

Industrial **System** Solution Guide





About Portwell

Portwell, Inc. was founded in 1993 and entered the Industrial PC market in 1995 by developing single-board computers. Today, our continuous development of leading-edge products has resulted in strong growth in market shares and revenue, a firm place on the Taipei stock exchange (TAISDAQ), and has established Portwell as a major worldwide supplier of specialty computing application platforms and services. Portwell, Inc. is a Premier member of the Intel® Internet of Things Solutions Alliance. From modular components to market-ready systems, Intel and the 250+ global member companies of the Intel® Internet of Things

Solutions Alliance provide scalable, interoperable solutions that accelerate deployment of intelligent devices and end-to-end analytics. Portwell, Inc. is also a member of the selected group of Intel® Applied Computing Platform Providers (IACPP), as well as Advanced Telecom Computing Architecture (ATCA) and an executive member of PCI Industrial Computer Manufacturing group (PICMG).



Portwell Engine (PE) Building

Portwell, Inc. has worldwide operations in the U.S.A., Taiwan, Japan, China, Netherlands, United Kingdom, Germany, Latin America and India. Whether you are working on a computer board or turnkey system, Portwell is the perfect partner to help you deliver your products to the market on time as well as maintain longevity of product. With 20 years experience in the design and manufacturing of specialty computer boards and systems, Portwell not only provides a one-stop resource for off-the-shelf products, but also supplies custom-built solutions and a global logistics services to suit your needs.

Portwell OEM and ODM solutions satisfy your needs in retail automation, medical equipment, industrial automation, infotainment, communication, and network security markets. Encouraged by our flexible business support, manufacturing excellence, and

compliance with high quality and environmental standards such as ISO 9001/14000/13485, OHSAS and RoHS, customers have taken advantage of our dedicated and sophisticated engineering resource to satisfy their requirements for the design, manufacturing and logistics of application-specific computer boards, customized computer chassis, and specific computer system configurations. Whether you are working on a Medical Single Board Computer or Internet Security Appliance, Portwell is, again, the perfect partner to help you deliver your products to the market on time and stay one step ahead of the competition.



Portwell is famous for her platform service that could offer the following benefits to customers.

■ Complete Product Portfolio

Select from our full range of both off-the-shelf and versatile custom solutions to scale your products. Portwell provides not only board-level products but also peripheral-level and complete system solutions.

■ Implement Latest Intel Technology

Portwell delivers cutting-edge solutions not only to meet and exceed the demand for the newest technologies, but also the need for greater product life cycles. Since partnering with Intel in 1999, and with streamline access to the latest Intel technologies and roadmaps, Portwell delivers superior products to meet your needs.

■ Faster Time-to-Market

Portwell's experienced engineers, complete product solutions,

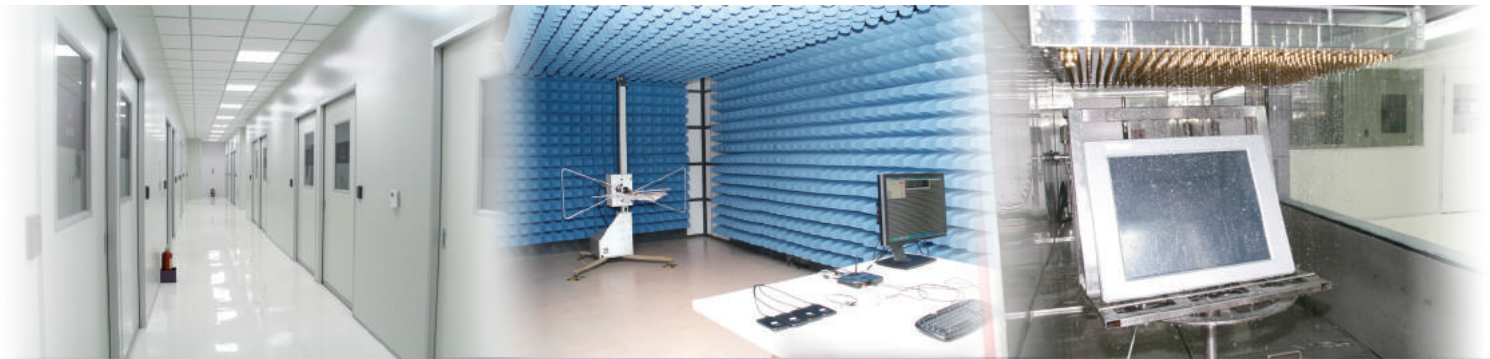
global operation and flexible business service help you meet the time-to-market requirement and reduce your new product introduction cycles as well as the costs of conducting business.

■ Leading Edge Innovator

Portwell is committed to product and solution innovation. We have a complete variety of proof-of-concept designs with Intel and we are also a leader in offering the latest technologies to the market.

■ Committed to Customer Satisfaction

Portwell maintains high expectations in a determined pursuit of commitment to continuously improve our products and services in order to satisfy and exceed our customers' needs.



Consulting • Design • Product • Manufacturing • Logistics



Portwell is proud of the technology service it provides to our partners. These services include complete service-demand consulting, product development, advanced design, quality production and global logistics.

Share for Success

Portwell is eager to share its industrial know-how with customers via our online consulting. This feature enables customers to obtain suitable or customized solutions quickly and efficiently.

Design, Develop, and Deliver

- We design, develop and deliver our customer requirements, such as production, reliability, stability, cost-effectiveness, and longevity of product.
- Our experienced and sophisticated engineering capabilities include electronic, mechanical, firmware and system integration expertise.

Portwell Manufacturing Excellence

- We supply component inventory management with automation.

- In-house SMT lines and PCB assembly and functional testing.
- In-house system integration and testing.
- ISO 14001 and ISO 9001 certified manufacturing facilities (89,000 sq. ft. in Taipei).
- Flexible production capability.

Portwell Global Presence

- Single contact window, global support.
- Sales and technical support teams are available through Portwell worldwide offices in the U.S.A., Taiwan, Japan, China, Netherland, United Kingdom, and India.
- Customer-centric service and support.



System Production Flow



Visual Inspection

Once systems have been assembled, they will have already been visually inspected. Our inspectors ensure all components and accessories are assembled properly and follow MFG before testing.



IPQC

Verifies that all the production processes are completed correctly and accordingly to specification.



Assembly

Makes certain that all the system components were assembled properly (Main board, Cable, Fan, HDD, etc.)

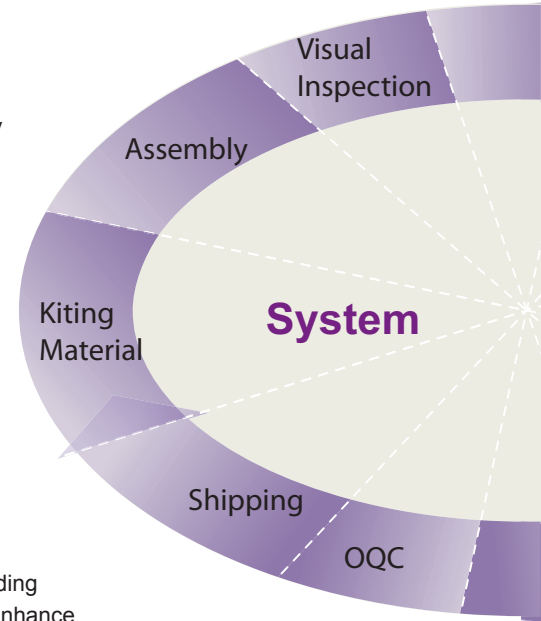
Shipping

In order to meet the demands of storage, transportation, loading and unloading the products mechanically, our pallet stretch wrap machine is designed to enhance production efficiency and prevent damage to the products during transportation.



OQC

To implement QC inspection procedure on packaged and finished goods, OQC has the MIL-STD 105E Table. QC staff conducts sampling according to required sampling by quantity.



Certifications

Portwell has been certified with ISO 9001 and TAF compliance by TUV NORD and UCS organizations since 2006. This certifies that Portwell implements an ISO-9001 quality system and is committed to continuous improvement.



Certifications

Portwell has been certified with ISO 14001 compliance by TUV NORD since 2010. Portwell follows the ISO 14001 standard as a fundamental principle. The overall goal is the concept of continuous improvement as well as commitment to the Plan-Do-Check-Act methodology.



Basic Function Test

In order to ensure the system product is able to boot up by Dynamic Burn-In, 100% of the system products are tested for electronic functionality via a Basic Function Testing after assembly.



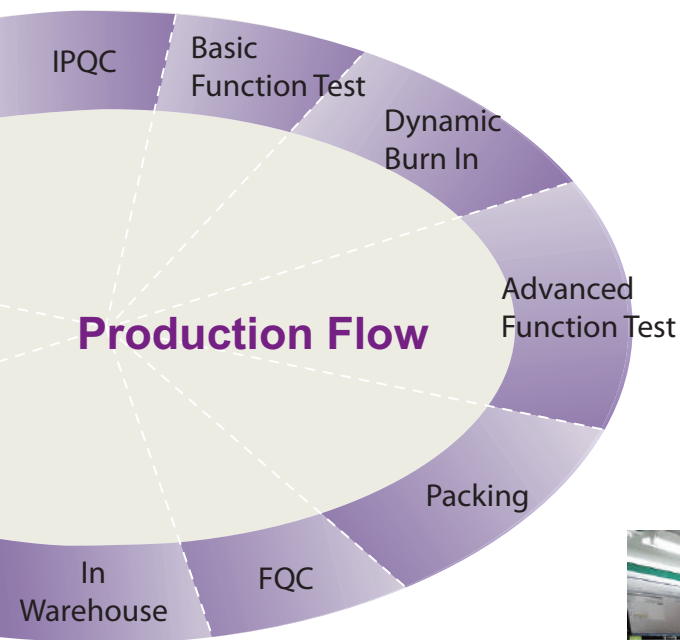
Dynamic Burn In Test

DBI is the test used before the product is shipped out. The purpose is to screen possible weaknesses and failures which affect its reliability under different environments.



Advanced Function Test

This procedure is to ensure the quality and functionality of the system product after the Burn-in test.



Packing

We inspect the product for external defectiveness. Once they have passed, we then collocate all accessories into plastic bags then proceed with boxing and labeling.



FQC

Finished and packed goods are placed in this area for inspection; the FQC department will inspect finished goods based on standard procedures.



Certifications

Portwell has been ISO 13485 certified by TUV NORD since 2010. In addition to Portwell's headquarters in Taiwan, her branch office in the U.S has also achieved the same certification which reflects Portwell's dedication to continuous improvement in the design and manufacturing of medical computing devices.





Certifications

Portwell has been ISO/TS 16949 certified by TUV NORD since 2014. Following ISO/TS 16949 specifications, Portwell has developed a quality management system that provides continual improvement, defect prevention and reduction of variation in serving automotive-related products.



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EMBEDDED COMPUTING SYSTEM

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		Embedded rugged fan-less system with Intel® Atom™ D2550 based NANO-ITX board				Embedded rugged fan-less system with Intel® Celeron and Core™ i3/i5/i7 based Mini-ITX board
						
		WEBS-2170				WEBS-3581
		15 WEBS-2190				23 WEBS-3583
		Embedded rugged fan-less system with Intel® Atom™ E3800 Series based NANO-ITX board				Embedded rugged fan-less system with Intel® Celeron and Core™ i3/i5/i7 based MINI-ITX board
						
		WEBS-2190				WEBS-3583
		17 WEBS-1341				25 WEBS-5481
		Embedded rugged fan-less system with Intel® Atom™ N455/D525 based 3.5" ECX board				Embedded rugged fan-less system with Intel® Celeron and Core™ i3/i5/i7 based specific form factor board
						
		WEBS-1341				WEBS-5481
		18 WEBS-1371				26 WEBS-5481-S
		Embedded rugged fan-less system with Intel® Atom™ D2550 based 3.5" ECX board				Embedded rugged fan-less system with Intel® Celeron and Core™ i3/i5/i7 based specific form factor board
						
		WEBS-1371				WEBS-5481-S
		19 WEBS-3392				27 WEBS-5482-W
		Embedded rugged fan-less system with Intel® Atom™ E3845/J1900 based Mini-ITX board				Embedded rugged fan-less system with Intel® Celeron and Core™ i3/i5/i7 based specific form factor board
						
		WEBS-3392				WEBS-5482-W
		20 WEBS-3560B				28 WEBS-5491
		Embedded rugged fan-less system with Intel® Celeron and Core™ i5/i7 based Mini-ITX board				Embedded rugged fan-less system with Intel® Atom™ E3845 specific form factor board
						
		WEBS-3560B				WEBS-5491

INDUSTRIAL CHASSIS



PAGE	30	About Chassis	31-32	Chassis Reference Table
		33-34 RPC-500NC/L		43-44 AREMO-8164
		19" 4U industrial rack-mount chassis		8-slot full-size industrial node chassis (Shoe-box)
				
		RPC-500NC/L		AREMO-8164
		35-36 AREMO-3194		45-46 AREMO-6182
		19" 3U rack-mount chassis for ATX M/B platform		6-slot full-size industrial node chassis (Shoe-box)
				
		AREMO-3194		AREMO-6182
		37-38 AREMO-2173P		47-48 AREMO-4184
		19" 2U industrial rack-mount chassis for PICMG backplane		19" 4U Height rack-mount chassis with dual AREMO-6182 node chassis
				
		AREMO-2173P		AREMO-4184
		39-40 AREMO-2173MX		49-51 AREMO-4196
		19" 2U industrial rack-mount chassis for Micro-ATX or mini-ITX mother board		The Best Cost-Performance 19" 4U Height Pentium® 4 processor Based Rack-mount Computer
				
		AREMO-2173MX		AREMO-4196
		41-42 AREMO-6163		52 EZDRV-400
		6-slot full-sized industrial node chassis (Shoe-box)		5.25" compact drive set with slim type DVD-ROM, SD/CF card reader, 2 USB ports and space for 2.5" HD
				
		AREMO-6163		EZDRV-400



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INDUSTRIAL PSU

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PLUTO-A1801PJ

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180W Flex form factor Power supl with Active PFC
Japan made capacitor 80PLUS and OVP,OCP,SCP



PLUTO-A2501PJ

- 56 PLUTO-A2501PJ**
250W Flex form factor Power supl with Active PFC
Japan made capacitor 80PLUS and OVP,OCP,SCP



PLUTO-D3501PJ

- 57 PLUTO-D3501PJ**
350W PS/2 ATX PSU with active PFC Japan made
capacitor 80 PLUS and SCP, OCP,OPP



PLUTO-D5001PJ

- 58 PLUTO-D5001PJ**
500W PS/2 ATX Power Supply with active
PFC Japan made capacitor 80 PLUS and SCP,
OCP,OPP



GADIWA-B1120

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120W DC/DC 12V Input/ATX output,Board Type
Converter



GADIWA-R9271

- 60 GADIWA-R9271**
9V~27V/wide-input, 12V/output,
Regulator Board Type



GADIWA-3160

- 61 GADIWA-3160**
128W DC/DC 12V~36V/wide-input, ATX/
output, Board Type Converter



GADIWA-B9120

- 62 GADIWA-B9120**
120W DC/DC 9V~29V Input/ATX output,
Board Type Converter



ORION-A1501P

- 63 ORION-A1501P**
150W 1U ATX power supply with active PFC



ORION-A2501

- 63 ORION-A2501**
250W 1U ATX power supply with active PFC



ORION-300DX/24

- 64 ORION-300DX/24**
300W/24V DC input
DC/DC PS/2 ATX power supply



ORION-300DX/48

- 64 ORION-300DX/48**
300W-48V DC input
DC/DC PS/2 ATX power supply



ORION-D3502P

- 65 ORION-D3502P**
350W+350W mini-redundant with active PFC
power supply



ORION-D4602P

- 65 ORION-D4602P**
460W+460W mini-redundant with active PFC
power supply



MPM-842P

- 66 MPM-842P**
400W PS/2 ATX power supply
with active PFC



MPI-815H

- 66 MPI-815H**
150W 1U ATX power
supply with active PFC



MPI-810H

- 67 MPI-810H**
120W universal input open-frame
power supply



MPD-810H

- 67 MPD-810H**
120W universal input open-frame,
DC to DC power supply



MPE-008A-P

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80W universal input open-frame
power supply



MPI-806H

- 68 MPI-806H**
60W universal input open-frame
power supply

69 Industrial Power Adapter

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What is WEBS

WEBS: Portwell Intelligent Fan-less System

Compact, Flexible, Rugged Computing Systems

With leading embedded computing technology, Portwell has developed the industrial grade WEBS fan-less computing systems for harsh environment such as factory automation, transportation, facility management, networking and public works.

To meet these harsh environmental parameters, each WEBS computing system is designed by precise thermal simulation and verification to make the system stable and user friendly.

The all-aluminum chassis design provides effective heat dissipation and transfers the heat out of the system quickly and easily.

Built with the latest Intel® chipsets, the WEBS systems feature not only superior performance but also low power consumption. They are suitable for energy-critical applications and environmental friendly.



Slim



M. I. T.



Small



Flexible



Fan-less



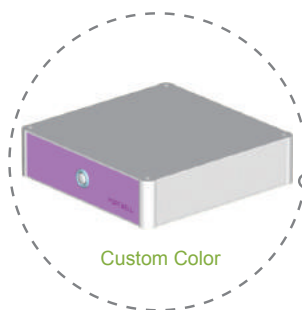
Performance



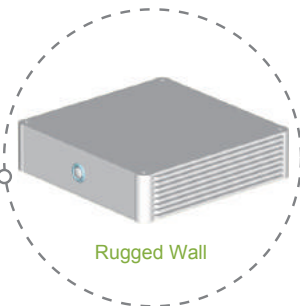
Wide Temp. Range



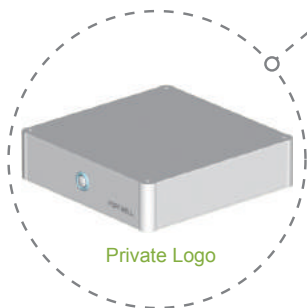
PCI/PCIE Expansion



Custom Color



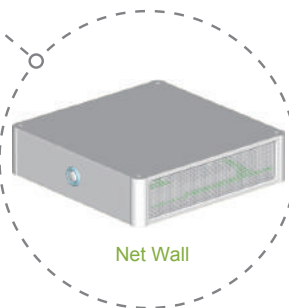
Rugged Wall



Private Logo



Expand I/O (By model)



Net Wall



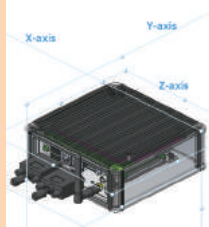
Quality Assurance

① Design & Analysis

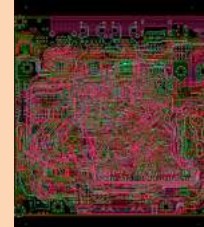
Portwell WEBS systems undergo quality assurance procedures during the critical early stages of development. Designing a stable product makes it easy for quality checking and complies with Design for Quality (DFQ).

At the development stage the product design also involves the material and assembly important for production, with the focus on Design for Manufacturability (DFM). This develops simple, consistent and efficient system structures and endows the product with a stable quality.

With their experienced engineering team and complete 3D circuit and layout development facility, Portwell is able to supply more efficient system development and support their customers in "Design Win."



Design & analysis is performed by 3D workstation. (WEBS-2190)



Circuit design & layout by advanced tools (NANO-6060)

② Thermal Design

Thermal Design Concept

Thermal control is the key to all future industrial appliances. Portwell knows this and has focused many hours of research and put immense efforts upon thermal solutions.

Based on our findings and experience, many components on the motherboard demonstrated wide temperature changes which affected the operating temperature endurance of the board and the system.

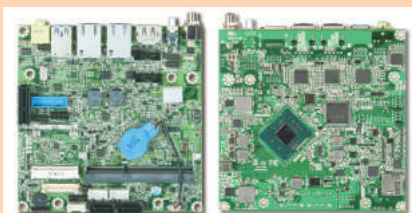
The CPU T-junction temperature, for example, will dramatically increase around 30 to 40 degrees Celsius from power-on to full loading under ambient temperature. This means the CPU T-junction could reach between 90 and 100 degrees Celsius when the ambient temperature is at 60 degrees Celsius. Moreover, the CPU T-junction temperature is capable of an additional 5 degrees Celsius, which exceeds CPU specifications, due to its fan-free chassis.

In our labs, we saw these symptoms and developed unique solutions. Thermal design and component placement on a motherboard go hand in hand. Therefore, heat ventilation in a chassis is necessary for fan-less or fan-free systems.

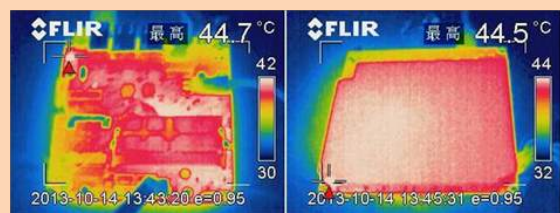
Some manufactures will claim they have solved the heat dissipation problem based on their calculations and data sets, but "seeing is believing!" So test your systems in our certified and advanced labs and see if your systems meet your specifications.

Since there is no fan and airflow inside the fan-less WEBS systems, handling the thermal output becomes one of the most important concerns. System heat comes from ICs on the embedded board and this is pre-determined by Intel®. Therefore, the key to developing a reliable fan-less system is determined by two major factors.

First is to balance the heat on the embedded board and make sure it does not accumulate. Determining the thermal balance for the hot components is a prime concern. The picture below shows the heat situation of the NANO-6060, NANO-ITX embedded board used in the WEBS-2190 system. The heat in this example is arranged and balanced for superior dissipation in a fan-less system design.



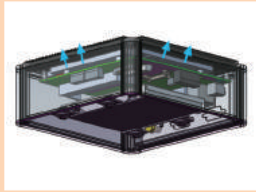
NANO-6060 M/B



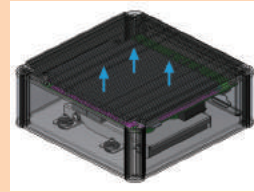
Thermal image of NANO-6060 M/B

Quality Assurance

Second is to maximize the arrangement of heat dissipation by system design. WEBS systems are designed with an all-aluminum chassis that is ideal for heat dissipation. Heat sinks link the ICs on the embedded board and the aluminum chassis for direct heat transference. The heat transfers from the heat spreader so the lower temperature is at the chassis top for greater ease of use and protection. The pictures below illustrate the heat flow of a WEBS system. Balancing the heat of the product in this way makes the perfect fan-less system.



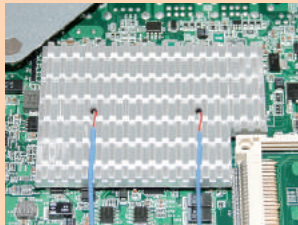
WEBS-2190 Heat-flow (Bottom)



WEBS-2190 Heat-flow (Top)

③ Thermal Validation

After completing the thermal design, the WEBS system undergoes thermal validation by following Intel's thermal guide. The system is tested inside the calibrated chamber with defined temperatures. The efficacy of the WEBS system is further improved when the temperature of any component is over specification. Thermal tests are conducted until all the major ICs are below thermal specification.



Holes are made on the heat sink and thermal sensor cables are added for measuring the temperature



④ Safety & Reliability Validation

In addition to the thermal validation, the WEBS systems undergo safety assessment and tests and achieve CE and FCC certification. Testing includes ESD, EMI and EMC.

To ensure product quality, complete quality assurance tests are performed during both the development and the manufacturing phases for all system-level products. Portwell WEBS systems are tested and comply with safety regulations, and are reliable to be used in the harsh environments.

-Based on customer's requirements, Portwell can do additional tests with a NRE (non-recurring engineering) charge.



ESD Test



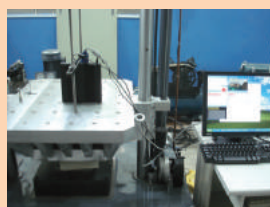
EMC Test



EMC Test



Vibration Test



Shock Test



Packing Vibration Test



Packing Drop Test



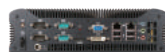
WEBS Reference Table



Model		WEBS-2170	WEBS-2190	WEBS-1341	WEBS-1371
M/B		NANO-5050	NANO-6060	PEB-2771/2781	PEB-2772
Form Factor		NANO-ITX	NANO-ITX	3.5" ECX	3.5" ECX
System	CPU	Atom™ D2550 1.86GHz	Atom™ E2827 1.75GHz Atom™ E3845 1.91GHz	Atom™ N455 1.6GHz Atom™ D525 1.8GHz	Atom™ D2550 1.86GHz
	Chipset	NM10	Intel® SoC	ICH8-M	NM10
	BIOS	Phoenix uEFI	Phoenix uEFI	AMI	Phoenix uEFI
	Memory	DDR3/4GB	DDR3L/4GB	DDR3 / 2GB	DDR3/4GB
	Graphic Controller	GMA3650	Gen 7	GMA 950	GMA3650
	Audio Codec	ALC886	ALC892	ALC-892	ALC886
	Super I/O	W83627DHG	EC ITE8528	W83627UHG	W83627UHG
	Storage	CF-SATA 2.5" SATA HDD	Micro-SD 2.5" SATA HDD	CF, 2.5" SATA	2.5" SATA HDD SATA DOM
External I/O	Serial	1x RS-232/422/485	1x RS-232/422/485	3x RS232+ 1x RS232/422/485	3x RS-232 + 1x RS-232/422/485
	USB	2x USB2.0	2x USB3.0	4x USB2.0	5x USB2.0
	Display	VGA, DP	VGA, DP	VGA	VGA, HDMI
	Ethernet	Intel® 82583V	Intel® I210IT x 2	Intel® 82567V+82583V	Intel® 82583V
	PS/2	N/A	N/A	N/A	N/A
	Audio	Mic-in, Line-out	Line-out	N/A	Line-in, Line-out, Mic-in
	D I/O	N/A	N/A	N/A	8-bit Digital I/O
Expansion		Full-size Mini-PCle	Half-size Mini-PCle	Mini-PCle	Full-size Mini-PCle
PWR	System	DC 12V	DC 12V	DC 12V	DC 12V
Environment	OP Temp.	-5°C ~ 45°C	-25°C ~ 60°C	-5°C ~ 45°C	-10°C ~ 50°C
	Stor. Temp	-20°C ~ 80°C	-40°C ~ 80°C	-20°C ~ 80°C	-20°C ~ 80°C
	Humidity	95%@40°C, non-condensing	95%@40°C, non-condensing	95%@40°C, non-condensing	95%@40°C, non-condensing
	Vibratoin	5Grms/10-500Hz	5Grms/10-500Hz	5Grms/10-500Hz	5Grms/10-500Hz
	Shock	50G, 11 msec	50G, 11 msec	50G, 11msce.	50G, 11 msec
Mechanical	Dimension(WxDxH)	150 x 150 x 53 mm	150 x 150 x 53 mm	200 x 150 x 51 mm	200 x 150 x 51 mm
	Weight	1.3 kg	1.3 kg	1.6 kg	1.6 kg
Page		14	15	17	18



WEBS Reference Table



Model		WEBS-3392	WEBS-3560B	WEBS-3581	WEBS-3583
M/B		WADE-8079	WADE-8020	WADE-8015	WADE-8015
Form Factor		Mini-ITX	Mini-ITX	Mini-ITX	Mini-ITX
System	CPU	Atom™ E3845 1.91GHz Atom™ J1900 2GHz	Intel® Core™ i5/i7 PGA 989 Mobile Processor	Intel® 4 th Generation Desktop Core™ Low Power Processor	Intel® 4 th Generation Desktop Core™ Low Power Processor
	Chipset	Intel® SoC	QM57	Q87	Q87
	BIOS	Phoenix(EFI) BIOS	AMI uEFI	Phoenix uEFI	Phoenix uEFI
	Memory	DDR3L/16GB	DDR3/8GB	DDR3/16GB	DDR3/16GB
	Graphic Controller	HD Graphics 4600	GMA HD	HD Graphic 4000 Family	HD Graphic 4000 Family
	Audio Codec	ALC892	ALC888	ALC886	ALC886
	Super I/O	Fintek F81216DG	ITE IT8721F	ITE IT8728F	ITE IT8728F
	Storage	2.5" SATA HDD/SSD, mSATA	2.5" SATA HDD/SSD SATA DOM	2 x 2.5" SATA HDD/SSD SATA DOM	2 x 2.5" SATA HDD/SSD SATA DOM
External I/O	Serial	3x RS-232 + 1x RS-232/422/485	3x RS-232 + 1x RS-232/422/485	4x RS-232 + 2x RS-232/422/485	4x RS-232 + 2x RS-232/422/485
	USB	4x USB2.0 1x USB3.0	6x USB2.0	2x USB2.0 4x USB3.0	4x USB2.0 4x USB3.0
	Display	VGA, DVI-D, DP	VGA, DVI-D, HDMI	VGA, DP, HDMI	VGA, DP, HDMI
	Ethernet	Intel® I210IT x 2	Intel® 82577LM+82574L	Intel® I217LM+I210AT	Intel® I217LM+I210AT
	PS/2	N/A	N/A	N/A	N/A
	Audio	N/A	Line-in, Line-out, Mic-in	Line-in, Line-out, Mic-in	Line-in, Line-out, Mic-in
	D I/O	N/A	8-bit Digital I/O	8-bit Digital I/O	8-bit Digital I/O
Expansion		Half-size Mini-PCle Full-size Mini-PCle	Full-size Mini-PCle	Full-size Mini-PCle	Full-size Mini-PCle 2x PCIe (or 1x PCIe + 1x PCI)
PWR	System	DV 12V ~ 24V	DC 12V ~ 36V	DC 12V ~ 36V	DC 12V ~ 36V
Environment	OP Temp.	-10°C ~ 45°C	-5°C ~ 50°C	-20°C ~ 50°C	-20°C ~ 50°C
	Stor. Temp	-40°C ~ 80°C	-20°C ~ 80°C	-40°C ~ 80°C	-40°C ~ 80°C
	Humidity	95%@40°C, non-condensing	95%@40°C, non-condensing	95%@40°C, non-condensing	95%@40°C, non-condensing
	Vibratoin	5Grms/10-500Hz	5Grms/10-500Hz	5Grms/10-500Hz	5Grms/10-500Hz
	Shock	50G, 11 msec	50G, 11 msec	50G, 11 msec	50G, 11 msec
Mechanical	imension(WxDxH)	200 x 200 x 51 mm	253 x 190 x 70 mm	253 x 191 x 85 mm	253 x 193 x 120 mm
	Weight	2.2 kg	4.2 kg	4.6 kg	7 kg
Page		19	20	21	23



WEBS Reference Table

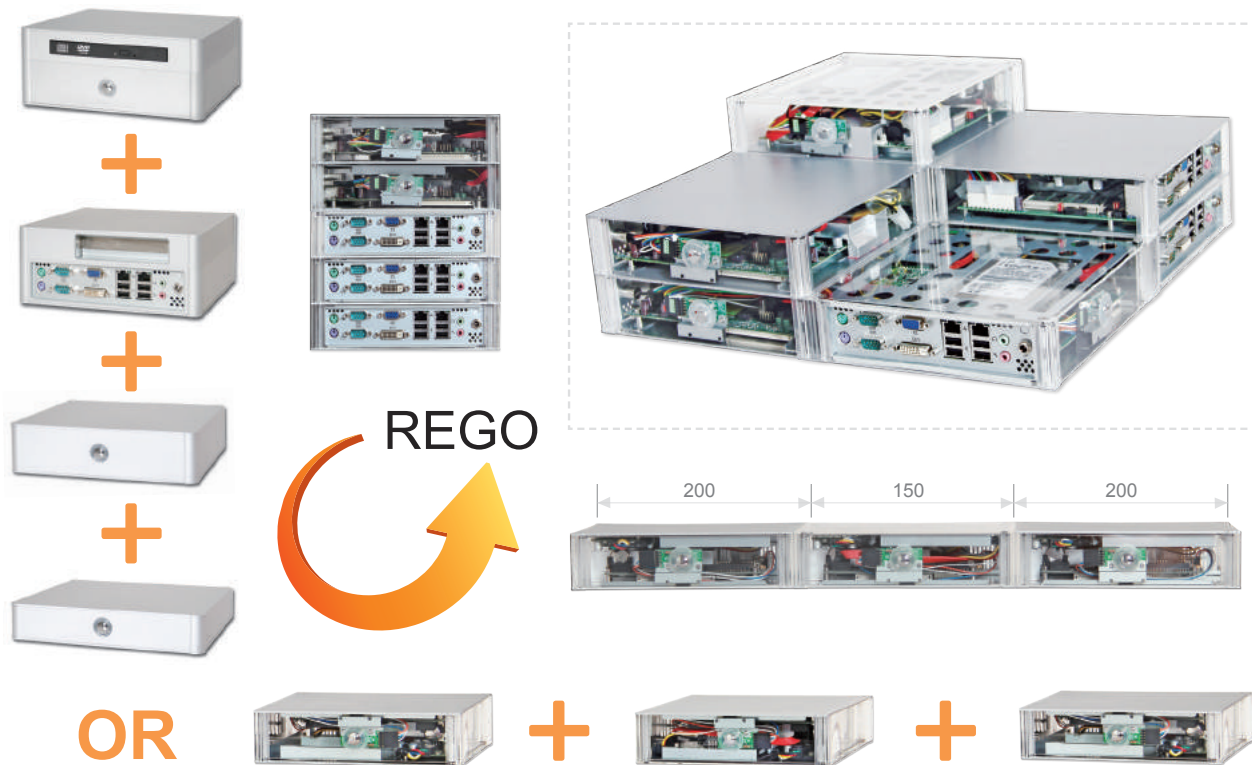


Model		WEBS-5481	WEBS-5481-S	WEBS-5482-W	WEBS-5491
M/B		PEB-5731-W	PEB-5731-W	PEB-5731-W	PEB-99A4-E3845
Form Factor		Specific form factor 170 x 135 x 1.6 mm	Specific form factor 170 x 135 x 1.6 mm	Specific form factor 170 x 135 x 1.6 mm	Specific form factor 279 x 164 x 34 mm
System	CPU	Intel® 4 th Generation ULT Core™ i Processor	Intel® 4 th Generation ULT Core™ i Processor	Intel® 4 th Generation ULT Core™ i Processor	Atom™ E3845 1.91GHz
	Chipset	Intel® SoC	Intel® SoC	Intel® SoC	Intel® SoC
	BIOS	AMI uEFI	AMI uEFI	AMI uEFI	AMI uEFI BIOS
	Memory	DDR3L/16GB	DDR3L/16GB	DDR3L/16GB	DDR3L/8GB
	Graphic Controller	HD Graphic 4000 Family	HD Graphic 4000 Family	HD Graphic 4000 Family	HD Graphics 4600
	Audio Codec	ALC892	ALC892	ALC892	ALC892
	Super I/O	EC ITE8528 + Fintek F81216AD	EC ITE8528 + Fintek F81216AD	EC ITE8528 + Fintek F81216AD	ITE IT8528E + Fintek F81216AD
	Storage	CFEX, 2.5" SATA HDD/SSD mSATA	CFEX, 2.5" SATA HDD/SSD mSATA	CFEX, 2.5" SATA HDD/SSD mSATA	2.5" SATA HDD/SSD, CF, SD card
External I/O	Serial	1x RS-232 + 1x RS-232/422/485	1x RS-232 + 1x RS-232/422/485	3x RS-232 + 1x RS-232/422/485	2x RS-232/422/485
	USB	2x USB2.0 2x USB3.0	2x USB2.0 2x USB3.0	2x USB2.0 2x USB3.0	3x USB2.0 1x USB3.0
	Display	DVI-D, DP, HDMI	DVI-D, DP, HDMI	DVI-D, DP, HDMI	DVI-I
	Ethernet	Intel® I218LM+I210AT	Intel® I218LM+I210AT	Intel® I218LM+I210AT	Intel® I210IT x 2
	PS/2	N/A	N/A	N/A	N/A
	Audio	Line-out, Mic-in	Line-out, Mic-in	N/A	Line-out
	D I/O	8-bit Digital I/O	8-bit Digital I/O	N/A	N/A
Expansion		Full-size Mini-PCle Half-size Mini-PCle 2x Optional Graphic Module	Full-size Mini-PCle Half-size Mini-PCle	Full-size Mini-PCle Half-size Mini-PCle 1x PCIe	Half-size Mini-PCle
PWR	System	DV 12V ~ 24V	DC 12V ~ 24V	DC 12V ~ 24V	DC 12V ~ 24V
Environment	OP Temp.	-20°C ~ 55°C	-20°C ~ 55°C	-20°C ~ 50°C	-30°C ~ 70°C
	Stor. Temp	-40°C ~ 80°C	-40°C ~ 80°C	-40°C ~ 80°C	-40°C ~ 80°C
	Humidity	95%@40°C, non-condensing	95%@40°C, non-condensing	95%@40°C, non-condensing	95%@40°C, non-condensing
	Vibratoin	5Grms/10-500Hz	5Grms/10-500Hz	5Grms/10-500Hz	5Grms/10-500Hz
	Shock	50G, 11 msec	50G, 11 msec	50G, 11 msec	50G, 11 msec
Mechanical	Dimension(WxDxH)	235 x 160 x 60 mm	235 x 160 x 50 mm	255 x 187 x 86 mm	279 x 164 x 34 mm
	Weight	2 kg	1.8 kg	5kg	2.8 kg
Page		25	26	27	28

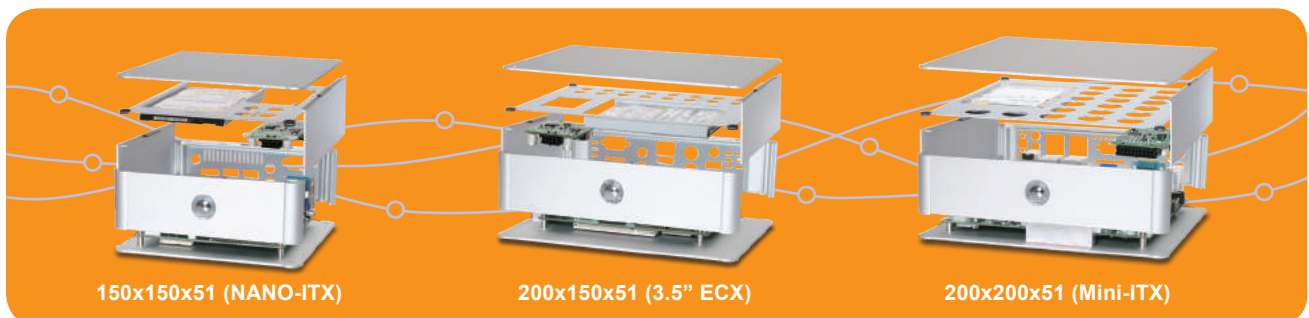
Brick Concept

As well as stable quality requirements, users are always looking for a unique product to differentiate them from their competitors. To simplify system customization, Portwell created the Brick concept, an intelligent structure for the WEBS systems that builds the WEBS chassis using three simple elements: wall, pillar and cover. This makes the chassis flexible and easy for customization by following customer's requirements. The illustration below shows the segments for customization.

* May necessitate extra cost and MOQ for an individual customization.



With its flexible structure, a Portwell WEBS system can adjust the size of its form-factor to supply a customized chassis for the customer. The three system sizes below illustrate the standard WEBS system form-factors. Customer can adapt any model to suit their applications. (Size unit is mm)

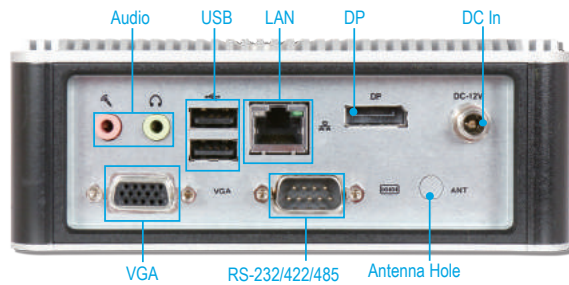


Configuration

- **Full System:** Chassis + (Power Module) + Adaptor + Cable + Embedded Board + Memory + HDD/CF
- **Bare System (By request only):** Chassis + (Power Module) + (Adaptor) + Cable + Embedded Board

WEBS-2170

Embedded Rugged Fan-less System with Intel® Atom™ D2550 based NANO-ITX Board



The WEBS-2170 adopts Intel® Atom™ D2550 CPU with NM10 chipset which for the Low Power compact size system. The new architecture integrates the 3D graphics engine and memory controller. The WEBS-2170 platform with fan-less and cable-less design is suitable for the kiosk, digital signage and networking applications.

FEATURES

- Fan-less and cable-less & small and exquisite design
- Fan-less solution with Dual-Core CPU
- Intel® Atom™ D2550 1.86GHz processor based on Intel® NM10 platform
- 1x 2.5" SATA HDD/SDD, CF-SATA
- 1x Full-size Mini-PCle socket (USB + PCle x1 signal)
- Single DC 12V power input for easy system integration
- 1x Antenna hole for WiFi or 3G/GPS module to use
- OP Vibration: 5Grms/10~500Hz
- OP Shock: 50G, 11msec
- IP40 Rating

ORDERING GUIDE

AS5-3363	(R).ATO.WEBS-2170.NANO-ITX System.
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System

M/B	NANO-5050
System Chipset	Intel® Cedarview NM10 Express chipset
CPU	Intel® Atom™ D2550, 1M L2 Cache, 1.86GHz, 10W TDP (2C/4T)
BIOS	Phoenix uEFI BIOS (SPI ROM)
System Memory	One 204-pin SODIMM socket supports DDR3 800/1066 up to 4GB
Storage	1x 2.5" SATA HDD/SSD, 1x CF-SATA
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
H/W Status Monitor	- Temperature (CPU & System) - Voltage (CPU Vcore, VBAT, 5VSB, 12V, 5V, 3.3V)
Expansion	1x Full-size Mini-PCle socket

External I/O

Serial Port	1x RS-232/422/485 (Selected by jumper setting)
Display	1x VGA, 1x DP
USB	2x USB2.0 (Expanded to 6x USB2.0 by customizing)
Audio	Line-out/Mic-in (ALC892)
Ethernet	1x Gigabit Ethernet (Intel® 82583V)
Other	1x Antenna hole for WiFi or 3G/GPS module

Power Supply Unit

Power Input	DC 12V
-------------	--------

Environmental

Operation Temperature	-5°C ~ 45°C
Storage Temperature	-20°C ~ 80°C
Relative Humidity	95%@40°C, non-condensing
Operation Vibration	5Grms/10-500Hz, IEC 60068-2-06
Operation Shock	50G, 11 msec, IEC 60068-2-27

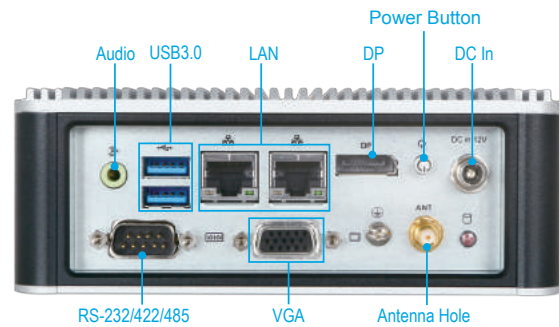
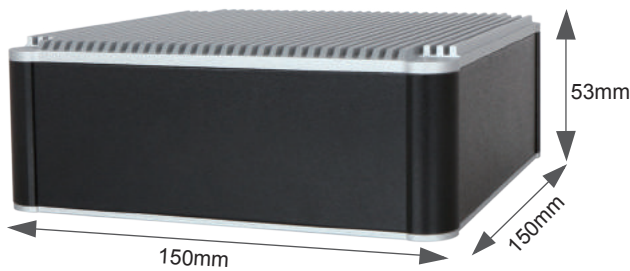
Mechanical

Dimension	150(W) x 150(D) x 53(H) mm; 5.9"(W) x 5.9"(D) x 2.1"(H)
Weight	1.3 kg
Mounting	Desk, Wall/Panel, and DIN Rail mounting



WEBS-2190

Embedded Rugged Fan-less System with Intel® Atom™ E3800 Series based NANO-ITX Board



The WEBS-2190 builds on Intel® Baytrail SoC and takes advantages of Intel® Atom™ E3800 Series processor technologies, especially its vastly superior Quad-Core processing power and capability. The cost-effective CPU with high performance is of great use to build up a compact system, the WEBS-2190, it supports a wide temperature from -25°C to 60°C for fan-less applications in harsh environment, such as POS, kiosk, digital signage, transportation and automation.

FEATURES

- Fan-less and cable-less & small and exquisite design
- Fan-less solution with Quad/Dual-Core CPU
- Intel® Baytrail SoC base platform
- 1x Half-Size Mini-PCIe socket (USB + PCIe x1 signal)
- 1x Antenna hole for WiFi or 3G/GPS module to use
- OP Vibration: 5Grms/10~500Hz
- OP Shock: 50G, 11msec
- IP40 Rating

ORDERING GUIDE

AS5-3367	(R).ATO.WEBS-2190.NANO-ITX System.
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System

M/B	NANO-6060
System Chipset	Intel® Baytrail SoC
CPU	- Intel® Atom™ E3845, 2M L2 Cache, 1.91GHz, 10W TDP (4C/4T) - Intel® Atom™ E3827, 1M L2 Cache, 1.75GHz, 8W TDP (2C/2T)
BIOS	Phoenix uEFI BIOS (SPI ROM)
System Memory	One 204-pin SO-DIMM socket supports DDR3L 1066/1333 up to 8GB
Storage	1x 2.5" SATA HDD/SSD, 1x Micro SD card
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
H/W Status Monitor	- Temperature (CPU & System) - Voltage (CPU Vcore, VBAT, 5VSB, 12V, 5V, 3.3V)
Expansion	1x Half-size Mini-PCIe socket

External I/O

Serial Port	1x RS-232/422/485 (Selected by BIOS)
Display	1x VGA, 1x DP
USB	2x USB3.0 (Expanded to 4x USB3.0 + 2x USB2.0 by customizing)
Audio	Line-out (ALC892)
Ethernet	2x Gigabit Ethernet (Intel® I210IT)
Other	1x Antenna hole for WiFi or 3G/GPS module

Power Supply Unit

Power Input	DC 12V
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Environmental

Operation Temperature	-25°C ~ 60°C
Storage Temperature	-40°C ~ 80°C
Relative Humidity	95%@40°C, non-condensing
Operation Vibration	5Grms/10-500Hz, IEC 60068-2-06
Operation Shock	50G, 11 msec, IEC 60068-2-27

Mechanical

Dimension	150(W) x 150(D) x 53(H) mm; 5.9"(W) x 5.9"(D) x 2.1"(H)
Weight	1.3 kg
Mounting	Desk, Wall/Panel, and DIN Rail mounting



Rugged Concept

WEBS 1000 & 4000 series is a rugged box pc series which is used in Digital signage, Transportation and industrial applications. The WEBS rugged series is anti-vibration/shock certified wide temperature Embedded system. Its compact and exclusively mechanical design facilitate conveniences for system integration.

COMPACT

WEBS has ingenious mechanical design which gives consideration small dimension, superior heat dissipation, flexible wall mounting or panel mounting, and intuitive.

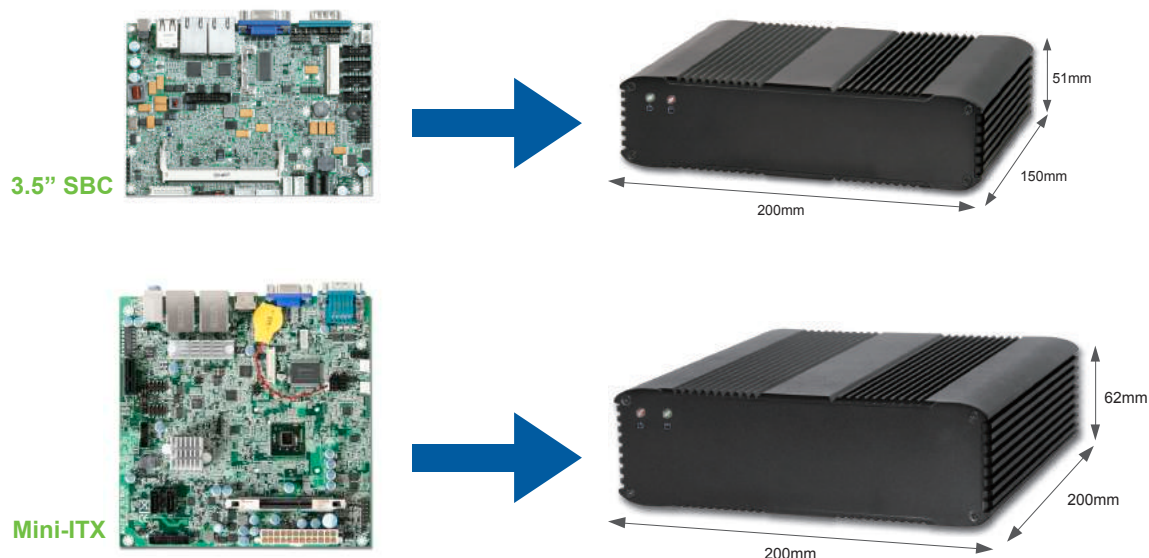


Anti-Vibration & Shock design

With the rugged design, the WEBS series is reliable in industrial environments to resist strong vibrations and can be used as a core computer requiring to be installed on moving object. Whole of the system can pass 5Grms vibration and 50G shock testing, providing a reliable platforms for any industrial applications.

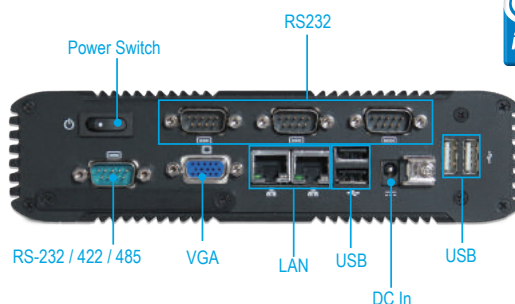
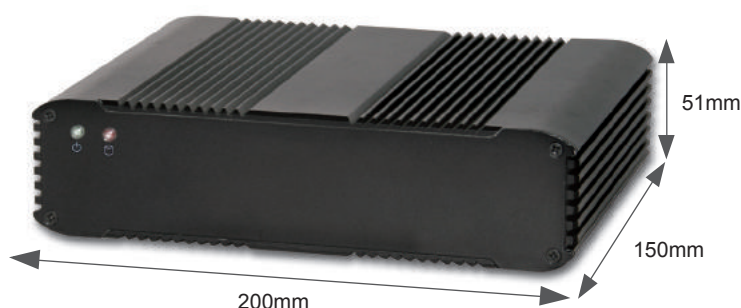
Hot-Swap of Entry 3.5" SBC & Semi-middle MINI-ITX

Common mechanical design for 3.5" Embedded & Mini-ITX board, our customer can easily to integrate Portwell's board to design their customized system. They can save development time and cost on their new product..



WEBS-1341

Embedded Rugged Fan-less System with Intel® Atom™ N455/D525 based 3.5" ECX Board



The WEBS-1341 takes advantage of the latest Intel® Atom™ technologies. It supports DDR3 SDRAM, dual gigabit ethernet and one expansion Mini PCI Express x1 socket. Based on Intel® Atom™ solutions, the fanless WEBS-1341 executes high performance with low power dissipation. Therefore, it's applied to, Kiosk, DS, and industrial automation.

FEATURES

- Fan-less solution with Dual-Core CPU
- Intel® Atom™ N455/D525 1.6/1.8GHz processor and Intel® ICH8-M chipset
- One Mini-PCIExpress expansion and antenna hole
- Rich I/O is good for versatile applications
- Rugged and compact design for harsh environment
- Versatile mounting solutions such as wall and panel mount (Optional)
- Single DC 12V power input for easy system integration
- One Mini-PCI Express expansion
- OP Vibration: 5Grms/10~500Hz
- OP Shock: 50G, 11 msec.
- IP40 Rating

ORDERING GUIDE

AS5-3271	(R).ATO.WEBS-1341. 3.5" ECX System.PEB-2771VG2A/2781VG2A. DDR3. 40W Adapter
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System

Board Dimension	PEB-2771/2781
System Chipset	Intel® ICH8-M
CPU	Intel® Atom N455 (1.6GHz)/D525 (1.8GHz) processor
FSB	800 MHz
BIOS	AMI BIOS
System Memory	One 204-pin SODIMM support DDR3 up to 2GB
Storage	1× CF, 1× SATA 2.5" HDD/SSD
Watchdog Timer	Programmable via S/W from 1 sec. to 255 min.
H/W Status Monitor	Temperature (CPU and System), Voltage
Expansion	1× Mini-PCIe socket

External I/O

Serial Port	3× RS-232 + 1× RS-232/422/485
Display	1× VGA
USB	4× USB 2.0
Ethernet	2× Gigabit Ethernet (82567V + 82583V)
Others	Removeable CF card; Internal header for Audio (ALC262)

Power Supply Unit

Power Input	DC 12V
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Environmental

Operation Temperature	-5°C ~ 45°C
Storage Temperature	-20°C ~ 80°C
Relative Humidity	95%@40°C, non-condensing
Operation Vibration	5Grms/10~500Hz, IEC 60068-2-06
Operation Shock	50G, 11 msec., IEC 60068-2-27

Mechanical

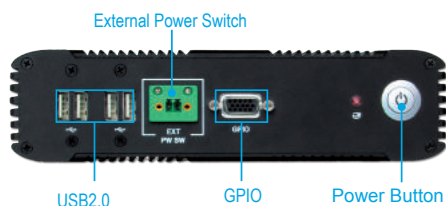
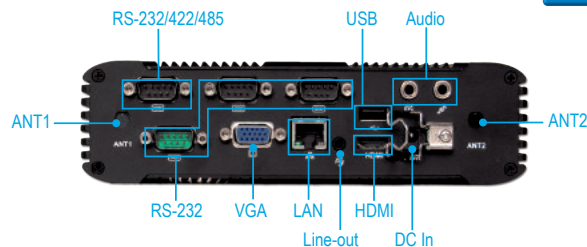
Dimension	200(W) × 150(D) × 51(H)mm; 7.9"(W) × 5.9"(D) × 2"(H)
Weight	1.6 kg
Mounting	Desk, Wall/Panel-mounting





WEBS-1371

Embedded Rugged Fan-less System with
Intel® Atom™ D2550 based 3.5" ECX Board



The WEBS-1371 adopts Atom™ D2550 CPU with NM10 chipset and takes its advantages to develop Portwell Design of that the CPU/chipset on the backside of the board is good for system thermal design. The perfect thermal solution can easily solve the thermal of CPU. The external power switch is an another plus factor. The WEBS-1371 is a great platform for kiosk, digital signage, and automation applications.

FEATURES

- Rugged and compact fan-less design for harsh environment
- Fan-less solution with Dual-Core CPU
- Intel® Atom™ D2550 1.86GHz processor based on Intel® NM10 platform
- 1x Full-size Mini-PCle socket
- Rich I/O is good for versatile applications
- 4x COM port with different power voltage selection
- 2x Antenna hole for WiFi or 3G/GPS module to use
- OP Vibration: 5Grms/10~500Hz
- OP Shock: 50G, 11msec
- IP40 Rating

ORDERING GUIDE

AS5-3352 (R).ATO.WEBS-1371.A.3.5" ECX System.

System

M/B	PEB-2772
System Chipset	Intel® Cedarview NM10 Express chipset
CPU	Intel® Atom™ D2550, 1M L2 Cache, 1.86GHz, 10W TDP (2C/4T)
BIOS	Phoenix uEFI BIOS (SPI ROM)
System Memory	One 204-pin SO-DIMM socket supports DDR3 800/1066 up to 4GB
Storage	1x 2.5" SATA HDD/SSD, 1x SATA DOM
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
H/W Status Monitor	- Temperature (CPU & System) - Voltage (CPU Vcore, VBAT, 5VSB, 12V, 5V, 3.3V)
Expansion	1x Full-size Mini-PCle socket

External I/O

Serial Port	4x COM Port (3x powered RS-232 + 1x powered RS-232/422/485) (R1/5V/12V is selectable by jumper setting)
Display	1x VGA, 1x HDMI
USB	4x USB2.0 (front) + 1x USB2.0 (rear)
Audio interface	Line-in/Line-out/Mic-in (ALC886)
Ethernet	1x Gigabit Ethernet (Intel® 82583V)
GPIO	1x Programmable 8-bit Digital I/O
Other	- 2x Antenna hole for WiFi or 3G/GPS module - 1x EXT Power Switch

Power Supply Unit

Power Input	DC 12V
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Environmental

Operation Temperature	-10°C ~ 50°C
Storage Temperature	-20°C ~ 80°C
Relative Humidity	95%@40°C, non-condensing
Operation Vibration	5Grms/10-500Hz, IEC 60068-2-06
Operation Shock	50G, 11 msec, IEC 60068-2-27

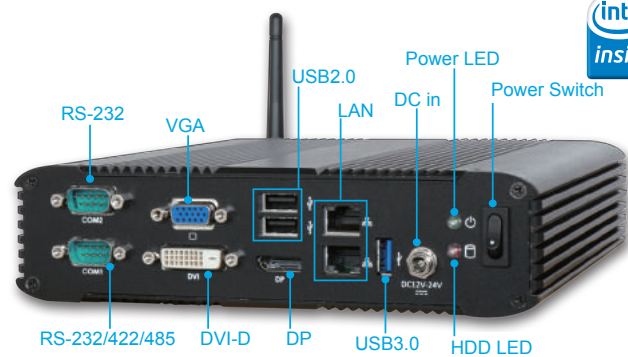
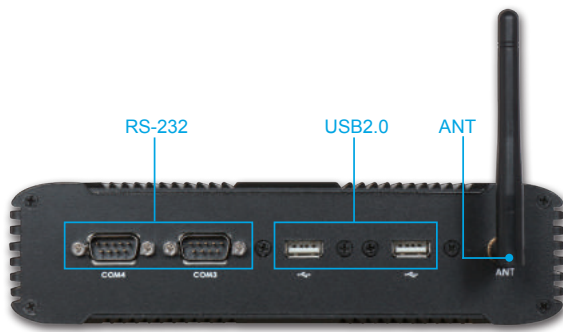
Mechanical

Dimension	200(W) × 150(D) × 51(H) mm ; 7.9"(W) × 5.9"(D) × 2"(H)
Weight	1.6 kg
Mounting	Desk, Wall/Panel mounting



WEBS-3392

Embedded Rugged Fan-less System
with Intel® Atom™ E3845/J1900 based
Mini-ITX Board



The WEBS-3392 is very compact and come without a fan. By using the latest Intel® Atom™ processor E3800 family with up to four CPU cores, the embedded system is suitable as an inexpensive entry-level model for diverse applications in plant engineering, power engineering, transportation & logistics, as well as display control and gateway.

FEATURES

- Latest Intel® Atom embedded processor with low power and quad core technology Intel® Q87 Chipset
- Dual channel SO-DIMM socket up to 16GB DDR3L Memory
- 1x 2.5" SATA HDD/SSD, 1x mSATA
- 1x RS-232/422/485, 3x RS-232, 1x USB3.0, 3x USB2.0, 2x Gigabit Ethernet Port
- Triple Display by DVI-D/VGA/DP
- 1x Antenna hole for WiFi or 3G module to use
- 1x Half-size Mini-PCIe socket (support PCIe & USB signal)
- 1x Full-size Mini-PCIe socket (support mSATA)
- OP Vibration: 5Grms/10~500Hz
- OP Shock: 50G, 11msec
- IP40 Rating

ORDERING GUIDE

AS5-3412	(R).ATO.WEBS-3392.Rugged Mini-ITX System.WADE-8079.
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System

M/B	WADE-8079 Series
System Chipset	Intel® Baytrail SoC
CPU	- Intel® Atom™ E3845, 2M L2 Cache, 1.91GHz, 10W TDP (4C/4T) - Intel® Atom™ J1900, 2M L2 Cache, 2GHz, 10W TDP (4C/4T)
BIOS	Phoenix(EFI) BIOS
System Memory	Dual 204-pin SO-DIMM socket supports DDR3L 1333/1600 up to 16 GB
Storage	1x 2.5" SATA HDD/SSD, 1x mSATA
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
H/W Status Monitor	- Temperature (CPU & System) - Voltage (CPU Vcore, VBAT, 5VSB, 12V, 5V, 3.3V)
Expansion	- 1x Half-size Mini-PCIe socket (USB+PCIe) - 1x Full-size Mini-PCIe socket (mSATA)

External I/O

Serial Port	4x COM ports (1x RS-232/422/485 by BIOS, 3x RS-232)
Display	1x DVI-D, 1x VGA, 1x DP
USB	1x USB3.0, 4x USB2.0
Audio	N/A
Ethernet	2x Gigabit Ethernet (Dual Intel® I210IT)
GPIO	N/A
Other	1x Antenna hole for WiFi or 3G module

Power Supply Unit

Power Input	DC 12V ~ 24V
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Environmental

Operation Temperature	-10°C ~ 45°C
Storage Temperature	-40°C ~ 80°C
Relative Humidity	95%@40°C, non-condensing
Operation Vibration	5Grms/10-500Hz, IEC 60068-2-06
Operation Shock	50G, 11 msec, IEC 60068-2-27

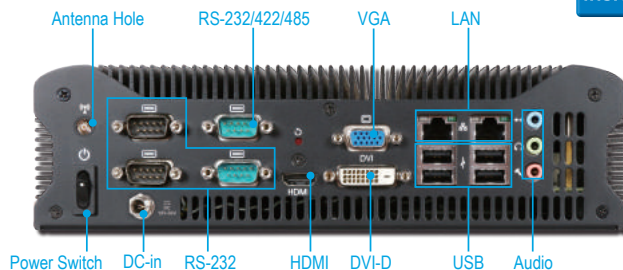
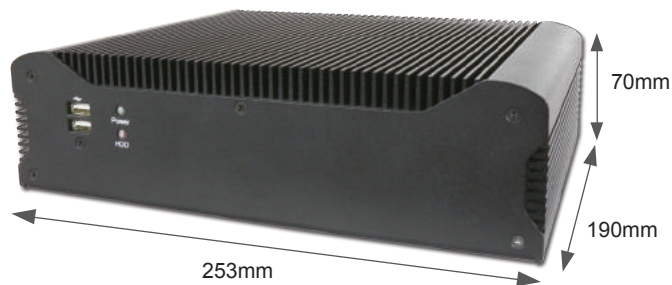
Mechanical

Dimension	200(W) x 200(D) x 51(H) mm; 7.9"(W) x 7.9"(D) x 2"(H)
Weight	2.2 kg
Mounting	Wall, DIN Rail, Panel mounting kit



WEBS-3560B

Embedded Rugged Fan-less System with
Intel® Celeron and Core™ i5/i7 based
Mini-ITX Board



The WEBS-3560B builds on Intel® mobile QM57 chipset and takes advantages of Intel® Core™ i5/i7 mobile processor technologies that can support dual channel DDR3 memory. Support two Gigabit Ethernet ports and one Mini-PCle socket. The WEBS-3560B is an ideal platform with rich I/O and high resolution for POS, kiosk, digital signage, and surveillance security monitoring applications.

FEATURES

- Fan-less and optional cable-less design for easy maintenance
- Intel® Celeron & Core™ i5/i7 Mobile PGA type processor supported
- Intel® QM57 Chipset
- Intel® Active Management Technology (Intel® AMT 6.0)
- Dual channel SO-DIMM sockets up to 8GB DDR3 Memory
- 1x 2.5" SATA HDD/SSD, 1x SATA DOM
- One Full-size Mini-PCle socket (USB + PCIe x1 signal)
- 1x RS-232/422/485, 3x RS-232, 6x USB2.0, 2x Gigabit Ethernet port
- Rich I/O is good for versatile applications
- Triple Display by VGA/HDMI/DP
- Rugged design is good for using in harsh environment
- OP Vibration: 5Grms/10~500Hz
- OP Shock: 50G, 11msec

ORDERING GUIDE

AS5-3269	(R).ATO.WEBS-3560B.Mini-ITX System
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System

Board Dimension	WADE-8020
System Chipset	Intel® BD82QM57 PCH
CPU	- Intel® Core™ i7-620M, 4M L2 Cache, up to 2.66 GHz, 35W TDP (2C) - Intel® Core™ i5-520M, 3M L2 Cache, up to 2.40 GHz, 35W TDP (2C) - Intel® Celeron P4500, 2M L2 Cache, up to 1.86 GHz, 35W TDP (2C)
BIOS	AMI uEFI BIOS (SPI ROM)
System Memory	Dual 204-pin SO-DIMM socket supports DDR3 Memory up to 8GB
Storage	1x 2.5" SATA HDD/SSD, 1x SATA DOM
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
H/W Status Monitor	- Temperature (CPU & System) - Voltage (CPU Vcore, VBAT, 5VSB, 12V, 5V, 3.3V)
Expansion	1x Full-size Mini-PCle socket

External I/O

Serial Port	4x COM port (1x RS-232/422/485 by Jumper, 3x RS-232)
Display	1x VGA, 1x DVI-D, 1x HDMI
USB	2x USB2.0 (Front), 4x USB2.0 (Rear)
Audio	Line-in/Line-out/Mic-in (ALC888)
Ethernet	2x Gigabit Ethernet (Intel® 82574L + 82577LM)
GPIO	N/A
Other	N/A

Power Supply Unit

Power Input	DC 12V ~ 36V
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Environmental

Operation Temperature	-5°C ~ 45°C
Storage Temperature	-20°C ~ 80°C
Relative Humidity	95% @ 40°C, non-condensing
Operation Vibration	5Grms/10-500Hz, IEC 60068-2-06
Operation Shock	50G, 11 msec, IEC 60068-2-27

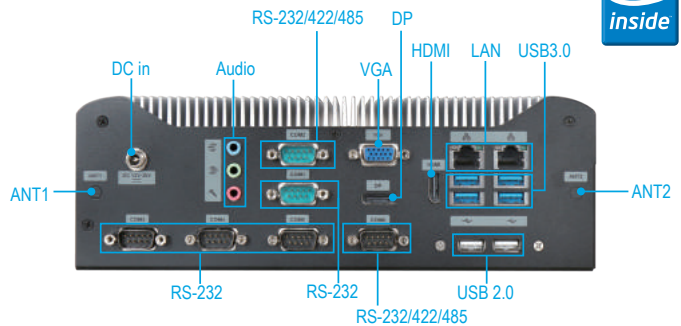
Mechanical

Dimension	253(W) x 190(D) x 70(H) mm; 10"(W) x 7.5"(D) x 2.8"(H)
Weight	4.2 kg
Mounting	Desk, Wall/Panel mounting



WEBS-3581

Embedded Rugged Fan-less System
with Intel® Celeron and Core™ i3/i5/i7
based Mini-ITX Board



The WEBS-3581 builds on Intel® desktop Q87 chipset and takes advantages of Intel® Core™ i3/i5/i7 desktop processor technologies that can support dual channel DDR3 memory. Support two Gigabit Ethernet ports and one Mini-PCle socket. The WEBS-3581 is an ideal platform with rich I/O and high resolution for POS, kiosk, digital signage, and surveillance security monitoring applications.

FEATURES

- 4th generation Intel® Celeron & Core™ i3/i5/i7 Desktop processor (Quad-Core CPU supported)
- Intel® Q87 Chipset
- Intel® Core™ i High performance fan-less embedded Box PC
- Dual Long-DIMM DDR3 up to 16GB
- 2x 2.5" SATA HDD/SSD, 1x SATA DOM
- 1x Full-size Mini-PCle socket
- 2x RS-232/422/485, 4x RS-232, 4x USB3.0, 2x USB2.0, 2x Gigabit Ethernet port
- Rich I/O is good for versatile applications
- Triple Display by VGA/HDMI/DP
- 2x Antenna hole for WiFi or 3G/GPS module to use
- Rugged design is good for using in harsh environment
- OP Vibration: 5Grms/10~500Hz
- OP Shock: 50G, 11msec

ORDERING GUIDE

AS5-3400	(R).ATO.WEBS-3581.Mini-ITX System
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System

M/B	WADE-8015
System Chipset	Intel® DH82Q87
CPU	<ul style="list-style-type: none"> - Intel® Core™ i7-4770TE, 2.3GHz, 8M L2 Cache, up to 3.30 GHz, 45W TDP (4C/8T) - Intel® Core™ i5-4570TE, 2.7GHz, 4M L2 Cache, up to 3.30 GHz, 35W TDP (2C/4T) - Intel® Core™ i3-4330TE, 2.4GHz, 4M L2 Cache, 35W TDP (2C/4T) - Intel® Pentium® G3320TE, 2.3 GHz, 3M L2 Cache, 35W TDP (2C/2T) - Intel® Celeron® G1820TE, 2.2GHz, 2M L2 Cache, 35W TDP (2C/2T)
BIOS	Phoenix uEFI BIOS (SPI ROM)
System Memory	Dual 240-pin Long-DIMM socket supports DDR3 1333/1600 up to 16GB
Storage	2x 2.5" SATA HDD/SSD, 1x SATA DOM
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
H/W Status Monitor	<ul style="list-style-type: none"> - Temperature (CPU & System) - Voltage (CPU Vcore, VBAT, 5VSB, 12V, 5V, 3.3V)
Expansion	1x Full-size Mini-PCle socket

External I/O

Serial Port	6x COM port (2x RS-232/422/485 selectable by BIOS, 4x RS-232)
Display	1x VGA, 1x DP+, 1x HDMI
USB	4x USB3.0, 2x USB2.0
Audio	Line-in/Line-out/Mic-in (ALC886)
Ethernet	2x Gigabit Ethernet (Intel® WGI217LM + WGI210AT)
GPIO	1x Programmable 8-bit Digital I/O
Other	<ul style="list-style-type: none"> - 2x Antenna hole for WiFi or 3G/GPS module - 1x EXT Power Switch

Power Supply Unit

Power Input	DC 12V ~ 36V
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Environmental

Operation Temperature	-20°C ~ 50°C
Storage Temperature	-40°C ~ 80°C
Relative Humidity	95% @ 40°C, non-condensing
Operation Vibration	5Grms/10-500Hz, IEC 60068-2-06
Operation Shock	50G, 11 msec, IEC 60068-2-27

Mechanical

Dimension	253(W) x 191(D) x 85(H) mm; 10"(W) x 7.4"(D) x 3.3"(H)
Weight	4.6 kg
Mounting	Wall mounting





Design Concept for WEBS-3583

Product Introduction

Portwell's WEBS-3583 is high performance fanless Box PC, powered by the Intel® 4th generation Intel® Core™ i7/i5/i3/Celeron® processor.

WEBS-3583 incorporate Intel newest mobile and desktop processor technology and Portwell's innovative PCI/PCIe expansion modularization design to construct a reliable and versatile embedded system. Using Intel® 4th generation processor with integrated HD 4000 graphic graphics, the WEBS-3583 provides nearly double graphics performance over its predecessor. This platform natively supports new features such as USB 3.0, SATA3 and DDR3 1600.

This newest system adapted Portwell's innovative Box PC structure. The modularized expansion architecture can reduce the thermal effect between add-on card and system, so that your system can always work in expected thermal condition.

Product Highlight

(1) Portwell Power-Optimized & Cost-Optimized Performance Platforms

Traditional embedded systems which adopt mobile solutions are easier to design as low power while avoiding thermal issues. Mobile solutions were designed to be high-performance and low power. However, mobile CPU and chipsets are more expensive than their desktop counterparts.

Now Portwell utilizes these two advantages from Intel® TDP 35W desktop CPU and Q87chipset to provide power-optimized and cost-optimized performance platforms.

(2) Innovative Expansion Cassette

Providing an expansion slot inside a fanless controller is easy, but the real challenge is to deal with the heat generated by add-on card. That's why we design our patent expansion cassette for WEBS-3583 expansion version. By creating an isolated chamber to accommodate add-on card separately, WEBS-3583 can effectively minimize the thermal interference and maintain system stability. Additional thermal solution, such as customized heat-spreader can be applied inside cassette to realize a truly rugged fanless system with diversified add-on cards.

(3) Wide Range DC Power Input

The WEBS-3583 accepts wide range DC power input, allowing it to be powered with multiple options, no matter if 12V, 24V, 19V or 36V power adapter is available. Besides, the wide range DC power input enables product usage in a variety of situations.

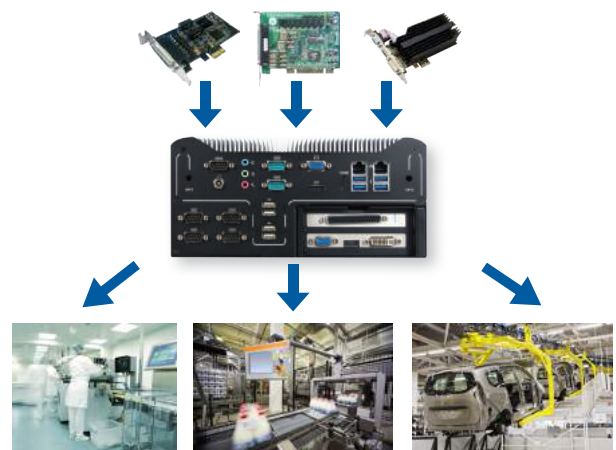
Product Feature

WEBS-3583 have lockable HDD tray, and this kind of design provides a physical level hard drive protection. The removable HDD tray provides 2x 2.5" Bay for 2.5" HDD/SSD so users don't need to remove any screws to maintain or change their storage device.

This system provides rich I/O interfaces and faster connectivity. Three independent displays(DP/HDMI/VGA), two Gigabit Ethernet, two RS-232/422/485 ports, four RS-232 ports, four USB2.0, four USB3.0, one 8 bits GPIO port and Mic-in/Line-in/Line-out.

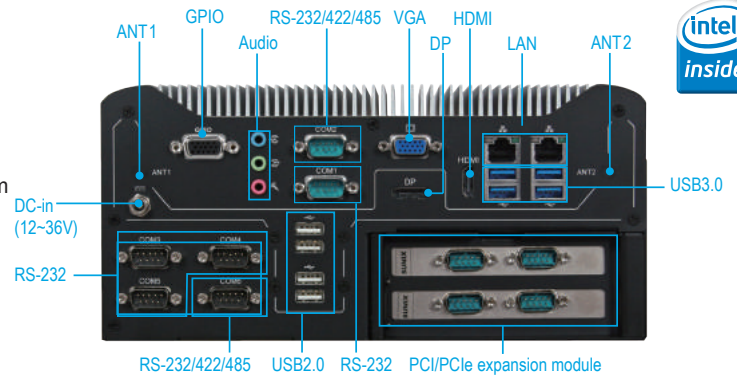
Optional wireless and 3G module can be added via a Mini-PCIe socket and additional function can be added via two PCIe x4 or one PCIe x4 + one PCI expansion slot.

The WEBS-3583 serves performance and graphic demanding application targeted at factory automation and industrial automation, which requires additional control feature via expansion slots.



WEBS-3583

Embedded Rugged Fan-less System with
Intel® Celeron and Core™ Intel® i3/i5/i7
based MINI-ITX Board



The WEBS-3583 builds on Intel® desktop Q87 chipset and takes advantages of Intel® Core™ i3/i5/i7 desktop processor technologies that can support dual channel DDR3 memory. Support two Gigabit Ethernet ports, two PCIe x4 expansion slots (or one PCIe x4 slot + one PCI expansion slot) and one Mini-PCIe socket. The WEBS-3583 is an ideal platform with rich I/O and high resolution for POS, kiosk, digital signage, factory automation and many industrial uses applications.

FEATURES

- 4th generation Intel® Celeron & Core™ i3/i5/i7 Desktop processor (Quad-Core CPU supported)
- Intel® Q87 Chipset
- Intel® Core™ i high performance fan-less embedded Box PC
- Dual Long-DIMM DDR3 up to 16GB
- 2x 2.5" SATA HDD/SSD, 1x SATA DOM
- 1x Full-size Mini-PCIe socket
- 2x PCIe x4 slot (PCIe x1 signal) or 1 x PCIe x4 slot (PCIe x1 signal) + 1 x PCI slot, innovative PCI/PCIe expansion module is easy for add-on cards replacement
- 2x RS-232/422/485, 4x RS-232, 4x USB3.0, 4x USB2.0, 2x Gigabit Ethernet port
- Triple Display by VGA/HDMI/DP
- 2x Antenna hole for WiFi or 3G/GPS module to use
- Rugged design is good for using in harsh environment
- OP Vibration: 5Grms/10~500Hz
- OP Shock: 50G, 11msec

ORDERING GUIDE

AS5-3364	(R).ATO.WEBS-3583.Mini-ITX System
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System

M/B	WADE-8015
System Chipset	Intel® DH82Q87
CPU	<ul style="list-style-type: none"> - Intel® Core™ i7-4770TE, 2.3GHz, 8M L2 Cache, up to 3.30 GHz, 45W TDP (4C/8T) - Intel® Core™ i5-4570TE, 2.7GHz, 4M L2 Cache, up to 3.30 GHz, 35W TDP (2C/4T) - Intel® Core™ i3-4330TE, 2.4GHz, 4M L2 Cache, 35W TDP (2C/4T) - Intel® Pentium® G3320TE, 2.3 GHz, 3M L2 Cache, 35W TDP (2C/2T) - Intel® Celeron® G1820TE, 2.2GHz, 2M L2 Cache, 35W TDP (2C/2T)
BIOS	Phoenix uEFI BIOS (SPI ROM)
System Memory	Dual 240-pin Long-DIMM socket supports DDR3 1333/1600 up to 16GB
Storage	2x 2.5" SATA HDD/SSD, 1x SATA DOM
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
H/W Status Monitor	<ul style="list-style-type: none"> - Temperature (CPU & System) - Voltage (CPU Vcore, VBAT, 5VSB, 12V, 5V, 3.3V)
Expansion	<ul style="list-style-type: none"> - 1x Full-size Mini-PCIe socket - 2x PCIe x4 slot (PCIe x1 Signal) - 1x PCIe x4 slot (PCIe x1 Signal) + 1x PCI slot

External I/O

Serial Port	6x COM port (2x RS-232/422/485 selectable by BIOS, 4x RS-232)
Display	1x VGA, 1x DP+, 1x HDMI
USB	4x USB3.0, 4x USB2.0
Audio	Line-in/Line-out/Mic-in (ALC886)
Ethernet	2x Gigabit Ethernet (Intel® WGI217LM + WGI210AT)
GPIO	1x Programmable 8-bit Digital I/O
Other	<ul style="list-style-type: none"> - 2x Antenna hole for WiFi or 3G/GPS module - 1x EXT Power Switch

Power Supply Unit

Power Input	DC 12V ~ 36V
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Environmental

Operation Temperature	-20°C ~ 50°C
Storage Temperature	-40°C ~ 80°C
Relative Humidity	95%@40°C, non-condensing
Operation Vibration	5Grms/10-500Hz, IEC 60068-2-06
Operation Shock	50G, 11 msec, IEC 60068-2-27

Mechanical

Dimension	253(W) x 193(D) x 120(H) mm; 10"(W) x 7.6"(D) x 4"(H)
Weight	7 kg
Mounting	Wall mounting





Product Introduction

The WEBS-5400 series fanless Box PC is ideal for video/graphic and automation control applications. This fanless, embedded ultra-low power platform is designed with an Intel® Core i3/i5/ i7™ processor which is the 4th generation Intel® Core™ ULT processor designed with triple-display support, and dual-core technology speeds up to 2.5 GHz while maintaining the same low power consumption and powerful computing ability. The WEBS-5400 series has a highly reliable chassis with a thermally-enhanced ripple fin design offering great thermal performance (-20°C ~ 55°C) while also integrating anti-vibration and shock resistance. The WEBS-5400 series is the ideal fanless Box PC controller for use with digital signage, surveillance, image processing, or machine automation industries.

Product Highlight

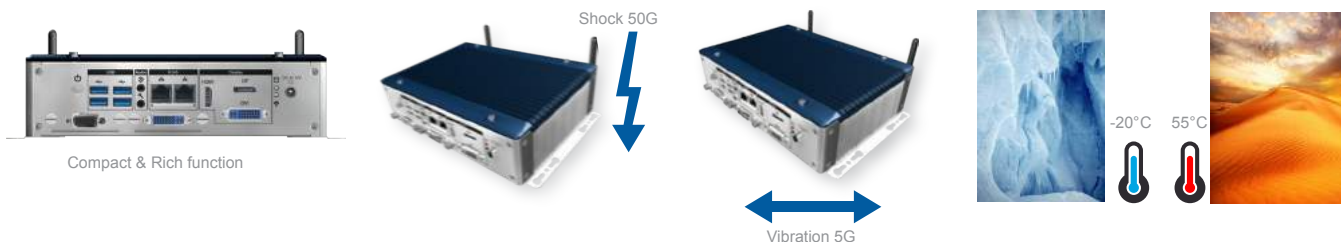
(1) Compact & Rich function/ Anti Vibration & Shock/ Wide temperature system

Compared with the previous generation, the new 4th generation Intel Core enable greater integration into mobile 2-in-1 system designs, the new 4th generation Intel Core is also the first to deliver a single SoC (System-on-Chip) solution that will give OEMs the flexibility to design even smaller, sleeker and lighter form factors. By eliminating the traditional 2-chip platform, the single BGA package which combines both CPU and PCH helps free up precious real estate space within the device, simplifying thermal designs as well as board complexity for highly integrated devices like ultrabooks and convertibles. This single chip processor will be available as the U-series with thermal design power as low as 15W.

New! 1-Chip BGA Solution	Traditional 2-Chip platform
	
<ul style="list-style-type: none">• CPU and PCH Integrated into single BGA package• 15W & 28W TDPs, 6W and below SDP• Supports LPDDR3 and DDR3L memory	<ul style="list-style-type: none">• 2 chip scalable solution: CPU and chipset• BGA and rPGA packages• 57W, 47W, and 37W TDPs• Supports DDR3L Memory• GT3e graphics

(2) Compact & Rich function /Anti Vibration & Shock /Wide temperature system

The WEBS-5400 series is a small footprint box computer designed to be both fanless and ruggedized. Withstands industrial operation environments for temperatures between (-20°C ~ 55°C), and it supports up to 16 GB of DDR3L memory, triple display with DVI-D, HDMI and DP, 5.1-CH audio and dual Intel® Gigabit Ethernet ports. It also provides 2x mini-PCIe socket, 1x SIM card holder, 1x 2.5" SATA HDD/SSD, 2x USB3.0, 2x USB2.0, 1x 8 bits GPIO, and 2x COM ports. Product reliability and stability are certified by industrial product quality tests, including anti-vibration (continuous vibrations) of up to 5 Grms, and anti-shock of up to 50 Grms tests.



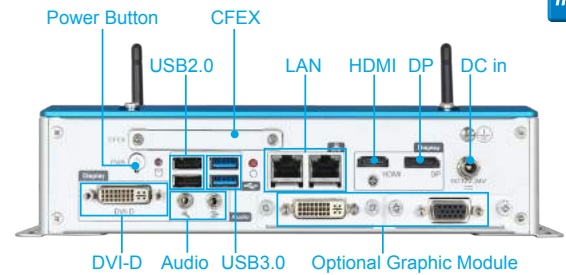
(3) 5 display output is available

WEBS-5481 can support 5 displays output in OS mode by extended mode or mirror mode. This system default can extend 2 additional display device by Optional Graphic Module, and customer can easily to remove or install this module by 2 screws.



WEBS-5481

Embedded Rugged Fan-less System
with Intel® Celeron and Core™ i3/i5/i7
based Specific Form Factor Board



The WEBS-5481 builds on Intel® Haswell ULT Low Power SoC and takes advantages of Intel® Core™ mobile processor technologies that can support dual channel DDR3L memory. Support two Gigabit Ethernet ports and two Mini-PCle sockets, even up to 5 displays by option. The WEBS-5481 is an ideal platform with HD graphic output for POS, kiosk, digital signage and transportation applications.

FEATURES

- 4th generation Intel® Celeron & Core™ i5/i7 ULT SoC
- Intel® Haswell ULT SoC low power & high performance embedded fan-less system
- Dual channel SO-DIMM socket up to 16GB DDR3L Memory
- 1x 2.5" SATA HDD/SSD, 1x CFEX, 1x mSATA
- 2x Mini-PCle socket can be used in a diversity of applications
- 1x RS-232/422/485, 1x RS-232, 2x USB3.0, 2x USB2.0, 2x Gigabit Ethernet Port
- 5 Display by VGA/HDMI/DP + Optional Graphic Module
- 2x Antenna hole + 1x onboard SIM card holder for WiFi or 3G/GPS module to use
- OP Vibration: 5Grms/10~500Hz
- OP Shock: 50G, 11msec
- IP40 Rating

ORDERING GUIDE

AS5-3366	(R).ATO.WEBS-5481.Haswell ULT. Fanless System
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System

M/B	PEB-5731-W Series
System Chipset	Intel® Haswell ULT SoC
CPU	- Intel® Core™ i7-4650U, 1.7GHz, 4M L2 Cache, up to 3.3 GHz, 15W TDP (2C/4T) - Intel® Core™ i5-4300U, 1.9GHz, 3M L2 Cache, up to 2.9 GHz, 15W TDP (2C/4T) - Intel® Celeron® 2980U, 1.6GHz, 2M L2 Cache, 15W TDP (2C/2T)
BIOS	AMI uEFI BIOS (SPI ROM)
System Memory	Dual 204-pin SO-DIMM sockets supports DDR3L 1333/1600 up to 16 GB
Storage	1x 2.5" SATA HDD/SSD, 1x CFEX, 1x mSATA
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
H/W Status Monitor	- Temperature (CPU & System) - Voltage (CPU Vcore, VBAT, 5VSB, 12V, 5V, 3.3V)
Expansion	- 1x Full-size Mini-PCle socket (USB+PCle) + SIM Card holder - 1x Half-size Mini-PCle socket (mSATA+PCle)

External I/O

Serial Port	2x COM port (1x RS-232/422/485 by BIOS, 1x RS-232)
Display	1x DVI-D, 1x HDMI, 1x DP 2x Optional Graphic Module
USB	2x USB3.0, 2x USB2.0
Audio	Line-out/Mic-in (ALC892)
Ethernet	2x Gigabit Ethernet (Intel® WGI218LM + WGI210AT)
GPIO	1x Programmable 8-bit Digital I/O
Other	2x Antenna hole for WiFi or 3G/GPS module

Power Supply Unit

Power Input	DC 12V ~ 24V
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Environmental

Operation Temperature	-20°C ~ 55°C
Storage Temperature	-40°C ~ 80°C
Relative Humidity	95%@40°C, non-condensing
Operation Vibration	5Grms/10-500Hz, IEC 60068-2-06
Operation Shock	50G, 11 msec, IEC 60068-2-27

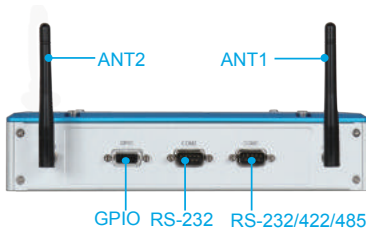
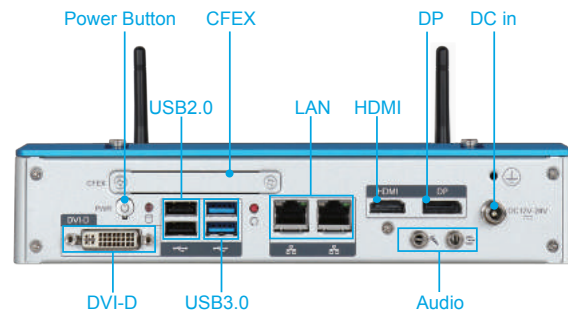
Mechanical

Dimension	235(W) x 160(D) x 60(H) mm; 9.2"(W) x 6.2"(D) x 2.3"(H)
Weight	2 kg
Mounting	Wall mounting



WEBS-5481-S

Embedded Rugged Fan-less System with Intel® Celeron and Core™ i3/i5/i7 based Specific Form Factor Board



The WEBS-5481-S, a downward/slim version of WEBS-5400 series design concept, builds on Intel® Haswell ULT Low Power SoC and takes advantages of Intel® Core™ mobile processor technologies that can support dual channel DDR3L memory. Support two Gigabit Ethernet ports and two Mini-PCle sockets. The WEBS-5481-S is an ideal platform with HD graphic output for POS, kiosk, digital signage and transportation applications.

FEATURES

- 4th generation Intel® Celeron & Core™ i5/i7 ULT SoC
- Intel® Haswell ULT SoC low power & high performance embedded fan-less system
- Dual channel SO-DIMM sockets up to 16 GB DDR3L Memory
- 1x 2.5" SATA HDD/SSD, 1x CFEX, 1x mSATA
- 2x Mini-PCle socket can be used in a diversity of applications
- 1x RS-232/422/485, 1x RS-232, 2x USB3.0, 2x USB2.0, 2x Gigabit Ethernet Port
- Triple Display by VGA/HDMI/DP
- 2x Antenna hole + 1x onboard SIM card holder for WiFi or 3G/GPS module to use
- OP Vibration: 5Grms/10~500Hz
- OP Shock: 50G, 11msec
- IP40 Rating

ORDERING GUIDE

AS5-3407	(R).ATO.WEBS-5481-S.Min-ITX Haswell ULT. Fanless System.
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System

Board Dimension	PEB-5731-W Series
System Chipset	Intel® Haswell ULT SoC
CPU	- Intel® Core™ i7-4650U, 1.7GHz, 4M L2 Cache, up to 3.3 GHz, 15W TDP (2C/4T) - Intel® Core™ i5-4300U, 1.9GHz, 3M L2 Cache, up to 2.9 GHz, 15W TDP (2C/4T) - Intel® Celeron® 2980U, 1.6GHz, 2M L2 Cache, 15W TDP (2C/2T)
BIOS	AMI uEFI BIOS (SPI ROM)
System Memory	Dual 204-pin SO-DIMM socket supports DDR3L 1333/1600 up to 16 GB
Storage	1x 2.5" SATA HDD/SSD, 1x CFEX, 1x mSATA
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
H/W Status Monitor	- Temperature (CPU & System) - Voltage (CPU Vcore, VBAT, 5VSB, 12V, 5V, 3.3V)
Expansion	- 1x Full-size Mini-PCle socket (USB+PCle) + SIM Card holder - 1x Half-size Mini-PCle socket (mSATA+PCle)

External I/O

Serial Port	2x COM port (1x RS-232/422/485 by BIOS, 1x RS-232)
Display	1x DVI-D, 1x HDMI, 1x DP
USB	2x USB3.0, 2x USB2.0
Audio	Line-out/Mic-in (ALC892)
Ethernet	2x Gigabit Ethernet (Intel® WGI218LM + WGI210AT)
GPIO	1x Programmable 8-bit Digital I/O
Other	2x Antenna hole for WiFi or 3G/GPS module

Power Supply Unit

Power Input	DC 12V ~ 24V
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Environmental

Operation Temperature	-20°C ~ 55°C
Storage Temperature	-40°C ~ 80°C
Relative Humidity	95%@40°C, non-condensing
Operation Vibration	5Grms/10-500Hz, IEC 60068-2-06
Operation Shock	50G, 11 msec, IEC 60068-2-27

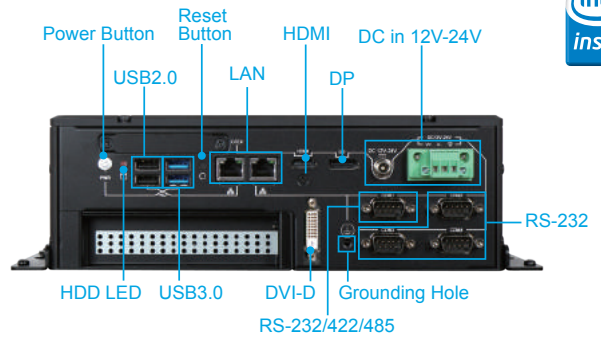
Mechanical

Dimension	235(W) x 160(D) x 50(H) mm; 9.2"(W) x 6.2"(D) x 2.0"(H)
Weight	1.8 kg
Mounting	Wall mounting



WEBS-5482-W

Embedded Rugged Fan-less System
with Intel® Celeron and Core™ i3/i5/i7
based Specific Form Factor Board



The WEBS-5482-W builds on Intel® Haswell ULT Low Power SoC and takes advantages of Intel® Core™ mobile processor technologies that can support dual channel DDR3L memory. Support two Gigabit Ethernet ports, one PCIe x4 expansion slot, and two Mini-PCle sockets. The compact design with dual power input, WEBS-5482-W, an ideal platform with HD graphic output for POS, kiosk, digital signage, and transportation applications.

FEATURES

- 4th generation Intel® Celeron & Core™ i3/i5/i7 ULT SoC
- Intel® Haswell ULT SoC low power & high performance embedded fan-less system
- Dual channel SO-DIMM socket up to 16GB DDR3L Memory
- 1x 2.5" SATA HDD/SSD, 1x mSATA
- 2x Mini-PCle socket can be used in a diversity of applications
- 1x PCIe x4 slot (PCIe x1 signal) innovative PCIe expansion module is easy for add-on cards replacement
- 1x RS-232/422/485, 3x RS-232, 2x USB3.0, 2x USB2.0, 2x Gigabit Ethernet Port
- Triple Display by DVI-D/HDMI/DP
- 2x Antenna hole + 1x onboard SIM card holder for WiFi or 3G/GPS module to use
- Dual power input
- OP Vibration: 5Grms/10~500Hz
- OP Shock: 50G, 11msec
- IP40 Rating

ORDERING GUIDE

AS5-3404	(R).ATO.WEBS-5482-W.Haswell ULT. Fanless System.
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System

Board Dimension	PEB-5731-W Series
System Chipset	Intel® Haswell ULT SoC
CPU	- Intel® Core™ i7-4650U, 1.7GHz, 4M L2 Cache, up to 3.3 GHz, 15W TDP (2C/4T) - Intel® Core™ i5-4300U, 1.9GHz, 3M L2 Cache, up to 2.9 GHz, 15W TDP (2C/4T) - Intel® Celeron® 2980U, 1.6GHz, 2M L2 Cache, 15W TDP (2C/2T)
BIOS	AMI uEFI BIOS (SPI ROM)
System Memory	Dual 204-pin SO-DIMM socket supports DDR3L 1333/1600 up to 16 GB
Storage	1x 2.5" SATA HDD/SSD, 1x CFEX, 1x mSATA
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
H/W Status Monitor	- Temperature (CPU & System) - Voltage (CPU Vcore, VBAT, 5VSB, 12V, 5V, 3.3V)
Expansion	- 1x Full-size Mini-PCle socket (USB+PCle) + SIM Card holder - 1x Half-size Mini-PCle socket (mSATA+PCle) - 1x PCIe x4 slot (PCIe x1 signal)

External I/O

Serial Port	4x COM port (1x RS-232/422/485 by BIOS, 3x RS-232)
Display	1x DVI-D, 1x HDMI, 1x DP
USB	2x USB3.0, 2x USB2.0
Audio	N/A
Ethernet	2x Gigabit Ethernet (Intel® WGI218LM + WGI210AT)
GPIO	N/A
Other	2x Antenna hole for WiFi or 3G/GPS module

Power Supply Unit

Power Input	DC 12V ~ 24V
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Environmental

Operation Temperature	-20°C ~ 50°C
Storage Temperature	-40°C ~ 80°C
Relative Humidity	95%@40°C, non-condensing
Operation Vibration	5Grms/10-500Hz, IEC 60068-2-06
Operation Shock	50G, 11 msec, IEC 60068-2-27

Mechanical

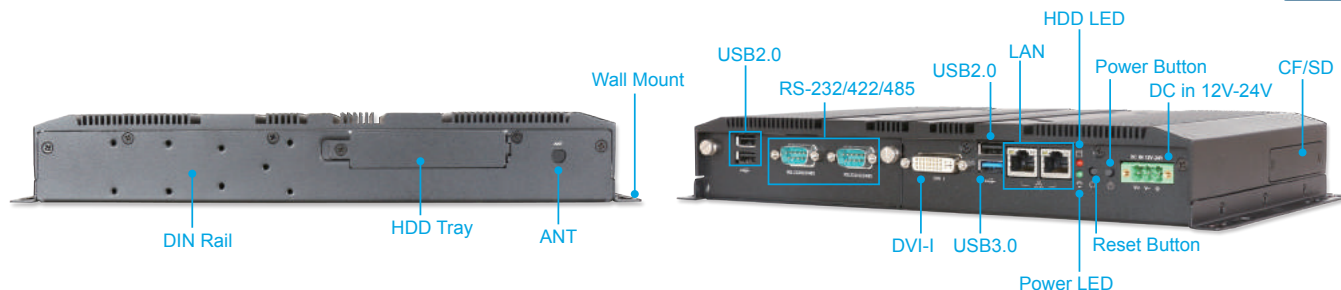
Dimension	255(W) x 187(D) x 86(H) mm; 10"(W) x 7.3"(D) x 3.3"(H)
Weight	5 kg
Mounting	Wall mounting





WEBS-5491

Embedded Rugged Fan-less System
with Intel® Atom™ E3845 Specific Form
Factor Board



The WEBS-5491 is powered by latest Intel® Atom™ quad-core processor. Despite its fan-less and cable-less design, the system can support wide temperature ranging from -30 to 70 degrees. Expandable I/O combination design makes it more flexible for various environments. By utilizing the low power technology, WEBS-5491 is an ideal platform for factory automation and transportation applications.

FEATURES

- Latest Intel® Atom™ embedded processor with low power and quad-core technology
- Fanless and cable-less design with wide temperature support (-30~70 degrees)
- One SO-DIMM socket up to 8GB DDR3L Memory
- 1x 2.5" SATA HDD/SSD, 1x CF & SD card
- 2x Gigabit Ethernet, 1x USB 3.0, 3x USB 2.0, 2x RS-232/422/485 (selectable by BIOS)
- 1x DVI-I (DVI-D & VGA signal included)
- 1x Antenna hole for WiFi or 3G module to use
- Expandable I/O combinations for diverse applications
- Support wide DC 12V ~ 24V input
- Wall, DIN rail mounting are supported
- OP Vibration: 5Grms/10~500Hz
- OP Shock: 50G, 11msec
- IP40 Rating

ORDERING GUIDE

AS5-3435	(R).ATO.WEBS-5491.Intel Baytrail E3845. Fanless System
----------	--

System

M/B	PEB-99A4-E3845
System Chipset	Intel® Baytrail SoC
CPU	Intel® Atom™ E3845, 2M L2 Cache, 1.91GHz, 10W TDP (4C/4T)
BIOS	AMI uEFI BIOS
System Memory	Single 204-pin SO-DIMM socket supports DDR3L 1333/1600 up to 8 GB
Storage	1x 2.5" SATA HDD/SSD, 1x CF, 1x SD card
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
H/W Status Monitor	- Temperature (CPU & System) - Voltage (CPU Vcore, VBAT, 5VSB, 12V, 5V, 3.3V)
Expansion	- 1x Half-size Mini-PCIe socket (USB+PCIe) - 2x RS-232/422/485, 1x RS-232 (Expansion: Option 1) - 1x Line-out, 1x RS-232/422/485, 2x USB2.0 (Expansion: Option 2)

External I/O

Serial Port	2x RS-232/422/485 (Expansion: Default)
Display	1x DVI-I
USB	1x USB3.0, 1x USB2.0, 2x USB2.0 (Expansion:Default)
Audio	1x Line-out (Expansion:Option2)
Ethernet	2x Gigabit Ethernet (Dual Intel® I210IT)
GPIO	N/A
Other	1x Antenna hole for WiFi or 3G module

Power Supply Unit

Power Input	DC 12V ~ 24V
-------------	--------------

Environmental

Operation Temperature	-30°C ~ 70°C
Storage Temperature	-40°C ~ 80°C
Relative Humidity	95%@40°C, non-condensing
Operation Vibration	5Grms/10-500Hz, IEC 60068-2-06
Operation Shock	50G, 11 msec, IEC 60068-2-27

Mechanical

Dimension	279(W) x 164(D) x 34(H) mm; 11"(W) x 6.5"(D) x 1.3"(H)
Weight	2.8 kg
Mounting	Wall, DIN Rail mounting





WEBS Mounting Solution

Wall Mount Kit



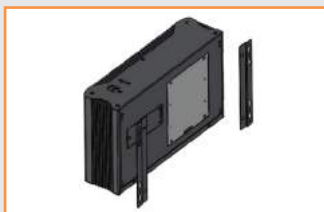
WEBS-2170/2190

System Size	150/200(W) x 150(D) x 51(H)mm
Ordering	WEBS-2120 Wall Mount Kit



WEBS-1341/1371

System Size	200(W) x 150(D) x 51(H)mm
Ordering	WEBS-1310 Wall Mount Kit



WEBS-3560B

System Size	253(W) x 190(D) x 70(H)mm
Ordering	WEBS-3560 Wall mount Kit

Panel Mount Kit



WEBS-2170/2190

System Size	150(W) x 150(D) x 51(H)mm
Ordering	WEBS-2120 Panel Mount Kit
Remark	VESA 75/100



WEBS-1341/1371

System Size	200(W) x 150(D) x 51(H)mm
Ordering	WEBS-1310 Panel Mount Kit
Remark	VESA 75/100



WEBS-3392

System Size	200(W) x 200(D) x 51(H)mm
Ordering	WEBS-3392 Panel Mount Kit
Remark	VESA 75/100

DIN Mount Kit



WEBS-2170/2190

System Size	150/200(W) x 150(D) x 51(H)mm
Ordering	WEBS-2190 DIN Rail Kit
Remark	DIN Rail H=35mm (w/o Rail)

WEBS-3392

System Size	200(W) x 200(D) x 51(H)mm
Ordering	WEBS-2120 DIN Rail Kit
Remark	DIN Rail H=35mm (w/o Rail)

WEBS-5491

System Size	270(W) x 164(D) x 34(H)mm
Ordering	DinRail-WEBS-5491
Remark	DIN Rail H=35mm (w/o Rail)

▾ FLEXIBLE AND UNIQUE

At Portwell, we take care of our customers' needs. Portwell has pledged to remain customer centric -- even amid the relative challenges of the rack-mount chassis market. Unlike most chassis suppliers, whose focus is cost-down, our priority is quality, and this is reflected in the concepts of our newly developed chassis designs.

■ NEW INDUSTRIAL DESIGN (ID)

Our new industrial design is definitely an eye-catcher, and the chassis has lines that make it easy to work with. We have invested heavily in our industrial design. Consequently, our rack-mount chassis is not just attractive, it is also built practically. This enhances the product outlook and strengthens the unity of our customers' systems.

■ ADVANCED FUNCTIONALITY INSIDE

Since they first evolved from the PC, the growing new technologies have changed the applications of the rack-mount chassis tremendously. New devices, such as USB and IEEE1394, have been completely adopted in the market. The advanced functionality inside of a Portwell chassis is consistently updated in order to meet changing trends, and assures Portwell of a position as a market leader.

■ MODULIZED DESIGN TO ENABLE SYSTEM DIFFERENTIATION AND SUITABILITY FOR FUTURE DEMANDS

The modularized, state-of-the-art design of our chassis enables Portwell to meet system differentiation and the suitability for future demands. At Portwell, we understand that our rack-mount chassis are not for use by application controllers alone. They could also be fault-tolerant systems. Therefore, some hot-swappable devices, such as Mirror or RAID disks, might be integrated into the system. Portwell keeps an eye on future demands to build the capability inside the chassis to work with your system now and in the future.

Contact your local Portwell office for more information on the state-of-the-art design of all new Portwell chassis

▾ FIRST PRIORITY FOR CUSTOMERS

AREMO®

An Outstanding Chassis For All Your Needs.

Advanced
Ruggedized
Enhanced
Modulized
Optimized

PORTWELL engineers custom-make products for customers quickly and efficiently.
Our Expertise:

- Experienced and well-trained design team.
- Integration of Industrial Design (ID), flexibility, and functionality.
- Fast sample offering for customer classification and approval.
- Collaborative design with customers.
- Fast response to customers' urgent demands:

Concept Design (3D): 2 working days

Mechanical Design: 5 working days

Samples Building: 14 working days



Chassis Reference Table



RPC-500NC/L



AREMO-4196



AREMO-3194



AREMO-2173P

PAGE	TYPE	MODEL	SLOT	ORDERING GUIDE	BACKPLANE				
					BP MODEL	PICMG	PCIe	PCI/PCI-X	ISA
33	4U	RPC-500NC/L	14	RPC-500NC RPC-500L RPC-500NC/B	PBPE-14AD64	1.3	2	3/8	
					PBPE-13A8	1.3	4	8/0	
					PBPE-13A4	1.3	8	4/0	
					PBPE-12AA64	1.3	1	2/8	
					PBPE-12A9	1.3	2	9/0	
					PBPE-12P4	1.3	8	4/0	
					PBPE-11A3	1.3	8	3/0	
					PBP-14AC-B	1.0		12/0	
					PBP-14AC	1.0		12/0	1
					PBP-14AA	1.0		10/0	2
					PBP-14A7	1.0		7/0	5
					PBP-14P4	1.0		4/0	7
					PBP-14I	1.0			13
					PBP-13R4	1.0		4/0	7
					PBP-13D4	1.0		4/0	2
33	4U	RPC-500NC/L-MX	ATX	RPC-500NC-MX RPC-500L-MX RPC-500NC-MX/B					
49	4U	AREMO-4196	14	AREMO-4196 AREMO-4196/B	PBPE-14AD64	1.3	2	3/8	
					PBPE-13A8	1.3	4	8/0	
					PBPE-13A4	1.3	8	4/0	
					PBPE-12AA64	1.3	1	2/8	
					PBPE-12A9	1.3	2	9/0	
					PBPE-12P4	1.3	8	4/0	
					PBPE-11A3	1.3	8	3/0	
					PBP-14AC-B	1.0		12/0	
					PBP-14AC	1.0		12/0	1
					PBP-14AA	1.0		10/0	2
					PBP-14A7	1.0		7/0	5
					PBP-14P4	1.0		4/0	7
					PBP-14I	1.0			13
					PBP-13R4	1.0		4/0	7
					PBP-13D4	1.0		4/0	2
49	4U	AREMO-4196-MX	ATX	AREMO-4196-MX AREMO-4196-MX/B					



Chassis Reference Table



AREMO-2173MX



AREMO-6163



AREMO-8164



AREMO-6182



AREMO-4184

PAGE	TYPE	MODEL	SLOT	ORDERING GUIDE	BACKPLANE				
					BP MODEL	PICMG	PCIe	PCI/PCI-X	ISA
35	3U	AREMO-3194	ATX	AREMO-3194-MX AREMO-3194-MX/B AREMO-3194E-MX AREMO-3194E-MX/B					
37	2U	AREMO-2173P AREMO-2173PA	6	AREMO-2173P AREMO-2173P/B AREMO-2173PA AREMO-2173PA/B	PBPE-06V464	1.3	1	0/4	
					PBPE-06V3	1.3	2	3/0	
					PBPE-06V	1.3	5		
					PEP-06V4	1.0		4/0	
39	2U	AREMO-2173MX	uATX						
41	Node	AREMO-6163	6	AREMO-6163 AREMO-6163/B	PBPE-06A364	1.3	2	1/2	
					PBPE-06P4	1.3	1	4/0	
					PBPE-06P3	1.3	2	3/0	
					PBPE-06P2	1.3	3	2/0	
					PBPE-05A364	1.3	1	1/2	
					PBP-06P464	1.0		4/0	
					PBP-06P4	1.0		4/0	
					PBP-06P3	1.0		3/0	1
					PBP-06I	1.0			5
43	Node	AREMO-8164	8	AREMO-8164 AREMO-8164/B	PBPE-08P41	1.3	3	4/0	
					PBPE-08A7	1.3		7/0	
					PBPE-07P4	1.3	2	4/0	
					PBP-08P4	1.0		4/0	2
					PBP-08P3	1.0		3/0	3
					PBP-08I	1.0			7
45	Node	AREMO-6182	6	AREMO-6182/B	PBPE-06A364	1.3	2	1/2	
					PBPE-06P4	1.3	1	4/0	
					PBPE-06P3	1.3	2	3/0	
					PBPE-06P2	1.3	3	2/0	
					PBPE-05A364	1.3	1	1/2	
					PBP-06P464	1.0		4/0	
					PBP-06P4	1.0		4/0	
					PBP-06P3	1.0		3/0	1
					PBP-06I	1.0			5
47	Node	AREMO-4184	12	AREMO-4184/B	(Same as AREMO-6182)				



RPC-500NC/L

19" 4U industrial rack-mount chassis



RPC-500NC/L is designed for PICMG SBC/SHB and RPC-500NC/L-MX for ATX mother boards which has maximum 14-slot expansion for PICMG backplane. It also supports PSU in PS/2 form factor that makes RPC-500NC/L the best selling 4U Rack-mount chassis for CTI, Industrial, Science, Engineering and Server applications.

FEATURES

- 5.25" x3 + 3.5" x2 drive bays for RAID 0, 1, 5 & CD-ROM
- Two ball-bearing cooling fans for better ventilation
- Traditional rack-mount handles
- Two card retainer positions
- Two USB ports on the control panel
- One PS/2 K/B connector cap included
- One modularized function panel for single (default) and dual (optional) systems
- ATX M/B applicable, especially for big-AT sized M/B (RPC-500L-MX)
- PS/2 redundant power supply installable

ORDERING GUIDE

- **RPC-500NC**
19" 4U rack-mount chassis for PICMG backplane
- **RPC-500NC/B**
19" 4U black rack-mount chassis for PICMG backplane
- **RPC-500NC-MX**
19" 4U rack-mount chassis for ATX M/B
- **RPC-500NC-MX/B**
19" 4U black rack-mount chassis for ATX M/B
- **RPC-500L**
19" 4U rack-mount chassis for PICMG backplane (Long size)
- **RPC-500L-MX**
19" 4U rack-mount chassis for server board (Long size)

GENERAL

Construction	Heavy-duty steel with aluminum front panel
Drive Bay	External: 3x 5.25", 1x 3.5" FDD Internal: 1x 3.5" HDD
Card Retainer	Two locations for one card retainer
Air Filter	One replaceable filter
Cooling Fan	One 12cm and one 8cm ball-bearing cooling fans
Indicator	1x Power On/Off, 1x HDD
Switch	1x Power On/Off, 1x System reset, 1x K/B lock
Connector	2x USB ports on the front panel
Standard Color	Beige, Black
Dimension	RPC-500NC: 482(W) x 450(D) x 177(H) mm; 19"(W) x 17.7"(D) x 7"(H) RPC-500L: 482(W) x 515(D) x 177(H) mm; 19"(W) x 20.3"(D) x 7"(H)
Weight	RPC-500NC: Net: 14 kg (30.9 lb); Gross: 15 kg (33.1 lb) RPC-500L: Net: 17.5 kg (38.6 lb); Gross: 18.5 kg (40.8 lb)
Backplane	PBPE-13A8: 14-slot [PCIe (4), PCI (8), PCI-X (0)] active PCIMG 1.3 backplane PBPE-13A4: 14-slot [PCIe (8), PCI (4), PCI-X (0)] active PCIMG 1.3 backplane PBPE-12A9: 14-slot [PCIe (2), PCI (9), PCI-X (0)] active PCIMG 1.3 backplane PBPE-12P4: 14-slot [PCIe (8), PCI (4), PCI-X (0)] PCIMG 1.3 backplane PBPE-11A3: 14-slot [PCIe (8), PCI (3), PCI-X (0)] active PCIMG 1.3 backplane

POWER SUPPLY

PLUTO-D3501PJ optional

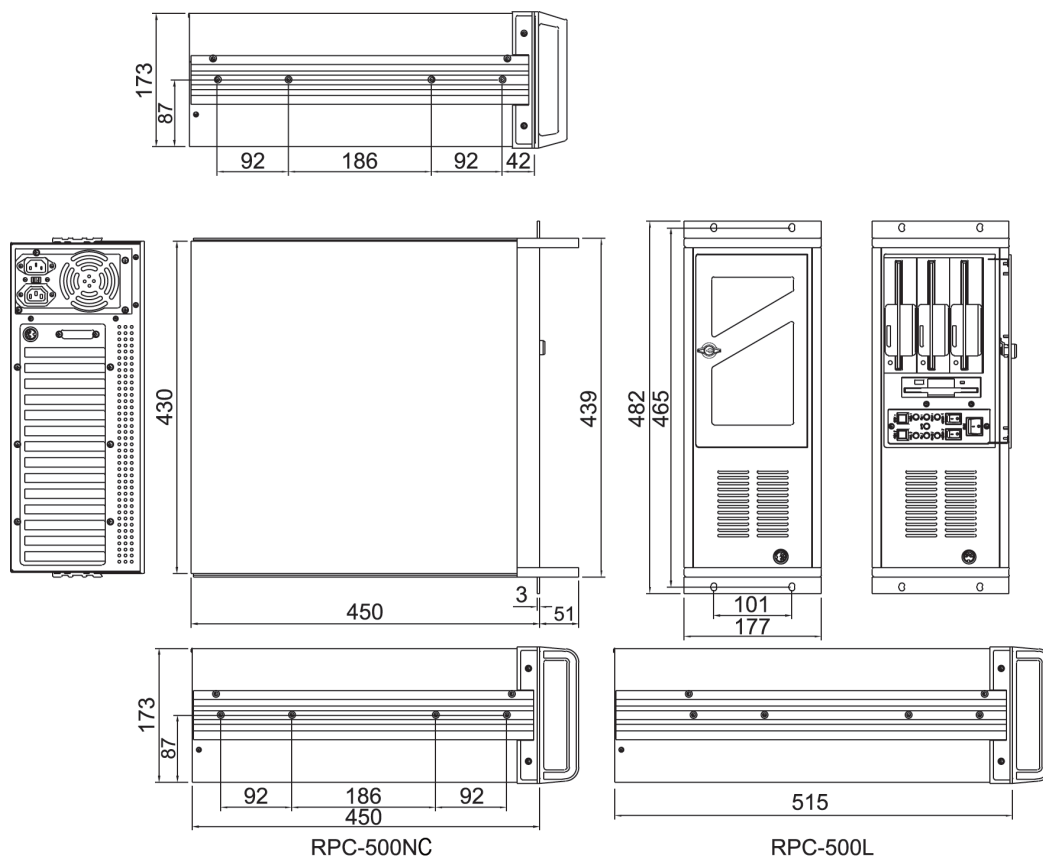
Maximum output	350W active PFC
Output Voltage & Current	+5V@12A; +12V1@18A; +12V2@18A; +3.3V@18A; -12V@0.3A, +5Vsb@2.5A
Input Voltage	90V ~ 264V AC, full range
Input Frequency	50 ~ 60Hz
Input Current	8A@115V, 8A@230V
Efficiency	> 80%
MTBF	100,000 hrs
EMI & Safety Approval	UL, TUV, CE, FCC, CB, VCCI, 80PLUS
Temperature/Humidity	Operating: 5°C ~ 50°C, 20% ~ 85%RH Storage: -40°C ~ 70°C, 10% ~ 95%RH
Dimension (WxDxH)	150 x 140 x 86 mm; 5.9" x 5.5" x 3.4"

ENVIRONMENT

Operating Temperature	0°C ~ 55°C
Storage Temperature	0°C ~ 70°C
Relative Humidity	5% ~ 95%, non-condensing
Vibration	5~7 Hz: 0.5" double amplitude displacement 7~2000 Hz: 1.5g acceleration

FEATURE	BENEFITS
■ A lockable front door with thumb lock	■ Good for dust-proof & Running status visible
■ One power on/off switch with LED indicator, one reset and one K/B lock switches inside the lockable door	■ Avoid accidental reset for better running security
■ Front replaceable air filter	■ For installing dual systems and redundant power supplies more easily
■ Two USB ports on the front panel	■ For easy access
■ One PS/2 K/B connector on the front panel	■ Convenient to connect to the keyboard
■ One K/B connector cap	■ Good for dust-proof for the front accessible K/B connector
■ Two ball-bearing cooling fans	■ Better ventilation to provide the system with higher reliability
■ Enhanced drive bracket to hold 3 x 5.25" + 1 x 3.5" (external) and 1 x 3.5" drives (internal)	■ For integrating varied systems with higher flexibility
■ Shock-resistant cushion for the drive bracket	■ Suitable for installing RAID and CD-ROM drive
■ Two adjustable positions for hold-down card retainers	■ For fixing all the cards more flexibly and tightly
■ Changeable modularized back panel for 14-slot ISA/PICMG backplane or ATX M/B	■ Only one minutes to change the back panel ■ Easy to change to different backplanes and keep stock
■ Field replaceable power supply bracket for both normal PS/2 power supply and PS/2 type redundant power supply	■ Only three minutes to change defective power supply ■ Only 30 seconds to change the defective PSU module

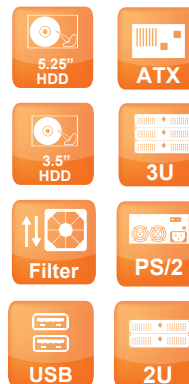
MECHANICAL DRAWING





AREMO-3194

19" 3U rack-mount chassis for ATX M/B platform



AREMO-3194-MX and AREMO-3194E-MX is designed for ATX form factor mother board within 19" 3U Rack-mount. It builds two USB interface and replaceable filter on front panel. There are two color selections, silver and black for customized demanding. AREMO-3194 series can provide efficient system assembly in Industrial and Server applications.

FEATURES

- IEEE 1394 port and two USB ports on the front panel
- Dedicated cooling fans for expiring the heat on the hot spots within the chassis
- Dustproof front-access air filter for easy cleaning and replacing
- Lockable front door provides greater security
- Thumb lock for greater security and to operate system more easily

ORDERING GUIDE

- **AREMO-3194-MX**
19" 3U rack-mount chassis for ATX M/B
- **AREMO-3194-MX/B**
19" 3U black rack-mount chassis for ATX M/B
- **AREMO-3194E-MX**
19" 3U rack-mount chassis for ATX M/B
- **AREMO-3194E-MX/B**
19" 3U black rack-mount chassis for ATX M/B

GENERAL

Construction	Heavy-duty steel
Drive Bay	External: 2x 5.25"+1x 3.5"; Internal: 1x 3.5"
Air Filter	Two replaceable air filters at the front
Cooling Fan	Two 8 cm ball-bearing cooling fans
Indicator	1x Power On/Off, 1x HDD
Switch	1x Power On/Off, 1x System reset
Speaker	One 8Ω speaker
Connector	2x USB ports and 1x IEEE 1394 port on the front panel
Standard Color	Silver, Black
Dimension	481.6(W) x 487.8(D) x 132.6(H) mm ; 19"(W) x 19.2"(D) x 5.22"(H)
Weight	Net: 16 kg (35.3 lb) ; Gross: 18 kg (39.7 lb)
M/B	Micro-ATX, ATX

POWER SUPPLY

PLUTO-D3501PJ optional for AREMO-3194E-MX

Maximum output	350W active PFC
Output Voltage & Current	+5V@12A; +12V1@18A; +12V2@18A; +3.3V@18A; -12V@0.3A, +5Vsb@2.5A
Input Voltage	90V ~ 264V AC, full range
Input Frequency	50 ~ 60Hz
Input Current	8A@115V, 8A@230V
Efficiency	> 80%
MTBF	100,000 hrs
EMI & Safety Approval	UL, TUV, CE, FCC, CB, VCCI, 80PLUS
Temperature/Humidity	Operating: 5°C ~ 50°C, 20% ~ 85%RH Storage: -40°C ~ 70°C, 10% ~ 95%RH
Dimension (WxDxH)	150 x 140 x 86 mm; 5.9" x 5.5" x 3.4"

ENVIRONMENT

Operating Temperature	0°C ~ 55°C
Storage Temperature	-20°C ~ 80°C
Relative Humidity	5% ~ 95%, non-condensing
Vibration	5~7 Hz: 0.5" double amplitude displacement 7~2000 Hz: 1.5g acceleration



FEATURE	BENEFITS
■ 350W Active PFC power supply	■ Sufficient power source for Intel® Desktop Platform
■ Cooling tunnel design	■ Better ventilation to enhance system reliability
■ More expansion slots	■ Support up to six expansion and one AGP slots for higher expansibility
■ Two USB and one IEEE 1394 ports on the front panel	■ Easy to operate the system
■ Lockable front door	■ Provide better security
■ Front replaceable air filters	■ For easy cleaning

REFINEMENT



Excellent In-System Cooling

Two 8cm ball-bearing fans provide better ventilation and keep smooth airflow



PCI Slots Expansion

PCI Slot expansion slots for adding more functions to the system



Front Replaceable Air Filters

Convenient to change air filters when needed



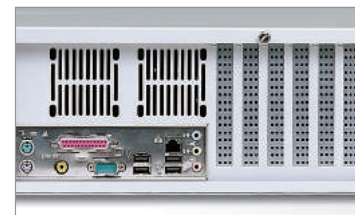
Lockable Front Door and Thumb Lock

Provide better security and operate the system more easily



Protection Cap and Touch-Free Reset Switch

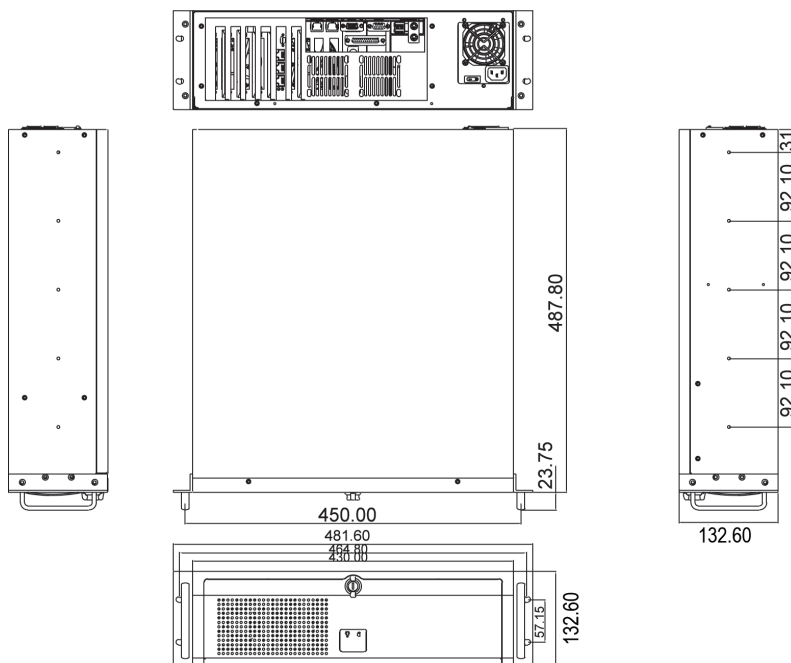
Avoid abnormal operation and increase system reliability



Excellent Cooling System

New slot cover and air holes for better ventilation

MECHANICAL DRAWING



Unit: mm



AREMO-2173P

19" 2U industrial rack-mount chassis
for PICMG backplane



AREMO-2173P, 19" 2U Rack-mount, designed for PICMG 1.0/1.3 can support 6-slot backplane that also builds two hot-swap 3.5" SATA HDD driver bays and two USB interface on front panel. AREMO-2173P can equip high wattage PS/2 form factor PSU. The build-in replaceable air filters are for easy maintenance. AREMO-2173P is suitable for Factory and Server applications.

FEATURES

- One slim CD-ROM and two hot-swap 3.5" HDD (SATA) Drive bays
- Two USB ports on the front panel
- Two 7cm ball-bearing cooling fans for better ventilation
- One power On/Off switch with protection cap and one touch free reset for secure access

ORDERING GUIDE

- **AREMO-2173P**
19" 2U rack-mount chassis with vertical 6-slot (4x PCI) PICMG backplane
- **AREMO-2173P/B**
19" 2U black rack-mount chassis with vertical 6-slot (4x PCI) PICMG 1.0 backplane
- **AREMO-2173PA**
19" 2U rack-mount chassis with vertical 6-slot (4x PCI) PICMG 1.3 backplane
- **AREMO-2173PA/B**
19" 2U black rack-mount chassis with vertical 6-slot (4x PCI) PICMG 1.3 backplane

GENERAL

Construction	Heavy-duty steel
Drive Bay	External: 1x Slim type CD-ROM, 2x Hot-swap 3.5" HDD
Air Filter	One external replaceable air filter
Cooling Fan	Two 7cm ball-bearing fans
Indicator	1x HDD+ 1x Power On/Off
Switch	1x Power On/Off (with a protection cap), 1x System reset
Speaker	One 8Ω speaker
Connector	2x USB ports equipped on the front panel
Standard Color	Silver, Black
Dimension	482(W) x 429.2(D) x 88.6(H) mm; 19"(W) x 16.9"(D) x 3.5"(H)
Weight	Net: 11.0 kg (23.1 lb); Gross: 12.0 kg (25.3 lb)
Backplane	PBPE-06V464: 6-slot [PCIe (1), PCI (0), PCI-X (4)] PICMG 1.3 backplane PBPE-06V3: 6-slot [PCIe (2), PCI (3), PCI-X (0)] PICMG 1.3 backplane PBPE-06V: 6-slot [PCIe (5)] PICMG 1.3 backplane PBPE-06V4: 6-slot [PCI (4), PCI-X (0)] PICMG 1.0 backplane

POWER SUPPLY

PLUTO-D3501PJ optional

Maximum output	350W active PFC
Output Voltage & Current	+5V@12A; +12V1@18A; +12V2@18A; +3.3V@18A; -12V@0.3A, +5Vsb@2.5A
Input Voltage	90V ~ 264V AC, full range
Input Frequency	50 ~ 60Hz
Input Current	8A@115V, 8A@230V
Efficiency	> 80%
MTBF	100,000 hrs
EMI & Safety Approval	UL, TUV, CE, FCC, CB, VCCI, 80PLUS
Temperature/Humidity	Operating: 5°C ~ 50°C, 20% ~ 85%RH Storage: -40°C ~ 70°C, 10% ~ 95%RH
Dimension (WxDxH)	150 x 140 x 86 mm; 5.9" x 5.5" x 3.4"

ENVIRONMENT

Operating Temperature	0°C ~ 55°C
Storage Temperature	-20°C ~ 80°C
Relative Humidity	5% ~ 95%, non-condensing
Vibration	5~7 Hz: 0.5" double amplitude displacement 7~2000 Hz: 1.5g acceleration

FEATURE	BENEFITS
■ 350W Active PFC power supply	■ Sufficient power source for Intel® Desktop Platform
■ Two 7cm high speed fans	■ Better ventilation to enhance system reliability
■ Two swappable SATA HDD drive bays	■ Easy to access HDD drives
■ Up to 5 PCI expansion slots	■ For system function expansion
■ Front replaceable air filters	■ Easy cleaning

REFINEMENT



Thumb Lock
Convenient to operate or protect the system



Two Swappable SATA HDD Drives
Easy to access HDD drives

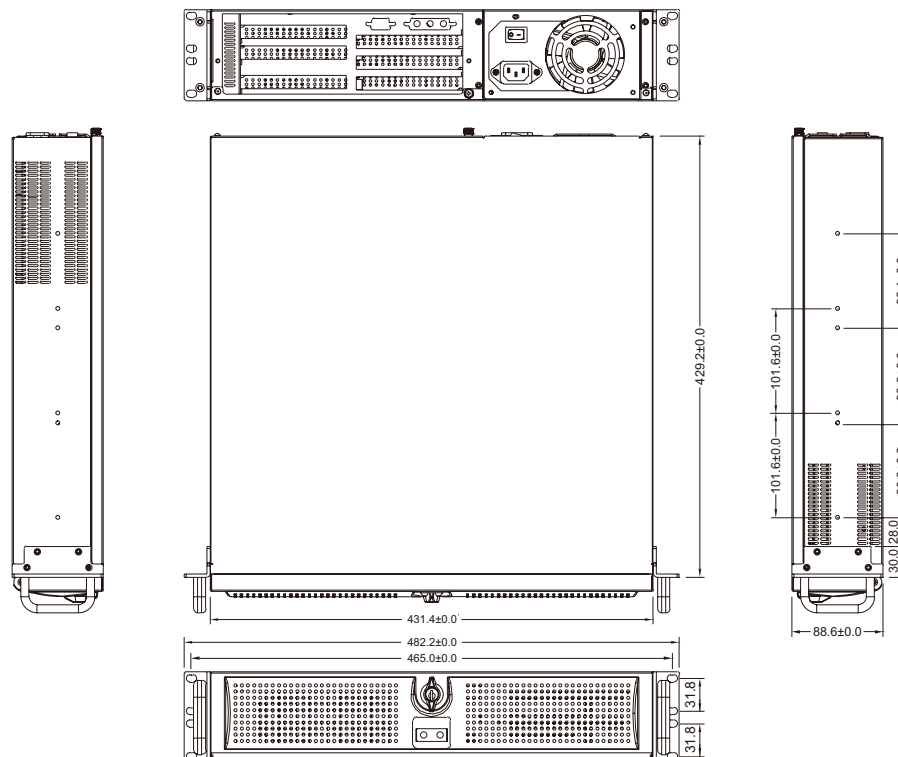


Front Replaceable Air Filters/Fans
Convenient to change air filters or fans when needed



Rear View

MECHANICAL DRAWING



Unit: mm



AREMO-2173MX

19" 2U industrial rack-mount chassis for Micro-ATX or mini-ITX mother board



AREMO-2173MX, 19" 2U Rack-mount, designed for Micro-ATX and Mini-ITX can support up to 4 low profile add-on cards that also builds two hot-swap 3.5" SATA HDD driver bays and two USB interface on front panel. AREMO-2173MX can equip high wattage PS/2 form factor PSU. The build-in replaceable air filters are for easy maintenance. AREMO-2173MX is suitable for Factory and Server applications.

FEATURES

- One slim CD-ROM and two hot-swap 3.5" HDD (SATA) Drive bays
- Two USB ports on the front panel
- Two 7cm ball-bearing cooling fans for better ventilation
- One power On/Off switch with protection cap and one touch free reset for secure access

ORDERING GUIDE

- **AREMO-2173MX**
19" 2U rack-mount chassis for micro-ATX or mini-TX M/B
- **AREMO-2173MX/B**
19" 2U black rack-mount chassis for micro-ATX or mini-TX M/B

GENERAL

Construction	Heavy-duty steel
Drive Bay	External: 1x Slim type CD-ROM, 2x Hot-swap 3.5" HDD
Air Filter	One external replaceable air filter
Cooling Fan	Two 7cm ball-bearing fans
Indicator	1x HDD+ 1x Power On/Off
Switch	1x Power On/Off (with a protection cap), 1x System reset
Speaker	One 8 Ω speaker
Connector	2x USB ports equipped on the front panel
Standard Color	Silver, Black
Dimension	482(W) x 429.2(D) x 88.6(H) mm; 19"(W) x 16.9"(D) x 3.5"(H)
Weight	Net: 11.0 kg (23.1 lb); Gross: 12.0 kg (25.3 lb)

POWER SUPPLY

PLUTO-D3501PJ optional

Maximum output	350W active PFC
Output Voltage & Current	+5V@12A; +12V1@18A; +12V2@18A; +3.3V@18A; -12V@0.3A, +5Vsb@2.5A
Input Voltage	90V ~ 264V AC, full range
Input Frequency	50 ~ 60Hz
Input Current	8A@115V, 8A@230V
Efficiency	> 80%
MTBF	100,000 hrs
EMI & Safety Approval	UL, TUV, CE, FCC, CB, VCCI, 80PLUS
Temperature/Humidity	Operating: 5°C ~ 50°C, 20% ~ 85%RH Storage: -40°C ~ 70°C, 10% ~ 95%RH
Dimension (WxDxH)	150 x 140 x 86 mm; 5.9" x 5.5" x 3.4"

ENVIRONMENT

Operating Temperature	0°C ~ 55°C
Storage Temperature	-20°C ~ 80°C
Relative Humidity	5% ~ 95%, non-condensing
Vibration	5~7 Hz: 0.5" double amplitude displacement 7~2000 Hz: 1.5g acceleration



AREMO-2173MX

19" 2U industrial rack-mount chassis for Micro-ATX or mini-ITX motherboard

FEATURE	BENEFITS
■ 350W Active PFC power supply	■ Sufficient power source for Intel® Desktop Platform
■ Two 7cm high speed fans	■ Better ventilation to enhance system reliability
■ Two swappable SATA HDD drive bays	■ Easy to access HDD drives
■ Four Low profile PCI expansion slots	■ For system function expansion
■ Front replaceable air filters	■ Easy maintenance

REFINEMENT



Thumb Lock

Convenient to operate or protect the system



Two Swappable SATA HDD Drives

Easy to access HDD drives



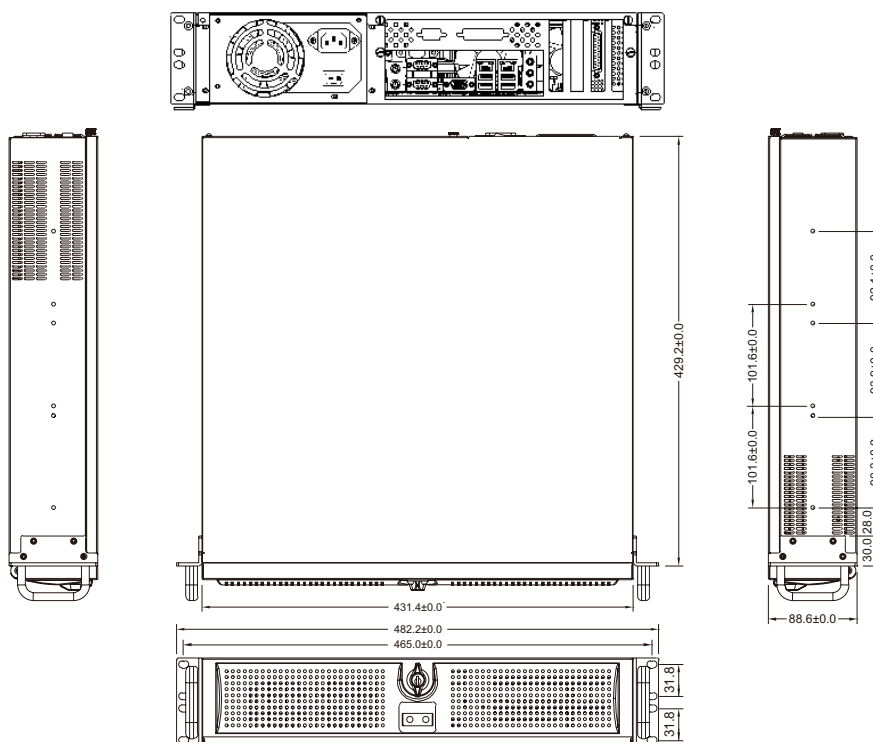
Front Replaceable Air Filters/Fans

Convenient to change air filters or fans when needed



Rear View

MECHANICAL DRAWING



Unit: mm



AREMO-6163 is designed for PICMG 1.0/1.3 with 6-slot backplane that is 4U full size industrial node chassis built with one 5.25" HDD driver space for CD/DVD-ROM, two internal 3.5" HDD driver bays and replaceable air filter for easy maintenance. AREMO-6163 equips two USB interface on front panel, and also high wattage PS/2 form factor PSU. The compact size feature of AREMO-6163 is suitable for Industrial and Engineering applications.

FEATURES

- One external 5.25" and two internal 3.5" HDD drive bays
- Two USB ports on the front panel
- Can be vertically or horizontally mounted, easy to fit into space limited environment
- One 12cm ball-bearing cooling fan for better ventilation
- One replaceable air filter for easy cleaning
- Two adjustable positions for hold-down card retainers provide better protection from vibration
- Wall-mounting bracket equipped
- Both 6-slot PICMG 1.0 or 1.3 backplane applicable; easy to change different backplanes
- Field replaceable power supply bracket for both normal PS/2 and PS/2 redundant power supply, easy for changing defected power supply

ORDERING GUIDE

- **AREMO-6163**
6-slot full-size industrial node chassis with 6-slot (3xPCI) PICMG backplane
- **AREMO-6163/B**
6-slot full-size industrial black node chassis with 6-slot (4xPCI) PICMG backplane

GENERAL

Construction	Heavy-duty steel
Drive Bay	External: 1x 5.25" Internal: 2x 3.5" HDD
Card Retainer	Two locations for one card retainer
Air Filter	One replaceable air filter at the front door
Cooling Fan	One 12cm ball-bearing fan
Indicator	1x Power On/Off, 1x HDD
Switch	1x Power On/Off, 1x System reset
Speaker	One 8Ω speaker
Connector	2x USB ports on the front panel
Standard Color	Silver, Black
Dimension	260(W) x 420.5(D) x 172(H) mm; 10.24"(W) x 16.56"(D) x 6.77"(H)
Weight	Net: 8.5 kg (18.7 lb); Gross: 9.5 kg (20.9 lb)
Backplane	PBP-06P4: 6-slot [PCIe (1), PCI (4), PCI-X (0)] PICMG 1.0 backplane PBP-06P3: 6-slot [PCIe (2), PCI (3), PCI-X (0)] PICMG 1.0 backplane PBP-06P2: 6-slot [PCIe (3), PCI (2), PCI-X (0)] PICMG 1.0 backplane

POWER SUPPLY

PLUTO-D3501PJ optional

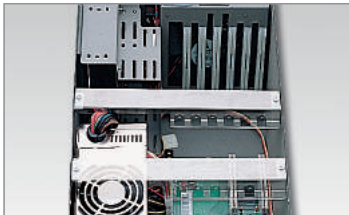
Maximum output	350W active PFC
Output Voltage & Current	+5V@12A; +12V1@18A; +12V2@18A; +3.3V@18A; -12V@0.3A, +5Vsb@2.5A
Input Voltage	90V ~ 264V AC, full range
Input Frequency	50 ~ 60Hz
Input Current	8A@115V, 8A@230V
Efficiency	> 80%
MTBF	100,000 hrs
EMI & Safety Approval	UL, TUV, CE, FCC, CB, VCCI, 80PLUS
Temperature/Humidity	Operating: 5°C ~ 50°C, 20% ~ 85%RH Storage: -40°C ~ 70°C, 10% ~ 95%RH
Dimension (WxDxH)	150 x 140 x 86 mm; 5.9" x 5.5" x 3.4"

ENVIRONMENT

Operating Temperature	0°C ~ 55°C
Storage Temperature	-20°C ~ 80°C
Relative Humidity	5% ~ 95%, non-condensing
Vibration	5~7 Hz: 0.5" double amplitude displacement 7~2000 Hz: 1.5g acceleration

FEATURE	BENEFITS
■ 5.25" drive space for CD-ROM or mobile rack	■ Easy to install software
■ Two USB ports at the front	■ Easy to operate the system
■ One replaceable air filter	■ Easy cleaning
■ Can be vertically or horizontally mounted	■ Easy to fit into different space limited environments
■ Two adjustable positions for hold-down card retainer	■ For fixing all the cards more flexibly and tightly
■ Both 6-slot and PICMG backplane applicable	■ Easy to change to different backplane and keep in stock
■ Field replaceable power supply bracket for both normal PS/2 power supply and PS/2 type redundant power supply	■ Easy maintenance

REFINEMENT



Two Adjustable Card Retainer Positions
For fixing all the cards more flexibly and tightly

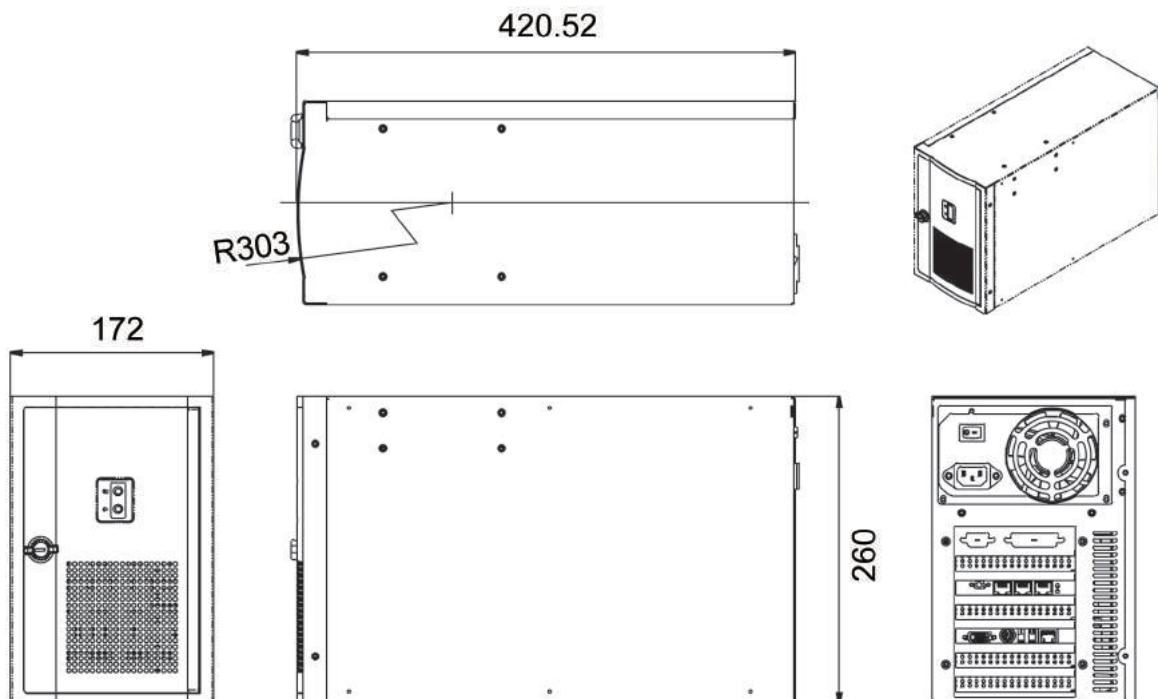


Plastic Fan Filter
For easy cleaning and replace



New HDD Drive Design
Easy to install HDD drives

MECHANICAL DRAWING



Unit: mm



AREMO-8164

8-slot full-size industrial node chassis
(Shoe-box)



AREMO-8164 is designed for PICMG 1.0/1.3 with 8-slot backplane that is 4U full size industrial node chassis built with two 5.25" HDD driver space for CD/DVD-ROM, two internal 3.5" HDD driver bays and replaceable air filter for easy maintenance. AREMO-8164 equips two USB interface on front panel, and also high wattage PS/2 form factor PSU. The compact size feature of AREMO-8164 is suitable for Industrial and Engineering applications.

FEATURES

- Two 5.25" and two internal 3.5" HDD drive bays for CD-ROM or mobile rack, easy to install software and mirror disk (RAID1)
- Two USB ports on the front panel
- Can be vertically or horizontally mounted, easy to fit into space limited environment
- One 12cm ball-bearing cooling fan for better ventilation
- One replaceable air filter for easy cleaning
- Two adjustable positions for hold-down card retainers provide better protection from vibration
- Wall-mounting bracket equipped
- Both 8-slot PICMG 1.0 or 1.3 backplane applicable; easy to change different backplanes
- Field replaceable power supply bracket for both normal PS/2 and PS/2 redundant power supply, easy for changing defected power supply

ORDERING GUIDE

- **AREMO-8164**
8-slot full-size industrial node chassis
- **AREMO-8164/B**
8-slot full-size industrial black node chassis

GENERAL

Construction	Heavy-duty steel
Drive Bay	External: 1x 5.25" Internal: 2x 3.5" HDD
Card Retainer	Two locations for one card retainer
Air Filter	One replaceable air filter at the front door
Cooling Fan	One 12cm ball-bearing fan
Indicator	1x Power On/Off, 1x HDD
Switch	1x Power On/Off, 1x System reset
Speaker	One 8 Ω speaker
Connector	2x USB ports on the front panel
Standard Color	Silver, Black
Dimension	330(W) x 420.8(D) x 172(H) mm; 12.99"(W) x 16.56"(D) x 6.77"(H)
Weight	Net: 10 kg (22.1 lb); Gross: 9.5 kg (20.9 lb)
Backplane	PBP-08P41: 8-slot [PCIe (3), PCI(4), PCI-X(0)] PICMG 1.3 backplane PBP-08A4: 8-slot [PCI(7), PCI-X(0)] active PICMG 1.3 backplane PBP-07P4 : 8-slot [PCIe (2), PCI(7), PCI-X(0)] PICMG 1.3 backplane

POWER SUPPLY

PLUTO-D3501PJ optional

Maximum output	350W active PFC
Output Voltage & Current	+5V@12A; +12V1@18A; +12V2@18A; +3.3V@18A; -12V@0.3A, +5Vsb@2.5A
Input Voltage	90V ~ 264V AC, full range
Input Frequency	50 ~ 60Hz
Input Current	8A@115V, 8A@230V
Efficiency	> 80%
MTBF	100,000 hrs
EMI & Safety Approval	UL, TUV, CE, FCC, CB, VCCI, 80PLUS
Temperature/Humidity	Operating: 5°C ~ 50°C, 20% ~ 85%RH Storage: -40°C ~ 70°C, 10% ~ 95%RH
Dimension (WxDxH)	150 x 140 x 86 mm; 5.9" x 5.5" x 3.4"

ENVIRONMENT

Operating Temperature	0°C ~ 55°C
Storage Temperature	-20°C ~ 80°C
Relative Humidity	5% ~ 95%, non-condensing
Vibration	5~7 Hz: 0.5" double amplitude displacement 7~2000 Hz: 1.5g acceleration

FEATURE	BENEFITS
■ 5.25" drive bays for CD-ROM or mobile rack	■ Easy to install software and mirror disk (RAID 1)
■ Two USB ports on the front panel	■ Easy to operate the system
■ One replaceable air filter	■ Easy cleaning
■ Can be vertically or horizontally mounted	■ Easy to fit into different space limited environments
■ Two adjustable positions for hold-down card retainer	■ For fixing all the cards more flexibly and tightly
■ Both 8-slot ISA and PICMG backplane applicable	■ Easy to change to different backplane and keep in stock
■ Field replaceable power supply bracket for both normal PS/2 power supply and PS/2 type redundant power supply	■ Easy maintenance

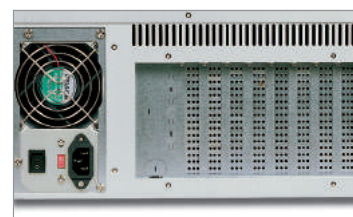
REFINEMENT



Two Adjustable Card Retainer Positions
For fixing all the cards more flexibly and tightly

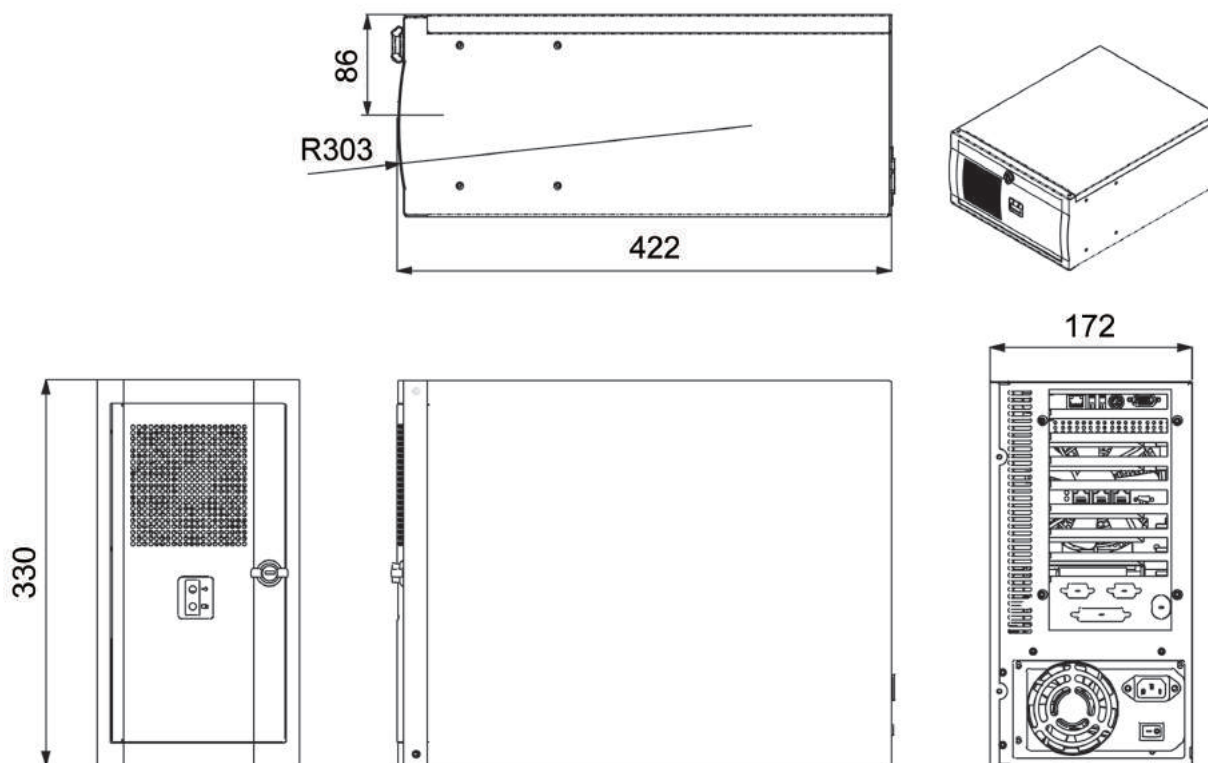


Plastic Fan Filter
For easy cleaning and replacing



Excellent Cooling System
New slot cover for better ventilation

MECHANICAL DRAWING



Unit: mm



AREMO-6182

6-slot full-size industrial node chassis (Shoe-box)



AREMO-6182 is designed for PICMG 1.0/1.3 with 6-slot backplane that is 4U full size industrial node chassis built with one 5.25" HDD driver space for CD/DVD-ROM, one internal 3.5" HDD driver bays and replaceable air filter for easy maintenance. AREMO-6182 equips two USB interface on front panel, and also high wattage 1U form factor PSU. The compact size feature of AREMO-6182 is suitable for Industrial and Engineering applications.

FEATURES

- One external 5.25" and one 3.5" internal HDD drive bay
- One replaceable air filter for easy cleaning
- Can be vertically or horizontally mounted, easy to fit into space limited environment
- One 12cm ball-bearing cooling fan for better ventilation
- The fan filter panel can be installed in different directions
- Two adjustable positions for hold-down card retainers provide better protection from vibration
- Wall-mounting bracket equipped
- Both 6-slot PICMG 1.0 or 1.3 backplane applicable; easy to change different backplanes

ORDERING GUIDE

- **AREMO-6182/B**
6-slot full-size industrial black node chassis adapted with 6-slot PICMG backplane

GENERAL

Construction	Heavy-duty steel
Drive Bay	External: 1x 5.25" Internal: 2x 3.5" HDD
Card Retainer	Two locations for one card retainer
Air Filter	One replaceable air filter at the front door
Cooling Fan	One 12cm ball-bearing fan
Indicator	1x Power On/Off, 1x HDD
Switch	1x Power On/Off, 1x System reset
Speaker	One 8Ω speaker
Connector	2x USB ports on the front panel
Standard Color	Black, Silver
Dimension	219(W) x 448(D) x 160(H) mm; 8.6"(W) x 17.6"(D) x 6.3"(H)
Weight	Net: 6.5 kg (14.3 lb); Gross: 8.0 kg (17.6 lb)
Backplane	PBP-06P4: 6-slot [PCIe (1), PCI (4), PCI (0)] PICMG 1.0 backplane PBP-06P3: 6-slot [PCIe (2), PCI (3), PCI (0)] PICMG 1.0 backplane PBP-06P2: 6-slot [PCIe (3), PCI (2), PCI (0)] PICMG 1.0 backplane

POWER SUPPLY

FSP350-701UH optional

Maximum output	350W active PFC
Output Voltage & Current	+5V@18A; +12V1@16A; +12V2@16A; +3.3V@16A; -12V@0.3A, -5V@0.3A, +5Vsb@2.5A
Input Voltage	90V ~ 264V AC, full range
Input Frequency	47 ~ 63Hz
Input Current	6A@115V, 3A@230V
Efficiency	> 80%
MTBF	100,000 hrs
EMI & Safety Approval	UL, TUV, CE, FCC, CB
Temperature/Humidity	Operating: 0°C ~ 50°C, 5% ~ 90%RH Storage: -20°C ~ 80°C, 5% ~ 95%RH
Dimension (WxDxH)	190x100x40.5 mm; 7.5"x3.9"x1.6"

ENVIRONMENT

Operating Temperature	0°C ~ 55°C
Storage Temperature	-20°C ~ 80°C
Relative Humidity	5% ~ 95%, non-condensing
Vibration	5~7 Hz: 0.5" double amplitude displacement 7~2000 Hz: 1.5g acceleration

FEATURE	BENEFITS
■ One 5.25" drive bay for EZDRV	■ For both CD-ROM and FDD support or Hot-swappable HDD
■ One replaceable air filter	■ For easy cleaning
■ Can be vertically or horizontally mounted	■ Easy to fit into different space limited environment
■ Two adjustable positions for hold-down card retainer	■ For fixing all the cards more flexibly and tightly
■ Both 6-slot ISA and PICMG backplane applicable	■ Easy to change to different backplane and keep stock
■ Field replaceable power supply bracket for both normal PS/2 power supply and PS/2 type redundant power supply	■ For ease of maintenance
■ Removable fan kit	■ Easy to replace the broken fan

REFINEMENT



Plastic Fan Filter

For easy cleaning and replacing



Can be Mounted in Different Styles

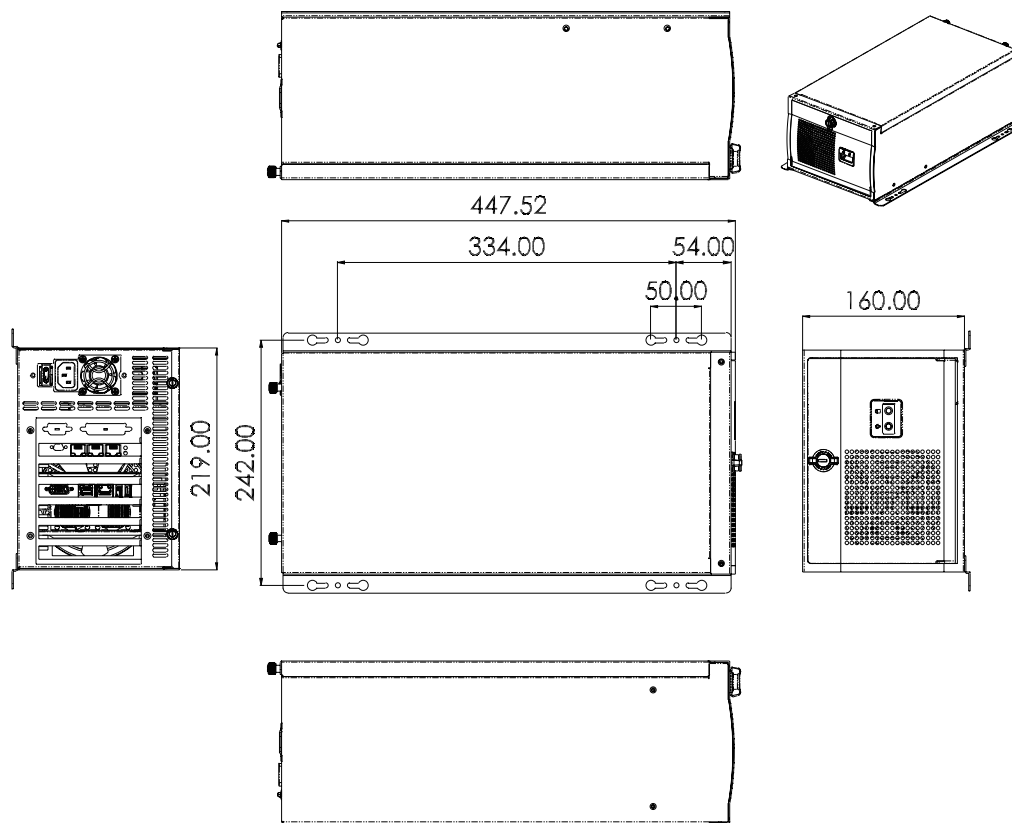
AREMO-6182 can be either vertically or horizontally installed



Dual Card Retainers

It has two positions for card clamps to hold both PCI and ISA cards tightly

MECHANICAL DRAWING



Unit: mm



AREMO-4184

19" 4U Height rack-mount chassis
with dual AREMO-6182 node chassis



AREMO-4184 combines double AREMO-6182 with dual system frame that lets double AREMO-6182 become 19" 4U Rack-mount size chassis designed for PICMG 1.0/1.3. It is built with one 5.25" HDD driver space for CD/DVD-ROM, one internal 3.5" HDD driver bays and replaceable air filter for easy maintenance in each AREMO-6182 which also equips two USB interface on front panel, and also high wattage 1U form factor PSU.

FEATURES

- Magic design for wall-mount, desk-top and rack-mount application
- Ruggedized steel node chassis suitable for harsh environment
- One built-in 12cm ball-bearing fan for better ventilation
- Built-in 1U ATX type power supply
- Support one external 5.25" and one internal 3.5" disk drive
- Optional one external 5.25" and one internal 3.5" disk drive
- Optional kit to combine two AREMO-6182 for the rack-mount application, AREMO-4184



AREMO-6182

ORDERING GUIDE

- **AREMO-4184**
Two sets of AREMO-6182 with black rack-mount kit, adapted with 6-slot PICMG backplane

GENERAL

Construction	Heavy-duty steel
Drive Bay	External: 1x 5.25" Internal: 2x 3.5"
Card Retainer	Two locations for one card retainer
Air Filter	One replaceable air filter at the front door
Cooling Fan	One 12cm ball-bearing fan
Indicator	1x Power On/Off, 1x HDD
Switch	1x Power On/Off (with a protection cap) , 1x System reset
Speaker	One 8Ω speaker
Connector	2 USB ports
Standard Color	Black
Dimension	AREMO-4184: 482(W) x 448(D) x 177(H) mm; 19"(W) x 17.6"(D) x 7"(H)
Weight	AREMO-6182: Net: 6.5 kg (14.3 lb); Gross: 8.0 kg (17.6 lb) AREMO-4184: Net: 15.5 kg (34.2 lb); Gross: 17.5 kg (38.6 lb)
Backplane	PBP-06P3: 6-slot (3xPCI) PICMG backplane PBP-06P4: 6-slot (4xPCI) PICMG backplane PBP-06I: 6-slot (6xISA) PICMG backplane

* each chassis

POWER SUPPLY

FSP350-701UH optional

Maximum output	350W active PFC
Output Voltage & Current	+5V@18A; +12V1@16A; +12V2@16A; +3.3V@16A; -12V@0.3A, -5V@0.3A, +5Vsb@2.5A
Input Voltage	90V ~ 264V AC, full range
Input Frequency	47 ~ 63Hz
Input Current	6A@115V, 3A@230V
Efficiency	> 80%
MTBF	100,000 hrs
EMI & Safety Approval	UL, TUV, CE, FCC, CB
Temperature/Humidity	Operating: 0°C ~ 50°C, 5% ~ 90%RH Storage: -20°C ~ 80°C, 5% ~ 95%RH
Dimension (WxDxH)	190x100x40.5 mm; 7.5"x3.9"x1.6"

ENVIRONMENT

Operating Temperature	0°C ~ 55°C
Storage Temperature	-20°C ~ 80°C
Relative Humidity	5% ~ 95%, non-condensing
Vibration	5~7 Hz: 0.5" double amplitude displacement 7~2000 Hz: 1.5g acceleration



FEATURE	BENEFITS
■ One 5.25" drive bay for EZDRV	■ For both CD-ROM and FDD support or Hot-swappable HDD
■ Front replaceable air filter	■ Easy cleaning & replacing
■ Two adjustable positions for hold-down card retainer	■ For fixing all the cards more flexibly and tightly
■ Both 6-slot ISA and PICMG backplane applicable	■ Easy to change to different backplane and keep in stock
■ 1U 350W ATX power supply	■ Save the space inside the chassis
■ Special kit to combine dual systems into 4U space	■ Can be integrated as a fault tolerant system

REFINEMENT



Special Configuration with EZDRV

AREMO-6182 adopts EZDRV-300NCF or mobile rack for 3.5" HDD



Easy to Mount

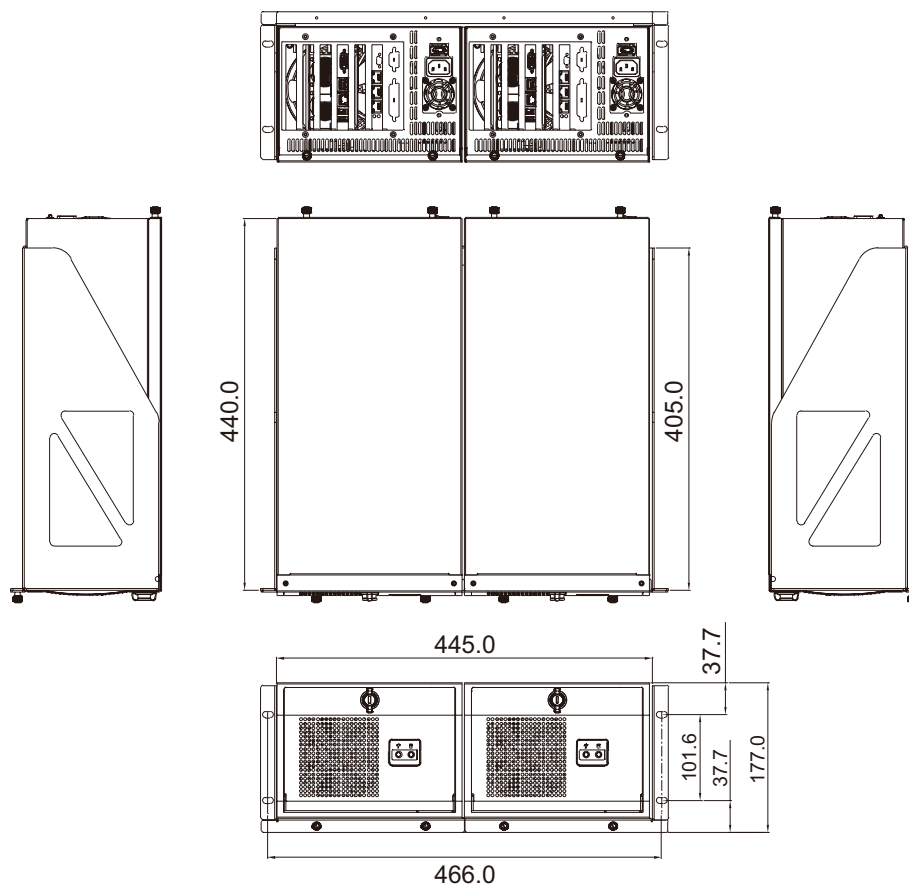
AREMO-6182 can be easily mounted on the supporter



Two become One

Combine two AREMO-6182 as a dual system 4U chassis

MECHANICAL DRAWING



Unit: mm

AREMO-4196

The Best Cost-Performance 19" 4U
Height Intel® Desktop Mother Board
Based Rack-mount Computer



AREMO-4196 and AREMO-4196-MX is 19" 4U Rack-mount chassis and designed for PICMG SBC/SHB and ATX form factor with stylish front panel design, up to 14-slot expansion for PICMG backplane. AREMO-4196 series can support PS/2 PSU, two USB interface on front panel and build with replaceable air filter. AREMO-4196 series is suitable in several vertical markets, like Factory and Server applications.

FEATURES

- Three 5.25" and one external 3.5" HDD drive bays for RAID 0, 1, 5 & CD-ROM
- Two USB ports on the front panel
- Dual 12cm ball-bearing cooling fans for better ventilation
- Two card retainer positions
- PS/2 or redundant power supply installable
- ATX M/B applicable (AREMO-4196-MX)
- Easily detached and washable air filter
- Equipped with fan control card to detect fan failure

ORDERING GUIDE

- **AREMO-4196**
19" 4U rack-mount chassis for PICMG version
- **AREMO-4196/B**
19" 4U black rack-mount chassis for PICMG version
- **AREMO-4196-MX**
19" 4U rack-mount chassis for M/B version
- **AREMO-4196-MX/B**
19" 4U black rack-mount chassis for M/B version

GENERAL

Construction	Heavy-duty steel with aluminum front panel
Drive Bay	Internal: 3x 5.25", 1x 3.5"HDD Internal: 2x 3.5"
Card Retainer	Three locations for one card retainer
Air Filter	Two replaceable air filter
Cooling Fan	Two 12cm ball-bearing cooling fans
Indicator	1x Power On/Off, 1x HDD
Switch	1x Power On/Off, 1x System reset
Speaker	One 8Ω speaker
Connector	T2x USB ports on the front panel
Standard Color	Silver, Black
Dimension	482(W) x 481(D) x 177(H) mm; 19"(W) x 18.1"(D) x 7"(H)
Weight	Net: 13.5 kg (29.8 lb); Gross: 14.5 kg (32 lb)
Backplane	PBPE-13A8: 14-slot [PCIe (4), PCI (8), PCI-X (0)] active PICMG1.3 backplane PBPE-13A4: 14-slot [PCIe (8), PCI (4), PCI-X (0)] active PICMG1.3 backplane PBPE-12A9: 14-slot [PCIe (2), PCI (9), PCI-X (0)] active PICMG1.3 backplane PBPE-12P4: 14-slot [PCIe (8), PCI (4), PCI-X (0)] PICMG 1.3 backplane PBPE-11A3: 14-slot [PCIe (8), PCI (3), PCI-X (0)] active PICMG1.3 backplane

POWER SUPPLY

PLUTO-D3501PJ optional

Maximum output	350W active PFC
Output Voltage & Current	+5V@12A; +12V1@18A; +12V2@18A; +3.3V@18A; -12V@0.3A, +5Vsb@2.5A
Input Voltage	90V ~ 264V AC, full range
Input Frequency	50 ~ 60Hz
Input Current	8A@115V, 8A@230V
Efficiency	> 80%
MTBF	100,000 hrs
EMI & Safety Approval	UL, TUV, CE, FCC, CB, VCCI, 80PLUS
Temperature/Humidity	Operating: 5°C ~ 50°C, 20% ~ 85%RH Storage: -40°C ~ 70°C, 10% ~ 95%RH
Dimension (WxDxH)	150 x 140 x 86 mm; 5.9" x 5.5" x 3.4"

ENVIRONMENT

Operating Temperature	0°C ~ 55°C
Storage Temperature	-20°C ~ 80°C
Relative Humidity	5% ~ 95%, non-condensing
Vibration	5~7 Hz: 0.5" double amplitude displacement 7~2000 Hz: 1.5g acceleration



FEATURE	BENEFITS
■ A lockable front door with thumb lock	■ Good for dust-proof & security
■ One power on/off switch and one system reset button on the front panel behind the lockable door	■ Avoid accidental reset for better running security
■ Fan control board	■ Detect fan fail and Alarm
■ Front replaceable air filter	■ For easy cleaning and install
■ Equipped two USB ports	■ Efficient Access
■ Dual 12cm ball-bearing cooling fans	■ Better ventilation to provide the system with higher reliability
■ Enhanced drive bracket to hold three 5.25" and two 3.5" HDD drives (internal)	■ For integrating varied systems with higher flexibility ■ Suitable for installing RAID and CD-ROM drive
■ Shock-resistant cushion for the drive bracket	■ Suitable for harsh industrial environment
■ Two adjustable positions for hold-down card retainers	■ For fixing all the cards more flexibly and tightly
■ Changeable modularized back panel for 14-slot ISA/PICMG backplane or ATX motherboard	■ Only one minute to change the back panel ■ Easy to change to different backplanes and keep stock
■ Field replaceable power supply bracket for both normal PS/2 power supply and PS/2 type redundant power supply	■ Only three minutes to change the defective power supply ■ Only thirty seconds to change the defective PSU module

REFINEMENT



PCI based RAID kits, supporting up to three SATA HDDs with RAID 0, 1, 5 selections. The Disk bus is E-IDE with Ultra DMA support. The RAID kits provide a GUI manager for installation and maintenance. Hot-swap and hot-spare capabilities are also supported.



Friendly design of handles, you can lift and uninstall AREMO-4196 comfortably and easily.



Power switch, RESET switch, HDD / Power / Fan-fail / LAN LEDs and two USB 2.0 ports are on the front panel.



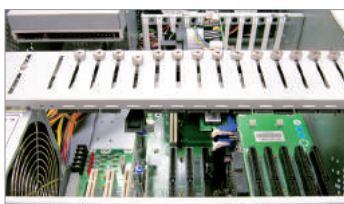
Flexible design to install power supply, the bracket can be adapt to PS/2 type or mini-redundant power supply.



AREMO-4196 enhances the drive bracket to integrate up to three 5.25" and one 3.5" disk drives within a limited space. (extra two 3.5" HDD drives for AREMO-4196-MX)



Equipped with dual 12cm ball bearing fans, AREMO-4196 provides the best ventilation up to 208CFM to expire heat from the system.



AREMO-4196 adopts the newly designed card retainer to hold both the PCI and ISA type add-on-cards more tightly.



AREMO-4196 is equipped with two USB 2.0 connectors on the front panel to have a better security control.



The washable fan filter can be easily taken off to make an easier maintenance.



LED indicators include power, HDD, Fan-fail and LAN functions.



The thumb lock offers easy operation. Users can choose to lock it or not.



The washable fan filter can be easily taken out for easier maintenance.



AREMO-4196

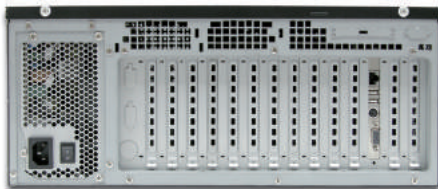
The Best Cost-Performance 19" 4U
Height Intel® Desktop Mother Board
Based Rack-mount Computer



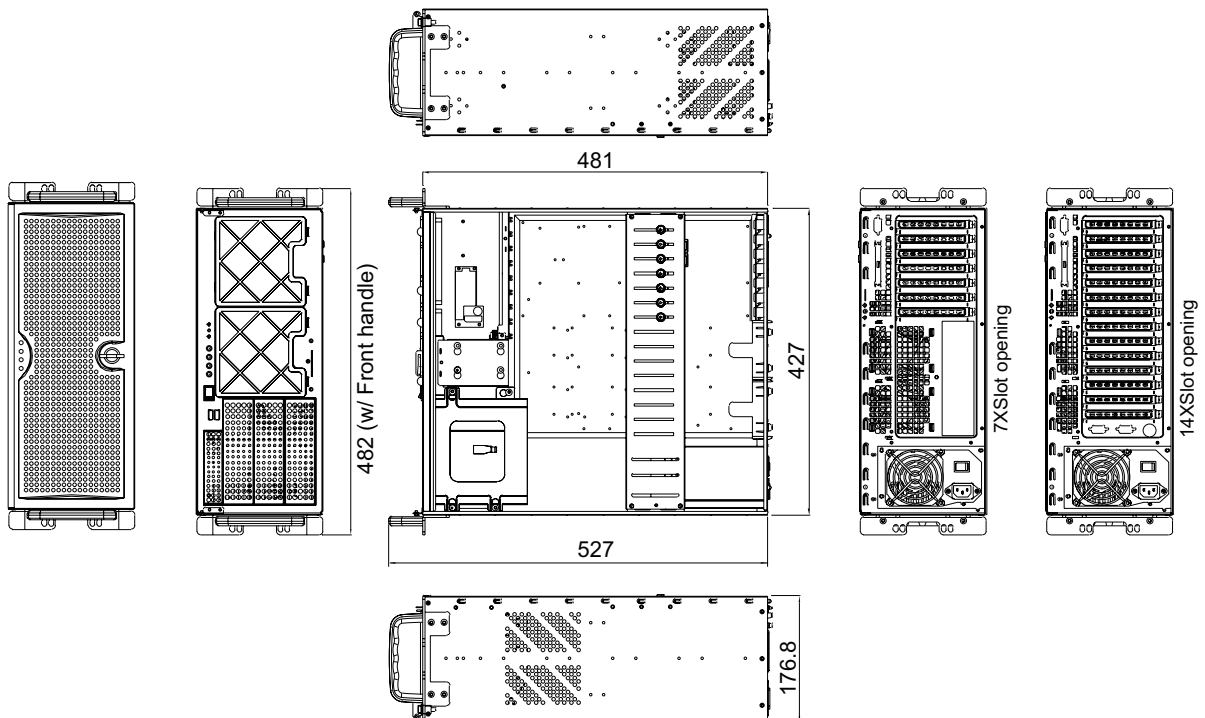
AREMO-4196



AREMO-4196-MX



MECHANICAL DRAWING



Unit: mm

EZDRV-400

5.25" compact drive set with slim type DVD-ROM, SD/CF card reader, 2USB ports and space for 2.5" HDD

External: 1xslim type DVD-ROM



Internal: 1xNB 2.5" HDD



SD Reader and 2 USB ports



CF Reader and LED for HDD

FEATURES

- All-in-one drive set can hold:
 - one slim type DVD-ROM
 - SD card reader
 - CF card reader
 - 2 USB ports
 - 2.5" HDD (internal)
- One LED for internal HDD

ORDERING GUIDE

- **EZDRV-400DR**
5.25" compact drive bracket with slim type DVD-ROM, SD/CF reader, 2 USB ports and space for 2.5" HDD
- **EZDRV-400DRW**
5.25" compact drive bracket with slim type DVD-RW, SD/CF reader, 2 USB ports and space for 2.5" HDD

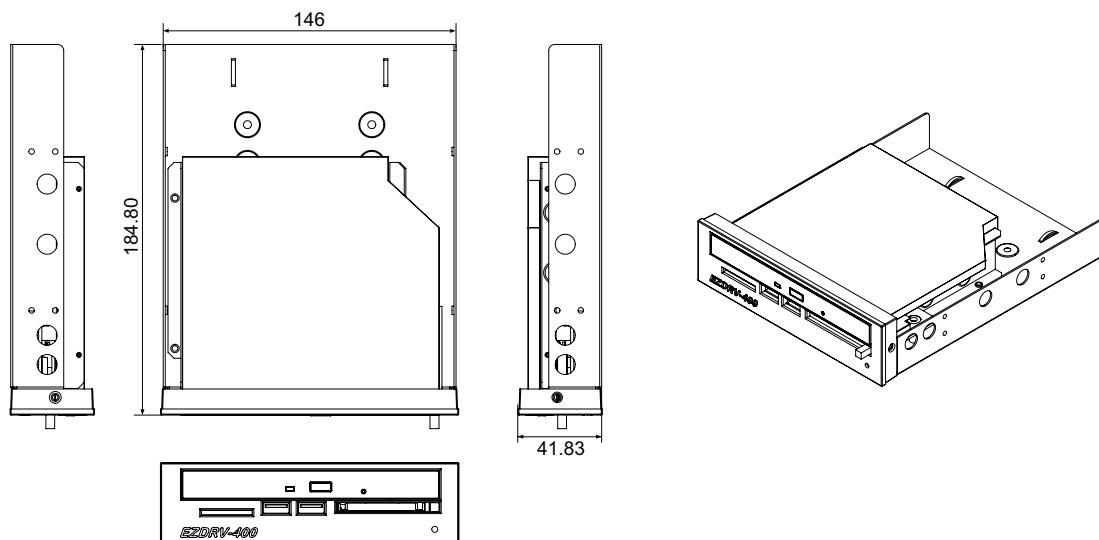
GENERAL

Construction	Heavy-duty steel with plastic front cover
Drive Bay	- External: 1x Slim type DVD-ROM + 2x 2-in-1 reader + 2x USB port - Internal: 1x 2.5" HDD
Indicator	1x HDD
Standard Color	Black
Dimension	149(W) x 185(D) x 43(H) mm; 5.9"(W) x 7.3"(D) x 1.7"(H)
Weight	Net: 0.9 kg (2 lb); Gross: 1.3 kg (2.9 lb)

ENVIRONMENT

Operating Temperature	0°C ~ 55°C
Storage Temperature	0°C ~ 70°C
Relative Humidity	5% ~ 95%, non-condensing

MECHANICAL DRAWING



Unit: mm

About Power Supply

■ PLUTO Series Can fit your Mission-Critical Applications

Portwell Inc. who has already set up for 20 years is dedicated to Industrial PC field for designing and manufacturing industrial standard and project based boards and systems in various form factors, rack-mount server, Box PC and Panel PC to meet customers' demanding and diversified applications. Certainly, suitable peripheral combinations, like chassis and power supply unit are included to providing more stable and higher performance total system solutions.

Since Box PC and Panel PC are almost based on system-oriented design, therefore, we know the quality of Power Supply Unit (PSU) is required. PSU to system is like the blood to body; hence, the crucial importance of PSU could not be over-emphasized. In an attempt to provide stable output and high reliability for different industrial applications such as communications, networks and servers, Portwell Inc. has done lots of related research on systems equipped with quality and reliable PSU. According to great experience in industrial fields and vertical markets, we believe that the best component bringing the best product, so we choose the components from Japanese manufacturers which are always earning high reputation of quality assurance from engineering verification and customer's feedback. Thus, in use of high quality PSU products, capacitors from Japanese brands, like NCC and RUBYCON are introduced into Portwell whole new PSU series, the PLUTO, to meet demanding requirements under harsh environment



To assure customers' systems to work steadily, dual forward converter in PLUTO series is design and reliability test under burn-in test condition at 0°C and 50°C for 12 hours at 100% full load is performed in order to keep stable and efficient status to meet industrial environment standards. PLUTO series also guarantee 80% de-rating output at 50°C which allows the whole system to work with enough watt at high temperature environment.

Besides safety concern, 100% HI-POT Test, Over Temperature Protection, Short Circuit Protection, Over Voltage Protection and Over Current Protection are considered into design phase; PLUTO series also pass several mechanism test, like 5G vibration and 50G shock which criteria is based on Portwell Inc. system integration experience. PLUTO series with 80PLUS efficiency level is certified and compliance of green energy is well followed. That's the corporate social responsibility Portwell Inc. takes.



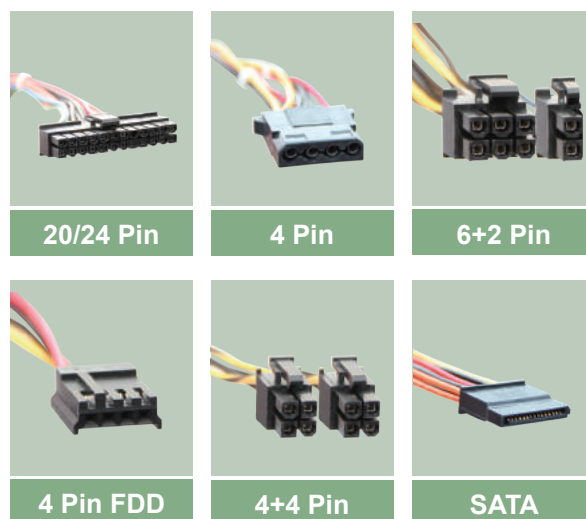


About Power Supply

■ PLUTO, your best choice, Portwell provides to you

Power consumption range of PLUTO series is covering from 150W up to as high as 500W is sufficient to support latest industrial applications. Why not much higher than 500W? First of all, the newest CPU and chipset use up-to-date technology, architecture and silicon process which means power consumption of whole components on board decreased year by year. Secondly, the higher the wattage is, the hotter the system is. The power range chosen by Portwell Inc. is the reasonable wattage we studied and come out proper configuration to meet rack-mount server's demand with most off-the-shelf chassis.

Furthermore, besides specification and quality components which are stated, the basic form factors, both Flex ATX and PS/2 ATX, serve different purpose also under Portwell's thoughtfulness. The PLUTO PSU in Flex ATX form factor is designed from 150W, 180W and 250W which is suitable for application of smaller size but higher efficient system. Such as in POS, Node Chassis or Network Systems, Flex ATX PSU not only can save space but also meet those lower power consumption applications demanding. PS/2 ATX PSU provides higher output of wattage, e.g. 350W and 500W, and various connectors (20+4 pin ATX main power cable, floppy drive power cable, 4 pin peripheral power cable, SATA power cable, 4 pin ATX +12 volt power cable and 6+2 pin PCI Express power cable) to meet customers' different requirements. For instance, PS/2 ATX PSU is mostly appropriate for the use of communication systems, servers, workstations and data storage within 2U, 3U and 4U systems.



In addition, considering over various demands in industrial fields, PLUTO series can be used in different devices, not only provide a simple power supply to customers. The comprehensive thought in technology and idea in specification will let our customers more understand what Portwell Inc. is to regard its products and to treat its partners.



180W Flex form factor Power supply with active PFC Japan made capacitor 80PLUS and OVP,OCP,SCP



250W Flex form factor Power supply with active PFC Japan made capacitor 80PLUS and OVP,OCP,SCP



500W PS/2 ATX Power Supply with active PFC Japan made capacitor 80 PLUS and SCP, OCP,OPP

PLUTO-A1801PJ

180W Flex form factor Power suppl with
Active PFC Japan made capacitor
80PLUS and OVP,OCP,SCP

180W
Flex ATX



20 Pin

4Pin P4_12V

4 Pin

4Pin FDD

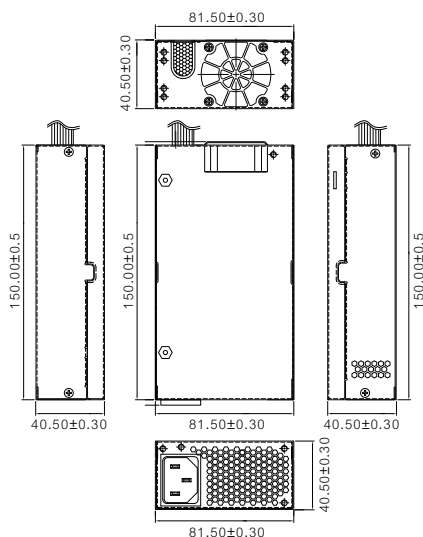
SATA

For different industrial environment, like POS, small size server station or Mini-ITX system, PSU takes an important position. For those applications, PLUTO-A1801PJ not only can provide high efficiency but also high reliability. In PLUTO-A1801PJ, capacitors are provided by NCC (Nippon Chemi-Con Corporation), and its electrical characteristics is better than other capacitors. It tolerates as high temperature as 105°C, and low current leakage.

High reliability is also an important feature for PLUTO-A1801PJ, Burn-in test in 0°C and 50°C for 12 hours at 100% loading is performed. In such test, PLUTO-A1801PJ can meet various environment standards and keep stable and efficient.

In order to protect customers' valuable data and machine, PLUTO-A1801PJ also comes with protective function such as 100% HI-POT Test, Short Circuit Protection, Over Voltage Protection and Over Current Protection.

MECHANICAL DRAWING



FEATURES

- Power Efficiency (25°C can meet the minimum efficiency(80%) for all loading conditions (20%,50,100%))
- Made in Japan capacitor (NCC)
- Internal 4 cm double bearing fan
- Leakage current: Less 3.5 mA-rms at 264Vac, 50 Hz
- Low ripple & noise
- 100% Hi-pot tested
- Hold-up Time in 16ms
- Power Good signal : TTL compatible on delay 100ms to 500ms , off delay 1ms
- Short Circuit Protection
- Over Voltage Protection
- Over Current Protection

INPUT SPECIFICATION

Input Voltage	90V~264V
Input Frequency	47-63Hz
Input Current	3.0A@115V,1.5A at 230V

OUTPUT SPECIFICATION

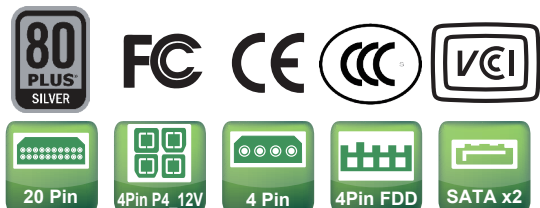
Wattage	180W
Efficiency	>85%
Holdup Time	16ms, at full load
Over Voltage Protection	+5V:5.7V~7.0V,+12V:13.3V~16V.+3.3V:3.7V~4.8V
Over Current Protection	+3.3V:40A, +5V:40A, +12V:22A
EMI & Safety Approval	CE, CB, FCC, VCCI, UL, TUV, 80PLUS, CCC

DC OUTPUT

	+5V	+3.3V	+12V	-12V	+5Vsb
Max.Load	14A	10.0A	10A	0.3A	2.5A
Min.Load	0.2A	0.1A	0.6A	0A	0A
Load Reg.	±5%	±5%	±5%	±10%	±5%
Ripple	50mV	50mV	120mV	120mV	50mV
Noise	50mV	50mV	120mV	120mV	50mV

GENERAL SPECIFICATION

MTBF	10,000 Hours at 100% loading
Temperature/ Humidity	Storage: -20°C ~ 80°C, 5% ~ 25% (non-condensing) Operation: 0°C ~ 50°C, 5% ~ 85% (non-condensing)
Dimension (W x D x H)	81.5 x 150 x 40.5mm; 5.9" x 3.2" x 1.6"
Risetime	0.1 ms to 20 ms.



250W
Flex ATX



20 Pin

4Pin P4_12V

4 Pin

4Pin FDD

SATA

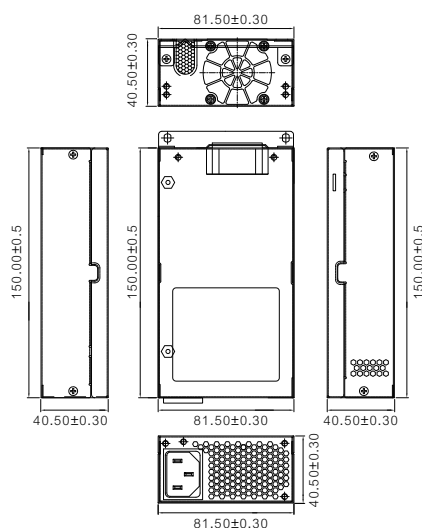
In an attempt to provide stable output and high reliability for different applications (communications, networks, servers and work stations), Portwell conducted a research to provide suitable PSU. In PLUTO series, only high quality components to meet those requirements are chosen.

The electrical characteristics of the PSU describe the quality of its outputs. In PLUTO-A2501PJ, all capacitors are from Japanese manufacturers: NCC and RUBYCON. The case material of PLUTO-A2501PJ is SECC that comes with high thermal conductive properties which helps to provide higher heat dissipating capacity.

High reliability is also an important feature for PLUTO-A2501PJ. Burn-in test in 0°C and 50°C for 12 hours at 100% loading is performed. In such test, PLUTO-A2501PJ can meet various environment standards and keep stable and efficient.

For the benefit of valuable machine and data, PLUTP-A2501PJ provides full protection including Over Temperature Protection, Short Circuit Protection, Over Voltage Protection, and Over Current Protection.

MECHANICAL DRAWING



FEATURES

- Power Efficiency (25°C and 50°C can meet the minimum efficiency (80%) for all loading conditions (20%,50,100%))
- Made in Japan capacitor (NCC and RUBYCON)
- Support Intel Celeron series
- Fan Control (Internal 4 cm fan)
- Audible Noise (40 dB ± 4dB)
- Remote on/off Control
- Hold-up Time in 17ms
- Power Good signal : TTL compatible on delay 100ms to 500ms, off delay 1ms
- Over Temperature Protection
- Short Circuit Protection
- Over Voltage Protection
- Over Current Protection

INPUT SPECIFICATION

Input Voltage	90V~264V AC
Input Frequency	47Hz~63Hz
Input Current	4.0A@90V and 264V

OUTPUT SPECIFICATION

Wattage	250W
Efficiency	>=80%
Holdup Time	17ms, at full load
Over Voltage Protection	+5V:5.5V~6.8V, +12V:13.2V~16.0V, +3.3V:3.7V~4.6V
Over Current Protection	+5V:20A, +12V:20A, +3.3V:18A
EMI & Safety Approval	CE, CB, FCC, VCCI, UL, TUV, 80PLUS

DC OUTPUT

	+5V	+3.3V	+12V	-12V	+5Vsb
Max.Load	12A	10A	16A	0.3A	2A
Min.Load	1.0A	0.5A	1.0A	0A	0A
Load Reg.	±5%	±5%	±5%	±5%	±5%
Ripple	100mV	100mV	20mV	200mV	200mV
Noise	100mV	100mV	20mV	200mV	200mV

GENERAL SPECIFICATION

MTBF	100,000 Hours at 100% loading
Temperature/ Humidity	Storage: -40°C ~ 70°C, 5% ~ 25% (non-condensing) Operation: 0°C ~ 50°C, 5% ~ 85% (non-condensing)
Dimension (W x D x H)	81.5 x 150 x 40.5mm; 3.2" x 5.9" x 1.6"
Storage altitude	-75.03~15250 meter
Operation altitude	-75.03~3000 meter



PLUTO-D3501PJ

350W PS/2 ATX PSU with active PFC
Japan made capacitor 80 PLUS and
SCP, OCP, OPP

**350W
PS/2 ATX**



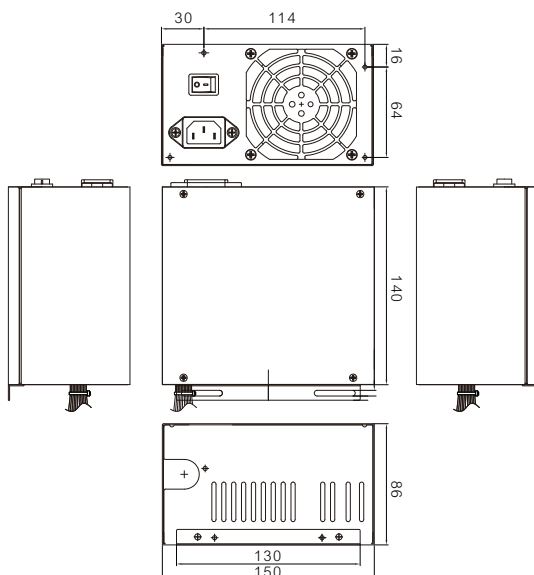
20 Pin 4Pin P4_12V 6+2 Pin 4 Pin 4Pin FDD SATA

For most PS/2 ATX in IPC applications are for server station and communication system; In those environments, heat is the major cause of output de-rating. PLUTO-D3501PJ also remains 80% de-rating output at 50°C which allows the whole system to work in high temperature environment. In addition, for various demands, PLUTO-D3501PJ provides dual +12V output for different devices.

In order to ensure the output of PLUTO-D3501PJ is stable and reliable, it has dual forward converter design and RUBYCON high quality Japanese capacitor, thus it has shown high performance at 50°C, 12 hours at 100 % loading Burn-in test.

PLUTO-D3501PJ has 80PLUS certification which helps to reduce energy consumption, and hence to save cost of electricity.

MECHANICAL DRAWING



FEATURES

- Meets ATX 12V V2.3 standard
- Dual forward converter design
- Active PFC (power factor correction) > 0.99
- Double independent +12V output
- Power Efficiency (25°C and 50°C can meet the minimum efficiency (80%) for all loading conditions (20%,50,100%))
- Leakage current: Less 3.5 mA-rms at 264Vac, 60 Hz
- Made in Japan capacitor (RUBYCON)
- Fan Control (Internal 80mm fan)
- Remote ON/OFF Control
- Hold-up Time in 16ms
- Power Good signal : TTL compatible on delay 100ms to 500ms
- Short Circuit Protection
- Over Voltage Protection
- Over Power Protection

INPUT SPECIFICATION

Input Voltage	90V~264V AC
Input Frequency	50-60Hz
Input Current	8A@115V,8A@230V

OUTPUT SPECIFICATION

Wattage	350W
Efficiency	>=80%
Holdup Time	16ms, at full load
Over Voltage Protection	3.3V@4.8V , 5V@7.0V, 12V@15.6V
EMI & Safety Approval	CE, CB, FCC, VCCI, UL, TUV, 80PLUS
Over Power/ Load Protection	Output power over 120%~160%

DC OUTPUT

	+5V	+3.3V	+12V1	+12V2	-12V	+5Vsb
Max.Load	12A	18A	18A	18A	0.3A	2.5A
Min.Load	1A	1A	1A	1A	0A	0A
Load Reg.	115W			302W		
Ripple	50mV	50mV	120mV	120mV	120mV	50mV
Noise	50mV	50mV	120mV	120mV	120mV	50mV

GENERAL SPECIFICATION

MTBF	100,000 Hours at 100% loading
Temperature/ Humidity	Storage: -40°C ~ 70°C, 10% ~ 25% (non-condensing) Operation: 5°C ~ 50°C, 20% ~ 85% (non-condensing)
Dimension (W x D x H)	150 x 140 x 85mm; 5.9" x 7.2" x 3.4"
Risetime	10 ms.



PLUTO-D5001PJ

500W PS/2 ATX Power Supply with active PFC Japan made capacitor 80 PLUS and SCP, OCP,OPP

**500W
PS/2 ATX**

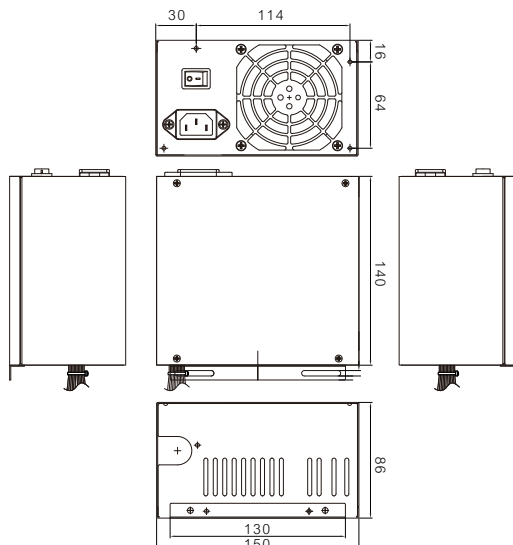


20 Pin 6+2 Pin 4+4 Pin 4 Pin 4Pin FDD SATA

To ensure PSU has well-appointed output for various devices in industrial environment, PLUTO-D5001PJ provides powerful output with dual +12V for different IPC applications. For quality output in PLUTO-D5001PJ, RUBYCON Japanese capacitors are used to reduce current leakage and lower ESR. It helps PLUTO-D5001PJ to maintain high level of stability and reliability output for various valuable machine. PLUTO-D5001PJ also passed 50°C, 12hours at 100% loading Burn-in test which shows its high reliability. In addition, PLUTO-D5001PJ remains 80% de-rating output at 50°C which allows the whole system to work in high temperature environment.

80PLUS certification can reduce energy consumption and hence to save cost of electricity, therefore, PLUTO-D5001PJ can be high efficient and keep green at the same time.

MECHANICAL DRAWING



FEATURES

- Meets ATX 12V V2.3 standard
- Dual forward converter design
- Support Intel Core i series and Xeon Series CPU
- Active PFC (power factor correction) > 0.99
- Double independent +12V output
- Power Efficiency (25°C and 50°C can meet the minimum efficiency(80%) for all loading conditions (20%,50,100%))
- Leakage current: Less 3.5 mA-rms at 264Vac, 60 Hz
- Made in Japan capacitor (RUBYCON)
- Fan Control (Internal 80mm fan)
- Remote ON/OFF Control
- Hold-up Time in 16ms
- Power Good signal : TTL compatible on delay 100ms to 500ms
- Short Circuit Protection
- Over Voltage Protection
- Over Power Protection

INPUT SPECIFICATION

Input Voltage	90V~264V AC
Input Frequency	50-60Hz
Input Current	10A@115V,8A@230V

OUTPUT SPECIFICATION

Wattage	500W
Efficiency	>=80%
Holdup Time	16ms, at full load
Over Voltage Protection	3.3V@4.8V, 5V@7.0V, 12V@15.6V
EMI & Safety Approval	CE, CB, FCC, VCCI, UL, TUV, 80PLUS
Over Power/ Load Protection	Output power over 120%~160%

DC OUTPUT

	+5V	+3.3V	+12V1	+12V2	-12V	+5Vsb
Max.Load	22A	24A	28A	20A	0.3A	2.5A
Mini.Load	1A	1A	1A	1A	0A	0A
Max.Watt	130W			456W		
Ripple	50mV	50mV	120mV	120mV	120mV	50mV
Noise	50mV	50mV	120mV	120mV	120mV	50mV

GENERAL SPECIFICATION

MTBF	100,000 Hours at 100% loading
Temperature/ Humidity	Storage: -40°C ~ 70°C, 10% ~ 95% (non-condensing) Operation: 5°C ~ 50°C, 20% ~ 85% (non-condensing)
Dimension (W x D x H)	150 x 140 x 85mm; 5.9" x 7.2" x 3.4"

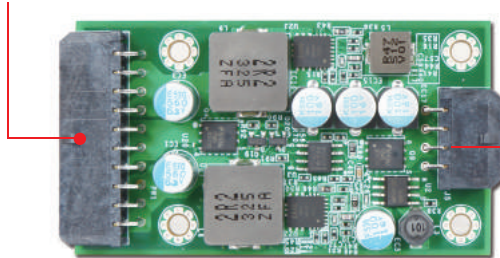


GADIWA-B1120

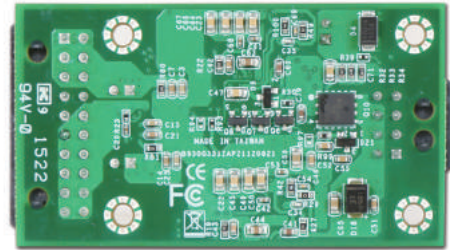
120W DC/DC 12V Input/ATX output,
Board Type Converter



Main / Mini-Fit 20 pin
output power connector



12V / Mini-Fit 8 pin
input power connector



GADIWA-B1120 is a DC to DC 12V input board type converter. It normally support continuous 120 Watts and peak 160 Watts.

GADIWA-B1120 can save more space, less than 1U width, and cost. It's not only capability for fan-less system but also suitability for different applications. Besides, the converter is made and tested by automatic production line; therefore, it can provide high quality and better performance.

FEATURES

- 12V DC/input, plug into the ATX connector with board output
- Compact and user-friendly design for installation and maintenance
- Fan-less design for mission-critical application
- Small size for 1U or higher system to save space
- -40°C to 75°C wide temperature support

SPECIFICATION

Input Voltage	12V (+5%/-4%)
Output	120Watts/ 160Watts peak
Efficiency	>90% @ 12V
MTBF	1,226,530hrs @40°C, 353,098hrs @75°C
EMI & Safety Approval	CE, FCC
Input Connector	Mini-Fit 8 pin (P/N: B6902040)
Output Connector	Mini-Fit 20 pin (P/N: B6902071)
Dimension (WxDxH)	38 x 68 x 12.5 mm
Operation Temperature	-40°C ~ 75°C

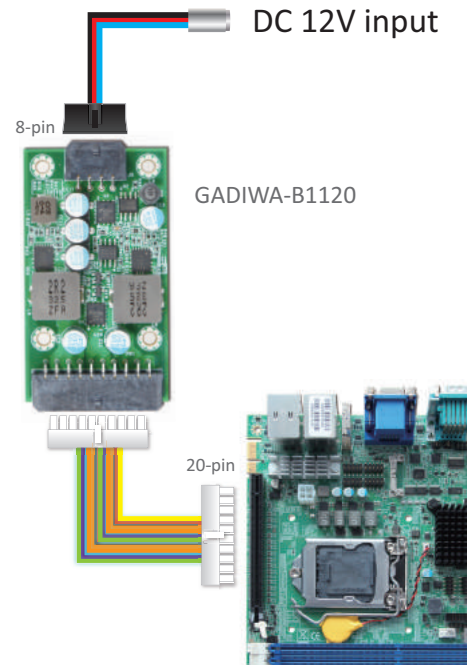
CHARACTERISTICS

Output Voltage	Load Regulation	Cross Regulation
+12V	0~6A	6A
+5V	0~6A	6A
+3.3V	0~6A	6A
+5Vsb	0~2A	1A
-12V	0~0.1A	0.1A

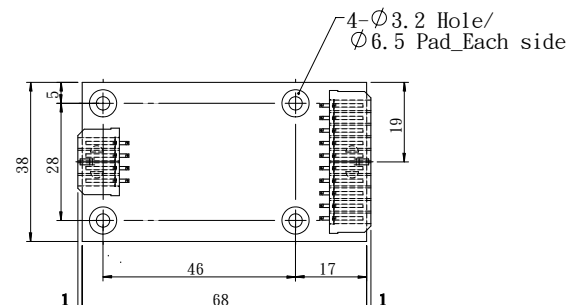
ORDERING GUIDE

- **GADIWA-B1120**
120W DC/DC 12V/input.ATX/output.Wide Temperature.Board Type Converter

INSTALLING DEMONSTRATION

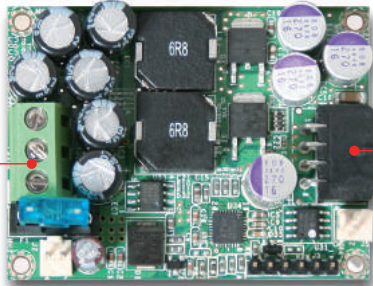


MECHANICAL DRAWING

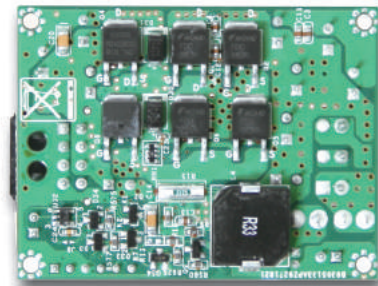




9V~27V / Mini-Fit 3 pin
input power connector



12V / Mini-Fit 8 pin
output power connector



GADIWA-R9271 is a wide input regulator for board type. GADIWA-R9271 can collocate with GADIWA-P0901 and GADIWA-1120 which are DC-DC converters; it's easily to deploy critical application. The converter is made and tested by automatic production line; therefore, it can provide high quality and performance. GADIWA-R9271 has special design for socket type fuse protection.

FEATURES

- Compact and user-friendly design for installation and maintenance
- Small size for 1U or higher system to save space
- Suitable for Car PC, Steamer, Truck, Boat and Adapter
- Special Design for Delay-Time
- Socket Type Fuse Protection

SPECIFICATION

Input Voltage	9V~27V
Line Regulation	9V~27V continuous, 7~30V<10 sec@cold start
Efficiency	>95% @ 14V input
MTBF	577,768hrs @45°C, 409,990hrs @55°C
EMI & Safety Approval	CE, FCC
Input Connector	Mini-Fit 3 pin (P/N: B6902060)
Output Connector	Mini-Fit 8 pin (P/N: B6902042)
Dimension (WxDxH)	60 x 45 x 22 mm

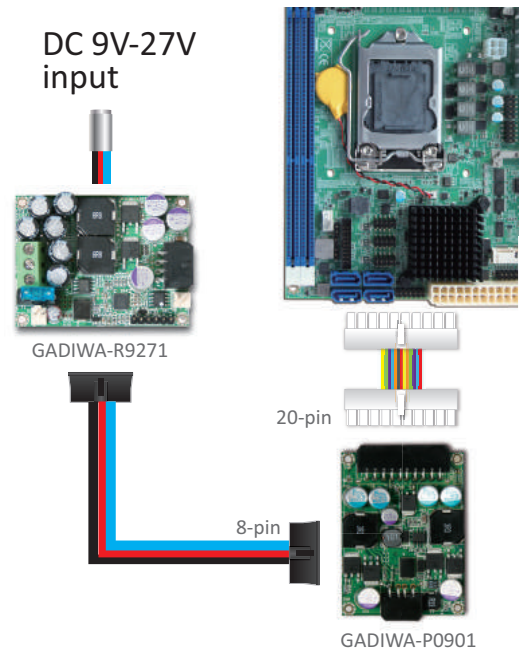
CHARACTERISTICS

Output Voltage	Load Regulation	Cross Regulation
+12V	12.3V @ 0~8.5A	12.3V @ 0~8.5A

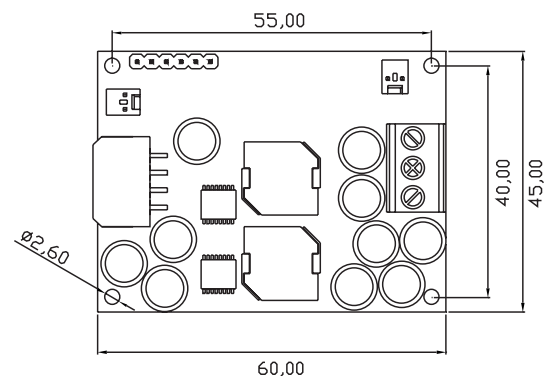
ORDERING GUIDE

- **GADIWA-R9271**
9V to 27V/Wide-input, 12V/output Regulator, Board Type

INSTALLING DEMOSTRATION



MECHANICAL DRAWING



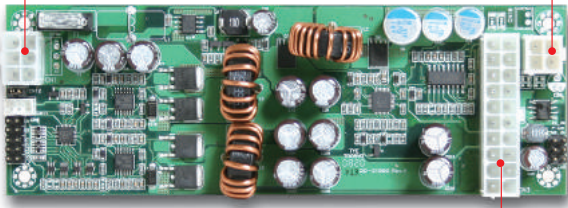
GADIWA-3160

128W DC/DC 12V~36V/wide-input,
ATX/output, Board Type Converter

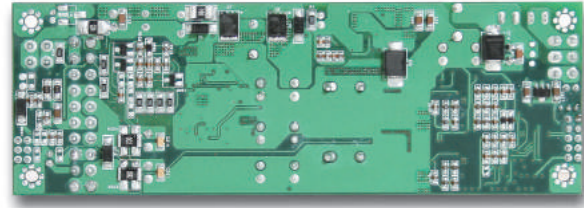


12~36V 6pin
Input Power Connector

12V 4pin Input
Power Connector



20pin Output Power
Connector



GADIWA-3160 is a wide input converter for board type. It normally support 128 Watts and peak 160 Watts. GADIWA-3160 can save more space and cost, it's not only capability for fan-less system but also suitability for different application. Gadiwa-3160 also have UL certification and watch dog function design, it'll be easy to deploy any critical application.

FEATURES

- 12~36V/Wide-input, plug into the ATX connector with board output
- Compact and user-friendly design for installation and maintenance
- Fan-less design for mission-critical application
- Small size for 1U or higher system to save space
- Watchdog Timer function

SPECIFICATION

Input Voltage	12V~36V
Line Regulation	11.5V~36V/input
Output	128Watts / 160Watts Peak
Efficiency	>85% @ 12V
MTBF	245,000hrs @45°C, 192,000hrs @55°C
EMI & Safety Approval	UL, CE, FCC
Input Connector	12V~36V / 6 pin
Output Connector	Main / ATX 20 pin
Dimension (WxDxH)	150 x 51 x 22.5 mm

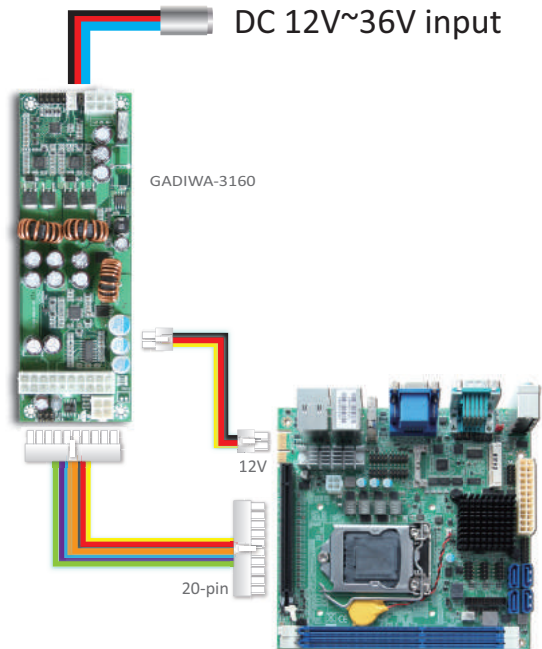
CHARACTERISTICS

Output Voltage	Current Range (forced air 10cfm)	Current Range (convection or high temperatures)
+12V	0~8A	0~6A
+5V	0~8A	0~6A
+3.3V	0~7A	0~5.25A
+5Vsb	0~2A	0~1.5A
-12V	0~0.15A	0~0.12A

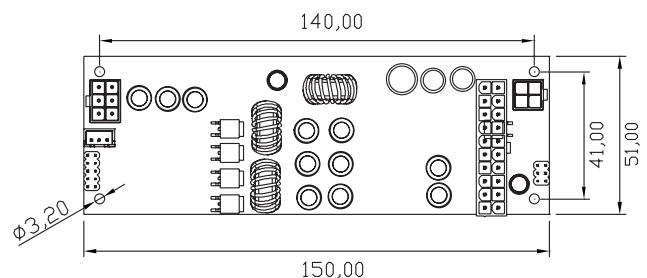
ORDERING GUIDE

- **GADIWA-3160**
128W DC/DC 12V~36V/wide-input, ATX/output, Board Type Converter

INSTALLING DEMOSTRATION



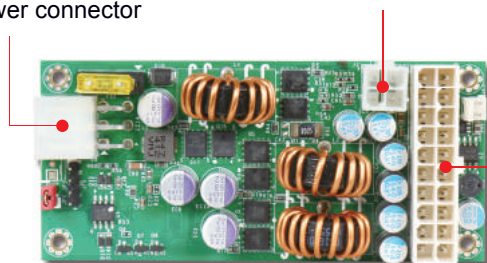
MECHANICAL DRAWING



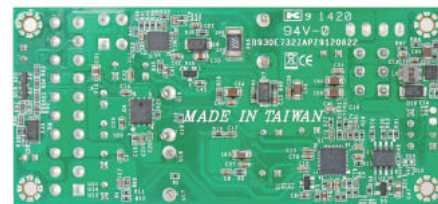


9V-29V / 6 pin input
power connector

12V / ATX 4 pin
output power connector



Main / Mini-Fit 20 pin
output power connector



GADIWA-B9120 is a DC to DC wide voltage input board type converter. It normally support continuous 120 Watts and peak 160 Watts.

GADIWA-B9120 can save more space and cost. It's not only capability for fan-less system but also suitability for different applications. Besides, the converter is made and tested by automatic production line; therefore, it can provide high quality and better performance.

FEATURES

- Compact and user-friendly design for installation and maintenance
- Small size for 1U or higher system to save space
- Suitable for Car PC, Steamer, Truck, Boat and Adapter
- Special design for delay-time
- Socket type fuse protection
- -40°C to 75°C wide temperature support

SPECIFICATION

Input Voltage	9V~29V
Output	120Watts / 160 Watts Peak
Efficiency	>90% @ 12V input, 120W output
MTBF	410,386hrs @ 55°C
EMI & Safety Approval	CE, FCC
Input Connector	9V~29V / 6 pin (P/N: B6902060)
Output Connector	ATX 20 pin + 12V 4 pin
Dimension (WxDxH)	100 x 45 x 22.5 mm
Operation Temperature	-40°C ~ 75°C

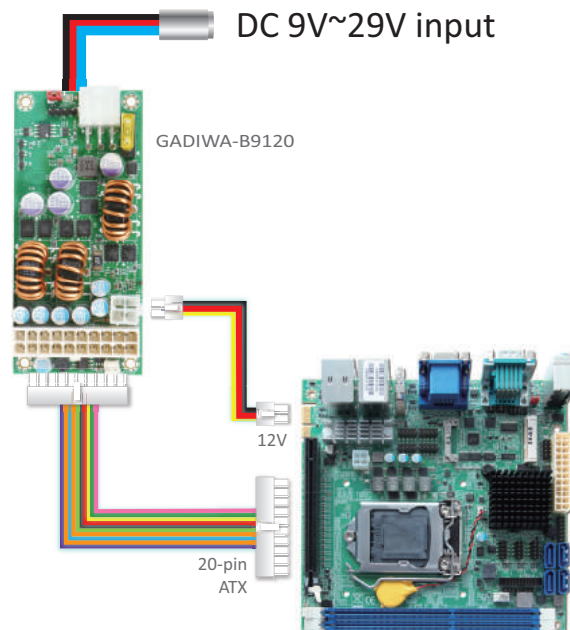
CHARACTERISTICS

Output Voltage	Load Regulation	Cross Regulation
+12V	0~6A	6A
+5V	0~6A	6A
+3.3V	0~6A	6A
+5Vsb	0~2A(Share with +5V)	2A(Share with +5V)
-12V	0~0.1A	0.1A

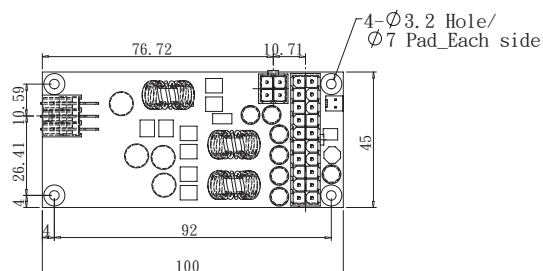
ORDERING GUIDE

- **GADIWA-B9120**
120W DC/DC 9V~29V/wide-input.ATX/output.Wide Temperature.Board Type Converter

INSTALLING DEMOSTRATION

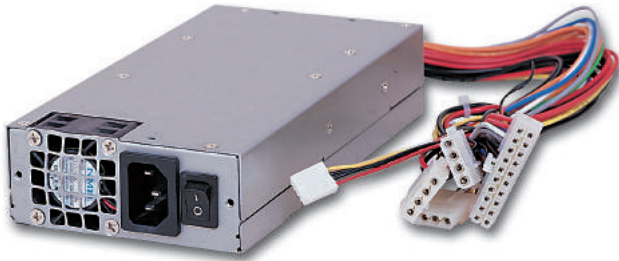


MECHANICAL DRAWING



ORION-A1501

150W 1U ATX power supply with active PFC



SPECIFICATION

Input Voltage	90V ~ 264V AC, full range
Input Frequency	47 ~ 63 Hz
Input Current	4A@115V, 2A@230V
Efficiency	> 65%
Holdup Time	16 ms. at full load
Over Voltage Protection	+5V: 5.6~6.6V; +3.3V: 3.6~4.2V; +12V: 13.2~14.6V
Over Power/Load Protection	Output power over 110% ~ 160%
MTBF	84,228 hrs
EMI & Safety Approval	UL, cUL, TUV, CE, FCC
Temperature/Humidity	Operating: 0°C ~ 40°C, 20% ~ 90%RH Storage: -20°C ~ 60°C, 5% ~ 95%RH
Dimension (WxDxH)	100 x 190 x 40 mm; 3.9" x 7.48" x 1.57"

FEATURES

- Low profile power supply suitable for 1U and node chassis
- Active PFC, full-range input
- Higher +5V and +3.3 V output
- Max. +5V standby output is 1.5A

DC OUTPUT

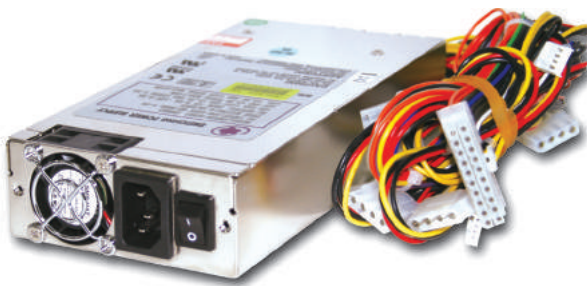
	+5V	+3.3V	+12V	-5V	-12V	+5Vsb
Max. Load	14A	10A	6A	0.5A	0.8A	1.5A
Min. Load	2A	1A	1A	0.1A	0.1A	0.1A
Max. Watt.	135W	135W	135W	2.5W	9.6W	7.5W
Load Reg.	±5%	±5%	±5%	±5%	±10%	±5%
Cross Reg.	±5%	±5%	±5%	±5%	±10%	±5%
Line Reg.	±1%	±1.5%	±0.8%	±1%	±1%	±1%
Ripple	±1%	±1.8%	±1%	±2%	±1%	±1.2%
Noise	±1.4%	±2.1%	±1%	±2%	±1%	±1.4%

ORDERING GUIDE

- **ORION-A1501**
150W 1U ATX power supply with active PFC

ORION-A2501

250W 1U ATX power supply with active PFC



SPECIFICATION

Input Voltage	90V ~ 264V AC, full range
Input Frequency	47 ~ 63 Hz
Input Current	6A@115V, 3A@230V
Efficiency	> 65%
Holdup Time	16 ms at full load
Over Voltage Protection	+5V: 5.4 ~ 6.5V; +3.3V: 3.9 ~ 4.4V; +12V: 13.6 ~ 15.6V
Over Power/Load Protection	Output power over 110% ~ 160%
MTBF	105,405 hrs
EMI & Safety Approval	UL, cUL, TUV, CE, FCC, CCC
Temperature/Humidity	Operating: 5°C ~ 40°C, 20% ~ 90%RH Storage: -20°C ~ 60°C, 5% ~ 95%RH
Dimension (WxDxH)	100 x 190 x 40.5 mm; 3.93" x 7.48" x 1.59"

FEATURES

- Low profile power supply suitable for 1U and node chassis
- Active PFC, full-range input
- Support for Intel® Pentium® 4 processor
- Total output power of +5V, +3.3V and +12V is 234W

DC OUTPUT

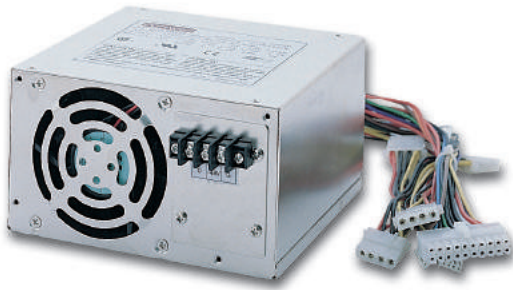
	+5V	+3.3V	+12V	-5V	-12V	+5Vsb
Max. Load	24A	20A	12A	0.5A	0.5A	1.5A
Min. Load	3A	1A	2A	0A	0A	0.1A
Load Reg.	±5%	±5%	±8%	±10%	±10%	±5%
Line Reg.	±1%	±1%	±1%	±1%	±1%	±1%
Ripple & Noise	80mv	80mv	120mv	150mv	150mv	80mv

ORDERING GUIDE

- **ORION 2501**
250W 1U ATX power supply with active PFC

ORION-300DX/24

300W 24V DC input DC/DC
PS/2 ATX power supply



SPECIFICATION

Input Voltage	19V~32V DC for ORION-300DX/24
Input Current	10A@-48V, 20A@24V DC input
Efficiency	> 65%
Holdup Time	16 ms
Over Voltage Protection	+5V: 5.7 ~ 7.0V
MTBF	100,000 hrs
EMI & Safety Approval	UL, TUV, CSA
Temperature/Humidity	Operating: 0°C ~ 40°C, 10% ~ 90%RH Storage: -60°C ~ 70°C, 5% ~ 95%RH
Dimension (WxDxH)	150 x 140 x 86 mm; 5.9" x 5.5" x 3.4"

FEATURES

- PS/2 ATX power supply suitable for 2U and larger chassis
- ORION-300DX/24 for +24V DC input, suitable for vehicle applications
- Max. -12V output is 2A, suitable for CTI application

DC OUTPUT

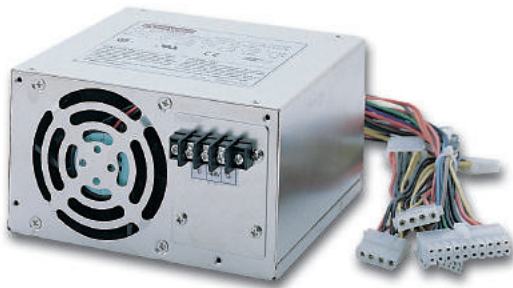
	+5V	+3.3V	+12V	-5V	-12V	+5Vsb
Max. Load	30A	15A	15A	2A	2A	1.2A
Min. Load	2A	0.3A	0.5A	0A	0A	0A
Load Reg.	±5%	±3%	±5%	±10%	±5%	±5%
Cross Reg.	±5%	±3%	±5%	±10%	±5%	±5%
Line Reg.	±1%	±1%	±1%	±1%	±1%	±1%
Ripple	±1%	±1.5%	±1%	±2%	±1%	±1%
Noise	±1%	±1.5%	±1%	±2%	±1%	±1%

ORDERING GUIDE

- **ORION-300DX/24**
300W 24V DC input DC/DC PS/2 ATX power supply

ORION-300DX/48

300W -48V DC input DC/DC
PS/2 ATX power supply



SPECIFICATION

Input Voltage	-40V~-72V DC for ORION-300DX/48
Input Current	10A@-48V, 20A@24V DC input
Efficiency	> 65%
Holdup Time	16 ms
Over Voltage Protection	+5V: 5.7 ~ 7.0V
MTBF	100,000 hrs
EMI & Safety Approval	UL, TUV, CSA
Temperature/Humidity	Operating: 0°C ~ 40°C, 10% ~ 90%RH Storage: -60°C ~ 70°C, 5% ~ 95%RH
Dimension (WxDxH)	150 x 140 x 86 mm; 5.9" x 5.5" x 3.4"

FEATURES

- PS/2 ATX power supply suitable for 2U and larger chassis
- ORION-300DX/48 for -48V DC input, suitable for telecommunication applications
- Max. -12V output is 2A, suitable for CTI application

DC OUTPUT

	+5V	+3.3V	+12V	-5V	-12V	+5Vsb
Max. Load	30A	15A	15A	2A	2A	1.2A
Min. Load	2A	0.3A	0.5A	0A	0A	0A
Load Reg.	±5%	±3%	±5%	±10%	±5%	±5%
Cross Reg.	±5%	±3%	±5%	±10%	±5%	±5%
Line Reg.	±1%	±1%	±1%	±1%	±1%	±1%
Ripple	±1%	±1.5%	±1%	±2%	±1%	±1%
Noise	±1%	±1.5%	±1%	±2%	±1%	±1%

ORDERING GUIDE

- **ORION-300DX/48**
300W -48V DC input DC/DC PS/2 ATX power supply

ORION-D3502P

350W+350W mini-redundant with active PFC power supply



SPECIFICATION

Input Voltage	100V~240V AC
Input Frequency	47 ~ 63 Hz
Input Current	6A@115V, 3A@230V
Efficiency	> 80%
Holdup Time	16 ms. at full load
Over Voltage Protection	3.3@4.5V; 5V@6.5V; 12V@14.5V
MTBF	> 100,000 hrs
EMI & Safety Approval	UL, cUL, TUV, CE, FCC
Temperature/Humidity	Operating: 0°C ~ 40°C, 20% ~ 90%RH Storage: -20°C ~ 60°C, 5% ~ 95%RH
Dimension (WxDxH)	150 x 190 x 84 mm; 5.9" x 7.2 x 3.4"

FEATURES

- Mini-redundant ATX power supply suitable for 2U and larger chassis
- Active PFC, full-range input
- Two independent AC inputs

DC OUTPUT

	+5V	+3.3V	+12V	-5V	-12V	+5Vsb
Max. Load	20A	20A	18A	0.5A	0.8A	2A
Min. Load	0.5A	0.5A	0.5A	0A	0A	0A
Load Reg.	±5%	±5%	±5%	±10%	±5%	±5%
Cross Reg.	±5%	±5%	±5%	±10%	±5%	±5%
Line Reg.	±1%	±1%	±1%	±1%	±1%	±1%
Ripple	50mv	50mv	120mv	200mv	200mv	50mv
Noise	50mv	50mv	120mv	200mv	200mv	50mv

ORDERING GUIDE

- **ORION-D3502P**
350W+350W mini-redundant power supply with active PFC (PS/2 bracket is available)

ORION-D4602P

460W+460W mini-redundant with active PFC power supply



SPECIFICATION

Input Voltage	90V ~ 264V AC, full range
Input Frequency	47 ~ 63 Hz
Input Current	9A@115V, 5A@230V
Efficiency	> 65%
Holdup Time	20 ms. at full load
Over Voltage Protection	+5V: 5.6 ~ 6.5V; +3.3V: 3.8 ~ 4.3V; +12V: 13.6 ~ 15.6V
Over Power/Load Protection	Output power over 110% ~ 130% on +3.3V/+5V; 120% ~ 150% on +12V
MTBF	100,000 hrs
EMI & Safety Approval	UL, TUV
Temperature/Humidity	Operating: 0°C ~ 40°C, 20% ~ 90%RH Storage: -40°C ~ 70°C, 5% ~ 95%RH
Dimension (WxDxH)	150 x 190 x 85 mm; 5.9" x 7.5" x 3.3"

FEATURES

- Mini-redundant power supply suitable for 2U/4U and larger chassis
- Active PFC, full-range input
- Two independent AC inputs

DC OUTPUT

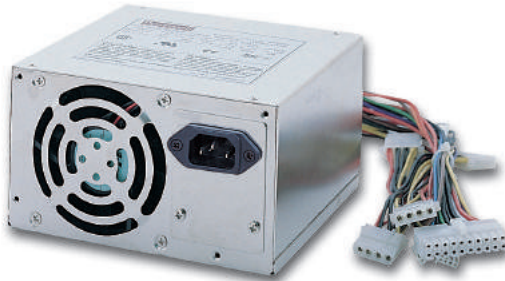
	+5V	+3.3V	+12V	-12V	+5Vsb
Max. Load	25A	25A	30A	0.8A	2A
Min. Load	2A	2A	2.5A	0A	0A
Max. Watt.	370W	370W	370W	9.6W	10W
Load Reg.	±5%	±5/-3%	±5%	±5%	±10%
Cross Reg.	±5%	±5/-3%	±5%	±5%	±5%
Line Reg.	±1%	±1%	±1%	±1%	±1%
Ripple	±1%	±1%	±1%	±1%	±1%
Noise	±1%	±1%	±1%	±2%	±1%

ORDERING GUIDE

- **ORION-D4602P**
460W+460W mini-redundant power supply with active PFC (PS/2 bracket is available)

MPM-842P

400W PS/2 ATX power supply with active PFC



SPECIFICATION

Input Voltage	90V ~ 264V AC, full range
Input Frequency	47 ~ 63 Hz
Input Current	7.5A@115V, 3.5A@230V
Efficiency	> 71%
Holdup Time	16 ms at full load
Over Voltage Protection	+5V: 4.75 ~ 5.25V; +3.3V: 3.14 ~ 3.47V; +12V: 11.4V ~ 12.6V
Over Power/Load Protection	Output power over 110% ~ 150%
MTBF	>160,000 hrs
EMI & Safety Approval	TUV, UL/cUL
Temperature/Humidity	Operating: 0°C ~ 40°C, 20% ~ 90%RH Storage: -20°C ~ 60°C, 5% ~ 95%RH
Dimension (WxDxH)	150 x 140 x 86 mm; 5.9" x 5.5" x 3.4"

FEATURES

- PS/2 ATX power supply suitable for 2U and larger chassis
- Active PFC, full-range input
- Support Intel® Pentium® 4 processor
- Max. 12V output is 22A
- Medical level power supply

DC OUTPUT

	+5V	+3.3V	+12V	-12V	+5Vsb
Max. Load	21A	22A	22A	0.8A	1.5A
Min. Load	0.3A	0.5A	1A	0A	0.1A
Load Reg.	±5%	±5%	±5%	±5%	±5%
Line Reg.	±1%	±1%	±1%	±1%	±1%
Ripple & Noise	50mv	50mv	120mv	120mv	50mv

ORDERING GUIDE

- **MPM-842P**
400W PS/2 ATX power supply with active PFC

MPI-815H

150W 1U ATX power supply with active PFC



SPECIFICATION

Input Voltage	90V ~ 264V AC, full range
Input Frequency	47 ~ 63 Hz
Input Current	6A@115V, 3A@230V
Efficiency	> 75%
Holdup Time	16 ms at full load
Over Voltage Protection	+5V: 5.7 ~ 6.5V; +3.3V: 3.9 ~ 4.3V; +12V: 13.6 ~ 15
Over Power/Load Protection	Output power over 110% ~ 150%
MTBF	>130,000 hrs
EMI & Safety Approval	UL
Temperature/Humidity	Operating: 0°C ~ 40°C, 20% ~ 90%RH Storage: -20°C ~ 60°C, 5% ~ 95%RH
Dimension (WxDxH)	198 x 93 x 40.5 mm; 7.8" x 3.66" x 1.6"

FEATURES

- 1U ATX power supply
- Full-range input
- Max. +5V standby output is 14A
- Thermal protection
- +5V standby & remote On/Off

DC OUTPUT

	+5V	+3.3V	+12V	-12V	+5Vsb
Max. Load	14A	12A	10A	1A	1.5A
Min. Load	1A	0A	0A	0A	0A
Load Reg.	±2%	±5%	±5%	±5%	±5%
Line Reg.	±1%	±1%	±1%	±1%	±1%
Ripple & Noise	50mv	50mv	100mv	150mv	100mv

ORDERING GUIDE

- **MPI-815H**
150W fanless, 1U, ATX power supply

MPI-810H

120W universal input open-frame power supply



SPECIFICATION

Input Voltage	90 ~ 260V AC
Input Frequency	47 ~ 63 Hz
Input Current	3A@115VAC or 1.5A@230VAC
Efficiency	> 70%
Holdup Time	16 ms at full load
Over Voltage Protection	+5V: 5.6 ~ 6.6V; +3.3V: 3.6 ~ 4.2V; +12V: 13.2 ~ 14.6V
Over Power/Load Protection	Output power over 110% ~ 160%
MTBF	130,000 hrs
EMI & Safety Approval	UL, VDE, CSA
Temperature/Humidity	Operating: 0°C ~ 50°C, 20% ~ 90%RH Storage: -20°C ~ 70°C, 5% ~ 95%RH
Dimension (WxDxH)	83.8 x 152.4 x 38.1 mm; 3.3" x 6" x 1.5"

FEATURES

- 3.3" x 6" open-frame power supply suitable for node chassis
- Five rails outputs
- (+5V, +12V, -12V, +3.3V & +5Vsb)
- Universal AC input
- Higher +5V output (14A)

DC OUTPUT

	+5V	+3.3	+12V	-12V	+5Vsb
Max. Load	14A	12A	6A	1A	0.75A
Min. Load	1A	0A	0A	0A	0A
Load Reg.	±3%	±5%	±5%	±5%	±5%
Line Reg.	±1%	±1%	±1%	±1%	±1%
Ripple	50mv	50mv	120mv	200mv	

ORDERING GUIDE

- **MPI-810H**
120W universal input open-frame power supply

MPD-810H

120W universal input open-frame, DC to DC power supply



SPECIFICATION

Input Voltage	10V ~ 30V DC
Input Frequency	47 ~ 63 Hz
Input Current	18A@10V DC
Efficiency	> 70%
Holdup Time	16 ms at full load
Over Voltage Protection	+5V: 5.6 ~ 6.6V; +3.3V: 3.6 ~ 4.2V; +12V: 13.2 ~ 14.6V
Over Power/Load Protection	Output power over 110% ~ 160%
MTBF	130,000 hrs
EMI & Safety Approval	UL
Temperature/Humidity	Operating: 0°C ~ 50°C, 20% ~ 90%RH Storage: -20°C ~ 70°C, 5% ~ 95%RH
Dimension (WxDxH)	83.8 x 152.4 x 38.1 mm; 3.3" x 6" x 1.5"

FEATURES

- Open-frame DC to DC power supply suitable for node chassis
- Five rails outputs (+5V, +12V, -12V, +3.3V & +5Vsb)
- 10~30 VDC input
- Higher +5V output (10A)

DC OUTPUT

	+5V	+3.3	+12V	-12V	+5Vsb
Max. Load	10A	8A	4A	1A	0.75A
Min. Load	1A	0A	0A	0A	0A
Load Reg.	±2%	±5%	±5%	±5%	
Line Reg.	±2.5%	±2.5%	±2.2%	±2.5%	±2.5%
Ripple	100mv	100mv	120mv	200mv	

ORDERING GUIDE

- **MPD-810H**
120W 10~30VDC input open-frame power supply



MPE-008A-P

80W universal input open-frame power supply



SPECIFICATION

Input Voltage	90V ~ 264V AC
Input Frequency	47 ~ 63 Hz
Input Current	2A@115V; 1A@230V
Efficiency	> 80%
Holdup Time	16 ms at full load
Over Voltage Protection	Automatic recovery up on of over voltage condition. Trigger point is at about 5.8V ~ 6.8V
MTBF	130,000 hrs
EMI & Safety Approval	UL, cUL, TUV, CE, CCC
Temperature/Humidity	Operating: -20°C ~ 50°C, 5% ~ 95%RH Storage: -20°C ~ 85°C, 5% ~ 95%RH
Dimension (WxDxH)	50.8 x 127 x 40 mm; 2.0" x 5" x 1.57"

FEATURES

- 60W convection cooling and 80W forced air-cooling
- Conductive EMI Meets CISPR/FCC Class B
- 2" x 5" compact size dual output
- A ray leakage current <100uA

DC OUTPUT

	5V	+12V
Max. Load	5A	5A
Min. Load	0A	0A
Load Reg.	±3%	±3%
Line Reg.	±1%	±1%
Ripple	50mv	120mv
Noise	50mv	120mv

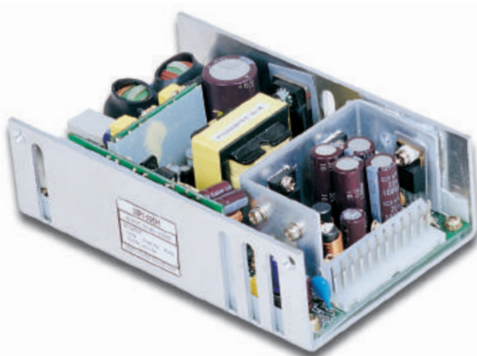
ORDERING GUIDE

- **MPE-008A-P**
80W universal input open-frame power supply



MPI-806H

60W universal input open-frame power supply



SPECIFICATION

Input Voltage	90V ~ 264V AC
Input Frequency	47 ~ 63 Hz
Input Current	2A@115V, 1A@230V
Efficiency	> 70%
Holdup Time	20 ms. at full load
Over Voltage Protection	+5V: 5.15 ~ 6.45V; +3.3V: 3.7 ~ 4.5V; +12V: 12.6 ~ 15.6V
Over Power/Load Protection	Output power over 120%
MTBF	130,000 hrs
EMI & Safety Approval	UL, TUV
Temperature/Humidity	Operating: 0°C ~ 40°C, 20% ~ 90%RH Storage: -20°C ~ 60°C, 5% ~ 95%RH
Dimension (WxDxH)	128 x 81 x 40 mm; 5.0" x 3.2" x 1.55"

FEATURES

- 80W with 8.6CFM forced air-cooling
- Compact size with ATX output
- PG/PF signal
- +5V standby & remote on/off

DC OUTPUT

	+5V	+3.3V	+12V	-12V	+5Vsb
Max. Load	8A	6A	3A	0.5A	0.75A
Min. Load	1A	0A	0A	0A	0A
Load Reg.	±2%	±4%	±4%	±5%	±4%
Line Reg.	±1%	±1%	±1%	±1%	±1%
Ripple	50mv	50mv	120mv	120mv	120mv
Noise	±1%	±1%	±1%	±2%	±1%

ORDERING GUIDE

- **MPI-806H**
60W ATX, open-frame power supply

Industrial Power Adapter

APH-3034

40W DC-Plug with Screw Power Adapter



FEATURES

- Efficiency: Meet CEC (California Energy Commission)
- Low Ripple& Noise, 120mV
- Short Circuit Protection
- Over Current Protection 5.5A(Max.)
- Over Voltage Protection 22Vdc Max. (Upper Trip limit)
- No Load Power Consumption \leq 0.06W
- DC plug with screw for securing

SPECIFICATION

AC Input Voltage	90V ~ 264V
DC Output Voltage	12V
Output Load	3.33A
Output Regulation	11.4V~12.6V
Efficiency	>83.1%, 115V@60Hz, 230V@50Hz
MTBF	100,000 hrs@25°C
EMI & Safety Approval	UL, cUL, TUV, CE, FCC, CB, CCC, KCC
Dimension	110(w) x 50(d) x 31.5(h) mm

APH-3038

60W DC-Plug with Screw Power Adapter



FEATURES

- Efficiency: Meet CEC (California Energy Commission)
- Low Ripple& Noise
- Short Circuit Protection
- Over Current Protection 10A(Max.)
- Over Voltage Protection 18Vdc Max. (Upper Trip limit)
- No Load Power Consumption \leq 0.5W
- DC plug with screw for securing

SPECIFICATION

AC Input Voltage	90V ~ 264V
DC Output Voltage	12V
Output Load	5A
Output Regulation	11.4V~12.6V
Efficiency	>87%, 115V@60Hz, 230V@50Hz
MTBF	60,000 hrs@25°C
EMI & Safety Approval	UL, cUL, TUV, CE, FCC, CB, CCC
Dimension	110(w) x 62(d) x 31.5(h) mm

APH-3039

120W DC-Plug with Screw Power Adapter



FEATURES

- Efficiency: Meet CEC (California Energy Commission)
- Low Ripple& Noise
- Short Circuit Protection
- Over Current Protection, Shutdown and no damage
- Over Voltage Protection 17Vdc Max. (Upper Trip limit)
- Over Temperature Protection (No fire, no smoke)
- No Load Power Consumption \leq 0.5W
- DC plug with screw for securing

SPECIFICATION

AC Input Voltage	90V ~ 264V
DC Output Voltage	12V
Output Load	10A
Output Regulation	11.4V~12.6V
Efficiency	>86%, 100V@60Hz, 240V@50Hz
MTBF	100,000 hrs@25°C
EMI & Safety Approval	UL, cUL, TUV, CE, FCC, CB
Dimension	171(w) x 72(d) x 42(h) mm

APH-3028

150W DC-Plug Power Adapter



FEATURES

- Efficiency: Meet CEC (California Energy Commission)
- Low Ripple& Noise
- Short Circuit Protection
- Over Current Protection, Shutdown and no damage
- Over Voltage Protection 17Vdc Max. (Upper Trip limit)
- Over Temperature Protection (No fire, no smoke)
- No Load Power Consumption \leq 0.5W
- DIN plug connector for power DIN plug (with lock)

SPECIFICATION

AC Input Voltage	90V ~ 264V
DC Output Voltage	12V
Output Load	12.5A
Output Regulation	11.4V~12.6V
Efficiency	>86%, 100V@60Hz, 240V@50Hz
MTBF	43,800 hrs@25°C
EMI & Safety Approval	UL, cUL, TUV, CE, FCC, CB
Dimension	171(w) x 72(d) x 40(h) mm



Further Contact

Completed Technical Service-In order to ensure that customers can get the right and speedy service from Portwell, we do offer the following services to meet your needs.



Logistics Service

It is not only for the scalable or world-grade customers, we offer the service to our partners who need the world-wide delivery to save time and expense.



Consulting Service

Our engineering experts provide a free service to discuss with you the projects or technologies that you need in a short period of time. Please visit Portwell web and click the button, then the on-line service will appear for you.



Product Service

We have the experienced product managers who can help you to get the right products in our list and also the related information to complete your solution.



Manufacturing Service

Portwell has the most advanced manufacturing facilities to produce the quality product for your application or business. Please pay a visit to our Portwell engine, you will know how best that we can do for you.



Design Service

If our existing products cannot meet your requirements, a customized design service can be initiated to build the exact products that you demand.

Both Portwell RDC & SIC are set for the completed service to our customers & Partners. Your any requirements or technical issues are welcome to contact us for further solution. Our service can be arranged in the following ways.

Web Service

Portwell already set up the contact for our technology service on the air. Please just visit our web on the internet and left the message for further contact by our people. Besides, you also can get the on-line consulting service via Skype or the phone if the immediate service is needed.

Extended Visits to PE

Some idea or issue is not easy to have the solution within short period of time. Portwell has the necessary facility and dormitory for customers or partners who need to stay with us for a period of time. Please contact us and our service people will give you the message for it.

Direct Contact

Portwell welcomes our customers to visit our Laboratory for the regulation test or design service. We believe that it is the fastest way to solve your questions and achieve the right solution. Just call or mail us; you will have the right service immediately.



Live Chat (Skype)

You can get the on-line consulting service via Skype if an immediate response is needed.

<http://www.portwell.com.tw/support/LiveChat.php>



Global Service (Telephone)

In addition, you can get immediate support via telephone. Check the web site for phone numbers.

<http://www.portwell.com.tw/contact/worldwide.html>



E-Mail

Portwell's technical support department can be reached by e-mail as follows

TSD@portwell.com.tw



www.portwell.com.tw



Portwell, Inc. (Headquarters)

No. 242, Bo'AI St., Shu-Lin Dist,
New Taipei City 238, Taiwan
Tel: +886-2-77318888
Fax: +886-2-77319888
E-mail: info@portwell.com.tw
<http://www.portwell.com.tw>

Americas

American Portwell (Fremont, CA)

44200 Christy St., Fremont, CA 94538,
USA
Tel: +1-510-403-3399
Fax: +1-510-403-3184
E-mail: info@portwell.com
<http://www.portwell.com>

Portwell Latin America (Brazil)

Av. Paulista, 1274 - 13 andar, CEP
01310-200, Sao Paulo
Tel: +55(11) 2309-3513
<http://www.portwell.com.tw>

India

Portwell India Technology

2nd Floor, 5M-665, 5th Main Road,
OMBR Layout, Banaswadi, Bangalore
-560043, India
Tel: +91-80-41684255
E-mail: info@portwell.in
<http://www.portwell.in>

China

Beijing Portwell

4F, Building 5, Qunying Zone,
Chuangye Rd. 8, Shangdi, Haidian
District Beijing 100085, China
Tel: +86-10-8270-1616
Fax: +86-10-8270-0606
E-mail: info@portwell.com.cn
<http://www.portwell.com.cn>

Shanghai Portwell

5F, 507/516, 280 Song Wei, North
Road, Songjiang District, Shanghai,
201613, China
Tel: +86-21-6772-2025
Fax: +86-21-6772-2027
E-mail: info@portwell.com.cn
<http://www.portwell.com.cn>

Europe

Portwell (UK) Ltd.

Office TH2
Trident House, Trident Park Basil
Hill Road, Didcot, OX11 7HJ, UK
Tel: +44(0)1235-750760
Fax: +44(0)1235-750761
E-mail: info@portwell.co.uk
<http://www.portwell.co.uk>

Europe

European Portwell

Haverstraat 10,
Nieuw-Vennep, 2153 GB,
Netherlands
Tel: +31-252-620790
Fax: +31-252-621325
E-mail: info@portwell.eu
<http://www.portwell.eu>

Portwell Deutschland GmbH

Otto-Hahn-Strasse 48, 63303
Dreieich
Tel: +49-8131-4305416
Fax: +31-252-621325
E-mail: info@portwell.eu
<http://www.portwell.eu>

Portwell Embedded Logic

Am Kroit 25-27, D-83123
Amerang (MUC)
Tel: +49-8075-91-4400
Fax: +49-8075-91-4409
E-mail: info@portwell.eu
<http://www.embedded-logic.de>

Japan

Portwell Japan, Inc. (Tokyo)

〒101-0042 Showa Kanda Bldg,
10-2 Kanda Higashi Matsusita-cho
Chiyoda-ku, Tokyo, Japan
Tel: +81-3-5298-8071
Fax: +81-3-5298-8072
E-mail: info@portwell.co.jp
<http://www.portwell.co.jp>

Portwell Japan, Inc. (Osaka)

〒532-0004 Ste.501 Nippo Shin-osaka
Da-2 Bldg, 1-3-33 Nishi-Miyahara,
Yodogawa-ku Osaka Japan
Tel: +81-6-4807-7721
Fax: +81-6-4807-7720
E-mail: info@portwell.co.jp
<http://www.portwell.co.jp>