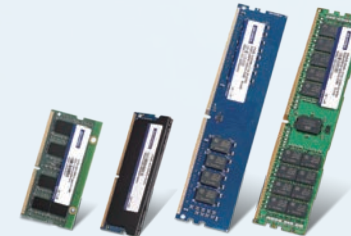
- Comprehensive DRAM series includes pioneer DDR5 and DDR4
- Extended temperature support (-20~ 85 ºC /-40 ~ 85 ºC)
- Intelligent software for real time monitoring

Industrial Wireless

- Full coverage wireless technology — 5G/Wi-Fi 6/BLE5.2/ LPWA
- Ruggedized industrial solution -40 ~ 85 ºC
- Open, agile, certificate-ready wireless kits

Ubuntu Desktop 20.04

- Full-blown graphic UI OS
- Preferred platform for AI, ML, and DL applications
- Consistent OS experience across platforms with long-term support

Embedded Software Services

Embedded Software Services

Windows 10 IoT
ubuntu
yocto PROJECT

- Embedded BIOS & LTS OS
- SUSI software API & OS lockdown utility
- iManager: Intelligent self-management on chip

Device Management
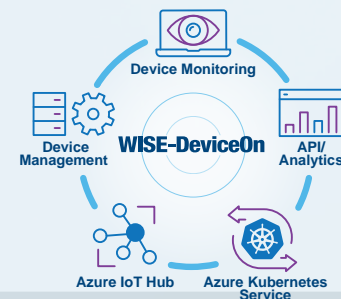
- Remote management
- Update management
- Data visualization
- Monitor & control
- Alert & action
- IT/OT total security

Edge AI

- Visual AI turnkey repository
- Embedded BIOS & LTS OS
- Instant AI experience OOB
- Cross-platform support for Windows & Ubuntu

Software & Cloud Integration

Acronis
McAfee
Microsoft Azure
Microsoft
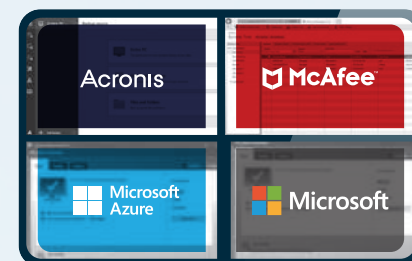
- Global distribution
- Monitor & control
- Alert & action
- Azure migration & consulting services
- Windows IoT add-on utility & customization

Boosting Retail Sales with Digital Advertising Signage

Intro

Retailers are increasingly using enhanced digital signage in their stores. This customer is a famous health and beauty retailer and pharmacy chain in Europe. They recently added more LCD digital signage systems to their stores in an effort to reduce print & POS requirements, and deliver dynamic content aimed at attracting customers and increasing sales.

Challenges

- Supports multiple simultaneous displays
- Fanless industrial grade design delivers stable long lifespan maintenance
- Slim for easy installation

Solutions and Technologies

- Supports 4 x displays at 4K UHD resolutions
- An ultra-slim profile of just 19 mm with fanless, cable-free design

Diagram

Management Center

DS-082

LAN

Internet
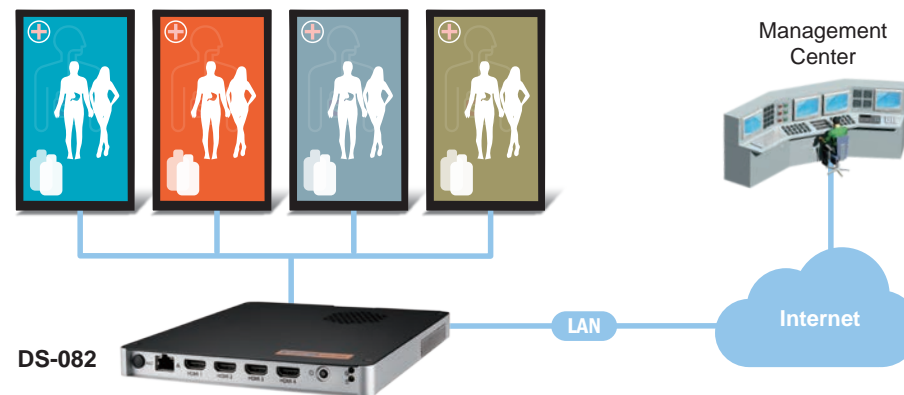
Benefits

- Zero-cost Advantech WISE-PaaS/SignageCMS content management software available
- Slim system design is easily installed into limited space enclosures
- Fanless thermal solution prevents issues caused by dust during long operation periods

Digital Transformation in Medical Imaging Analysis

Intro

Medical imaging systems — such as CT, MRI, X-ray, and ultrasound machines — are important tools for diagnosis prior to intervention. Consequently, imaging analysis accuracy is a matter of life and death.

Challenges

There is a shortage of medical imaging analysis specialists. Indeed, some studies indicate that by 2023, the world will need 31% more specialists than traditional manpower. Medical organizations are expected to fill such jobs. This could result in analysis mistakes, and be exacerbated by shortened working times.

Solutions and Technologies

Graphic AI based edge computers have the potential to tackle this problem. AI algorithms operating with powerful graphics processing capacities can deliver analytic results that help medical professionals diagnose patients accurately faster. The Advantech EPC-B5592 leverages the AMD EPYC 7003 Milan CPU and the NVIDIA Quadro A6000 CPU to deliver server-grade computing power to complex AI tasks.

Diagram

DICOM Image

Private Cloud (Ethernet)

EPC-B5592

An Average of 100 ~ 300 Images, up to 2GB Per Study

Benefits

- Superior computing power designed for graphic AI applications
- Industrial system design endures harsh EMC environments
- 1200W 80+ GOLD power supply to support up to 2 x NVIDIA Quadro GPU cards

Machine Learning Assisted Computing Upgrade for Automated Visual Inspection Equipment

● Intro

Deploying Advanced Visual Inspection solutions in smart manufacturing necessitates high computing power and machine learning capabilities that maximize productivity.

● Challenges

Seeking to to improve production efficiency, the customer in this case required multiple high-speed digital cameras run with an embedded computer featuring additional machine learning capabilities

● Solutions and Technologies

Advantech AIMB-522 and EPC-B3522 leverage high-performance AMD Ryzen Embedded 5000 CPUs with 16 cores. These CPU are capable of managing manufacturing data processing workloads. The high-expandability provided by onboard PCIe x16/x4 slots and the M.2 socket provide the interfaces needed to install add-on cards that engender AI acceleration and/or robot control. In addition, high-speed I/O connectivity with 8 x USB 3.2 Gen 2 (10Gbps) ports and 4 x 1GbE Ethernet ports simplify the adoption of mainstream industrial cameras and help customers build visual inspection machines with ease.

Diagram

AIMB-522   EPC-B3522

PCIe x16	Machine Learning **AMD RX580**
4x GbE	Networking IP Camera
PCIe x4/x4	Robot Control
8x USB 3.2	Image Capture
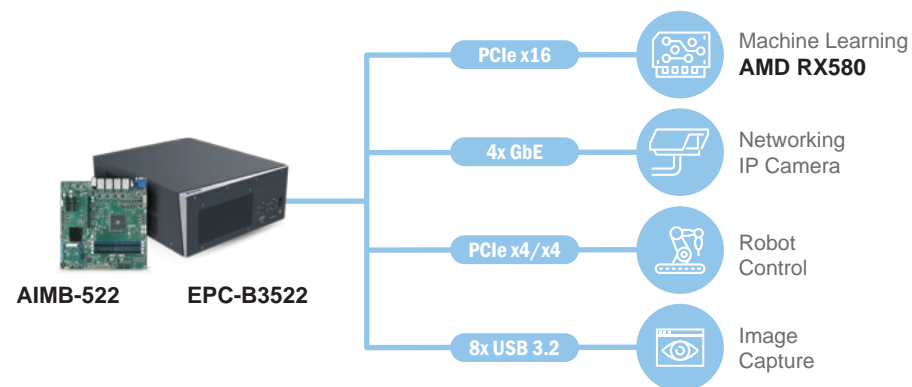
Benefits

• Capable of managing multiple high-speed cameras
• Improve manufacturing accuracy and productivity
• Fast deployment and resilience

The Regulated Gaming Industry Requires High Performance Hardware with Specialized Hardware and Software Features

● Intro

An OEM slot machine manufacturer was looking for a long term, reliable platform with features that meet the requirements of the Regulated Gaming industry. Their latest gaming content required high-performance hardware.

● Challenges

High-performance, long-lifecycle hardware with necessary industry features.

● Solutions and Technologies

- DPX-S450 specialized gaming platform
- AMD Ryzen™ Embedded V1000 SOC, Quad core APU at 3.35 GHz (3.8 GHz turbo)
- Integrated Radeon™ "Vega" Graphics Core up to 11 CU (GFX9)
- Supports 4 x independent 4k monitors
- Comprehensive gaming features meet the requirements of GLI-11
- Sophisticated battery backed intrusion logging
- Full featured driver API for I/O and security

Diagram
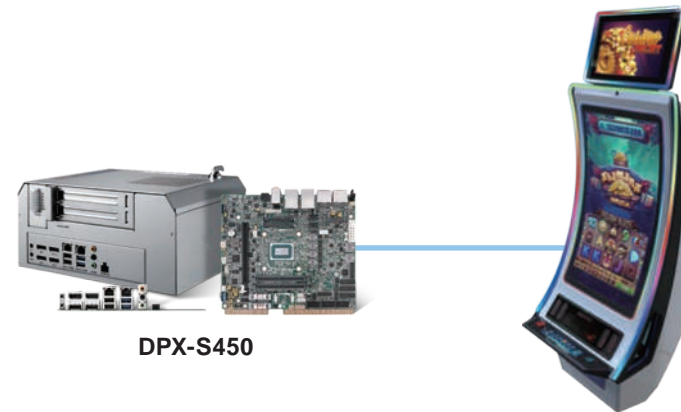
DPX-S450

Benefits

- Reliable, field-proven platform with track record of regulatory approvals reduces risk and time to market
- High-performance capabilities support the running of up-to-date gaming content on high-resolution screens
- 7 years product lifecycle
- DPX-S450 is the 10th generation of DPX-S and boasts a strong roadmap for upcoming products. This protects customer investment in both hardware and software using cross generational mechanical and API compatibilities

SOM-E780, Most Powerful COM HPC Module to Enable Fast & Flexible Deployment on 5G Edge AI Server

● Intro

Edge AI Servers are used in visualized data collection applications. They are often used to monitor, collect, and analyze big data and thus provide valuable business insights and opportunities.

● Challenges

Upgrading traditional 13U servers requires too much time and money.

● Solutions and Technologies

The Advantech SOM-E780 is equipped with an AMD EPYC 7003 socket CPU with up to 64 cores for superior computing power. It features a 512GB ECC RAM and 79 pairs of PCIe Gen 4.0 within a COM HPC Server module. This reduces edge AI server time to market and corresponding development costs. It is also easily upgraded & maintained, and fulfills a variety of demands in different platforms or 5G server applications. When paired with Advantech's prompt and professional local design in services, it facilitates the rapid exploitation of business opportunities.

Diagram

5G Networking	Edge AI Server	Bid Data Analysis
Cloud	SOM-E780	Security Management
Big Data Collection		DPI System
	Dynamic Output	Data Analysis
		Other applications
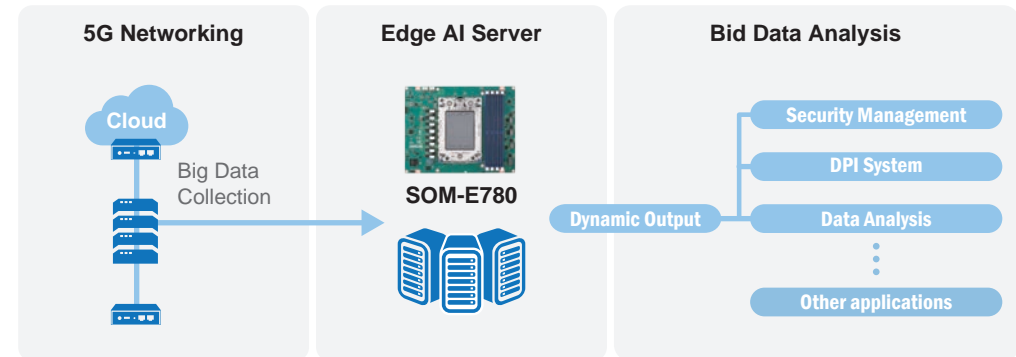
Benefits

- Featuring a COM-HPC proprietary pinout for EYPC 7003 REAL Server-grade socket CPU, up to 64 Cores to save energy & costs by supporting more VM per server. Producing a solution with high-performance-per-watt
- 79 x PCIe Gen4.0 lanes for various add-on cards, like NIC, GPU, and FPGA
- On-board TPM chipset for Advanced Security
- Active and Passive Thermal Solutions for 60 °C environments

Fastest way to integrate a EV Charging System within a Rugged 3.5" Single Board Computer

Intro

Electric vehicles (EV) and their charging infrastructures are a rapid growth market. Market size is projected reach USD$ 25.5 billion by 2027. These solutions boast a 26.8% CAGR since 2020.

Challenges

EV charging systems require multiple sub-systems with different control buses according to domain preference. These solutions must connect to watt meters, battery controller logic, external management devices, payment systems, HMI, and displays. Integrating systems with this level of complexity takes time and money.

Solutions and Technologies

The Advantech MIO-5376 is a 3.5" compact single board computer (SBC). It features an AMD 2000 series CPU and provides extraordinary computing and graphics performance, better user experiences, and content displays. MIO-5376 integrates 3 x 2.5GbE ports — including 2 x optional PoE, CANBus, high speed UARTs, and I2C Bus to simplify the integration of power meters, battery controllers, payment systems, HMI, and displays on one board on EV charging stations.

Diagram

Recognition & Surveillance

MIO-5376

Energy Storage Cabinet   Power Meter   Electric Vehicle   Control Room

Monitor & Control HMI   Charging PLC Logic   Billing
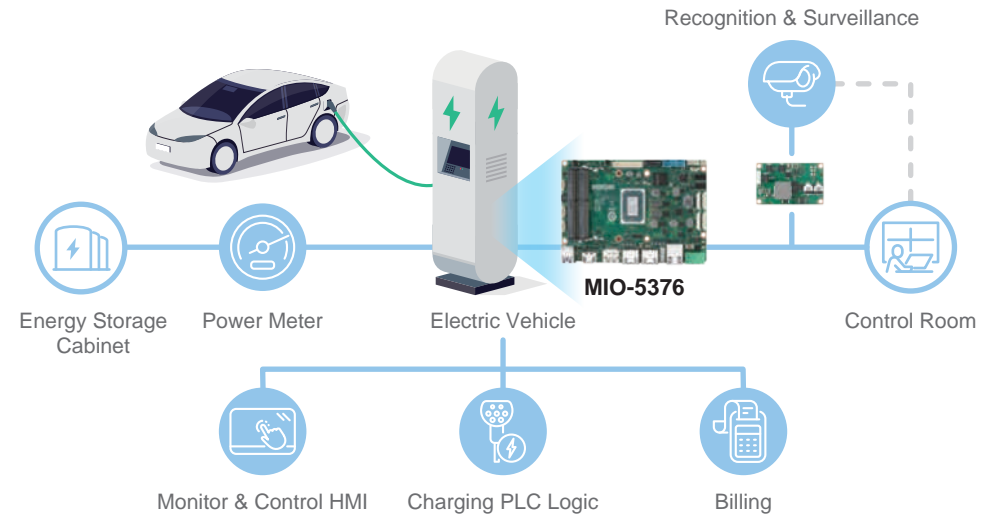
Benefits

• AMD R2000 series provides extraordinary computing & graphics capabilities
• Integrated LAN, PoE, CANBus, UARTs, and I2C
• DC-in 12~24V, 0 ~ 60 °C & -40 ~ 85 °C operating temperature

	SOM-E780	AIMB-592	EPC-B5592
	Computer on Module COM-HPC	Industrial Motherboard Micro-ATX	Embedded PC
AMD Processor	EPYC™ 7003 Series	EPYC™ 7003 Series	EPYC™ 7003 Series
Memory	4 x Channel 288-pin DDR4 RDIMM up to 3200MHz, both ECC and Non-ECC supported 4 x RDIMM slots, Max. 512GB (128GB per RDIMM)	6 x Channel 288-pin DDR4 RDIMM up to 3200MHz 6 x DIMM slots, Max. 768GB (128GB per DIMM)	6 x Channel 288-pin DDR4 RDIMM up to 3200MHz 6 x DIMM slots, Max. 768GB (128GB per DIMM)
Display	N/A	VGA	VGA
Expansion	79 x PCIe Gen 4 lanes	4 x PCIe x16 slots	4 x PCIe x16 slots
Power Input	Vin: 11.4-12.6V VSB: 4.75-5.25V	ATX input	ATX input
I/O Ports	1 x 2.5 Gigabit LAN 4x USB 3.2 Gen1 & 4x USB2.0 2 x serial (RS-232) 12 x GPIO 1 x IPMB	2 x 2.5GbE 2 x 10GbE 1 x 1GbE for BMC Management 4 x USB 3.2 Gen1 1 x RS-232	2 x 2.5GbE 2 x 10GbE 2 x 1GbE for BMC Management 4 x USB 3.2 Gen1 1 x RS-232
Thermal (Fan or Fanless)	1U Heatsink 2U Heatsink	CPU cooler	CPU cooler and system fan
Operating Temperature	0 ~ 60 ℃	0 ~ 40 ℃ (Depends on CPU)	0 ~ 40 ℃ (Depends on CPU)
Dimensions	200 x 160 mm (7.87" x 6.30")	244 x 244 mm	380 x 454 x 176 mm
Software	WISE-DeviceOn Windows Linux	WISE-DeviceOn	WISE-DeviceOn

	AIMB-522	EPC-B3522	SOM-6872	AIMB-229	EPC-T3229	MIO-5376
	Industrial Motherboard Micro-ATX	Embedded PC	Computer on Module COMe Compact	Industrial Motherboard Mini-ITX	Embedded PC	3.5" Single Board Computer
AMD Processor	Ryzen™ Embedded 5000 Series	Ryzen™ Embedded 5000 Series	Ryzen™ Embedded V2000	Ryzen™ Embedded V2000	Ryzen™ Embedded V2000	Ryzen™ Embedded R2000
Memory	4 x Channel 288-pin DDR4 UDIMM up to 3200MHz 4 x DIMM slots, Max. 128GB (32GB per DIMM)	4 x Channel 288-pin DDR4 UDIMM up to 3200MHz 4 x DIMM slots, Max. 128GB (32GB per DIMM)	2-CH 260-pin DDR4, 3200MHz Up to 64 GB (32 GB per SO-DIMM; ECC/non-ECC)	2-CH 260-pin DDR4, 3200MHz Up to 64 GB/ 32 GB per SO-DIMM (ECC/non-ECC)	2-CH 260-pin DDR4, 3200MHz Up to 64 GB/ 32 GB per SO-DIMM (ECC/non-ECC)	2 x channel 260-pin DDR4 SODIMM up to 3200MHz 2 x SODIMM slots, Max. 32GB (16GB per SODIMM)
Display	HDMI, VGA, DP	HDMI, VGA, DP	1 x VGA (optional to DDI) 1 x LVDS (optional to eDP) 2 x DDI	2 x HDMI, 2 x DP (Type-C)	2 x HDMI, 2 x DP (Type-C)	1 x HDMI 2.0b 4K@60 Hz 2 x DP1.4b 4K@60 Hz 1 x LVDS Dual-Channel 18/24-bit WUXGA
Expansion	1 x PCIe x16, 2 x PCIe x4, 1 x M.2 M key & 1 x M.2 E key	1 x PCIe x16, 2 x PCIe x4, 1 x M.2 M key	16 PCIe Gen3 lanes	1 x PCIe x8 1 x M.2 M key & 1 x M.2 E key	1 x PCIe x8 1 x M.2 M key & 1 x M.2 E key	M.2 E-key 2230 M.2 B-key 3052/3042 w/ SIM M.2 M-key 2280 NVMe
Power Input	ATX input	ATX input	Vin: 8.5-20V VSB: 4.75-5.25V	12V DC-in	12V DC-in	DC-in 12-24V +/- 10% AT/ATX Mode
I/O Ports	4 x GbE 8 External USB 3.2 Gen2 4 x Internal USB 3.0 3 Internal USB 2.0 2 x Internal RS-232/422/485 4 x internal RS-232	4 x GbE 8 x External USB 3.2 Gen2	1 x Gigabit LAN 4x USB 3.2 Gen2 & 8x USB2.0 2 x serial (RS-232) 8 x GPIO 1 x HD Audio	2 x GbE 4 x USB Gen 2 2 x USB Type-C 6 x internal RS-232	2 x GbE 4 x USB Gen 2 2x USB Type-C	3 x 2.5GbE (2 PoE Optional) 4 x USB 3.2, 2 x USB 2.0 2 x RS-232/422/485 2 x RS-232 (4-wire) 1 x CAN 2.0 Audio (Line-in/out/MIC) I2C/SMBus Smart Fan Control 1 x SATA Port Invertor Power, HDD Power
Thermal (Fan or Fanless)	CPU Cooler	CPU cooler and system fan	Heat spreader Semi-cooler	CPU cooler	CPU Heat sink and system fan	Fanless for CPU TDP 15W Cooler for CPU TDP 25W
Operating Temperature	0 ~ 40 °C (Depends on CPU)	0 ~ 40 °C (Depends on CPU)	0 ~ 60 °C	0 ~ 60 °C	0 ~ 60 °C (Depends on CPU)	Standard: 0 ~ 60 °C Extended: -40 ~ 85 °C
Dimensions	244 x 244 mm	310 x 360 x 134 mm	95 x 95 mm	170 x 170 mm	330 x 270 x 44 mm	146 x 102 mm
Software	WISE-DeviceOn	WISE-DeviceOn	WISE-DeviceOn Windows Ubuntu 20.04	WISE-DeviceOn	WISE-DeviceOn	Windows 10 IoT Ubuntu 20.04 WISE-DeviceOn

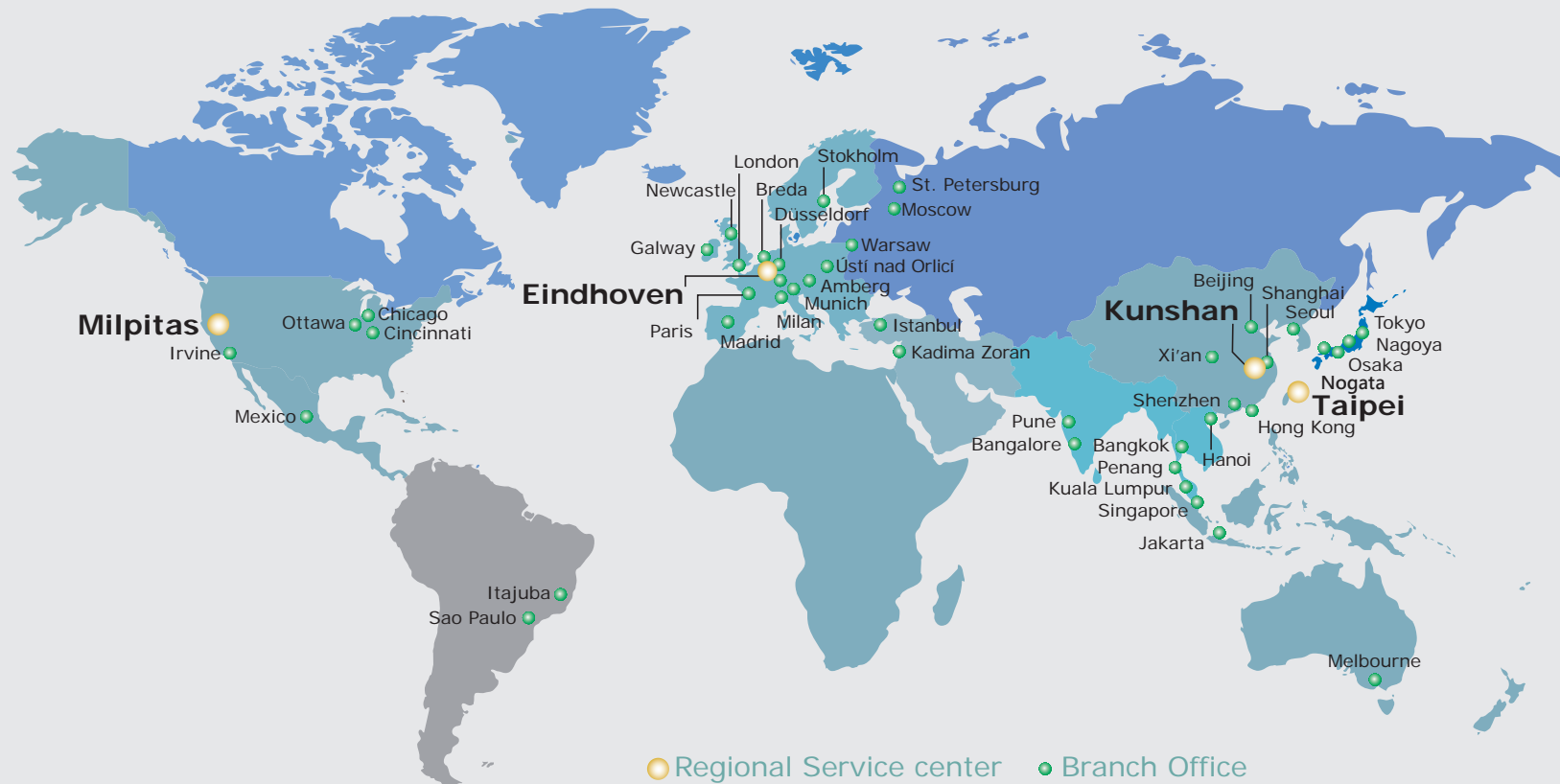|	DPX®-S451	DPX®-E265	DPX®-E140	DPX®-S450	DPX®-J100	DS-082
	Gaming Platform	Gaming Platform	Gaming Platform	Gaming Platform	Gaming Platform	Digital Signage
AMD Processor	Ryzen™ Embedded R2000	Ryzen™ Embedded V1000/R1000	Ryzen™ Embedded V1000/R1000	Ryzen™ Embedded V1000/R1000	Ryzen™ Embedded V & R Series	Ryzen™ Embedded V1000/R1000
Memory	2 x channel 260-pin DDR4 SODIMM up to 3200MHz 2 x SODIMM slots, Max. 32GB (16GB per SODIMM)	2 x channel 260-pin DDR4 SODIMM up to 3200MHz 2 x SODIMM slots, Max. 32GB (16GB per SODIMM)	2 x channel 260-pin DDR4 SODIMM up to 3200MHz 2 x SODIMM slots, Max. 32GB (16GB per SODIMM)	2 x channel 260-pin DDR4 SODIMM up to 3200MHz 2 x SODIMM slots, Max. 32GB (16GB per SODIMM)	2 x Channel DDR4 SODIMM up to 2400MHz	Dual channel DDRR4 2400MHz SODIMM
Display	4 x Display Port	4 x Display Port (V1000) 3 x Display Port (R1000)	x4 Display Port (V1000) x3 Display Port (R1000)	4 x Display Port (V1000) 3 x Display Port (R1000)	3 xmonitor 1 x DP++ 1 x HDMI 1 x VGA (2 x with R1102)	AMD Radeon HD graphics
Expansion	One PCIe x 16 slot	One PCIe x 16 slot	NA	One PCIe x 16 slot	Half length mini-PCI card	M.2 2230 E Key
Power Input	12VDC and ATX input	12VDC and ATX input	12VDC and ATX input	12VDC and ATX input	AT12V (V1605) 5V/ 12V Jamma 20pins (R series)	19V DC-in (ATX/AT mode)
I/O Ports	2 x Gigabit LAN 11 x USB (8 x USB 2.0, 3 x USB 3.0/2.0) 12 x serial (RS232/CCTalk/TTL/RS485) 2 x I2C ports 1 x Line out 5.1	2 x Gigabit LAN 7 x USB (1 x USB 3.0) 5 x Serial (RS-232/CCTalk/ID003/RS485) 1 x Line out	2 x Gigabit LAN 9 x USB (2x USB 3.0) 11 x serial (RS232/CCTalk/ TTL/RS485) 2 x I2C port 1 x Line out 5.1	2 x Gigabit LAN 11 x USB (8 x USB 2.0, 3 x USB 3.0/2.0) 12 x serial (RS232/CCTalk/TTL/RS485) 2 x I2C ports 1 x Line out 5.1	1 x Gigabit LAN 6 x RS232 4 x USB 2.0 2 x USB 3.1/2.0 1 x Line out 5.1 1 x SPDIF out (Option)	1 x 1Gbe 2 x USB 3.0 2 x USB 2.0 1 x RS-232
Thermal (Fan or Fanless)	Fan	Fan	Fan/Fanless	Fan	Fanless (R1102) Fan (others)	Fanless
Operating Temperature	Board 0 ~ 60 ℃ System 0 ~ 50 ℃	Board 0 ~ 60 ℃ System 0 ~ 50 ℃	Board 0 ~ 60 ℃ System 0 ~ 50 ℃	Board 0 ~ 60 ℃ System 0 ~ 50 ℃	Board 0 ~ 60 ℃ System 0 ~ 50 ℃	0 ~ 40 ℃
Dimensions	200 x 170 mm	170 x 185 mm	200 x 270 mm	200 x 170 mm	190 x 190 mm	180 x 190 x 19 mm
Software	DirectPCI API, DPX® Connector SDK, DPX®-SAS Engine	WinPuC serial protocol	DirectPCI API, DPX® Connector SDK, DPX®-SAS Engine	DirectPCI API, DPX® Connector SDK, DPX®-SAS Engin	WinJIOC serial protocol	WISE-DeviceOn

Worldwide Presence

3 Manufacturing Sites　　**14** Service Centers　　**4** Logistics Center　　**28** Countries

Stokholm
London
Newcastle　　Breda　　St. Petersburg
Düsseldorf　　Moscow
Galway　　Warsaw
Eindhoven　　Ústí nad Orlicí
Amberg
Munich　　Beijing　　Shanghai
Milpitas　　Milan　　**Kunshan**　　Seoul
Ottawa　　Chicago　　Paris　　Istanbul　　Xi'an　　Tokyo
Irvine　　Cincinnati　　Madrid　　Kadima Zoran　　Nagoya
Osaka
Nogata
Shenzhen　　**Taipei**
Mexico　　Pune　　Hong Kong
Bangalore　　Bangkok　　Hanoi
Penang
Kuala Lumpur
Singapore
Jakarta

Itajuba
Sao Paulo

Melbourne

○ Regional Service center　　● Branch Office

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