Breakout Session

12th Gen Intel® Core™ Processor PICMG 1.3 Single Host Board

Russell Cheng, Portwell

Portwell

Portwell

Portwell is dedicated to providing innovative and high-quality AIoT turnkey solutions to support our customer's business goals. In addition to our extensive and scalable list of products, we offer a wide range of technology services that are designed to help our customers develop and deploy their applications with ease so that they can achieve and expand their industry leadership.

In 2017, Portwell Inc. was acquired by Posiflex Technology, Inc., a global leader in POS solution design and manufacturing. This has established Portwell as a major worldwide supplier of specialty computing application platforms.

Portwell Engine (PE) Building

Headquarter : Taipei, Taiwan
Founded : 1993
OTC Listed : 2001 ~ 2017
Capital : NT$ 9.8B
Consolidate Rev. : ~ US$176M(2020)/~ US$189M(2021)
Employee : ~ 720 WW

![Portwell logo]

Global Organizations

Oxford
Amsterdam
Munich
Fremont
Beijing
Seoul
Tokyo
Osaka
Shanghai
Taipei
Bangalore

📍 Headquarters / Manufacturing Sites
📍 Subsidiaries with Services (Tech. / Assembly & Sales)
📍 Subsidiaries (Sales only)

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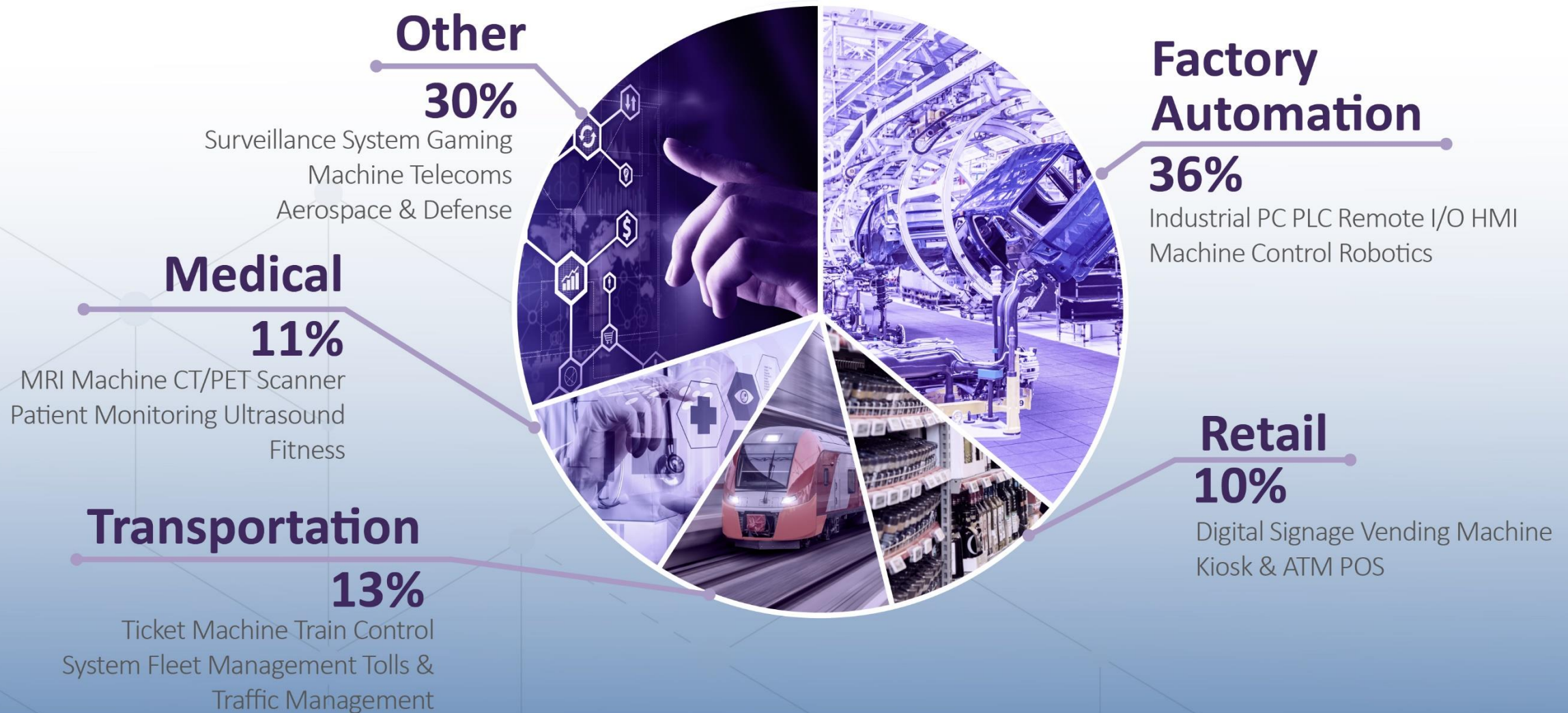E-mail: info@portwell.com.cn
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Industrial Applications

Single Board Computer, Standalone Board & Computer-On-Module

Other

30%

Surveillance System Gaming Machine Telecoms Aerospace & Defense

Medical

11%

MRI Machine CT/PET Scanner Patient Monitoring Ultrasound Fitness

Transportation

13%

Ticket Machine Train Control System Fleet Management Tolls & Traffic Management

Factory Automation

36%

Industrial PC PLC Remote I/O HMI Machine Control Robotics

Retail

10%

Digital Signage Vending Machine Kiosk & ATM POS

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12th Gen Intel® Core™ Desktop Processor
PICMG 1.3 Single Host Board
ROBO-8116G2AR Key Features

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ROBO-8116G2AR Quick Guide
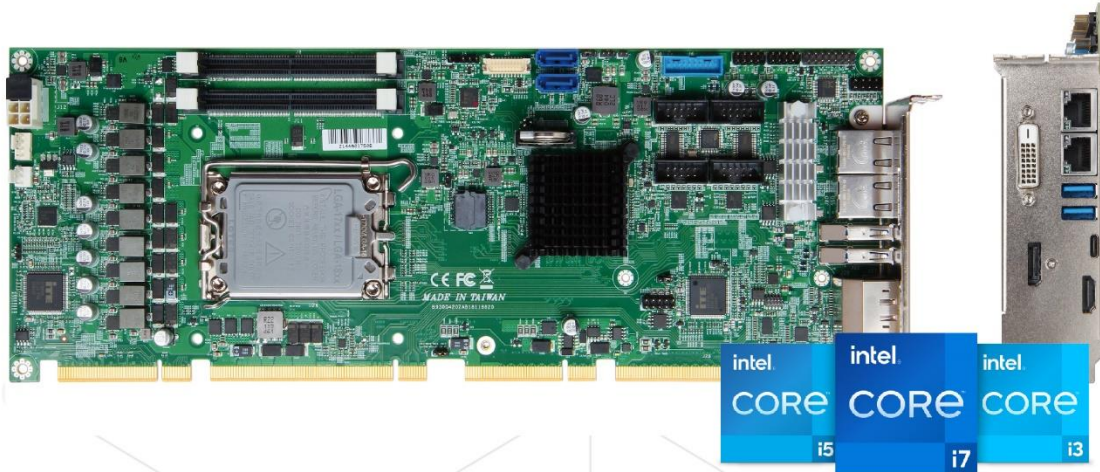
12th Gen Intel® Core™ Desktop Processor	R680E/Q670E	M.2 Type M
2x DDR5 slot	4 x SATA III	Dual Giga LAN
DP	DVI	HDMI
4x UART	1x USB3.2 Type C	4x USB 3.2

intel. CORE i5
intel. CORE i7
intel. CORE i3

- ❈ 12th Gen Intel® Core™ Desktop Processor
- ❈ Support M.2 Type M(2280) socket
- ❈ DVI-D , HDMI , DP display output
- ❈ Target Applications for Automation, Network and Medical
- ❈ From CPU: 1x PCIe x16 or 2x PCIe x8 by jumper / BIOS
- ❈ From PCH: 1x PCIe x4 or 4x PCIe x1 by different BIOS support
- ❈ 4x PCI devices at 32bit 33MHz

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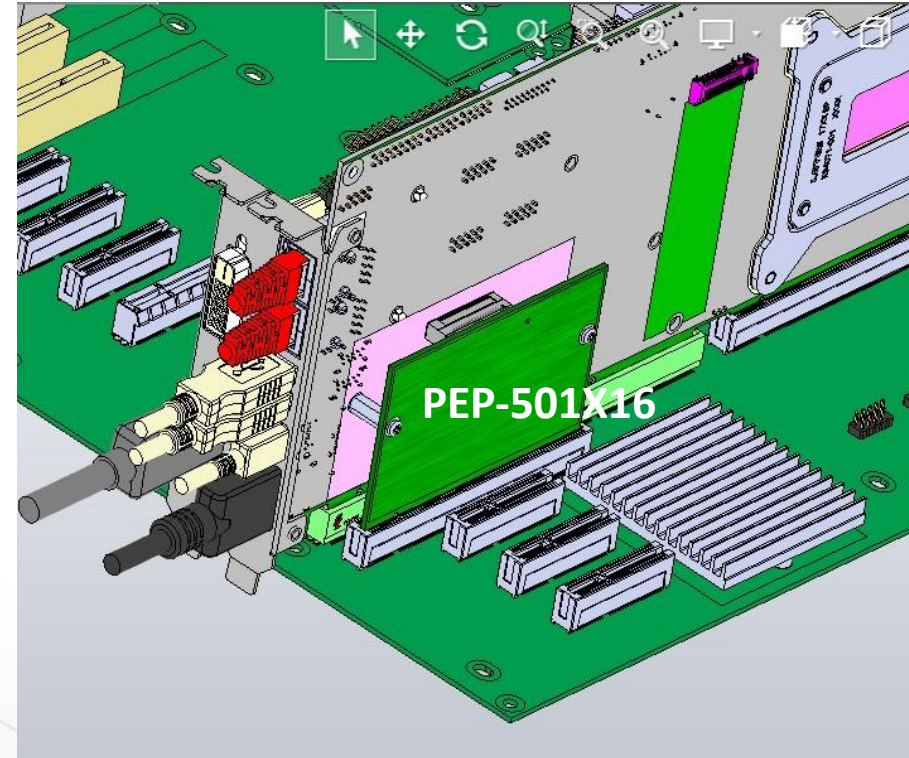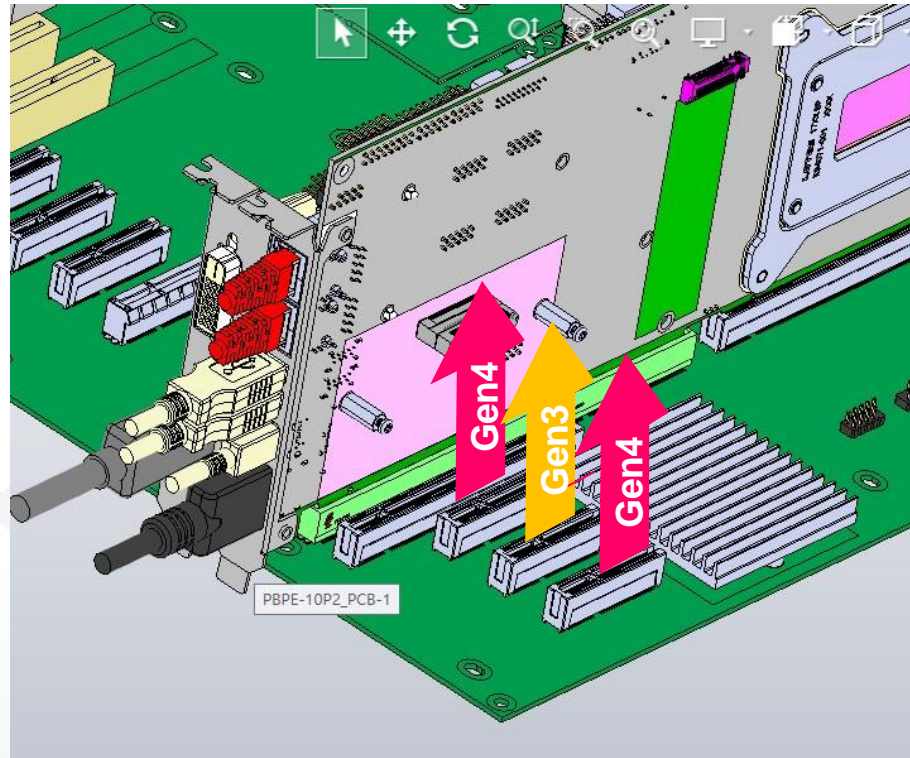
BP Support
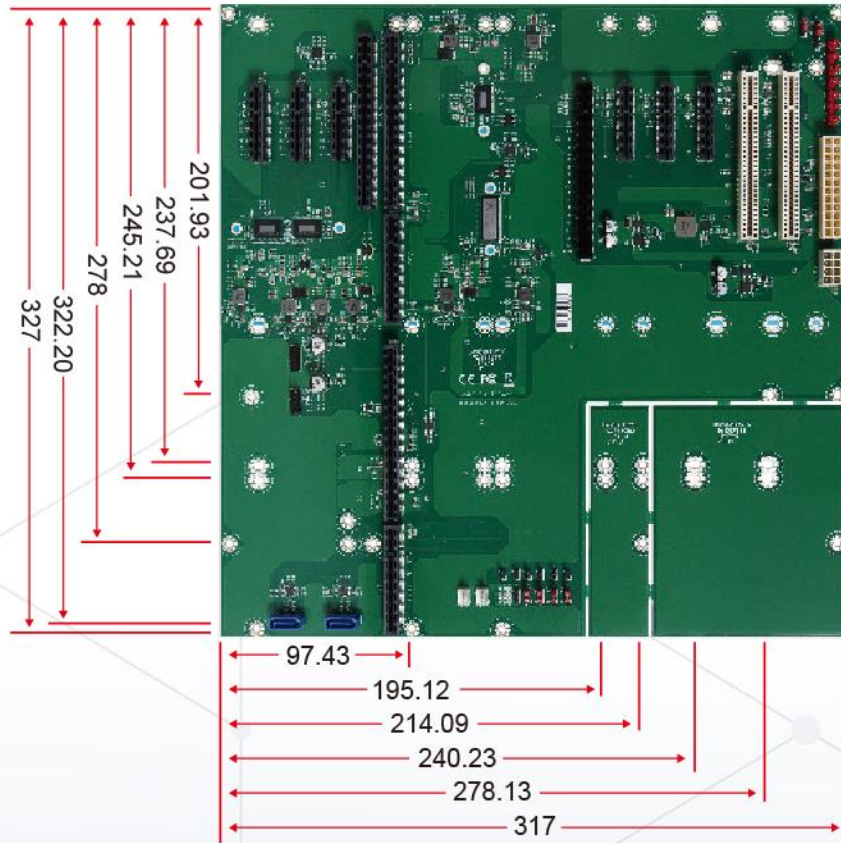
PBPE-10P2

10-slot [PCIe x16 (1), PCIe x4 (3, x4 signal), PCIe x4(3, x1 signal), PCI(2)]

- Fit for 4U Chassis
- Four USB ports
- Two SATA ports
- Support PCIe Gen5 with ROBO-8116 series

✵ Support 1x PCIe x16(Gen5) / 3x PCIe x1(Gen4)

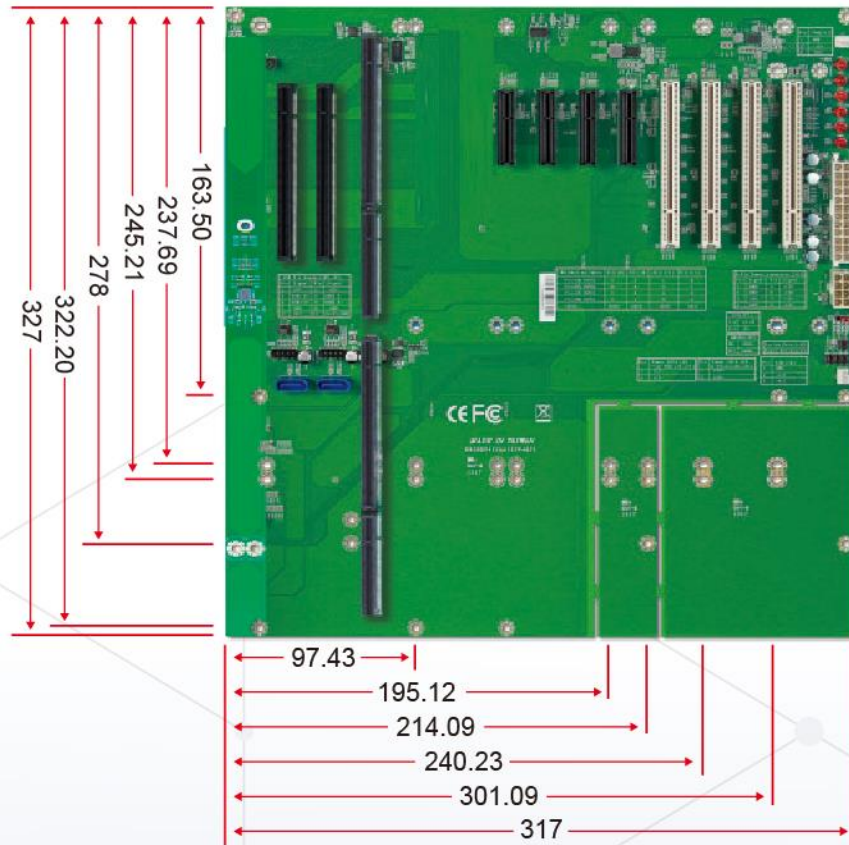✵ Support 2x PCIe x4(Gen4) / 1x PCIe x4(Gen3) with PEP-501X16

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PEP-501X16 Mechanical Design

2x PCIe x4(Gen4) / 1x PCIe x4(Gen3) with PEP-501X16

J6	PCIe x4 Slot (Gen4, From CPU)
J7	PCIe x4 Slot (Gen3, From PCH)
J8	PCIe x4 Slot (Gen4, From PCH)

BP Support

PBPE-11P4

11-slot [PCIe x16 (2, 1x16 or 2x8 signal), PCIe x4(4, x1 signal), PCI(4)]

- Fit for 4U Chassis
- Four USB ports
- Two SATA ports
- Support PCIe Gen5 with ROBO-8116 series

✿ Support 1x PCIe x16(Gen5) or 2x PCIe x8(Gen5) select by BIOS

✿ 1x PCIe x4 or 4x PCIe x1 select by BIOS

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Performance

12th Gen - S Overview

Processor block diagram

Embedded DisplayPort 1.4b

x4 DDI
DP 1.4

x12 PCIe 4.0

Discrete Intel® Wi-Fi
Integrated Intel® Wi-Fi 5

Intel® LAN 2.5GbE with TSN

intel
12th Gen
Intel® Core™

x8 DMI 4.0

intel
600 Series
Chipset

DDR4/5
2CH/2DPC

x16 PCIe 5.0
x4 PCIe 4.0

USB 3.2 Gen 2x2 (20 Gb/s) ports
USB 3.2 Gen 2x1 (10 Gb/s) ports
USB 3.2 Gen 1x1 (5 Gb/s) ports

Discrete Thunderbolt™ 4

x16 PCIe 3.0

SATA 3.0

- **10nm Intel Core S Processer**
- **PCIe Gen5 support**
- **Up to 16Cores**
- **Up to DDR5 – 4800 support**
- **USD3.2 Gen2x2 20G support**

Not all features are supported in every operating system.
Not all features are available on all SKUs.

eSPI   SPI   SMBus   HD Audio,
MIPI
SoundWire

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Comparison

Comparison

MODEL	ROBO-8116G2AR	ROBO-8115VG2AR
Form Factor	PICMG1.3	PICMG1.3
CPU	Intel® Core TM i3/i5/i7/i9/ Pentium®/Celeron®	Intel® Xeon® W/ Core™ i3/i5/i7/i9/Pentium®/Celeron®
Chipset	Intel® R680E	Intel® W480E
BIOS		
Memory	2 x DDR5 ECC SODIMM up to 64GB	4 x DDR4 ECC DIMM up to 128GB
Expansion	4x PCI slots 1x PCIe x16 slot or 2x PCIe x8 slot 1x PCIe x4 slot or 4x PCIe x1slot	4x PCI slots 1x PCIe x16 slot or 2x PCIe x8 slots or 1x PCIe x8 slot 1x PCIe x4 slot
Display	DVI-D / HDMI / DP	DVI-I / HDMI
Audio	Realtek ALC888S HDA codec	Realtek ALC888S HDA codec
LAN	2x GbE	2x GbE
Serial Port	2x RS-232 ports 2x RS-232/422/485	2x RS-232 ports 2x RS-232/422/485
USB	1x USB3.2 Gen2x2 2x USB3.2 Gen2 2x USB3.2 Gen1 4x USB2.0	6x USB3.2 Gen2 8x USB2.0
Storage Devices	4x SATA III 1x M.2 Type M 2280	5x SATA III 1x M.2 Type M 2280
GPIO	8 bit	8 bit
Others	N/A	PS2/KB & MS
Dimension	338.5 x 126.39mm	338.5 x 126.39mm

1. Support DDR5 4800 MHz SODIMM up to 64GB
2. Support PCIe Gen5 performance
3. Support DVI-D / HDMI /DP display output on Bracket
4. Support Dual 2.5G Lan
5. Support USB3.2 Gen 2x2 Type C

Portwell Software Value (PET)

Portwell Software Value - PET

PET : Portwell Engineering Toolkit

The name of the Portwell API(Application Programming Interface). A bridge to simplify and enhance H/W & S/W application implementation efficiency.

What PET do ?

⚙ Hardware monitor

⚙ Fan control
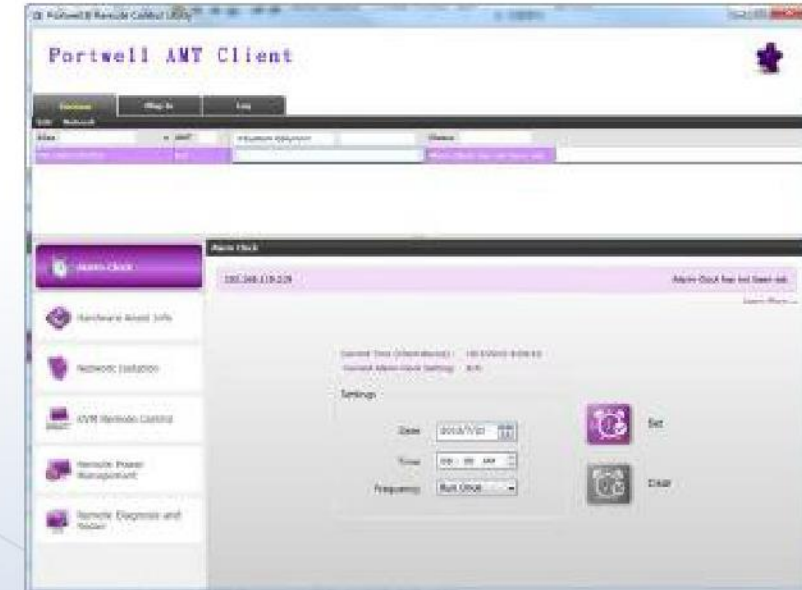
⚙ GPIO control

⚙ WDT

⚙ SMBus

⚙ I^{2}C

PET_4.4.31

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Portwell Software Value - PAC

PAC : Portwell AMT Client

A management program which support the newest version of the Intel AMT (Active Management Technology).

What PAC do ?

❖ Remote power on/off

❖ OS independent KVM

❖ Network isolation

❖ Remote Diagnosis and repair

   • reboot to bios

   • reboot to CDROM

   • boot to user selected OS image

Success Story / Application

![Portwell]

Application-Automation

Industrial automation control

Key feature for IAC:

4x UART	M.2 Type M
x16 PCIe slot	Dual Giga LAN
TCN/TCC	Extensibility

RS-232/RS-485
High-Speed Line Drivers

RS-232/RS-485
High-Speed Line Drivers

RS-232

RS-232

RS-485 Cable

PC

Lathe

Time
Clock

Conveyor
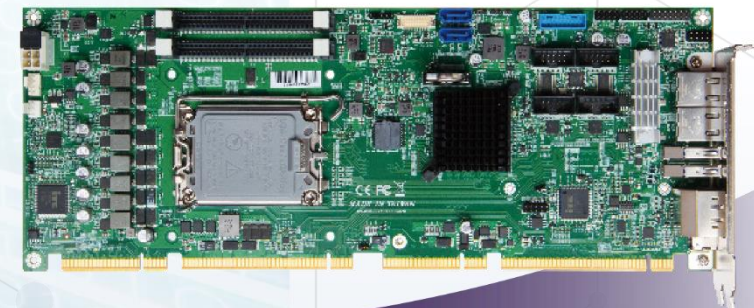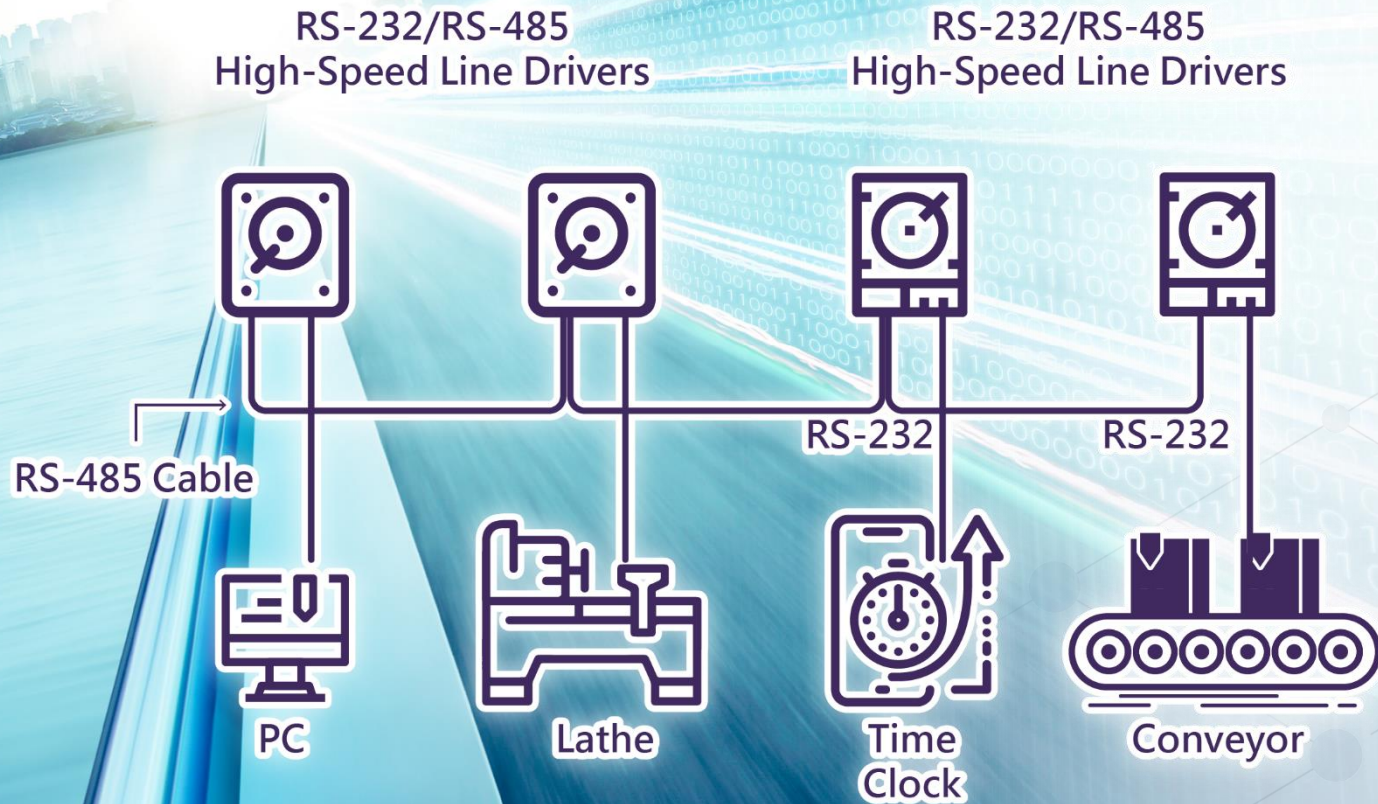
COM / x16 slot / 2.5G Lan(TSN for R680E only)

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Download Center
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